advancing with ESIF financial instruments

Stocktaking study on financial instruments by sector

Progress to date, market needs and implications for financial instruments

Final report

European Commission

European Investment Bank The EU bank

Table of Contents

Table of Figures

Table of Tables

Table of Boxes

Glossary, acronyms and definition of terms

Expression	Explanation
BGK	'*Bank Gospodarstwa Krajowego*', the Polish National Promotional Bank
Broadband	High-speed data transmission in which a single cable can carry a large amount of data at once.
Broadband coverage	The percentage of households that can be connected to the internet compared to the total number of households.
CAGR	Compound Annual Growth Rate
CEBF	Connecting Europe Broadband Fund
CEF	Connecting Europe Facility
CF	Cohesion Fund
CO	Carbon monoxide
COSME	Competitiveness of Enterprises and Small and Medium-sized Enterprises
CPR	Common Provisions Regulation Regulation (EU) No 1303/2013 of the European Parliament and of the Council of 17 December 2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) No 1083/2006
DBFMO	PPPs where the private party designs, builds, finances, maintains and operates the asset
DG EMPL	Directorate-General for Employment, Social Affairs and Inclusion of the EC
DG REGIO	Directorate-General for Regional and Urban Policy of the EC
DOCSIS 3.0	Data Over Cable Service Interface Specification
DSL	Digital Subscriber Line
EAFRD	European Agricultural Fund for Rural Development
EAP	Environment Action Programme
EBRD	European Bank for Reconstruction and Development
EC	European Commission

Expression	Explanation
EE	Energy Efficiency
EEA	European Environmental Agency
EECC	European Electronic Communications Code
EFG	COSME Equity Facility for Growth
EFSI	European Fund for Strategic Investment
EIB	European Investment Bank
EIF	European Investment Fund
EMFF	European Maritime and Fisheries Fund
EPC	Energy Performance Contract(s) / Contracting
ERDF	European Regional Development Fund
ESCO	Energy Service Company
ESF	European Social Fund
ESIF / ESI Funds	European Structural and Investment Funds
EU	European Union
FA(s)	Funding Agreement(s)
FI(s)	Financial instrument(s) Financial instruments are '*Union measures of financial support provided on a complementary basis from the budget to address one or more specific policy objectives of the Union. Such instruments may take the form of equity or quasi-equity investments, loans or guarantees, or other risk-sharing instruments, and may, where appropriate, be combined with grants*' (Article 2(p) Financial Regulation; Article 37(7)(8)(9) CPR).
FoF	Fund-of-Funds
FTTP	Fibre-To-The-Premise
GBER	General Block Exemption Regulation [Regulation (EU) No 651/2014 of June 2014]
Gb	Gigabits
Gbps	A unit of data transfer equal to 1 000 000 000 bits *per* second
GDP	Gross Domestic Product
GNI	Gross National Income

Expression	Explanation
GW	Gigawatt
GWh	Gigawatt-hour
IB(s)	Intermediate Body(ies)
ICT	Information and Communication Technologies
IFI(s)	International Financial Institution(s)
Innovation	New or significantly improved product (good or service) introduced to the market, or the introduction within an enterprise of a new or significantly improved process[1]
INVEGA	'*Investicijų ir Verslo Garantijos*', the Lithuanian National Promotional Bank
IP(s)	Investment Platform(s)
JEREMIE	Joint European Resources for Micro to Medium Enterprises
JESSICA	Joint European Support for Sustainable Investment in City Areas
KET(s)	Key Enabling Technology(ies)
KfW	'*Kreditanstalt für Wiederaufbau*', the German National Promotional Bank
LCoE	Levelised Cost of Energy
LGF	COSME Loan Guarantee Facility
LTE	Long-Term Evolution
MA(s)	Managing Authority(ies)
Mb	Megabits
Mbps	A unit of data transfer equal to 1 000 000 bits *per* second
MFB	'*Magyar Fejlesztési Bank*', the Hungarian National Promotional Bank
MS	Member State(s)
MW	Megawatt
MWh	Megawatt-hour
NGA	Next Generation Access
NCFF	Natural Capital Financing Facility

[1] The Measurement of Scientific and Technological Activities. Oslo Manual. A joint publication of OECD and Eurostat, 2005. Available here: https://circabc.europa.eu/sd/a/ba5badd1-f834-4677-81f0-a1a6138c7f1a/Oslo%20Manual.pdf.

Expression	Explanation
NH_3	Ammonia
NMVOC	Non-methane volatile organic compounds
NO_2	Nitrogen dioxide
NREAP(s)	National Renewable Energy Action Plan(s)
NUTS	Nomenclature of Territorial Units for Statistics
NPB(s) / NPI(s) / NPBI(s)	National Promotional Bank(s) National Promotional Institution(s) According to Article 2(3) of Regulation (EU) No 2015/1017 (the EFSI Regulation), '*National Promotional Banks or Institutions' means legal entities carrying out financial activities on a professional basis which are given a mandate by a Member State or a Member State's entity at central, regional or local level, to carry out development or promotional activities*.
OECD	Organisation for Economic Co-operation and Development
OP(s)	Operational Programme(s)
PE	Private Equity
$PM_{2.5}$	Particulate matter (2.5 micrometres or smaller)
PM_{10}	Particulate matter (10 micrometres or smaller)
PPP(s)	Public-Private Partnership(s)
PVs	Photovoltaics
R&D	Research and Development 'Research and Development' is a term covering three activities: (i) basic research, (ii) applied research, and (iii) experimental development[2]. 'Basic research' comprises experimental work undertaken to acquire new knowledge. 'Applied research' is directed towards a specific practical objective. 'Experimental development' is systematic work drawing from existing knowledge gained from research activities.
R&D intensity	Gross domestic expenditure on R&D as a percentage of GDP[3]
RDI	Research, Development and Innovation
RE	Renewable Energy
RES	Renewable Energy Source(s)

[2] Glossary of Statistical terms. Research and development. OECD. Last updated on June 1, 2013. Available here: https://stats.oecd.org/glossary/detail.asp?ID=3111.

[3] Europe 2020 indicators – R&D and innovation. Eurostat. Available here: https://ec.europa.eu/eurostat/statistics-explained/index.php/Europe_2020_indicators_-_R%26D_and_innovation.

Expression	Explanation
ROI	Return on Investment
SFC	System for Fund Management (in the EU)
SME(s)	Small and Medium-sized Enterprise(s)
SO_2	Sulphur dioxide
SPV(s)	Special Purpose Vehicle(s)
TA	Technical Assistance
TEN-T	Trans-European Transport Network(s)
TFEU	Treaty on the Functioning of the European Union
TO(s)	Thematic Objective(s)
TWh	Terawatt-hour
UDT	Urban Development and Transport
UIA	Urban Innovative Action
UK	United Kingdom
Uptake / penetration / subscription rate	The percentage of households with an internet subscription compared to the total number of households.
US(A)	United States of America
VC	Venture Capital
VDSL	Very high speed Digital Subscriber Line
WiMAX	Worldwide interoperability for Microwave Access
YEI	Youth Employment Initiative

Executive Summary

This stocktaking study conducted by *fi-compass* aims to assist the European Commission (EC) and other stakeholders involved in the development of financial instruments – especially managing authorities – in gaining, firstly, a better understanding of the sectors which have not yet, or only to a lesser extent, been supported by financial instruments in the 2014-2020 programming period. Secondly, the study aims to explore the reasons for this and develop an understanding of the sectors where there are continued investment opportunities still in the 2014-2020 programming period and/or sectors where new investment opportunities are expected to arise in the future. Finally, the study considers the scope to expand financial instruments in these sectors in the short- and medium-term, including in the next Multiannual Financial Framework (MFF).

The study focuses on five sectors deemed to have potential for more use of financial instruments, being:

- **Renewable Energy** (RE);
- **Urban Development and Transport** (UDT);
- **Environment** (including air, water and waste);
- **Information and Communications Technology** (ICT) **infrastructure**; and
- **Research, Development and Innovation in Small and Medium-sized Enterprises** (RDI in SMEs).

The following activities have been performed for these five sectors:

- An analysis of existing investment gaps and/or anticipated future **investment opportunities**;
- Identification of **key hindering factors** (sectoral and horizontal) for the use of financial instruments;
- Outlining of **key enabling factors** for the uptake of financial instruments (*i.e.* sectoral pre-requisites and/or facilitating horizontal measures);
- Preparation of **case studies** on financial instruments (one case study per sector);
- Formulation of **policy recommendations** for the development of European Regional Development Fund (ERDF) / Cohesion Fund (CF) supported financial instruments.

A quantitative data analysis and a qualitative analysis have been performed for this study. The **quantitative data analysis** consisted of using the financial data that the Member States submit to the EC for monitoring / reporting purposes in relation to the implementation of their Operational Programmes, covering both grants and financial instruments. The cut-off date of the data analysed was 31 December 2017. In addition, several **qualitative data analysis** tools have been used: a literature review, 28 interviews, five sectoral focus groups, five case studies, and an online survey conducted between December 2018 and February 2019. The online survey was addressed to all types of European Union (EU) stakeholders involved in ERDF / CF financial instruments in the five sectors. Almost 130 responses were received in total.

Each sector is analysed in detail in this study. This Executive Summary provides an overview of these five sectors.

The use of ERDF / CF-supported financial instruments in the five sectors

EU-wide nominal amounts programmed *via* financial instruments in the five sectors represent, in total, EUR 3.3 billion[4]**. This amount still remains quite small in comparison, however, with the total amounts programmed of EUR 108.3 billion** (*i.e.* grants and financial instruments together). This discrepancy is particularly striking in the UDT and Environment sectors, where grants remain, by far, the main form of ERDF and CF funding.

[4] As mentioned, the cut-off date of the data analysed in the present stocktaking study was 31 December 2017. The quantitative data analysis performed in this study consisted in using the financial data that Member States regularly send to the European Commission for monitoring / reporting purposes in relation to the implementation of their Operational Programmes.

Thirteen Member States have developed financial instruments in one or more of these five sectors, and the **'RDI in SMEs' sector is the only one supported by all thirteen Member States**.

ERDF / CF supported financial instruments for SME financing (and especially 'general SME financing' under Thematic Objective 3) **appear to act as an 'entry door'** to the development of financial instruments supporting other sectors, including the five sectors analysed. Indeed, in many cases, **the development of financial instruments in the five sectors analysed often seem to result from Member States and managing authorities who have existing experience with ERDF / CF supported financial instruments for SMEs, and wish to use this experience for additional sectors** (such as the ones analysed in this stocktaking study).

The 'less developed' regions are where the use of financial instruments is the most distributed across the five sectors; **whilst the 'transition' and 'more developed' regions focus primarily on the 'RDI in SMEs' and UDT sectors**.

Ten Member States have developed financial instruments in sectors other than the five analysed in this study. These Member States may consider these five sectors as:

- Inappropriate for financial instruments; and/or
- Outside their competence area due to lack of knowledge / experience.

Many Member States seemingly still need to be convinced of the rationale, relevance and viability of using financial instruments in at least four of the five sectors (with the exception of the 'RDI in SMEs' sector, where the revolving and leverage features of financial instruments appear to be already well understood and appreciated).

Barriers common to the five sectors

The stakeholders that did not consider or take forward the use financial instruments in the five sectors have reported similar challenges. These often related to**:**

- **Insufficient political support** (*i.e.* support from the political sphere to provide impetus for the development of the instruments);
- **Lack of market sponsoring** (*i.e.* sponsor needed from market stakeholders like future final recipients and/or potential financial intermediaries); and
- Perceived **administrative complexity**.

The **top five challenges experienced during the design / set-up phases of the financial instruments** implemented during the 2014-2020 programming period, identified in the five sectors analysed were:

- Difficulty to understand and/or comply with **State aid** rules;
- Difficulty to understand and/or comply with the **regulatory framework at the EU level**;
- Issues related to a **time consuming process** given the sector specificities;
- Difficulty to understand and/or comply with **regulatory constraints at the local level**; and
- The **administrative complexity** given the sector specificities.

The **main challenge experienced during the implementation** of financial instruments in the five sectors analysed relates to difficulties in **integrating financial instruments into the current environment of grants**.

In addition to these transversal barriers, the analyses undertaken for each sector revealed a number of barriers whose relevance or impact varies between sectors. These barriers may be grouped into two categories:

- Barriers hindering investments in the sectors more generally. These barriers do not only relate to financial instruments but it is important to understand them in order to assess why such financing schemes are not as developed as they could; and
- Barriers hindering the uptake of ERDF / CF supported financial instruments, which relate to the design, set-up and implementation of such financing schemes in each sector.

The table below synthesises these barriers and indicates their relative impact on the development / deployment of financial instruments in each of the five sectors.

Table 1: Overview of the main barriers for the uptake of ERDF / CF-supported financial instruments in the five sectors

Barrier	RE	UDT	Environment	ICT infrastructure	RDI in SMEs
Barriers hindering investments in the sectors – Part 1					
Uncertain sectoral regulatory framework	▲	▲ especially in transport	▲	▲	△
Administrative burden / complexity related to the sector (including permit regulations)	▲	▲	▲	▲	△
Regulatory constraints induced by other sectors	▲	▲	▲	▲	▲
Emerging technologies (leading to uncertain return on investment, appraisal challenges, uncertainty on commercialisation, and difficulties in sourcing financing)	▲	▲ especially in transport	▲	▲	▲
Competition with existing technologies proposed by incumbents	△	△	△	▲	△
High up-front development costs and long investment horizons	▲	▲	▲	▲	△
Limited revenue generation potential	△	△	▲	▲ in sparsely populated areas	△
Stranded assets risk (dependent on regulatory and technology changes)	▲	▲ especially in transport	▲	▲	▲
Municipal budgetary constraints	▲	▲	▲	N/A	N/A
Limited (but needed) incentives to invest	▲	△	▲	▲	▲
Limited experience and credibility in developing a project pipeline (critical mass)	▲	▲	▲	▲ especially smaller scale projects	△ or ▲ depending on the MS
Uncertain and limited future demand	▲	△	△	▲	▲
Lack of technical sectoral support (other than projects pipeline development)	▲	▲	▲	▲	▲

Legend:

N/A	Not applicable
△	No or insignificant impact of this barrier in the decision-making process or in deployment of a financial instrument in this given sector.
▲	Limited impact of this barrier in the decision-making process or in deployment of a financial instrument in this given sector.
▲	Noticeable impact of this barrier in the decision-making process or in deployment of a financial instrument in this given sector.
▲	Important impact of this barrier, potentially preventing the decision to deploy a financial instrument in this given sector.

Source: fi-compass*, 2020.*

Barrier	RE	UDT	Environment	ICT infrastructure	RDI in SMEs
Barriers hindering the uptake of ERDF / CF-supported financial instruments in the sectors – Part 2					
Difficulties in operationalising policy goals	▲	▲	▲	▲	▲
Insufficient political support to develop financial instruments in the sector	▲	▲	▲	▲	▲
Regulatory constraints related to ERDF in regards to market practice	▲	▲	▲	△	▲
Difficulties with State aid compliance and cumulation of State aid	▲	▲	▲	▲	▲
Misalignment between the EU-level and the national regulations	▲	△	▲	△	▲
Fragmentation of European Structural and Investment Funds (ESIF) resources and unnecessary restriction in eligibility	▲	▲	▲	△	▲
Competition with grants, subsidies, and other financial instruments (and lack of effective combination with grants)	▲	▲	▲	△	▲
Limited awareness of financial instruments' potential among the key stakeholders	▲	▲	▲	▲	▲
Limited availability of financial advisory support	▲	▲	▲	▲	△
Difficulties in ensuring the appropriate co-financing / leverage effect	▲	▲	▲	▲	▲
Limited existence / capacity / involvement of financial intermediaries in sector	▲	▲	▲	▲	△ or ▲ depending on the MS

Legend:

N/A	Not applicable
△	No or insignificant impact of this barrier in the decision-making process or in deployment of a financial instrument in this given sector.
▲	Limited impact of this barrier in the decision-making process or in deployment of a financial instrument in this given sector.
▲	Noticeable impact of this barrier in the decision-making process or in deployment of a financial instrument in this given sector.
▲	Important impact of this barrier, potentially preventing the decision to deploy a financial instrument in this given sector.

Source: fi-compass*, 2020.*

Some of the barriers presented in the table above may be considered within the control / influence of the managing authorities. In some instances, however, the barriers may also be within the control/influence of other public sector authorities, thus adding to the (perceived) complexity of implementing financial instruments. Addressing these barriers could lead to a higher prioritisation of the use of financial instruments in these sectors during the 2021-2027 programming period. As illustrated in the table, these barriers include for instance:

- **Administrative burden / complexity** and **regulatory constraints**, when such complexity / constraints relate to national regulations in relation to the sector targeted by the financial instruments, or to other sectors impacting these financial instruments (potentially within the control / influence of other public bodies);
- **Limited (but necessary) incentives** to invest in the sector, such as, in the RE sector, subsidies for electricity generation in the form of feed-in tariffs or green certificates, or, as in the case of the 'ICT infrastructure', sector vouchers covering subscription fees for an initial period or to cover costs to connect to the main network (potentially in the competence of other public bodies);
- **Lack of sectoral knowledge / capacity**, such as, in the `Environment sector', limited administrative capacity to plan and procure complex environmental infrastructure projects, *i.a.* through Public-Private Partnerships (PPPs), or, in the 'ICT infrastructure' sector, limited capacity among financial intermediaries to understand the features and risks of the sector;
- **Difficulties in operationalising policy goals** and aligning sectoral strategies with the Operational Programmes;
- **Limited experience and capacity in developing a network of market players which would develop a project pipeline** suitable for financial instrument support;
- **Insufficient political support to develop financial instruments in the sector**;
- **Fragmentation of ESIF resources**, which requires Operational Programmes to be drafted in a more cross-sectoral manner to facilitate better the use of financial instruments; and
- **Limited awareness of financial instruments' potential among key stakeholders**, requiring greater awareness raising.

When considering the 2021-2027 programming period, almost 70% of respondents to the online survey have considered the implementation of financial instruments under shared management with the support of ERDF or CF funding. It seems that the managing authorities will base their **future decision to develop financial instruments in the 2021-2027 programming period on technical aspects**, **as well as on their existing experience in the given sector**. This illustrates a **rational decision-making process**. It however also illustrates that **extending the use of financial instruments to sectors where such use was limited in the past** (such as the RE, the Environment, and the 'ICT infrastructure' sectors in the 2014-2020 programming period) **would require substantiated technical arguments favouring such use, educational and communication activities in regards to local market environments, the development of awareness raising activities presenting the opportunities offered by financial instruments in these sectors, and probably technical support in the design and implementation of financial instruments in these sectors**. Such technical support would include:

- Knowledge-sharing between managing authorities, and in that vein;
- Peer-to-peer learning; as well as
- Capacity building towards various stakeholders such as: managing authorities, financial intermediaries in some sectors, including National Promotional Banks and Institutions (NPBIs), and final recipients, including SMEs.

Opportunities and potential for ERDF / CF-supported financial instruments in the five sectors

Opportunities for an improved uptake of financial instruments have been identified in the five sectors. Whilst the financing needs may differ from one sector to the other, common elements may be observed:

- **Financial instruments may (and sometimes should) be designed in a way that covers several target sectors**. This would help:
  - Achieve several policy and Operational Programme objectives at once;
  - Reach the critical mass needed to make the financial instrument(s) viable; and
  - Raise more interest from potential (public and private) fund managers / intermediaries, since the financial instrument(s) designed is (are) more viable.

  The same approach is also valid for achieving several objectives within a single sector. The different sectors to 'include' in each financial instrument should vary and depend on local market needs and conditions, including the availability of fund managers / intermediaries with sufficient breadth of skills and experience in the sectors in question, as well as on the policy objectives prioritised by the managing authority.
- In addition to providing long-term debt financing, **financial instruments can be designed to provide a range of financial products and offer flexibility to address specific sector risks and final recipient needs**. For instance, in the RE sector, depending on the technology used in the project, long-term loans could be appropriate for more established RE sources, whilst guarantees, subordinated debt, and/or equity financing could be needed for less-established RE sectors.
- **Financial instruments should often be designed and implemented together with a grant component**. For all five sectors, such a grant component could help 'de-risk' or improve the financial viability of the projects. It may also help integrate the financial instrument(s) into the existing sectoral financial eco-systems, where grants are often predominant.
- **Financial instruments should be designed with a supporting technical assistance component**. In addition to a grant component, financial instruments could be designed with a technical assistance component that, in addition to supporting the set-up and implementation of the instrument itself, could also offer support to final recipients, to assist in the preparation and development of mature and bankable projects.
- **The use of ERDF and CF funding in financial instruments could support more financial innovation**. For instance:
  - The use of ERDF / CF funding in innovative financing schemes such as Energy Performance Contracts (EPCs), PPPs, and off-balance sheet solutions should be considered for the RE and UDT sectors;
  - PPPs and off-balance sheet solutions may also be considered for the Environment sector;
  - Financing lease solutions could be designed for 'small projects' in the RE sector; and
  - The use of ERDF / CF funding as financial instruments may be an opportunity to address niches, innovation and sub-sectors perceived as more risky in the 'RDI in SMEs' sector.

When considering the potential for future financial instruments in each sector, it is to be noted that:

- The '**RDI in SMEs**' sector presents the highest potential for an increased uptake of ERDF / CF-supported financial instruments during the 2021-2027 programming period. It is the least constrained sector and specific schemes may be relatively easily considered as 'add ons' or sub-windows to more main stream instruments designed for 'general SME financing'.
- The **RE** sector also presents good potential for financial instruments. Specific market regulatory conditions however need to be addressed in some areas (technologies) / regions to favour such increased use.

Moreover, some eligibility rules need to be more favourable to financial instruments in order to avoid competition with grants.

- The **UDT** and **Environment** sectors present potential in some areas for financial instruments. They are however constrained by issues like municipal borrowing limits and lack of technical capacity within public administrations. Similar to the RE sector, competition with grants is also perceived as a major obstacle for a greater uptake of financial instruments.
  - Among the five sectors analysed, the '**ICT infrastructure**' sector presents the least potential for a greater use of financial instruments. This is due to demand and technology risk uncertainties that both negatively impact the revenue generating potential of projects (reducing the relevance of the use of financial instruments).

Recommendations – Key enabling factors for the use of ERDF / CF-supported financial instruments

In order to address the barriers identified, and to foster the uptake of financial instruments in the five sectors in the current (2014-2020) and future (2021-2027) programming periods, a number of key enabling factors have been identified. These enabling factors aim to facilitate the decision-making process and the deployment of financial instruments in the five sectors (and potentially in other sectors too).

Defining integrated sectoral approaches / strategies, with sufficient critical mass and stabilised sectoral regulatory frameworks to guarantee political support

In order to **ensure continuous political support** for the development of financial instruments in specific sectors, it is important to ensure that these sectors are sufficiently high on the political agendas, with regulatory stability, in order to provide the medium to long-term support necessary to develop and implement a financial instrument and attract important private sector co-investment.

Moreover, investments in some sectors (such as the Environment sector), need to **be considered holistically** with other sectors (such as Urban Development). This helps combine objectives and facilitates the creation of sufficient **critical mass of projects / investments**, which in turn increases the chances of attracting interested fund managers / intermediaries, additional (public and private) co-investors, and identifying project pipelines.

An example of such an integrated approach could be to increase ERDF supported financial instruments designed for 'general SME financing' by including windows or specific schemes for projects related to RE and/or ICT. This would help increase the number of projects supported in these sectors, and facilitate the use of financial instruments in these sub-sectors.

Designing 'financial instrument friendly' Operational Programmes and providing supporting technical assistance

Since the process of designing and implementing financial instruments in any sector may be time-consuming, managing authorities need to **consider the use of financial instruments** as early as possible **during preparations for the programming period**.

Moreover, financial instruments require a sufficient pipeline of investable projects in order to be viable and attract financial intermediaries implementing the instruments. To avoid multiple Funding Agreements, contributions from multiple Priority Axes (and the related investment restrictions and monitoring and reporting burdens), and coordination with several managing authorities, it is advisable **to concentrate / aggregate contributions to financial instruments within the Operational Programmes**. That would make these Operational Programmes more 'financial instrument friendly'. In this respect, consideration should be given to preparing a short practical material, for managing authorities, setting out the key requirements for a 'financial instrument friendly' Operational Programme.

Combining financial instruments with grants

From the perspective of a managing authority, the development of a financial instrument may be perceived as more time-consuming and complicated compared to the disbursement of ERDF / CF resources as grants. As such, **the wider use of financial instruments is constrained to a certain extent by the availability of 'competing' grants**, although revenue generating or cost-saving projects in the five sectors analysed could be more efficiently supported using financial instruments.

Integrating financial instruments into existing sectoral grants eco-systems is however a challenge. **Grants can act as an enabling factor for financial instruments**. They may **support the highest risk component of the projects and/or cover the part of the investment cost that is not considered to be repayable from project revenues or cost-savings**, independently of the sector considered. For instance, grants could cover the initial development costs of an RDI project, or cover the major water / ICT infrastructure costs in less densely populated areas; or, in poorer areas, they can keep the fees to access the networks affordable for households. Other combination options include for instance:

- **Loans with capital rebates**, where part of the loan is written off, in the event specific results are achieved; such set-up is considered particularly attractive for final recipients in some sectors, such as the RE and the Environment sectors; and
- The **integration of ancillary grants**, including investment grants, in the financial instruments.

In this context, stakeholders involved in the development of financial instruments in the five analysed sectors expressed a **need to foster knowledge of how financial instruments can be combined with grants during the 2021-2027 programming period**. Such considerations would also imply a need to set clear **demarcations and synergies between grants and financial instruments,** in order to incentivise managing authorities to consider a more systematic and integrated use of financial instruments in the context of sectors heavily-supported by grants.

The regulatory proposals of the EC for the 2021-2027 programming period allows for **integrating ancillary grants**, **including investment grants**, **in financial instruments**. This means that both the **repayable and the non-repayable components of an investment / project can be governed by a single, financial instrument specific set of rules**. It is expected that this will significantly **simplify the combination of different forms of support** (*i.e.* the combination of grants and financial instruments) in comparison with the current 2014-2020 programming period. It should therefore act as an **enabler** for the uptake of financial instruments in many sectors (including the five sectors analysed in this study). Consideration should be given to the development of further information material on financial instrument / grant combinations for managing authorities, to ensure that these new possibilities are well understood and their potential fully maximised.

Providing specific technical assistance throughout the financial instrument's lifecycle and to all relevant stakeholders

The provision of technical assistance and support facilitates the smooth design, set-up and implementation of financial instruments in all sectors. To be effective, such support should be provided at the level of **public authorities** (including managing authorities, intermediate bodies and/or technical / local authorities), **financial intermediaries** (including NPBIs, banks and fund managers), as well as **final recipients** (*i.a.* municipalities, households, and/or SMEs, depending on the sectors).

Firstly, **public authorities** may sometimes need technical assistance schemes focused on **awareness raising and capacity building** in order to increase their interest in such financing schemes, and their willingness to deploy them. Such technical assistance support is particularly relevant during the **early stages of the financial instrument's lifecycle**; especially in Member States and/or sectors where past experience with financial instruments is limited.

Secondly, also during the design and set-up phases of the financial instruments, **awareness needs to be raised in the relevant markets** (on both financing supply and project demand sides). The **appointment of financial intermediaries** with experience and sufficient capacity to deploy the funds with impact in a given sector is key. Indeed, **the markets / sectors to be addressed need to be informed in advance about the existing and future opportunities offered by the use of financial instruments in order to prepare and then apply for them**. Both future financial intermediaries and future final recipients need to become aware of the coming opportunities offered by the financial instruments to include them in:

- Their financing supply package (in the case of the financial intermediaries); and
- Their choice-set of financing options (in the case of the final recipients).

This is a key enabling factor to **facilitate the future 'buy-in' of the instruments by the market stakeholders**.

Thirdly, **technical assistance support may be provided to final recipients / projects in parallel to the implementation of the financial instruments**. Such support would aim to **address the individual projects' needs** in order to make them investment-ready. It would principally use **ad hoc advice from external experts**, both from a technical and a financial perspective, and concern all types of final recipients depending on the market addressed.

The study has demonstrated that there is potential for further financial instruments in the five sectors reviewed, even though it is recognised that this may be easier to achieve in some of these sectors. It is clear though that further effort is needed to increase the level of managing authorities' interest in the use of financial instruments as delivery mechanisms in these specific sectors. In part, this can be achieved through greater knowledge-sharing and promotion of existing examples to help address any scepticism. The programming process also presents a significant opportunity to ensure that facilitative Operational Programmes are developed, which offer sufficient flexibility to accommodate financial instruments, as well as the possibility for multi-sectoral financial instrument approaches. New possibilities offered by the Common Provisions Regulation (CPR) for the 2021-2027 programming period, such as combination with grants, should also be promoted to the largest extent possible in view of the specific positive effect expected in these sectors.

1 Introduction

1.1 Objectives and scope of the stocktaking study

Overall objective of the stocktaking study

In the context of exploring the further potential for ERDF[5] / CF[6]-supported financial instruments[7], **this stocktaking study conducted by *fi-compass*[8] aims to assist DG REGIO[9] in gaining** (i) **a better understanding of the sectors which have not yet, or only to a minor extent, been supported by financial instruments in the 2014-2020 programming period,** (ii) **the reasons for this,** (iii) **an understanding of the sectors where there is continued investment opportunities still in the 2014-2020 programming period and/or sectors where new investment opportunities are expected to arise in the future, and** (iv) **the scope to expand financial instruments in the context of these sectors in the short- and medium-term**.

Specific objectives and scope of the stocktaking study

In line with the above-mentioned overall objective, the stocktaking study aims to fulfil several specific objectives:

- Identify **five sectors** which are deemed to have additional potential in terms of financial instruments uptake and/or have not yet benefited from broad support from financial instruments using ERDF and/or CF, but where projects can nevertheless be revenue-generating/cost-saving or can become bankable given their characteristics. The five sectors analysed are:
  1. Renewable Energy (RE);
  2. Urban Development and Transport (UDT);
  3. Environment (including air, water and waste),
  4. Information and Communications Technology (ICT) infrastructure; and
  5. Research, Development and Innovation (RDI) in Small and Medium-sized Enterprises (SMEs).

  These sectors represent key priorities for Cohesion Policy but where the uptake of financial instruments during the 2014-2020 programming period is not as significant as in other sectors such as SME financing or support to Energy Efficiency (EE) measures.
- Analyse currently existing investment gaps and/or anticipated future **investment opportunities** in the five sectors.
- Identify **key hindering factors** (sectoral and horizontal) for the use of financial instruments in the five analysed sectors.

---

5 The European Regional Development Fund.

6 The Cohesion Fund.

7 Financial instruments are here considered '*Union measures of financial support provided on a complementary basis from the budget to address one or more specific policy objectives of the Union* [under] *the form of equity or quasi-equity investments, loans or guarantees, or other risk-sharing instruments*' (Article 2(p) of the Financial Regulation; Article 37(7)(8)(9) of the Common Provisions Regulation, CPR: Regulation (EU) No 1303/2013 of the European Parliament and of the Council of 17 December 2013).

8 *fi-compass* is the platform for advisory services on financial instruments under ESI Funds. *fi-compass* is provided by the European Commission in partnership with the European Investment Bank (EIB). It is designed to support ESIF managing authorities and other interested parties, by providing practical know-how and learning tools on financial instruments. These include 'how-to' manuals, factsheets and case study publications, as well as face-to-face training seminars, networking events, and video information. More background information about *fi-compass* may be found on the website: https://www.fi-compass.eu/about-fi-compass.

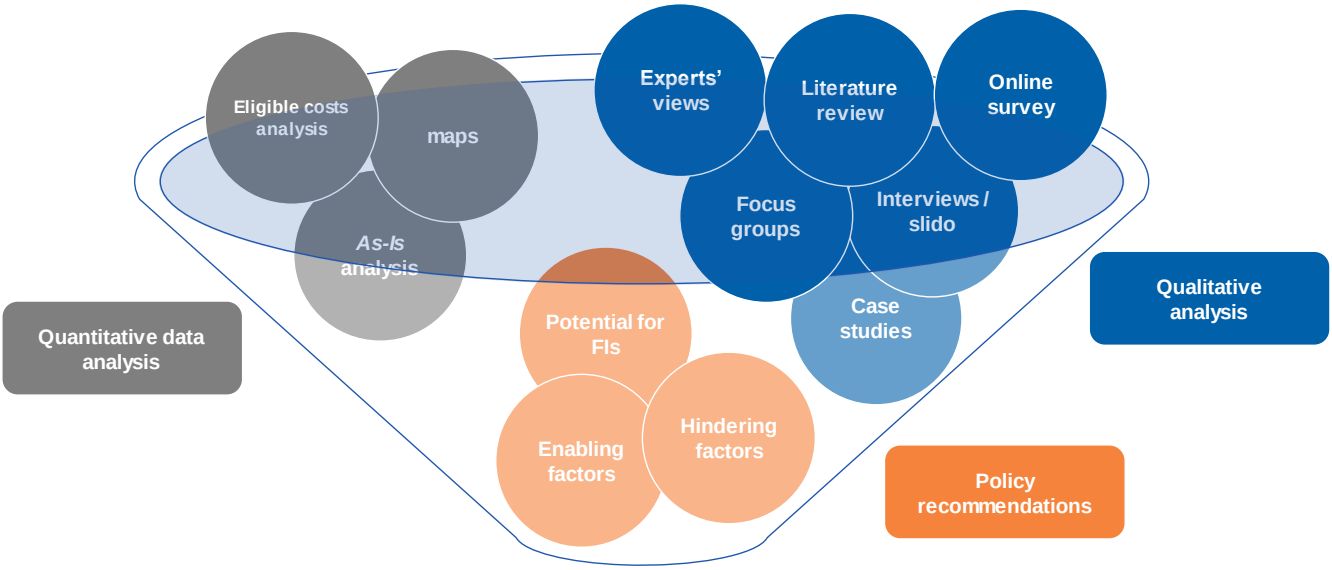
9 The Directorate-General for Regional and Urban Policy (DG REGIO) of the European Commission (EC).

- Outline **key enabling factors** for the uptake of financial instruments in the five sectors (*i.e.* sectoral pre-requisites and/or facilitating horizontal measures).
- Prepare **case studies** on financial instruments in the five sectors (one case study *per* sector).
- Based on the above-listed analyses and the case studies, formulate **policy recommendations** for the development of financial instruments using ERDF and CF in the five sectors.

1.2 Methodology

The overall methodology applied to the present stocktaking study is illustrated in the following figure.

Figure 1: Overview of the methodology applied to the stocktaking study



Source: fi-compass*, 2019.*

As illustrated in the figure above, two types of analyses were conducted for the stocktaking study in order to formulate policy recommendations: (i) a quantitative data analysis, and (ii) a qualitative analysis.

1.2.1 Quantitative data analysis

The quantitative data analysis consisted of using the financial data that MS regularly submit to the EC for monitoring / reporting purposes in relation to the implementation of their Operational Programmes (OPs), covering both grants and financial instruments. This financial data is provided by the MS broken down by '*categories of intervention*', which enables the grouping of individual categories into sectors. Once 'created' these sectors have been analysed.

The variable analysed in the present study is the '*total eligible cost of the operations*'. This variable is understood to be the best proxy for the amount from an OP committed by a given managing authority to a financial instrument *via* a Funding Agreement (FA).

This approach, and consequently the data analysed and the outputs obtained, are overall consistent[10] with the data considered in the abovementioned EC report '*Financial instruments under the European Structural and Investment Funds – Summaries of the data*'[11].

Another important element is the fact that the cut-off date of the submitted (and consequently analysed) data is 31 December 2017 (hence more than 18 months before the drafting of the present study).

Following these methodological considerations, it needs to be clearly mentioned that:

- The variable analysed in the stocktaking study is an '*amount*' (the amount identified in the FA whose unit is in euro) and consequently not a '*number of financial instruments*' (this specific information being not available in a detailed manner that would have enabled a sectoral analysis using the 'categories of intervention').
- Only the financial data reported by the managing authorities under the considered categories of intervention composing the sectors are analysed. This implies that:
  - If a managing authority reports amounts committed to financial instruments under several categories of intervention then these amounts may (i) be reported in various sectors (for instance in both RE and UDT), and/or (ii) be partly reported in one of the sectors studied in the present stocktaking (such as RE) and partly in another sector not studied in the present study (such as EE). Hence, there is no risk of 'double reporting' (where the same amount would be reported several times in different sectors) since each amount is reported for each specific category of intervention. The figure may however indicate only part of the total amounts committed in a FA (whose available amount is then larger since it covers several sectors). It is consequently important to keep in mind that the variable analysed in the present study is an amount reported for a specific category of intervention, and not the number of financial instruments.
  - If a managing authority decides to finance one of the sectors analysed in the study with financial instruments but reports the related amounts committed under categories of intervention that are not covered by this specific 'sector, such an amount is then not captured in the analysis. This may be for instance the case of managing authorities reporting amounts devoted to financial instruments for '*general SME financing*' under categories of intervention that concern '*general SME financing*' (hence not '*RDI in SMEs financing*'), while the actual financial instrument also covers RDI in SMEs in its investment strategy. Such reported amounts are consequently not captured in the '*RDI in SMEs*' sector, even if the financial instrument finances RDI in SMEs. Such situation may however be considered marginal among the managing authorities and does not compromise the analysis conducted in this study.
- Since the cut-off date is 31 December 2017, the present study does not capture financial instruments that have been set-up and implemented in the meantime. This aspect is however mitigated by the online consultation, the interviews, the focus groups and the case studies that are part of the qualitative data analysis conducted between December 2018 and May 2019, which have allowed for more recent progress to be captured where relevant.

The methodological approach adopted for the present stocktaking study is detailed in the Methodological note presented in Annex 1. The outputs and outcomes from this analysis are presented in various sections and

[10] A few inconsistencies between the data transmitted in the 'Financial Data by categories' dataset and the *Summary of Data* have been identified. The analysis bases on the first set of data in order to allow for a comprehensive and consistent approach, but deviations with the data reported in the Summary of Data are duly indicated in the report.

[11] European Commission, Directorate-General for Regional and Urban Policy, *Financial instruments under the European Structural and Investment Funds – Summary of data on the progress made in financing and implementing financial instruments for the programming period 2014-2020 in accordance with Article 46 of Regulation (EU) No 1303/2013 of the European Parliament and of the Council, Situation as at 31 December 2017*, November 2018.

Annexes of this study (such as country maps detailing the use of ERDF and CF financial instruments presented in Annex 3).

1.2.2 Qualitative data analysis

In addition -and in parallel- to the quantitative data analysis, several qualitative data analysis tools have been used, as illustrated in Figure 1 above:

- A **sectoral literature review** and data analysis was performed. The detailed bibliography is provided in Annex 8.
- An **online consultation** was conducted between 3 December 2018 (launched at FI Campus 2018) and 15 February 2019. This online survey was addressed to all types of EU stakeholders involved in ERDF and CF financial instruments in the five sectors studied. 129 answers were received in total, including 36 from managing authorities, 12 from Intermediate Bodies (IBs), 31 from public authorities (other than managing authorities and IBs, such as audit authorities and national coordination authorities, and 20 from National Promotional Banks and Institutions (NPBIs). The population of respondents and the questionnaire used for the online consultation are presented in Annex 4.
- A number of **interviews** were performed, targeting various external stakeholders. 28 stakeholders were interviewed in total, covering all five sectors. The detailed list of interviewees is indicated in Annex 5 and the interview guide used to perform these interviews is provided in Annex 6.
- Five **sectoral focus groups** were organised in - March 2019 in Brussels; gathering various stakeholders involved in the use of ERDF and CF financial instruments in the five studied sectors. The agendas and participants lists of the five sectoral focus groups are presented in Annex 7.
- Five **case studies** have been produced and are included in each sectoral chapter (Chapters 4 to 8) of the report. These case studies are listed in the table below.

Table 2: Case studies

Sector	Country	Short description and rationale behind the choice of the case study
Renewable Energy	Greece	• The case study presents the EUR 400m–EUR 450m Fund-of-Funds (FoF) managed by the European Investment Bank (EIB) in Greece, covering TO 4[12] and TO 6.[13] The case study has been selected as it has a broad investment strategy, financing large RE infrastructure projects in addition to photovoltaics and urban development.
Urban Development and Transport	Slovakia	• The case study presents the D4/R7 Public-Private Partnership (PPP) (for Transport – Road) and in particular the role of PPPs as a delivery route for financial instruments.
Environment	Czech Republic	• The case study presents a financial instrument implemented by the Czech State Environment Fund providing loans combined with grants to enterprises for investment in the risk management of hazardous substances. The case study has been selected as it is understood to be the only ESIF financial instrument addressing environmental risk management in enterprises, it also relies on combination with national grants.

[12] TO 4: '*Supporting the shift towards a low-carbon economy*'.

[13] TO 6: '*Preserving and protecting the environment and promoting resource efficiency*'.

Sector	Country	Short description and rationale behind the choice of the case study
ICT infrastructure	Poland	• The case study presents a financial instrument managed by BGK ('*Bank Gospodarstwa Krajowego*', the Polish National Promotional Bank) for broadband financing. The case study has been selected to highlight some of the sector specific regulatory difficulties, initially reported during the focus group discussions.
RDI in SMEs	Lithuania	• The case study presents a co-investment fund managed by '*Koinvesticinis fondas*', the subsidiary of INVEGA ('*Investicijų ir Verslo Garantijos*', the Lithuanian National Promotional Bank), financing RDI. The rationale behind this case study is to illustrate how an NPB develops a financial instrument using ERDF 100% focused on RDI and leveraging the RDI environment of the MS (including to find / attract co-investors not necessarily focused on RDI financing).

Source: fi-compass*, 2019.*

Finally, the stocktaking study also aims to **leverage the EIB Group's**[14] **experience** in the design, set-up and implementation of financial instruments in the five sectors analysed. In this respect, stakeholders involved in the development of financial instruments in these five sectors, and working at the European Investment Bank (EIB) and/or at the European Investment Fund (EIF) have been interviewed by *fi-compass* experts. The list of EIB Group stakeholders interviewed is provided in Annex 5.

1.3 Structure of the stocktaking study

This study is structured as follows:

- Chapter 2 provides an overview of the use of ERDF and CF financial instruments in the five studied sectors, principally making use of the quantitative data analysis presented in Section 1.2.1 above;
- Chapter 3 presents an overview of the results of the online consultation conducted between December 2018 and February 2019 among various types of EU stakeholders involved in ERDF and CF financial instruments in the five studied sectors;
- Chapters 4 to 8 provide sectoral analyses of the use of financial instruments in each of the five sectors studied, and more particularly their use in:
  - The 'Renewable Energy' sector (Chapter 4);
  - The 'Urban Development and Transport' sector (Chapter 5);
  - The 'Environment' sector (Chapter 6);
  - The 'Information and Communication Technologies infrastructure' sector (Chapter 7); and
  - The 'Research, Development and Innovation in Small and Medium-sized Enterprises' sector (Chapter 8).
- Chapter 9 provides conclusions and recommendations to the stocktaking study, notably by synthetizing the common barriers and enabling factors observed for the uptake of financial instruments in the five sectors.

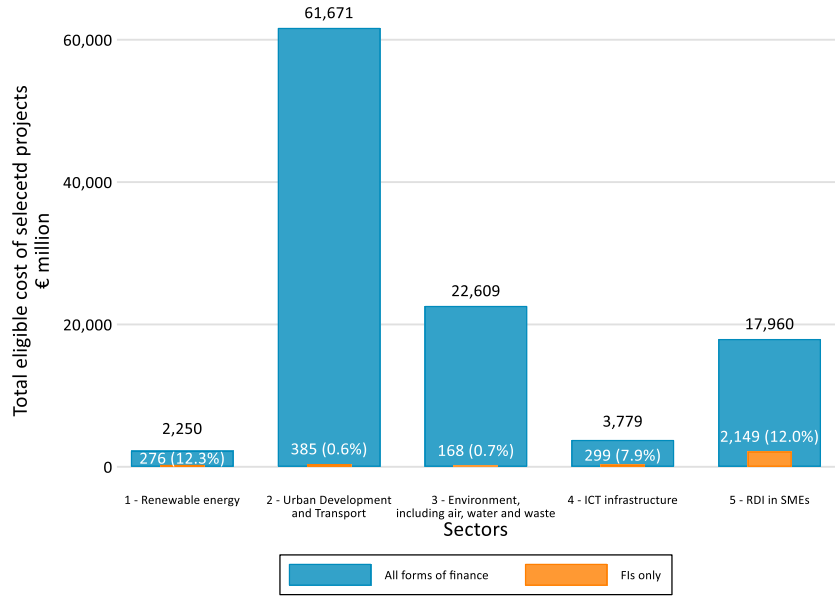
[14] The EIB Group is composed of the European Investment Bank (EIB) and the European Investment Fund (EIF).

2 Overview of the use of financial instruments using the European Regional Development Fund and the Cohesion Fund in the five sectors

The present chapter details EU-wide data on the deployment of financial instruments in these five sectors. This data is presented under the forms of several figures detailed below and are summarised later on in Table 3 on page 38. Further on, an EU-wide map (Figure 6 on page 41) and its complementary table in Annex 2 provide a comprehensive view of the use of financial instruments in these five sectors by Member State. A more 'sectoral approach' using the same data is provided in each of 'sectoral chapters' (*i.e.* Chapters 4 to 8), while country maps and more national information are provided in Annex 3.

As presented in the following figure, even if ERDF and CF funding is used under the form of financial instruments in all of the five sectors (*i.e.* there is no sector where no financial instrument is developed), the amounts devoted to financial instruments for these sectors represent only on average 3.0% of all the forms of finance possible to support these sectors (varying from 0.6% in the UDT sector to 12.3% in the RE sector). **The EU-wide nominal amounts devoted to financial instruments in these sectors are also not minimal (representing in total EUR 3.3bn), but they still remain marginal in comparison with the total amounts devoted to 'all forms of finance' (*i.e.* grants and financial instruments altogether representing about EUR 108.3bn)**. As listed below, this is more particularly the case for the UDT and Environment sectors, both sectors where grants remain by far the main form of finance when using ERDF and CF funding. The case of the 'RDI in SMEs' sector is also interesting since a higher proportion in the use of financial instruments could have been expected since the 'SME at large' sector is one of the most developed for financial instruments in the EU. This is illustrated in the figure below.

Figure 2: Proportion of ERDF and CF funding devoted to financial instruments in comparison with ERDF and CF funding devoted to all forms of finance (grants and financial instruments altogether) in the five sectors[15]



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

[15] For each sector, this figure indicates the 'total eligible cost of selected projects' for 'all forms of finance' (*i.e.* grants and financial instruments altogether; in the thicker blue column) and for 'financial instruments only' (in the inner orange column). For each sector, data labels provide the nominal amounts in millions euros as well as the share of the amounts devoted to financial instruments among the total amounts devoted to all forms of finance.

In terms of **progress in the deployment of financial instruments in the five sectors**, it is to be mentioned that, **at an EU level and as of 31 December 2017, on average, 31.7% of the total eligible cost has been declared**. This shows that, overall, financial instruments in the five sectors are progressing. Indeed, in light of the CPR, 25% are the maximum amount for a first tranche of ERDF or CF financing provided to a financial instrument. These 25% can consequently be considered as the basis / start for the implementation of such financial instrument; and have been exceeded for the five sectors analysed.

More precisely and as illustrated in Table 3 on page 38, the level of disbursement of the financial instruments implemented in the five sectors is as follows:

- In the RE sector, the financial instruments have been deployed up to 36.4%; on average and at an EU-wide level;
- In the UDT sector, they have been deployed up to 22.8%;
- In the Environment sector, they have been deployed up to 24.1%;
- In the 'ICT infrastructure' sector, they have been deployed up to 26.1%; and
- In the 'RDI in SMEs' sector, they have been deployed up to 34.1%.

Following this, the share of eligible expenditure declared to the EC, is more than 25% of the amounts committed in three of the five sectors studied (*i.e.* the RE, 'ICT infrastructure', and 'RDI in SMEs' sectors). This situation means that the financial instruments in these three sectors are performing well; since, on average and at an EU level, at least a second tranche has been started to be disbursed. In parallel, the financial instruments in the other two sectors (*i.e.* the UDT and Environment sectors) seem to have just been set up and/or are performing at slower pace.

When considering the ERDF and CF financial instruments developed in these five sectors in comparison with all ERDF and CF financial instruments developed, so far, in the 2024-2020 programming period, it appears that **the amounts of ERDF and CF funding devoted to financial instruments set up in the five sectors studied represent at the EU level 18.6% of the total amounts of such funding devoted to financial instruments** (*see Table 3 on page 38 further on*). This indicates that, even altogether, these five sectors are not always considered as priorities for managing authorities when developing a strategy for their use of financial instruments (all sectors considered).

When considering the **products deployed by financial instruments** (*i.e.* loans, guarantees, equity financing and/or subsidies or technical support), the figure below indicates an overall clear preference for loans. This product is the only one used in all sectors. It is even:

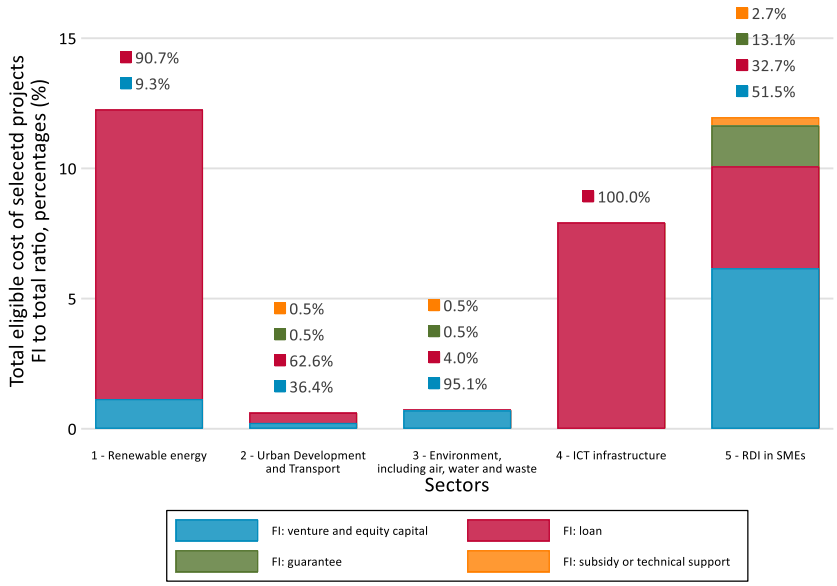
- The sole form of financial instruments used in the 'ICT infrastructure' sector (as illustrated later on in Chapter 7, this situation can be explained by the two examples of ERDF and CF financial instruments currently existing in this sector); and
- The main form for both (i) the RE sector (representing 90.7% of the amounts provided under the form of financial instruments, in comparison with 9.3% for venture and equity capital), and (ii) the UDT sector (representing 62.6% or the financial instruments amounts, in comparison with 36.4% for venture and equity capital, 0.5% for guarantees and 0.5% for subsidies and technical support).

On the opposite, the Environment sector is mainly financed by venture and equity capital when financial instruments are chosen to support the sector (representing 95.1% of the amounts provided under the form of financial instruments; while loans represent 4.0% of amounts proposed, guarantees represent 0.5% and subsidies and technical support represent also 0.5%).

Unsurprisingly, the split between the forms of financial instruments is more equally distributed in the case of the 'RDI in SMEs' sector. 51.5% of the amounts provided under the form of financial instruments are provided as

venture and equity capital (so more than half); while loans represent 32.7% of amounts proposed, guarantees represent 13.1% and subsidies and technical support represent 2.7%.

Figure 3: Split between forms of financial instruments of the ERDF and CF funding devoted to financial instruments in the five sectors[16]



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

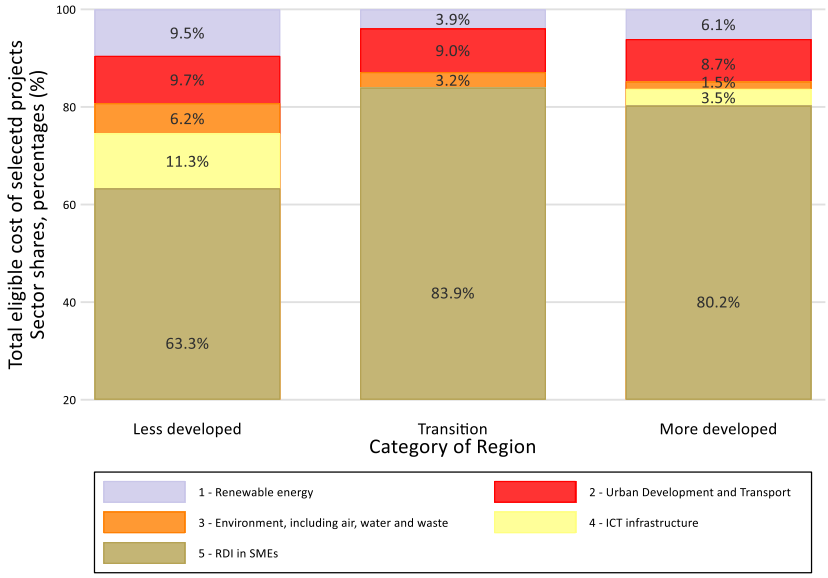
When considering the **three categories of regions** (*i.e.* 'less developed', 'transition' and 'more developed' regions), the figure below indicates that:

- Independently from the categories of regions, the 'RDI in SMEs' sector is the most supported sector: representing between 63.3% of the amounts devoted to financial instruments in the 'less developed' regions to 83.9% in the 'transition' regions, and 80.2% in the 'more developed' regions. It is also observable that the UDT sector is supported in a similar manner in the three categories of regions (for around 9% to 10% of the amounts devoted to financial instruments); indicating a common approach for all categories of regions when financing this sector, and resulting from probably common perceived market needs for this sector, independently of the development of the regions.
- Overall, the three categories of regions have implemented financial instruments in all five sectors (in different proportions), with the exception of the 'transition' regions which have implemented financial instruments in 'only' four sectors (*i.e.* not in the 'ICT infrastructure' sector, where actually only two MS have developed financial instruments, as illustrated further on in this section).
- Unsurprisingly, the 'less developed' regions are the category of regions where the use of financial instruments is the most diversified among the five sectors (in terms of amounts devoted). This situation probably results from (i) larger amounts at disposal in these regions and so a potential higher willingness to use both grants and financial instruments (including in sectors where such use is new), (ii) important needs in all five sectors that justify the use of diverse financing tools (and so responding to various market needs), and (iii) a potential need to stimulate these specific markets in the less developed regions (in comparison with the 'transition' and 'more developed' regions where the eco-systems around the five

[16] For each sector, this stacked column figure indicates the 'share of financial instruments' out of the 'total eligible cost of selected projects' for 'all forms of finance', broken down by type of financial product. For each sector, data labels provide the percentage contribution of each form of financial instrument to the total use of financial instruments.

sectors are more established and where a specific use of ERDF and CF financial instruments may be perceived as less needed to develop these markets).

Figure 4: Split between sectors of the ERDF and CF funding devoted to financial instruments in the three categories of regions[17]

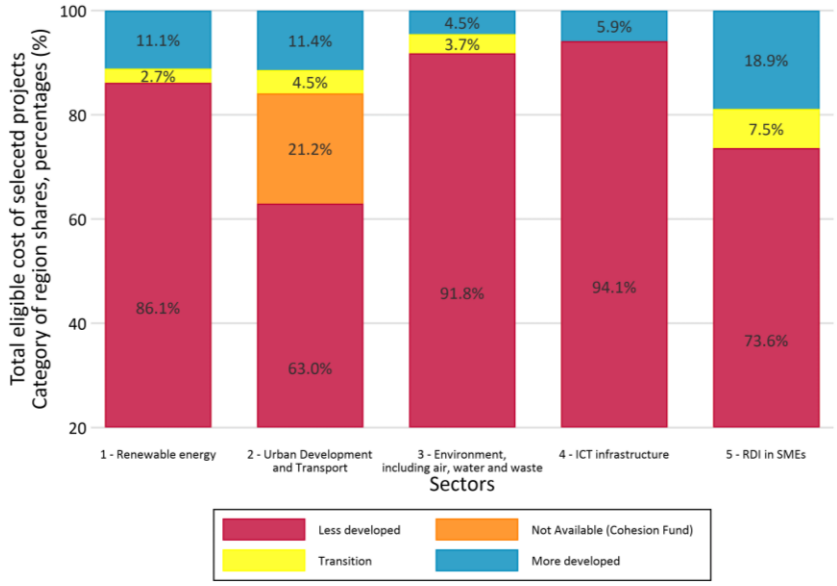


Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

When considering a different view of the development of financial instruments in the three categories of regions, the figure below indicates the split between regions of the amounts devoted to financial instruments in each sector. It confirms the higher implication of the 'less developed' regions in the development of financial instruments in the five sectors (representing between 63.0% and 94.1% of the amounts). It also confirms that the 'transition' and 'more developed' regions focus primarily on the 'RDI in SMEs' sector when it comes to set up financial instruments (representing up to 18.9% of the amounts in the case of the 'more developed' regions), followed by the UDT sector.

[17] For each category of regions, this stacked column figure indicates the percentage contribution of the different sectors to the 'total eligible cost' of the selected 'financial instruments operations'. Data labels detail the percentage value for all sectors within each category of region. 'Urban Development and Transport' is the only sector contributing to category of region 'Not Available', corresponding to Cohesion Fund priority axes, which is not indicated in the figure.

Figure 5: Split between categories of regions regarding the ERDF and CF funding devoted to financial instruments in the five sectors[18]



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

The various elements depicted in the different figures above are summarised in the table hereafter.

[18] For each sector, this stacked column figure indicates the percentage contribution of the different categories of regions to the 'total eligible cost' of the selected 'financial instruments operations'. Data labels detail the percentage value for all categories of regions within each sector. The 'category' 'Not Available' corresponds to Cohesion Fund priority axes, which cannot be referred to any of the three categories of regions. It is consequently indicated as such and only used in the 'Urban Development and Transport' sector.

Table 3: Overview of the use of ERDF and CF financial instruments in the five studied sectors in the European Union

	Renewable Energy	Urban Development and Transport	Environment, including air, water and waste	ICT infrastructure	RDI in SMEs	Total (five sectors)
Total eligible cost of selected projects for FIs (EUR)	**275 904 453.7**	**384 949 965.7**	**168 212 043.1**	**299 312 092.3**	**2 148 938 871.0**	**3 277 317 425.8**
Share of 'eligible cost' related to FIs among 'total eligible cost' (%)	*12.3%*	*0.6%*	*0.7%*	*7.9%*	*12.0%*	***3.0%***
Share of 'expenditure' to 'eligible cost' for operations related to FIs (%)	*36.4%*	*22.8%*	*24.1%*	*26.1%*	*34.1%*	***31.7%***
Share of amounts devoted to FIs in the five sectors among the amounts for FIs in all sectors (%)	*1.6%*	*2.2%*	*1.0%*	*1.7%*	*12.2%*	***18.6%***
Share of FIs under the form of venture and equity capital (%)	*9.3%*	*36.4*	*95.1%*	*-*	*51.5%*	***43.7%***
Share of FIs under the form of loans (%)	*90.7%*	*62.6%*	*4.0%*	*100.0%*	*32.7%*	***45.8%***
Share of FIs under the form of guarantees (%)	*-*	*0.5%*	*0.5%*	*-*	*13.1%*	***8.7%***
Share of FIs under the form of subsidy or technical support for FIs (%)	*-*	*0.5%*	*0.5%*	*-*	*2.7%*	***1.8%***
Share of FIs developed in 'Less Developed Regions' (%)	*86.1%*	*63.0%*	*91.8%*	*94.1%*	*73.6%*	***76.2%***
Share of Cohesion Fund used by relevant Regions (%)	*-*	*21.2%*	*-*	*-*	*-*	***2.5%***
Share of FIs developed in 'Transition Regions' (%)	*2.7%*	*4.5%*	*3.7%*	*-*	*7.5%*	***5.9%***
Share of FIs in 'More Developed Regions' (%)	*11.1%*	*11.4%*	*4.5%*	*5.9%*	*18.9%*	***15.4%***

Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

As already mentioned, the financial data provided by the MS for reporting purposes have also been used to produce maps. An EU-wide map of the use of financial instruments is presented below. It indicates several key elements on the use of financial instruments in the EU during the 2014-2020 programming period (*as at 31 December 2017*):

- **Five Member States have not reported ERDF or CF financial instruments in any sector**: Cyprus, Czechia[19], Denmark, Ireland, and Luxembourg (*in pink*). Depending on the country, this may indicate:
  - A lack of interest in this type of financing;
  - A limited amount of ERDF or CF funding to envisage financial instruments alongside grants;
  - A former inconclusive experience with ERDF or CF financial instruments that led to a conscious choice not to develop such financing in the 2014-2020 programming period; and/or
  - A late or long start in the set-up of such type of financing (and so the development of such financing by the 31 December 2017 cut-off).
- **Ten Member States have implemented ERDF or CF financial instruments in sectors that are not covered by the present stocktaking study** (for instance in the SME and EE sectors): Austria, Belgium, Croatia, Estonia, Finland, Latvia, Lithuania, Malta, Spain and Sweden (*in blue*). Depending on the country, this may indicate:
  - A focus on other sectors in their individual 'financial instruments strategy';
  - A limited amount of ERDF or CF funding to envisage financial instruments in too many sectors (and so a preference to develop financial instruments in sectors that they already know, and/or where they already have experience, and/or where they perceive the higher market failure / gap);
  - The perception that 'other sectors' than the one(s) supported *via* financial instruments (notably the five sectors studied in the study) are already financed by other financing sources to which ERDF or CF funding under the form of financial instruments would add only limited value (in regards to the effort required to set up such financing tools for instance);
  - But more importantly for the stock-talking study, it may indicate a lack of interest or of conviction to develop financial instruments in the five sectors studied despite the fact that these MS and managing authorities already have proven experience with financial instruments in the 2014-2020 programming period but may consider these five sectors as (i) inappropriate for financial instruments and/or (ii) too far away from their comfort zone [and so the development of a financial instrument supporting such sector(s) would constitute a risk they are not keen to take].

  Following this, and independently from the sectors already supported by financial instruments in these MS, this situation indicates potential for the design, set-up and implementation of financial instruments in '*other sectors*' – including the five sectors studied in this study – that would leverage their experience and lessons learnt already acquired. This is particularly true if market opportunities in these '*other sectors*' were proven to these MS and managing authorities, as well as if appropriate knowledge / experience sharing and technical support were provided if / when needed.
- **Thirteen Member States have implemented at least one financial instrument in at least one of the sectors studied the present stocktaking study** (*in green*). As first insights, the following figure and the

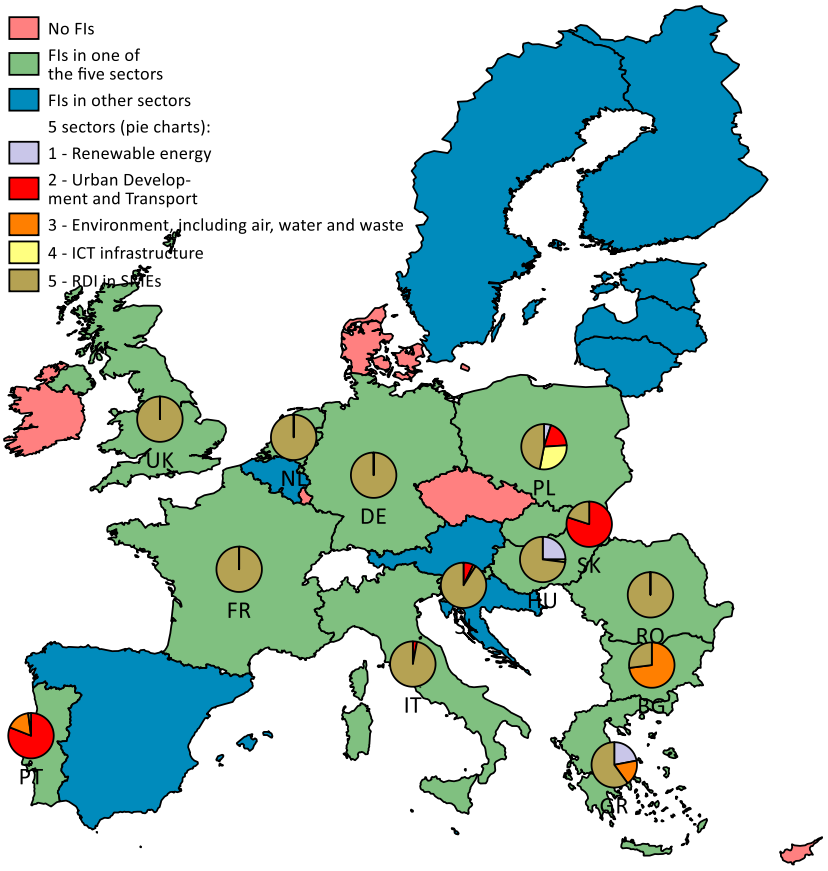
[19] Czechia has not reported on financial instruments in the 'Financial Data by categories' dataset by end of 2017. In the meantime, *fi-compass* and European Commission experts know that financial instruments have been set up in this period. These financial instruments concerned the 'general SME financing', the EE and the Environmental sectors. In that context, the Annual Summary of data reports an allocation of EUR 479.1m to financial instruments for Czechia.

table in Annex 2 indicate that even if these thirteen MS have financial instruments in the five sectors, they have very different approaches to these financial instruments and to these sectors. In summary:

- Three Member States have developed ERDF and CF financial instruments in the RE sector (Greece, Hungary, and Poland);
- Five Member States have developed ERDF and CF financial instruments in the UDT sector (Italy, Poland, Portugal, Slovenia, and Slovakia);
- Four Member States have developed ERDF and CF financial instruments in the Environment sector (Bulgaria, Greece, Portugal, and Slovenia);
- Two Member States have developed ERDF and CF financial instruments in the 'ICT infrastructure' sector (Hungary and Poland); and
- Thirteen Member States have developed ERDF and CF financial instruments in the 'RDI in SMEs' sector (*i.e.* all the Member States that have developed financial instruments in the five sectors).

The development of such financial instruments is more detailed in the 'sectoral chapters' (*i.e.* Chapters 4 to 8) where one case study for each sector is also included. In addition, a table in Annex 2 provides more detailed information on the financial instruments developed in each Member State for the five sectors studied. Finally, and as previously mentioned, country maps (following the same presentation), together with additional national information, are provided in Annex 3.

Figure 6: EU-wide map of the uptake of ERDF and CF financial instruments in the five sectors[20]



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

As an interim conclusion and based on the quantitative elements gathered thanks to the financial data provided by the MS to the EC in relation to the implementation of their OPs, it is possible to highlight that:

- **The EU-wide nominal amounts devoted to financial instruments in the five sectors are not insignificant (representing in total EUR 3.3bn), but they still remain marginal in comparison with the total amounts devoted to 'all forms of finance'** (*i.e.* grants and financial instruments altogether representing about EUR 108.3bn). This discrepancy is particularly striking in the UDT and Environment sectors, where grants remain by far the main form of finance when using ERDF and CF funding.
- **The deployment of financial instruments in three sectors is progressing relatively well** (the RE, the 'ICT infrastructure' and the 'RDI in SMEs' sectors); **while their deployment in the other two sectors** (the UDT and the Environment sectors) **seems to have just started and/or is progressing at a more slowly pace**.
- Two categories of regions (the 'less developed' and the 'more developed' regions) have implemented financial instruments in all five sectors. The 'transition' regions have developed financial instruments in four sectors. Independently from the categories of regions, the 'RDI in SMEs' sector is the most supported sector. **The 'less developed' regions are the category of regions where the use of financial instruments**

[20] For each Member State, this map indicates whether (i) no financial instruments (in pink), (ii) financial instruments in 'other sectors' (*i.e.* in any sector but the five sectors studied in the present stocktaking study; in blue), or (iii) financial instruments in at least one of the five sectors studied (*in green*) have been set up by 31 December 2017. Where a Member State – or at least one of its managing authorities – has set up a financial instruments operation in one of the five sectors studied, a pie chart details the share of each sector among the five studied in terms of 'total eligible cost'.

is the most distributed among the five sectors; **while the 'transition' and 'more developed' regions focus primarily on the 'RDI in SMEs' sector, followed by the UDT sector**.

In order to complement these quantitative insights, other data sources have been used, notably through an online consultation addressed to all types of EU stakeholders involved in ERDF and CF financial instruments in the five sectors studied. The results of this online consultation are presented in the following chapter.

3 Overview of the results of the online consultation

As mentioned in the introduction, an online consultation was conducted between 3 December 2018 and 15 February 2019. It was addressed to all types of EU stakeholders involved in ERDF and CF-supported financial instruments with a view to collect their views and experience in the five studied sectors. 129 answers were received in total, including 36 from managing authorities, 12 from IBs, 31 from public authorities (other than managing authorities and IBs, such as audit authorities and national coordination authorities in regionalized MS), and 20 from NPBIs.

The detailed population of respondents and the questionnaire used for the online consultation are presented in Annex 4.

The present chapter depicts the overall results from this online consultation.

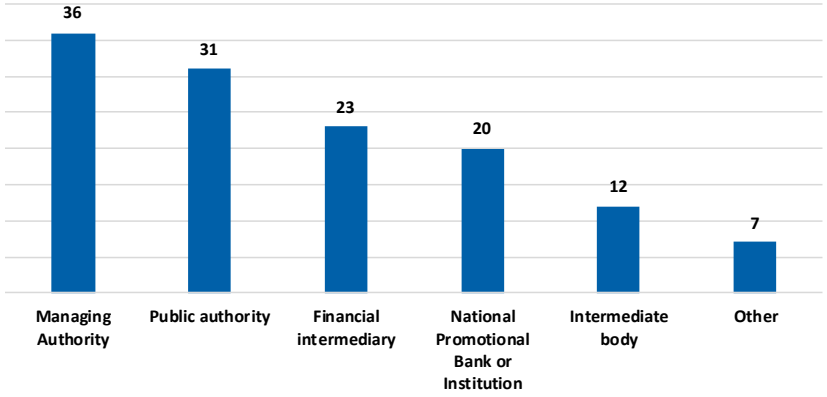
As an overall disclaimer for the chapter, it is to be mentioned that the feedback and views collected through 129 entities[21] cannot be considered to be totally exhaustive. Indeed, more than 300 managing authorities are in charge of OPs for ERDF and CF funding, and the overall population of entities involved in the development and use of ERDF / CF-supported financial instruments is large and diverse [including IBs, audit authorities, NPBIs, commercial banks, as well as Venture Capital (VC) and Private Equity (PE) funds]. Despite this, the opinions and experience captured through the online consultation are considered to provide relevant inputs from knowledgeable and concerned entities whose opinions and feedback are valuable. Moreover, the 129 views collected encompass the variety of entities involved in financial instruments (*as illustrated in Table 50 on page 253*).

3.1 Sample population

The highest number of responses were provided by managing authorities and public authorities, accounting for 36 and 31 answers respectively. When it comes to individual MS, the majority of managing authorities that participated in this consultation were from Czechia, France, Greece, Italy, Poland and Romania (three to four answers *per* MS). The following figure presents this EU-wide sample population while a table with the geographical coverage is presented in Annex 4.

[21] Considering also that this number of answers does not allow for an in-depth analysis by sector. That is why most of the analysis in the present chapter covers all five sectors, and include as many types of entities as possible.

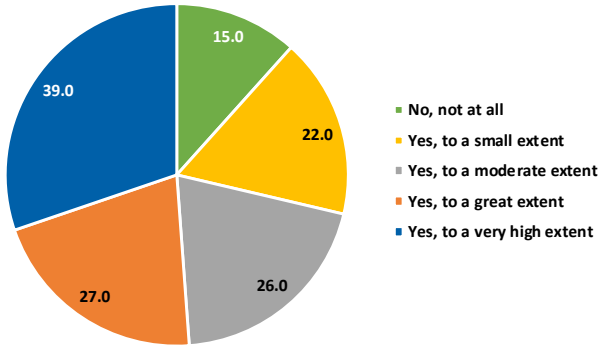
Figure 7: Types of entities having answered to the online consultation



Source: Results of the online consultation, Online consultation addressed to EU financial instruments stakeholders, fi-compass *and PwC analysis, 2019.*

In addition to information on the entities and MS where the respondents were evolving, it is important to know their relations / experience with financial instruments. On that matter, a majority of respondents declared having experience in the deployment of financial instruments in the current 2014-2020 programming period. As presented in the figure below, about 90% of them had experience in the deployment of financial instruments; and even 51% declared having experience to a great (21%) or to a very high extent (30%) in the deployment of financial instruments.

Figure 8: Respondents' level of involvement in the deployment of financial instruments in the 2014-2020 programming period



Source: Results of the online consultation, Online consultation addressed to EU financial instruments stakeholders, based on 129 answers, fi-compass *and PwC analysis, 2019.*

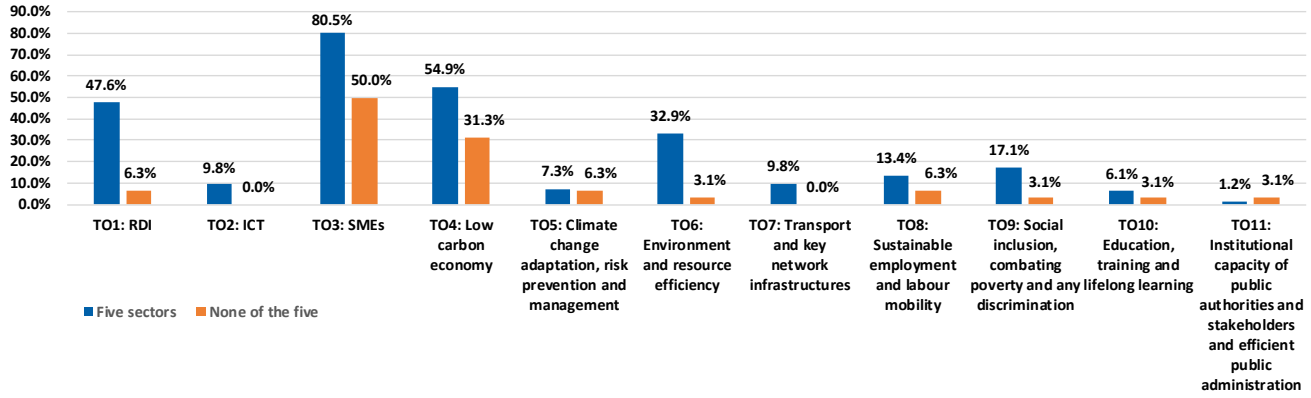
3.2 Consideration for financial instruments

The figure below presents the consideration for financial instruments across the eleven TOs of the 2014-2020 programming period for two groups of respondents. The first group represents respondents that have considered deploying a financial instrument in at least one of five sectors. The second group encompasses respondents who have not considered the deployment of financial instruments in any of the five sectors. As illustrated below, the vast majority of the respondents that have considered (or have been involved in) the deployment of financial instruments in at least one of the five sectors in the 2014-2020 programming period (80%) reported having considered financial instruments in relation with TO 3 (*i.e.* SME financing for competitiveness). **Financial instruments related to SME financing consequently appear as an '*entry door*' to ERDF- and CF-supported financial instruments**. **This consideration for SME-financing financial instruments**

seem consequently to act as a key driver in the decision-making process when it comes to put financial instruments on the policy agenda (being for SME financing or for another sector). As also illustrated in the figure below, it is also not surprising that TO 3, TO 1 and TO 4 are the TOs where the respondents have the highest consideration for financial instruments (in both groups) since these TOs were the main markets where structural funds could be used under the form of financial instruments during the 2007-2013 programming period. Following this, **past experiences with financial instruments in these sectors seem also to have influenced the respondents to reiterate or continue the use of financial instruments in similar sectors (such as the UDT and the 'RDI in SMEs' in the present stocktaking study) and in certain cases expand these experiences to other sectors**, as allowed by the CPR during the 2014-2020 programming period.

Past experiences, lessons learnt and priority considerations for markets where there is consensus on the relevance and use of financial instruments – such as SME financing – are key drivers for putting financial instruments on policy agendas (for these '*already-known*' sectors as well as sometimes new ones).

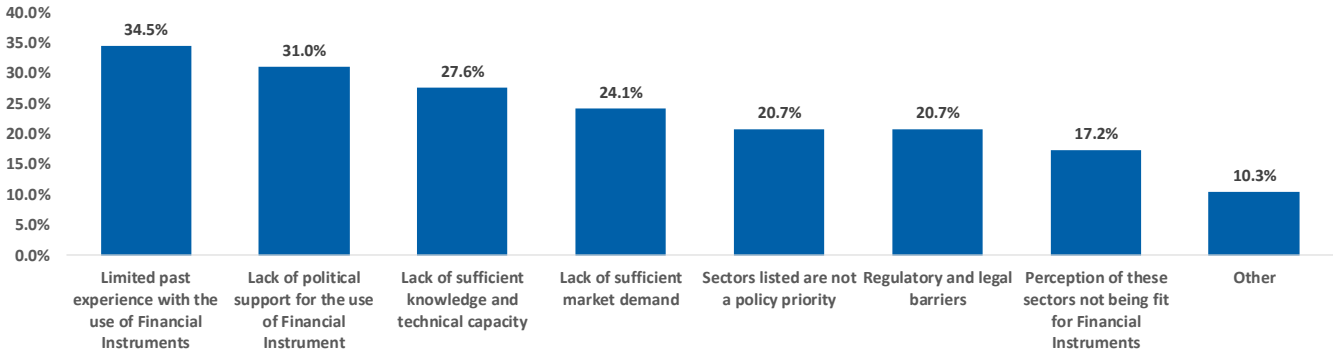
Figure 9: Respondents' consideration for financial instruments by thematic objective (for respondents having considered financial instruments in one of the five sectors or none of them)



Source: Results of the online consultation, Online consultation addressed to EU financial instruments stakeholders, Group 1 – Considered the deployment of FI in at least one of five sectors (81 respondents), Group 2 – Considered the deployment of financial instruments in none of the five sectors (31 respondents), fi-compass *and PwC analysis, 2019.*

On the contrary, when it comes to the **main reasons why financial instruments have not been considered in any of the five studied sectors**, about one third of the respondents in this situation (all types of entities taken together) pointed out: (i) limited past experience with the use of financial instruments, (ii) the lack of political support for the use of financial instruments and (iii) the lack of sufficient knowledge and technical capacity, as the main barriers encountered. Further to this, as illustrated in the figure below, the lack of sufficient market demand, the lack of political prioritisation of the sectors as well as regulatory and legal barriers, and the lack of understanding of the potential to use financial instruments in these sectors were also mentioned. Following this, **if some of these factors are beyond the control of the main stakeholders** (such as the managing authorities and/or the Intermediate Bodies)**, some of them may be influenced for an increased interest and use of financial instruments in these sectors in the future**.

Figure 10: Reasons why financial instruments were not considered in any of the five studied sectors



Source: Results of the online consultation, Online consultation addressed to EU financial instruments stakeholders, based on answers given by 29 respondents, fi-compass *and PwC analysis, 2019.*

3.3 Challenges experienced in the deployment of financial instruments in the five studied sectors

3.3.1 Design and set-up stages of financial instruments in the five studied sectors

The top five **challenges**, experienced by more than half of the respondents, **during the design and set-up stages** of the financial instruments are:

- **State aid rules** (for 76.2% of the respondents);
- Regulatory framework at the EU level (for 57.1% of them);
- Time consuming process given the sector specificities (for 57.1%);
- Regulatory constraints at the local level (for 54.8% of them); and
- The administrative complexity given the sector specificities (for 50.0% of them).

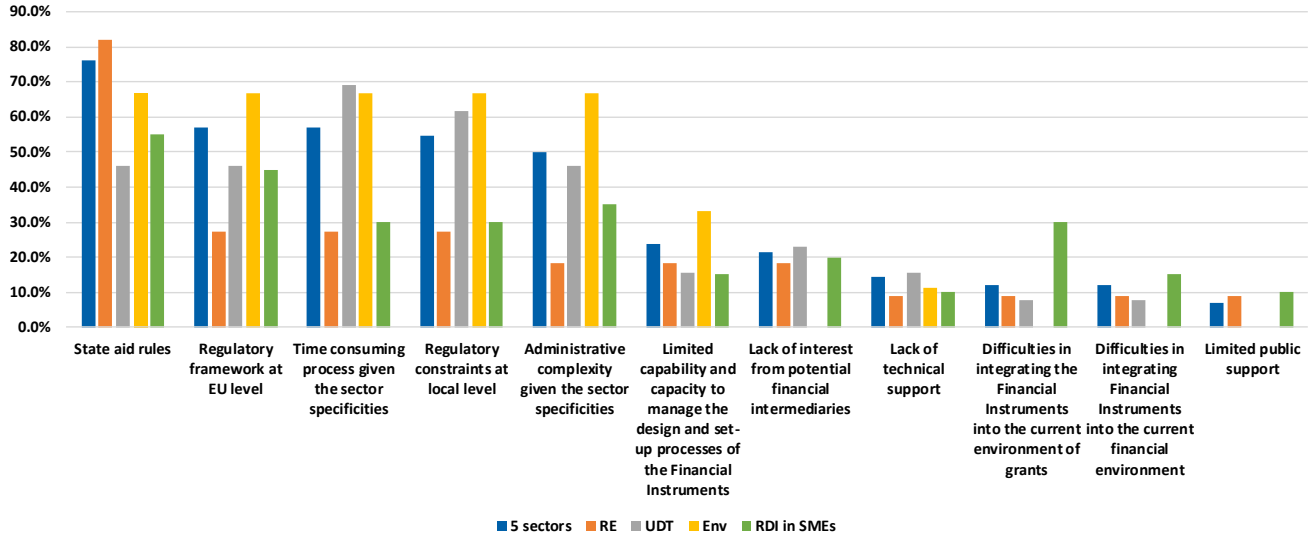
When it comes to differences among the five sectors within the scope of the present stocktaking study:

- State aid rules are, by far, the key challenge in the RE sector (for 81.8% of the sectoral respondents);
- Respondents related to the UDT sector do not seem to have experienced particular challenges (in comparison with other sectors or the five sectors taken together), except in regards to a perceived time consuming process given the sector specificities (for 69.2% of the sectoral respondents), which can be explained by the variety of projects that fall under this specific sector;
- **Respondents related to the Environment sector seem to have comparatively experienced more challenges than in the other sectors**, especially in the 'top five challenges' listed above;
- No specific answers related to the 'ICT infrastructure' sector were received in relation to challenges; and
- If **the respondents related to the 'RDI in SMEs' sector seem to have comparatively experienced fewer challenges than in the other sectors** (which can be explained by lessons learnt from past experiences), stakeholders dealing with this sector seemed to have experienced specific challenges in relation to difficulties in '*integrating the financial instruments into the current environment of grants*' (for 30.0% of the sectoral respondents in comparison with 11.9% of the respondents of the five sectors) or in '*integrating financial instruments into the current financial environment*' (for 15.0% of the sectoral respondents in comparison with 11.9% of the respondents of the five sectors). This latter aspect can be

explained by the fact that financial instruments (sometimes non-ESIF) may already exist on the market (which is more seldomly the case in the other four sectors).

Finally, the following figure indicates that '*lack of technical support*' and/or '*lack of public support*' do not seem to be key challenges, despite the fact that '*limited capability and capacity to manage the design and set-up processes of the financial instruments*' was a challenge for 23.8% of the respondents. This indicates that capacity building may still be relevant in the future for the design and set-up stages of a financial instrument's lifecycle; especially in sectors where past experience is limited, such as the Environment sector.

Figure 11: Challenges experienced at the design and set-up stages of financial instruments in the five studied sectors



Source: Results of the online consultation, Online consultation addressed to EU financial instruments stakeholders, based on answers given by 42 respondents (11 for RE, 13 for UDT, 9 for Environment, and 20 for RDI in SMEs)[22]*,* fi-compass *and PwC analysis, 2019.*

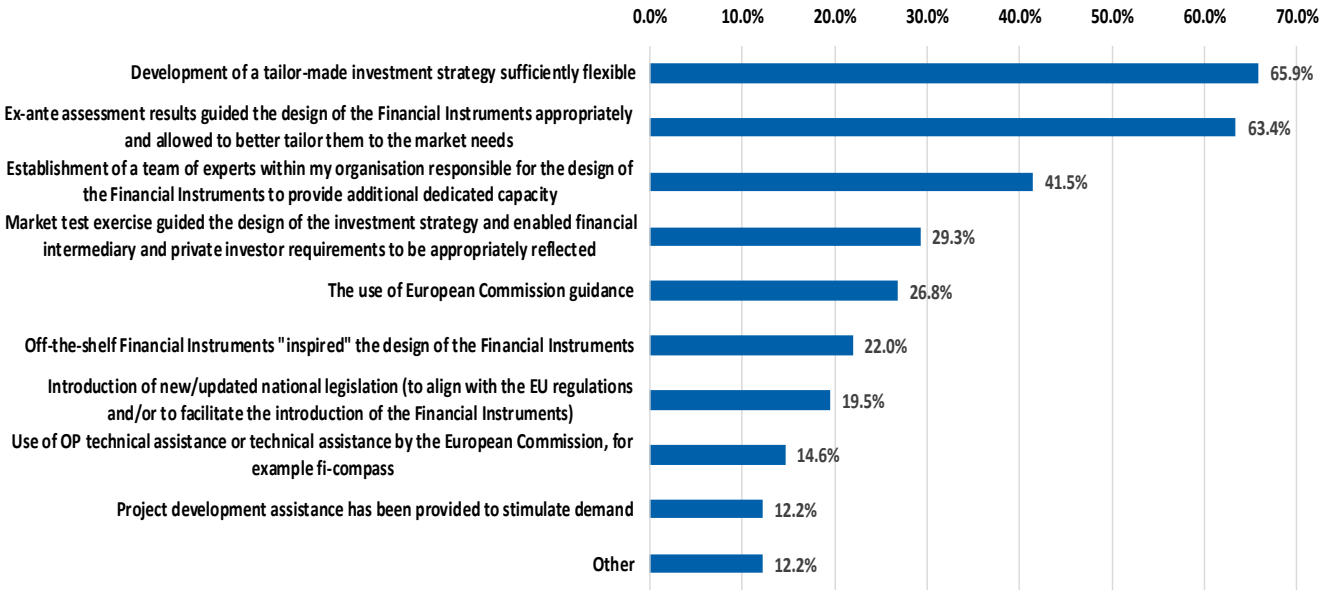
As illustrated in the figure below, when it comes to the **solutions** that the respondents developed to address these challenges associated with the design and set-up stages of a financial instrument's lifecycle:

- The key two solutions relate to the '*development of a sufficiently flexible tailor-made investment strategy*' (for 65.9% of the respondents) and to the '*results of the* ex-ante *assessment*' that guided the design of the financial instruments appropriately and allowed to better tailor them to the market needs (for 63.4% of the respondents). These two main solutions also need to be considered together with the '*market test exercise* [that] *guided the design of the investment strategy*' (for 29.3% of the respondents). **A supportive *ex-ante* assessment, together with an appropriate market test exercise and a flexible investment strategy appear then solutions to challenges and key enabling factors for the design and set-up of financial instruments in the five studied sectors**.
- Another key success factor revealed by the results of the online consultation is the '*establishment of a team of experts* […] *responsible for the design of the financial instruments to provide additional dedicated capacity*' (for 41.5% of the respondents). This indicates that **developing ERDF / CF-supported financial instruments often deserves an internal mandate within the entity in charge; this mandate being translated into a devoted team (with the necessary time / resources, experience / skills and capacity) committed to their design and set-up**.

[22] Some respondents answered for more than one sector.

- Other sources of support such as the EC guidance documents, the off-the-shelf instruments developed for the 2014-2020 programming period, external Technical Assistance (TA) financed by the OPs or provided by the EC have also played a supportive role but to a lesser extent the first factors mentioned above.

Figure 12: Solutions to the challenges at the design and set-up stages of financial instruments in the five studied sectors



Source: Results of the online consultation, Online consultation addressed to EU financial instruments stakeholders, based on answers given by 41 respondents, fi-compass *and PwC analysis, 2019.*

3.3.2 Implementation of financial instruments in the five studied sectors

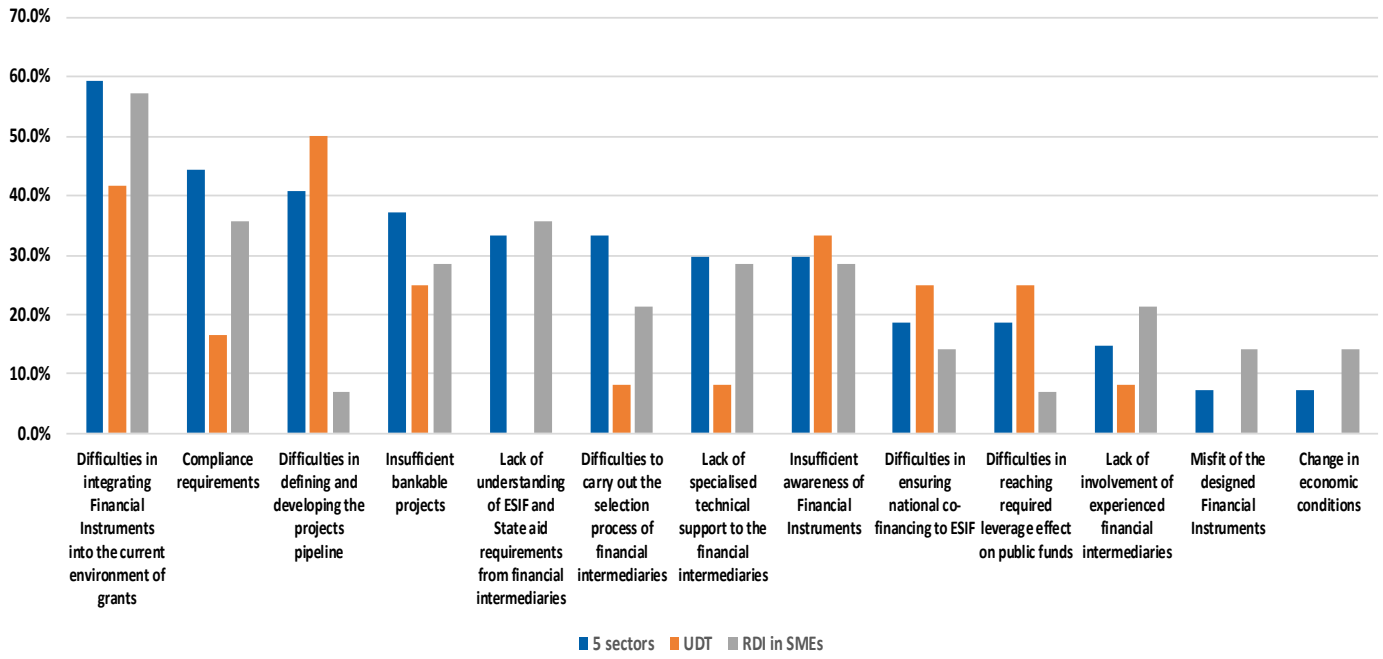
As illustrated in the figure below, the main **challenge** experienced **during the implementation** of financial instruments in the five sectors relates to '*difficulties in* ***integrating financial instruments into the current environment of grants***' (for 59.3% of the respondents). It is however to be noted that only respondents involved in financial instruments in the UDT and 'RDI in SMEs' sectors provided answers to this aspect.

In a more detailed view, there are clear differences in the challenges experienced by the respondents in the two illustrated sectors:

- While for the UDT sector, '*insufficient awareness of financial instruments*' (for 33.3% of the respondents), '*difficulties in ensuring national co-financing to ESIF*' (for 25.0% of the respondents), and '*difficulties in reaching required leverage effect on public funds*' (for 25.0% of the respondents) are key challenges;
- The latter are not an apparent issue for the 'RDI in SMEs' sector; where the '*lack of understanding of ESIF and State aid requirements from* [the] *financial intermediaries*' (for 35.7% of the respondents), the '*lack of specialised technical support to the financial intermediaries*' (for 28.6% of the respondents), the '*difficulties to carry out the selection process of financial intermediaries*' (for 21.4% of the respondents), and the '*lack of involvement of experienced financial intermediaries*' (also for 21.4% of the respondents) are more challenging.

Following this, **while the challenges during the implementation stage relate to (i) project pipeline development and (ii) ensuring the appropriate co-financing / leverage effect in the UDT sector, they relate more to (i) compliance requirements (especially with ESIF and State aid rules) as well as (ii) capacity / involvement of the financial intermediaries in the 'RDI in SMEs' sector**.

Figure 13: Challenges experienced at the implementation stage of financial instruments in the five studied sectors

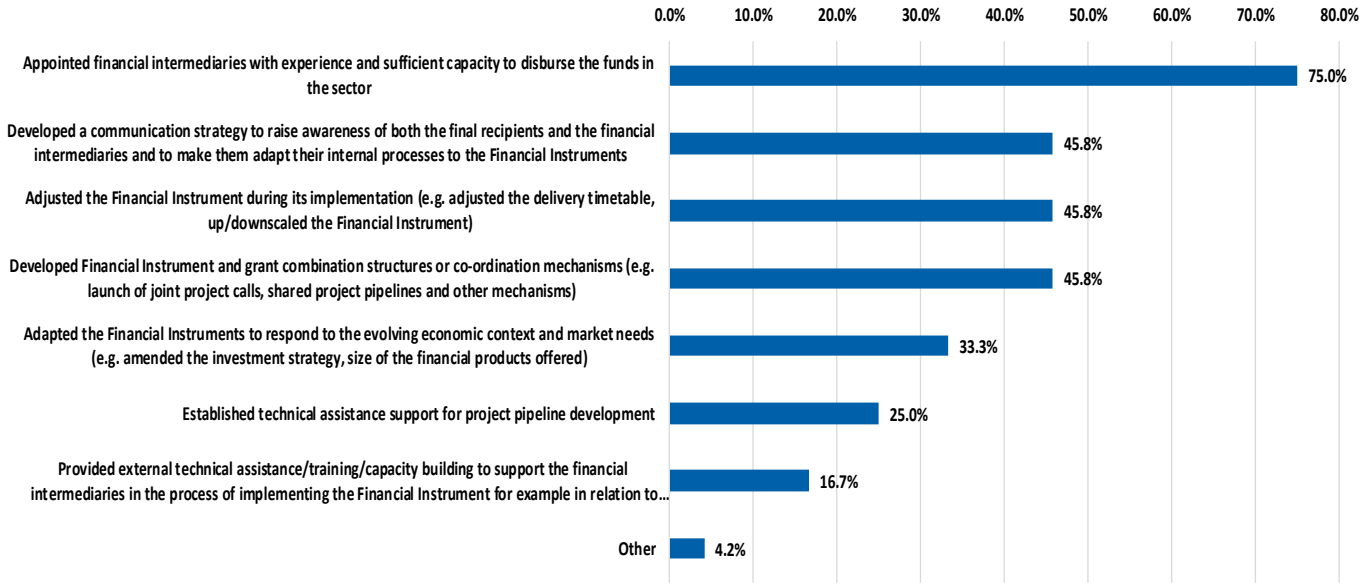


Source: Results of the online consultation, Online consultation addressed to EU financial instruments stakeholders, based on answers given by 27 respondents (12 for UDT, and 14 for RDI in SMEs), fi-compass *and PwC analysis, 2019.*

The **solutions** that respondents developed to address these challenges associated with the implementation stage of financial instruments are illustrated in the figure below. It clearly indicates that **the main solution and key enabling factor for such implementation relates to the appointment of *'financial intermediaries with experience and sufficient capacity to disburse the funds in the* [given] *sector'*** (for 75.0% of the respondents).

Other solutions were developed by nearly half of the respondents: (i) a '***communication strategy*** *to raise awareness of both the final recipients and the financial intermediaries*', (ii) the **adjustment of the financial instrument** during the implementation, and (iii) **combination structures or co-ordination mechanisms between the financial instrument and grants**.

Figure 14: Solutions to the challenges at the implementation stage of financial instruments in the five studied sectors



Source: Results of the online consultation, Online consultation addressed to EU financial instruments stakeholders, based on answers given by 24 respondents, fi-compass *and PwC analysis, 2019.*

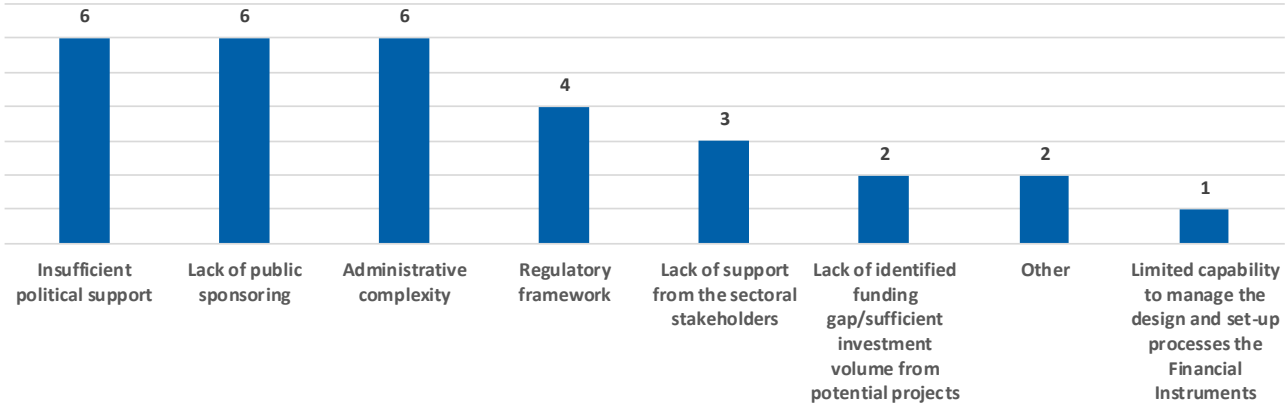
3.3.3 Hindering and enabling factors in the case of 'non-deployment' of financial instruments in the five sectors

The online consultation also covered the '*factors that prevented the deployment of financial instruments in the five sectors*'; hence collecting the views of stakeholders that considered developing financial instruments in one of the five sectors but did / could not set them up. The online consultation captured the views of nine entities in this situation. Considering this limited number of respondents, the following figure indicates the exact number of answers for each factor. It appears that **three main factors seem to have hindered the deployment of financial instruments in the five sectors** according to the respondents in this specific situation:

- An **insufficient political support** (such support being expected from the political sphere, and needed to provide an impetus for the development and implementation of ERDF / CF-supported financial instruments);
- A **lack of market sponsoring** (such sponsor being needed from the stakeholders of the various markets to be addressed by the future financial instruments, such as *i.a.* the future final recipients' representatives – like the Chambers of Commerce –, and the potential financial intermediaries); and
- **Administrative complexity**.

These factors appear very much in line with the main reasons why financial instruments have not been considered at all in any of the five studied sectors (*see Section 3.2 above*). It consequently seems that stakeholders that (i) did not consider the deployment of financial instruments in any of the five sectors and those that (ii) considered such deployment but stopped their process / did not succeed in deploying them, have faced the same difficulties. The preliminary conclusions developed in Section 3.2 may then also apply in the present situation.

Figure 15: Hindering factors that prevented the deployment of financial instruments in the five studied sectors



Source: Results of the online consultation, Online consultation addressed to EU financial instruments stakeholders, based on answers given by 9 respondents, fi-compass *and PwC analysis, 2019.*

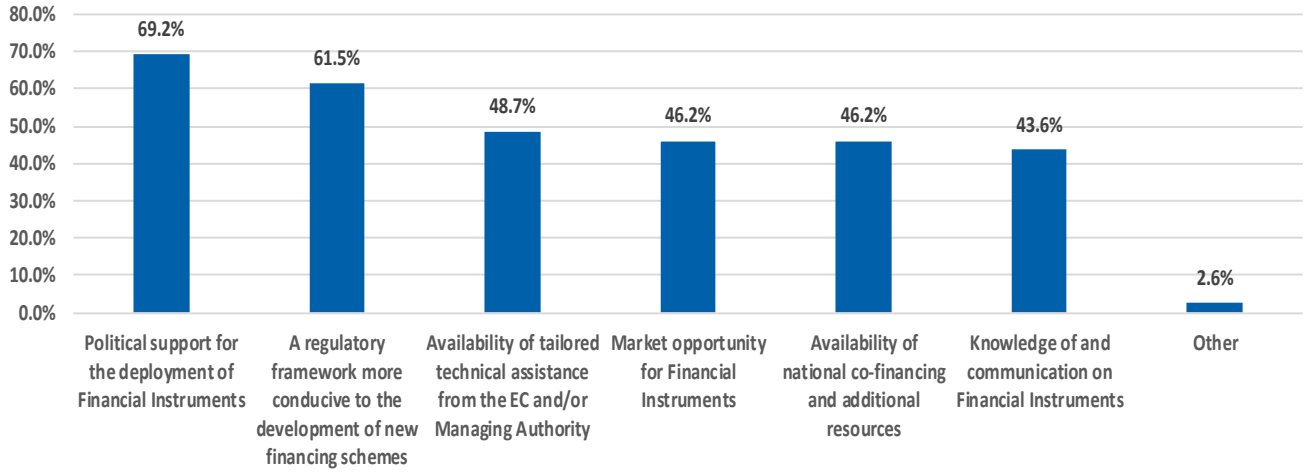
The online consultation also asked the stakeholders who attempted to deploy financial instruments in one of the five sectors but did not succeed what factors could have made this possible (both at design and implementation stages). As illustrated in the figure below, respondents identified **two key enabling factors for the deployment of financial Instruments**:

- **Political support** for the deployment of financial instruments (for 69.2% of the respondents); and
- **Greater regulatory support for the development of the new financing schemes** (for 61.5% of the respondents).

In addition to these two key factors, almost half of the respondents also pointed out as key enabling factors for the deployment of financial instruments:

- The availability for the managing authority or the IB of tailored TA for the design, set-up, and implementation of the financial instruments (for 48.7% of the respondents);
- Market opportunity for financial instruments in the given sectors (for 46.2% of the respondents), indicating that market opportunities for financial instruments still need to be proven in some sectors such as the ones analysed in the present study;
- The availability of co-financing (for 46.2% of the respondents); and
- Knowledge as well as communication on financial instruments (for 43.6% of the respondents).

Figure 16: Enabling factors that could have facilitated the deployment of financial instruments in the five studied sectors



Source: Results of the online consultation, Online consultation addressed to EU financial instruments stakeholders, based on answers given by 39 respondents, fi-compass *and PwC analysis, 2019.*

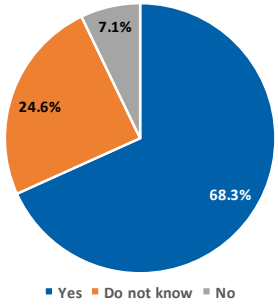
Following this, the respondents identified very diverse factors as facilitators for the deployment of financial instruments; each being under various scopes and responsibilities. Two sets of external factors may be considered. The first set concerns external factors on which public and para-public entities may have a role to play, being: (i) a more conducive regulatory framework, (ii) tailored TA (including from the EC and the managing authorities), as well as (iii) knowledge and communication measures / support facilities. The second set of external factors rather concerns the financial sphere and each market environment, including: (i) the perception for market opportunities (often deriving from the opinions of financial stakeholders), and (ii) the availability of co-financing (to be often provided by financial stakeholders).

3.4 Considerations for financial instruments for the 2021-2027 programming period

As illustrated in the figure on the right, almost 70% of the respondents to the online consultation considered the implementation of financial instruments under shared management with the support of the ERDF or CF in the 2021-2027 programming period.

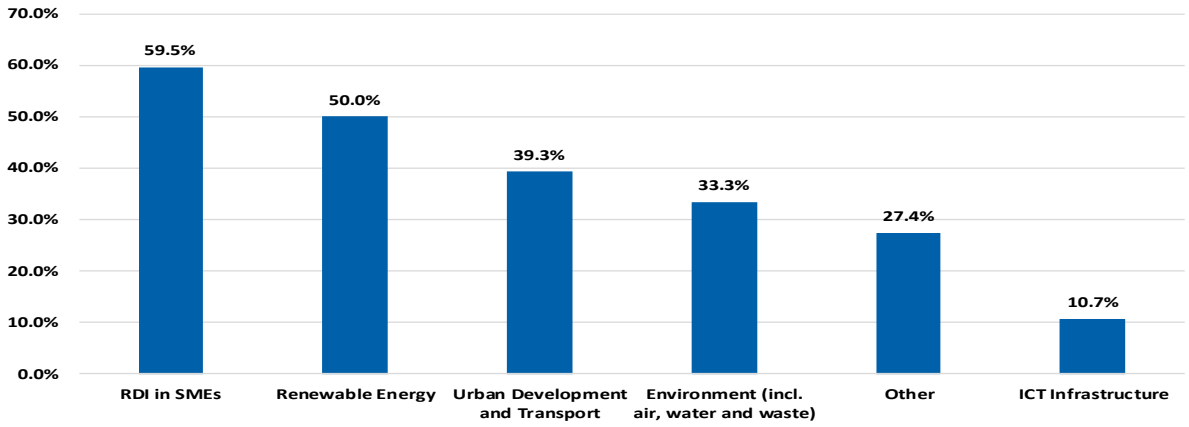
Among those who considered the implementation of financial instruments in the 2021-2027 programming period, a majority was interested in financial instruments dedicated to the 'RDI in SMEs' sector (59.5% of the respondents) and to the RE sector (50.0% of them). Respondents also considered the implementation of financial instruments in the UDT sector (39.3% of them) and the Environment sector (33.3% of them). Following this, it may be assumed that **at least one third of the respondents to the online consultation considered financial instruments for the 2021-2027 programming period in four of the five sectors studied**.

Figure 17: Consideration for implementation of ERDF-CF-supported financial instruments in the 2021-2027 programming period[23]



Source: Results of the online consultation, Online consultation addressed to EU financial instruments stakeholders, based on answers given by 129 respondents, fi-compass *and PwC analysis, 2019.*

Figure 18: Sectors considered for the implementation of ERDF / CF-supported financial instruments in the 2021-2027 programming period



Source: Results of the online consultation, Online consultation addressed to EU financial instruments stakeholders, based on answers given by 84 respondents, fi-compass *and PwC analysis, 2019.*

When deciding to deploy financial instruments in the 2021-2027 programming period, the respondents estimated the following **factors as supportive in their own decision-making process**:

- The **revolving character of financial instruments** (71.8% of the respondents);
- The existence of a **financing gap in the sector** (64.7% of the respondents); and
- Their **own experience with financial instruments in this / these given sectors** (61.2% of the respondents).

[23] A majority of the '*no population*' results from the Brexit situation (Pls make clear for readers what is meant by 'the Brexit situation').

In parallel, the respondents seemed more risk-averse when it considering to deploy financial instruments in sectors where they are not used to use such financing tool(s), despite political willingness ('only' 32.9% of the respondents would consider such possibility).

Following this, it appears that **the EU stakeholders involved in ERDF and CF financial instruments would base their future decision relative to the deployment of such financing tools on technical aspects** (*i.e.* the revolving aspect of the instruments and the financing gap to be filled) **and on their own (previous) experience in each given sector**. This illustrates a rational decision-making process (probably deriving from the lessons learned during the *ex-ante* assessment and market test exercise processes). It however also illustrates that **extending the use of financial instruments to sectors where such use was limited in the past** (*i.e.* the RE, Environment, and 'ICT infrastructure' sectors during the 2014-2020 programming period in the context of the present stocktaking study) **would require substantiated technical arguments favouring such use**[24]**, pedagogy in regards to local market environments, the development of awareness raising activities presenting the opportunities offered by financial instruments in these sectors, and probably technical support in the design and implementation of financial instruments in these sectors**.

3.5 Main outputs from the online consultation

As an interim conclusion and based on the online consultation, it is possible to highlight that:

- **ERDF and CF financial instruments related to SME financing appear as an '*entry door*' to the development of financial instruments supporting other sectors**. Past experiences, lessons learnt and priority considerations for markets where there is consensus on the relevance and use of financial instruments – such as SME financing – are key drivers for putting financial instruments on policy agendas (potentially for several sectors).
- Stakeholders that (i) '*did not consider the deployment of financial instruments in the five sectors*' and those that (ii) '*considered such deployment but stopped the process and did not succeed in deploying them',* faced the same difficulties. **Their main issues concerned: (i) insufficient political support, (ii) lack of market sponsoring**[25]**; and (iii) administrative complexity**.
- For the stakeholders that implemented financial instruments in one of the five sectors, the **top five challenges during the design and set-up stages** of the financial instruments were: (i) [difficulty to understand and/or comply with] State aid rules, (ii) [difficulty to understand and/or comply with the] regulatory framework at the EU level, (iii) [issues related to a] time consuming process given the sector specificities, (iv) [difficulty to understand and/or comply with] regulatory constraints at the local level, and (v) the administrative complexity given the sector specificities.
- A supportive *ex-ante* assessment, together with an appropriate market test exercise and a flexible investment strategy appear to represent **solutions to challenges during the design and set-up stages** of financial instruments in the five studied sectors. Capacity building may also be relevant during these stages; especially in sectors where past experience with financial instruments is limited.
- The **main challenge experienced during the implementation** of financial instruments in the five sectors relates to: difficulties in integrating financial instruments into the current environment of grants. Differences between sectors also exist during this stage: while the challenges in the UDT sector relate to (i) projects pipeline development and (ii) ensuring the appropriate co-financing / leverage effect, they

[24] This element being one of the objectives of the present stocktaking study.

[25] An 'insufficient political support' refers to the support that may be expected from the political sphere in order to provide an impetus for the development and implementation of ERDF / CF-supported financial instruments. A 'lack of market sponsoring' refers to the sponsor needed from the stakeholders of the various markets to be addressed by the future financial instruments, such as *i.a.* the future final recipients' representatives – like the Chambers of Commerce –, and the potential financial intermediaries.

relate more to (i) compliance requirements (especially with ESIF and State aid rules) as well as (ii) capacity / involvement of the financial intermediaries in the 'RDI in SMEs' sector.

- The main **solutions to these challenges during the implementation stage** relate to: (i) the appointment of financial intermediaries with experience and sufficient capacity to disburse the funds in the given sector, (ii) a communication strategy to raise awareness of both final recipients and financial intermediaries, (iii) the adjustment of the financial instrument during the implementation, and (iv) combination structures or the development of appropriate co-ordination mechanisms between the financial instrument and grants.
- **When considering the 2021-2027 programming period**, almost 70% of the respondents to the online consultation consider the implementation of financial instruments under shared management with the support of the ERDF or CF. It may also be assumed that at least one third of the respondents to the online consultation consider financial instruments in four of the five sectors studied (except the 'ICT infrastructure' sector). It seems that the key stakeholders would base their **future decision on technical aspects**, **as well as on their own (previous) experience in each given sector**. This illustrates that **extending the use of financial instruments to sectors where such use was limited in the past** (such as the RE, the Environment, and the 'ICT infrastructure' sectors) **would require substantiated technical arguments favouring such use, pedagogy in regards to local market environments, the development of awareness raising activities presenting the opportunities offered by financial instruments in these sectors, and probably technical support in the design and implementation of financial instruments in these sectors**.
- Finally, it may be assumed that overall fostering the deployment of financial instruments in the five sectors studied involves: (i) a **political steer from a decision-making entity**, (ii) the **support from other public and/or para-public entities in relation to a conducive regulatory framework**, an **easy access to TA** and the **set-up of facilities favouring communication and knowledge-sharing on financial instruments**, and (iii) the **implication of the financial sphere** (with the promotion of financial instruments by potential financial intermediaries) to prove that market opportunities exist in these sectors and that they are ready to put '*skin in the game*' under the form of co-financing within financial instruments.

Following the EU-wide and cross-sectoral insights provided by (i) the quantitative analysis of the financial data provided by the MS (Chapter 2), and (ii) the results of the online consultation (Chapter 3), the five chapters hereafter detail sectoral analyses on the use of financial instruments in the five selected sectors.

4 Foster the use of financial instruments in the 'Renewable Energy' sector

4.1 Policy context

With an objective of sending a strong signal to the market and to encourage investment in the sector the European Council agreed on the '2030 Energy Strategy'[26], which defines the EU-wide climate and energy targets for the period between 2020 and 2030. These targets have been further increased in the scope of the '**Clean Energy for All Europeans**'[27] package, whose negotiations have now been concluded and are expected to be adopted later in 2019.

The 'Clean Energy for All Europeans' package sets new, more ambitious and binding targets to be achieved across the EU by 2030. These targets are a 40% reduction of greenhouse gas emissions by 2030, a 32% increase of the share of renewable energy in final energy consumption at EU level by 2030 and a 32% increase in energy efficiency by 2030.

To reach these targets, **the EU needs to increase investments in Renewable Energy** (RE) and place greater priority on Energy Efficiency (EE). The objectives set out in the 'Clean Energy for All Europeans' package require **an annual investment of EUR 177bn** from private and public sources from **2021 to 2030**[28]. It is important to note, however, that most of these investments are needed to improve the EE of the demand side (*e.g.* households, companies and public sector buildings). The additional annual investments required on the energy supply side – for the power generation and grid – are estimated at **EUR 9bn**[29]. This estimate takes into account the financing needs of clean energy sources and the investment associated with upgrading aging energy infrastructure[30].

4.1.1 Progress on reaching the Renewable Energy goals across EU Member States

The investment needs to increase the share of Renewable Energy Sources (RES) in the energy mix at the level of each Member State (MS) can be measured by taking into account the gap between:

- The **current RES share** in the final energy consumption of each EU Member State; and
- The individual **2020 RES share targets** set by each MS.

These targets are presented in the table below.

[26] European Commission, Energy Strategy 2030. Available here: https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/2030-energy-strategy.

[27] European Commission, Clean Energy for All Europeans. Available here: https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/clean-energy-all-europeans

[28] Estimated based on Impact Assessment for the amendment of the Energy Efficiency Directive, SWD (2016) 405.

[29] Based on the 2016 spending levels.

[30] Rademaekers, K et al, 2017a. European Energy Industry Investments. Study for the European Parliament, ITRE Committee. Available here: http://www.europarl.europa.eu/RegData/etudes/STUD/2017/595356/IPOL_STU(2017)595356_EN.pdf.

Table 4: The EU-level *vs.* national RES share targets

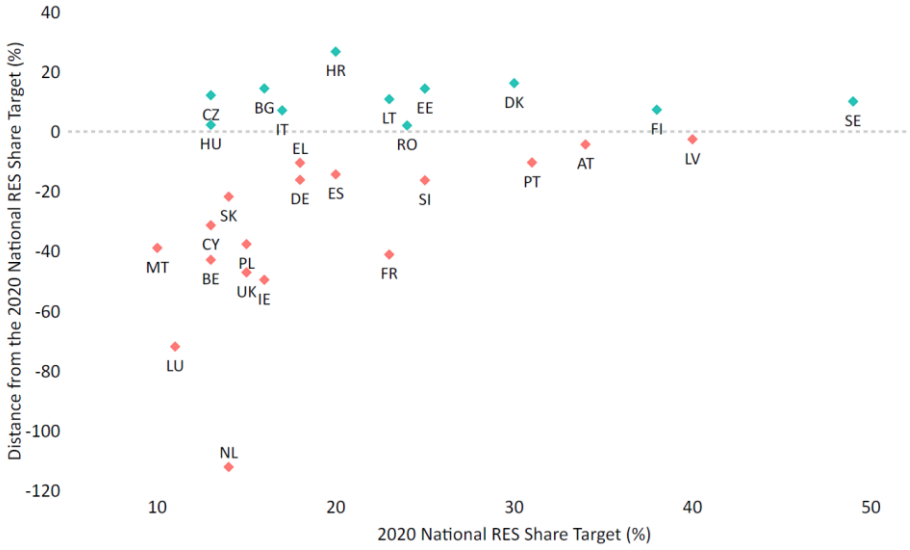
EU-level 2020 RES share target	National 2020 RES share targets
The current EU-wide RES share target is set at 20%, however will be further increased to reach 32% at the EU-level by 2030 as defined in the revised version of the Renewable Energy Directive[31].	To reach the EU-wide 2020 target, each Member State has committed to an **individual national target**. These vary substantially, from 10% in Malta to up to 49% in Sweden.

Source: Briefing. EU Legislation in Process. Promoting renewable energy sources in the EU after 2020, 2019[32].

Case for a stronger political support and additional investments

As illustrated on the figure below, the current situation across the EU calls **for a stronger and more committed political support to RE**, combined with the **provision of additional investments**. Most of EU Member States are yet to achieve their individual 2020 RES share targets. In this respect, the further increase of the EU-level RES share target to 32% at the EU-level by 2030 will constitute an even bigger challenge for most of the MS and will thus require **additional investments**, increased **political support** and **Technical Assistance** (TA). The scope for TA refers to both capability in the local / regional / national governments to set up incentive and financing schemes, as well as financial and technical support to project promoters to improve projects' bankability. The sub-sections below look into the current relative distance of the MS and the potential reasons behind the situation in some of these MS.

Figure 19: Distance to reach the national 2020 targets of increasing the share of RES in the final energy consumption



Source: Eurostat SHARES Dataset[33], Compiled by PwC, 2019.

[31] Official Journal of the European Union. Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast). Available here: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L2001&from=EN.

[32] Published on 15 January 2019. Available here: http://www.europarl.europa.eu/RegData/etudes/BRIE/2017/599278/EPRS_BRI(2017)599278_EN.pdf.

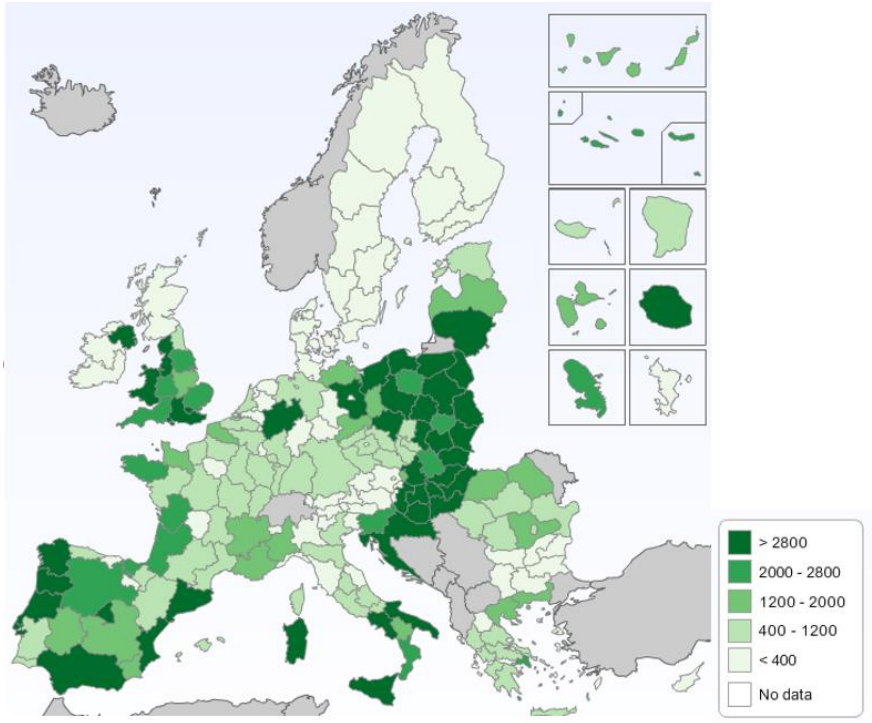
[33] Available here: https://ec.europa.eu/eurostat/web/energy/data/shares.

4.1.2 Planned ERDF / CF investments in Renewable Energy during the 2014-2020 programming period

To meet the current and future objectives, significant investments will be required to accelerate the speed of the EU Member States' transition to a more sustainable energy mix. **Planned ERDF / CF investments in RE** (*as outlined in the OPs for the 2014-2020 programming period*) **may be used as a proxy to reflect the level of political willingness** to support investments in the sector.[34]

The map below illustrates the distribution of planned ERDF / CF investments across the EU for RES. It needs to be taken into account that the highest amounts of ERDF / CF planned for RES within the scope of the study correspond to the MS, which are, at the same time, among the top ERDF / CF recipients in the EU. **The total ERDF / CF financing for the 2014-2020 programming period for the sub-sectors related to the RE sector across the EU amounts to EUR 5 948m. Poland, Hungary and Spain represent 43.8% of the ERDF / CF expenditure planned to support the RE sector and therefore, are the top three MS in terms of planned ERDF / CF investment in the sector**.

Figure 20: ERDF / CF planned amounts for the Renewable Energy sector in the EU (in mEUR)



Source: EC, Smart Specialisation Platform, Categories of intervention: 009 to 012 and 015, Planned investments in European Structural and Investment Funds (ESIF) data (ERDF, CF, ESF and YEI) based on the ESIF OPs, Retrieved on 20/01/2017 from the SFC2014/Infoview database, Unit applied: mEUR, 2017[35].

The table below compares the planned ERDF / CF investment within the scope of this sectoral analysis across these three MS to the EU-28, in absolute and relative terms. Poland, Hungary and Spain are heterogeneous in terms of support towards RES, as well as their performance towards reaching the RES share targets.

[34] The list of intervention codes used for the quantitative analysis is presented in Annex 1.

[35] Planned investments in European Structural and Investment Funds (ESIF) data (ERDF, CF, ESF and YEI) based on the ESIF Operational Programmes (OP) (retrieved on 20/01/2017 from the SFC2014/Infoview database).
Available here: http://s3platform.jrc.ec.europa.eu/esif-energy.

Table 5: Top three planned ERDF / CF MS spenders compared to the EU-28 total spending for selected intervention codes related to Renewable Energy

Sub-sector	Member States with the highest amounts of ERDF / CF planned for RES						EU-28	
	Poland		Hungary		Spain		EU-28 total	
	mEUR	*Share*	mEUR	*Share*	mEUR	*Share*	mEUR	*Share*
Solar energy	371.0	*35%*	252.0	*29%*	172.0	*26%*	1 200.0	*20%*
Biomass energy	287.0	*27%*	364.0	*41%*	240.0	*36%*	1 864.0	*31%*
Wind energy	176.0	*17%*	0.5	*0%*	140.0	*21%*	431.0	*7%*
Other RE (incl. hydroelectric, geothermal and marine)	117.0	*11%*	261.0	*30%*	103.0	*15%*	1 373.0	*23%*
Intelligent Energy Distribution	103.0	*10%*	1.0	*0%*	18.0	*3%*	1 080.0	*18%*
Total	**1 054.0**	***100%***	**878.5**	***100%***	**673.0**	***100%***	**5 948.0**	***100%***

Source: Planned investments in European Structural and Investment Funds (ESIF) data (ERDF, CF, ESF and YEI) based on the ESIF OPs, Retrieved on 20/01/2017 from the SFC2014/Infoview database, Compiled by PwC, 2019.

4.2 The use of financial instruments in the Renewable Energy sector

As mentioned in Chapter 2, 'sectoral analyses' were performed using the financial data provided by MS to the EC for monitoring / reporting purposes in relation to the implementation of their OPs. The present analysis consider the three pieces of information below altogether (namely Figure 21, Figure 22 and Table 6).

The following figures and table indicate that only three MS were using ERDF and CF funding for financial instruments in the RE sector (as of 31 December 2017); namely: Greece[36], Hungary, and Poland.

At the EU level (so when considering these three MS altogether), EUR 275.9m have been devoted to financial instruments in the RE sector, representing 12.3% of the 'total eligible cost' for the RE sector. The main form of finance chosen by the managing authorities is, by far, loans (for 90.7% of the amounts). Finally, the share of financial instruments in the EU-wide RE sector among financial instruments in all sectors (including the five studied sectors but not only) represents 1.6%, indicating that managing authorities and Intermediate Bodies do not seem to prioritise the RE sector when developing their strategies for financial instruments[37]. The individual approaches decided by the three MS appear different, proving that ERDF / CF-supported financial instruments can adapt to local / national needs and sectoral strategies. For instance:

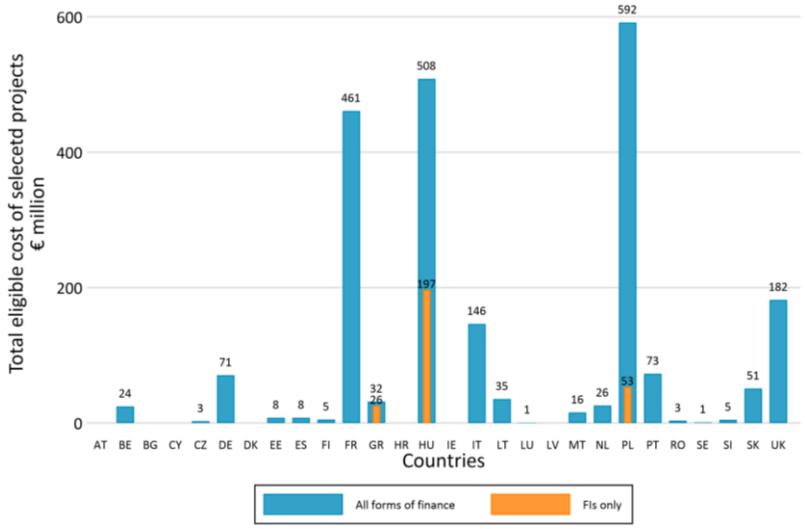
[36] Greece is setting up a financial instrument for the RE sector, which is presented as a case study to this chapter. Nevertheless, there is an inconsistency between the 'Financial Data by categories' and the 'Summary of Data' for allocations to financial instruments. No funding agreement was yet signed for the RES financial instruments by the cut-off date 31/12/2019. Therefore the amount allocated to financial instruments should be zero.

[37] For comparison purposes, and as detailed in the following 'sectoral analyses / chapters', this share is: 2.2% for the UDT sector, 1.0% for the Environment sector, 1.7% for the 'ICT infrastructure' sector, and 12.2% for the 'RDI in SMEs' sector. This share for the five sectors altogether is of 18.6%.

- While Poland has the largest ERDF / CF amount available for the RE sector (EUR 592m;, financial instruments 'only' represent EUR 53.4m, hence 9.0% of the 'total eligible cost'. This percentage (9.0%) is the lowest of the three MS: Hungary having devoted 38.7% (with EUR 196.7m out of EUR 508m) and Greece 81.5% (with EUR 25.7m out of EUR 32m).
- It also indicates that **a minimum amount (volume) seems required to make the financial instruments in the RE sector viable**. This may explain why the top two MS with the highest available amounts for the RE sectors – namely Poland and Hungary – decided to use financial instruments; while France, the UK, Italy, and Germany (i.e. other MS with large available ERDF / CF amounts for the RE sector) are regionalised, which may limit the development of financial instruments in this sector.
- The share of financial instruments in the RE sector among financial instruments in all sectors (including the five studied sectors but not only) represent between 1.4% (Poland) and 8.3% (Hungary). As mentioned in Chapter 2, Poland has developed financial instruments in four (of the five) sectors, while Greece and Hungary have developed financial instruments in three (of the five) sectors. Following this, **the development of financial instruments in the RE sector seems a decision from MS that have past experience with ERDF / CF financial instruments and wish to develop such form of finance in 'new' sectors** (such as the RE one).

The financial instrument implemented in Greece for the RE sector will be detailed in a specific case study.

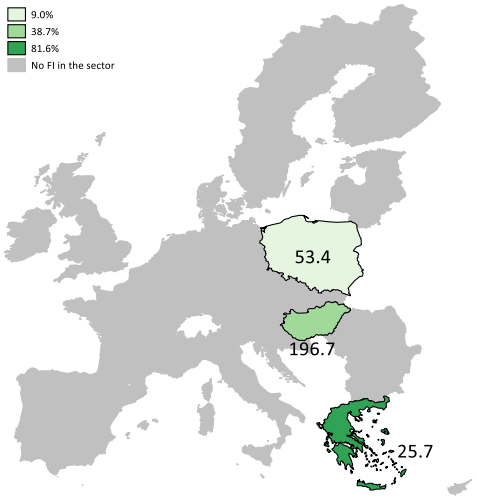
Figure 21: Proportion of ERDF and CF funding devoted to financial instruments in comparison with ERDF and CF funding devoted to all forms of finance (grants and financial instruments altogether) in the Renewable Energy sector[38]



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

[38] This figure indicates the 'total eligible cost of selected projects' for 'all forms of finance' (*i.e.* grants and financial instruments altogether; in the thicker blue column) and for 'financial instruments only' (in the inner orange column). For each Member State, data labels provide the nominal amounts in millions euros for the amounts devoted to financial instruments and the total amounts devoted to all forms of finance.

Figure 22: EU-wide map of the uptake of ERDF and CF financial instruments in the Renewable Energy sector[39]



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Table 6: Overview of ERDF and CF financial instruments in the Renewable Energy sector by Member State

Member State	Renewable Energy			
	Amount devoted to FIs (mEUR)	Share of FIs among all forms of finance (FIs and grants, %)	Type of financial products	Share of FIs in the sector among FIs in all sectors (not only the five sector, %)
Greece[40]	25.7	*81.5%*	*100% venture and equity capital*	*2.6%*
Hungary	196.7	*38.7%*	*100% loans*	*8.3%*
Poland	53.4	*9.0%*	*100% loans*	*1.4%*
EU Total	**275.9**	***12.3%***	***9.3% venture and equity capital 90.7% loans***	***1.6%***

Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

As mentioned above and in Section 1.2.2 in the introduction, **the RE sector is illustrated by a case study on the financial instrument developed in Greece**. It is presented in detail in the sub-section below.

4.2.1 The Greek Infrastructure Fund-of-Funds

In 2019, Greece set up a EUR 450m Fund-of-Funds (FoF) managed by the European Investment Bank (EIB), using ERDF resources from TO 4[41] and TO 6[42] aimed at financing projects related to Renewable Energy (RE), Energy

[39] This map indicates (*in green*) the Member States that have implemented financial instruments in the Renewable Energy sector by 31 December 2017. Where a Member State – or at least one of its managing authorities – has set up a financial instruments operation in this sector, the amount devoted to this / these financial instruments operation(s) is indicated in millions euros. The 'intensity' of green indicates the share of financial instruments among all forms of finance in this specific sector.

[40] In case of Greece, there has been some inconsistency in reporting. Greece is setting up a debt instrument for the RE sector, with not yet finally determined amounts of OP resources.

[41] TO 4: '*Supporting the shift towards a low-carbon economy*'.

[42] TO 6: '*Preserving and protecting the environment and promoting resource efficiency*'.

Efficiency (EE), and Urban Development. The latter sub-sector also benefited from the reflows of the JESSICA Holding Fund (HF) set up in Greece during the 2007-2013 programming period. As of September 2019, four financial intermediaries have been selected (out of which two have combined in a consortium)[43].

Although, at the time of writing, the FoF had only been operational for a short period of time, the commitment demonstrated by the relevant public authorities for its implementation, combined with some positive aspects of the foreseen activities, makes this a positive endeavour to further observe. More specifically, in comparison with other financial instruments supporting the RE sector in the EU, the Greek Infrastructure FoF encompasses some interesting elements, namely (i) a broader scope and (ii) an aim at financing also large RE infrastructure projects. Finally, as illustrated below, this case study also helps demonstrate the potential for using financial instruments' reflows.

Description of the financial instrument

Rationale and objectives

According to local experts and stakeholders involved in the design and set-up of the FoF, and as demonstrated in the conclusions of the *ex-ante* assessment of 2016, the RE sector presents high potential in Greece; mainly thanks to the climate and natural characteristics of the country. RE projects already exist in relation to solar, wind, biofuel, and biomass energy sources. Some biofuel and biomass projects were even supported by the JESSICA HF during the 2007-2013 programming period. The 2014-2020 FoF has been developed as a continuation of this successful JESSICA initiative.

In the *ex-ante* assessment performed in 2016, market failures in the Greek RE and EE markets were identified; among them: market instability (in particular in relation to changes in regulations in the RE sector), lack and asymmetry of information between project promoters and other stakeholders (among which financers and the administration), increased trading costs in these sectors (due to the length that such projects may imply), lack of specialised banking products targeting new technology products, and an overall very limited access to finance due to the financial crisis that hit the country in 2008[44].

Although the FoF itself cannot remedy these market failures, it aspires to motivate the relevant market stakeholders and provide financing opportunities. It also aims to finance the implementation of priority infrastructure projects that have been delayed in recent years in Greece and to support new commercial projects that will be developed in previously abandoned facilities. As such, the managing authority decided to set up this comprehensive FoF in order to:

- Motivate private financiers to operate in the sector and increase available funding;
- Capitalise on the positive experience gained from the JESSICA initiative during the 2007-2013 programming period; and
- Use JESSICA reflows.

Although the FoF is multi-thematic and multi-sectoral, according to local stakeholders, it is expected that most of the funding will be allocated to finance RE projects. The support of this sector through a financial instrument is perceived as highly important by the relevant stakeholders. Prospective investors in the sector have been facing several challenges in recent years, making financiers reluctant to undertake potential risks. As described

[43] Please see: https://www.eib.org/en/press/all/2019-235-eib-and-greek-banks-confirm-eur-650-million-infrastructure-investment-fund-and-agree-to-strengthen-business-support#.

[44] *Ex-ante* assessment for financial instruments in Greece, 2016, p.85.
For instance, in the context of the EE market (also studied in *ex-ante* assessment), the main market failure and challenge relates to the age of the buildings to renovate (while energy saving is a key policy objective), thus urging public authorities to intervene. Taking into account the economic crisis that hit the country in the 2008-2013 period, the potential for investment in the EE sector is limited, leading to a financing gap and a justification for the set-up of a financial instrument in this sector (p.91).

above, frequent changes in the regulatory framework have undermined the credibility of the sector. For example, while investors entered the sector with an understanding that their revenues will be generated by a tariff based system, changes in the regulation introduced an auction-based system a few years ago. This led to a volatility in the energy prices, with the risk that price drops could render projects as non-profitable.

Although a public intervention such as the FoF cannot secure a stable regulatory environment, it can motivate prospective financiers to undertake a higher risk. According to local stakeholders, the creation of the FoF will reinforce the credibility of the sector. In addition, it is important to take into account that the Greek financial market has still not fully recovered from the financial and economic crisis. It is important to recall that the banking sector went through a massive restructuring following a reduction in value of government bonds to which most banks were overexposed. This led to almost all foreign banks shutting down operations in the country, and remaining banks merging into four so-called systemic banks. Despite this restructuring and the recapitalisation of the remaining banks, their financing capabilities remain very limited. Because of this reality, and despite Greece's great natural potential for RE, certain bankable RE projects are unable to secure financing. The presence of the FoF in the sector, combined with the gradual recovery of the remaining banks will introduce new financing opportunities for prospective investors.

As such, the development of the FoF will hopefully help to:

- Bear part of the financial risk linked to investments in the sector by reducing commercial banks' exposure to risks;
- Reinforce the degree of credibility in the sector despite a proven instability of the regulatory framework; and
- Provide liquidity (under the form of soft loans), especially thanks to the use of public funding in the instrument.

Scope

The main target sectors of the FoF are: (i) RE projects, (ii) EE projects in non-residential sub-sectors, and (iii) Urban Development projects. It is expected to finance projects such as:

- Wind and photovoltaic parks (RE);
- Biomass and biogas plants (RE);
- Energy efficiency (*i.e.* energy upgrading and energy savings) in public and commercial buildings (EE)[45];
- Waste and water management projects (Urban Development with environmental objectives);
- Projects for the rehabilitation of deprived districts (Urban Development); as well as
- Industrial parks, conference centres, education and cultural facilities, and tourism facilities (Urban Development).

2014-2020 Operational Programme

EUR 200m of funding originating from the 'Competitiveness, Entrepreneurship and Innovation 2014-2020' Operational Programme has been allocated to the FoF (EUR 155.76m of ERDF funding and EUR 44.24m of national co-financing). More precisely:

- EUR 125m originating from TO 4, covering RE and EE projects (more specifically: TO 4b – Promotion of Energy Efficiency and Renewable Energy in Business, and TO 4c – Supporting Energy Efficiency, Smart Energy Management and the Use of Renewable Energy in Public Infrastructures); and
- EUR 75m originating from TO 6 for Environment and Urban Development projects.

[45] The Infrastructure FoF co-finances EE operations only in the non-residential sector.

Financial allocation and governance

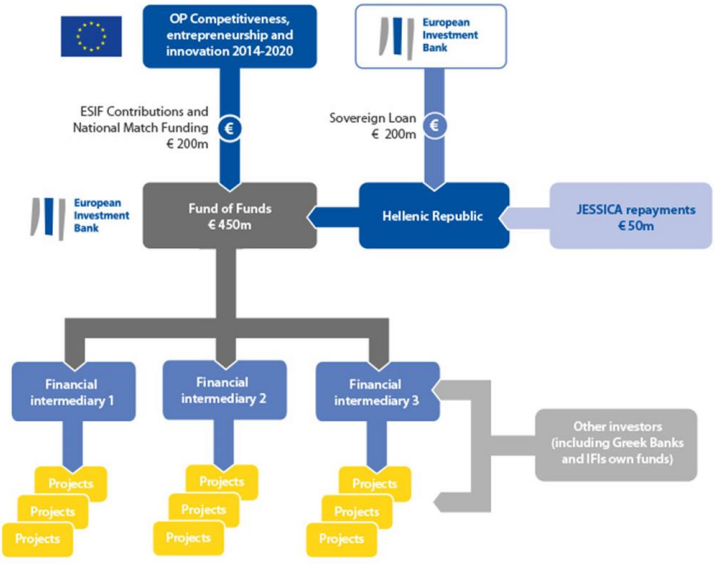
As illustrated in the figure below, in addition to the EUR 200m of 2014-2020 Operational Programme funding, there is:

- EUR 200m provided by the Greek State in the form of additional national contribution, thanks to an EIB sovereign loan provided to Greece, which is 100% devoted to the FoF; and
- About EUR 50m (estimation) from JESSICA reflows (from the 2007-2013 programming period) expected to be repaid to the HF until 2022. These reflows are meant to be allocated to the best performer(s) among the financial intermediaries.

Following the signature of the last Operational Agreement with the financial intermediaries, a pool of funds of up to EUR 450m will be available to all financial intermediaries for investment. The allocation between them will be performance driven, as follows: in the beginning, 25% of the total FoF allocation (*i.e.* about EUR 100m, excluding the EUR 50m from JESSICA legacy funds which will be allocated at a later stage to the best performer(s)) will be allocated equally to all selected intermediaries, while the remaining 75% will be distributed according to the performance of each intermediary. Also, if one (or several) financial intermediaries do not meet certain absorption objectives, the FoF manager may reallocate the funding to other better performing intermediaries. This set-up aims to ensure the disbursement of funds, and reflects the managing authority's decision to put pressure on the intermediaries and to favour competition among them.

In terms of governance, the FoF has adopted a standard structure with an independent Investment Board.

Figure 23: Sources of funding and overall organisation of the Greek Infrastructure Fund-of-Funds



Source: EIB, 2019.

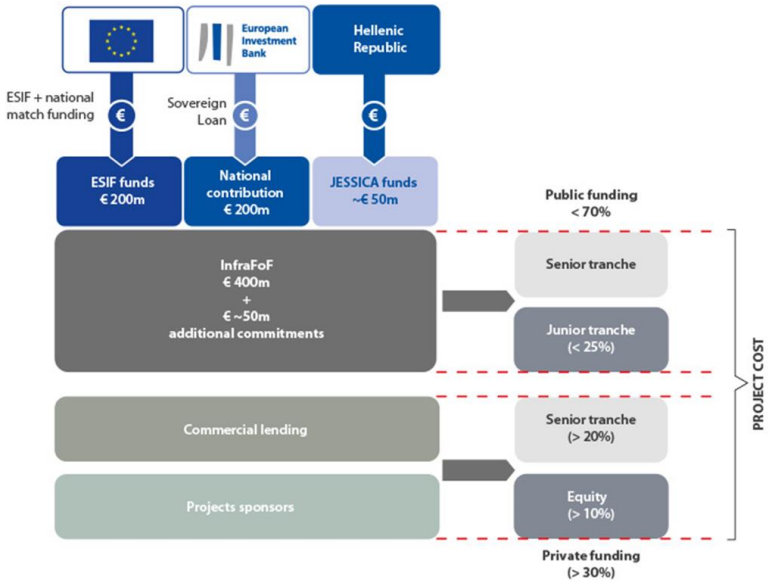
Financial products

The FoF will aim to provide soft loans with favourable features, including interest rates below market pricing (subject to State aid considerations), and longer tenures.

There will be a junior tranche that represents no more than 25% of the total financing provided to each project, while the remaining 75% of the total financing will take the form of a senior tranche. At project level, funding coming from the FoF will constitute no more than 70% of the total cost of each project, while the inclusion of private investors – originating from Greek banks (*i.e.* the selected financial intermediaries), and/or from project

promoter's own resources – will represent not less than 30% of each project, with at least 10% as equity and 20% as a senior tranche loan in each project. This structuring is illustrated in the figure below.

Figure 24: FoF structuring and project financing in the context of the Greek Infrastructure Fund-of-Funds



Source: EIB, 2019.

Leverage

The objective of the FoF is to unlock a total investment of at least EUR 650m. Considering the EUR 155.76m of ERDF funding originating from the 2014-2020 Operational Programme, that indicates a leverage effect targeted of 4.17.

State aid

State aid was (and is still) a question for the 'RE component' of the FoF. While the use of the General Block exemption Regulation (GBER) was quite obvious for the Urban Development component, following the experience acquired with the JESSICA initiative during the 2007-2013 programming period[46], it was less easy for the 'RE component'. State aid constitutes one of the barriers to the development of financial instruments in the RE sector. In the case of Greece, the managing authority envisaged, at first, to notify a specific State aid regime to DG COMP[47], but this process did not go through[48]. As of now, the State aid regime for the 'RE component' is expected to follow Article 41 of GBER[49]. It is undergoing a fine-tuning procedure since the managing authority is currently preparing a circular relative to the Gross Grant Equivalent (GGE) calculation for RE projects *as per* this Article of GBER, where the calculation of eligible costs necessitates counterfactuals that may be difficult to establish. The outcome of this circular is awaited.

The need for preferential remuneration for private co-financers was also considered in the *ex-ante* assessment. This assessment envisages that preferential fees may need to be frontloaded, given the conditions of the Greek

[46] The aid granted through the financial instruments for the 'Urban Development component' has to be compatible with the provisions relative to urban development aid *as per* Article 16 of Regulation (EU) No 651/2014 (GBER).

[47] European Commission's Directorate-General for Competition.

[48] The main reason for this situation being that the European Commission (DG COMP) considers that GBER offers a sufficient number of possibilities and consequently that *ad hoc* schemes should be limited.

[49] Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty.

economy at the time the study was drafted. In that perspective, it recommended to the managing authorities to consider a few factors when attracting / remunerating private co-financers, including:

- The potential for profits (and losses) of the instrument;
- The expectations of these private co-financers (to be assessed during the selection process); and
- The necessary / appropriate amount required for the preferential remuneration; considering that this amount is to be estimated as the difference between the expected rate of return of the financial instrument, and the reasonable rate of return expected by the private co-financer[50].

Lessons learned

Results

By the end of September 2019, the Greek Infrastructure FoF has signed Operational Agreements with all selected financial intermediaries.

Barriers and challenges

The fragmentation of ERDF funding in the Operational Programme, the level of detail of the eligibility criteria, as well as the coverage of various categories of regions in a single scheme may slow down the implementation of the financial instrument; especially in the RE sector. This is despite the advantages that ERDF funding brings to the set-up; such as a more intensive support to the regions lagging behind, which helps stimulate demand from projects in these regions, and the capacity of ERDF funding to generate leverage thanks to a contribution in the riskiest share of the set-up. In that context, the EUR 200m provided by the state will help to ease the implementation of the instrument and enable the development and the financing of a viable pipeline of projects throughout the country.

A key challenge for the FoF relates to its nation-wide scope and the regional disbursement requirements related to ERDF (especially with regards to the different categories of regions in Greece, *i.e.* 'developed', 'transition' and 'less developed'). Indeed, while there might be an important demand for financing from mature projects in 'developed' regions, some of these may not be able to receive financing because of the limited available resources. In parallel, it may be difficult to source projects in 'less developed' regions, where generating demand may be challenging. This challenge is actually even greater for the 'Urban Development component' of the FoF since municipalities need to develop 'integrated sustainable urban development strategies' to benefit from the financial instrument (*as per* Article 16 of GBER[51]). In that context, the managing authority and the EIB developed guidelines for municipalities to help them develop such strategies during the 2007-2013 programming period, and expect to leverage this former effort during the current 2014-2020 programming period with the uptake of the new FoF.

The use and combination of various sources of financing in the FoF (including from various TOs within the Operational Programme) adds monitoring and reporting complexity. The latter is however perceived as overcompensated by the added value anticipated thanks to the financing of strategic infrastructure projects in the various sectors it enables.

Finally, as mentioned above, part of the 'RE component' of the FoF is currently on hold; pending the results of the study conducted on the GGE calculation under Article 41 of GBER before being fully implemented.

---

50 *Ex-ante* assessment for financial instruments in Greece, 2016, p.159.

51 According to GBER, an '*integrated sustainable urban development strategy*'' means a '*strategy officially proposed and certified by a relevant local authority or public sector agency, defined for a specific urban geographic area and period, that set out integrated actions to tackle the economic, environmental, climate, demographic and social challenges affecting urban areas*' [Article 2(60)].

Key enabling factors

The Infrastructure FoF in Greece is presented as a positive example not only as a stand-alone public intervention but also as an element of a gradually evolving financial instruments' environment and culture in a country. Greece is an example of a country that introduced several financial instruments in various sectors. Through this process, it was then possible to increase awareness of the benefits of financial instruments, develop capacity in the public administration on specialised topics (such as Public-Private Partnerships, PPPs) and motivate private financiers to target new sectors (such as new technologies and EE).

Specifically in the infrastructure sector in Greece, the experience of JESSICA during the 2007-2013 programming period proved the importance of introducing recyclable forms of financing since the reflows from those revenue generating projects are adding up resources to the current Infrastructure FoF and influenced its very creation[52]. As such, the FoF becomes a tangible case of the sustainability element of financial instruments.

The experience acquired by various stakeholders during the 2007-2013 programming period in relation to the implementation of financial instruments is also expected to support the smooth implementation of the FoF. In that perspective, the set-up of a pipeline of viable projects is expected to be facilitated by the experience and the capacity acquired by the Greek public administration, as well as a strong communication campaign. The choices made by the different actors for the set-up of the FoF (for instance in relation to the amounts devoted to the financing scheme and to the sectors covered by it) also takes into consideration the limited remaining time for the use of ERDF funding in the context of the 2014-2020 programming period.

The FoF also provides a positive example of a streamlined approach at blending diverse sources of funds. With funds originating from ERDF, ESIF reflows, and national budget (provided through an EIB loan), the FoF can be characterised as an innovative public intervention. Moreover, in this set-up, the ERDF contribution to the FoF aims to help stimulate demand from infrastructure projects in the 'less developed' Regions and contributes to the riskiest share of the financing scheme.

The FoF is also a positive sign of the public administration, and the financial market in general, becoming more confident in the use of financial instruments, and shifting from generic sectors of public intervention (like SME financing, and Urban Development), to more specialised sectors, such as RE and EE.

The FoF has also developed a 'competitive' structure enabling the transfer of funding from non-performing financial intermediaries to the more performing ones, including for the use of reflows from the JESSICA HF of the 2007-2013 programming period.

It is also worth mentioning that Greece has one of the best public support systems in Europe for the set-up of PPPs. This well-organised, efficient and commonly perceived as successful support helps set up larger infrastructure projects in the country, including in sectors targeted by the FoF. The latter may consequently be able to benefit from it; like Urban Development projects supported by JESSICA during the 2007-2013 programming period. This support system helps generate a pipeline of viable projects in a reasonable time, which should facilitate the implementation of the FoF, despite the time needed for its set-up.

Finally, as previously mentioned, the challenges related to the use of ERDF funding into the FoF (such as the level of detail required in the eligibility criteria, and the geographical distribution related to ERDF funding) is to some extent alleviated by the EUR 200m provided by the state's national contribution into the FoF. This source of funding is allowing the FoF to be as 'market-oriented' as possible (*i.e.* being able to meet actual demand from the different categories of regions in Greece). This is a sign that for the setting up of the FoF, the lessons learned from the previous period were taken into account. The selection of three different financial intermediaries also

[52] It is also to be noted that the JESSICA initiative during the 2007-2013 programming period was also pioneering in Greece since it enabled the combination of Structural Funds with EIB financing at project level, which notably supported a number of PPP projects.

aims to facilitate the geographical coverage of the FoF, and the constitution of a viable projects pipeline through the country.

Overall, this Greek Infrastructure FoF provides a good example of a political and technical decision from public administration to leverage previous positive experience and strengths (such as the JESSICA HF during the 2007-2013 programming period and the PPP support system) so as to take it to a new level under the form of a multi-sectoral FoF managed by an International Financial Institution; including in support of sectors that were not supported by financial instruments in the past.

4.3 Market opportunities

To assess which RES could benefit the most from the deployment of financial instruments, it is necessary to first obtain an **overview of the current RE market** in the EU. This section on market opportunities is followed by an analysis of some of the financial products suitable to meet the financing needs of the sector, and some of the key actors in the financing landscape of Renewable Energy.

The **maturity of the EU Renewable Energy market varies depending on the type of RES**. Over the past decade, leading RES for electricity generation, such as solar and wind, have seen a rapid expansion reinforced by cost reduction. At the same time, in the case of some of the less developed alternative energy sources, such as geothermal or marine energy, investment stalled[53]. Hydropower is not included in the present analysis as there is no significant potential for additional installations in the EU. Solar concentrated power is also not included as there has been no new installations in the EU since 2012.

To reflect this heterogonous RES landscape, **the present market opportunities section classifies the RES based on their level of maturity or limited potential to be used at a larger scale** (solar thermal) into two categories: established and less-established RES. They are listed and classified in the table below.

Table 7: Established and less-established Renewable Energy Sources

Established RES	Less-established RES
• Wind; • PVs; • Biogas; and • Biomass.	• Solar thermal; • Geothermal; • Ocean energy; and • Biofuels.

Source: fi-compass*, 2019.*

To provide a more detailed overview of the market size, current investment volumes and future prospects for key RES in Europe, this section[54] is structured around the following three themes:

- **Energy output and installed capacity**. For each of the RES, data is provided on the total share of the energy generated from a given RES [measured in gigawatt hours (GWh)] in comparison to the total EU energy output. This information is complemented by the total installed generation capacity of a given RES [measured in gigawatts (GW)].
- **Current investment in new RES**. For each of the RES, data is provided on the investment volume in new installed capacity in the period from 2016 to 2017, as well as the type of finance used.

[53] Rademaekers, K et al, 2017a.

[54] The quantitative data used in this section comes from the 2018 edition of the 'The State of Renewable Energies in Europe' published annually by EurObserv'ER. Available here: https://www.eurobserv-er.org/18th-annual-overview-barometer/.

- **Outlook for meeting the 2030 goals**. Where available, information is provided on the estimated **financing needs** to reach the 2030 target of increasing the share of RES in the final energy consumption to 32% at the EU-wide level.

Quantitative data included in the following sub-sections is summarised in the table at the end of this section on market opportunities.

4.3.1 Established Renewable Energy Sources

Established RES have attracted a total amount of over EUR 85bn for the development of new installed capacity in the period from 2016 to 2017. The following sub-sections provide summary of the main characteristics of each of the established RES within the scope of the analysis, *i.e.* wind, PVs, biogas and biomass.

Wind

Energy output and installed capacity

Wind energy is **the leading RES in the EU**. In 2017, output reached **11.2%** (362.4 TWh) of the total electricity generated in the EU, which is an increase by 19.7% compared to 2016.

In terms of installed generation capacity, wind energy has registered the **highest year-on-year growth**, to a total of 168.9 GW, increasing by 14.7 GW since 2016. This growth is attributed to the growth in the three largest European markets: Germany, the UK and France. In fact, an increase in installed capacity in Germany by 6 126 Megawatts (MW) accounts for 40% of new installed capacity in the EU.

Investments in new installed capacity and type of finance

Investment in wind energy in 2017 amounted to almost **EUR 24bn** (to support the development of 12.2 GW new installed capacity). Most of the investments were financed with corporate finance. Project finance amounted to 23% of the investment volume. It was however used for larger-scale investments. Venture Capital (VC) and Private Equity (PE) investments in the sector were equal EUR 267m in 6 projects.

In comparison to 2016, the **overall investment flows into wind energy in 2017 decreased**, which is mostly due to a decrease of investments in off-shore wind in Europe by 50%. The **average size of an off-shore project** was **EUR 1.61bn** – an amount significantly larger – compared to the **average size of an on-shore project**, which amounted to **EUR 24m**.

The **average cost *per* MW in 2017 was around EUR 3.7m** for **off-shore** and **EUR 1.38m** for **on-shore**. On-shore wind markets tend to be financed with debt with loan terms between 14 and 16 years, and with equity typically representing between 20% to 40% of the total costs of the project[55].

Outlook for meeting the 2030 goals

At the EU level, wind energy is on track for reaching the 2020 targets, however the projections for meeting the 2030 targets remain uncertain. The capacity of on-shore wind is expected to reach 255 GW by 2030, assuming no additional policies are launched. Additionally there is need of investment into the electricity grid to be able to cope with wind energy and the transmission from locations with high wind energy potential and areas with high consumption. Off-shore's outlook is less positive, since there are concerns regarding the high deployment costs, especially regarding (i) the connection to the grid, (ii) limited availability of the relevant sites, and (iii)

[55] Rademaekers, K et al, 2017a.

permitting. The **investment needs** in the sector at the EU-level are estimated **at EUR 343bn by 2030 for on-shore wind** and around **EUR 131bn for off-shore projects**[56].

PVs

Energy output and installed capacity

In the EU, **electricity from PVs has been generated mostly by individual commercial and residential installations**, which allows households to avoid purchasing more expensive energy from the grid. For larger investments (over 750 kWh), tenders are organised, whereby a slight decrease of the prices between 2016 and 2017 was observed (by EUR 0.433/kWh).

The share of electricity generated by PVs in the EU represented **3.4%** (113.7 TWh) of the EU's total electricity output. The annual **new installed capacity is declining**[57], following the peak growth achieved in 2011.

Investments in new installed capacity and type of finance

Total investments in PVs totalled EUR 2.05bn. The **average size of the project amounts to EUR 8.3m**, while the **average investment cost *per* MW was equal to EUR 1.04m**. Investments in commercial and residential panels were equal to EUR 3.7bn. It is important to note that the investment costs observed a downward trend with a 12% decrease between 2016 and 2017. With regard to the financing type, **corporate finance dominates with around 78% of investment volume** and **project finance representing 21%**. In 2017, VC and PE invested EUR 1.06bn in the sector, in 19 projects.

Outlook for meeting the 2030 goals

At the EU-level, the solar capacity already meets the 2020 policy objectives. The **growth rate is set to continue**, although some of the high-growth markets, such as Czechia, Bulgaria and Romania are now stagnant. The reason for this is a change to the incentive scheme in place[58].

There is also still room for growth. It has been estimated that solar electricity may account for 5% in 2020 and for 7% in 2030 of the total EU electricity output, assuming no additional policies are launched after 2020[59]. Investment needs of the sector are challenging to predict. One of the reasons is the rapidly declining Levelised Cost of Energy (LCoE), making electricity generation from PVs increasingly competitive to fossil fuels.

Biogas

Energy output and installed capacity

The primary energy production from biogas amounts to 195.5 TWh which reflects about 2% of the total energy production. The sub-sector has been facing a **slower growth since 2011**. This is due to more constraining regulations regarding the use of food crops and less attractive remuneration schemes. Biogas is used for heat

[56] Rademaekers, K. et al 2017b. Assessing the European clean energy finance landscape, with implications for improved macro-energy modelling. Study for the European Commission, DG Energy.

[57] For more information on the reasons behind a more stagnant market in the EU, please refer to the JCR report. 2018. Available here: http://publications.jrc.ec.europa.eu/repository/bitstream/JRC113626/pv_status_report_2018_online.pdf.

[58] For more information on the policy recommendations for the uptake of RES in these countries and across the EU, please refer to the European Forum for Renewable Energy Resources (2015): http://www.keepontrack.eu/contents/publicationspolicyrecommendations/policy_recommendations_2015.pdf.

[59] Using PRIMES model: European Commission, the EU Reference Scenario 2016 Energy, transport and GHG emissions Trends to 2050. Available here: https://ec.europa.eu/energy/sites/ener/files/documents/ref2016_report_final-web.pdf.

and for electricity production. In terms of electricity output, the EU biogas sector recorded a total of 63.4 TWh, representing about 1.5% of the total electricity generation.

Investments in new installed capacity and type of finance

Investments in 2017 declined considerably compared to 2016, as only three plants were signed off worth in total EUR 95m financed through corporate finance.

Outlook for meeting the 2030 goals

The current output is in line with the 2020 target at an aggregated level. As for the 2030 targets, the biogas sub-sector is given high importance in all EC's scenarios and **the 2030 output target of 350 TWh** is considered to be attainable by specialists[60]. The growth potential of the biogas sub-sector is dependent on the regulatory discussions at the European level on the sustainability of biogas. Policy-makers call for biogas to be based on the use of by-products and organic waste[61].

Biomass

Energy output and installed capacity

Biomass from wood or straw is used for heat and for electricity generation. Installations range from stoves and ovens in households to large power plants for electricity generation. Electricity output generated by biomass in the EU amounted to 94.7 TWh in 2017. This production is largely concentrated in four countries: the UK, Sweden, Finland, and Germany, which accounted for 55.7% of the total electricity production using biomass.

Investments in new installed capacity and type of finance

Investments in Europe **decreased** considerably in 2017 **to EUR 679m**, down **from EUR 5.1bn** in 2016. **The investment costs *per* MW equalled EUR 3.3m**, while **the average size of a project increased**, with 72% being financed through corporate finance.

Outlook for meeting the 2030 goals

The future growth of the sector depends on the availability of feedstock from forestry and agriculture, incentive schemes but also from environmental regulation as biomass from households may have negative impact on air quality. **Investment needs are estimated to be EUR 527m *per* year until 2030** for all bio-energy sources (solid mass, biofuels, and biogas).

4.3.2 Less-established Renewable Energy Sources

Less-established RES, such as geothermal, solar thermal, ocean energy, and biofuels have a significantly smaller share of the contribution into the total energy output (less than 5% for all four RES together). Their higher-risk profile is reflected by the lower amounts of financing attracted. Details on the current state and potential of these technologies can be found in Table 8.

60 EurObserv'ER, 2018.

61 Rademaekers, K. et al 2017b.

Table 8: Summary of the key investment needs *per* RES to reach the 2030 EU-wide energy goals, main investment characteristics of each RES, and electricity generating capacity in 2017

RES type		Investment needs*	Investments (EUR) made in 2017	Key interventions	Financing type used in 2016-2017 (corporate finance/project finance and bond/other)	Average investment size	Average investment cost *per* MW	Output (TWh)	Installed capacity
Established RES	PVs (plants)	-	5.75bn	Concessional debt and subsidies (including investment grants)	73.3%/23%/3.7%	EUR 1.61bn	EUR 3.7m	113.7	106.7 GW
	Off-shore wind	EUR 131bn	24bn			EUR 24m	EUR 1.38m	362.4	15.8 GW
	On-shore wind	EUR 343bn			78%/21%/0.3%	EUR 8.3m	EUR 1.04m		153.1 GW
	Biogas	EUR 527m *per* year across biogas, biomass and biofuels	85m		72%/28%/0%	EUR 75m	EUR 3.3m	63.4	-
	Biomass		679m		100%/0%/0%	-	-	94.7	-
Less-established RES	Biofuels		-	Concessional debt and subsidies (including investment grants)	-	-	-	0.179	-
	Geothermal	-	131m		0%/100%/0%			6.7	-
	Solar thermal	EUR 2bn *per* year	-		-	-	-	-	36 GWth
	Ocean energy (*e.g.* marine)	-	-		-	-	-	-	257.1 MW

*Source: 'The State of Renewable Energies in Europe' published annually by EurObserv'ER and Rademaekers, K. et al 2017b. Assessing the European clean energy finance landscape, with implications for improved macro-energy modelling. Study for the European Commission, DG Energy. Figures used in the table are further described and referenced in the market opportunities section. *Additional investment needs to achieve the 2030 targets of 'Clean energy for all Europeans' package. Annual refer to the period from 2021 to 2030. Compiled in 2019.*

4.3.3 Overview of the financing landscape of the Renewable Energy sector

The current public financing landscape in the EU offers a variety of incentives to drive investments in the RE sector ranging from subsidies (*e.g.* tax credits, guaranteed minimum prices from feed-in tariffs, green certificates, investment grants*)* to repayable support in form of concessional loans or equity financing. Repayable funding is provided to bankable projects, which have a commercial outlook, yet would not be able to start without a public intervention[62]. The table below provides the sectoral financing landscape. It takes into account the key actors from the demand and supply sides of the Renewable Energy sector.

Table 9: Overview of the financing landscape of the Renewable Energy sector

Supply side	Demand side
National / regional public administration: Is involved through public direct investments, and can provide grants, as well as national subsidies (including investment grants), but the most important policy tools are policy-based incentives (often related to regulation) that help optimise the RE market (with feed-in tariffs, and quota systems for instance).	Mid-caps, large companies and Special Purpose Vehicles (SPVs): Act as both suppliers and beneficiaries of financing for their RE projects. Based on revenue flows, savings and assets, companies can (i) fund RE projects using equity, (ii) access public incentive mechanisms, and (iii) take part in SPVs. At the same time, they can benefit from financing to develop their own RE projects.
EU funds: Sourced from various EU budget lines and funds, including loans and guarantees.	Small end-users: This stakeholder group includes households, small farmers, and SMEs, which usually invest their savings in developing RE projects. They are also the main beneficiaries in accessing public funding for RE projects.
National Promotional Banks (NPBs): Can offer concessional loans, and loans at market-rates.	
International Financial Institutions (IFIs): Offering loans, concessional loans and guarantees to clean energy projects or may provide equity to SPVs.	
Commercial banks: Can act as intermediaries by lending to SPVs and offering loans to companies and households.	
Other financial actors (Private Equity funds): Provide equity or quasi-equity.	

Source: Rademaekers, K. et al 2017b. Assessing the European clean energy finance landscape, with implications for improved macro-energy modelling. Study for the European Commission, DG Energy, 2017.

4.4 Barriers

To analyse the sectoral barriers constraining investments in the Renewable Energy sector, this section:

- First, looks at the key barriers constraining investments in the sector; and
- Second, assesses the barriers, which could hinder the uptake of financial instruments deployed with the objective of increasing investments in Renewable Energy.

[62] EurObserv'ER, 2018.

4.4.1 Barriers hindering investments in the Renewable Energy sector

The uptake of investments in the sector is hampered by a number of constraints, such as (i) the uncertain regulatory environment, (ii) competition on energy prices from conventional energy sources, or (iii) long-term payback periods, to name a few.

Uncertain regulatory framework

The lack of certainty over policy support is reflected in **frequent changes in the energy and fiscal policies** at national level. The Renewable Energy sector requires long-term regulatory stability. On the contrary, **volatile regulatory landscape reduces investors' confidence** and translates into additional risk premiums[63], making RE investments more risky, more expensive and so less competitive in comparison with other technologies.

In 2015, Europe remained the leading macro-region for the solar energy sector (in terms of cumulative installed capacity), however, the installation rate has significantly decreased since peaking in 2011. Changes to the policies and regulatory environment are considered among the main reasons for this decline.

The regulatory framework of the Renewable Energy sector is considered to be complicated, however this **complexity** relates more to national sector-specific legislative constraints, rather than EU-level legislation[64].

Infrastructure constraints

For some of the RES, achieving return on investment is associated with long investment horizons. Projects tend to be **capital intensive** and require **high up-front investment costs**. High investment costs are not only related to the development of a RES project, but also to the necessary transmission infrastructure. In some countries, the **physical limit in the grid** between energy generation and energy consumption has become a barrier to further investments in RES. The **limit in the capacity of storage facilities** also sets capacity restrictions for the development of RES.

Emerging technologies and resource risk

For the established RES, advances in technology drive down costs and attract further investments, thereby resulting in an increasingly higher market share of the 'developed' RES. Conversely, for less-established RES, the **development stage of each technology** and their associated risks act as a barrier for investors.

4.4.2 Barriers hindering the uptake of ERDF / CF-supported financial instruments in the Renewable Energy sector

In addition to the above-listed general barriers, there are '*financial instrument specific barriers*' in relation to the RE sector, which were identified during the stakeholder interviews and focus groups.

Competition with grants and other subsidies

The availability of grants and other incentives deployed to encourage the use of RES are often not complementary with financial instruments. The **relative ease of access to grants and other subsidies**, such as feed-in tariffs and premiums are **among the main hindering factors for the uptake of financial instruments in the RE sector**.

63 Rademaekers, K et al, 2017a.

64 Rademaekers, K et al, 2017a.

The revenue-generating RE projects, such as electricity generating PVs for households, have potential to be financed with financial instruments. Without a **reorientation across the policy-makers** and final recipients **towards a wider use of revolving finance**, where feasible, the **availability of grants and other subsidies may have a constraining effect** on the uptake of financial instruments. At the same time, there is an **opportunity to leverage on the availability of grants and use them in combination with financial instruments**.

Fragmentation of ESIF resources and unnecessary restriction in eligibility

Allocations for RES in some MS are **spread over different OPs or different Priority Axes** of the same OP depending on the type of RES or type of beneficiary. For financial instruments, this results in a fragmentation of resources, that either leads to **several small financial instruments with insufficient economy of scale** or the **complex management of contributions to financial instruments** from different OPs and Priority Axes.

An additional difficulty for supporting RES investments through financial instruments stems from eligibility criteria in the OPs. The **eligibility of operations** (developed by the managing authorities) **is often defined with having grant support in mind**. This means eligibility is narrowed down to investments and final recipients with the highest political priority and additionality (with regards to other public / private sources of finance). In order to allow financial instruments to have sufficient scale, and support the largest possible number of revenue-generating RES projects, **eligibility criteria should be defined as wide as the CPR and/or ERDF / CF regulations allow**. An example for this, was that eligibility of projects supported by ERDF / CF was limited to projects reducing CO_2 emissions, but not including projects that reduce other greenhouse gasses. Furthermore, a wider scope of eligibility would make it easier to allow for complementarity between financial instruments and grants.

Cumulation of State aid

To prevent State aid from having a distorting effect on the internal market and trade between MS, compliance with competition rules is of key importance. **Cumulation of different State aid forms remains one of the key challenges** for the design and set-up of financial instruments in the RE sector.

Specific difficulties often occur during the design of a financial instrument, and State aid implications should be considered on the outset of creating this financial instrument. In case RES projects are awarded *via* a competitive tender, which is less market distortive than feed-in tariffs or premiums, financial instruments need to be made available in a non-discriminatory way before the tender, in order to avoid State aid problems.

One of the issues emerging from the stakeholders' consultation in the RE sector is the **difficulty in combining operational and investment aid**. Operational aid, in the form of national subsidies, such as, for example, feed-in tariffs, may have a constraining effect on the potential involvement of financial support to the investment costs of the RES project. Stakeholders have indicated that even in the case a market conform financial instrument that does not contain State aid, it may not be possible to combine it with national subsidy schemes. Moreover, in some national regulations, the presence of ERDF / CF resources, implies automatically the presence of State aid. This is a problem regarding the cumulation of aid. Stakeholders have also reported **challenges in calculating the aid component** of investment and operational aid, in cases where no counterfactual exists.

Stakeholders have indicated that **Articles 41 and 42** of the General Block Exemption Regulation (GBER)[65] were a **supportive measure to ensure State aid compliance**, however, due to a perceived **significant level of complexity**, seeking legal advice at the level of each transaction is considered to be a good practice. State aid

[65] Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty.
Available here: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02014R0651-20170710.

compliance also poses a challenge for RES, mostly for projects with an aid component over the *de minimis* threshold. Indeed, no challenges related to State aid were reported when SMEs were the final recipients and the RES projects was within the *de minimis* threshold. Similarly, RES projects where households or public authorities are final recipients, are considered to be State aid compliant[66].

4.5 Potential for the use of financial instruments in the Renewable Energy sector

Market opportunities for financial instruments reside in the areas where private funding is not optimally allocated due to the associated risks, as well as where longer payback period are needed.

For established RES (*e.g.* wind, PVs, biogas and biomass), the **scalability of projects** and the **policy environment** are among the **key decisive factors for private sector investors** deciding to invest in these sub-sectors.

The less-established RES (*e.g.* geothermal, sola thermal, ocean energy, and biofuels) are associated with significantly higher risks, capital intensity and uncertain return on investment, in addition to the unpredictability of the policy environment[67]. The untested business models of less-established RES, and the insufficiently tested technologies also reduce the investment appetite of private sector investors. This, in turn, limits access to finance for these RES interventions and results in a market failure[68].

The role of financial instruments depends on the maturity of the RES (referred to in this report as the 'established' and 'less-established' sub-sectors). On the one hand, the deployment of financial instruments can **catalyse additional private sector investments** in the established RES sub-sectors, thus driving the uptake of the share of RES in the total energy mix. On the other hand, **public resources** (*e.g.* EU, national and/or regional resources) **can accelerate the involvement of private funding** in the financing of less-established RES by covering risks associated with unproven technologies and untested business models.

Areas offering potential for the use of financial instruments in the Renewable Energy sector

Based on the analysis conducted in the previous sections (*i.e.* the section on market opportunities, including the financial landscape, and the current barriers), four areas emerge with potential for the use of financial instruments in the RE sector[69]. They are presented below.

1. **Design combined financial instruments for both RES and EE**. One area with potential to boost investments using financial instruments in the RE sector is the combination of RES interventions with the EE interventions. This possibility of synergies is more detailed in the following box.

[66] To support the achievement of its EU-wide energy goals set out in the Renewable Energy Directive, the European Commission has issued specific guidelines on State aid for environmental protection and energy.
Available here: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52014XC0628%2801%29.

[67] Williams et al. Energy and the MFF, Study requested by the European Parliament's Committee on Industry, Research and Energy (ITRE), 2018. Available here: http://www.europarl.europa.eu/RegData/etudes/STUD/2018/614223/IPOL_STU(2018)614223_EN.pdf.

[68] Williams et al., 2018.

[69] These areas are only indicative. The suitability of any specific area would need to be assessed on the case-by-case basis with a detailed feasibility study for each financial instrument, such as an *ex-ante* assessment.

Box 1: Fostering the use of financial instruments in the RE sector by designing schemes financing both RES and EE interventions

Synergies resulting from combining RES and EE investments
The rationale behind this approach comes from the **mutual benefits** that can be achieved through **joint implementation of RE interventions**, such as installation of PVs on rooftops or of a biomass heating system, when conducting a **comprehensive renovation of buildings**, **with an objective of increasing its energy efficiency**. Firstly, a combined approach will reduce the energy demand of the renovated buildings. Secondly, RES usually have shorter payback time compared to comprehensive renovation. This allows for RES to 'cross-subsidise' energy efficiency measures and make them bankable. From the perspective of the managing authorities, the combination of RES and EE interventions **contributes to the achievement of national climate goals** and offers an **opportunity to use ERDF / CF-supported financial instruments for two highly-strategic areas simultaneously**.

Source: fi-compass*, 2019.*

2. **Promoting Energy Performance Contracting (EPC) combining RES and EE**. Energy Service Companies (ESCOs) can undertake EE measures combined with RES investments. The **guaranteed savings** the ESCO provides to its client will then be the combination of energy savings and revenues from RE. The ESCO will only be reimbursed by its client when the latter achieves the guaranteed savings. **EPCs can be supported through dedicated financial instruments that cater for the specific needs of the ESCO business**, such as long-term financing, longer grace periods and/or forfaiting.

3. **Long-term loans for established RES**. For projects within the scope of established RES, financial instruments have the potential to enhance the availability of additional funding by offering debt with preferential financing conditions for the final recipients, *i.e.* lower interest rates and longer payback periods.

4. **Guarantees, subordinated debt and equity for less-established RES**. For projects being part of the less-established RES, financial instruments can unlock their access to finance. The involvement of public resources under the form of guarantees, subordinated debt and equity can attract private investors, who otherwise might not invest in the sector due to the higher risk profiles of investments or too long investment horizons.

5. **Financing lease instrument for RES installations**. This approach can increase the affordability of removable RES assets. For instance, PVs or biomass boilers can be leased to SMEs and/or households. The advantage is that for removable RES installations no additional collateral is required from the final recipient.

4.6 Key enabling factors for the use of financial instruments

Although differences across national contexts, as well as varying market maturities between the RES, limit the scope for transferability of solutions applied from one financial instrument to another, **lessons learnt** and **good practices** can offer insights on the **key enabling factors** that have contributed and/or could contribute in the

future to the development of successful financial instruments[70] in the RE sector, independently of the RES sub-sector[71].

4.6.1 Transferring knowledge on financial instruments in the sector

Financial instruments need to correspond to the sectoral and national needs. The transfer of experience gained with the deployment of financial instruments with ERDF / CF but also national resources across regions and MS is challenging, yet offers a stock of valuable insights. It is a good practice to take advantage of experience accumulated within a given MS and to adapt it in other regions / countries (taking local characteristics and specificities into account). **Knowledge transfer** between MS (and sometimes within a MS between managing authorities), and **capacity building** across territories through **peer-to-peer learning** have been pointed out as one of the factors enabling the deployment of financial instruments, particularly at the design phase. Similarly, experience gathered when implementing financial instruments in one programming period offers a stock of specific lessons learnt, which can be successfully leveraged on during the following programming period[72]. If a financial instrument has already been deployed in the field of EE, there is scope to build on its experience to date and to develop it further with RES components.

4.6.2 Integrating Renewable Energy financing into financial instruments for SMEs

Financial instruments for RES in enterprises, especially SMEs, may be integrated in existing standard SME financial instruments. This would (i) facilitate RES projects' access to finance, (ii) facilitate the chances to develop a pipeline of projects with an adequate critical mass, and (iii) reduce the need to apply for different financial instruments for a single project, or eventually to even different financial intermediaries depending on the purpose of their financing offers. In order to make investment more attractive, **the part of the financing addressing the RE component could contain additional incentives, such as a lower interest rate or TA support**.

4.6.3 Combining grants with financial instruments

Possibility to combine grants with financial instruments has the potential to accelerate the shift towards an increased use of financial instruments. The CPR proposal of the EC for the 2021-2027 programming period allows for **integrating ancillary grant, including investment grants, in financial instruments**. This means that the repayable and the non-repayable parts are governed under the financial instrument rules. It is expected that this will significantly simplify the combination of different forms of support compared to the current 2014-2020 programming period. The stakeholders' consultation showed that loans with capital rebates, where part of the loan is written off, in case specific results are achieved, are considered especially attractive for final recipients.

4.6.4 Designing financial instrument-friendly Operational Programmes

Financial instruments require a sufficient pipeline of investable projects in order to make it economically viable and attract financial intermediaries implementing the instruments. To avoid multiple Funding Agreements, contributions from multiple Priority Axes and the coordination with several managing authorities or Intermediate Bodies, it is advisable **to concentrate contributions to financial instruments within the OPs**.

Financial instruments should have sufficient critical mass to be able to support a number of different projects and be an efficient method of delivering support. It is therefore advisable to **differentiate** already in the OP

[70] As detailed in the different 'sectoral chapters' (Chapter 4 to 8 included), some key enabling factors are cross-sectoral. These cross-sectoral aspects of the key enabling factors for financial instruments are more developed in Section 9.2.

[71] Wishlade, Michie and Vernon, 2017.

[72] Wishlade, Michie and Vernon, 2017.

between **eligibility criteria for grants**, which are meant to be stricter, **and those for financial instruments**, that should have a much broader eligibility. Through this, it is possible to support projects with the highest risks with grants, and other projects with repayable instruments. This approach also makes it easier to use financial instruments and grants in a complementary way.

4.6.5 Technical Assistance

Access to TA accelerates the development of the right capabilities needed for the development of financial instruments in any sector, both at the level of public authorities and of project promoters. This is also the case for the RE sector.

Firstly, on a more general and non-sector specific basis, public authorities need to be educated about the benefits of financial instruments and granted access to the TA facilities focused on capability building to increase their willingness of deploying financial instruments. In an RE sector context, this education should **promote a shift from grant-oriented approach towards a revolving finance mechanism and could take the form of peer-to-peer learning amongst public authorities with experience of developing and implementing financial instruments in the sector and also projects in the sector that have benefitted from financial instrument support**. The aim of such support being to increase the level of understanding of the pre-requisites needed for both financial instruments to be successful but also for projects to be capable of receiving of financial instrument support.

Secondly, awareness needs to be built more generally among potential final recipients regarding existing publicly-supported financing (including financial instruments) favouring the deployment of RES. Indeed, **the market needs to be informed about the existing opportunities offered by the use of financial instruments to apply for them**. In that perspective, 'small' final recipients (*i.e.* households, household associations and SMEs), need to become aware of the financing opportunities offered by financial instruments and include them in their choice-set of attractive financing options.

Thirdly, due to the heterogonous landscape of the RES, technical support enables to **address the individual projects' complexity needs** and to make them investment-ready. Finally, the **use of *ad hoc* advice from external experts**, both from a technical and a financial perspective, is essential to transform projects into investment-ready business models. Often, public authorities do not have all necessary sector-specific skills in house to make project an interesting and a bankable opportunity for investors. In the RE sector, this constraint can be reinforced by the technical complexity inherent to each sub-sector.

The **involvement of the right experts**, such as financial engineers specialised in RES, or sector-specific technical advisors, enables to reach the project maturity required by financers / investors, and consequently, a stronger interest from the private sector (which then support the uptake of financial instruments).

Awareness-raising of the benefits brought by financial instruments

To ensure engagement of key stakeholders, it is necessary to **increase awareness of advantages brought by financial instruments** for each type of stakeholders involved[73]. The key element to the awareness-raising of advantages of financial instruments comes with the **cultural shift from a grant culture towards a revolving finance mechanism culture**. Policy-makers, managing authorities and public authorities need to be convinced of the added value generated by the deployment of financial instruments, as opposed to grants, where it is feasible. Revenue-generating and energy-saving **RES projects offer this opportunity**. Following this, the

[73] Wishlade, Michie and Vernon, 2017.

advantages of using financial instruments over grants need to be communicated to a wide range of stakeholders, starting from public authorities to final recipients.

'Buy-in' of a range of stakeholders

Public authorities need to **take the lead in promoting financial instruments** among the final recipients, as well as potential co-investors. Financial instruments require co-investment, which leads to **the need from the public sector to take initiatives** to communicate / attract private sector stakeholders, and keep an open mind-set towards private sector investors. The latter need to see the advantages of investing alongside the public sector, which go beyond the financial returns and encompass also the environmental and social benefits of the investments made. The **environmental and social benefits of investments fuelled by revolving finance mechanisms** – especially in the RE sector – **can increase the chances of political support** (hence facilitating the mobilisation of ERDF / CF funding), even if the environmental goals achieved need to be measured (resulting in necessary monitoring measures). Even if such approach may be challenging and costly for the final recipients (in terms of monitoring and reporting), it is crucial to assess the non-financial progress made by the RES project (in regards to the objectives established in the OP). TA budgets exist to support such initiatives.

Legal expertise

Legal expertise is necessary for the development of financial instruments as early as their **design phase** in order to facilitate the selection of the most adequate State aid compliance regime. For example, the financial instruments dedicated to RE in the UK took advantage of GBER, which allowed for the provision of lawful State aid regimes without the need of going through the process of State aid notification to the EC. In parallel, Hungary developed a methodology for the calculation of the Net-Present Value of the combination of investment and operational aid in order to allow for the support of investment grants, financial instruments and feed-in tariffs altogether. The selection of the adequate State aid approach consequently needs to be carefully tailored on a case-by-case basis. The use of dedicated legal advice in this process is considered as good practice.

4.7 Overview – Key sectoral outputs for the 'Renewable Energy' sector

The table below summarises the key outputs to consider for the further development of financial instruments in the 'Renewable Energy' sector.

Table 10: Overview of the key outputs of the stocktaking study for the further uptake of financial instruments in the 'Renewable Energy' sector

	Renewable Energy	
	Factors	**Impact on the development of financial instruments**
Barriers	Uncertain regulatory framework	
	Infrastructure constraints	
	Emerging technologies and resource risk	
	Competition with grants and other subsidies	
	Fragmentation of ESIF resources and unnecessary restriction in eligibility	
	Cumulation of State aid	
Potential for the use of financial instruments	Design combined financial instruments for both RES and EE	☆☆
	Promoting Energy Performance Contracting (EPC) combining RES and EE	☆
	Long-term loans for established RES	☆☆☆
	Guarantees, subordinated debt and equity for less-established RES	☆☆☆
	Financing lease instrument for RES installations	☆
Key enabling factors for the use of financial instruments	Transferring knowledge on financial instruments in the sector	
	Integrating Renewable Energy financing into financial instruments for SMEs	
	Combining grants with financial instruments	
	Designing financial instrument-friendly Operational Programmes	
	Technical Assistance – Awareness-raising of the benefits brought by financial instruments	
	Technical Assistance – 'Buy-in' of a range of stakeholders	
	Technical Assistance – Legal expertise	

Source: fi-compass*, 2019.*

Legend:

Barriers

 Barrier with a limited negative impact on the uptake of financial instruments in the sector.

 Barrier with a noticeable negative impact on the uptake of financial instruments in the sector (dissuading the managing authorities or other stakeholders from developing financial instruments in the sector).

 Barrier with an important negative impact on the uptake of financial instruments in the sector (almost preventing the use of financial instruments in the sector).

Potential for the use of financial instruments

☆ Potential for such financial instrument scheme exists.

☆☆ Potential for such financial instrument scheme is high.

☆☆☆ Such financial instrument scheme may provide critical added value to the sector.

Key enabling factors for the use of financial instruments

 Key enabling factor that facilitates the use of financial instruments in the sector.

 Important key enabling factor to facilitate the use of financial instruments in the sector.

 Critical key enabling factor to facilitate the use of financial instruments in the sector.

5 Foster the use of financial instruments in the 'Urban Development and Transport' sector

5.1 Policy context

5.1.1 Urban Development and Transport

More than 70% of European citizens live in urban areas and this is set to increase in the future. This makes European cities a critical place to stimulate growth and innovation. The urban dimension has been increasingly prioritised by the European Union (EU) policy agenda over the last decade of EU policy work and this culminated in May 2016, in the adoption of the Pact of Amsterdam, setting out an Urban Agenda for the EU[74]. The Urban Agenda for the EU aims to provide an integrated and coordinated approach to deal with the urban dimension of EU and national policies and legislations.

The urban dimension has also been increasingly emphasised in EU regional and cohesion funding and benefited from a series of dedicated policy initiatives. This has also included financial instruments, notably during the 2007-13 programming period, through the **Joint European Support for Sustainable Investment in City Areas** (JESSICA) and the concept of the Urban Development Funds[75]. Through JESSICA, EU funds were provided on a repayable basis to support integrated, sustainable urban-renewal projects. Between 2007 and 2013, 72 JESSICA funds were launched in 11 different Member States. Overall, managing authorities invested EUR 1 438.31 million in JESSICA initiatives during that programming period[76].

Urban development has not been explicitly prioritised in Regional Development and Cohesion Policy during 2014-2020 programming period among the eleven TOs defined in the CPR. Despite this, over this period, more than 50% of European Regional Development Fund (ERDF) resources have been dedicated to investments in urban areas, as defined in the Cohesion Policy[77]. About EUR 10bn from ERDF has been aimed at supporting integrated strategies for sustainable urban development for about 750 cities, during the same period[78]. Also, as more detailed in the following section on the use of financial instruments in the UDT sector during the 2014-2020 programming period, at the EU level, EUR 385.0m were reported as eligible costs for financial instruments in the UDT sector. Urban projects in energy efficiency, social housing and regeneration of areas have subsequently benefited from a number of financial instruments in various MS (*see Section 5.2 below*), albeit these instruments have typically had a multi-sector focus, as opposed to a primary urban focus (in line with the eleven Thematic Objectives of the respective Operational Programmes)[79].In the new 2021-2027 programming period, much more explicit emphasis on urban investment activity is envisaged, a new objective 'Europe closer to citizens' is proposed among the five main policy goals. This priority will focus on the support of locally-led development strategies and sustainable urban development across the European Union[80].

---

74 Please see: https://ec.europa.eu/futurium/en/urban-agenda.

75 EIB, *JESSICA A new way of using EU funding to promote sustainable investments and growth in urban areas*, 2008.

76 Summary of data on the progress made in financing and implementing financial engineering instruments reported by the managing authorities in accordance with Article 67(2)(j) of Council Regulation (EC) No 1083/2006, Programming period 2007-2013, Situation as at 31 March 2017 (at closure), European Commission, 2017.

77 European Commission, *Guidance for Member States on Integrated Sustainable Urban Development (Article 7 ERDF Regulation)*, 2016.

78 Please see: https://ec.europa.eu/regional_policy/en/policy/themes/urban-development/portal/.

79 *fi-compass* case studies: CAP Troisième Révolution Industrielle Nord-Pas de Calais, France; London Green Fund, the United Kingdom. Both available here: https://www.fi-compass.eu/.

80 Please see: https://ec.europa.eu/regional_policy/en/2021_2027/.

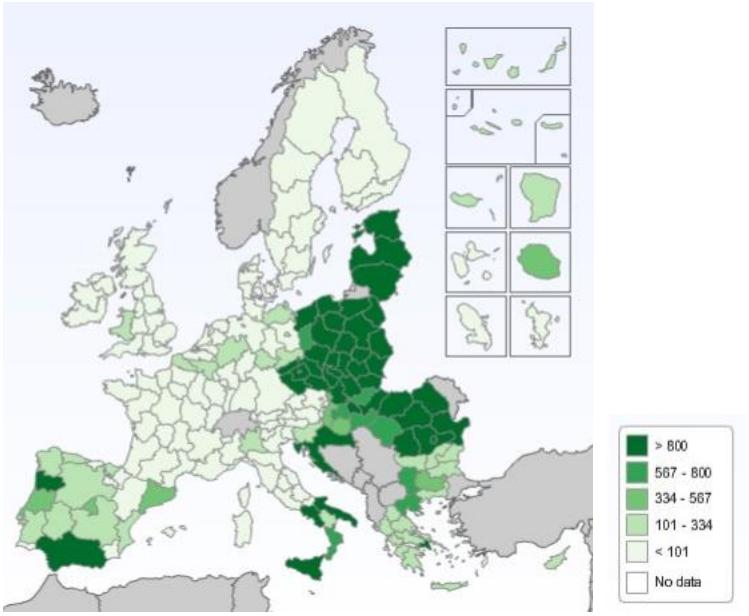
The urban dimension of Cohesion Policy is proposed to be further strengthened for the post 2020 period, through the dedication of more ERDF sources to sustainable urban development. The allocation of the ERDF to urban areas is planned to be increased from the current 5% to 6%.

In addition, a new networking and capacity-building programme for urban authorities, the **European Urban Initiative** will be launched, which is expected to build upon the activities of the previous URBACT and Urban Innovative Actions programmes.

5.1.2 Planned ERDF / CF investments in Urban Development and Transport during the 2014-2020 programming period

Investments in Urban Development and Transport, with the use of the European Structural and Investment Funds (ESIF), typically comprises investment in transport infrastructure, sustainable transport (mainly urban transport) and interventions in social, health and education infrastructure and related investments. During the 2014-2020 programming period, these ESIF investments have been mostly planned and taken place in Eastern Europe and Southern Europe. As illustrated in the figure below, at the beginning of 2017, Poland planned to spend EUR 30 570m in these areas and is followed by Romania (EUR 8 440m) and Czechia (EUR 7 747m), based on data from the end of January 2017.

Figure 25: ERDF / CF planned amounts for the UDT sector in the EU (in mEUR)



Source: EC, Smart Specialisation Platform, Categories of intervention: 024 to 044 and 049 to 055, Planned investments in European Structural and Investment Funds (ESIF) data (ERDF, CF, ESF and YEI) based on the ESIF OPs, Retrieved on 20/01/2017 from the SFC2014/Infoview database, Unit applied: mEUR, 2017.

By taking a closer look at the sub-categories that fall under the scope of this analysis, ESIF investments were developed in the following areas:

- Transport: development of all modes of transport (024-042);
- Urban Transport: sustainable transport, i.e. clean urban transport infrastructure, intelligent transport systems (043-044); and
- Urban Development: Social, health and education infrastructure and related investment (049 to 055).

The Table below illustrates the breakdown of investments scheduled. Regarding interventions in development of all modes of transport (intervention codes 024-042), the majority of investments are undertaken in promoting sustainable transport and removing bottlenecks in key network infrastructures, which constitutes above 90% of all planned investment. Regarding investment in sustainable transport, above 50% of all interventions are

planned in supporting the shift towards a low-carbon economy in all sectors. While about 22% of investments are envisaged in promoting sustainable transport and removing bottlenecks in key network infrastructures and in multi-sectoral interventions. When it comes to the urban investments in social, health and education infrastructure and related investment, above 35% of outlined investments are multi-thematic. They are followed by interventions in promoting social inclusion, combating poverty and any discrimination (33%) and investing in education, training and vocational training for skills and lifelong learning (24%).

Table 11: Breakdown on the ESIF investments planned in the 'Urban Development and Transport' sector during the 2014-2020 programming period (in mEUR)

Thematic Objective	All modes of transport		Sustainable transport		Social, health and education	
	Value (mEUR)	*Share (%)*	Value (mEUR)	*Share (%)*	Value (mEUR)	*Share (%)*
TO 01 - Strengthening research, technological development and innovation	-	-	1	*0.01%*	159	*0.96%*
TO 02 - Enhancing access to, and use and quality of, ICT	-	-	-	-	3	*0.02%*
TO 03 - Enhancing the competitiveness of SMEs, of the agricultural sector (for the EAFRD) and of the fishery and aquaculture sector (for the EMFF)	65	*0.12%*	-	-	132	*0.80%*
TO 04 - Supporting the shift towards a low-carbon economy in all sectors	565	*1.05%*	7 884	*54.83%*	2	*0.01%*
TO 06 - Preserving and protecting the environment and promoting resource efficiency	129	*0.24%*	-	-	89	*0.54%*
TO 07 - Promoting sustainable transport and removing bottlenecks in key network infrastructures	49 829	*92.27%*	3 177	*22.09%*	-	-
TO 08 - Promoting sustainable and quality employment and supporting labour mobility	228	*0.42%*	7	*0.05%*	640	*3.87%*
TO 09 - Promoting social inclusion, combating poverty and any discrimination	43	*0.08%*	-	-	5 547	*33.52%*
TO 10 - Investing in education, training and vocational training for skills and lifelong learning	-	-	-	-	4 054	*24.50%*
TO 11 - Enhancing institutional capacity of public authorities and stakeholders and efficient public administration	-	-	10	*0.07%*	11	*0.07%*
Multi-thematic objective	3 144	*5.82%*	3 301	*22.96%*	5 909	*35.71%*
Total	***54 003***	***100.0%***	***14 380***	***100.0%***	***16 546***	***100.0%***

Source: s3platform, PwC analysis, 2019.
Data from the ESIF Operational Programmes (OP) (retrieved on 20/01/2017 from the SFC2014/Infoview database), 2019.

Whilst there is not a dedicated urban related Thematic Objectives, urban interventions are strewn among numerous categories and many of them fall under the multi-thematic classification. As illustrated in the Table above, **integrated urban development with a holistic approach** constitutes about one third of ESIF investments planned, including sustainable transport and social, health and education infrastructure. Therefore, urban

interventions represent a significant investment activity, which tackles multi-sectoral developments. These numbers support the development of the dedicated urban priority in the post-2020 MFF that will focus exclusively on urban related areas.

5.2 The use of financial instruments in the sector

As mentioned in Chapter 2, 'sectoral analyses' were performed using the financial data provided by MS to the EC for monitoring / reporting purposes in relation to the implementation of their OPs. The analysis considers the three pieces of information below altogether (namely Figure 26, Figure 27 and Table 12).

The following figures and table indicate that five MS were using ERDF and CF funding for financial instruments in the UDT sector as of 31 December 2017; namely: Italy, Poland, Portugal, Slovenia and Slovakia. At the EU level, EUR 385.0m have been devoted to financial instruments in the UDT sector, however this represents only 0.6% of the 'total eligible cost' for this sector. As already mentioned in Chapter 2, this share may be considered quite low for the UDT sector. It appears that **the lessons learnt and the experience acquired with the JESSICA initiatives** during the 2007-2013 programming period (often positive according to the main stakeholders) **have not necessarily motivated other MS to develop similar initiatives for the future. The development of financial instruments in the UDT sector consequently seems still specific to some MS, despite very large amounts of ERDF / CF funding available in total in the sector**. The main form of finance chosen by the managing authorities are loans (considering that three MS out of the five only developed this form of finance for the sector). Finally, the share of financial instruments in the UDT sector among financial instruments in all sectors EU wide represents 2.2%. This indicates that, as for the RE analysed earlier (and like the Environment and the 'ICT infrastructure' sectors analysed later on), managing authorities and Intermediate Bodies do not seem to fully consider the UDT sector when developing their strategies for financial instruments; despite the previous positive experience of the JESSICA initiatives[81].

The individual approaches decided by the five MS in regards to their financial instruments in the UDT sector, indicate both similarities and differences. For instance:

- **The amounts devoted by the five MS to financial instruments in the sector remain quite low** in regards to the ERDF / CF funding amounts available for the sector in the 2014-2020 programming period.
- Also, while Poland has (by far) the largest ERDF / CF amount reported as eligible expenditure for the UDT sector (EUR 22.6bn), financial instruments 'only' represent EUR 181.3m, hence 0.8% of the 'total eligible cost'. This percentage (0.8%) is among the lowest of the five MS: Italy having reported 0.3%, Slovenia 2.5%, Portugal 3.0% and Slovakia 4.3%. This needs to be considered in parallel to the fact that other MS have high amounts of ERDF / CF funding available for the sector, and have already reported high volume of eligible expenditures, but with no financial instrument involved. This is for instance the case of Hungary, Romania, and Czechia. It therefore seems that (unlike in other sectors analysed in the present study, such as the RE sector), **the percentage devoted to financial instruments in the UDT sector does not depend on the amount of ERDF / CF funding available in the OPs**. In the meantime, the quite limited amounts devoted to financial instruments in the sector indicate that **grant financing is still needed and relevant for UDT projects**.
- In terms of differences, the case of Slovakia appears quite unique. While loans is the form of finance preferred by all other four MS, Slovakia decided to use 92.2% of its ERDF / CF funding under the form of (quasi-)equity financing in the UDT sector. On that matter, Portugal is also different since it also uses its ERDF / CF funding as a guarantee product, and (as already mentioned) for subsidy / technical support in

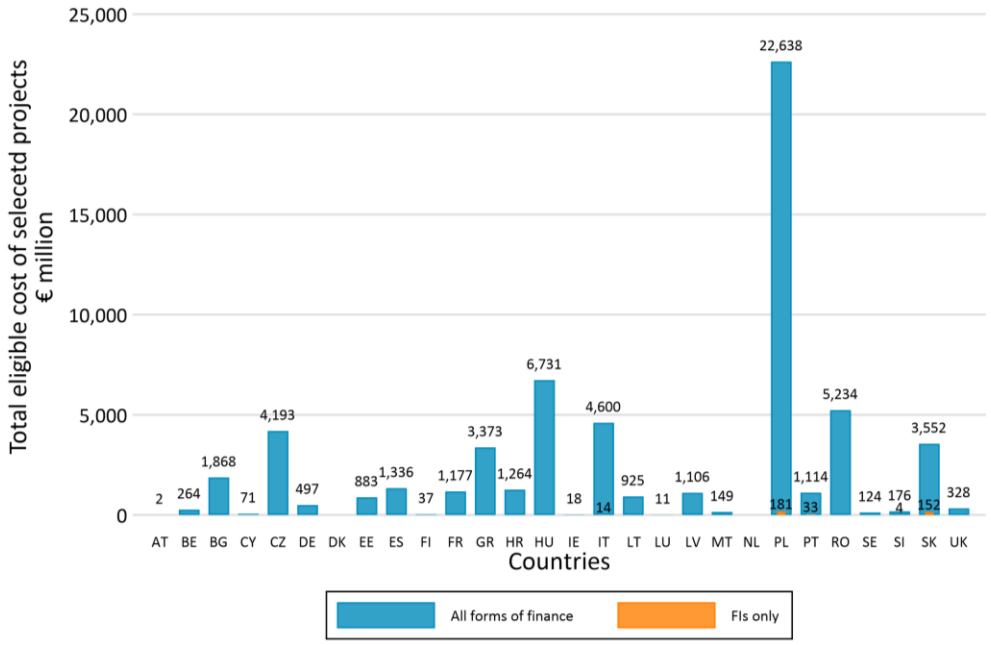
[81] For comparison purposes, and as detailed in the other 'sectoral analyses / chapters', this share is: 1.6% for the RE sector, 1.0% in the Environment sector, 1.7% for the ICT infrastructure' sector, and 12.2% for the 'RDI in SMEs' sector. As already mentioned, this share for the five sectors altogether is of 18.6%.

relation to its financial instruments (in addition to loans). This indicates that – as for other sectors – **in the UDT sector, various financial products provided through financial instruments may add value.**

- Another particularity of the financial instruments developed in Slovakia for the UDT sector is its proportion in regards to the total amount devoted to financial instruments in the country in all sectors: 25.6%. Such a share suggests a high prioritisation of the use of financial instruments in this specific sector.

In that context and in order to better illustrate the development of ERDF / CF-supported financial instruments in the sector, the financial instrument implemented in Slovakia for the UDT sector will be detailed in a specific case study.

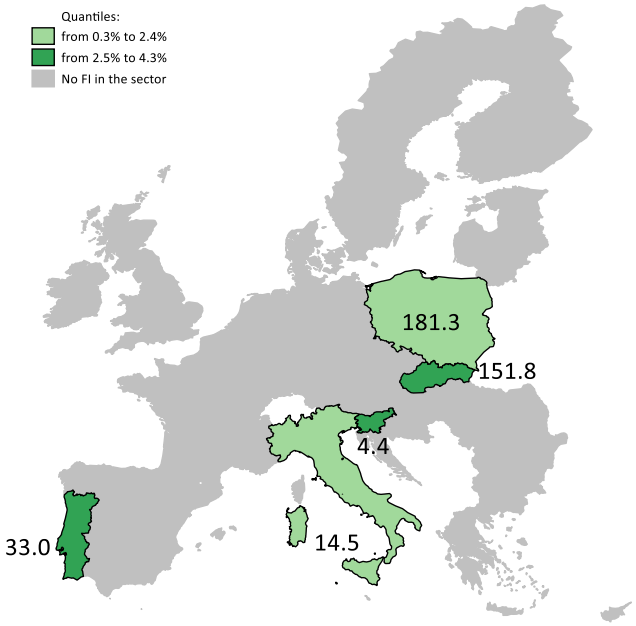
Figure 26: Proportion of ERDF and CF funding devoted to financial instruments in comparison with ERDF and CF funding devoted to all forms of finance (grants and financial instruments altogether) in the UDT sector[82]



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

[82] This figure indicates the 'total eligible cost of selected projects' for 'all forms of finance' (*i.e.* grants and financial instruments altogether; in the thicker blue column) and for 'financial instruments only' (in the inner orange column). For each Member State, data labels provide the nominal amounts in millions euros for the amounts devoted to financial instruments and the total amounts devoted to all forms of finance.

Figure 27: EU-wide map of the uptake of ERDF and CF financial instruments in the UDT sector[83]



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Table 12: Overview of ERDF and CF financial instruments in the UDT sector by Member State

Member State	Urban Development and Transport			
	Amount devoted to FIs (mEUR)	Share of FIs among all forms of finance (FIs and grants, %)	Type of financial products	Share of FIs in the sector among FIs in all sectors (not only the five sectors, %)
Italy	14.5	*0.3%*	*100% loans*	*0.9%*
Poland	181.3	*0.8%*	*100% loans*	*4.7%*
Portugal	33.0	*3.0%*	*88.3% loans* *5.9% guarantee* *5.9% subsidy or technical support*	*3.8%*
Slovakia	151.8	*4.3%*	*92.2% venture and equity capital* *7.8% loans*	*25.6%*
Slovenia	4.4	*2.5%*	*100% loans*	*1.2%*
EU Total	**385.0**	***0.6%***	***36.4% venture and equity capital*** ***62.6% loans*** ***0.5% guarantee*** ***0.5% subsidy or technical support***	***2.2%***

Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

[83] This map indicates (*in green*) the Member States that have implemented financial instruments in the UDT sector by 31 December 2017. Where a Member State – or at least one of its managing authorities – has set up a financial instruments operation in this sector, the amount devoted to this / these financial instruments operation(s) is indicated in millions euros. The 'intensity' of green indicates the share of financial instruments among all forms of finance in this specific sector.

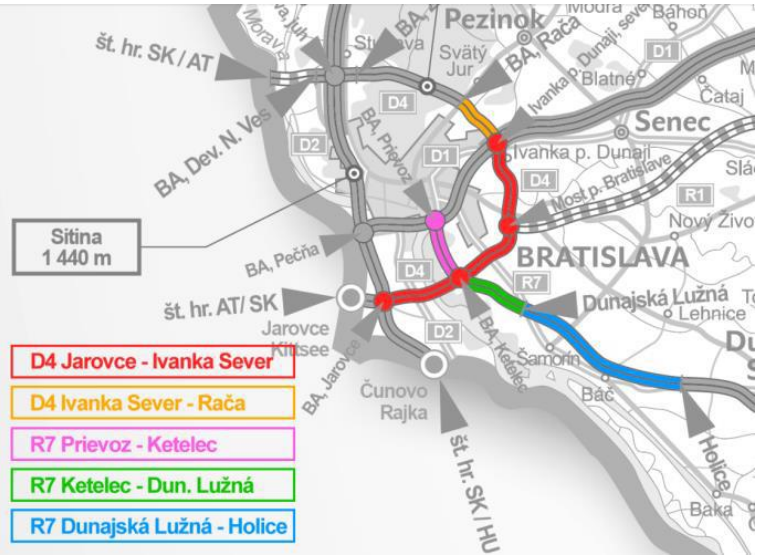
As mentioned above and in Section 1.2.2 in the introduction, **the UDT sector is illustrated by a case study on the financial instrument developed in Slovakia**. It is presented in detail in the sub-section below.

5.2.1 The Slovak mezzanine loan into a PPP for Bratislava ring-road

In June 2016, the finance contracts of the Public-Private Partnership (PPP) for the Bratislava by-pass ring-road called D4R7 (*the road is illustrated in the figure below)* were signed between the Ministry of Transport (MoT) and the private party. Part of this EUR 989m PPP is financed through a Cohesion Fund-supported financial instrument which is providing a mezzanine loan into the scheme. The mezzanine loan is being provided by the Slovak Investment Holding (SIH), using EUR 28m of Cohesion Fund funding originating from the '2014-2020 Integrated Infrastructure Operational Programme'. Furthermore, the case study shows how ESIF financial instruments and European Fund for Strategic Investment (EFSI) resources can be combined at project level.

This case study illustrates how PPPs can provide a viable delivery route for financial instruments, especially in the 'Urban Development and Transport' (UDT) sector.

Figure 28: The Bratislava by-pass D4R7 ring-road financed by the PPP partly supported by a Cohesion Fund-supported financial instrument



Source: Ministry of Finance of the Slovak Republic, *2019.*

Description of the financial instrument

Rationale and objectives

SIH was established on 1st May 2014 to implement, among others, financial instruments from ESIF. It acts as the manager of legacy resources from 2007-2013 programming period, bundled together in the National Development Fund I and as manager of the National Development Fund II (NDF II) for ESIF resources from 2014-2020 programming period. Financial resources allocated to NDF II 2017 amount to EUR 623m. Its investment strategy is based on Operational Programmes from which funds were invested into NDF II and on Funding Agreements between the managing authorities / Intermediate Bodies and SIH. NDF II's main objective is to improve access to financing for projects and institutions that are active in the following areas: transport infrastructure, Energy Efficiency, waste management, social economy and SMEs. Depending on the sector NDF II is either investing directly into the final recipient or *via* financial intermediaries.

The D4R7 PPP project involves designing, building, financing and maintaining (DBFM) 27km of the D4 motorway that will connect to the 32km R7 expressway, thus forming a by-pass ring-road around Bratislava. The D4R7 is an availability payment-based PPP, meaning there will be no user toll charged and the private partner will be paid for the availability of the road at a predefined quality, with a concession period of 30 years. It has been classified by the Slovak government as a national priority in supporting economic growth and social cohesion, by providing a new high-capacity by-pass route around Bratislava to help ease current congestion on the existing road network. The D4 motorway is also part of the Trans-European Transport network (TEN-T). The R7 segment of the project is not part of the TEN-T network. Finally, the D4R7 connection was not listed as a major project in the 'Integrated Infrastructure OP', meaning in case of grant financing to a project the total eligible cost cannot exceed EUR 75m.

From the public sector, the Ministry of Transport and Construction of the Slovak Republic (MoT) is the project promoter, procuring the PPP, and SIH provides the mezzanine loan supported by Cohesion Fund to the PPP scheme. It is worth noting that SIH is a specialised fund of funds managed by SZRB Asset Management (SZRB AM, the asset management entity of the Slovak Guarantee and Development Bank)[84]. SIH was established by the Slovak authorities to implement ESIF-supported financial instruments in the country. From the private sector, a call for tenders was awarded to a Special Purpose Vehicle (SPV), a consortium comprised of Macquarie Capital, Cintra Infraestructuras Internacional SL and PORR AG. These companies are responsible for the design, construction, operation, and financing of the motorway. Prior to the contract award, the SPV secured financing in the form of senior debt, most of which was provided by the European Investment Bank (EIB) supported by the guarantee of the European Fund for Strategic Investments (EFSI).

In terms of timeline of the PPP:

- The environmental impact and strategic environmental assessments of the D4 highway were finalised in 2012;
- The tender notice for the PPP feasibility study was published in April 2014; the study was finalised in October 2014 and published in January 2015;
- The invitation to tender was published in January 2015 and the selection of the preferred bidder was finalised in January 2016;
- The concession contract (with commercial closes) was signed in May 2016, and
- The finance contracts of the PPP were signed in June 2016.

The ring-road is currently under construction. The construction phase of the project started after the signature of the finance contracts in June 2016.

Scope

The scope of the financial instrument set up by SIH is to provide debt financing to projects in the transport sector. The first operation was a mezzanine loan to the PPP in view to finance the D4R7 ring-road around Bratislava.

2014-2020 Operational Programme

The EUR 28m of the instrument is from Cohesion Fund resources originating from the 'Integrated Infrastructure Operational Programme' of Slovakia.

[84] In 2018, the fund manager SZRB AM was renamed Slovak Investment Holding (SIH) and the Fund-of-Funds was renamed National Development Fund II (NDF II).

Financial allocation and governance

The PPP combines several sources of funding:

1. **Cohesion Fund funding provided as a mezzanine loan**

   SIH uses Cohesion Fund resources to provide a mezzanine loan to the SPV created for the project. This subordinated loan is (i) senior to equity and shareholder loans, provided by the members of the winning consortium but (ii) junior to senior debt provided by banks. Due to the full subordination of this mezzanine loan to the senior debt, it is treated by senior lenders as equity replacement. Consequently, the Cohesion Fund-supported financial instrument helps reduce the private sector's cost of capital (as the Cohesion Fund resources carry no funding costs, the mezzanine loan may be priced cheaper than commercial sources of equity, where needed). According to the Slovak authorities (i.e. the Slovak Antimonopoly Office) there is no State aid involved in this project.

   The total amount NDF II had available from the Operational Programme for transport sector projects is limited to EUR 50m. SIH has limited its investment in the EUR 989m project to EUR 28m supported by Cohesion Fund, as a higher contribution would have reduced the equity of EUR 87m too much compared to the amount of debt. The mezzanine loan is provided for a 33 year period at a fixed rate.

   The opportunity to inject Cohesion Fund funding into the PPP was discussed with bidders during the initial tender stage which enabled all four bidders to include the financial instrument into their funding structures. The partial replacement of equity with a mezzanine loan reduced the total cost of capital significantly and this resulted in a reduction in the annual availability payments to be paid by the MoT.

   In addition, in order to satisfy the concerns of sponsors and private lenders, that the SIH investment might grant undue influence to the public sector, the role of the mezzanine lender is largely passive in the PPP with no voting rights, and limited step-in rights. The modest size of SIH's investment (EUR 28m) was also a factor that gave co-investors comfort that the instrument would not impact intercreditors' normal decision making processes.

   EIB's contribution was considered more beneficial on the side of senior debt as described below. Using Cohesion Fund resources under a financial instrument provides the following advantages to the scheme:

   - If Cohesion Fund resources would have been deployed as a grant to the project, the total private sector financing requirement of EUR 989m would have been reduced by EUR 28m. This would have replaced mainly the debt as the ratio between equity and debt (the gearing) would have remained the same; while deploying Cohesion Fund resources as a mezzanine financial instrument (the latter replacing equity, which is the most expensive tranche of capital), reduces the equity share of the project.
   - A grant is also a one-time investment. Once invested, the funding is spent and is not to be repaid; while the deployment of a financial instrument is more sustainable as the instrument is repayable, and assuming the project performs as expected, the SIH will even earn a return on its investment.
   - Finally, whilst limited in scope, the financial instrument provides limited rights related to the project in which it has invested over the whole period of the concession (*i.e.* mainly information rights), which a grant would have not provided.

2. **EIB's senior loan supported by the EFSI guarantee**

   The EIB provides a senior loan of EUR 427m with a long maturity of 33 years, with a grace period of 5 years, to the SPV, representing 43% of the total project costs, and generating substantial additionality. These factors helped the commercial investors finance the project at an acceptable price level. In a PPP project all bidders need to secure commitments from commercial banks for the total amount of debt. Given the large size of senior debt (EUR 952m), and the fact that each of the bidders had to obtain finance to support their bids, financing that represented four times the size of the project had to be secured. Raising this amount of project finance debt has never previously been attempted in Slovakia. In order to increase competition and achieve a reduction in construction costs it was essential that the public sector maximise the potential sources of finance for the project.

The EIB, which could offer support to all bidders, was asked to maximise its support for the project so that the bidders financing terms would remain competitive despite the large numbers of bidders. Consequently, and in order to provide significantly larger facility sizes than what would have been made available in its standard business, EIB has sought the support from EFSI, the Investment Plan for Europe. The benefits of the financial terms of the EIB loan offered to all bidders were passed on to the public sector as the consortia reduced their bid prices during the competitive procurement process.

3. **Commercial investors**

   The financing of the project was further facilitated by the involvement of another international financial institution, the EBRD. The EBRD also has offered its financing to all interested bidders and it provided additional EUR 148m senior loan. The remaining EUR 377m of debt was provided by the Spanish NPBI ICO and four commercial banks, Unicredit, ČSOB, SMBC and Credit Agricole. The EBRD, ICO and the commercial banks provided floating rate loans, split into three tranches, short term (10 years), medium term (20 years) and long term (32 years)[85].

The procurement model chosen was competitive dialogue. The procurement phase had a critical impact on reducing the costs of the project. The choice of an efficient competitive dialogue resulted in the optimisation of the project technical specifications by the bidders.

The PPP contract was designed in a way that majority of risks are with the private party, such as design, build, finance and maintenance risk. Some risks such as land acquisition, traffic risk remain with the public sector. This arrangement made it possible for this project to receive an *ex-ante* approval by Eurostat to be considered outside the government sector according to the European System of Accounts 2010 (ESA 2010). Thus the project does not increase the public debt and deficit of Slovakia which was a prerequisite for such a sizable project.

Finally, the payment from the MoT to the SPV is made through an availability-based service fee. The public side will make annual availability payments of EUR 52.8m to the private partner, based on the availability of the road and quality criteria referring to maintenance of the road and provision of the necessary services like winter servicing. The public partner has the right to reduce the availability payments, if the SPV fails to fulfil the defined availability and quality criteria.

Regarding the design of the financial instrument. SIH, as a fund of funds, invested directly into the project without a financial intermediary. This allowed for fast deployment of a substantial amount ESIF financing without delays through the process of selecting financial intermediaries. This is especially useful for the investment in single large projects.

Financial products

As already mentioned, the financial product provided by SIH to the PPP using Cohesion Fund resources is a mezzanine loan replacing part of the equity.

Lessons learned

Results

The MoT mandated consultants for the feasibility study of the project, covering technical, financial, and legal elements. The study was performed between September and October 2014. It recommended a PPP structure as the optimal delivery method, mainly for Value for Money reasons, as well as for a more efficient use of the Cohesion Fund resources. Also, the analysis underlined that the impact of the project on public finances over the

[85] Please see: http://www.freshfields.com/en/deals/Freshfields_advises_Zero_Bypass_Limited_on_construction_of_Slovakia%E2%80%99s_D4_Highway_and_R7_Expressway/?LangId=-1.

2015-2050 period would be lower with a PPP than with a traditional procurement route. According to the MoT, the PPP approach was also deemed to be a means to accelerate the project delivery.

A clear benefit achieved for the MoT was that the final D4R7 budget was substantially lower (about 60%) than a base case scenario estimated under the MoT feasibility study. According to the Ministry of Finance this was achieved through favourable financial market conditions in the period between bid submission and financial close, a significant appetite of the market to support this type of transaction, the participation of EIB with EFSI and SIH, technical optimisation of the project and high quality and robust competitive dialogue.

The case shows that the possibility for a fund of funds manager to invest directly into larger projects offers opportunities to invest into projects that are not part of a larger project pipeline. The selection of financial intermediaries for single transactions is time consuming and does not allow for sufficient flexibility.

According to the main stakeholders, the key take-aways from this project are:

- Publicly-supported financial instruments (including supported by Cohesion Fund) and private finance may be combined successfully within a PPP project;
- Combining ESI Funds and EIB resources guaranteed by EFSI in a PPP project may support Cohesion Policy projects; and
- Combining publicly-supported financial instruments with private finance can help with the affordability and bankability / finance-ability of a project, including a PPP.

Barriers and challenges

PPPs compared to traditional work contracts are perceived as more complex. Generally, PPP need more detailed preparatory studies. Furthermore, PPP are usually procured via negotiated procedure or competitive dialogue, which take more time and are more complex than open procedures. In the case of the D4R7, it took two years, between tendering the PPP feasibility study until the start of construction. This can be considered as fast compared to other PPPs in the transport sector. Public sector actors need the right set of skills to engage with the private sector during the procurement and also during contract implementation. Procuring authorities need to build up and maintain the capacity to manage PPP contracts.

Project finance, such as PPP, requires a different set of skills than corporate finance. Many NPBs do not have the necessary experience to engage into such financing. On the other side the private banks or investment funds are not familiar with the specificities of ESIF financial instruments.

The financial instrument of this size (EUR 28m) is considered a great success by all stakeholders when maximising the impact of Cohesion Fund funding. It shows that financial instruments can provide an added value to project financing in general and specifically to PPP. It is not clear if this approach is replicable in smaller PPP projects. In this project the equity replacement loan, for legal reasons, is limited to around 3% of the total capital expenditure.

Key enabling factors

Regarding the use of Cohesion Fund funding into the PPP:

- Since Cohesion Fund resources available for this project were very limited other forms of financing (like financial instruments) had to be considered;
- The Slovak government believed that demand for the new D4R7 infrastructure would be high and attractive to private investors, so appropriate for a financial instrument;
- The fiscal treatment of project expenditures (*i.e.* off-balance sheet financing in compliance with Eurostat regulations) was a key determinant in favour of the PPP option, because constitutional law prevents public administrations from increasing public debt above current thresholds; and

- Finally, according to the views expressed of the Slovak authorities (Ministry of Finance and MoT), PPPs and projects in which financial instruments improve financing structures are viewed as complementary to projects funded by the EU Cohesion Policy *via* traditional grants.

From an EFSI perspective:

- This D4R7 PPP was the first project to benefit from the EFSI guarantee in Slovakia. Also, it is the second PPP project in the transport sector in Slovakia and it is considered a successful example of a PPP procurement; and
- The combination of ESI Funds and EIB resources guaranteed by EFSI is an enabling factor for the project. The ESIF contribution allowed for a reduction of the equity related cost and the EFSI guarantee facilitated the EIB's senior loan for the whole duration of the concession. Without the EFSI guarantee it would have been difficult to secure senior debt for the 33 year period.

The PPP also benefited from Technical Assistance (TA) provided by the EIB. In addition to its senior loan, the EIB provided a number of technical recommendations to improve the project optimisation during its own appraisal process, as well as before and during the public procurement phase. Following a further review of the project scope, the MoT incorporated these technical recommendations in the minimum scope required by the private sector. As these discussions were held at a timely stage of the competitive bid process, the MoT was able to benefit from the expertise of the bidders, whilst achieving a full transfer of the selected risks to the private sector representatives.

The EIB also provided informal TA / expertise in the area of PPP financing, and for the deployment of Cohesion Fund-supported financial instruments. This support also included a PPP feasibility study building on the ex-ante assessment, which covered the design and implementation of ESIF-supported financial instruments *via* SIH in Slovakia, the provision of public sector PPP expertise, and overall capacity building to SIH. The joint EC-EIB technical assistance facility JASPERS provides support for the project review process. The EIB advisory service EPEC (European PPP Expertise Centre) clarified the treatment of the PPP in government accounts with Eurostat. Finally, EIB's involvement in the project appraisal phase helped reduce the final project costs compared to the initial estimates of the feasibility study.

Also European Commission services have played a significant role in the whole process. For instance, they provided clarification of environmental conditions in the framework of the Environmental Impact Assessment and overcoming challenges of constructing the road partly in NATURA 2000 protected areas. Together with the EIB, it played an important role in the technical optimisation of the project and provided clarifications *vis-à-vis* rules applicable for financial instruments, and modifications of the Operational Programme in order to enable the project to be co-financed by NDF II.

In parallel, the MoT dedicated significant resources to make the project happen, both at a senior and at the PPP unit level. The Ministry:

- Established a project team composed of people with relevant experience (with both internal and external experts);
- Managed the relationship and the communication with public stakeholders and Non-Governmental Organisations well with regards to the project; and
- Ensured active cooperation on the eligibility checks of the different multilateral / national development banks in the early phase of the project.

According to all stakeholders involved, the drive of the MoT was perceived as key for the implementation of this PPP project.

5.3 Market opportunities

5.3.1 Urban Development

Investment activities in urban areas

Investment in urban infrastructure supports the smart and sustainable development of European cities. European municipalities are in charge of development of the urban development strategies that are aligned with European and national objectives.

The EIB Investment Survey tracks annual changes in investment activities, investment needs and investment barriers across Member States. There is one dedicated survey module that consults municipalities and monitors their infrastructure investments, i.e. investments in urban transport, health, education, housing, environment, and ICT infrastructure[86].

In 2017, 555 municipalities across Europe were interviewed[87]. In relation to investment activities undertaken over the last years (2012-2017), 42% of European municipalities reported that their urban interventions increased. **The highest increased of investments has been observed in education, environment, and ICT infrastructure**, where about 50% of municipalities have increased their investments. When it comes to the investments in health, in the majority of cases their levels have stabilised over the last years.

From the regional perspective, the survey found that more than 60% of municipalities from Poland and the Baltic countries have reported an increase in infrastructure investments. However, 20% of municipalities from Italy and Southern Europe reported the highest decrease in their infrastructure investments. These investment activities are mainly financed with own municipality resources (more than 50%) and they are followed by other public transfers from regional or national government (23%), external finance (18%) and EU co-financed programmes, including ESIF (8%). It should be noted that the ESIF figure reported is potentially understated as it is probable that ESIF has been included in the municipality own resources and regional and national government categories.

The external finance represents a very small share at around 5% in Poland, Other Southern Europe, Other Central Europe, South East Europe and Baltics. However, in the Benelux private sector financing represents above 40% of investment financing, being the highest in this region and exceeding the share of own municipality funding.

EU financing represents the highest share of financing in the Baltic region – 36%, while the own resources constitute the highest share of investment in Poland – 68%. National public funds have the highest share in the UK – 35%.

Since the municipality own resources constitute a significant part of urban infrastructure financing, it is important to underline that municipalities need to prioritise among projects tackling multiple different sectors and they need to decide which projects will be implemented using their own budget. EU and other forms of public finance are spent in the majority of cases in the form of grants, leading to the high dependency on priorities already defined in the OPs. Such an approach does not always allow for the flexible financing of the real current needs. Commercial borrowing strongly depends on the municipality's credit rating and/or bankability of the underlying project(s). This leads to the existence of the current investment gap and the need for the more preferential and flexible conditions of financing instruments that will be able to address public sector borrowing constraints, leverage more limited public sector investment and attract private sector investors. This approach will also introduce additional expertise and knowledge transfer and thus support better performance and project quality improvement.

86 Please see: https://www.eib.org/en/about/economic-research/surveys-data/investment-survey.htm.

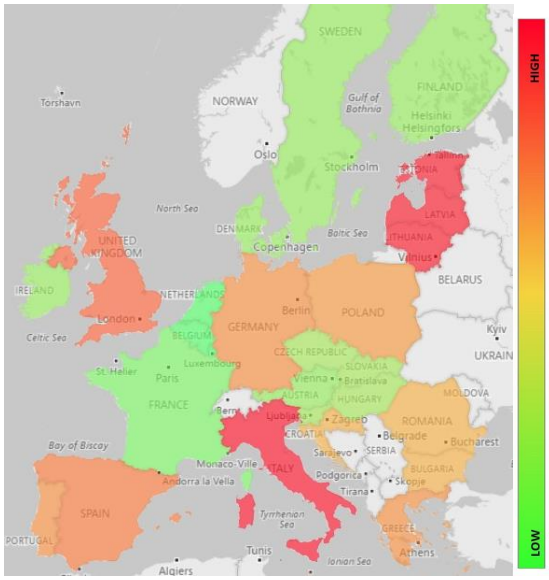
87 EIB, Interviews were carried out between May and August 2017, EIB Investment Survey, 2018.

Investment gap

The highest **investment gaps have been highlighted in the survey in housing (about 45% municipalities), urban transport and ICT infrastructure (about 30% of municipalities)**[88].

From a cross-EU perspective Italy, the UK and Baltic countries reported the highest investment gaps (above 40% of municipalities surveyed). Housing infrastructure investments have been identified by survey respondents as the most under-provisioned in the UK (69%) and Baltics (58%). The figure below illustrates the perceived investment gap across EU identified by municipalities across urban interventions.

Figure 29: Perceived investment gap in urban investments



Source: EIB survey, PwC analysis, 2019.

About 45% of municipalities assess that the remaining gap will be filled in the coming years. Furthermore, about 35% of municipalities were also optimistic to address the pending needs in education and environment infrastructure. The UK remains sceptical when it comes to closing the investment gaps in urban transport (50% of municipalities) and environment (10% of municipalities).

Local Government debt limits can also have an impact. It can be argued that especially locally, regional/local authorities' budgets are even under greater pressure to limit deficit operations and debt levels that at the level of central government. Therefore, since access to finance is a prerequisite to boost urban development, there is a need to support municipalities' investments, taking into consideration the EU and national statistical treatment rules. **More innovative financing mechanism** for the implementation of urban development programmes providing for so called 'off-balance financing solutions', such as PPPs or EPCs would serve as catalyst for the development of new urban investment opportunities. PPPs and EPC models offer the potential to aggregate similar projects with similar scope and attract private capital and project development and delivery expertise. Furthermore, projects can such as these can be structured as off-balance sheet, thereby not impacting on debt ceilings, and while accounting treatment should not be the primary motivation in selecting one contractual scheme over another, it can be a material advantage of these models.

Financial instruments and investment platforms can be effective financing solutions of both PPP and EPC models as they can potentially provide a more flexible mechanism to fill the gap to finance complex, multi-sectorial urban & transport projects.

[88] EIB, *Municipal Infrastructure*, EIB Investment Survey, 2017.

5.3.2 Transport

Effective transport mobility is essential in improving the quality of life of urban citizens. Investment in urban transport infrastructure, can help to ensure that the problems related to high congestion, air and noise pollution, as well as road safety can be addressed in European cities[89]. Furthermore, transport investments are also strategic in achieving European targets regarding the reduction of the greenhouse gas emissions and clean air policy[90].

Investments made in all modes of transport

According to the OECD data about investments made in the transport infrastructure, the biggest spender in 2017 was the UK with an investment of EUR 22.19bn in motorway, roads and rail infrastructure. The UK was followed by Germany (EUR 19.46bn) and France (EUR 16.78bn).

Based on the transport infrastructure investments made in 23 Member States, the following patterns have been noted:

- **Rail infrastructure** investments represented the majority of investments taken in Austria, Denmark, Belgium and Portugal.
- **Road infrastructure investments, excluding motorways,** constituted the significant part of the investments made in Germany, France, Spain, Sweden, Poland, Romania, Finland, Hungary, Lithuania and Estonia.
- When it comes to the **inland waterways infrastructure investments**, they have been taken by Germany, France, Romania and Belgium.
- The **airport infrastructure investments** represented the major part of investments made in Croatia and Portugal.
- The **maritime port infrastructure investments** have been taken by Spain, Germany, France, Lithuania, Slovenia, Estonia and Ireland.
- The **motorway road infrastructure investments** have been taken in the UK, France, Poland, Hungary, Slovakia, Lithuania, Croatia and Slovenia.

Quality of transport infrastructure in 2018

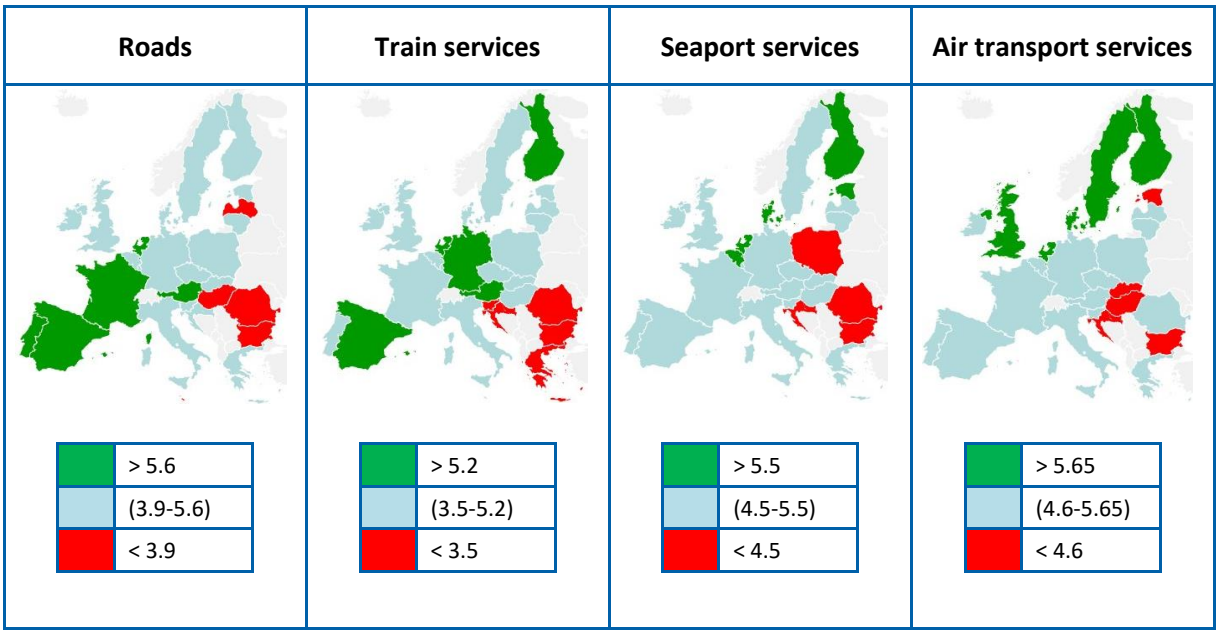
The quality and efficiency of European transport has been assessed in the Global Competitiveness Report[91] as one of the key components that impacts the enabling environment of countries – worldwide. Having a closer look at the situation across EU, the Figure below highlights that the Member States with the poorest quality of transport infrastructure investments are located in the Eastern Europe. Bulgaria is notably the only one of the EU Member States where all modes of transport have been deemed inefficient.

89 European Union, *European Urban Mobility*, Policy context, 2017.

90 Please see: http://ec.europa.eu/environment/air/clean_air_policy.htm.

91 World Economic Forum, *The Global Competitiveness Report*, 2018.

Figure 30: Quality of the infrastructure investments by mode of transport in 2018



Rating based on a survey by the World Economic Forum, using a scale from 1 (extremely inefficient) to 7 (extremely efficient).
Source: World Economic Forum Global Competitiveness Report, https://ec.europa.eu/transport/facts-fundings/scoreboard_en.
Source: Eurostat, PwC analysis, 2019.

Reduction of transport emissions

The Commission set out two targets for transport emissions in its White Paper on Transport[92]:

- A 20% reduction from 2008 levels by 2030; and
- A 60% reduction from 1990 levels by 2050.

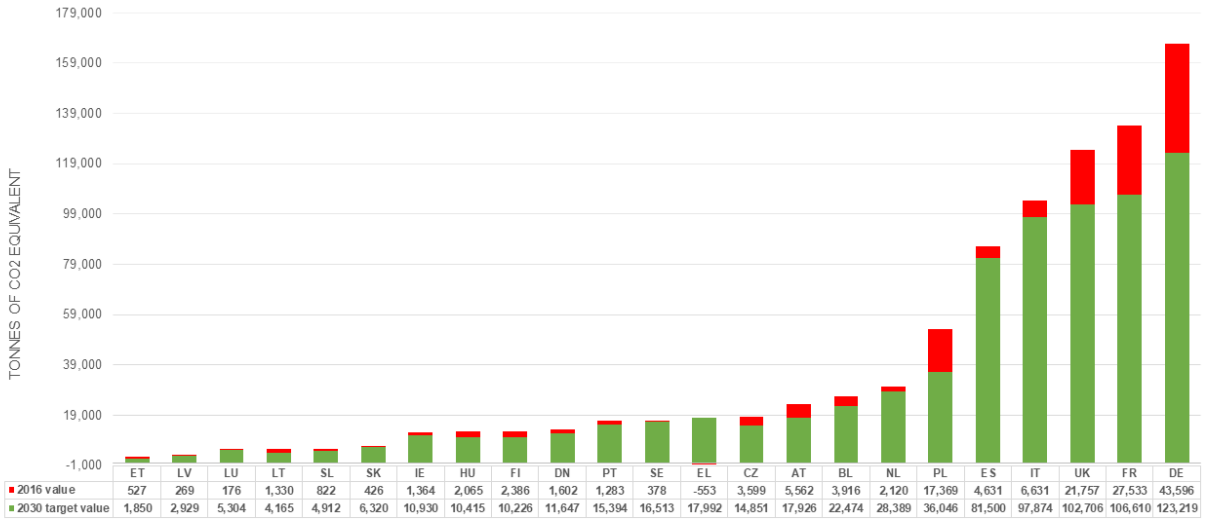
The proposed 2030 EU Climate and Energy policy framework reiterates these goals.

Based on data at the end of 2016, Greece is the only country that has already met the 2030 target and cut the emission by more than 20% compared with the 2008 emission level. Other Member States still need to cut transport emissions. However, the majority of them are close to meeting the 2030 target. Germany, France, the UK and Poland have to still significantly reduce the transport emission to get closer to their national targets. Due to the size of their economies and the size of emissions that need to be cut, more time and investment may be needed to meet 2030 targets.

The Figure below plots in green the allowed emission by 2030 and in red the emission that still needs to be cut by the deadline.

92 Please see: https://ec.europa.eu/transport/themes/strategies/2011_white_paper_en.

Figure 31: Transport greenhouse gases pollutant by country 2016 values against 2030 target



	ET	LV	LU	LT	SL	SK	IE	HU	FI	DN	PT	SE	EL	CZ	AT	BL	NL	PL	ES	IT	UK	FR	DE
2016 value	527	269	176	1,330	822	426	1,364	2,065	2,386	1,602	1,283	378	-553	3,599	5,562	3,916	2,120	17,369	4,631	6,631	21,757	27,533	43,596
2030 target value	1,850	2,929	5,304	4,165	4,912	6,320	10,930	10,415	10,226	11,647	15,394	16,513	17,992	14,851	17,926	22,474	28,389	36,046	81,500	97,874	102,706	106,610	123,219

Source: OECD, PwC analysis, 2019.

5.4 Barriers

5.4.1 Barriers hindering investment in the UDT sector

Limited resource long-term strategic and investment planning: Long term investment planning to address policy priorities and which would facilitate the consideration of a range of financing solutions, is not always prioritised by public authorities. This is evidenced by municipalities' representatives often focusing on the implementation of projects that meet the requirements of grant calls and do not necessarily address the real current need. In addition, grant calls can sometimes support the specific individual policy areas and thus hinder the integration of the integrated multi-sectorial projects, which often characterise urban development activities. This can limit the potential to develop long term urban development strategies with associated investment plans.

Lack of capacity and capability of multiple stakeholders, including public administrations and project promoters to stimulate the development of the project pipeline and investments around urban development and transport interventions. As many potential beneficiaries focus on grant schemes available they do not always have sufficient capacity to identify and develop the most suitable financing means for the projects in question. There can also be a lack of sufficient internal competences e.g. at the level of the Managing Authority or municipality, due to the limited experience and awareness about financial instruments and other private sector led project financing opportunities. The set-up and implementation of financial instruments, development of the bankable business and operational models and off-balance solutions requires the right skills. Capacity building efforts in relation to financial instruments have to date been targeted at Managing Authorities and to a lesser extent financial intermediaries. There is a need to consider broadening these activities to also encompass public sector project promoters, particularly in sectors which are important from a policy perspective and where there is considered to be significant additional potential.

Multi-thematic interventions: Many urban interventions have a broad scope that goes beyond one sector. This set-up often results in multiple promoters that then directly impacts the number of borrowers and risks associated. The more complex the structure, the more difficult is to assess all associated risks. The potential default of one of the project borrower or of one of the project can impact the bankability of the entire integrated intervention. When carefully structured, however, this also presents an opportunity for sharing the revenues

between projects with varying bankability, and common financing the non-revenue generating projects with revenue generating projects.

One of the solutions for financing of these integrated interventions, with multiple borrowers, can be the use of the public-private partnership (PPP) model. Although PPPs possess a higher level of complexity, creating a partnership between private and public sectors' entities to finance and support urban development projects have proved to be an attractive solution, which meets an increasing interest from the corporate side, bears significant material advantage, and contributes to the development of the market. However, due to the perceived complexity of these types of financing schemes and in some instances previous negative experiences, many entities do not consider to use this scheme.

Lack of standards and common regulations for innovative transport solutions: Innovative transport technologies and services lack standards and common regulations, such as a common definition of mobility services or standards for autonomous driving at the EU level that would facilitate their growth. Also, when it comes to the institutional environment, European markets have less friendly institutional environment due to the fixed cost, national regulations, as well as the access to labour force[93]. All of these elements limit the size of the innovative market in the EU and as a consequence, limit the following investments that are strategic for the boost of the sector.

5.4.2 Barriers hindering uptake of financial instruments in the sector

Limited availability of financial advisory support: The sector is not well equipped with the access to technical assistance that is provided to municipalities and urban project promoters, from a financial advisory perspective. Currently, urban interventions can benefit from technical assistance offered by ESIF technical assistance, JASPERS and URBIS. Due to the constant pressure on the public sector to limit deficit operations and debt levels, technical assistance (TA) to support the development of **off-balance sheet nature of certain contractual schemes** and the development of financing structures which encourage participation by the private sector is vital to help fund investments. Currently, the preparation of projects is driven by the availability of grants. Dedicated technical assistance to support the advanced financial structuring could be a solution to support the **more sustainable long term development of projects** and increase the use of financial instruments.

Domination of grants: UDT projects typically contain non-bankable components, where the involvement of grants is important to facilitate the implementation of projects. Examples of non-bankable components include certain infrastructure, addressing abnormal costs (such as contaminated sites and costs associated with heritage works to historical buildings), viability issues associated with low land values and the inclusion of early R&D activities to trigger innovation in a specific sector. Supporting the shift from a strong focus on grants available to a greater use of repayable funding would also encourage the public sector to adopt a more business-driven approach that helps to better secure the sustainability of the projects. The increased involvement of private sector can also improve public policy outcomes by incentivising higher quality financial, technical and operational discipline on their projects. More effective grant and FI combinations, ideally through single operations or where this is not possible through the strong coordination of two separate operations, which are designed to limit the grant component to the minimum necessary should be encouraged. To support the increased use of combination structures, guidance and case studies demonstrating real life combination examples could be developed.

Limited borrowing capacity of municipalities: Urban projects are often developed by municipalities that need to use their own financing capacity to access the required external financing. The borrowing capacity of municipalities does not always support the implementation of urban projects. This is driven by the constraints to the level of the **indebtedness of municipalities and in some circumstances necessary national government**

[93] EIB, *Financing innovation in clean and sustainable mobility Study on access to finance for the innovative road transport sector*, 2018.

approvals. This often encourages municipalities faced with borrowing constraints towards the use of grants as opposed to financial instruments.

Lack of the direct prioritisation of urban development among the Operational Programmes (2014-2020): Lack of the prioritisation of the urban development directly among Operational Programmes has resulted in the split of the urban interventions among multiple objectives. This has directly impacted the critical mass of funding available for urban projects. Due to the disbursed nature of allocations amongst various thematic objectives, it has proved more difficult to create dedicated financial instruments for urban investment, with the necessary critical mass. The change in the prioritisation for the new programming period will address this and support urban interventions, including their multi-sectoral focus.

State aid: Article 16 of the General Block Exemption Regulations defines the regional urban development aid that can be given to the urban development projects. This provision is limited to assisted areas. In certain cases, urban development plans span assisted and non-assisted areas, preventing a holistic/single State aid solution under Article 16 from being effective.

5.5 Potential for the use of financial instruments in the UDT sector

Financial instruments in the sector can offer the following benefits:

- Achieve **critical mass** as some municipalities and their projects can be too small to be reach the required scale of financing needed to access sufficiently attractive finance in their own right – they benefit from the joined pipeline thanks to aggregation;
- Provide **improved financing conditions** in terms of longer maturity and affordable costs and enhanced terms to public and private project promoters;
- Provide coordinated **multi-source financing** and technical assistance for projects' conceptualisation and readiness through the development of an effective overarching mechanism; and
- Develop a flexible mechanism to **fill the gap** to finance complex, multi-sectorial smart city and transport projects with financing solutions with reflect the integrated nature of the investments.

The following activities have been identified as areas where urban based FIs could add particular value added.

Facilitating a more sophisticated offer

- FIs can be used as a means to develop innovative off balance sheet solutions through the use of PPP and other similar structures, where it makes economic sense to do so:
  - Traditionally, a lot of urban and transport infrastructure has been financed directly from public funds. There is, however, a need to better use the limited public financial resources and change the model for financing new 'smarter' infrastructures. This requires the funding model to realise a shift from the use of 'traditional' tools such as public (e.g. municipal or national) resources to contractual models of PPPs or EPCs and FIs, so as to be able to attract private capital.
  - The borrowing capacity of municipalities does not always support the implementation of urban and transport projects. More innovative financing mechanisms for the implementation of urban and transport projects are so called 'off-balance financing solutions', such as PPPs or EPCs as already defined earlier. PPPs and EPCs projects may not only be structured as off-balance sheet, not impacting debt ceilings, but by their nature provide opportunities to attract private capital, which can then be used to support a proportion of the investment costs, limiting the amount of public funding needed – making it go further and maximising the benefits of available public funds.

- Through providing financing for smart based urban development, encouraging the development of innovative, sustainable and integrated solutions to urban development needs, which may prove more costly or more risky than traditional solutions, due to the operational risks associated with new technologies, implementation and maintenance processes.

Through integrated TA combined with the financial instrument

- Field work undertaken in a number of MS has confirmed the importance and need to first invest in the development and preparation of many potential projects and, therefore, to develop a dedicated Technical Assistance offer to public and private project promoters and to embed that as part of the financing structures. This will stimulate investment demand thanks to a combination of technical support and adequate financing solutions provided to municipal project promoters, thus helping them to evolve from an almost exclusively grant driven investment policy to a more balanced funding mix, including repayable forms of financing.

Through effective combinations of grant and financial instruments

- Deployment of grants to cover the preparation of the investment-ready projects and to address viability issues (for example to address costs associated with brownfield sites and with heritage projects and to address projects which exhibit a cost value gap due to the prevalence of low property values), allowing FIs to address deeper market failures than they might otherwise, whilst also through the combination mechanism, reducing the level of grant to the minimum amount to enable the project to proceed/maximising the repayable component. Due to the different characteristics of urban development projects (public and private sector promoters, various end uses and the potential for standalone and integrated projects combining a mix of different uses) it is not possible to provide a general indication of the typical level of grant funding which may be needed alongside a financial instrument contribution. What will therefore be important is that within a combination solution, there is a clear and agreed methodology for the calculation of the level of granted needed at project level with the stakeholders involved so that the grant level is tailored to the specific needs of the individual project and importantly to the minimum amount necessary to unlock the project and enable it to proceed and benefit from financial instrument support.
- Switching from a grant based approach in favour of repayable financial solutions has a list of other tangible advantages. The shift results in an increased set of private sector actors present which also has a positive impact on existing public policies by incentivising higher standards of operational, technical, and financial practices in the projects the public sector promoters then design and develop. This can result in higher quality projects. In addition, such an approach secures the sustainability of urban development projects through encouraging public-sector entities to act actively, adopting a business-driven approach and considering financing options and delivery structures at an earlier stage.

Through the creation of aggregation mechanisms, which provide a range of financing solutions

Urban development projects can often be quite small in size and on a standalone basis, can lack the necessary critical mass to secure the financing needed on terms that are sufficiently attractive to enable the projects to go ahead. FIs offer a means to aggregate smaller projects, to provide greater critical mass and diversification in order to attract new investment. The financing needs of urban development projects are also extremely varied and often involve different borrowers and financing risks, which can range from long term low cost debt financing to equity based requirements. Financial instruments can be structured in such a way to meet such diversified financing needs. It is anticipated that the majority of demand for financial instrument support from urban

development projects will be for long term loan financing, however demand for equity investment could also be envisaged, particularly where off balance sheet financing solutions are proposed. Capacity to provide both forms of financing should actively investigated in the *ex-ante* assessment process and flexibility to provide both forms of financing ideally encouraged.

5.6 Key enabling factors for the use of financial instruments

The enabling factors for this sector have identified in part already been highlighted in relation to the renewable energy sector. They are the following.

5.6.1 Combining grants with financial instruments

The possibility to combine grants with financial instruments has the potential to accelerate the shift towards an increased use of financial instruments in the urban development sector. The urban development sector in particular, has previously experienced the dominance of grants, which in some instances has crowed out more sustainable forms of financing including through financial instruments. The CPR proposal of the EC for the 2021-2027 programming period allows for the integration of an ancillary grant, including investment grants, in financial instruments. This means that the repayable and the non-repayable parts are governed under the financial instrument rules and that the financial intermediary responsible for the financial instrument, will have much greater control over target final recipient's access to grant funds. It is expected that this will significantly simplify the combination of different forms of support compared to the current 2014-2020 programming period. In the urban development context, the use of investment grants alongside financial instrument support is expected to be an attractive offer for final recipients. Offering a single financing solution and associated process to addressing both viability and financing issues typically associated with urban projects

5.6.2 Designing financial instrument-friendly Operational Programmes

Financial instruments require a sufficient pipeline of investable projects in order to make it economically viable and attract financial intermediaries implementing the instruments. To avoid multiple Funding Agreements, contributions from multiple Priority Axes (and the related investment restrictions and additional monitoring and reporting obligations) and the coordination with several managing authorities or Intermediate Bodies, it is advisable to concentrate contributions to financial instruments within the OPs. The cross cutting nature of urban development makes this issue a particular challenge for urban financial instruments. The dedicated urban based priority in the next period, should greatly facilitate this aspect.

5.6.3 Providing access to Technical Assistance facilities

Access to TA accelerates the development of the right capabilities needed for the development of financial instruments in any sector, both at the level of public authorities and of project promoters. This is also the case for the urban sector, where additional support particularly at the level of the public sector project promoter, would be very beneficial.

In order to provide maximum value added in the urban sector, such technical assistance support, would ideally take two forms. Firstly, it should comprise awareness raising activities targeted at potential final recipients regarding existing financial instruments and the types of projects suited to FIs and advantages offered by FIs. This will ensure that project pipelines are developed with a range of financing solutions in mind, beyond the traditional grant routes, this in turn will drive demand for financial instrument support. Secondly, there is a need to provide greater financial advisory support to help project promoters more effectively consider the financing options available to projects, develop financing solutions for such projects and support the structures of such

projects so that they are capable of accommodating repayable forms of investment through financial instruments. The latter form of technical assistance would ideally be embedded within the financial instrument and provided by or under the supervision of the financial intermediary.

5.7 Overview – Key sectoral outputs for the 'Urban Development and Transport' sector

The table below summarises the key outputs to consider for the further development of financial instruments in the 'Urban Development and Transport' sector.

Table 13: Overview of the key outputs of the stocktaking study for the further uptake of financial instruments in the 'Urban Development and Transport' sector

	Urban Development and Transport	
	Factors	**Impact on the development of financial instruments**
Barriers	Limited resource long-term strategic and investment planning	○●○
	Lack of capacity and capability of multiple stakeholders	○○●
	Multi-thematic interventions	○●○
	Lack of standards and common regulations for innovative transport solutions	○●○
	Limited availability of financial advisory support	○○●
	Domination of grants	○●○
	Limited borrowing capacity of municipalities	○○●
	Lack of the direct prioritisation of urban development among the Operational Programme (2014-2020)	○○●
	State aid	○●○
Potential for the use of financial instruments	Facilitating a more sophisticated offer (*i.a.* off-balance sheet solutions, PPPs, and EPCs)	★★
	Integrated TA combined with the financial instrument	★★★
	Effective combinations of grant and financial instruments	★★★
	Creation of aggregation mechanisms, which provide a range of financing solutions	★★
Key enabling factors for the use of financial instruments	Combining grants with financial instruments	▲
	Designing financial instrument-friendly Operational Programmes	▲
	Providing access to Technical Assistance facilities	▲

Source: fi-compass*, 2019.*

Legend:

Barriers

○●○ Barrier with a limited negative impact on the uptake of financial instruments in the sector.

○●○ Barrier with a noticeable negative impact on the uptake of financial instruments in the sector (dissuading the managing authorities or other stakeholders from developing financial instruments in the sector).

Barrier with an important negative impact on the uptake of financial instruments in the sector (almost preventing the use of financial instruments in the sector).

Potential for the use of financial instruments

☆ Potential for such financial instrument scheme exists.

☆☆ Potential for such financial instrument scheme is high.

☆☆☆ Such financial instrument scheme may provide critical added value to the sector.

Key enabling factors for the use of financial instruments

Key enabling factor that facilitates the use of financial instruments in the sector.

Important key enabling factor to facilitate the use of financial instruments in the sector.

Critical key enabling factor to facilitate the use of financial instruments in the sector.

6 Foster the use of financial instruments in the 'Environment' sector

6.1 Policy context

In the context of the 'Environment' sector, the study focuses on (i) the '*reduction of negative environmental externalities*', and (ii) the 'transition towards a more sustainable development' through investments in air quality, water, and waste. Other areas such as nature protection and biodiversity, protection of soil, and prevention of land degradation, though crucial but much less suitable for financial instruments, are not covered in this study. **The EIB has estimated the EU-wide investment needs only in the 'water and waste' sector for about EUR 98bn annually**[94]. Given the current investment levels, the resulting **EU-wide investment gap**, only in these two sectors, may amount up to **EUR 63bn *per* year**. Following this, the **investment gap points to a need for the MS to step up their environmental action**, and indicates the potential for future investment opportunities in the sector.

6.1.1 The EU's strategy for environment

The cornerstone document defining the EU's strategy for environment – the 7th Environment Action Programme (EAP)[95] – sets out specific policy objectives for the EU until 2020, and outlines a high-level vision until 2050. The environmental strategy of the EU is structured around three key thematic objectives:

- '*Protecting, conserving and enhancing Union's natural capital*'[96];
- '*Turning the Union into a resource-efficient, green and competitive low-carbon economy*'; and
- '*Safeguarding the Union's citizens from environment-related pressures and risks to health and well-being*'[97].

In 2017, the European Parliament's Committee on Environment, Public Health and Food Safety assessed the level of impact of the 7th EAP across the MS. among the key challenges: (i) the **difficulties in improving resource efficiency** in the area of waste management, (ii) the **high probability of not achieving air quality standards** across the EU, and (iii) **challenges in managing urban waste water**, while insufficient financing halted progress in improving drinking water quality[98].

---

94 European Investment Bank, *Restoring EU competitiveness,* 2016.
Available here: https://www.eib.org/attachments/efs/restoring_eu_competitiveness_en.pdf.

95 Decision No 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 'Living well, within the limits of our planet'.
Available here: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32013D1386.

96 This thematic priority is strengthened with a substantial body of legislation. Associated directives include: Water Framework Directive, the Marine Strategy Framework Directive, the Urban Waste Water Framework Directive, the Nitrates Directive, the Floods Directive, the Priority Substances Directive, the Air Quality Directive, and the Habitats and Birds Directives.

97 Decision No 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 'Living well, within the limits of our planet'.
Available here: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32013D1386.

98 Report on the implementation of the 7th Environment Action Programme issued by the European Parliament's Committee on the Environment, Public Health and Food Safety, 2017.
Available here: http://www.europarl.europa.eu/doceo/document/A-8-2018-0059_EN.html.

The following paragraphs look at specific policies in air, water and waste sub-sectors, which are considered to be potential areas for the deployment of financial instruments in the Environment sector. Concrete recommendations related to the 'Potential for financial instruments in the sector' are included in Section 6.5.

The EU policy framework for air quality

The EU policy measures targeting the reduction of emissions to improve air quality across the EU are defined in the **EU Clean Air Policy package** adopted in 2013, which reinforced the importance of the **air quality standards as the key policy objectives** across the EU. The programme has been revised in 2018 and detailed progress results, referred to as the Air Quality Directive Fitness Check[99], will be available by the end of 2019.

State of play of the air policy implementation at the EU level – Key points

Despite the strategic importance of the air quality for the health and well-being of European citizens, **most of the MS face infringement procedures** due to exceedances of hazardous pollutants above the limit values. This points to the difficulties across the MS in implementing the policies set at the EU level. At the same time, according to the European Environmental Agency (EEA), air pollution is considered to be a cause of almost **400 000 premature deaths in the EU**[100], while the external costs related to health are estimated to range from EUR 330bn to EUR 940bn[101].

The EU policy framework for water

Water is a common good and a scarce resource, which therefore needs to be managed in a sustainable manner. There are two main legal frameworks in the EU supporting the protection and management of freshwater and marine resources: the **Water Framework Directive** and the **Marine Strategy Framework Directive**. These frameworks are further regulated by a number of more targeted Directives, such as Groundwater Directive, the proposal for a revision of the Drinking Water Directive, or the Urban Waste Water Treatment Directive to name a few[102].

State of play of the water policy implementation at the EU level – Key points

Implementation of the environmental objectives set at the EU level has proved to be challenging across the MS. In terms of water, **the most common pressures affecting the quality are pollution from industrial and agricultural activities**, resulting in excessive concentrations of hazardous nutrients. As such, the policy goals of the Urban Waste Water Directive, are yet to be achieved.

Overall compliance with the Drinking Water Directive is positive, with the **compliance rate for microbiological and chemical parameters standing at 99%** but indicators have not been revised since 1998 and do not reflect the current scientific progress. Overall, the costs of the proposed revised Directive are estimated between **EUR 5.9bn and EUR 7.3bn**[103].

---

[99] For more information on the timeline for the Air Quality Directive Fitness Check, please refer to: http://ec.europa.eu/environment/air/quality/aqd_fitness_check_en.htm.

[100] EEA Report No 13/2017 of 11.10.2017 on 'Air quality in Europe 2017', 2017.
Available here: https://www.eea.europa.eu/publications/air-quality-in-europe-2017.

[101] Report on the implementation of the 7th Environment Action Programme issued by the European Parliament's Committee on the Environment, Public Health and Food Safety, 2017.
Available here: http://www.europarl.europa.eu/doceo/document/A-8-2018-0059_EN.html.

[102] For a comprehensive list of legislation associated with water protection and management please refer to the article by the European Parliament published in 2018.
Available here: https://www.europarl.europa.eu/factsheets/en/sheet/74/water-protection-and-management.

[103] European Parliament. *Briefing. Revision of the Drinking Water Directive*, 2019.
Available here: http://www.europarl.europa.eu/RegData/etudes/BRIE/2018/625179/EPRS_BRI(2018)625179_EN.pdf.

The EU policy framework for waste management

The underpinning objective of the EU waste policies focuses on **waste prevention and management**, *i.e.* encouraging waste prevention, setting requirements for reuse and recycling, minimising disposal within compliant landfills, and eliminating the use of non-compliant landfills.

The overarching legislation governing waste management in the EU is the **Waste Framework Directive** complemented by a number of more targeted directives.

To promote a **systemic approach to waste prevention across product's value chains**, the EU has adopted the **Action Plan for the Circular Economy**. The 54 specific actions defined in the Plan address the entire cycle of products resulting into waste; starting from the production and consumption to waste management, and development of a market for secondary raw materials. It has been estimated that, only in 2016, activities related to circular economy (*e.g.* repair, reuse and recycling activities) represented around EUR 17.5bn of investment[104].

State of play of the waste policy implementation at the EU level – Key points and challenges

The environmental implementation review conducted in 2017 identified **waste management as one of the policy fields posing major implementation gaps** and **challenges**. The prevention of waste and waste hierarchy proved to be among the main challenges also in MS with the highest recycling rates[105].

At EU level, **47% of all municipal waste in the EU was recycled or composted[106]**. However, at the same time, according to the review of the MS' waste policies and recycling performance of 2018[107], half of MS have been assessed as at risk of missing the 2020 target of 50% (*i.e.* the target share of reusing and recycling municipal waste)[108].

6.1.2 Overview of the EU-wide Environment policy instruments

The following table synthetizes the existing EU-wide policy instruments related to the Environment sector.

[104] European Commission, *Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the implementation of the Circular Economy Action Plan.* March, 2019. Available here: https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1551871195772&uri=CELEX:52019DC0190.

[105] European Parliament. *Briefing. Environmental*.

[106] European Parliament. *Waste management in the EU: infographic with facts and figures.* Accessed on April 10, 2019. Available here: http://www.europarl.europa.eu/news/en/headlines/society/20180328STO00751/eu-waste-management-infographic-with-facts-and-figures.

[107] Conducted for the purposes of early warning assessment envisaged by the revised Directive on waste management. For more information please refer to: https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1537873850842&uri=COM:2018:656:FIN#document2.

[108] Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the implementation of EU waste legislation, including the early warning report for Member States at risk of missing the 2020 preparation for re-use / recycling target on municipal waste, 2018. Available here: https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1537873850842&uri=COM:2018:656:FIN#document2.

Table 14: Examples of EU policy instruments supporting activities in the Environment sector in the 2014-2020 programming period

Policy instrument	Objectives	Type of financing	Amount available in bnEUR and mEUR
European Structural and Investment Funds (ESIF)	• ESI Funds support the protection and preservation of natural assets (*i.e.* water, nature and biodiversity, clean air and raw materials). • The largest share of ERDF and CF for environmental purposes has been allocated to waste water treatment infrastructure (*e.g.* construction / upgrading of waste water treatment networks) and waste management (*see Section 6.1.3 hereafter*).	Grants and financial instruments	• EUR 15bn are allocated for water management (in the 2014-2020 programming period) • EUR 5.5bn are for waste management (in the 2014-2020 programming period) • EUR 2.3bn are for SMEs to support sustainable production processes and resource efficiency (in the 2014-2020 programming period)[109]
LIFE[110]	• LIFE is the main financing mechanism supporting the implementation of the environmental and nature conservation projects across the EU. The key objective of the Programme is to support the implementation of the 7th EAP and facilitate the EU's transition towards a resource-efficient and climate resilient economy. • It notably finances the implementation of the Natural Capital Financing Facility (NCFF) managed by the EIB.	Grants	• EUR 1.6bn have been earmarked for the LIFE budget over the 2018-2020 period • Over EUR 1.2bn are dedicated to environmental projects (*e.g.* within the Environment and Resource Efficiency or Nature and Biodiversity priority area), and the remaining EUR 0.4bn are earmarked to finance the Climate Action priority area
Natural Capital Financing Facility (NCFF)[111]	• Financial instrument piloted under the LIFE's Environment and Climate Action priority areas. Its objective is to test the potential of innovative financing approaches for projects promoting the preservation of natural capital. • NCFF is implemented by the EIB, and until 2020, it aims to support 9 to 12 environmental projects with revenue generating/cost-saving potential. NCFF also finances Technical Assistance support services to ensure that the projects reach sufficient maturity for financing.	Financial instrument (direct and indirect financing through debt, equity and guarantee instruments)	• The EC provided EUR 50m for the risk-sharing mechanism, and EUR 10m for the Technical Assistance facility. Leveraging on this basis, the EIB is meant to invest further EUR 125m *via* loans, equity financing, and guarantees for loans instruments

Source: EC, Various sources, Compiled by PwC, 2019.

[109] European Commission Website. *Cohesion policy support for the circular economy*. Accessed on: 15 April, 2019. Available here: https://ec.europa.eu/regional_policy/en/policy/themes/environment/circular_economy/.

[110] Commission Implementing Decision (EU) 2018/210 of 12 February 2018 on the adoption of the LIFE multiannual work programme for 2018-2020, 2018. Available here: https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1518531793134&uri=CELEX:32018D0210.

[111] Commission Implementing Decision (EU) 2018/210 of 12 February 2018 on the adoption of the LIFE multiannual work programme for 2018-2020, 2018. Available here: https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1518531793134&uri=CELEX:32018D0210.

6.1.3 Planned ERDF / CF investments in Environment during the 2014-2020 programming period

The Regional Policy of the EU has a strong impact on some of the most strategic sectors for the European economy, including Environment. Out of the total EUR 351.8bn set aside from the EU budget for the 2014-2020 programming period for the Cohesion Policy[112], approximately **EUR 36.4bn has been dedicated to accelerate investments in the Environment sector**. The allocation by subsectors are presented in the table below:

By taking a closer look at the sub-categories within the scope of this sectoral analysis, the distribution of ESIF investments planned across these categories of intervention is presented in the table below. The allocation of planned ESIF investments indicates that MS have prioritised investments in water and waste water management, (intervention codes 20 to 22) which account for over 41% of planned ESIF investments, which is followed by the waste management (intervention codes 17 to 19 representing over 16%). Air quality, on the other hand, accounts only for around 4% of planned ESIF investments across the EU.

Table 15: Planned ERDF / CF investments in the Environment sector during the 2014-2020 programming period by category of intervention code

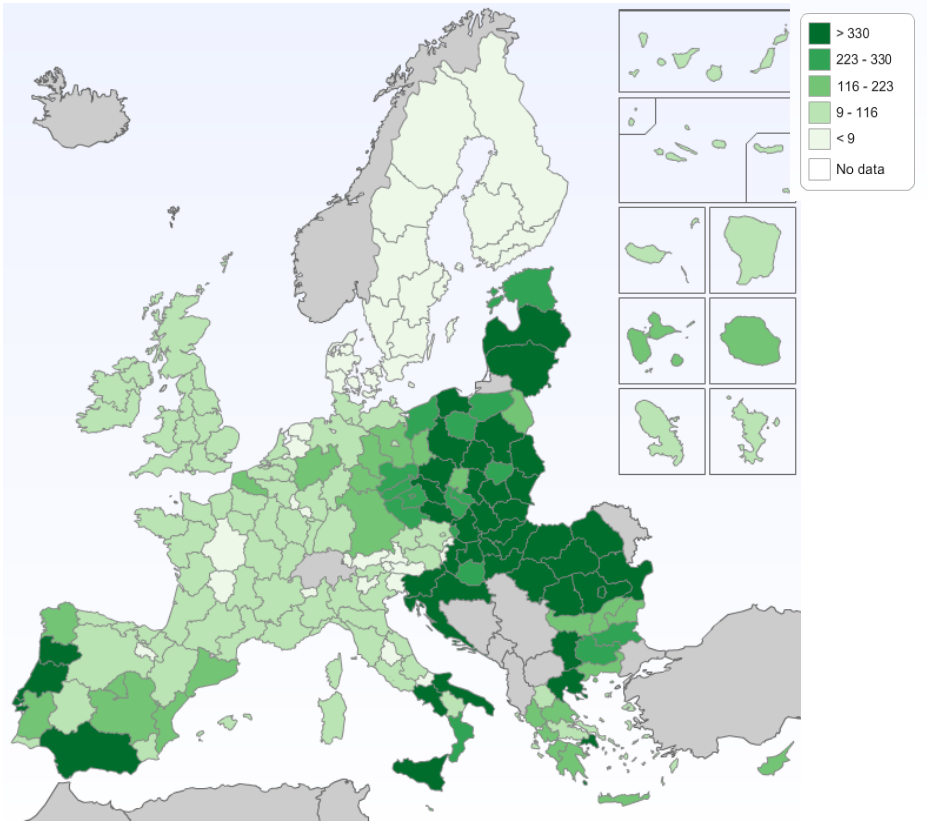
Category of intervention	Planned ESIF investments (mEUR)	Share of planned ESIF investments
017 – Household waste management (including minimisation, sorting, recycling measures)	2 123	*6%*
018 – Household waste management	2 775	*8%*
019 – Commercial, industrial or hazardous waste management	619	*2%*
020 – Provision of water for human consumption (extraction, treatment, storage and distribution infrastructure)	1 761	*5%*
021 – Water management and drinking water conservation	2 967	*8%*
022 – Waste water treatment	10 046	*28%*
023 – Environmental measures aimed at reducing and/or avoiding greenhouse gas emissions	450	*1%*
083 – Air quality measures	1 615	*4%*
084 – Integrated pollution prevention and control (IPPC)	152	*≈0%*
085 – Protection and enhancement of biodiversity, nature protection and green infrastructure	2 661	*7%*
086 – Protection, restoration and sustainable use of Natura 2000 sites	976	*3%*
087 – Adaptation to climate change measures	6 355	*17%*
088 – Risk prevention and management of non-climate related natural risks	1 052	*3%*

[112] European Commission. *Regional policy: The EU's main investment policy*. Available here: https://ec.europa.eu/regional_policy/index.cfm/en/policy/what/investment-policy/.

Category of intervention	Planned ESIF investments (mEUR)	Share of planned ESIF investments
089 – Rehabilitation of industrial sites and contaminated land	2 837	*8%*
Total:	**36 389**	***100%***

Source: EC, Smart Specialisation Platform, Categories of intervention: 056 and 061 to 065. Data from the ESIF OPs, Retrieved on 20/01/2017 from the SFC2014/Infoview database, Compiled by PwC, 2019.

Figure 32: ERDF / CF planned amounts for the Environment sector in the EU (in mEUR)



Source: EC, Smart Specialisation Platform, Categories of intervention: 017 to 023 and 083 to 089. Data from the ESIF OPs, Retrieved on 20/01/2017 from the SFC2014/Infoview database, 2017.

6.2 The use of financial instruments in the sector

As mentioned in Chapter 2, 'sectoral analyses' were performed using the financial data provided by MS to the EC for monitoring / reporting purposes in relation to the implementation of their OPs. The present analysis consider the three pieces of information below altogether (namely Figure 33, Figure 34 and Table 16).

The following figures and table indicate that only four MS were using ERDF and CF funding for financial instruments in the Environment sector (*as of 31 December 2017*); namely: Bulgaria, Greece, Portugal, and Slovenia[113].

[113] Czechia is also using a financial instrument for the Environmental sector. Czechia has not reported on its financial instruments in the 'Financial Data by categories' for 2017, therefore the financial instrument is not included in this chapter.

At the EU level (so when considering these four MS altogether), EUR 168.2m have been devoted to financial instruments in the Environment sector, representing 0.7% of the 'total eligible cost' for the Environment sector. This is the lowest amount of ERDF and CF funding used in financial instruments among the five studied sectors, but not the lowest percentage of the total eligible cost *per* sector (the latter being in the 'RDI in SMEs' sector with 0.1%). The main form of finance chosen by the managing authorities is venture and equity capital (for 51.5% of the amounts); but all forms of finance are used in the sector (including for subsidy and technical support, in Portugal). This illustrates the flexibility allowed in the design and the implementation of financial instruments during the 2014-2020 programming. It also illustrates that managing authorities and Intermediate Bodies have analysed and decided to address different financing needs in this specific sector. Finally, the share of financial instruments in the EU-wide Environment sector among financial instruments in all sectors (including the five studied sectors but not only) represents 1.0%, indicating that, as for the RE sector, managing authorities and Intermediate Bodies do not seem to prioritise the Environment sector when developing their strategies for financial instruments[114].

In more detail, the individual approaches decided by the four MS in regards to their financial instruments in the sector appear different. For instance:

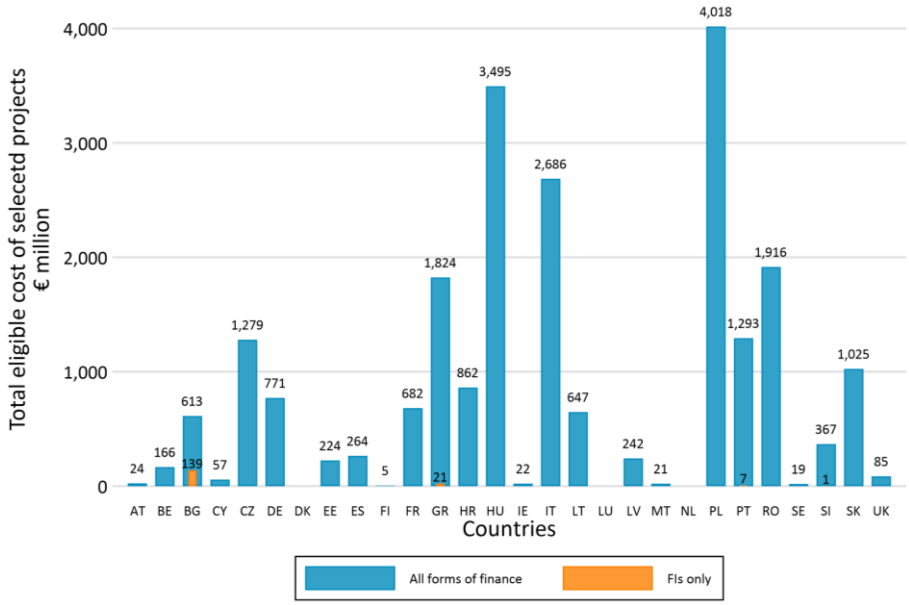
- Bulgaria, and Greece, which devoted the largest ESIF amounts to financial instruments in the sector (EUR 138.7m and EUR 21.3m) and decided to focus its supply on equity financing. In both countries the instrument address large infrastructure projects requiring equity, which may be difficult to raise in the market. Slovenia and Portugal provide debt financing as the financial instruments address smaller projects for example implemented by SMEs, which are not suitable for equity financing.
- Except in the case of Bulgaria, the amounts devoted to financial instruments in the sector appear quite limited.
- Also, in comparison with other sectors analysed in the present study (such as the RE sector), it is not necessarily the MS that have the highest ERDF / CF amounts devoted to a sector that develop financial instruments in the Environment sector. In that context, Poland, Hungary, Italy, and Romania – **the countries with the highest amounts reported as eligibly costs in the sector – have not developed financial instruments in the sector**; probably because they did not consider this financing option as a possibility for the sector, and/or favoured a 'grant-only' approach.
- Following this and finally, the share of financial instruments in the Environment sector among financial instruments in all sectors (including the five studied sectors but not only) represent between 0.4% (Slovenia) and 26.4% (Bulgaria); with 0.8% in Portugal, and 2.2% in Greece. As mentioned in Chapter 2, Greece, Portugal, and Slovenia have developed financial instruments in three (of the five) sectors; while Bulgaria has developed financial instruments in two (of the five) sectors studied. This results in a very high share for the Bulgarian financial instruments in the Environment sector among all ERDF / CF-supported financial instruments in the country[115]. Also, and as for the RE and the UDT sectors analysed in Chapters 4 and 5 for instance, **the development of financial instruments in the Environment sector seems a decision from MS that have past experience with ERDF / CF financial instruments and wish to develop such form of finance in 'new' sectors** (such as Environment).
- This observation also indicates that **other MS** that have experience with ERDF / CF financial instruments have not developed financial instruments in the Environment sector, because they **rely on a high share of**

[114] For comparison purposes, and as detailed in the other 'sectoral analyses / chapters', this share is: 1.6% for the RE sector, 2.2% for the UDT sector, 1.7% for the 'ICT infrastructure' sector, and 12.2% for the 'RDI in SMEs' sector. As already mentioned, this share for the five sectors altogether is of 18.6%.

[115] This observation is valid for the two sectors where Bulgaria has developed financial instruments; the second sector being the 'RDI in SMEs' sector (which represents 9.7% of the amounts devoted to all ERDF / CF-supported financial instruments). Following this, the two sectors taken together represent 36.1% of the Bulgarian ERDF / CF-supported financial instruments (in terms of amounts reported as eligible costs).

ESIF grants in combination with traditional municipal or corporate financing for environmental projects**.** The opportunities of **combining financial instruments with investment grants or capital rebates** in the 2021-2027 programming period offer an opportunity to convince MS to consider ESIF financial instruments in the environmental sector.

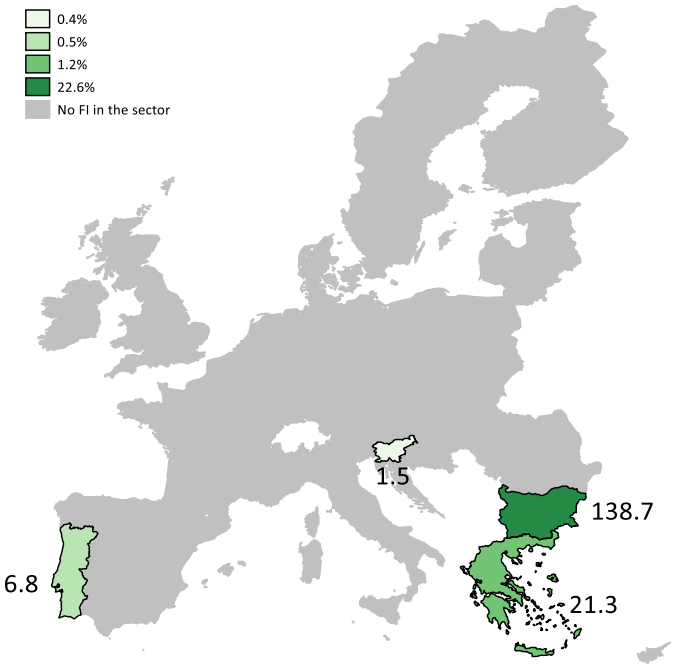
Figure 33: Proportion of ERDF and CF funding devoted to financial instruments in comparison with ERDF and CF funding devoted to all forms of finance (grants and financial instruments altogether) in the Environment sector[116]



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

[116] This figure indicates the 'total eligible cost of selected projects' for 'all forms of finance' (*i.e.* grants and financial instruments altogether; in the thicker blue column) and for 'financial instruments only' (in the inner orange column). For each Member State, data labels provide the nominal amounts in millions euros for the amounts devoted to financial instruments and the total amounts devoted to all forms of finance.

Figure 34: EU-wide map of the uptake of ERDF and CF financial instruments in the Environment sector[117]



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Table 16: Overview of ERDF and CF financial instruments in the Environment sector by Member State

Member State	Environment			
	Amount devoted to FIs (mEUR)	Share of FIs among all forms of finance (FIs and grants, %)	Type of financial products	Share of FIs in the sector among FIs in all sectors (not only the five sector, %)
Bulgaria	138.7	*22.6%*	*100% venture and equity capital*	*26.4%*
Greece	21.3	*1.2%*	*100% venture and equity capital*	*2.2%*
Portugal	6.8	*0.5%*	*77.2% loans* *11.4% guarantee* *11.4% subsidy or technical support*	*0.8%*
Slovenia	1.5	*0.4%*	*100% loans*	*0.4%*
EU Total	**168.2**	***0.7%***	***51.5% venture and equity capital*** ***32.7% loans*** ***13.1% guarantee*** ***2.7% subsidy or technical support***	***1.0%***

Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

[117] This map indicates (*in green*) the Member States that have implemented financial instruments in the Environment sector by 31 December 2017. Where a Member State – or at least one of its managing authorities – has set up a financial instruments operation in this sector, the amount devoted to this / these financial instruments operation(s) is indicated in millions euros. The 'intensity' of green indicates the share of financial instruments among all forms of finance in this specific sector.

As mentioned in the introduction and in Annex 1, since the cut-off date of the data analysed in the present stock-staking study is 31 December 2017, (other / new) financial instruments may have been developed since (and are not present in the data analysed in the study). This is notably the case of the selected case study for the Environment sector that details hereafter a financial instrument implemented in Czechia (while Czechia is not presented in the figures and table above)[118]. Hence, as mentioned in Section 1.2.2, **the Environment sector is illustrated by a case study on the financial instrument developed in Czechia**. It is presented in detail in the sub-section below.

6.2.1 The Environmental risk loan instrument in Czechia

The Czech Ministry of the Environment has set up a EUR 18.5m loan instrument managed by the State Environmental Fund (SEF) to address, reduce and manage environmental risks. The instrument is, probably, the only financial instrument in the current programming period addressing TO 6 – Environment and resource efficiency in the enterprise sector.

Description of the financial instrument

Rationale and objectives

In the 2015 *ex-ante* assessment for the OP Environment[119], all five Priority Axes were screened for their suitability for financial instruments. The result was that the highest potential was identified in energy efficiency in the public sector, (outside of the scope of this case study), and for waste recycling, waste prevention in industry, as well as environmental risk prevention and management. Limited potential was identified in the areas of water management and air quality, which mainly referred to boiler replacement in housing. For nature protection and biodiversity, it was concluded that financial instruments were not suitable.

Investment in waste management, such as recycling or waste to energy, waste prevention in industry, and environmental risk management were analysed together. The total demand was estimated to range from EUR 300m [120] to EUR 420m with a resulting financing gap of EUR 100m to EUR 140m for the 2014-2020 programming period. This exceeded the available allocation of OP resources of EUR 65.2m. About 2/3 of the financing gap related to investments into waste prevention and the remaining part (representing between EUR 44m and EUR 62m) related to financing needs for environmental risk management. The proposed allocations in the OP for waste prevention are EUR 47.2m and for environmental risk management EUR 18m. The main factors for market failures were identified as the following:

- Limited bankability of projects: long payback periods and low rate of return of the investments, high risk of investment, difficulties to quantify the financial benefit of the projects;
- Limited bankability of borrowers through lack of sufficient collateral and low credit scores; as well as
- Regulatory barriers: uncertainty about future fees for the disposal of industrial waste and hazardous substances.

It also became clear that the two different sectors show different characteristics regarding the barriers to investment. In 'waste prevention and management', the main barriers are the high risk of the projects and of the borrowers, whereas in 'environmental risk management and prevention', the main problems relate to the very low rate of return of the investments. In this context, the managing authority decided to set up two separate financial instruments. The waste prevention and management was launched in August 2019 and the

[118] As it is also the case study for the 'RDI in SMEs' sector, illustrated by a case study in Lithuania.

[119] Ministry of the Environment, *Ex-ante* assessment of the possibility for use of financial instruments in the OPE, 2015, p. 52.

[120] All amounts in the *ex-ante* assessment were calculated in Czech Crowns (CZK). For this case study a simplified exchange rate of EUR 1 = CZK 25 was used.

environmental risk management and prevention instrument is operational for two years. This case study focuses on the latter instrument.

Scope

The financial instrument covers the following investments:

- Refurbishment of cooling systems, including ice-hockey rinks;
- Reconstruction of facilities producing hazardous chemical substances;
- Reconstruction and purchase of technologies for monitoring of industrial pollution; and
- Construction and reconstruction of installations for the storage of hazardous chemical substances.

The final recipients are enterprises, independent of their size as well as public entities, such as municipalities or municipal enterprises. Projects located in the City of Prague are not eligible for the instrument as the capital city is covered by a separate Operational Programme.

Financial allocation and governance

The instrument became operational in October 2017. It has a financial allocation of EUR 18.5m for the loan component from OP resources and about EUR 6m for the grant component from the SEF's own resources. SEF was chosen as financial intermediary as it is the main body managing grants for environmental investments from ESIF and national resources. The potential final recipients are familiar in working with the fund and the fund has experience with the provision of soft-loans and their combination with grants from national sources. Commercial banks or the National Promotional Bank ČMZRB (the Czech-Moravian Guarantee and Development Bank) were not considered to be the appropriate providers due the loan-grant combination, a complexity that it was considered SEF could manage better.

The process of requesting support from the loan instrument is the same as for a grant scheme. A comprehensive project description with accompanying documentation has to be submitted for the annual call with strict deadlines.

Financial products

The instrument provides soft loans for eligible projects. The minimum level of the loan is 35% and it can reach up to 100% of the eligible expenditure. The loan is provided without appraisal fees, with an interest free grace period of up to 14 months for the period of project implementation. The repayment period of the loan is up to 10 years, for which a 0.45% *per annum* interest rate is charged. The grace period can be extended up to 2 years and the repayment period will then be shortened accordingly. The loan can be combined with a grant from SEF's resources for up to 25% of the investment. The combined amount of support cannot exceed 100% of the investment cost and the Gross Grant Equivalent (GGE) of the combined support cannot exceed the maximum amounts as defined under State aid regimes (*see below*). The loan offers flexible conditions, such as postponing instalments or earlier repayment without penalty.

The *ex-ante* assessment proposed a soft-loan combined with a capital rebate of the loan that is provided conditional to the environmental impact of the investment. This proposal was not followed up as it is not possible under the current regulations.

The final recipients submit their applications for the loan and the ancillary grant *via* a SEF electronic form. There is also a calculator on the website to calculate the amount of total public support. The procedure of submitting an application is similar to grants from the OP Environment.

Both the loan and the grant element are paid out continuously according to the implementation of the investment.

Leverage

The financial instrument is designed in a way that it provides the maximum amount of support to the final recipients. The loans to final recipients consist only of ERDF contribution without national public or private co-financing. The instrument is consequently 100% composed of ERDF funding and therefore the leverage, following the definition of the Financial Regulation, is one[121]. The financial instrument additionally mobilises a national grant part of up to 25% of the investment cost and, depending on the project, own financing of the final recipient.

One objective of the instrument is to generate revolving resources that are available for investments into environmental risk prevention and management for the period after the current programming period.

State aid

An objective for the managing authority was to avoid notification of the State aid scheme to the EC and to use either the General Block Exemptions Regulation (GBER)[122] or the *de minimis* regime. For the environmental sector, there are several possibilities to provide aid depending on the type of investment, the location of the project, or the size of final recipient. Generally, a project can benefit from aid under the *de minimis* rules which limit the total amount of GGE within 3 years to EUR 200 000. Considering the size of the projects and that the final recipients may also receive State aid for other investments, this approach may be very limited. The table below gives an overview of the applicable maximum GGE for projects chosen for the financial instrument in Czechia.

Table 17: Maximum aid intensity according for projects supported by the environmental risk instrument

Article under GBER	Municipalities	Small enterprises	Medium enterprises	Large enterprises
Independent of the aid regime	**85%**			
Regional investment aid – Article 14		**45%**	**35%**	**25%**
Investment aid for investments going beyond EU standards – Article 36		**75%**	**65%**	**55%**
Investment aid for early adaptation to future Union standards – Article 37 * the higher rate applies, if implementation takes place at least 3 years before new standards come into force		**30-35%***	**25%-30%***	**20-25%***
Aid for sport and multifunctional recreational infrastructures – Article 55		**35%**	**35%**	**35%**

Source: Call description as of April 2018, 2019.
Available here: https://www.sfzp.cz/files/documents/storage/2018/04/24/1524549646_Výzva_01_2017_IFN_aktualizace_1.pdf.

Depending on the applicable article under GBER, the amount of grant may be reduced for investments by larger enterprises under the rules of Articles 14 and 37.

[121] Considering that management cost and fees need to be deducted from the amounts invested, the leverage may be even below one.

[122] Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty.

Lessons learned

Results

As of July 2019, eight projects have been approved under the scheme. The total amount of investment of the projects financed is of EUR 7.8m, with EUR 5.7m provided through loans and EUR 2.1m by grants. 30% of the total amount allocated to the financial instrument has already been committed to projects, but not yet fully paid out. Projects received loans ranging from 35% to 75% of the eligible expenditure and 25% of grant. Six of these projects are ice hockey rinks that need to refurbish their cooling systems in order to replace environmentally harmful coolants. The beneficiaries are mainly municipalities or municipal enterprises. Two industrial projects have applied successfully. One food processing company, investing into a new water treatment system, is the largest project financed by the instrument with a total cost of EUR 2.4m, while a chemical factory, rebuilding its storage facilities for inflammable substances, is the smallest project supported with a total cost of EUR 190k.

Barriers and challenges

There was a significant delay in the implementation of the financial instrument. The *ex-ante* assessment assumed that the instrument would become operational in January 2016. The decision on the design and scope of the financial instrument took longer than expected. A further difficulty came from the combination of grants and financial instrument. In the original considerations, it was planned to combine a loan and a grant, both from ERDF resources. This approach was abandoned as the combination in two operations was considered as too complex, but an investment grant element was considered essential for the success of the financial instrument.

The financial instrument has now been operational for two years and first conclusions can be drawn. The uptake of the instrument is slower than expected as it did not exactly meet market needs. A lesson learned is that a market testing exercise directly before launching the instrument would have been useful and there should be Technical Assistance available for this. Nevertheless, it can be expected that the total amount of OP allocated to the instrument will be invested by the end of 2023. A second observation is that all projects have been eligible for the maximum amount of grant support. Following that, if future projects also receive 25% of support, the allocation from SEF may not be sufficient to cover all projects receiving the loan, especially if reflows are going to be reinvested.

A more general challenge encountered when implementing this financial instrument in the environmental sector is the lack of political support. The initiative of setting up the financial instrument came from the staff of the responsible line ministries, *i.e.* the Ministry of the Environment or the Ministry of Regional Development. At this time, the merits of financial instruments were less endorsed at the political level, which was still relying more on traditional grant support to achieve policy objectives. From the ex-ante assessment it is very clear that enterprises and municipalities prefer grants over financial instruments.

Overcoming, the grant dependency is important not only at a political level but also on the level of final recipients. Especially in the Environment sector, State aid in form of grants has been the norm over the last decades and enterprises may tend to postpone investments and wait for grants to be available in the next programming period.

Key enabling factors

The possibility to access preferential financing with additional investment grants is key for the success of investments with a low rate of return but high environmental externalities such as investments in environmental risk management. This is also important in the transition from generous grant schemes to financial instruments. The financial product is considered very beneficial for final recipients as it provides low interest rate, and flexible conditions, such as postponing instalments or earlier repayment without penalty. Furthermore, grants for this type of investments are only available if they are taken together with loans. The one-stop shop approach of applying for the loan and grant in one application, to one institution is reducing the administrative burden for

final recipients and provides certainty about bank and grant financing at the same time. The loan and grant were made available through an open call until end of 2019 and it was expected to be extended beyond this date. The process of open calls is aligned with the process of investment decisions in enterprises.

The appraisal of technically very specific projects and the management of a complex State aid regime is difficult for financial intermediaries. Therefore, the implementation through SEF is important for the success of the instrument. SEF's experience with financial instruments from own funds are essential for the implementation of financial instruments in sectors where they have never been used so far. Nevertheless, despite the fact that the managing authority and the fund are familiar with revolving funds and with ESIF grant rules, they have expressed that there is need for additional capacity building on the specificities of ESIF-supported financial instruments.

The preparation of investment projects in the environmental sector is quite onerous. It was mentioned that Technical Assistance to better prepare projects for final recipients would be beneficial. This would result in more and better prepared projects applying.

Regarding State aid, several GBER articles are applicable for investments in the environmental sector. This brings complexity to the financial intermediary, and uncertainty about the possible amount of support for the final recipient. SEF as financial intermediary is familiar with State aid from its experience in providing ESIF and national aid to final recipients. The availability of a web application to calculate the amount of aid of the combined instrument, and the applicable State aid regime gives the final recipient certainty about the amount of aid the project can receive and not bring unexpected surprises about the amount of aid at a later stage of project implementation.

The financial instrument does not compete with grants for the same investments, neither from ESIF nor national resources. All allocations of this priority axis have been allocated to the combined instrument. This reduces the possibility of 'grant shopping' among final recipients and that investment decisions are postponed in order to wait for grants to become available.

The managing authority has recently launched a second financial instrument for the environmental sector. The instrument is addressing investments in waste prevention in industry and waste management in enterprises. The ex-ante assessment has shown that the financing needs of this sector are different to the environmental risk management. The rate of return is comparable with other investments in SMEs, thus no investment grant is needed. The managing authority decided not to establish a separate financial instrument for this sector, but to integrate the scheme into the existing loan and guarantee instrument for SMEs, *'Expanze*', under the responsibility of the Ministry of Industry and Trade, and implemented by ČMZRB. For the managing authority the advantage is a faster implementation of the instrument as it is using existing and functioning processes. For final recipients the advantage is that they can access the instrument through the financial intermediaries they are already working with. Often investments into environment aspects are undertaken with other investments such as measures to increase of production capacity or changes in production process. Having environmental aspects integrated in a general SME instrument allows to access financing for different objectives in one process, despite the fact that allocations come from different OPs and different managing authorities.

6.3 Market opportunities

To provide an overview of the different environment sub-sectors having potential for wider use of financial instruments, this section focuses on the market opportunities in the waste, water and air quality sub-sectors. These sub-sectors have been identified as potential areas for the deployment of financial instruments, as further explained in the section on the 'Potential for financial instruments in the sector' (*Section 6.5*).

6.3.1 Investment needs of the EU's environmental policy

Despite the strategic importance of investments in environmental infrastructure for public health and human well-being, the data on the environmental investment needs across the EU is limited and scattered. A study by the EIB estimated that **the existing annual investment gap only for the water and waste sub-sectors amounts to EUR 63bn at the EU-level**. This estimate can be further broken down into water security, water infrastructure, and waste management sub-sectors, as summarised in the table below. It indicates the required and current annual investment, as well as the corresponding investment gap for each sub-sector.

Table 18: Annual investment gap in the water and waste sectors in the EU

Investment needs / objectives	Annual investment (bnEUR)		
	Required	Current	Gap
Water security, including flood risk management	15	2	13
Compliance and rehabilitation of Europe's water infrastructure	75	30	45
Enhancing waste management / materials recovery	8	3	5
Total	**98**	**35**	**63**

Source: EIB, Restoring EU Competitiveness, 2016.

Costs of not implementing the environmental targets

The costs of not implementing the EU environmental law are high – a recent study by the EC has quantified the potential costs and **foregone benefits at the EU-level may amount to EUR 55bn annually** (as from 2018)[123]. As it is difficult to assess losses in quality of life, environmental degradation, and remediation of pollution in monetary terms, the range estimated is wide, with a central estimate providing an insight into a possible scenario. The table below includes a summary of the implementation gap costs only for the air quality, water, and waste sub-sectors.

Table 19: Annual costs of not implementing the EU environmental policies in the air quality, water and waste sub-sectors

Policy area	Range estimate (bnEUR)	Central estimate (bnEUR)
Air quality	8.7 – 40.4bn	24.4bn
Water	4.3 – 14.3bn	9.3bn
Waste	3.2 – 4.8bn	4.0bn
Total	16.2 – 59.5bn	**37.7bn**

Source: EC, The costs of not implementing EU environmental law, 2019.

The foregone benefits resulting from the lack of compliance with air policies are related to public health costs and are based on the population exposed to exceeding limit values of air pollutants. In the case of water, the implementation gap costs are related to the foregone benefits of water not being of good quality from the public

[123] This is the aggregate cost of not implementing environmental law in the central estimate. It comprises the following policy areas: air, nature and biodiversity, water, waste, chemicals, industrial emissions, and major accident hazards.

health perspective, as well as the resulting economic losses caused by damages in water resources (*e.g.* nitrogen discharges). For waste, the costs of not implementing the environmental policies are related to the public health costs of illegal landfills and foregone benefits stemming from circular economy and non-recycled waste being landfilled rather than converted to energy.

The following sub-sections provide a brief overview of the market opportunities for investments in the water, waste and air quality sub-sectors. For each of the sub-sectors, statistics from Eurostat and the European Environmental Agency (EEA) are used as a proxy to indicate the performance of the EU with respect to key waste, water, and air quality targets, as presented in the policy context. Where available, this information is further complemented by data on expenditures in the given sub-sector.

6.3.2 Air quality measures

Based on the EU's Air Quality Directive, MS have to implement and report on the measures implemented in areas, where air quality target values are exceeded. According to the European Air Quality Index[124], compared to 2000, the **main pollutants in the EU have been on a decreasing trend**, with **reductions ranging from 76% for SO_2 to only 9% for NH_3** (the main pollutant substances are measured on a regular basis in the EU). Since 2006, a slight decreasing trend can be observed, confirming that **reductions in air pollution continue**. However, despite the progress, today, **European citizens are still exposed to hazardous pollutants on a daily basis**, while **MS find it challenging to comply with the air quality standards**.

The two main substances that are often exceeding the allowed levels are particulate matter (PM_{10} and $PM_{2.5}$) and nitrogen dioxide (NO_2). Ozone is also a major pollutant, especially in the South of Europe. It is a secondary pollutant that is created in the presence of primary pollutants under specific atmospheric conditions[125]. As such, measures that aim to improve the air quality in the EU should mainly focus on these three / four key pollutants and their subsequent sources, especially in the Eastern regions of the EU.

In terms of sources of air pollution, **particulate matters and NO_2 are largely emitted by the fuel combustion in residential and commercial buildings**, and by road transport, respectively[126]. In addition, NH_3 (ammonia) is mostly released by the agricultural sector, more specifically by the usage of fertilisers. Finally, NMVOC (Non-Methane Volatile Organic Compounds) mostly originates from industrial products, particularly from using solvent substances (*i.e.* paints), and contributes to the formation of O_3 pollution.

The measures to decrease some of the main pollutants have been introduced mostly in the transport sector; while commercial, institutional and households sub-sectors, despite their high share of pollution, have been addressed by policies to a lesser extent[127]. Moreover, it has to be taken into account that emissions in road transport have significantly decreased for all main pollutants (with an average of 60% decrease), while in commercial, institutional and residential, this decrease has only averaged around 20% compared to the levels in 2000.

In addition to this, **the air quality sub-sector can benefit from investments in measures supporting the switch to the more sustainable heating fuels in the residential buildings**, combined with Energy Efficiency measures to reduce the overall heat consumption. The figure below presents the investments made in this sub-sector. In line

[124] Please see: http://airindex.eea.europa.eu/#.

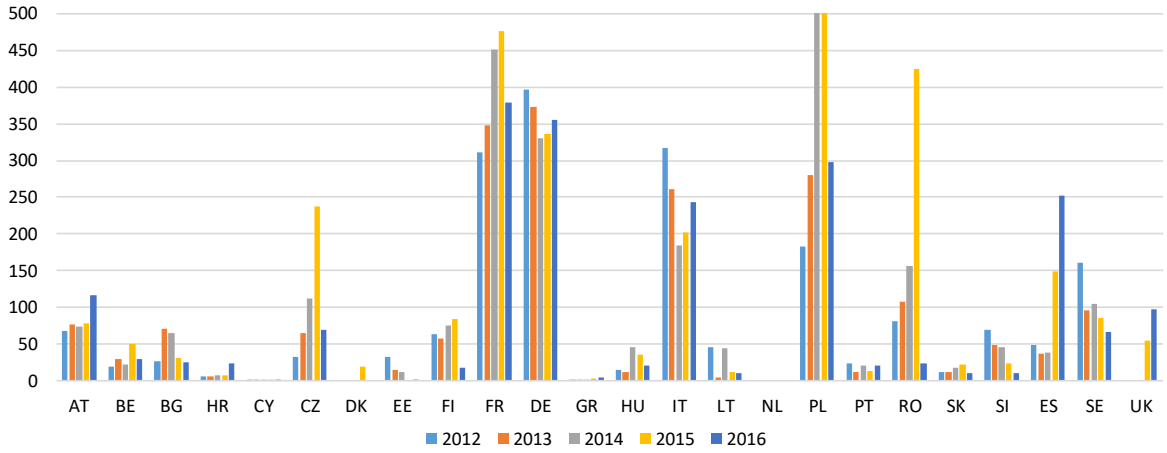
[125] O_3 is a secondary pollutant (created in the atmosphere), which results from the chemical interactions of other pollutants such as nitrogen oxide or NMVOC (Non-Methane Volatile Organic Compounds) in the presence of sunlight and high air temperature. This is why the Southern region of Europe is most affected by this type of pollution. For more information, please refer to the European Environment Agency report '*Air quality in Europe – 2018*'.
Available here: https://www.eea.europa.eu/publications/air-quality-in-europe-2018/download.

[126] Please see: https://www.eea.europa.eu/publications/improving-europe-s-air-quality.

[127] European Environment Agency, Air quality in Europe, 2018.

with the observations on the planned ESIF spending above, it can be seen that Poland and Romania have prioritised investments in air quality solutions.

Figure 35: Expenditure in air quality measures across the EU (in mEUR)[128]



Source: Eurostat, 2019.

The current investment levels and the existing policy goals indicate a potential investment gap that has to be addressed by a public sector intervention. It has been estimated that **EUR 79.2bn *per* year until 2030 will be required to meet the existing air quality policy targets**, based on the PRIMES 2016 scenario[129]. Reducing air pollution will require 54% from investments in road transport, 13% from investments in industry and power sectors, 12% from non-road machinery, only 5% from domestic investments, and 3% from investments in agriculture[130].

6.3.3 Water and waste water management

The water sub-sector in Europe is regulated by the Water Framework Directive and a number of specific Directives. This section focuses on the following aspects of the water sub-sector: (i) waste water management, and (ii) quality of water and its management, including ensuring access to clean drinking water.

Waste water management

The Urban Waste Water Directive requires the MS to ensure that agglomerations (including villages, towns and cities) collect and treat urban water waste. The **treatment of urban waste water across Europe has improved** over the recent decades since the implementation of the Directive in 1991. As of 2014, approximately 95% of waste water in the EU was collected and further 89% was treated[131]. The connection of the population to waste water treatment facilities across the EU varies on average from 70% in Southern Europe to 97% in Central Europe[132].

[128] Data for Ireland, Latvia, Luxembourg, and Malta is missing.

[129] Please see: https://ec.europa.eu/energy/sites/ener/files/documents/20160713%20draft_publication_REF2016_v13.pdf.

[130] Please see: http://ec.europa.eu/environment/air/pdf/clean_air_outlook_economic_impact_report.pdf.

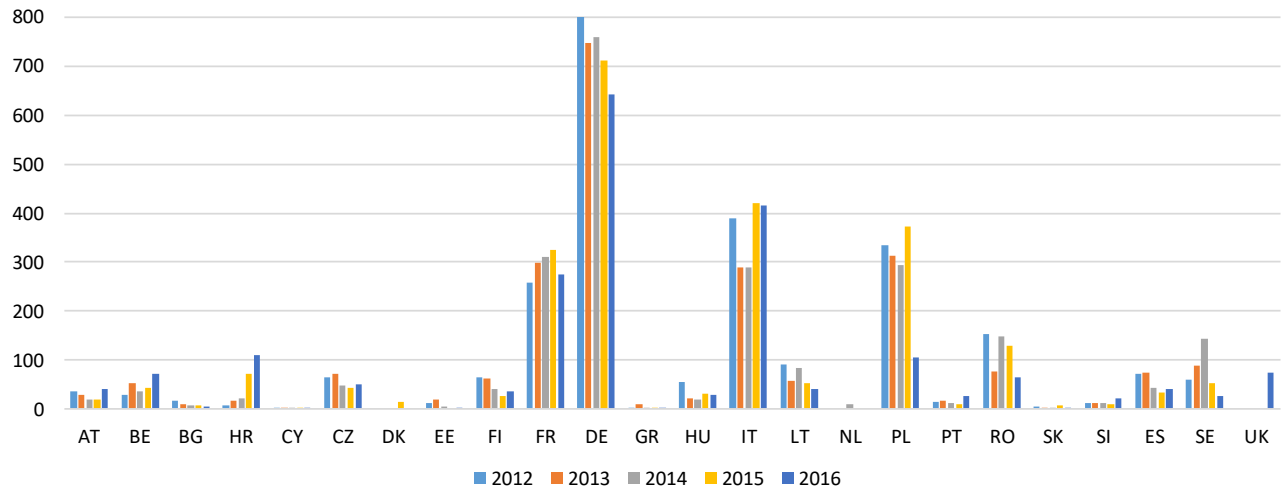
[131] European Commission, *Press release: New Report on EU Waste Water Treatment shows significant improvement in EU-13 Member States*, 2017. Available here: http://ec.europa.eu/environment/pdf/15_12_2017_news_en.pdf.

[132] European Environment Agency, *Urban Waste Water Treatment*. Available here: https://www.eea.europa.eu/data-and-maps/indicators/urban-waste-water-treatment/urban-waste-water-treatment-assessment-4.

Despite high connection rates, there is still **an opportunity to narrow the existing gap, which requires additional infrastructural investments**. The European Water Association has pointed to the **ageing water infrastructure in Europe** as one of the key challenges for the sector[133]. The upgrade of existing water infrastructure has the potential to narrow the urban waste water treatment connection gap in the Southern and Eastern parts of Europe, however requires mobilisation of investment.

Based on the assessment of the Urban Waste Water Treatment Directive implementation gap that measured the compliance with Article 3, 4 and 5, (*i.e.* connection to a collection system for primary and secondary treatment), **only three Member States** (Austria, Germany, and the Netherlands) **have been assessed as fully compliant**. At the EU level, the implementation gap for the connection to a collection system is 5%, for the primary treatment (for removing solid pollutants) it increases to 10%, while for the secondary treatment (removing organic matter) the remaining gap reaches 16%. MS with largest compliance gap across these three indicators are **Bulgaria, Romania, Malta, Ireland and Slovenia**. Expenditure in waste water management, does not fully correspond to the compliance gap. The numbers below show the total investment, which includes also refurbishment and upgrade of existing infrastructure, which is the highest in MS with larger and sparse population. It can be seen that the spending levels in both Bulgaria and Slovenia are among the lowest with no change over the 2012-2016 period (providing some insights to the situation in these two MS in the table above). Therefore, in these two MS (which have developed ERDF / CF financial instruments for the Environment sector during the 2014-2020 programming period, as illustrated in Section 6.2), additional investment in the waste water management sector has high potential to significantly improve their waste water management system and effectively contribute to the improved well-being and public health of their populations.

Figure 36: Expenditure[134] in waste water management (in mEUR)



Source: Eurostat, 2019.

[133] European Water Association, *EWA Water Manifesto*, 2014. Available here: http://www.ewa-online.eu/tl_files/_media/content/documents_pdf/Publications/Water-Manifesto/EWA_WATER_MANIFESTO_2014_FINAL.pdf.

[134] As mentioned earlier, expenditure for environmental protection consists of outlays and other transactions related to: (i) inputs for environmental protection activities, (ii) capital formation and the buying of land (investment) for environmental protection activities, (iii) users' outlays for buying environmental protection products, and (iv) transfers for environmental protection.
For more information, please refer to:
https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Classification_of_environmental_protection_activities_(CEPA).

Water quality and management

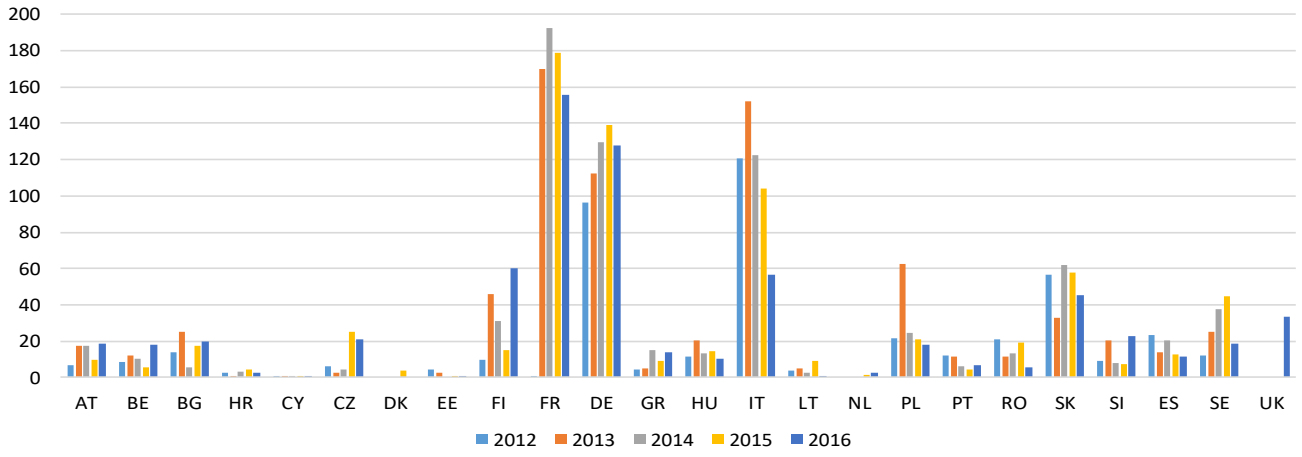
The supply of drinking water in Europe covers almost the entire population. The exceptions are Romania (only 63.7% of the population is covered), Lithuania (80.2%), and Slovakia (88.0%), where additional investment in drinking water supply is needed to cover this gap, and ensure basic drinking water supply for all EU citizens[135].

Another area requiring further investments in infrastructure is the upgrading of **water distribution networks**. The need to update existing water infrastructure networks arises in the context of **significant water distribution losses**. The following figure illustrates the distribution losses in water supply networks across the EU. In some cases, most of the losses occur because of ageing infrastructure, which would need to be upgraded. Rates of water loss above 35% can be observed in Ireland, Malta, Romania and[136].

6.3.4 Waste management

Issues and objectives related to recycling and re-use gain in importance in the EU waste management policies; especially in the context of the transition towards a more circular economy. The waste management sub-sector includes multiple sources. Municipal waste and packaging waste, are both generated largely by households. There are also underlying differences in the business models of dealing with these two types of waste. Most EU countries have introduced dual waste management systems. For packaging waste, users pay a fee included in the price of the product for the collection, segregation and recycling of a particular package. Whereas household waste is financed through waste management fees usually paid to municipalities. The following figure illustrates the trend in the expenditure spent in waste management between 2012 and 2016; underlining the differences between the MS, and the importance of such expenditures in MS like France, Germany and Italy. According to the Ellen McArthur Foundation, **the costs to develop a comprehensive sustainable waste management infrastructure in the EU would amount to EUR 108bn**[137].

Figure 37: Expenditure in waste management (in mEUR)[138]



Source: Eurostat, PwC analysis, 2019.

[135] As there is considerable missing data, it is possible that other EU Member States do not have almost full coverage of water supply.

[136] Distribution losses comprise all non-revenue generating distribution of water. Such distribution includes the supply of some institutions for free (such as for fire-fighting purposes), but also ageing infrastructure. Following this, this indicator does not completely reflect 'only' ageing infrastructure.

[137] Ellen McArthur Foundation, *Growth within: a circular economy vision for a competitive Europe*, 2015.

[138] This estimate excludes the investment needs related to industrial and construction waste.

Municipal waste

In general, a decreasing trend of municipal waste generation is observed in Europe. In 2014, 474kg of waste *per capita* was generated, which is an improvement compared to the 2007 figure of 523kg[139]. At the EU level, 44% of all municipal waste was recycled or composted in 2016. MS with lower recycling rates have the highest landfilling shares (Malta (92%), Greece (82%), and Cyprus (81%)). In fact, most of the landfilling occurs in Eastern Europe, with some exceptions. Other countries have resorted to other methods, such as incineration or waste to energy (*e.g.* Estonia with 55%).

As the municipal waste recycling target is set at 50% by 2020 (and since most of the MS are still below this target as observed in the figure above), there is a clear need for more investments. Following this, there is also a need to **boost investments in fixed assets for a more sustainable waste management process**, the latter being linked to waste transport and handling assets. Nevertheless, such projects should also take into account the transition to a circular economy. Building capital intensive waste treatment facilities may disincentivise reuse and recycling of waste.

Packaging waste

Recycling of packaging waste reached 65% of total waste at EU level in 2016, which is above the 55% target. The recycling rates are higher on average than municipal solid waste there are considerable differences across the types of packaging waste. Recycling rates for plastic remain at a low level with 37%. With the EC's policy efforts to reduce waste[140] there is an increased investment need in plastic recycling estimated **at around EUR 8.4bn to EUR 16.6bn** Countries with an average recycling rate below the EU target are Malta, Hungary, Greece, Croatia, with Latvia and Poland just reaching 55%.

6.4 Barriers

To address the sectoral barriers constraining investment in the Environment sector, the following sections:

- Identify the key barriers constraining investments in the sector; and
- Assess the barriers, which could hinder the uptake of financial instruments in the sector.

6.4.1 Barriers hindering investment in the Environment sector

Despite the positive externalities of investment in the Environment, their development is constrained by various factors. Among the barriers halting investments in the sector are the **high up-front development costs**, the **limited revenue generation potential**, **municipalities' budgetary constraints**, **costs risks related to regulatory and technology changes**, and **a lack of incentives** for households, businesses and local governments to engage in environmental projects.

This section takes a closer look at some of the key barriers, which are inherent to the nature of investments in the Environment sector, and may constraint such investments. The barriers analysed in this section focus mainly on the sub-sectors identified as the ones offering potential for financial instruments, notably waste water treatment, waste management, and air quality[141].

[139] European Parliament Briefing, *Circular economy package: Four legislative proposals on waste*, 2018.
[140] European Commission, *COM (2018)28 final*, 2018.
[141] Further analysis on how financial instruments could be deployed in these sub-sectors is presented in the following Section 6.5.

High up-front development costs and long investment horizons

Investments in environmental projects, such as waste and water treatment installations tend to be **capital-intensive** and require **high up-front investment costs**. These high initial investment requirements are combined with **long payback periods** of often 20 to 30 years, which reduces the attractiveness of environmental project's business cases for financers and investors.

Private sector investors are interested in shorter return on investment horizons and have **limited willingness** to engage in long-lived environmental projects. On the other hand, public sector investors can engage in investments with longer payback period, however need co-financing to maximise the impact of public resources, especially where the availability of public financing is constrained.

Given the strategic importance of environmental projects from the perspective of public health and simultaneous **difficulties in monetising the benefits** brought by environmental investments, there is a **scope for a public sector intervention**.

Limited revenue generation potential

The limited revenue generation potential in the Environment sector is combined with the uncertainty of demand resulting from declining population and affordability. The lack of certainty over future **revenue flows** leads to **challenges in defining an optimal pricing** for the services provided (*e.g.* especially in the water and waste sub-sectors). The limitations in revenue generation are recognised in the CPR, where flat rates of net-revenue for revenue generating projects are defined. The rate for waste management projects according to Annex V is 20% and 25% for water projects. This means that the CPR assumed that projects do not generate more than 20% – and respectively 25% – of the eligible cost, and so that the remaining 80% – and respectively 75% – are eligible for support from an OP.

Affordability principle

Fees charged for services related to natural resources are governed by the '***polluter pays principle***', which implies that those producing pollution should cover the costs of managing it, and preventing the environmental damage[142]. This principle is **constrained by the affordability principle,** which emphasises the importance of affordable access to universal public goods and services, such as clean water and waste management. As access to clean water, access to the sewer and waste water treatment as well waste management **needs to be affordable** for all citizens; while additionally public authorities may be **reluctant to increase their tariffs** due to **political implications**. Where the tariffs charged for the services provided are not sufficient, national grant and other subsidies or EU grants cover the remaining operational costs. The box below details an example of affordability of water services in the EU.

Box 2: Barriers related to the affordability of environmental services

Affordability of water services and the case for encouraging energy savings in densely populated areas
One measure to ensure the affordability of access to clean water, is the definition of a maximum upper limit value for the tariff on water services, which is relative to an average income in a specific area. Taking into account current water consumption levels in the EU, currently all of the MS are within the affordability threshold. For several Central Eastern and South Eastern Member States, despite having among of the lowest water fees in the EU, the affordability threshold is expected to be exceeded, with the costs coming from improved water and waste water treatment. The affordability limit

[142] For more information on the polluter pays principle please refer to: http://www.lse.ac.uk/GranthamInstitute/faqs/what-is-the-polluter-pays-principle/.

Affordability of water services and the case for encouraging energy savings in densely populated areas
is exceeded due to the combination of high water consumption and low average income. Although water in Bulgaria is considered among the least affordable, it can in many cases not fully cover associated operational costs[143].

Source: Ecorys, 2018, PwC, 2019.

Demand uncertainty risks

Investment needs for environmental infrastructure are associated with high infrastructure development costs, as well as significant maintenance costs. In principle, the operational costs should be covered by tariffs charged for the services provided, and tax revenues. Whether the tariffs would be able to cover the running costs depends on the density and migration of the population living in the area, which defines the demand for the services provided. Sparsely populated areas with outmigration often face difficulties covering the operating cost of the infrastructure, whereas more densely populated areas can generate sufficient revenues to repay investments, despite higher overall investment cost.

Challenges of municipal budgetary constraints

The high upfront costs and the need to finance the installations may result in **increased indebtedness levels of local authorities**. In many MS, there are debt limits for municipalities depending on their revenue. Therefore municipalities tend to delay investment in environmental infrastructure to be able to borrow for other activities such as urban transport, education or health service, which have a higher priority to citizens. The budgets for environmental infrastructure compete with other functions of municipalities. There is a **tendency to cut environmental budgets** – reducing maintenance expenditure and delaying investment in the sector results in negative effects only in a long-term perspective. This is challenge particularly for environmental projects, which do not generate any direct revenue flows or cost savings, such as air quality or flood risk prevention projects.

Limited incentives for households and enterprises to undertake environmental projects

Incentives for households **investing in renovating** their buildings with the objective of achieving **environmental benefits** are **limited**. They exist to encourage homeowners to switch to more environmentally-friendly solutions, but in a limited number. Without economic rationale and strong business cases, the full potential of environmental projects cannot be reached.

Similarly enterprises do not priorities investments in environmental protection. Many of the projects such as water saving measures, waste management or environmental risk management are not considered core business activities and are therefore not prioritised. Most enterprises undertake such investments if there are legal requirements to do so.

For example, there is a lack of incentives for households to invest in replacing coal or heating oil fired boilers to cleaner energy solutions or in using grey water (e.g. rain water) for toilets and repayment periods of such investments are very long. Similarly there are little incentives for enterprises to reuse waste from production processes even if the changes to the production process have a positive IRR. This barrier could be addressed both by a preferential financing mean available to support such projects, as well as capacity building programmes increasing awareness of the homeowners about the financing opportunities and Technical Assistance to support

[143] Ecorys, 'Assessing Drinking Water Affordability in the EU: A Quantitative Approach', 2018. Available here: https://www.safe2drink.eu/wp-content/uploads/2018/09/Ecorys_Assessing-drinking-water-affordability-in-the-EU_27092018.pdf.

the implementation of the projects. Similarly enterprises can encouraged with technical assistance for example through environmental audits to be able to identify potential investments in the environmental sector.

6.4.2 Barriers hindering the uptake of ERDF / CF-supported financial instruments in the Environment sector

Given the number of sectoral barriers inherent to the nature of environmental projects and a simultaneous beneficial impact for society, there is a scope to address these barriers with public interventions. Where projects are generating revenues or achieving cost-savings, financial instruments have potential to support the uptake of investments in the sector and attract private sector co-financing by unlocking access to long-term, patient financing. The uptake of financial instruments in the sector is, however, constrained by factors such as **limited awareness of the benefits** of financial instruments among the key stakeholders, **misalignment of national and EU-level regulation**s, as well as **difficulties in the development of strong project pipeline** of investment-ready projects, and **competition with traditional public financing**.

Limited awareness of the potential of financial instruments among the key stakeholders

Public sector support for investments in environmental infrastructure usually takes the form of grants or other national **subsidies** as well as EU grants, which are **considered as a primary policy intervention tool**. However, where the projects are revenue-generating and potentially bankable, there is a potential for deployment of financial instruments.

To support the transition from non-revolving financing to financial instruments, it is key to ensure that there is sufficient awareness of the opportunities and benefits offered by revolving finance on the level of national and regional governments, as well as managing authorities.

The consultation with stakeholders revealed that the **availability of non-revolving finance** in the sector and their familiarity with their use compared to revolving finance, as a factor, which hinders the use of financial instruments. **Integrating financial instruments** into an environment dominated by grants is among the key challenges. Private sector investors, municipalities and public sector companies (public water and waste management companies) need to be made **aware of the preferential conditions offered by financial instruments** and the benefits of sharing the investment risk with public sector bodies. As long as grants will be more accessible than financial instruments, key stakeholders, both from the public and private sectors will prioritise their use.

Difficulties in operationalising environmental policy goals

The development of a **pipeline of investment-ready projects of sufficient critical mass** to be attractive for private sector investors may be a **challenge** from the perspective of the wider use of financial instruments.

This is directly linked with difficulties in operationalising environmental policy goals set out in sectoral strategies at the EU and national level. These difficulties are reflected in the possibility of encountering only a **limited number of investment opportunities** in the Environment sector. To overcome this barrier, environmental projects should be **considered holistically in wider urban development portfolios**. This way, there is an opportunity to blend less bankable projects yielding lower return on investment with those with higher degree of bankability. The **development of a strong projects pipeline** with attractive business opportunities is key to ensure the interest of private sector stakeholders and increase the chances of securing co-financing from private sector investors.

With this respect, it is also important to highlight the **resistance towards the privatisation of some of the environmental sub-sectors** at political level[144]. This is the case for water infrastructure, where reluctance towards involvement of private sector investors may be a hindering factor from the perspective of financial instruments, which benefit from engagement of co-investment from private sector.

Competition with traditional public financing

In many MS, water and waste management is still undertaken by public entities; either by local governments directly, or by dedicated publicly owned companies. Indeed, waste and water management projects more often get financed either *via* **traditional municipal financing** or **directly by the national treasury**. In parallel, long-term lending is already available, and **ERDF / CF-supported financial instruments**, with their eligibility criteria and the burden on reporting, **may not be sufficiently attractive for all potential final recipients**.

6.5 Potential for the use of financial instruments in the Environment sector

The financial needs of projects in the Environment sector depend on a number of variables. There are however three key factors defining the financial needs of environmental projects:

- The investor type (depending if the investor is a public or a private sector entity);
- The geographical location; and
- The scope of the project.

This section discusses these three issues and proposes the potential solutions as to how financial instruments could facilitate public financing interventions in the Environment sector.

6.5.1 Investor type: the perspective of public sector investors with a focus on municipalities

The majority of the investments in the Environment sector are provided by public sector entities, such as municipalities or municipal enterprises. The business case of such intervention is driven by the local demand for services, and expected revenues. Therefore, the financing needs of environmental projects led by public sector entities are strictly related with the size of the municipality, and the number of final users.

Potential for financial instruments offering long-term debt

Larger municipalities that benefit from high demand for water and waste services can develop bankable projects that need an access to long-term debt instruments. Since many interventions in this sector target areas, where the tariffs for the services provided are set by political decision, it is challenging to increase future revenues, which could be foreseen by the project promoter. That is why, many projects struggle with limited streams of revenues, and need to wait many years to break-even.

Additional environmental investment areas, such as air quality or flood risk prevention, which do not generate direct streams of revenues but have significant quantifiable externalities, could also be financed by long-term

[144] For more information, please refer to the article published by European Economic and Social Committee in July 2018. Available here: https://www.eesc.europa.eu/en/news-media/news/no-more-water-privatisation-says-eesc-0.

debt with preferential financing terms given to public municipalities. National, regional or local public authorities, instead of paying flood damage to citizens, could repay a long-term loan given *ex-ante* to prevent the risk event.

Long-term debt with preferential financing terms, such as 20-25 years payback period and preferential interest rates, could offer a solution **for densely populated areas**. Due to the potential of reaching the **economies of scale**, municipalities will be able to repay investment with future streams of revenues proceeding from the tariffs on the service(s) provided.

Instruments combining long-term debt with a grant component

Small and medium-sized municipalities need to address the challenge of a limited demand for water and waste services, on one hand, and very high costs *per capita* to connect the rural areas with the existing infrastructure(s), on the other.

An **instrument combining long-term loans with a grant component** could address significant indebtedness constraints of small municipalities. An access to this financing mechanism can unlock access to key environmental infrastructure (*e.g.* water and/or waste management infrastructures) for smaller, remotely located and disconnected areas (*e.g.* rural areas with lower population). In this case, the **grant component could cover the infrastructure connection costs**, while the **financial instrument, providing long-term debt with preferential conditions**, **could support the development of the infrastructure investment in the populated area**.

An argument in favour of **schemes combining financial instruments and grants in one operation**, is that ESIF grants, according to small municipalities, are too complex to manage. Smaller municipalities have shied away from ESIF grants because of potential financial corrections, mainly due to difficulties in public procurement and audit requirements. These municipalities prefer **preferential loans**, **with grant elements**.

A special form of combination, that should become possible in the 2021-2027 programming period, is a **financial instrument providing long-term loans with a capital rebate option**. This could be an attractive form of financing that offers a capital rebate **if the project meets a set of financial and environmental indicators** defined on the outset of the investment. The potential requirements could incentivise project promoters to (i) deliver the project on time, (ii) meet the environmental targets, and (iii) repay the loan according to the amortisation table agreed *ex-ante*. The capital rebate could either be offered after the successful commissioning of the projects. In this way, it would function in a similar way to a blended instrument, with stronger performance elements. Alternatively, the capital rebate could be provided at the end of the investment's timeline as a bonus, depending on fulfilling specific environmental criteria. In this way, it reduces the size of financial liabilities to be repaid.

The following box provides an example of a financial instrument / grant combination in Poland.

Box 3: Example of a financial instrument combined with a grant component

Example of a financial instrument / grant combination: Long-term debt with a capital rebate in Poland
The Polish National Fund for Environmental Protection and Water Management, using national funds, offers a loan with low interest rates that has an option of a capital rebate[145]. Up to 10% of the capital, but not more than PLN 1m, can be rebated if the final recipient does not benefit from another form of grant. An option of a capital rebate is activated when at least 75% of the loan is repaid on time and the environmental objectives are met. The loan is given for up to 15 years, but the tenor can be extended to up to 25 years. The loans can allow for a grace period of up to 18 months. The interest rates are paid based on the WIBOR 3 months, and the minimal threshold is defined in advance.

Source: fi-compass*, 2019.*

[145] Please see: http://nfosigw.gov.pl/oferta-finansowania/srodki-krajowe/informacje-ogolne/umorzenia/.

Public-Private Partnership (PPP) and public enterprise business model

Since some of the municipalities' environmental activities can be made bankable, they can be implemented with a limited involvement of public resources. These projects can be implemented either under a PPP model, either with user fees or availability payments, or under a public enterprise business model.

Projects sponsored by municipalities can benefit from these forms project implementation that enable the implementation of capital intensive interventions, without increasing the debt level of public entities.

The following box shows how an environmental infrastructure PPP is realised with the use of ESIF together with an EU level financial instrument. This example could be replicated with ESIF financial instruments.

Box 4: Example of a Public-Private Partnership using EU Funds

Example of a PPP: Poznan Waste-to-Energy Project, Poland: Using EU Funds in PPPs

The Poznań Energy from Waste plant was developed under a PPP model, as a result of an agreement made on 8 April 2013 between the City of Poznań and SUEZ Zielona Energia[146], with the involvement of the EU-level financial instrument Marguerite Fund as co-investor. The project is also partly financed through availability payments from the City to the SPV. This means that the City collects the waste fees and pays the SPV only for the availability of the installations. A second stream of income is the heat and electricity produced, as well as secondary raw material sold by the SPV, which are dependent on the volume and composition of waste. The volume risk of the SPV is managed thanks to the City which has the control over the waste stream, through its local waste policy. Local decision makers also control the import of waste from other parts of Poland or abroad.

In a nutshell, the PPP presents an innovative financing structure, combining private capital with grants from the Cohesion Fund[147], as well as equity from the Marguerite Fund, loans from the EIB and BGK, and private financing from a commercial bank. This financing model was a pioneering solution at the national, as well as at the European level, and is an example of how blended finance can (i) unlock financing for environmental projects, (ii) meet policy objectives, and (iii) attract private co-financing.

Source: fi-compass*, 2019.*

6.5.2 Investor type: the perspective of private sector investors with a focus on households and businesses

Combination of investments fulfilling different objectives

The rationale behind such combination is to develop a financial instrument that focuses on private project promoters, such as households and SMEs, brings an additional potential to boost investments in the Environment sector, and can significantly contribute to the achievement of air quality standards.

For instance, a **joint investment support scheme** could aim at upgrading the energy efficiency of a building, on one hand, and contribute to improvements in air quality measures, on the other. As such, a financial instrument targeting home and business owners, could be an important financing tool to address two policies objectives simultaneously.

In that perspective, **long-term debt with preferential interest rates** could be a solution for households and SMEs to finance the modernisation of buildings, and to switch to more environmentally sustainable fuel boiler at the same time.

Similarly, the financing of environmental measures in enterprises, such as replacement of hazardous substances or water saving measures, should be combined with financing of the expansion of production, or improvement

[146] Please see: http://www.marguerite.com/2017/03/energy-from-waste-plant-in-poznan-starts-operations/.
[147] Please see: https://www.eib.org/attachments/epec/epec_using_eu_funds_in_ppps_case_study_en.pdf.

of services. This allows for a higher critical mass of the financial instrument and reduces the administrative burden on final recipients applying for different sources of financing. It also allows measures for environmental protection with lower return on investment to be 'cross-subsidised' with investments generating higher returns in the core business of a company.

6.6 Key enabling factors for the use of financial instruments

To accelerate the deployment of financial instruments in the Environment sector, it is critical to assess the key enabling factors with potential to positively influence the transition towards revolving finance mechanisms. It is important to note, however, that a number of key enabling factors increasing the chances of a successful deployment of financial instruments can have a positive effect on the uptake of financial instruments independently of the environmental sub-sector.

6.6.1 Integrating environmental objectives into financial instruments for municipalities and SMEs

Following the need for a more holistic approach for urban development and infrastructure agendas integrating environmental projects, financial instruments for environmental investments in municipalities, can be integrated in **city funds having a broad urban development scope**. This would allow municipalities to access financing for their investment needs more easily, independently of the sector they are investing in. Furthermore, there is a need of increased awareness at the level of project promoters regarding opportunities offered by financial instruments.

Similarly, financial instruments for environmental measures in enterprises, especially SMEs, have potential to be **integrated into existing '*standard SME financial instruments*'**. This would make access to finance for environmental investments in SMEs easier and reduce the need to apply for different financial instruments or eventually even different financial intermediaries depending on the purpose of the financing. In order to make investment more attractive, the part of the financing addressing environmental investments could **contain additional incentives**, such as lower interest rate or Technical Assistance.

6.6.2 Designing financial instrument-friendly Operational Programmes

Financial instruments require a sufficient pipeline of investable projects in order to make them economically viable, and attract financial intermediaries to implement them. To avoid multiple Funding Agreements, contributions from multiple Priority Axes, and the complexity of coordinating several managing authorities or Intermediate Bodies, it is advisable **to concentrate contributions to financial instruments within the OPs**.

Financial instruments should support a large number of projects. It is therefore also advisable to **differentiate** already in an OP between **eligibility criteria for grants**, which need to be stricter, **and those for financial instruments**, that require much broader eligibility criteria to be viable. Through this, it is possible to support non-profitable projects supporting policy priorities with grants, and other projects with revolving mechanisms. This approach also makes it easier to use financial instruments and grants in a complementary way.

Furthermore, support from the OPs should be designed in a way that they allow the support to projects independent of their form of implementation. Often OPs are formulated in a way having work contracts for implementation in mind, making it difficult to provide support in form of financial instruments and grants to PPPs, or other form of private involvement.

6.6.3 Combining grants with financial instruments

The stakeholders' consultation has confirmed that grants tend to be the preferred financing source for environmental projects, despite the potential for deployment of financial instruments in the case of revenue generating or cost-saving projects. **Integrating financial instruments into the current environment of grants** is a challenge. In the meantime, grants can also have an enabling effect on the wider use of financial instruments, if their use is complimentary to the use of financial instruments.

This can be achieved if grants are used to cover the part of the investment cost that is not repaid by revenue or cost-savings. For example, grants can cover water infrastructure costs in less densely populated areas, or, in poorer areas, it can keep the waste and water fees affordable for households. Grants can also be used to cover operational risks during the investment phase of an environmental project, and then improve its return on investment.

The CPR proposal of the EC for the 2021-2027 programming period, which allows for **integrating ancillary grants**, including investment grants, in financial instruments, should therefore act as an **enabler** for the uptake of financial instruments in the Environment sector, as it will **simplify the combination of different forms of support**.

6.6.4 Technical Assistance

TA plays a key role in realising environmental policy goals on the ground. The provision of technical support can facilitate the smooth implementation of financial instruments in the sector, and can be implemented at the level of **public authorities** (including managing authorities, Intermediate Bodies and/or technical authorities), **project promoters** (including the NPBIs), as well as **final recipients** (such as municipalities, households and/or SMEs) of a financial instrument.

Small-sized municipalities could benefit from an access to TA **when preparing their business plans and/or preparing funding applications**. Indeed, a proper assessment of the market potential and the preparation of accurate cash-flow forecasts are essential to receive funding for a project. By involving sectoral expertise early, projects originating from less experienced municipalities could be implemented. TA could also support the design and management of funding applications procedures, and be made available to the less experienced, smaller public sector entities. Also, in the case of PPPs, TA could be provided to the less experienced public sector entities in the set-up and procurement phases.

TA support could also be provided to **households** and **SMEs**. For example, in the case of financial instruments aiming to finance the replacement of heating sources in households, a TA component could support the provision of consultation with experts to define the scope of intervention, and support them filing the financing applications.

6.7 Overview – Key sectoral outputs for the Environment sector

The table below summarises the key outputs to consider for the further development of financial instruments in the Environment sector.

Table 20: Overview of the key outputs of the stocktaking study for the further uptake of financial instruments in the Environment sector

	Environment	
	Factors	**Impact on the development of financial instruments**
Barriers	High up-front development costs and long investment horizons	
	Limited revenue generation potential	
	Challenges of municipal budgetary constraints	
	Limited incentives for households and enterprises to undertake environmental projects	
	Limited awareness of the potential of financial instruments among the key stakeholders	
	Difficulties in operationalising environmental policy goals	
	Competition with traditional public financing	
Potential for the use of financial instruments	Financial instruments offering long-term debt	
	Instruments combining long-term debt with a grant component	
	Public-Private Partnership (PPP) and public enterprise business model	
	Combination of investments fulfilling different objectives	
Key enabling factors for the use of financial instruments	Integrating environmental objectives into financial instruments for municipalities and SMEs	
	Designing financial instrument-friendly Operational Programmes	
	Combining grants with financial instruments	
	Technical Assistance	

Source: fi-compass*, 2019.*

Legend:

Barriers

 Barrier with a limited negative impact on the uptake of financial instruments in the sector.

 Barrier with a noticeable negative impact on the uptake of financial instruments in the sector (dissuading the managing authorities or other stakeholders from developing financial instruments in the sector).

 Barrier with an important negative impact on the uptake of financial instruments in the sector (almost preventing the use of financial instruments in the sector).

Potential for the use of financial instruments

 Potential for such financial instrument scheme exists.

 Potential for such financial instrument scheme is high.

 Such financial instrument scheme may provide critical added value to the sector.

Key enabling factors for the use of financial instruments

 Key enabling factor that facilitates the use of financial instruments in the sector.

 Important key enabling factor to facilitate the use of financial instruments in the sector.

 Critical key enabling factor to facilitate the use of financial instruments in the sector.

7 Foster the use of financial instruments in the 'Information and Communication Technologies infrastructure' sector

7.1 Policy context

Broadband acts as the backbone of the Digital Single Market Strategy[148], which could result in EUR 415bn *per* year of added value, mainly by creating jobs, increasing competition, and boosting investments. This translates into an estimate that a 10% increase in broadband coverage can lead to an average growth in GDP of 1%[149]. Moreover, internet connectivity ensures that everyone can have an access to the opportunities that a digital era can / will offer, such as the digital market, content, and job opportunities. The EU strategy in broadband is defined by two initiatives:

- The '**Digital Agenda for Europe**' (DAE 2020), launched in 2010 set the overall policy goals up to 2020[150]. It called for a fast connectivity access (combining fixed and mobile) to all European citizens by 2020, and defined the expected growth of ultra-fast broadband that will serve as the basis for faster connectivity (*i.e.* 5G networks). Moreover, the strategy set a demand-side target on the uptake of ultra-fast Internet.
- In 2016, the EC devised a second strategy, '**Gigabit Society for 2025**' (GS 2025), to complement the 2020 targets. It proposes three, more ambitious, targets for broadband connectivity in the EU to be achieved by 2025[151]. It follows on the expected growth of ultra-fast networks by 2020, targeting full coverage by 2025. Moreover, it sets the EU vision with regards to 5G connectivity.

The following table details the objectives of both EU strategies.

Table 21: Objectives defined in the Digital Agenda for Europe and the Gigabit Society for 2025 strategies

	Intervention area	Target	Progress up to 2017
DAE 2020	Basic broadband (<30 Mbps)	100% coverage by 2013	100% coverage
	Fast broadband (>30 Mbps)	100% coverage by 2020	79% coverage
	Ultra-fast broadband (>100 Mbps)	50% uptake by 2020	15.4% uptake
GS 2025	Ultra-fast broadband upgradable to 1 Gbps	100% coverage by 2025	58% coverage
	Broadband of at least 1 Gbps	Coverage for all main socio-economic drivers by 2025	To be measured
	5G connectivity	100% coverage for all urban areas and transport paths by 2025	To be developed

Source: COM(2010) 245, 2010, COM(2016) 587, 2016.

148 European Commission, *Communication – 'A Digital Single Market Strategy for Europe', COM (2015) 192*, 2015.

149 L. Holt, M. Jamison, 'Broadband and contributions to economic growth: lessons from the US experience', Telecommunications Policy v. 33 p. 575-581; Global Industry Leaders' Forum, Broadband enabled innovation, ITU, 2011.

150 European Commission, *Communication – 'Digital Agenda for Europe', COM (2010) 245*, 2010.

150 European Commission, *Communication – 'Digital Agenda for Europe', COM (2010) 245*, 2010.

151 European Commission, *Communication – Connectivity for a Competitive Digital Single Market - Towards a European Gigabit Society, COM (2016) 587*, 2016.

At national level, each MS has been committed to develop national targets and strategies for ensuring broadband coverage. Nevertheless, some MS have been late to finalise their national plans to deploy fast broadband, and in some countries, the targets are less ambitious than those set by the EC[152]. Some MS have also defined uptake rates. The 2025 targets widen the investment gap, and the absence of policy goals in line with the updated EU strategy will most likely slow down their implementation.

Regulatory framework

The EC has ensured that the existing regulatory framework enables the right actions towards meeting the policy goals. The European Electronic Communications Code (EECC) entered into force on 20 December 2018 and is seen by sectoral stakeholders as a '*step in the right direction*'[153]. The main objective of the EECC is to increase investment in very high capacity networks (*i.e.* ultra-fast broadband) and, at the same time, to preserve healthy competition among companies in the telecom market. To that end, the EECC provides incentives for specific business models that are fit for public intervention; and more particularly the wholesale model, because it limits anti-competitive behaviours compared to vertically-integrated business models. The lighter regulatory treatment of the wholesale business model reduces the risk of investing for the private sector and becomes attractive for investors especially in grey and white areas (*as defined in Figure 38 below*). The EC has also launched a public consultation on updating the European Guide to Broadband Investment[154], and issued the Cost Reduction Directive, which outlines measures to be taken to decrease the broadband deployment costs[155]. Last but not least, the '5G for Europe Action Plan' was issued to advance the deployment of the next generation of mobile connectivity[156].

Technical assistance for broadband

The EC also provides extensive assistance and guidelines, mainly on State aid, mapping coverage and deploying broadband, to assist the efforts of MS in this 'ICT infrastructure' sector. In this way, a network of '*Broadband Competence Offices*' was set up voluntarily at national and regional level with the goal of informing citizens, companies, and local authorities on investments in broadband infrastructure, primarily in rural areas[157]. These offices organise regular meetings, discussions, and share best practices on relevant topics, such as State aid, to support broadband deployment. The feedback from participants in the workshops has been positive towards these initiatives, particularly in sessions about State aid[158].

All these initiatives and regulatory support are expected to serve as a basis for the further development of high-capacity broadband infrastructures in the EU, with a special focus on under-developed areas[159].

State aid

State aid for ICT infrastructure can be provided under the GBER, Article 14 on 'Regional Investment Aid' for assisted areas, meeting the following conditions:

1. Aid shall be granted only in areas where there is no network of the same category (either basic broadband or Next Generation Access, NGA) and where no such network is likely to be developed on commercial terms within three years from the decision to grant the aid; and

[152] ECA, *Broadband in the EU Member States: despite progress, not all the Europe 2020 targets will be met*, 2018.
[153] Please see: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_.2018.321.01.0036.01.ENG.
[154] European Commission, *Guide to High-Speed Broadband Investment*, Release 1.1 – 22 October 2014, 2014.
[155] Directive 2014/61/EU of the European Parliament and the Council, 2014.
[156] European Commission, *Communication – COM (2016)588, '5G for Europe: An Action Plan'*, 2016.
[157] Please see: https://ec.europa.eu/digital-single-market/en/broadband-competence-offices.
[158] BCO Network, *Report for Futurium*, 2018.
[159] *fi-compass* stakeholder consultations.

2. The subsidised network operator must offer active and passive wholesale access under fair and non-discriminatory conditions, including physical unbundling in the case of NGA networks; and
3. Aid shall be allocated on the basis of a competitive selection process[160].

State aid can also be provided without notification under GBER Article 52 on 'Aid for broadband infrastructures'. In this context, State aid rules must meet all of the following conditions [161]:

1. An investment size of maximum EUR 70m *per* project, or of EUR 150m *per* scheme pear year;
2. To be located in 'white areas' (*see Figure 38 below*);
3. To be implementation based on a wholesale open-access network model; and
4. To be based on a fund allocation made by means of competitive tenders.

In other cases than those mentioned above, State aid can be provided after notification, which is approved only when a '*step change*' is planned, which is a significant improvement over the existing services provided by the ICT infrastructures already in place. In addition, the EC requires that these interventions occur only through implementing a wholesale network model[162].

Figure 38: Definitions of areas relevant for State aid in the 'ICT infrastructure' sector

White areas – **No provider of broadband** is currently present or plans to enter in the next three years.

Grey areas – **One active infrastructure-based provider** is present and owns the infrastructure, but these areas are not targets for any other provider or network type in the next three years.

Black areas – Usually urban and sub-urban areas where **at least two basic broadband networks** of different operators are currently active, or planned to operate in the next three years.

Source: CERRE, State aid broadband infrastructure in Europe, 2018.

Planned investments in the sector for the 2014-2020 programming period

As a traditionally market-oriented sector, with the telecom industry being the main investor, broadband infrastructure is increasingly on the radar of public authorities. The aim is to address the existing market failures (mainly identified in terms of white, grey and black areas) to ensure that everyone has access to sufficient connectivity. The implementation of the above-mentioned policy objectives is thus supported through **several intervention mechanisms at EU level** that primarily assist public investments across the EU. The table below presents the main sources of EU funding in the sector, representing **a total of almost EUR 15bn for the 2014-2020 programming period**. As a general implementing rules, these funds are used in a complementary and synergetic way to address different aspects of deploying broadband infrastructures.

160 Commission Regulation (EU) No 651/2014, 2013.
161 CERRE, *State aid for broadband infrastructure in Europe*, 2018.
162 BCO, *Report for Futurium*, 2018.

Table 22: Main sources of EU financing for ICT infrastructures in the 2014-2020 programming period

Financing source	Type of financing	Amount (mEUR)	Comments
ESIF (ERDF and EAFRD)	Grants	6 940	The main financing source for the sector, focused on rural and semi-urban areas.
European Fund for Strategic Investments (EFSI)	Loans and equity	2 032	Dedicated to the development of strategic, high-speed broadband projects. 19 approved projects that are meant to mobilise EUR 10.6bn of total investment.
Connecting Europe Facility (CEF) (including Wifi4EU, without CEBF)	Loans and grants	138	Complements ESI Funds in sub-optimal investments. Could increase to EUR 3bn for the 2021-2027 programming period, focusing on broadband networks and digitisation.
Connecting Europe Broadband Fund (CEBF) (CEF+EIB, partly backed by ESIF)	Equity	480	Focuses on equity tickets of up to EUR 30m in greenfield projects in white and grey areas. The wholesale business model is preferred.
European Investment Bank	Loans	5 600	

Source: ECA, Broadband in the EU Member States: despite progress, not all the Europe 2020 targets will be met, 2018; EC, European Funding for broadband, 2014-2020, PwC analysis, 2019.

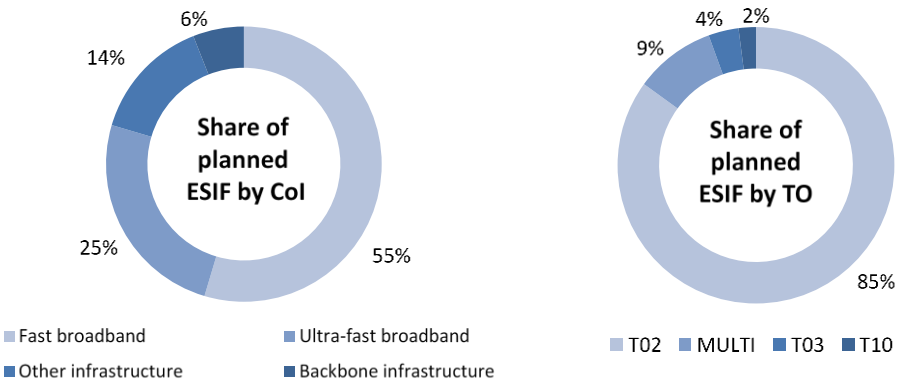
The figure below details the investments planned for ESIF-supported projects in the 'ICT infrastructure' sector by category of intervention (CoI) and by TO.

Regarding the categories of intervention codes, which range from 045 to 048, ESI Funds have been allocated to:

- Backbone networks (for EUR 360m at EU level);
- **Fast broadband networks** of at least 30 Mbps (for EUR 3 287m);
- **Ultrafast speed broadband** of at least 100 Mbps (for EUR 1 502m); and
- Other types of ICT infrastructures, such as data centres and e-infrastructure (for an overall EU amount of EUR 869m).

In terms of TOs, most of the ESIF resources are planned to be allocated to the development and upgrades of ICT infrastructure within Priority Axes of OPs dedicated to **T0 2 – Information and Communication Technologies**, (for EUR 5 097m), enhancing SME competitiveness (**T0 3**) (for EUR 212m), and/or Priority Axes addressing several TOs (for an overall EU-level amount of EUR 567m).

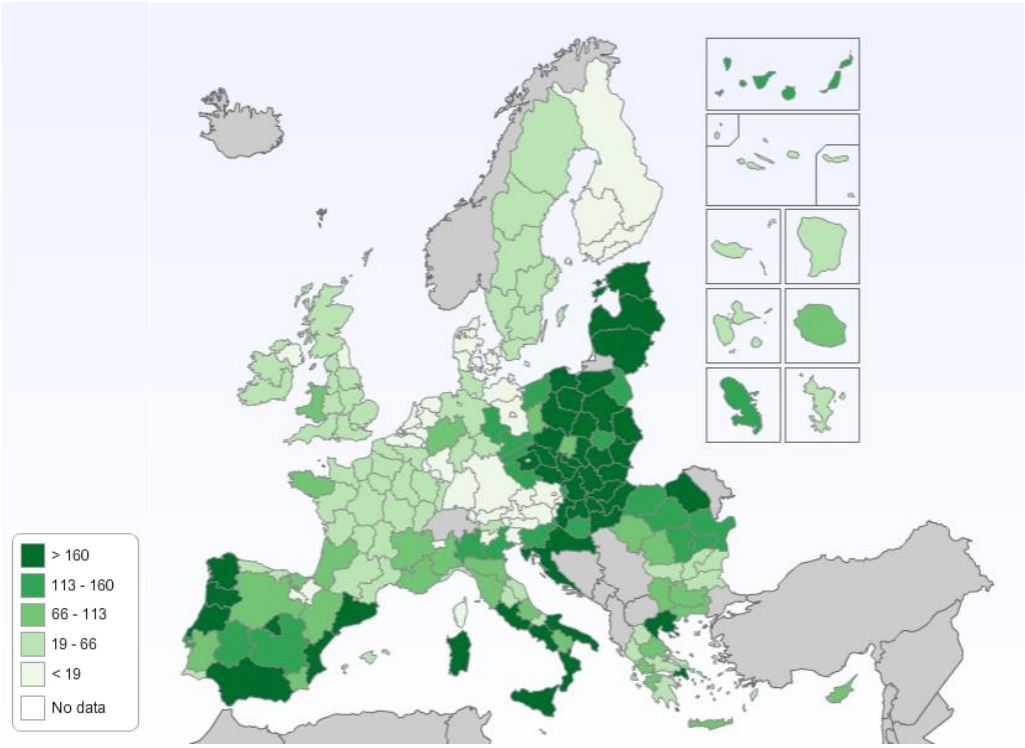
Figure 39: Planned ERDF / CF investments in the 'ICT infrastructure' sector by category of intervention and by TO (in mEUR)



Source: EC, Smart Specialisation Platform, Categories of intervention: 045 to 048. Data from the ESIF OPs, Retrieved on 20/01/2017 from the SFC2014/Infoview database, PwC analysis, 2019.

In terms of geographical investment allocation, planned ERDF / CF investments in the 'ICT infrastructure' sector – as outlined in the OPs for the 2014-2020 programming period – are mainly located in large countries with scattered populations. The figure below illustrates the total planned ERDF / CF financing planned for the 2014-2020 programming period in the sector, amounting to more than EUR 6bn, with **Italy** (EUR 1 444m), **Poland** (EUR 1 025m), and **France** (EUR 680m) being the top three planned spenders.

Figure 40: ERDF / CF planned amounts for the 'ICT infrastructure' sector in the EU (in mEUR)



Source: EC, Smart Specialisation Platform, Categories of intervention: 045 to 048. Data from the ESIF OPs, Retrieved on 20/01/2017 from the SFC2014/Infoview database, 2017.

In the meantime, in relation to the estimated investment needs (*see further sections in the present sectoral analysis*), **the amount of public funding available until 2020 is likely to come short in unlocking enough private**

investment to meet even the DAE 2020 targets. Almost EUR 7bn is estimated to be available from public authorities (both at EU and national level), in developing the broadband sector in the 2018-2020 period[163]. As such, this sum represents an estimated **6% of the total investment needed for this 2-year period**.

All in all, there exists an ambitious vision for the EU with respect to the 'ICT infrastructure' sector, which has been materialised through an updated regulatory framework, and assistance that aims to – and will – support the further deployment of broadband infrastructure. However, given the shortage of public funding available, **public authorities need to support broadband projects that will attract more private capital**. **Moreover, these interventions should directly address existing gaps in the broadband market**, which are identified and discussed in details in the following sections.

7.2 The use of financial instruments in the 'ICT infrastructure' sector

As mentioned in Chapter 2, 'sectoral analyses' were performed using the financial data provided by MS to the EC for monitoring / reporting purposes in relation to the implementation of their OPs. The present analysis considers the three pieces of information below altogether (namely Figure 41, Figure 42 and Table 23).

The following figures and table indicate that only two MS were using ERDF and CF funding for financial instruments in the 'ICT infrastructure' sector (*as of 31 December 2017*); namely: Hungary, and Poland. As presented in Chapter 2, this is the sector – among the five sectors studied – where the development and uptake of ERDF / CF-supported financial instruments have been the most limited in terms of number of MS that decided to implement financial instruments in a given sector[164]. At the EU level (so when considering the two MS altogether), EUR 299.3m have been devoted to financial instruments in the 'ICT infrastructure' sector, representing 7.9% of the 'total eligible cost' for this sector. Despite this (very) limited number of MS using financial instruments in the sector, this total amount and this percentage appear quite high in comparison with the other four sectors analysed in the present stocktaking study (*please refer to Chapter 2 and the other sectoral analyses*). This consequently indicates that, **even if, the use of financial instruments in the 'ICT infrastructure' sector is an exception among the managing authorities** (including in MS with large ERDF / CF amounts available for the sector, such as Italy and France, as indicated in Section 7.1), **the two MS that decided to implement financial instruments in this sector devoted sizeable amounts, especially in comparison with the total ERDF / CF amounts available in their OPs** (especially Poland, as detailed below). The only form of finance chosen by the managing authorities is loans. This illustrates that the managing authorities, presumably together with other technical public authorities, have analysed their respective markets (as required under the form of *ex-ante* assessments), and observed that this sector mainly needed such form of finance[165]. Finally, the share of financial instruments in the EU-wide 'ICT infrastructure' sector among financial instruments in all sectors (including the five studied sectors but not only) represents 1.7%. This indicates that, as for the RE and the Environment sectors analysed earlier (and like the UDT sector to a lesser extent), managing authorities and Intermediate Bodies do not seem to consider the 'ICT infrastructure' sector when developing their strategies for financial instruments[166].

---

[163] CERRE, *State aid for broadband infrastructure in Europe*, 2018.

[164] As presented in Chapter 2, the sector with the most limited amount devoted to financial instruments is the Environment sector (with EUR 168.2m devoted to financial instruments, in comparison with EUR 275.9m in the RE sector, and EUR 299.3m in the 'ICT infrastructure' sector).

[165] As reminder, the 'ICT infrastructure' sector as defined in the present stocktaking study only focuses on broadband and other related ICT infrastructures. Following this, the business-type of financing (including for SMEs) that may relate to the 'general ICT sector', and may be financed through TO 2, are not considered in the present chapter (while such financing / investment may require a more 'equity-type' form of financing). Also, the RDI-related investments required / developed by SMEs in the ICT sector are considered in Chapter 8 since they fall into the remit of the 'RDI in SMEs' sector.

[166] For comparison purposes, and as detailed in the other 'sectoral analyses / chapters', this share is: 1.6% for the RE sector, 2.2% for the UDT sector, 1.0% in the Environment sector, and 12.2% for the 'RDI in SMEs' sector. As already mentioned, this share for the five sectors altogether is of 18.6%.

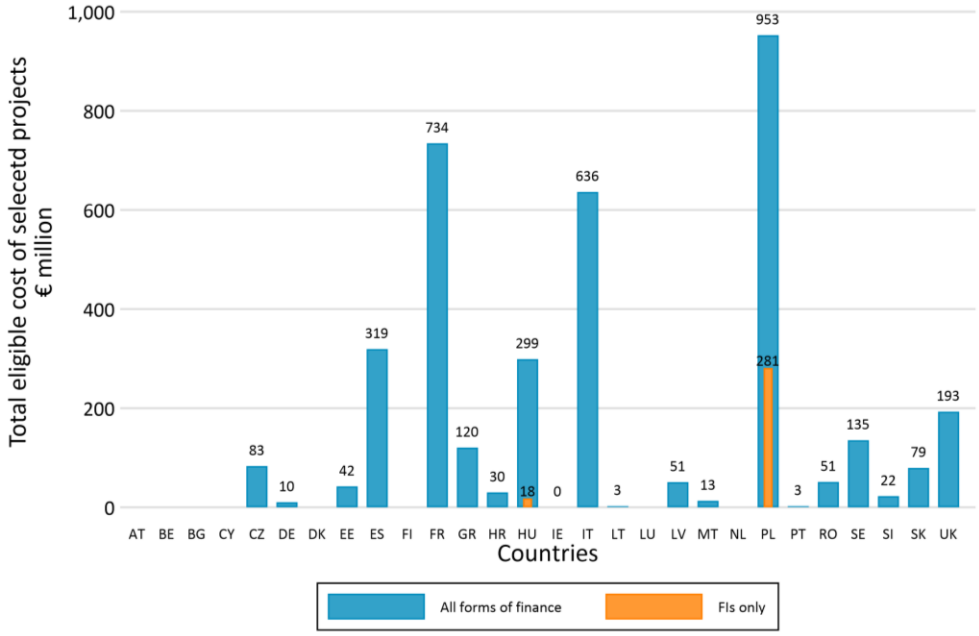
In more details, the individual approaches decided by the two MS in regards to their financial instruments in the sector indicate more similarities than the national approaches decided for the four other sectors analysed in the present stocktaking study. For instance:

- Even if the amounts devoted to financial instruments in the sector by each MS are very different (EUR 18.1m in Hungary, in comparison with EUR 281.3m in Poland), the relative percentages of such amounts (*i.e.* in regards to the total amounts devoted to 'financial instruments together with grants') are less different: 6.0% in Hungary, in comparison with 29.5% in Poland. Even if these percentages are, obviously, different, such discrepancy is more striking in other sectors (*please see for instance Section 8.2 on the 'RDI in SMEs' sector*). **This indicates that the 'ICT infrastructure' sector** (as observed for the RE and the UDT sectors) **require substantive amounts of funding to develop financial instruments**. Following this, and as observed in the RE sector (*please see Section 4.2*), **the regionalisation of the OPs in some MS may explain why France, Italy, and Spain** (*i.e.* other MS with large available ERDF / CF amounts for the 'ICT infrastructure' sector, but regionalised), **may have not developed financial instruments in the sector**, since the latter would have been on a regional basis, and not mobilising the consequently required amounts (while such countries have white and grey areas to cover as well, and consequently need to further invest in the sector, as detailed in the following sections of the present chapter). It is to be noted here that Poland is also a regionalised country for Cohesion Policy, but, as indicated in Annex 3, the financial instruments for the 'ICT infrastructure' sector have been developed on a national basis. This element may have constituted a facilitating factor in the design, set-up and implementation of the instruments.
- Following this, it appears that even if Poland and Hungary are among the MS with the largest planned ERDF / CF amounts for the sector (*please see Figure 40 above in Section 7.1*), such amounts (and consequently the idea that 'large' amounts are available to finance such sector / projects) are not the only reasons why both countries have decided to develop financial instruments in the sector. Indeed, **if the availability of ERDF / CF financing appears to be an argument to develop financial instruments in the 'ICT infrastructure' sector (since large amounts are needed for projects in this sector), the development of financial instruments in the sector also relate to the overall 'financial instrument strategies' and willingness from MS to develop such form of financing in parallel to grants**. Indeed, and as mentioned in previous chapters, Poland has developed financial instruments in four (of the five studied) sectors, and Hungary has developed financial instruments in three (of the five studied) sectors. Following this, and as for the RE and Environment sectors especially, **the development of financial instruments in the 'ICT infrastructure' sector seems a decision from MS that have past experience with ERDF / CF financial instruments and wish to develop such form of finance in 'new' sectors** (such as the 'ICT infrastructure' one). This observation also indicates that **other MS that have experience with ERDF / CF financial instruments (and further investment opportunities in the sector), but which have not developed financial instrument in this sector, still need to be convinced by the rationale, the relevance and the viability of financial instruments in the 'ICT infrastructure' sector**.
- To complement this argument, despite their differences, **the financial instruments developed in both MS are complementary to grants financing in the 'ICT infrastructure' sector**.
- In terms of financial products, as previously mentioned, both MS have decided to provide only **loans** *via* their ERDF / CF-supported financial instruments. **This seems to indicate that this form of finance is to be privileged for the sector** (following the conclusions and recommendations from the respective *ex-ante* assessments undertaken in the two MS). This aspect is further analysed and detailed in Section 7.5 of the present chapter.
- Finally, the share of financial instruments in the 'ICT infrastructure' sector among financial instruments in all sectors (including the five studied sectors but not only) represents 0.8% in Hungary, and 7.3% in Poland. This underlines the role devoted by Poland to financial instruments in this sector (considering in particular

that Poland developed financial instruments in four of the five studied sectors, as well as in other sectors not analysed in the present stocktaking study).

In that context and in order to better illustrate the development of ERDF / CF-supported financial instruments in the sector, the financial instrument implemented in Poland for the 'ICT infrastructure' sector will be detailed in a specific case study.

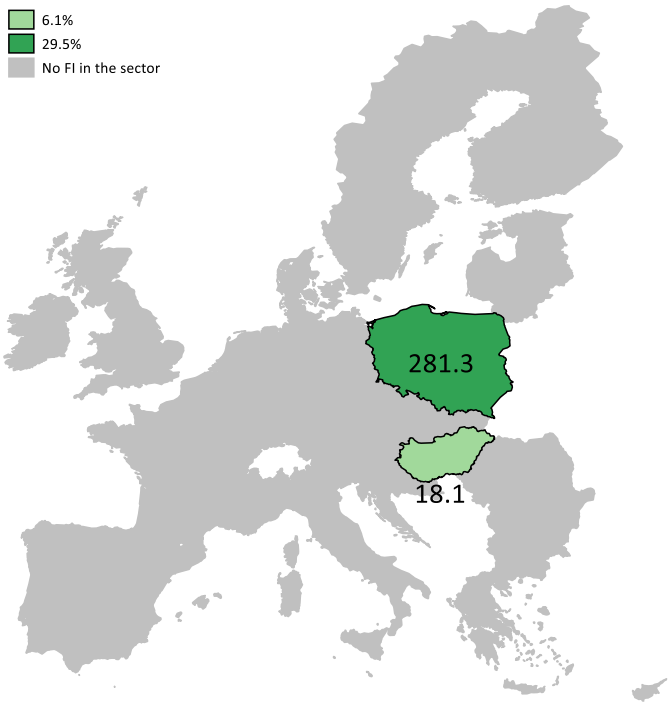
Figure 41: Proportion of ERDF and CF funding devoted to financial instruments in comparison with ERDF and CF funding devoted to all forms of finance (grants and financial instruments altogether) in the 'ICT infrastructure' sector[167]



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

[167] This figure indicates the 'total eligible cost of selected projects' for 'all forms of finance' (*i.e.* grants and financial instruments altogether; in the thicker blue column) and for 'financial instruments only' (in the inner orange column). For each Member State, data labels provide the nominal amounts in millions euros for the amounts devoted to financial instruments and the total amounts devoted to all forms of finance.

Figure 42: EU-wide map of the uptake of ERDF and CF financial instruments in the 'ICT infrastructure' sector[168]



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Table 23: Overview of ERDF and CF financial instruments in the 'ICT infrastructure' sector by Member State

Member State	ICT infrastructure			
	Amount devoted to FIs (mEUR)	Share of FIs among all forms of finance (FIs and grants, %)	Type of financial products	Share of FIs in the sector among FIs in all sectors (not only the five sector, %)
Hungary	18.1	*6.0%*	*100% of loans*	*0.8%*
Poland	281.3	*29.5%*	*100% of loans*	*7.3%*
EU Total	**299.3**	***7.9%***	***100% of loans***	***1.7%***

Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

As mentioned above and in Section 1.2.2 in the introduction, **the 'ICT infrastructure' sector is illustrated by a case study on the financial instrument developed in Poland**. It is presented in detail in the sub-section below.

7.2.1 The Polish broadband loan instrument

The Department for Digital Development of the Polish Ministry of Development Funds and Regional Policy, the managing authority of the Operational Programme (OP) '*Polska Cyfrowa*' (Digital Poland), has developed a financial instrument for the deployment of broadband infrastructure. This is one of only two financial

[168] This map indicates (*in green*) the Member States that have implemented financial instruments in the 'ICT infrastructure' sector by 31 December 2017. Where a Member State – or at least one of its managing authorities – has set up a financial instruments operation in this sector, the amount devoted to this / these financial instruments operation(s) is indicated in millions euros. The 'intensity' of green indicates the share of financial instruments among all forms of finance in this specific sector.

instruments in this sector in the 2014-2020 programming period. The EUR 145m financial instrument is managed by the Polish promotional bank *Bank Gospodarstwa Krajowego* (BGK) acting as Fund-of-Funds (FoF) manager and implemented through financial intermediaries.

Description of the financial instrument

Rationale and objectives

Poland has the lowest fixed broadband coverage rate in the EU. Unsurprisingly, Poland decided to allocate the highest amount of ERDF among all Member States to the improvement of ICT infrastructure. Funding of an equivalent of EUR 1bn is delivered through the national OP '*Cyfrowa Polska*'. For the 2014-2020 programming period, Poland is using financial instruments alongside grants for the first time.

In an *ex-ante* assessment[169], finalised in 2017, the following market barriers regarding the investment in broadband were identified. The focus of the *ex-ante* assessment was investment in the 'last mile', meaning the connection from the glass fibre trunk line to the client. In comparison to other Member States, it is common in Poland that the internet provider is a small and medium sized company that provides the last mile connection:

- Network operators, especially micro and small operators, have major problems with accessing ESIF grants. The calls do not necessarily coincide with the request from clients and grant calls are often tailored towards project promoters such as large operators;
- Operators face problems in accessing debt financing for their projects. Despite the profitability of broadband networks, the projects are not considered bankable for commercial lenders. The risk of investments is very high due to competition between different ICT technologies (fibre *vs.* mobile data), strong competition between small operators and the demand risk. Projects have relatively long repayment times exceeding even 10 years and ramp-up periods from project inception until there are sufficient subscribers sometimes last 3 years;
- Banks have problems in assessing broadband projects and their profitability. They are generally not willing to accept the invested infrastructure as a collateral as there is no functioning market to sell glass fibre networks.

It is difficult for the public sector to address these barriers with financial support due to the specific State aid regime for ICT. Public support is limited to 'white areas', where there is no existing New Generation Access network (NGA, more than 30Mb/s) leaving out areas where are there are already operators offering NGA access, so called 'grey and black areas'.

The *ex-ante* assessment identified a market gap of debt financing of between EUR 440m[170] and EUR 600m for the period 2017-2023. A loan instrument with an allocation of almost EUR 250m was proposed. The original *ex-ante* assessment did not consider the use of a guarantee instrument. The risk coverage *per* transaction, because of State aid considerations, is limited to 80% of the outstanding loan and the remaining risk would have been more than financial intermediaries are willing to accept. A risk-sharing loan with a minimum 5% contribution by the financial intermediary was considered instead.

The Polish national promotional bank, BGK, was identified as FoF manager for the instrument and several financial intermediaries were intended to be selected through a series of competitive tenders. It was also recognised that there is a need for capacity building on the level of BGK and financial intermediaries in order to assess market risk in this sector.

[169] WYG PSDP, *Ex-ante* assessment for financial instruments in the framework of the Operational Programme '*Cyfrowa Polska*', 2017, p. 34.

[170] All amounts in the *ex-ante* assessment were calculated in Polish Złoty (PLN). For this case study a simplified ex-change rate of EUR 1 = PLN 4 was used.

Scope

The financial instrument is designed to be complementary to existing grants schemes under the Operational Programme. The scope of eligibility is significantly wider than for grants covering project preparation cost, active and passive infrastructure, investment into connection to the client and working capital necessary for realisation of the project. Whereas grants are limited to 'white areas', the loan instrument can support investments also in 'grey' and 'black areas'. In order to qualify for the project, household and business clients need to secure access to broadband infrastructure of at least 30Mb/s networks and educational institutions of at least to 100 Mb/s.

Financial allocation and governance

In the funding agreement of February 2017, EUR 230m[171] from ERDF funding originating from the '*Cyfrowa Polska*' OP was committed to the FoF for the broadband loan instrument. There is no public national co-financing in the scheme. Additionally, financial intermediaries have to contribute at least 15% private national co-financing to the financial instrument, resulting in OP resources of EUR 270m being available for the instrument.

Two financial intermediaries have been selected in the first two selection processes: the commercial bank, Alior Bank, and the loan fund *Towarzystwo Inwestycji Społeczno-Ekonomicznych* (TISE – Social and Economic Investment Company). The amounts allocated to the financial intermediaries allow for a later increase of the allocation if the financial intermediary is successful in deploying the instrument without the need for a further selection process. Both financial intermediaries already have wide experience in implementing ESIF financial instruments under different OPs. As part of the selection process, the financial intermediaries had to prove that they have the technical capacity to appraise projects in the ICT sector.

Financial products and State aid

The loan can cover up to 95% of the eligible cost of the projects with the remaining amount to be provided by the network operator. The minimum size of a loan is EUR 5 000 and the maximum is EUR 12.5m, with an expected average size of loans of EUR 170 000. The maturity of the loan is 15 years with a grace period of up to 2.5 years, depending on the needs of the client. The ESIF part of the loan will be priced at 0.25% *per annum* and no fees will be charged. Risk related interest and fees will be charged on the part provided by the financial intermediary. Alior Bank for example, charges a bank commission of 2% and an interest rate of 4.4% *per annum* on average[172]. The loans are provided under the *de minimis* rules and thus they can be used in white, but also 'grey and black areas'. In the case of larger loans the interest rate of the ESIF share will be increased, so that the Gross Grant Equivalent (GGE) can remain within the *de minimis* threshold. Alternatively, loans are offered at the EU reference rate.

Leverage

With EUR 230m from ERDF funding and a total volume of the loan instrument of EUR 270m, the expected leverage of the instrument over the ESIF contribution is 1.17. The total amount of investment that is expected to be mobilised by the instrument is at least EUR 280m, including the own resources provided by the final recipients in their respective projects. This should allow almost 100 000 final clients to have NGA broadband access.

---

[171] The total amount of allocation is according to EC, *Summaries of the data on the progress made in financing and implementing the financial instruments for the programming period 2014-2020 in accordance with Article 46 of Regulation (EU) No 1303/2013 of the European Parliament and of the Council* – Status as at 31 December 2018, 2019, p. 112.
Available here: https://ec.europa.eu/regional_policy/sources/thefunds/fin_inst/pdf/summary_data_fi_1420_2018.pdf.

[172] Alior Bank, 'Broadband loan at Alior Bank'. Please see: https://cppc.gov.pl/images/uploads/ALIOR_CPPC_warsztat_06022018.pdf.

Lessons learned

Barriers and challenges

The implementation of the instrument was much slower than originally expected. As of March 2019, only EUR 33m have been allocated to financial intermediaries and in total EUR 9.5m have reached final recipients. Various challenges have been reported to be making the roll out of the instrument difficult[173]:

- The risk of broadband projects is very high. According to a follow-up *ex-ante* assessment finalised in 2018, the expected risk of projects on average is 30% and the unexpected is 15%. Because banks have to use the normal scoring methods, the majority of projects are not considered bankable and small operators cannot provide sufficient collateral;
- The loan instrument is covering only a part of the financing needs of broadband investments. Working capital, Value Added Tax (VAT), and the cost of acquisition of networks from competitors are not eligible;
- The loan instrument was not sufficiently attractive for financial intermediaries, as the focus is on providing cheap funding, but not on risk-coverage.

Addressing the challenges

In response to the challenges, the Ministry of Infrastructure and Development undertook an update of the *ex-ante* assessment in 2018, as referenced above. As a result of the assessment, several changes to the loan instrument were introduced in response to the challenges mentioned above:

- The scope of eligible expenditure was significantly widened. VAT and working capital associated with the investment can now be financed with loans. It is also possible to receive financing for projects that are already in construction, but have not been physically completed;
- Additionally, it is now possible for the financial instrument to finance projects receiving grants. The eligibility is limited to the costs that are not eligible under the grant, with the exception of VAT of the grant operation.

It is expected that these measures will accelerate the absorption of funding, it will allow more operators to access the funding and more projects to be supported. Additionally, it is expected that the instrument will help developing broadband financing in Poland.

In 2018, BGK reduced the allocations to the loan instrument to EUR 145m and allocated the remaining amounts of EUR 105m to a new guarantee instrument addressing the same market. The guarantee instrument is expected to better address the needs of financial intermediaries and final recipients. It is expected that allocations of EUR 105m, will allow for a guaranteed amount of EUR 217m and total of new loans issued of EUR 271m. The guarantee rate on a deal-by-deal basis is 80% and a single guarantee may amount to EUR 2.5m. The low multiplier of 2.5 between the amount of OP resources and new loans, reflects the high level of risk in the market. Compared to the loan instrument, the guarantee instrument is simpler to administer for the bank providing the loan, as there is no detailed check required for the eligible expenditure. Additionally, the maximum maturity has been extended to 20 years. The guarantee is provided without guarantee fees.

So far, BGK has selected four banks lending under the guarantee instrument financial intermediaries to implement the guarantee instrument. These are Alior Bank, which is also implementing the loan instrument, PEKAO S.A., *Spółdzielcza Grupa Bankowa* – SGB (Cooperative Banking Group) and *Bank Polskiej Spółdzielczości* – BPS (Polish Cooperative Bank). The cooperative banking groups have a strong position in the rural areas.

[173] BGK, *Financial instruments of the Operational Programme 'Cyfrowa Polska'*, 2019. Please see: https://www.uke.gov.pl/download/gfx/uke/pl/defaultaktualnosci/36/193/1/popc_bgk_warsztat_instrumenty_finansowe_popc_19_03_2019.pdf.

Key enabling factors

The financial instrument focussed its support on the 'last mile' of broadband delivery to final customers. This was made possible through the small ticket size of loans. The average size of EUR 170 000 is small for infrastructure related investments.

From the very beginning it was important that there was sufficient ICT specific technical capacity on the level of FoF manager and financial intermediaries. The financial intermediaries need this expertise on the one hand to be able to appraise the projects, but also to be recognised as business partners by the final recipients.

Flexibility in the design of the instrument is essential in sectors where there is little experience with financial instruments. This means that the funding agreements should be sufficiently flexible to allow adaptation of the financial product to market needs. The selection of financial intermediaries also should be flexible enough to allow the reallocation of amounts that are not used to other financial intermediaries or other financial products.

The managing authority and the FoF manager had regular exchanges with the regulatory body, the financial community and *Krajowa Izba Komunikacji Ethernetowej* (KIKE – the National Chamber of Ethernet Communication) as representatives of the broadband industry. This created awareness about the instrument and allowed also to adapt the instrument in a collaborative way with the market players.

7.3 Market opportunities

Broadband is the term used to define 'fast Internet speeds' that can be achieved either through fixed or mobile connections. There are several types of broadband technologies, which are summarised in the table below.

Table 24: Overview of the main broadband technologies

Type	Technology<	Indicative download speed[174]	Indicative upload speed
Fixed (Wired)	Optical fibre (FTTP[175])	up to 10 Gbps	up to 10 Gbps
	Coaxial cable (DOCSIS 3.0[176])	300 Mbps up to 2 Gbps	up to 50 Mbps
	Copper phone (DSL[177])	5 Mbps up to 100 Mbps	up to 10 Mbps
Mobile	Terrestrial wireless (LTE[178], 4G, 5G, WiMAX, Wi-Fi)	60 Mbps	up to 10 Mbps
	Satellite	up to 30 Mbps	up to 8 Mbps

Source: ECA, Broadband coverage in the EU Member States, 2018. EC, Comparison of technologies, 2018.

Moreover, the broadband sector consists of two main indicators that describe the state of the market:

- On the supply side, **coverage indicators illustrate the level of deployment of broadband infrastructure** at national and regional level, which is also aggregated at the EU level; while

[174] The actual download and upload speeds of the copper and coaxial networks depend on the distance of the connection. The efficiency range is around only 0.2 km, while for fibre networks around 60 km.

[175] As for 'Fibre-To-The-Premise'.

[176] As for 'Data Over Cable Service Interface Specification'.

[177] As for 'Digital Subscriber Line'.

[178] As for 'Long-Term Evolution'.

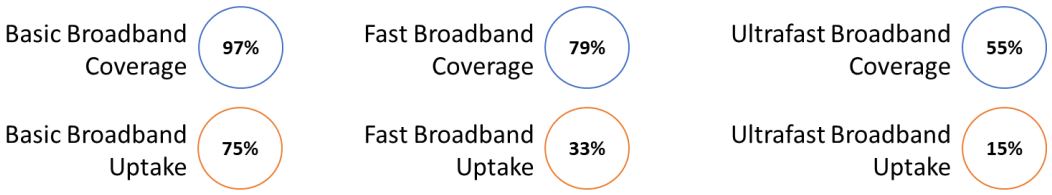
- On the demand side, **the penetration rate**[179] **proxies the level of demand in an area**. This indicator is important for the present stocktaking study as the DAE 2020 specifies as an objective, a 50% uptake of ultra-fast broadband (hence a '50%' penetration rate of ultra-fast broadband).

The present section indicates the existing gaps in the current coverage levels of various technologies across Europe. Furthermore, it analyses the current penetration rates across the EU, and discusses several reasons that explain the current uptake of broadband in the EU, such as: price, usage, and the telecom market that conditions the current state of broadband in Europe. A summary of the estimated investment needs is presented at the end of the chapter (*see Section 7.3.3*).

7.3.1 Fixed broadband coverage

The coverage level in the EU from both fixed and mobile broadband stands at 99.9%, meaning that 219 million households are connected[180], which meets the first target of the DAE 2020 strategy. The figure below indicates significant difference between coverage by infrastructure and the uptake. This refers to the barrier of providing access to broadband on 'last mile', meaning the connection to the household.

Figure 43: The EU coverages and uptakes of fixed broadband technologies



Source: EC, Digital Economy and Society Index Report 2018 – Connectivity, 2018.

National coverage

Although some MS report quite significant white areas for fixed broadband (*e.g.* Poland 13%, Romania 12%, and Estonia 11%), they are assumed to be covered by mobile networks. However, as the GS 2025 strategy is already being prioritised, **these gaps will still have to be addressed**, especially in rural areas, in order to enable ultrafast broadband coverage.

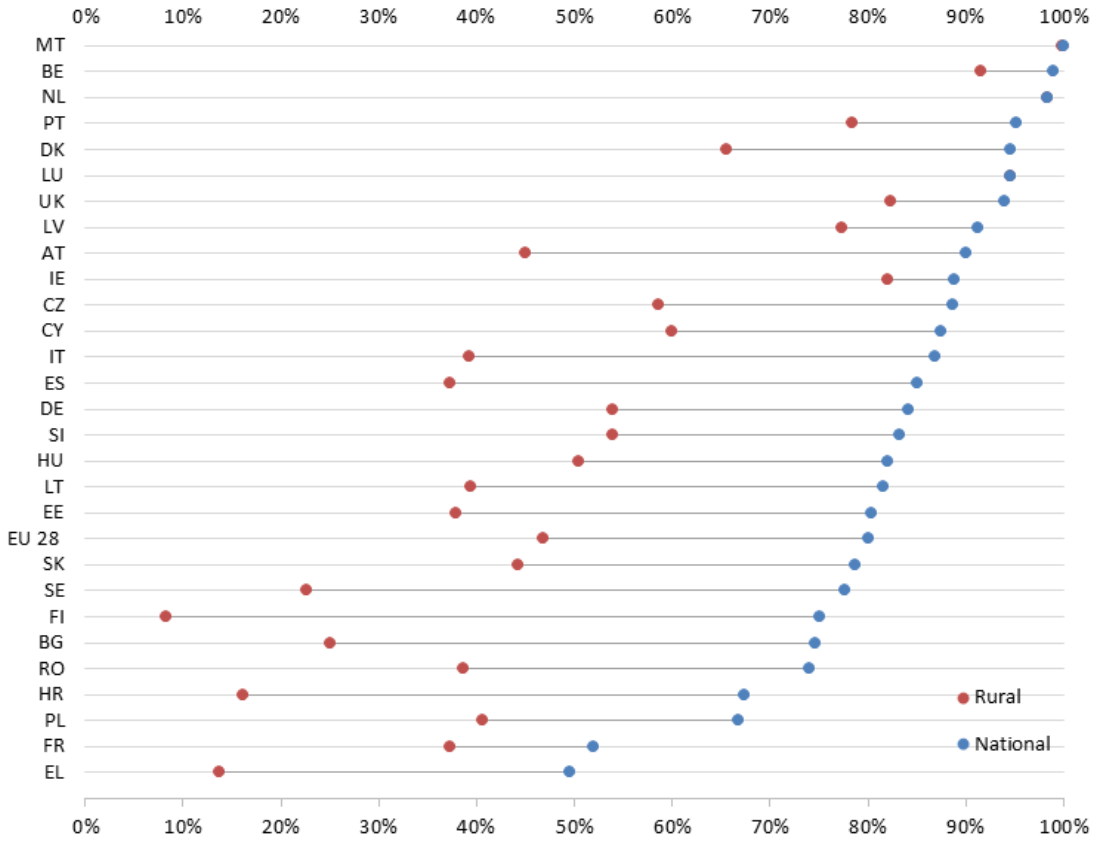
With regards to Target 2 of the DAE 2020 strategy, Next Generation Access (NGA) **coverage has reached 80.1%** in July 2017[181]. The figure below presents the situation at national levels, and compares it to the respective coverage in rural areas.

[179] The 'penetration rate' is defined as the number of households subscribed to Internet providers as a share of all connected households in an area.

[180] European Commission, *Digital Economy and Society Index Report 2018 – Connectivity*, 2018.

[181] It is to be noted that the NGA coverage is 80.1% while the level of fast broadband is at 79%. This slight difference is due to the decreasing performance of copper (DSL) and cable (DOCSIS 3.0) networks when distance is increasing. This similarly affects the ultrafast broadband coverage in terms of speeds (55%) and technology (57.8%).

Figure 44: Next Generation Access coverage at national and rural levels in 2017 (in % of households)



Source: EC, Digital Economy and Society Index Report 2018 – Connectivity, 2018.

As such, at an aggregate EU level, there is **a significant gap in broadband coverage** (20.9%) that still has to be addressed. As a consequence, the EU is most likely not going to meet the 2020 target of 100% fast broadband coverage[182]. This gap is translated into an **additional investment need of around EUR 34bn**, which was estimated in 2016 and may be lower at the time of writing of the present study[183].

In terms of ultrafast connectivity, which is based on fibre (FTTP), and enhanced cable connections (DOCSIS 3.0), **the coverage at EU level equalled 57.8%** in mid-2017. Fibre, which is going to be the critical technology to meet the 2025 targets, stood at only a 26.8% coverage at EU level in mid-2017. In the meantime, as of September 2018, **the EU average increased to 36.4%**[184].

As there is no specified EU target for ultrafast coverage, but only for subscription level, it has been argued that the absence of a coverage target created an additional challenge for public authorities[185]. In any case, this complicates the estimation of the necessary coverage levels required to achieve a 50% penetration. Nevertheless, the EC estimates that **an additional EUR 92bn of investments will be needed to achieve a 50% uptake of ultrafast broadband by 2020**[186]. Moreover, **in line with the 2025 targets**, some countries which have

[182] ECA, *Broadband in the EU Member States: despite progress, not all the Europe 2020 targets will be met*, 2018.

[183] European Commission, SWD (2016) 300, 2016.

[184] FTTH Council, *Europe Panorama*, 2018.

[185] Analysys Mason. Retrieved from: http://www.analysysmason.com/About-Us/News/Newsletter/2020-DAE-broadband-targets-Oct2015/.

[186] European Commission, *SWD (2016) 300*, 2016.

intensively invested in fibre infrastructures should be on track to meeting these targets. However, countries such as Greece and Italy still need significant investments.

The data indicate that in a number of MS there are significant investment needs that need to be addressed in order to achieve EU targets. Considering the past progress in investment in infrastructure it is unlikely that the broadband network operators will undertake the investment without public incentives. There is scope for public intervention with the support of ESIF, such as financial instruments to accelerate the deployment of infrastructure.

Rural coverage

The national level indicators relative to broadband coverage largely depend on the gaps in rural areas (in comparison with both urban areas and national targets). As such, a detailed analysis of broadband in rural areas is needed to identify additional needs for financing supply and potential investment gaps in the 'ICT infrastructure' sector.

Although 99.4% of rural areas have at least one basic broadband connection, **fast broadband is available only for 46.9% of households,** representing a big gap with the DAE 2020 target. According to the main sectoral stakeholders, the main cause behind this situation is the **unwillingness of the private sector to invest in scattered, low-density rural areas** due to the higher marginal cost of connection. The cost of deploying broadband in rural areas is on average 80% more expensive than in towns and cities[187]. It is estimated that the financial viability threshold is around EUR 600-700 *per* house passed, while the cost of deploying fibre in rural areas (*i.e.* territories with less than 100 inhabitants *per* km^2) exceeds EUR 2 700

The big gap existing in NGA and ultrafast broadband in rural areas may build the case for deploying the latter type of connectivity by directly prioritising the 2025 targets. However, this decision should be based on a cost-benefit analysis of building fibre networks or going for cheaper alternatives (*e.g.* mobile technologies) that offer comparable speeds, given the overly-expensive deployment of FTTP in rural areas.

Broadband penetration

Data from July 2018 indicates that at the EU level, **77% of the households have a fixed broadband subscription**[188]**.** In addition, the penetration rate has been increasing since 2009, but growth has slowed down mainly due to competition with mobile internet[189]. In rural areas, 70% of the households had a fixed broadband subscription in 2017, representing **a gap of 7% in penetration rate** compared to the national levels.

It is to be noted that only the Netherlands and Belgium have penetration rates of fast broadband higher than 60%, mostly due to their extensive cable networks. In parallel, Sweden and Romania are leading with over 40% of subscriptions in the ultrafast category, mainly because of their extensive fibre networks. Cyprus, Italy, and Austria have high levels of fast broadband coverage, but the uptake rates to fast and ultrafast broadband are significantly lower. **This implies either that demand is not present and its stimulation (if present) has not been effective, or that the market has not been able to serve the existing demand, suggesting the presence of a market failure to be addressed by public intervention**. The last reason may imply a potential role for publicly-supported financing schemes such as financial instruments especially in combination with incentives to the final user of the infrastructure covering the cost of connecting to the broadband network.

In conclusion, although the uptake of ultrafast internet will likely increase with the advent of increased digitisation, **intervention mechanisms on the demand side are needed to stimulate and incentivise this demand**

[187] Schneir & Xiong, *A cost study of fixed broadband access networks for rural areas*, 2016.

[188] Eurostat, http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do.

[189] European Commission, *DESI Report 2018 – Connectivity*, 2018.

for ultrafast broadband. Following this, financial instruments addressing broadband coverage in the EU (as part of the potential public interventions) should take into account the demand side primarily by making the access to broadband more affordable for final consumers (including in rural areas).

7.3.2 Mobile broadband market

This sub-section presents the state of the EU mobile broadband market. In terms of coverage, the figure below presents the state of wireless coverage across MS as of July 2017. At the EU level, 98% of the households were covered by 4G networks, while in the rural areas 90% of them had the same access.

There is **a substitution effect between fixed and mobile broadband technologies**, meaning that consumers tend to access the internet either through a fixed or through a mobile connection. This occurs: (i) in countries where fixed broadband coverage is insufficient, (ii) if the mobile offer is similar in speed and price, and (iii) if the demand for data connection does not make the mobile offer too expensive compared to a fixed connection for the end consumer. If these conditions are not met, then a rather complementary effect is observed.

Moreover, in the current context of 5G networks deployment as well as of an increased demand for faster connectivity and data connection in general**, a convergence effect of fixed and wireless solutions seems to occur**. In this context, it is to be assumed that mobile networks (especially 5G ones) will be less likely to sustain the increased demand without an underlying fixed backbone network [190]. The implications for **a public intervention through financial instruments thus needs to take into account the current state and the forecasted outlook of mobile broadband usage**.

It is expected that the deployment of 5G will increase the urban-rural divide in access to IT infrastructure. Therefore 5G technology in rural areas where applications in agriculture or tourism rely on this technology should be supported with public support for example financial instruments.

7.3.3 Investment needs

The above analyses of the current fixed and mobile broadband markets indicate a clear investment gap. All these identified needs and issues in both supply and demand sides in relation to the broadband markets are translated into several investment needs. Although detailed analyses of investment needs that would quantify the exact needs of the identified gaps do not exist, multiple estimations of investment gaps at the aggregate EU level have been proposed by the EIB and Analysys Mason. Indeed, when considering the 2025 targets – which translate into a complete rollout of fibre networks in the EU – several estimates have been proposed. The table below presents these estimates.

[190] Vantage Point, *Evaluating 5G wireless technology as a complement or substitute for wireline broadband*, 2017.

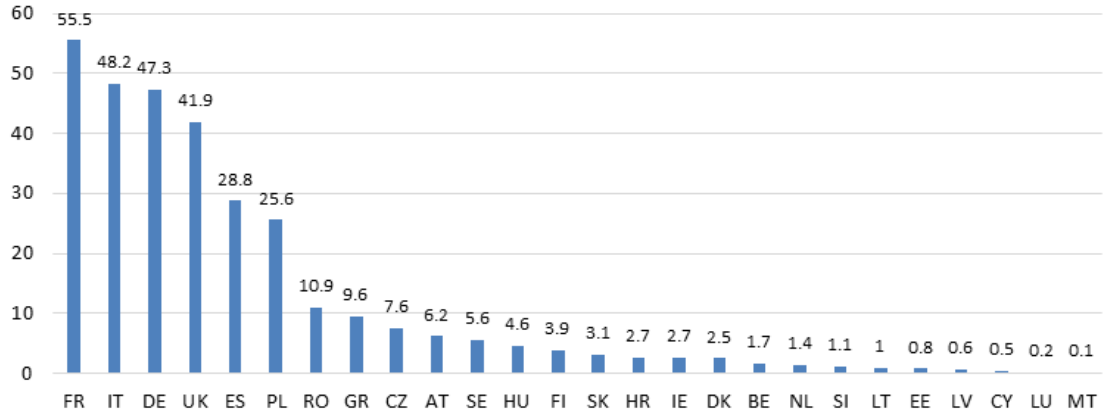
Table 25: Estimated investment gaps to meet the 2025 targets in the 'ICT infrastructure' sector

Investment need	Year of estimation	Source
EUR 221bn for fibre rollout[191]	2011	The EIB Group
EUR 250bn for FTTP rollout[192]	2013	Analysys Mason
EUR 183bn for rural FTTP deployment[193]	2016	Analysys Mason
EUR 155bn investment gap to meet all 2025 targets[194]	2016	Analysys Mason

Source: EIB Group, Analysys Mason, several years and sources, compiled by PwC, 2019.

Another study by the World Economic Forum (WEF) estimates the investment needs to fully deploy 100 Mbps broadband by country, which will enable the creation of an EU Digital Single Market. The figure below presents these estimations. The latter indicate that the largest investment needs remain in the largest EU Member States.

Figure 13: Estimated investment needs to meet the 2025 targets by Member State (in bnUSD)



Source: WEF, Financing a forward-looking internet for all, 2018. Please consult the report for a detailed description of the methodology used.

These estimations suggest that the investment needs are in all cases considerable and that the currently committed public funding will not be enough to make the transition to ultrafast broadband possible. In line with this currently limited public funding, financial instruments should be able to unlock significant private investments to achieve the Digital Single Market strategy of the EU.

7.4 Barriers

The 'ICT infrastructure' sector is currently facing barriers that limit the uptake of investment opportunities. The present section outlines the main barriers hindering:

- Investment in the 'ICT infrastructure' sector; and the ones hindering
- The wider uptake of ERDF / CF-supported financial instruments in the 'ICT infrastructure' sector.

[191] EIB Papers – Productivity and growth in Europe: ICT and the e-economy.
[192] Analysys Mason, The socio-economic impact of bandwidth, 2013.
[193] Analysys Mason, Costing the new potential connectivity needs. SMART 2015/0068, 2016.
[194] Analysys Mason, Costing the new potential connectivity needs. SMART 2015/0068, 2016.

7.4.1 Barriers hindering investments in the 'ICT infrastructure' sector

The barriers that slow down investments in the sector depend on the type of technology deployed. For fibre networks, the challenges hindering investment are the most stringent compared to less technologically-advanced types of broadband. These include (i) high investment costs, (ii) higher subscription prices, and (iii) more regulated ecosystems. Nevertheless, as only optical fibre technology will be capable of delivering the EU 2025 targets, the investment barriers in FTTP infrastructure should be prioritised. Most of these barriers relate to the lack of incentives for the telecom industry, especially the incumbents and other private investors to upgrade the existing infrastructures or invest in new fibre networks. They are highlighted in greater detail in the following paragraphs.

National administrative burden related to permit regulation(s)

At national level, the existing regulations on construction permits may in some cases slowing down the deployment of ultrafast broadband infrastructures. The existing procedures to get **the construction permits for civil works are time-consuming**. This increases, on the one hand, the **cost related to the preparation of the investment**, and, on the other hand, the **risk of delays in the implementation schedule**.

Moreover, in some MS, **permit regulations differ regionally**, and large-scale projects are facing increased transaction costs in a context of inconsistent regulatory frameworks. This not only delays the delivery process, but also increases the investment cost.

Competition with existing technologies proposed by incumbents

The presence of technologies proposed by incumbents in a specific area limits the potential of deploying ultrafast broadband infrastructures. This is driven by two main aspects:

- First, **incumbent operators** who own most of the copper (DSL) and cable (TV) networks **do not necessarily have an incentive to build new infrastructures**. An example is VDSL technology, which updates the copper connection or DOCSIS 3.0, and then offers relatively high speeds through cable.
- Second, market entrants willing to develop their fibre networks can be discouraged by the **incumbents' cheaper offers** of reasonable quality of services. Vectoring is used to improve the performance of existing infrastructures by 30-50%[195] which is sufficient for many of the clients. It is a cheaper alternative than rolling out fibre technology. This decreases the potential demand for faster broadband since current service is sufficient for many clients in terms of quality and price. But the EU targets can only be achieved with investment in fibre networks.

Limited revenue potential in sparsely populated areas

According to sectoral stakeholders, the main reason for the gap in broadband coverage between rural and urban areas is the **unsustainable business model of the market in sparsely populated areas**. This is related to the higher investment cost required *per* connected home, given the larger distances between the premises. In turn, the price that should be set for the final customers is getting higher than their 'willingness-to-pay'. These costs increase even higher when fibre networks are deployed. Following that, the insufficient return on investment of the projects (since the operation costs cannot always be covered by the subscription fees) result in a lack of bankability of such projects in areas where limited demand exists. This situation points out to a market failure,

[195] Vectoring is a technological method that decreases the interferences between the cables attached to each other, which generally increases the connectivity speeds.

and consequently room for an adapted public intervention (which would potentially include a publicly-supported financing scheme).

Uncertain and limited demand in some areas

The estimated demand in an intervention area is a key driver, as well as a barrier, for telecom operators' investments. Demand estimation becomes a challenging task for these operators because of the **uncertainty related to the final uptake of the services** that may be implemented. This factor often limits the willingness of the operators to expand their coverage in some areas.

In return, the lack of investments in these areas is often one of the causes that limits demand. This demand then cannot increase due to the limited infrastructures; while an insufficient demand usually limits the willingness of the operators to expand their networks. This situation indicates the importance of **stimulating demand and supply simultaneously when developing the broadband network**. Meaning the expansion of infrastructure should be accompanied with the provision of data intensive public services such as e-health or incentives to enterprises to use cloud based services.

Limited incentives for households to upgrade their in-house infrastructure

Demand risk is one of the main barriers that limits the investment uptake by private investors. This may result in a limited pipeline of potential projects for financial instruments. Since investors are afraid that **customers will not be ready to upgrade their own facilities for high-speed broadband due to higher costs**, they do not go beyond their current activities. Users are very sensitive to prices in the broadband market, so if the upfront cost for accessing new service is perceived as too high households and SMEs shy away from the investment. Supporting mechanism to make the access to networks more affordable, such as investment grants or will encourage user to subscribe to high(er)-speed broadband.

7.4.2 Barriers hindering the uptake of ERDF / CF-supported financial instruments in the 'ICT infrastructure' sector

Although several market opportunities for public intervention have been identified, the 'ICT infrastructure' sector is not extensively making use of financial instruments during the 2014-2020 programming period (*see Section 7.2 above*). Several barriers to a higher uptake have been identified and discussed with the sectoral stakeholders.

Limitation in the State aid regime

As presented in the sections above, broadband investments may benefit from grants or operational subsidies. However, the access to both financing sources is limited mainly to white areas or assisted regions. The **scope of the State aid limits which interventions can be financed**, leaving the grey areas beyond its scope. These territories struggle with bankability problems, while they need public support to unlock access to financing, including *via* financial instruments.

Limited number and types of private investors

Broadband investments in the EU have been largely financed by vertically-integrated telecom operators. **Project financing in the 'ICT infrastructure' sector has played a marginal role**, compared to other sectors implying also large infrastructure such as transport and utilities. As banks have been (until now) the main financing actors of broadband projects, other potential private investors have not been sufficiently involved. It is argued that long-term focused investors, such as pension funds and insurance companies, could serve as a significant source of

investments. The ability of ICT infrastructure investments, after an initial ramp-up period, to generate stable long-term cash flows make them attractive to institutional investors. However, this has not materialised so far in the EU, mainly due to the lack of investable projects.

Limited pipeline of investment-ready projects

As stressed by the consulted sectoral stakeholders, the **number of investment-ready projects in the 'ICT infrastructure' sector is limited**. This impacts the demand for a dedicated financial instrument. Since the decision to design and implement financial instruments is strongly driven by the availability of a sufficient pipeline of viable projects, it is important to understand what the underlying reasons for this situation are. For instance, adjusting the ticket sizes provided by the financers to the market needs is one of the drivers that may increase the number of available investment-ready projects in the sector. Indeed, **proposing financial instruments that can aggregate smaller investments / projects is expected to result in a significant increase of the number of investment-ready projects**.

Limited availability of experts and potential financial intermediaries

The involvement of experts with sufficient sectoral knowledge, including fund managers and/or financial intermediaries, is key to develop a mature pipeline of projects. Access to sectoral expertise at the level of fund managers is needed to achieve sufficient scale for financial instruments, and to involve / attract additional investors into the funding scheme.

Involving sectoral experts at the level of managing authorities in the development of financial instruments in the 'ICT infrastructure' sector can therefore facilitate the whole (future) ecosystem around the financial instrument(s). This would translate into (i) an improved and facilitated projects pipeline development, as well as (ii) a higher interest from various potential investors to participate into / co-finance the financial instrument(s). This would also develop the use of project finance schemes in the 'ICT infrastructure' sector.

7.5 Potential for the use of financial instruments in the 'ICT infrastructure' sector

This section presents proposals for financial instruments which could stimulate the demand for higher quality broadband services, and incentivise operators to carry out more investments in the sector. Such financial instruments aim to (i) help make 'ICT infrastructure' projects more bankable, and/or to (ii) address / reduce the high risks associated with investment in the sector.

Loans for households and SMEs for the last mile connection

Micro-loans with preferential conditions dedicated to households and SMEs could boost an upgrade of in-house broadband infrastructures. The primary objective of this instrument would be to **foster the technological upgrade of the final users' infrastructures**, while the secondary objective would be to **increase the demand for fast-broadband services**. This mechanism could incentivise the demand for broadband services and **stimulate the uptake of investments** by the operators, who would be less constraint by the existing demand. This financial instrument should be designed in parallel with demand stimulating measures, such as vouchers and/or investment grant schemes, that could be implemented by public authorities using ESIF or own public resources.

Credit enhancement

Operators investing in the newest technologies with the capacity to unlock access to ultrafast broadband face the risk of uncertainty about **demand** for their services. Usually, time is needed to achieve a sufficient number of subscriptions to these types of internet contracts due to their higher costs for the final users. Since the uptake of new infrastructures by consumers will take more time, operators need access to **financial instruments which will accept this higher risk**. **Subordinated loans**, providing credit enhancement could be an adequate form of finance that would support private sector promoters in upgrading broadband infrastructure in view of meeting the connectivity targets.

Furthermore, in areas with higher demand risk subordinated debt can be used to provide operators access to affordable long-term loans. The loans would act as **credit enhancement** to lenders by protecting, at least partly them from demand risk.

State aid rules for grey and black areas require that financial instruments providing credit enhancement need to be priced to market terms. In white areas aid may be provided more easily to operators.

Loans combined with grants

Broadband interventions in sparsely populated areas are hindered the **very high investment costs *per capita*** necessary to connect rural areas to existing infrastructures. A combined instrument offering an access to **long-term debt with a grant component** could facilitate investments in these areas. The **grant could be used to connect sparsely populated area** – *i.e.* villages – to the infrastructure. Often the distances between towns and villages are important, and require significant investments that cannot be covered by revenues generated by the services. However, by making this connection using grants, the **remaining part of the intervention**, either in the village or in the town, can **become bankable**. As soon as the connection is established, the other services may be financed through financial instruments, such as **long-term debt with preferential conditions**.

Such combined forms of support need to be assessed from a State aid perspective. Without notification of the support scheme, State aid is currently only possible in white areas. Otherwise it needs to be ensured that the operators pass on the financial advantage to the end users of the infrastructure.

Debt and equity financing to address smaller projects

In countries, such as Poland and Hungary, where there are many small ICT infrastructure operators active in the 'last mile' segment loans to SMEs operating in this sector can be provided. Due to the long repayment period and uncertainty in uptake loans have to have longer maturity than normal SME financing. Experience shows that loans within the '*de minimis*' threshold can address the financing needs of small operators and also be used in black and grey areas.

The two EU-level financial instruments existing in the 'ICT infrastructure' sector, the Marguerite Fund and the CEBF, have shown that it is feasible to provide equity financing from patient public sector investors to ICT infrastructure projects, especially when there is insufficient private investment. Both fund managers operate on an EU-wide scale and invest only in projects of larger size. An ERDF / CF funded equity fund could **co-invest into smaller projects** that do not attract internationally operating investors. Investment on a *pari passu* basis with the network operator would avoid the limitations from State aid.

7.6 Key enabling factors for the use of financial instruments

Even though ERDF / CF-supported financial instruments have not been widely used across Europe in the 'ICT infrastructure' sector, the two MS that have developed financial instruments in the sector have also established good practices for financing broadband interventions that could stimulate the uptake of this financing mechanism in the future. Both instruments provide loans to operators, and are working under the *de minimis* regulation, which limits the support to smaller projects and operators.

In that context, State aid regime provides a demarcation line between EU-level financial instruments and ESIF-supported financial instruments in the sector. While EU-level financial instruments, which due to their State aid consistency, can support larger operators, as well as grey and black areas, **ESIF-supported financial instruments** can be used to **finance small and medium sized operators**, as well as investments of a larger scale in **white areas**. Both types of financial instruments are consequently complementary and ESIF-supported financial instruments have a role to play in parts of the 'ICT infrastructure' sector that are currently not addressed by EU-level financial instruments.

7.6.1 Developing awareness about financial instruments among managing authorities

There seems limited awareness of the potential for financial instruments in the sector among managing authorities. The opportunity should be used to draw on the two existing ESIF-supported financial instruments, and similar successful schemes, to promote the use of financial instruments in the 'ICT infrastructure' sector. Due to the State aid regime and regulatory complexity in the sector, it is also useful to **involve national network regulators** early in the design of potential financial instruments.

7.6.2 Adjusting the ticket size to the market needs

To boost the uptake of new technologies and to support smaller operators, it becomes important to adjust the offer of products to the needs of smaller promoters. **A reduction of the ticket size is one approach to increase broadband coverage**.

The Polish National Promotional Bank ('*Bank Gospodarstwa Krajowego*', BGK), has developed a broadband loan product that serves the needs of projects between EUR 4 600 and EUR 2.3m. This instrument is designed to support the construction, extension and/or reconstruction of broadband infrastructures that offer at least 30 Mb for households and businesses, and at least 100 Mb for educational entities.

7.6.3 Designing financial instrument-friendly Operational Programmes

Financial instruments require a sufficient pipeline of investable projects in order to make them economically viable, and attract financial intermediaries to implement them. To avoid multiple Funding Agreements, contributions from multiple Priority Axes, and the complexity of coordinating several managing authorities or Intermediate Bodies, it is advisable **to concentrate contributions to financial instruments within the OPs**.

Financial instruments should support a large number of projects. It is therefore also advisable to **differentiate** already in an OP between **eligibility criteria for grants**, which need to be stricter, **and those for financial instruments**, that require much broader eligibility criteria to be viable. For example connection to the premise, working capital, VAT, and publicity cost to attract new subscriber may be considered eligible under financial instruments in order to make them more attractive for operators. Through this, it is possible to support non-profitable projects supporting policy priorities with grants, and other projects with revolving mechanisms. This approach also makes it easier to use financial instruments and grants in a complementary way.

7.6.4 Financing interventions using project finance schemes

Often broadband investments are sponsored by telecom operators who are active in certain territories. The ability to invest, using balance sheet financing, significantly decreases in the case of new promoters in the market willing to extend their activities to new regions. A good practice used by private sector promoters, consists of **delivering this type of project using project financing schemes**. A Public-Private Partnership (PPP) model can also be used in case of joint interventions of the public and private sector entities. The Gironde region in France is deploying ultra-fast broadband across smaller towns and rural areas using the PPP model. The region procured a network operator to invest EUR 669m in the deployment of 28 000km of optic fibre cable. Majority of the financing has been provided by the operator, with grant support from national and regional resources. The network will be publically owned but designed, built, maintained, financed and operated (DBFMO) by the private SPV.

7.6.5 Developing demand incentives schemes

There are two main reasons limiting investments in broadband infrastructures, and both of them are related to demand risk. The demand for broadband services is one of the key barriers since it impacts the cash flows of projects. On the one hand, the subscription level of final users is sensitive to the **price of the internet packages**, and, on the other hand, access to (ultra)fast broadband services requires an **upgrade of in-house infrastructures**. These two limitations can be addressed by the right demand incentive schemes. For example, **vouchers for households** could intervene by reducing the subscription fee, and by facilitating the affordability of (future) services[196]. Furthermore, the **set-up of dedicated financial instruments or the integration of ICT infrastructure in existing financial instruments for households and/or SMEs could support the upgrade of in-house infrastructures**.

7.6.6 Establishing a collaborative network of stakeholders

The development of **collaborative relationships between local public authorities and operators** could act as an import driver to boost investments in broadband infrastructures. Thanks to a more strategic approach, the development of **ICT infrastructure projects can be done jointly for multiple entities**, and can result in / create viable investments for streams of financing that are already available. The involvement of sectoral experts also becomes strategic when it comes to large investments.

For instance, the Katowice network project (SilesiaNet), in cooperation with the agglomeration of Silesian cities, may serve as an example of a successful project developed in Poland using ESIF[197]. This project connected above 100 publicly-owned entities to fast broadband, including schools and public institutions.

7.7 Overview – Key sectoral outputs for the 'ICT infrastructure' sector

The table below summarises the key outputs to consider for the further development of financial instruments in the 'ICT infrastructure' sector.

[196] Please see for example: https://ec.europa.eu/commission/presscorner/detail/en/IP_19_162.

[197] Please see: https://www.katowice.eu/Strony/SilesiaNet--budowa-spo%C5%82ecze%C5%84stwa-informacyjnego-w-Subregionie-Centralnym-Wojew%C3%B3dztwa-%C5%9Al%C4%85skiego--Miasto-Katowice.aspx.

Table 26: Overview of the key outputs of the stocktaking study for the further uptake of financial instruments in the 'ICT infrastructure' sector

	ICT infrastructure	
	Factors	**Impact on the development of financial instruments**
Barriers	National administrative burden related to permit regulation(s)	
	Competition with existing technologies proposed by incumbents	
	Limited revenue potential in sparsely populated areas	
	Uncertain and limited demand in some areas	
	Limited incentives for households to upgrade their in-house infrastructure	
	Limitation in the State aid regime	
	Limited number and types of private investors	
	Limited pipeline of investment-ready projects	
	Limited availability of experts and potential financial intermediaries	
Potential for the use of financial instruments	Loans for households and SMEs for the last mile connection	☆☆
	Credit enhancement	☆☆
	Loans combined with grants	☆☆☆
	Debt and equity financing to address smaller projects	☆☆
Key enabling factors for the use of financial instruments	Developing awareness about financial instruments among managing authorities	
	Adjusting the ticket size to the market needs	
	Designing financial instrument-friendly Operational Programmes	
	Financing interventions using project finance schemes	
	Developing demand incentives schemes	
	Establishing a collaborative network of stakeholders	

Source: fi-compass*, 2019.*

Legend:

Barriers

 Barrier with a limited negative impact on the uptake of financial instruments in the sector.

 Barrier with a noticeable negative impact on the uptake of financial instruments in the sector (dissuading the managing authorities or other stakeholders from developing financial instruments in the sector).

 Barrier with an important negative impact on the uptake of financial instruments in the sector (almost preventing the use of financial instruments in the sector).

Potential for the use of financial instruments

☆ Potential for such financial instrument scheme exists.

☆☆ Potential for such financial instrument scheme is high.

☆☆☆ Such financial instrument scheme may provide critical added value to the sector.

Key enabling factors for the use of financial instruments

Key enabling factor that facilitates the use of financial instruments in the sector.

Important key enabling factor to facilitate the use of financial instruments in the sector.

Critical key enabling factor to facilitate the use of financial instruments in the sector.

8 Foster the use of financial instruments in the 'Research, Development and Innovation in Small and Medium-sized Enterprises' sector

8.1 Policy context

Small and Medium-sized Enterprises (SMEs)[198] are the **backbone of the European economy**, while innovation is the **key driver to the SMEs' competitiveness**. The EU's efforts to create a business and regulatory environment conducive to the uptake of innovative activities are targeting both:

- Established SMEs, intending to enhance their performance with the use of innovative solutions; as well as
- Young, new-entrants, developing their competitive advantage based on innovation.

The lack of new innovators reduces the chances of introducing **breakthrough novelties**, which pave the way for the development of new markets through the creation of new products, services and business models. Despite a consensus on the benefits brought by innovation, **transforming innovative ideas into marketable products and services has been a challenge for Europe**. The following issues have been identified[199]:

- Creating the right investment conditions and constrained access to high-risk capital (*i.e.* equity financing);
- Reinforcing the innovation capacity of SMEs; and
- Supporting the industry in the development of products, which integrate different technologies.

To overcome the difficulty of converting knowledge and innovation into marketable products and services, the EU has developed a set of strategies defining the direction of the EU's innovation efforts. With regards to R&D, Europe 2020 Strategy has defined a target of investing 3% of the EU's GDP in R&D activities[200]. To support the implementation of Europe 2020 strategy, the EC developed seven flagship initiatives, with three of them being directly linked to the innovation efforts of the EU, namely:

- 'The **Innovation Union**';
- '**A digital agenda for Europe**'; and
- '**An industrial policy for globalisation era**'.

8.1.1 The EU-wide leading innovation policy instruments

To drive the implementation of the EU-level flagship initiatives strongly linked to innovation, the EC has developed a set of policy instruments designed to unlock financing for innovative activities across the private, public and research organisations.

The table below provides a summary of the major policy instruments deployed during the 2014-2020 programming period which can be used by SMEs for their RDI activities.

---

198 SMEs are firms that comprise less than 250 employees, which have a turnover of less than EUR 50m and/or a balance sheet size not exceeding EUR 43m.

199 European Commission. DG GROW Website. Industry – challenges for Europe.
Available here: https://ec.europa.eu/growth/industry/policy/key-enabling-technologies/challenges_en.

200 European Commission. Europe 2020 Strategy Website.
Available here: https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/eu-economic-governance-monitoring-prevention-correction/european-semester/framework/europe-2020-strategy_en.

Table 27: Key EU policy instruments supporting innovative activities of SMEs in the 2014-2020 programming period

Policy instrument	Objectives	Type of financing	Amount available in bnEUR
Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME)[201]	• At least 60% of the programme funds is allocated for improving access to finance for SMEs, *via* two financial instruments: – The COSME Loan Guarantee Facility (LGF) supports guarantees and counter-guarantees to financial intermediaries with an objective to unlock more loans and lease finance to SMEs; and – The COSME Equity Facility for Growth (EFG) focusing on investments in risk capital funds – provides Venture Capital and mezzanine finance for expansion- and growth-stage SMEs.	Guarantee	2.3
European Fund for Strategic Investment (EFSI)[202]	• Launched as a joint initiative between the EC and the EIB Group, EFSI aims to address the **structural investment gaps** that affect the competitiveness of the EU economy in the most strategic sectors. **RDI is one of the sectors, where an investment gap of approximately EUR 130bn is constraining the realisation of Europe's full economic potential**[203]. • EFSI has a dedicated SME Window implemented by the European Investment Fund (EIF) and an Infrastructure and Innovation Window managed by the EIB.	Guarantee provided to the EIB Group	As of July 2018, EFSI has mobilized EUR 375.5bn (more than its EUR 315bn objective by mid-2018) benefitting to more than 1 000 operations, and notably to the benefit of 858 000 SMEs[204]
European Structural and Investment Funds (ESI Fund)[205]	• The **ESI Funds dedicated to innovation activities amount to EUR 110bn over the 2014-2020 programming period** to accelerate investments in ICT, SMEs competitiveness, and low carbon economy. • The key priority areas are: KETs, advanced manufacturing, bio-based products, creative industries and tourism.	Grants and financial instruments	110
Horizon 2020	• This is the **main EU policy instrument focusing on innovation**. Its objectives are to: (i) boost private sector's technological leadership and innovation capability, (ii) leverage the contribution of research and innovation in order to tackle societal challenges, and (iii) strengthen the EU's science base.	Grants and financial instruments under InnovFin and VentureEU (*see below*)	77
InnovFin – EU Finance for Innovators[206]	• This joint initiative between the EC (co-financed with Horizon 2020) and the EIB Group aims to unlock finance for research and innovation activities, which otherwise may face challenges in accessing finance. Two key streams are related to SMEs: – Early stage enterprises (through intermediated equity financing); and – SMEs (through intermediate debt financing).	Debt, guarantee, and equity financing	Track record of EUR 14bn invested in innovation activities / projects from start-ups to research centres

[201] European Commission. EU support for business – COSME infographics.
Available here: https://ec.europa.eu/docsroom/documents/32041/attachments/1/translations/en/renditions/native.

[202] European Commission. Financing Programmes for SMEs.
Available here: https://ec.europa.eu/info/business-economy-euro/growth-and-investment/financing-investment/financing-programmes-smes_en.

[203] European Investment Bank. Evaluation of the European Fund for Strategic Investment. Available here: https://www.eib.org/attachments/ev/ev_report_evaluation_of_efsi_en.pdf.

[204] https://www.eib.org/en/efsi/index.htm.

[205] European Commission. DG GROW website. (Accessed on March 29, 2019). Available here: https://ec.europa.eu/growth/industry/innovation/funding/esif_en.

[206] InnovFin. EU Finance for Innovators. Available here: https://www.eib.org/attachments/thematic/innovfin_eu_finance_for_innovators_en.pdf.

Policy instrument	Objectives	Type of financing	Amount available in bnEUR
SME Instrument and Enterprise Europe Network	• These are two of the Horizon 2020 flagship initiatives related to SME innovation, directly related to fostering SMEs efforts in research, development and commercialisation of innovative products, services and processes. • The '**SME Instrument**' aims to unlock access to business coaching and acceleration services in order to facilitate the commercial development of innovation. It is a EUR 1.6bn grants fund which helps innovative SMEs to develop disruptive concepts of products, services or processes. It provides business innovation grants for feasibility assessment (for EUR 50 000 *per* project), as well as innovation grants for innovation development and demonstration purposes (from EUR 500 000 to EUR 2.5m *per* project). • The '**Enterprise Europe Network**' helps European SMEs to find competent and trustworthy business and technology partners. It also helps them apply for EU funding, by connecting over 3 000 experts in 50 countries.	Grants	The SME Instrument is a EUR 1.6bn fund
VentureEU	• To address the lack of **insufficient Venture Capital**, the EC has launched **VentureEU**: a policy instrument dedicated to supply European start-ups with VC financing necessary to develop, test and bring their ideas to market. Across the EU, a total of 1 500 start-ups and scale-ups is expected to benefit from the programme. • The VentureEU is an independently managed VC Fund-of-Funds, which brings together EUR 200m funds from Horizon 2020 InnovFin Equity, EUR 105m from EFSI, EUR 105m from COSME, and EUR 67m of EIF own resources. To ensure a market-driven approach, further financing will be mobilised by six selected fund managers and will mostly proceed from independent investors.	Equity	The total of more than EUR 470m of financing aims to mobilise EUR 2.1bn through the EIF and up to EUR 6.5bn of total investment[207].

Source: Various sources, Compiled by PwC, 2019.

[207] European Commission. VentureEU Factsheet. 2018. Available here: http://europa.eu/rapid/attachment/IP-18-2763/en/Factsheet%20VentureEU.pdf.

Horizon 2020 – the largest RDI programme in the world

The main EU's innovation policy instruments is Horizon 2020. With a budget allocation of EUR 77bn for a period between 2014 and 2020, it is the **largest RDI funding programme in the world**. By end of 2016, it was already successful in unlocking EUR 6.7bn from EU resources to finance innovative projects[208]. However, the demand for RDI financing in Europe is continuous and there is still room for other RDI financing programmes.

Box 5: Horizon 2020 – Key facts from the mid-term evaluation

Continuous demand for RDI financing: example of Horizon 2020

- Already three years after the launch of Horizon 2020[209], a total of over 100 000 eligible proposals were submitted, for a total EU financial contribution of EUR 182.4bn. Although around half of these proposals were evaluated by independent experts as high-quality, only one in four proposals received funding, amounting to a total EU contribution of EUR 24.8bn[210].
- An **additional EUR 62.4bn would have been needed to fund all high-quality proposals submitted**[211].
- **There is still room for the deployment of other financing mechanisms in addition to Horizon 2020**, including with ERDF.

Source: EC, Horizon 2020 mid-term evaluation, Turning excellence into success – enhancing Europe's innovation agenda, 2017.

To boost the current innovation efforts in the EU, the EC has presented in 2018 its '*Renewed Agenda for Research and Innovation – Europe's chance to shape its future*'[212] (*see the box below*).

Box 6: A Renewed Agenda for Research and Innovation – 'Europe's chance to shape its future' – Key takeaways

EC's proposition to enhance the EU Research and Innovation agenda

The Renewed Agenda introduces the concept of **Europe's innovation deficit**, not as the lack of innovative ideas, but as **challenges in the scaling-up, diffusion and commercialisation of innovation**. The implementation of these actions will be supported by new instruments including:

- **Creation of the European Innovation Council** offering a one-stop shop for high-potential technologies and start-ups.
- **Creation of new insolvency law** to allow for early restructuring and prevent bankruptcy.
- **Further leverage on ESIF to build a stronger innovation capacity** by strengthening the Smart Specialisation Strategies, which promote innovation based on regional strengths through initiatives such as **Innovation Hubs**, which provide SMEs with access to infrastructure and expertise to experiment with innovation.

Source: Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions[213]*, 2018.*

---

[208] Over the 2014-2016 period, EUR 24.8bn were allocated to grants, out of which approximately EUR 6.7bn (around 27%) were allocated to '*private for-profit companies*'. Based on calls in 2014, 2015 and 2016, Signed Grants cut-off date by 01/09/2017. For more information please refer to: European Commission, Horizon 2020 in full swing, Three years on, 2018. Available here: https://ec.europa.eu/programmes/horizon2020/sites/horizon2020/files/h2020_threeyearson_a4_horizontal_2018_web.pdf.

[209] Based on calls for proposals with call deadlines in 2016, with the cut-off date of 01.09.2017.

[210] European Commission, Horizon 2020 in full swing, Three years on, 2018. Available here: https://ec.europa.eu/programmes/horizon2020/sites/horizon2020/files/h2020_threeyearson_a4_horizontal_2018_web.pdf.

[211] European Commission, Horizon 2020 mid-term evaluation, 2017.

[212] European Commission, A renewed European Agenda for Research and Innovation – Europe's chance to shape its future, 2018. Available here: https://ec.europa.eu/info/sites/info/files/com-2018-306-a-renewed-european-agenda-_for_research-and-innovation_may_2018_en_0.pdf.

[213] European Commission, *A renewed European Agenda for Research and Innovation – Europe's chance to shape its future*, 2018.

8.1.2 Planned ERDF / CF investments for RDI in SMEs during the 2014-2020 programming period

The EU regional policy supports the most strategic sectors of the EU economy, including RDI in SMEs. Out of the total of EUR 351.8bn set aside from the EU budget for the Cohesion Policy of the 2014-2020 programming period[214], approximately EUR 110bn are dedicated to accelerate investments in ICT, SMEs' competitiveness, and low carbon economy[215]; areas, which are directly related to innovation in a broader context.

To narrow down the scope of analysis to 'RDI in SMEs' and better reflect the specific innovation areas of SMEs benefitting from Cohesion Policy, the present section provides an overview of the planned ERDF / CF investments during the 2014-2020 programming period allocated under the following codes for categories of intervention:

- 056 – Investment in infrastructure, capacities and equipment in SMEs directly linked to research and innovation activities;
- 061 – Research and innovation activities in private research centres including networking;
- 062 – Technology transfer and university-enterprise cooperation primarily benefitting SMEs;
- 063 – Cluster support and business networks primarily benefitting SMEs;
- 064 – Research and innovation processes in SMEs (including voucher schemes, process, design, service and social innovation; and
- 065 – Research and innovation infrastructure, processes, technology transfer and cooperation in enterprises focusing on the low-carbon economy and on resilience to climate change.

These six intervention codes define the scope of 'RDI in SMEs' activities of this sectoral analysis. The table below summarises the planned ERDF / CF investments in 'RDI in SMEs' under these intervention codes in both absolute and relative terms. Following this, it is to be noted that a total amount of approximately **EUR 25.3bn** of ERDF / CF investments is planned to support 'RDI in SMEs' activities with **investments supporting research and innovation processes of SMEs** (category of intervention 064) **having over one third of a total share**, amounting to **EUR 8.8bn**.

Available here: https://ec.europa.eu/info/sites/info/files/com-2018-306-a-renewed-european-agenda-_for_research-and-innovation_may_2018_en_0.pdf.

[214] European Commission, Regional policy: The EU's main investment policy.
Available here: https://ec.europa.eu/regional_policy/index.cfm/en/policy/what/investment-policy/.

[215] European Commission, DG GROW website. Accessed on 29 March 2019.
Available here: https://ec.europa.eu/growth/industry/innovation/funding/esif_en.

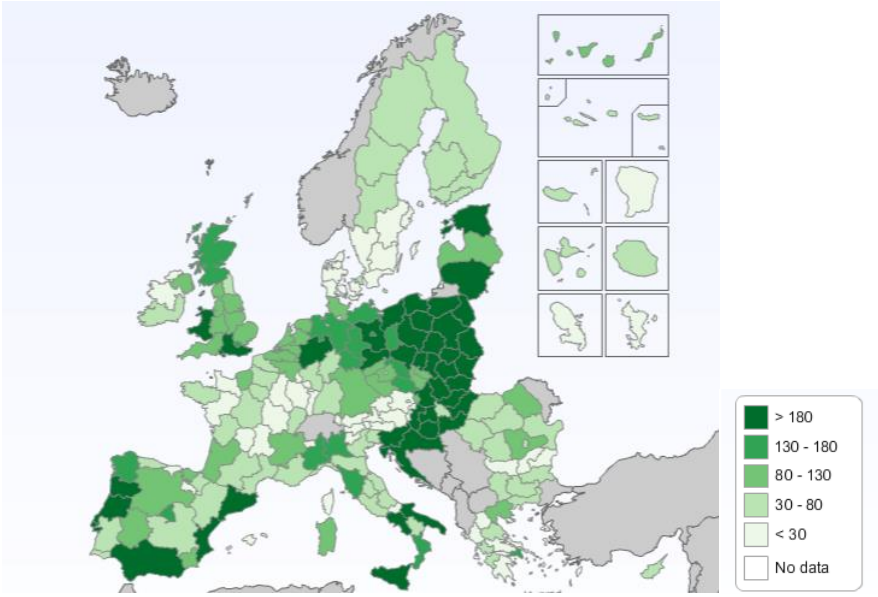
Table 28: Planned ERDF / CF investments in the 'RDI in SMEs' sector during the 2014-2020 programming period by category of intervention code

Category of intervention	Planned ERDF / CF investments (mEUR)	Share of planned ERDF / CF investments
064 – Research and innovation processes in SMEs (including voucher schemes, process, design, service and social innovation)	8 820	*34.9%*
062 – Technology transfer and university-enterprise cooperation primarily benefiting SMEs	5 402	*21.4%*
056 – Investment in infrastructure, capacities and equipment in SMEs directly linked to research and innovation activities	4 358	*17.2%*
063 – Cluster support and business networks primarily benefiting SMEs	2 320	*9.2%*
061 – Research and innovation activities in private research centres including networking	2 236	*8.8%*
065 – Research and innovation infrastructure, processes, technology transfer and cooperation in enterprises focusing on the low carbon economy and on resilience to climate change	2 148	*8.5%*
Total	**25 284**	*100%*

Source: EC, Smart Specialisation Platform, Categories of intervention: 056 and 061 to 065. Data from the ESIF OPs, Retrieved on 20/01/2017 from the SFC2014/Infoview database, Compiled by PwC, 2019.

The figure below illustrates how ESIF investments within the scope of the present sectoral analysis have been planned across the EU for the 2014-2020 programming period. In the beginning of 2017, Poland planned an investment of EUR 7 612m, followed by Italy (EUR 2 324m) and Germany (EUR 2 290m) based on data retrieved at the end of January 2017. **These three Member States together account for almost half (48.3%) of the total planned ERDF / CF investment in 'RDI in SMEs' across the EU**.

Figure 45: ERDF / CF planned amounts for the 'RDI in SMEs' sector in the EU (in mEUR)



Source: EC, Smart Specialisation Platform, Categories of intervention: 056 and 061 to 065. Data from the ESIF OPs, Retrieved on 20/01/2017 from the SFC2014/Infoview database, 2017.

The table below provides a more detailed overview of the ESIF investment planned across the top three spenders, in terms of the intervention codes considered in the scope of this sectoral analysis, in comparison with the EU average. It is however to be noted that an 'EU average' for 'RDI in SMEs' investments may only be indicative since the amounts are very different from one MS to the other.

Planned ESIF investments in **research and innovation processes in SMEs** (including voucher schemes, process, design, service and social innovation) **have the highest share of ESIF investments on the EU-28 average**, but also account for significant proportions within the three top spenders, with Poland having dedicated around 44.7%, Italy 26.9%, and Germany 20.5% of its RDI in SMEs resources to this category. As **research and innovation processes of SMEs are of high-risk profiles and may be of intangible character**, they differ from traditional investments in tangible assets. Following this, in case of limited collateral for the SME, access to research and innovation finance can be challenging. This reinforces **the need for supporting research and innovation processes in SMEs with public intervention** to cover the highest risk component of the projects and **support the transition from research to development phase**. This notion is further analysed in the market opportunities and potential for financial instruments sections hereafter.

Technology transfer and university-enterprise cooperation, primarily benefitting SMEs, is an area with the **second highest EU-28 average** in terms of planned ESIF investment supporting 'RDI in SMEs'. The EU average totals approximately 20% of the total planned ESIF investment in 'RDI in SMEs'. In Germany, this share doubles with 40.3% of German planned ESIF investment for 'RDI in SMEs' supporting the development of SMEs-universities collaborations / cooperation. As **the EU faces challenges in bridging the gap between the development of innovative ideas and their commercialisation**, this is an area, which requires further attention also from other MS. Germany is the 7th top innovation performer in the EU based on the 2018 European Innovation Scoreboard. The country is however still within the 'innovation followers' category, rather than 'innovation leaders', which indicates further need to revamp its innovation efforts.

It also needs to be noted, that the amounts of planned ESIF investment are strongly dependent on the overall share of the Cohesion Policy available resources. As such, MS considered to be 'top innovators' in Europe, such as Sweden, Denmark, Finland, the UK, the Netherlands and Luxembourg are not the top spenders of ESIF resources for innovation, despite having high level of RDI intensity (*i.e.* RDI expenditure independently on the

source of funds as percentage of GDP). At the same time, however, the data indicates that a number of MS with the highest financial Cohesion Policy allocations, and at the same time lower innovation performance, have the potential to increase their investments in the sector.

Cohesion Policy is also an integral part of the smart specialisation process initiated by the MS / regions for the 2014-2020 programming period[216]. In this context, a Smart Specialisation Platform was designed to support the EU regions in **structuring their entrepreneurial discovery process**, and in so doing, **understanding the sectoral and industrial strengths of their regions**. This Smart Specialisation Platform notably identifies the sectoral areas where a given region has the highest innovation potential and so where stimulating investment in innovation would add value for its development[217]. Aligning ESIF investment for 'RDI in SMEs' with the regional key industrial strengths captured by the Smart Specialisation Platform would be an integrated approach that can further catalyse additional investment in and for the EU regions.

Table 29: Top three planned ERDF / CF MS spenders compared to the EU-28 average for selected intervention codes related to 'RDI in SMEs'

Sub-sector	Member States with the highest amounts of ERDF / CF planned for 'RDI in SMEs'						EU-28	
	Poland		Italy		Germany		EU-28 average	
	mEUR	*Share*	mEUR	*Share*	mEUR	*Share*	mEUR	*Share*
056 – Investment in infrastructure, capacities and equipment in SMEs directly linked to research and innovation activities	2 395	*31.5%*	111	*4.8%*	323	*14.1%*	155.6	*17.2%*
061 – Research and innovation activities in private research centres including networking	655	*8.6%*	337	*14.5%*	42	*1.8%*	79.9	*8.8%*
062 - Technology transfer and university-enterprise cooperation primarily benefiting SMEs	591	*7.8%*	580	*25.0%*	1 005	*43.9%*	192.9	*21.4%*
063 – Cluster support and business networks primarily benefiting SMEs	117	*1.5%*	661	*28.5%*	188	*8.2%*	82.9	*9.2%*
064 - Research and innovation processes in SMEs (including voucher schemes, process, design, service and social innovation)	3 406	*44.7%*	624	*26.9%*	469	*20.5%*	315.0	*34.9%*
065 - Research and innovation infrastructure, processes, technology transfer and cooperation in enterprises focusing on the low carbon economy and on resilience to climate change	448	*5.9%*	10	*0.4%*	263	*11.5%*	76.7	*8.5%*
Total	**7 612**	***100%***	**2 323**	***100%***	**2 290**	***100%***	**903.0**	***100%***

Source: EC, Smart Specialisation Platform, Categories of intervention: 056 and 061 to 065. Data from the ESIF OPs, Retrieved on 20/01/2017 from the SFC2014/Infoview database, 2017.

[216] European Commission, The role of Smart Specialisation in the EU Research and Innovation Policy Landscape, 2018. Available here: https://ec.europa.eu/regional_policy/sources/docgener/brochure/smart/role_smartspecialisation_ri.pdf.

[217] Despite a focus on R&I (and so not exclusively on 'RDI in SMEs'), the Smart Specialisation Platform is a useful policy tool to consider investment potential in the 'RDI in SMEs' sector.

8.2 The use of financial instruments in the 'RDI in SMEs' sector

As mentioned in Chapter 2, 'sectoral analyses' were performed using the financial data provided by MS to the EC for monitoring / reporting purposes in relation to the implementation of their OPs. The present analysis consider the three pieces of information below altogether (namely Figure 46, Figure 47 and Table 30).

The following figures and table indicate that thirteen MS were using ERDF and CF funding for financial instruments in the 'RDI in SMEs' sector (*as of 31 December 2017*). As presented in Chapter 2, this is the sector – among the five sectors studied – where most of financial instruments have been developed. Indeed, all the MS that have developed financial instruments in the five sectors have developed some in the 'RDI in SMEs' sectors, including five MS that have developed financial instruments only in this sector among the five studied (namely France, Germany, the Netherlands, Romania, and the United Kingdom).

In the meantime, the EU-level numbers concerning ERDF / CF-supported financial instruments in the sector illustrate some missed opportunities (or a misalignment with the policy agendas presented in the above sections) when considering the importance of RDI financing in the European and national policy agendas. Indeed, at the EU level, EUR 2 148.9m have been devoted to ERDF / CF-supported financial instruments in the 'RDI in SMEs' sector. This represents 12.0% of the 'total eligible cost' for the whole sector (while the revolving nature of financial instruments for the sector is mentioned as relevant and key by all stakeholders consulted). The main form of finance chosen by the managing authorities is equity financing (for 51.5% of the amounts), followed by loans (for 32.7% of the amounts), and guarantees (for 13.1% of the amounts). Finally, at the EU level, the share of financial instruments for the 'RDI in SMEs' sector among financial instruments in all sectors (including the five studied sectors but not only) represent 12.2%. This is, by far, the highest share of the five sectors studied[218], but it still appears still quite low since it may imply that **only few other sectors (presumably the 'general SME' and the EE sectors) represent altogether 81.4% of the amounts devoted to ERDF / CF-supported financial instruments in the 2014-2020 programming period** (considering that this share for the five sectors altogether is of 18.6%).

As illustrated in the three pieces of information below, the approaches decided by the thirteen MS are very different from one another when developing ERDF / CF-supported financial instruments in the 'RDI in SMEs' sector. For instance:

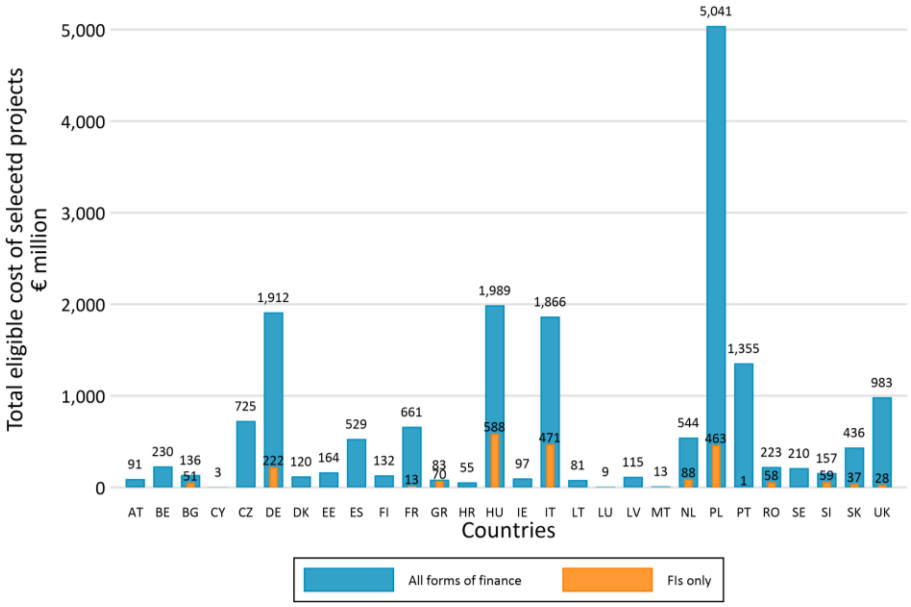
- Four MS seem to have devoted large amounts for financial instruments in the sector; namely Hungary (EUR 587.5m), Italy (EUR 470.9m), Poland (EUR 462.8m), and Germany (EUR 221.9m). On the other hands, the amounts devoted by some MS to financial instruments in the sector appear quite limited (for instance EUR 13.0m for France, in one region, or EUR 1.2m for Portugal).
- In the meantime, when considering the percentage of amounts devoted to financial instruments in the sector in comparison with the '*total eligible cost*', other MS appear; illustrating their individual strategies for both the sector and the use of financial instruments. For instance, the use of ERDF / CF funding in financial instruments for the 'RDI in SMEs' sector represent 84.0% of the 'total eligible cost' in Greece (with EUR 70.0m), 37.9% in Slovenia (with EUR 59.3m), and 37.5% in Bulgaria (with EUR 51.0m). These are the three MS where financial instruments represent more than one third of the 'total eligible cost' in the sector.
- Following this, and contrary to other sectors analysed in the present stocktaking study, several MS have decided to devote a large share of their available amounts to financial instruments, even when this amount is limited (while in the case of the RE sector for instance, the largest share of financial instruments was aligned with the overall amount available in the sector, indicating a different strategy for the sector). It may consequently be assumed that **developing 'smaller' financial instruments in the 'RDI in SMEs' sector**

[218] As reminder, this share is: 1.6% for the RE sector, 2.2% for the UDT sector, 1.0% for the Environment sector, and 1.7% for the 'ICT infrastructure' sector. This share for the five sectors altogether is of 18.6%.

may be relevant as soon as these instruments fit to the local market needs and characteristics (while in the other sectors studied, the need for a large amount available in the financial instruments was more structuring for (i) choosing to develop financial instruments, and (ii) defining the features of the financial instruments).

- This factor is also illustrated by the choices of financial products provided through financial instruments. Even if the main financial product provided at the EU level is related to 'venture and equity capital', all types of products are provided (including 'subsidy and technical support', as in Romania). Poland and Slovakia have for instance decided to propose three products (equity financing, loans, and guarantees), while four MS provide both equity financing and loans, namely: Bulgaria, Germany, Hungary, and Italy. Guarantee products seem less relevant for the sector since only three MS have chosen to develop financial instruments providing such product (Poland, Slovenia, and Slovakia). Finally, when MS decide to focus their ERDF / CF funding only on one form of financial product, the latter is always 'venture and equity capital' (with the exception of Romania). This is the case of France, Greece, the Netherlands, Portugal, and the United Kingdom. As for the other sectors studied, this situation at the EU level indicates that **various financial products may be provided through financial instruments and can adapt to the sectoral and local needs**.
- Finally, and to a larger extent than for the other four sectors studied, the share of funding devoted to financial instruments in the 'RDI in SMEs' sector among the funding allocated to financial instruments in all sectors (including the five studied sectors but not only) varies a lot from one MS to the other: it represents between 0.1% (in Portugal) and 91.7% (in the Netherlands). This variation illustrates the differences in the amounts of ERDF / CF funding available in each MS, but more importantly, it indicates the policy choices of the managing authorities / Intermediate Bodies, and their priorities. In the meantime, as already mentioned, this share for the 'RDI in SMEs' sector is highest of the five studied sectors, illustrating that **managing authorities and Intermediate Bodies know the added value of revolving finance mechanisms for the sector**. That is why it seems among the favourite / preferable sectors to consider when the managing authorities decide for which sectors financial instruments should be developed. Overall, **the 'RDI in SMEs' sector seems consequently one of the main sectors considered when the managing authorities / Intermediate Bodies develop their cross-sectoral financial instruments strategy**. The amounts allocated and the percentages presented in the following figures and table illustrate however that **room for improvement still exist for the development of financial instruments in the 'RDI in SMEs' sector, especially when considering the commonly-agreed perception that revolving finance mechanisms are relevant to support such SME projects**.

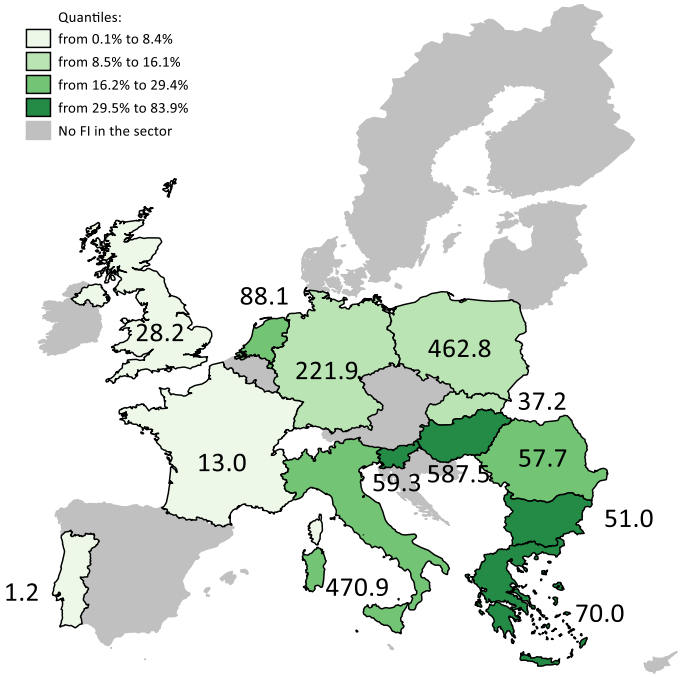
Figure 46: Proportion of ERDF and CF funding devoted to financial instruments in comparison with ERDF and CF funding devoted to all forms of finance (grants and financial instruments altogether) in the 'RDI in SMEs' sector[219]



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

[219] This figure indicates the 'total eligible cost of selected projects' for 'all forms of finance' (*i.e.* grants and financial instruments altogether; in the thicker blue column) and for 'financial instruments only' (in the inner orange column). For each Member State, data labels provide the nominal amounts in millions euros for the amounts devoted to financial instruments and the total amounts devoted to all forms of finance.

Figure 47: EU-wide map of the uptake of ERDF and CF financial instruments in the 'RDI in SMEs' sector[220]



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Table 30: Overview of ERDF and CF financial instruments in the 'RDI in SMEs' sector by Member State

Member State	RDI in SMEs			
	Amount devoted to FIs (mEUR)	Share of FIs among all forms of finance (FIs and grants, %)	Type of financial products	Share of FIs in the sector among FIs in all sectors (not only the five sector, %)
Bulgaria	51.0	*37.5%*	*58.8% venture and equity capital* *41.2% loans*	*9.7%*
Germany	221.9	*11.6%*	*47.9% venture and equity capital* *52.1% loans*	*16.3*
France	13.0	*2.0%*	*100% venture and equity capital*	*3.8%*
Greece	70.0	*84.0%*	*100% venture and equity capital*	*7.2%*
Hungary	587.5	*29.5%*	*56.0% venture and equity capital* *44.0% loans*	*24.8%*
Italy	470.9	*25.2%*	*42.5% venture and equity capital* *57.5% loans*	*29.9%*
Netherlands	88.1	*16.2%*	*100% venture and equity capital*	*91.7%*
Poland	462.8	*9.2%*	*51.5% venture and equity capital* *3.9% loans* *44.6% guarantee*	*12.1%*
Portugal	1.1	*0.1%*	*100% venture and equity capital*	*0.1%*

[220] This map indicates (*in green*) the Member States that have implemented financial instruments in the 'RDI in SMEs' sector by 31 December 2017. Where a Member State – or at least one of its managing authorities – has set up a financial instruments operation in this sector, the amount devoted to this / these financial instruments operation(s) is indicated in millions euros. The 'intensity' of green indicates the share of financial instruments among all forms of finance in this specific sector.

Member State	RDI in SMEs			
	Amount devoted to FIs (mEUR)	Share of FIs among all forms of finance (FIs and grants, %)	Type of financial products	Share of FIs in the sector among FIs in all sectors (not only the five sector, %)
Romania	57.7	*25.9%*	*100% subsidy or technical support*	*26.6%*
Slovenia	59.3	*37.9%*	*25.0% loans* *75.0% guarantee*	*15.9%*
Slovakia	37.2	*8.5%*	*43.8% venture and equity capital* *32.0% loans* *24.2% guarantee*	*6.3%*
United Kingdom	28.2	*2.9%*	*100% venture and equity capital*	*1.6%*
EU Total	**2 148.9**	***12.0%***	***51.5% venture and equity capital*** ***32.7% loans*** ***13.1% guarantee*** ***2.7% subsidy or technical support***	***12.2%***

Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

As mentioned in the introduction and in Annex 1, since the cut-off date of the data analysed in the present stock-staking study is 31 December 2017, (other / new) financial instruments may have been developed since (and are not present in the data analysed in the study). This is notably the case of the selected case study for the 'RDI in SMEs' sector that details hereafter a financial instrument implemented in Lithuania (while Lithuania is not presented in the figures and table above)[221]. Hence, as mentioned in Section 1.2.2, **the 'RDI in SMEs' sector is illustrated by a case study on the financial instrument developed in Lithuania**. It is presented in detail in the sub-section below.

8.2.1 The Lithuanian RDI-specific equity instruments

In the 2014-2020 programming period, a strategic decision was taken by Lithuania to build on the experience acquired in the previous period and further promote the use of equity financial instruments. In this context, RDI-specific financial instruments were set up and implemented as of 2018. The case of Lithuania illustrates the initiative of a National Promotional Institution (NPI) developing ERDF-supported financial instruments 100% focused on RDI, leveraging and structuring the RDI eco-system of the country, as well as aligning the strengths and interest of research centres, Venture Capital (VC) and Private Equity (PE) funds, as well as Business Angels (BAs) to specifically finance RDI.

The RDI instruments are being implemented under the umbrella management of the NPI INVEGA[222] which has a long standing experience in the implementation of ESIF-supported financial instruments, mostly focusing on loans and guarantees. In the current programming period, INVEGA was also entrusted by the State to set up and implement equity instruments.

From a governance aspect, INVEGA has set up a subsidiary entity named *UAB Kofinansavimas* in the form of a limited liability stock company (with shares owned by INVEGA). This subsidiary operates as an umbrella VC fund, implementing, amongst others, the RDI specific instruments.

[221] As it is also the case study for the Environment sector, illustrated by a case study in Czechia.

[222] '*Investicijų ir Verslo Garantijos*' (INVEGA), standing for 'Investment and Business Guarantees'.

Description of the financial instrument

Rationale and objectives

The Lithuanian NPI, INVEGA, was established in 2001 as a guarantee agency providing individual guarantees to Small and Medium Sized Enterprises (SMEs). Building on this experience, it launched additional financial instruments such as a microfinance instrument in 2006, soft loans in 2008, and other financial instruments since. As of now, INVEGA manages four Fund-of-Funds (FoF), all dedicated to corporate financing. In total, INVEGA manages 22 active financial instruments, providing a variety of financial products (loans, guarantees, and equity financing).

In the context of equity financing, INVEGA (through its subsidiary *UAB Kofinansavimas*) has developed three financial instruments dedicated to RDI. Two of these instruments are implemented by the Fund *Koinvesticinis Fondas*[223]. The latter is a co-investment VC fund that provides equity financing (as a co-investor together with private VC and PE funds, as well as groups of BAs) to start-ups and growing Lithuanian SMEs. The relations it builds with private VC, PE funds and groups of BAs aim to favour the development of the Lithuanian equity market, as well as stimulate BAs investments with a view to promote a better access to equity financing for Lithuanian SMEs. The two RDI focused instruments implemented by *Koinvesticinis Fondas* are 'Koinvest MTEPI'[224] and 'Koinvest II' (*their scopes are described in the next section*).

The third instrument is a VC fund managed by a private fund manager (*described in the next section*).

Scope

An *ex-ante* assessment was conducted before launching the instruments. The analysis identified a financing gap and a market failure in the Lithuanian equity market in relation to SMEs developing Research and Development (R&D) projects, and suggested the set-up of dedicated instruments. Looking more closely at the three RDI-specific equity instruments, their scopes are defined as follows:

- The first instrument, Koinvest MTEPI, aims to attract Research and Scientific Institutions (RSIs) and private investors to co-invest in RSIs' spin-offs (*i.e.* start-ups or SMEs created to commercialise an innovation developed in an RSI). It was set up in 2018 and is managed by the Fund *Koinvesticinis Fondas*. The entire instrument must be invested in SMEs implementing or intending to undertake R&D projects in the areas of the Lithuanian Smart Specialization Strategy (S3). EUR 5m[225] of ERDF funding is devoted to this instrument. As of beginning of November 2019, five investments for EUR 2.2m in total were already made by this instrument;
- The second instrument, Koinvest II, aims to finance SMEs with projects in relation to the S3. RSIs are not required to co-invest with this instrument. In the meantime, at least 50% of the instrument must be

[223] The Fund '*Koinvesticinis Fondas*' is also managing two additional instruments:
- 'Koinvest I', which uses EUR 11m of resources already returning to INVEGA which have been earmarked by the Ministry of Economy and Innovation (non-ERDF) in order to provide equity financing to SMEs of less than five years and not necessarily developing RDI-related projects; and
- '*Koinvest susisiekimui*' ('*susisiekimui*', standing for 'transport and communications'), which uses EUR 4m of Cohesion Fund (CF) funding earmarked by the Ministry of Transport and Communications in order to provide equity financing to SMEs developing mobility services and products, Intelligent Transport Systems (ITS), and innovative transport technologies reducing CO_2 emissions produced by the transport sector.

[224] 'Koinvest MTEPI' ('*Mokslinių tyrimų ir eksperimentinės plėtros bei inovacijų*' – MTEPI, standing for 'Scientific research, Experimental Development and Innovation activities'). The full official name of the 'Koinvest MTEPI' instrument is '*Ko-investicinis fondas MTEPI, finansuojamas iš ERPF*', standing for 'Co-investment Fund for Scientific research, Experimental Development and Innovation activities, financed from ERDF'.

[225] A minimum amount of EUR 4m is earmarked for investments under this financial instrument, with up to EUR 1m devoted to cover management costs.

invested in SMEs implementing or intending to undertake R&D projects in the areas of the S3. Similar to 'Koinvest MTEPI', 'Koinvest II' was set up in 2018 and is managed by the Fund '*Koinvesticinis Fondas*'. EUR 11.6m of ERDF funding are devoted to this instrument. As of beginning of November 2019, no investment have been made by this instrument;

- The third instrument, Venture Capital Fund II, is a VC fund managed by a private fund manager, Iron Wolf Capital[226]. The budget of this instrument (up to 80%) is intended to be invested in SMEs developing RDI-related projects in the areas of the S3. It was set up in December 2018 and operates as a standard equity fund (as opposed to a co-investment fund, like the first two instruments). EUR 13.76m of ERDF funding are devoted to this fund (with no national co-financing). A first roundtable aiming to attract co-investors has led to a total available funding of EUR 16m and, once the current second roundtable is finished (final closing is expected by the end of 2019), the total amount of funding available within the fund is intended to be of EUR 20m. As of beginning of November 2019, three investments for EUR 1.7m in total were already made by this fund.

The companies targeted by the three instruments are SMEs:

- Engaged or having the intention to engage in economic activities in relation to the Lithuanian S3 by implementing RDI activities; and
- Whose shareholders include, or will include at the time of investment, an RSI.

The instruments also define further criteria for the financing of the SMEs. For instance, as detailed on the specific website[227] of 'Koinvest MTEPI' the instrument invests in SMEs fulfilling the following criteria:

- At the time of investment, the SME must meet all of the State aid requirements (detailed on the website);
- The SME must be an 'innovative enterprise' *as per* the meaning of Article 2(80) General Block of Exemptions Regulation (GBER)[228];
- The SME must be implementing or intending to implement scientific research, experimental development and/or innovation projects in areas of the S3, and be in line with at least one action plan of the priorities established in the National Programme for Priority Research and Experimental (Social, Cultural) Development and Innovation Development;
- An RSI is either one of the shareholders of the SME or should become shareholder at the time of investment;
- The instrument can invest in SMEs operating in Lithuania or in another EU Member State, if this investment benefits Lithuania[229]. Investments in companies operating outside Lithuania cannot however exceed 15% of the sub-fund. Also, the total investment made by the instrument in a single SME, including its follow-on investments, cannot exceed EUR 1.6m.

2014-2020 Operational Programme

The three ERDF-funded instruments have a combined budget of EUR 30.36m originating from the 'Operational Programme for EU Structural Funds Investments for 2014-2020' of Lithuania.

[226] Please see: https://www.ironwolfcapital.com.

[227] Please see: https://www.koinvest.lt/en.

[228] Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty.

[229] In that context, the Fund '*Koinvesticinis Fondas*' has published online a Guideline on the eligibility of costs of its financial instruments. The specific webpage of the 'Koinvest MTEPI' instrument also provides an extensive list of 'ineligible investments'. Please see: https://www.koinvest.lt/en.

Financial allocation and governance

The two RDI-specific co-investment VC instruments (Koinvest MTEPI and Koinvest II) are fully financed by ERDF funding The ESIF funding is co-invested with RSIs and private investors – private VC and PE funds and/or teams of at least two BAs – in viable RDI-related projects. The RDI investments follow a number of steps:

1. First, any co-investment made by the instruments has to be initiated by a private investor (*i.e.* an RSI, a private VC or PE fund, or a group of at least two BAs) which provides proposals to the Fund Manager regarding investments in high-potential companies. It is to be noted that only private investors present on the list of the 113 BAs and private VC / PE funds already selected by the Fund *Koinvesticinis Fondas* may submit a request for co-investment with the Fund. A start-up / SME cannot do it directly;
2. Second, to request a co-investment, the private investor(s) and the proposed SME must submit a request for investment under a specific form (the information / documents needed in / with the form are easily available / listed on the internet). If the SME has not been founded yet, it must be represented, and documents must be submitted by the author of the idea, its founder;
3. Third, when submitting the request for co-investment, the accredited private investor(s) have to justify why, in their opinion, the investment is viable and potentially profitable. They also need to present the terms of their current financing agreement with the SME; and
4. Fourth, as established in the shareholder agreements signed between the instrument and the private investors following a specific negotiation for each deal, the instrument operates as a silent shareholder in the management of the financed start-ups / SMEs.

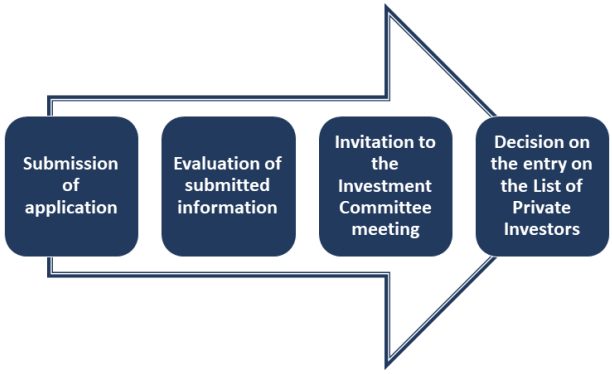
This process, common to all sub-funds under the Fund *Koinvesticinis Fondas* (and so including Koinvest MTEPI and Koinvest II), is illustrated and detailed on the Fund's website with the following figure.

Figure 48: Investment process of any sub-fund within the Fund '*Koinvesticinis Fondas*'

Source: www.koinvest.lt, 2019.

As mentioned, only the selected private investors may submit a request for co-investment. An SME cannot send a direct request. This selection follows specific terms. If the private investor meets these requirements, the Investment Committee decides on the entry of the applicant to the 'list of private investors' on the basis of its assessment of the application. This selection is an ongoing process which will continue until the end of the investment period (expected for 31 December 2020, and can be extended). It is illustrated by the figure below.

Figure 49: Selection process of private investors that may then request co-investment with the Fund '*Koinvesticinis Fondas*'



Source: www.koinvest.lt, 2019.

Once a private investor (one private VC or PE fund or two BAs together) present on the list sends its request for investment, the latter is assessed. In their request, the private investors have to prove the profitability of the investment and the terms of investment agreed with the SME (under the form of a term sheet). These private investors cannot be current shareholders of the SMEs targeted for investment. The manager of the Fund *Koinvesticinis Fondas* may conduct an additional due diligence. Following this, the Investment Committee assesses the request based on the SME's team, its business model and the private investor(s) involved.

The negotiation and investing phase then starts. Once the Investment Committee agrees to invest in the SME, contracts are negotiated:

- A 'shareholder agreement' between the appropriate sub-fund (such as Koinvest MTEPI) and the private investor(s); as well as
- An 'investment agreement' between the sub-fund, the private investor(s), including the RSIs in the case of the 'Koinvest MTEPI', the existing shareholders of the target SME, and the target SME.

The investment is made once all the agreements are signed.

Looking more closely at the case of Koinvest MTEPI, the contribution takes the form of new equity financing or of convertible bonds for up to 90% of each specific investment. Also, as mentioned, the total investment from Koinvest MTEPI, including potential follow-on investments, in one single SME cannot exceed EUR 1.6m. Finally, in parallel, the funding provided by the RSI(s) must represent around 5% of the value of the specific investment or of the authorized capital of the SME. RSI funding is understood as own private funds from the RSI, which would not be financed from public sources (*i.e.* from State budget). Once the investment is effective, Koinvest MTEPI – as any sub-funds of the Fund – behaves as a silent shareholder and transfers the majority of its non-material rights to its private co-investor(s) who represent its interests.

As a general policy of the Fund *Koinvesticinis Fondas*, and as explained on its website, Koinvest MTEPI aims a 4% annual profit on the amount invested for each investment year, which is the maximum return for the Fund as a public investor. The remaining profits, after this annual distribution of 4% for the Fund, go to the private investors. This set-up helps attract private investors while ensuring a minimum return for the public sector when a very successful investment is supported by the Fund. If the profit from the investment does not reach 4%, it is allocated between the Fund, and the private investor(s) based on the *pro rata* to their respective investments in the SME. As a general policy, the Fund *Koinvesticinis Fondas* aims to exit each SME after 5 to 7 years, and not later than the private investor(s) with which it co-invested in the SME. When exiting simultaneously with the private investor(s), the terms of investment disposal must be at least as favourable as those offered to this / these private investor(s).

In parallel, the investment process of Venture Capital Fund II is quite different. First, the selected fund manager has to raise funding from private investors at fund level, in complement to the ERDF funding (as reminder, there is no national co-financing from the managing authority in this VC fund). The first roundtable of this fundraising process has been achieved and the second roundtable is ongoing. Its closure is expected by end 2019. Second, the fund manager selects and invests into innovative SMEs with high-growth potential that are still in their early development and which develop RDI-related projects in the areas of the S3. The fund has already performed three investments for a total invested amount of EUR 1.7m.

Financial products

As already mentioned, the contribution of the instruments to the start-ups / SMEs takes the form of new equity financing or of convertible bonds for up to 90% of each specific investment.

Leverage

Taking the example of Koinvest MTEPI, since the maximum share in each investment may be up to 90%, the minimum leverage to be expected is around 1. This predictable leverage is consequently quite limited, but in line with what is to be expected for such RDI instrument focusing on spin-offs. In the meantime, since the investment share taken by the instrument is decided on a case-by-case basis, and may then be less than this maximum of 90%, this minimum leverage of 1 may be higher on an investment-by-investment level. However, since this instrument has been specifically designed to finance RDI (and considering that spin-offs which are among the projects with the highest risk profile in the RDI sector), it is expected to take higher risks. It is consequently to be assumed that a quite low leverage is expected from the instrument, *i.e.* around 1.

In parallel, the leverage effect expected for Venture Capital Fund II is between 1.2 and 1.45 (if the fund achieves a total volume of EUR 20m at the end of its fundraising process by end 2019).

State aid

The State aid regime applied to Koinvest MTEPI and Koinvest II follows the rules detailed in Article 22 GBER established for aid for start-ups. The State aid regime applied to Venture Capital Fund II follows the rules of Article 21 GBER relative to risk finance aid.

Lessons learned

Results

Since the instruments were created in 2018, as of beginning of November 2019, their implementation is still at the beginning of their investment phase. In total, the three instruments have performed eight investments for a total invested amount of EUR 3.9m: five investment for Koinvest II representing EUR 2.2m, three investments for Venture Capital Fund II representing EUR 1.7m and no investment for Koinvest MTEPI.

It is important not to undermine the very fact that such dedicated instruments have been actually set up. The willingness of the public administration to conduct the relevant *ex-ante* assessment, to seek technical support to set up all legal structures, to gradually build capacity in such a technical topic, and to address complex issues such as procurement, reveal a commitment in promoting such instruments. Especially when taking into account that such targeted instruments in more narrow sectors such as RDI usually take up more time to produce results and substantial impact in the market. Even more so in 'small' markets like Lithuania. In addition, such equity related instruments require a very strong knowledge of the market and substantial field work to source the investors and projects. In this context, the timely set-up of the structures and of the procedures should be seen as a positive result.

In parallel to this, it is anticipated that the instruments will also produce tangible results such as to:

- Stimulate the RDI market (notably thanks to agreements with RSIs, private VC and PE funds, and groups of BAs at the Fund level);
- Focus on projects considered as too risky by private stakeholders;
- Act where a public intervention can add value, share risk with the private sector, and incentivise the latter to also invest in SMEs with higher risk profiles; and
- Be complementary with other financial instruments (including loans and guarantee instruments) already available and provided by / through INVEGA to Lithuanian SMEs.

Barriers and challenges

The first series of barriers and challenges encountered by the instruments relate to the historic nature of RDI financing. Grants remain the most widespread public financing scheme for the RDI sector in Lithuania. They are often perceived as a 'quicker / simpler' financing scheme to implement, in comparison with financial instruments. They may also be perceived as more attractive from a political perspective, as opposed to financial instruments; the latter being often perceived as more time-consuming to develop and to obtain results. In that context, the introduction of financial instruments related to RDI (such as the three instruments set up in Lithuania) needs to be structured in a complementary manner with grants and needs to be supported with communication (*i.e.* publicity).

Another challenge relates to the innovative nature of these instruments, as well as of the projects to be financed, and consequently their perceived risks. RSIs may be reluctant to invest, due to their historic dependence on grant financing. Simultaneously, spin-offs may experience difficulties in explaining their concepts or purposes in view to commercialise these projects and attract private financers. This challenge is addressed by another entity (Enterprise Lithuania) that directly supports the spin-offs / start-ups / SMEs when developing their business models and plans, making it a key enabling factor for the financial instruments.

Third, still because Lithuania may be considered as a small market, the financial instruments may encounter difficulties in establishing a pipeline of viable projects sufficiently deep to make them viable. Indeed, as mentioned by INVEGA[230], even though there are a lot of ideas in Lithuania, it may be challenging to find investable projects. That is why the instruments have been appropriately calibrated to the Lithuanian market in order to ensure absorption.

Key enabling factors

As mentioned by INVEGA, there is a need for a shift from grants towards financial instruments when it comes to developing publicly-supported financing mechanisms. This is especially valid for RDI financing**,** where financial instruments providing equity, or other types of financing, are needed in Lithuania (as observed in the *ex-ante* assessment). Key enabling factors for the three RDI-specific instruments (developed in parallel, using ERDF funding, and focusing on S3-related projects financing) are:

- Cooperation with RSIs (specifically for Koinvest MTEPI), private VC and PE funds, and groups of BAs to raise interest and structure the RDI-financing market, as well as to develop an ecosystem of equity investors in Lithuania;
- The awareness-raising campaigns initiated by INVEGA and *UAB Kofinansavimas*; as well as
- The use of public funding (including ERDF) to develop financial instruments specifically aiming to finance RDI, and so bear a part of risks that private stakeholders are reluctant to take, attract private investors, and structure new / niche markets in the country.

[230] INVEGA representatives were interviewed in the context of this case study.

Overall, the three Lithuanian RDI-specific financial instruments provide a good example of how public authorities may build on previous positive experience (regarding market knowledge, successful financial products implemented and work with various stakeholders) in order to define and cope with new challenges, such as better structuring the RDI sector with the support of financial instruments.

8.3 Market opportunities

Despite the consensus on the impact of innovation on the competitiveness of the European economy, all stakeholders consulted perceive that there still an opportunity to mobilise further investment in the 'RDI in SMEs' sector, support the existing unmet demand for innovation finance, and fully tap into EU SMEs' innovation potential.

The EU is among the global leaders in research and scientific activities, accounting for almost one third of top citations. At the same time, **turning knowledge into innovative products still remains a major challenge**. **Europe's potential to improve its innovation performance lies in its ability to leverage on its competitive advantages**: high-quality research, world-class universities and skilled workforce. By improving the commercialisation of research activities, developing stronger science-industry links[231] and taking advantage of the knowledge spill-overs, the EU could strengthen its position among the global innovation leaders and further increase its economic competitiveness.

8.3.1 R&D spending in the European Union

Although the EU accounts for 20% of global R&D spending, there is still a **gap in the level of R&D intensity between the EU and leading global innovators**. For example, in 2015, '*R&D intensity*' in South Korea comprised 4.2% of GDP, 3.3% in Japan and 2.8% in the US, while it was at 2.1% in the EU-28 in 2017[232].

The R&D expenditure in Europe is mostly driven by the private sector, **accounting for 66% of total R&D spending** in 2017, regardless of the source of funds. In terms of R&D expenditure, private sector is followed by the higher education sector (22%), the government sector (11%) and the private non-profit sector (1%)[233]. Also, **although businesses are the top R&D spenders in Europe**, there is still **room for increasing R&D spending, not only as compared to other major economies globally**, but also to narrow the gap between the current R&D spending levels and the objectives (especially the overall objective of 3% of GDP in R&D spending). One of the estimates established by the EIB in 2016, concluded that **additional EUR 130bn of annual R&D spending above the current levels is needed to reach the EU R&D target of 3%**, defined already in 2010[234]. The table below summarizes the R&D investment gap estimates of the EIB.

[231] Please see: https://www.eib.org/attachments/efs/restoring_eu_competitiveness_en.

[232] Eurostat, R&D expenditure as percentage of GDP, 2015 and 2017.

[233] Eurostat, OECD, 2019.

[234] European Investment Bank, Restoring EU Competitiveness, 2016.
Available here: https://www.eib.org/attachments/efs/restoring_eu_competitiveness_en.

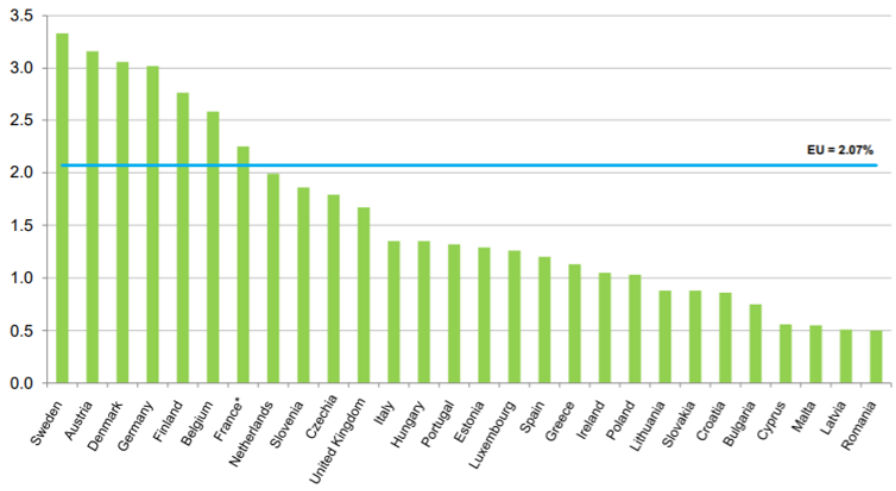
Table 31: Annual R&D investment gap in the EU

Investment needs / objectives	Annual investment (bnEUR)		
	Required	Current	Gap
Reaching the 3% GDP target:	370	240	**130**
Private sector	200	130	70
Public sector	170	110	60

Source: EIB, Fostering innovation to remain competitive, 2016.

The figure below illustrates the R&D expenditure as a percentage of GDP at the national level across the EU. The EU's long-standing target to invest 3% of the European GDP in R&D activities has been reached only by four EU MS, namely: Sweden, Austria, Denmark, and Germany. The EU R&D spending as a percentage of GDP has an **average of 2.07%**, however **the majority of the MS are significantly below the EU average**[235].

Figure 50: R&D expenditure as a percentage of GDP at national level across the EU



Source: Eurostat, 2019[236].

R&D expenditure by SMEs

As SMEs are the backbone of the European economy, being responsible for the employment of two thirds of the active working population and 57% of the value added[237], the capacity of SMEs to innovate and remain competitive is crucial to the overall growth of the European economy. The analysis of the R&D expenditure data based on the size of the company indicates that **SMEs are not the main contributor to the R&D intensity in the EU**. The figure below presents the R&D intensity of SMEs. The MS with leading R&D expenditure of SMEs are Slovenia, Belgium, and Austria. On the other hand, Romania, Cyprus and Greece recorded the lowest levels of

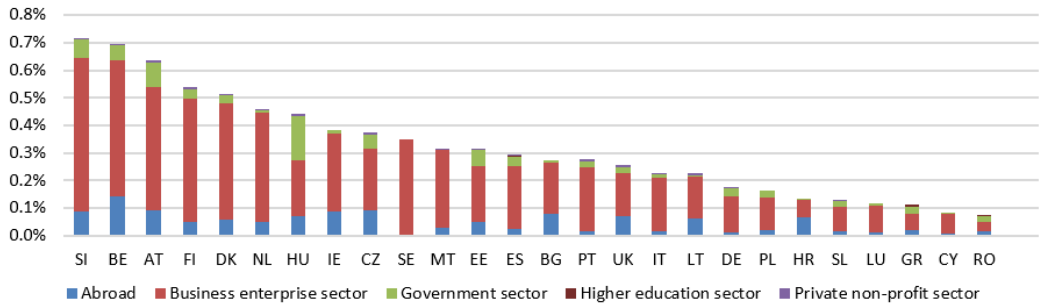
[235] For the latest Eurostat data on the GDP per capita in PPS, please refer to: https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tec00114&plugin=1.

[236] Eurostat, *First estimates of Research & Development expenditure*, 2019.
Available here: https://ec.europa.eu/eurostat/documents/2995521/9483597/9-10012019-AP-EN.pdf/856ce1d3-b8a8-4fa6-bf00-a8ded6dd1cc1.

[237] Including mid-caps, as detailed here: https://www.eib.org/en/projects/priorities/sme/index.htm.

R&D spending by SMEs. This is particularly challenging for Cyprus and Greece, where SMEs account for over 99% of the entire business population[238].

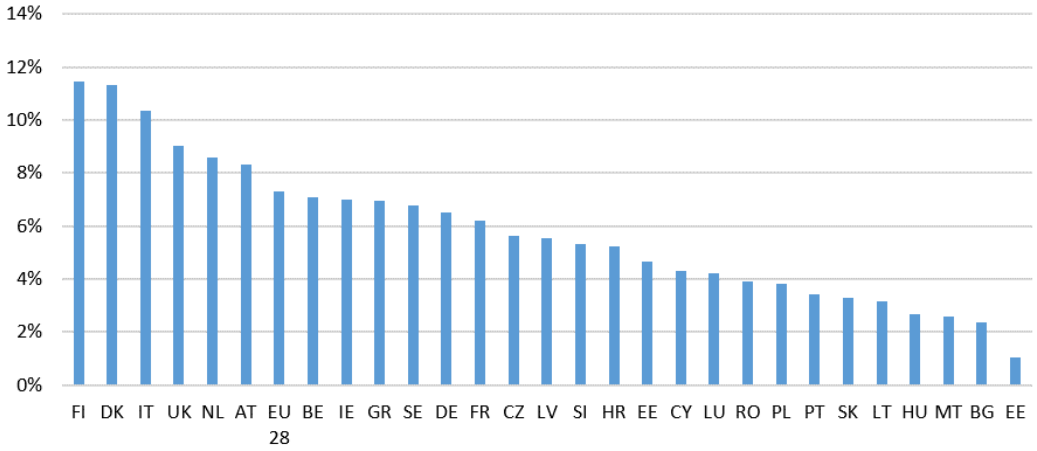
Figure 51: R&D expenditure by SMEs across the EU, as percentage of GDP (2015) by source of funds



Source: Eurostat BERD Dataset, Eurostat National Accounts Data, PwC Analysis, 2019.

As for R&D activities in particular, the figure below indicates that investments in R&D by SMEs vary significantly from one MS to the other. In Finland, Denmark, and Italy SMEs allocated around 10% of their investments to R&D in 2017. On the other hand, the same year, SMEs in Estonia, Bulgaria, and Malta allocated less than 3% of their investments to R&D activities. Given the **highly diverse landscape of R&D expenditure by SMEs in the EU**, the subsequent **policy interventions should continue to focus on narrowing the discrepancies between the MS** and **further unlock access to finance for innovation across all MS**.

Figure 52: R&D expenditure by SMEs across the EU in 2017, as share of total investments



Source: EIB Investment Survey 2018.

8.3.2 EU innovation performance

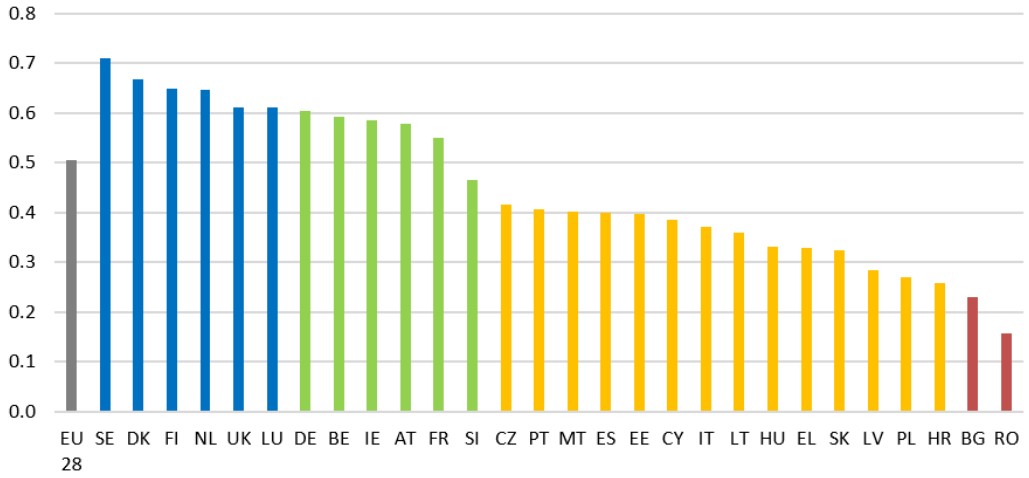
Unlocking finance for SMEs' innovation has the potential to improve their productivity and overall competitiveness. The EU SME landscape needs to be more **dynamic in bringing innovation to the market** and enhancing the **dissemination of its ideas throughout industries**. There is still ample room for improvement. Indeed, according to innovation experts, the EU has more **static firms** (growing, in terms of revenues, at a slower rate than 5%) compared to the US[239].

[238] European Commission, *SME Performance Review*, 2018.

[239] Bravo-Biosca, Criscuolo, Menon, *What drives the dynamics of business growth*, Nesta Working Paper 14/03, 2014.

The figure below presents the innovation status of each MS in 2017. The EU innovation landscape is spread across four categories: (i) the leaders, (ii) the followers, (iii) the moderate innovators, and (iv) the modest innovators. As illustrated below, **the vast majority of the MS has been classified** by the European Innovation Scoreboard **as moderate innovators** in 2017, thus indicating scope for fostering innovation and stimulating investment in the sector at an EU-wide level (including with the support of publicly-supported initiatives).

Figure 53: Innovation index of the EU Member States and the EU-28



Source: European Innovation Scoreboard, 2018.
Note: The four colours correspond to the four groups, with blue representing the leaders; green, the followers; yellow, the moderate innovators; and red, the modest innovators.

Performance of EU SMEs: scaling-up vs. innovating

Although SMEs represented 66% of the EU employment and were responsible for 57% of the added value in 2017, product innovation was lower in SMEs compared to larger companies[240]. In 2014, 51% of the large enterprises have introduced product innovations, compared to only almost 25% of the SMEs. In this context, when differentiating 'developing new products' and 'expanding existing capacity', more SMEs focused, in 2017, on increasing scale rather than innovating. **At the EU-level, only 15% of the SMEs have invested in innovation in 2017**[241]. For example, in Germany, one of the top R&D spenders in Europe, less than a third (27%) of all SMEs have been considered as innovators[242]. In terms of types of innovations, 15% of SMEs were imitators, while only 4% developed a new-to-market product or service.

8.3.3 High-growth innovative SMEs in the EU

High-growth enterprises are defined as having at least 10 employees and experiencing a growth of at least 10% in employment in three consecutive years[243]. In 2016, there were 179 060 high-growth SMEs in Europe. These companies are considered the 'job-creating champions'[244]. In this context, only 3% of start-ups reached the status of a scale-up, but they accounted for 43% of job creation and 30% of total production between 2003 and 2016.

[240] Eurostat, Product and process innovative enterprises by NACE Rev. 2 activity and size class.
[241] EIB, *EIB Investment Survey 2018*, 2018.
[242] In the period between 2014 and 2016. KfW, SME Innovation Report, 2017.
[243] European Commission, *SME Performance Review*, 2018.
[244] EIB Working Paper 2019/03, Financing and obstacles for high growth enterprises: the European case, 2019.

Unlocking access to finance for potential high-growth SMEs, and especially those with highly innovative ideas, is an opportunity to improve innovation performance of the EU. On the contrary, **challenges in the access to finance** (especially for these companies) **lead to lower chances of bringing breakthrough innovation to the European market**. For example, as presented in the table below, the EU is home to 26 'unicorn start-ups' (*i.e.* start-ups valued at over USD 1bn), compared to 59 in China and 109 in the US.

At the same time, the VC funds in the US are three times bigger than the EU ones, with an average size of EUR 56m in the EU, compared to EUR 156 in the US. Similarly, the amount of VC capital invested in the EU in start-ups is six times less than in the US (EUR 6.5bn as opposed to EUR 39.4bn). This results in the **European start-ups unable to scale-up as quickly as their US competitors**. Indeed, the features of the EU VC market negatively impact its capacity to support high-growth (innovative) SMEs. More specifically, the (smaller) size of VC funds reduces their ability to take more risks at a portfolio level. This results in the reduction of their capacity to, *inter alia,* (i) invest in higher risks start-ups, (ii) invest higher financial contributions without putting at risk their existing investment portfolio or their previously agreed risk strategy, (iii) participate in more investment rounds, and (iv) recruit / build highly-skilled investment teams. This is where publicly-supported initiatives may intervene in order to strengthen the VC (and PE) markets in Europe.

Finally, it is to be noted that the EU VC market is largely focused on the initial stages of start-ups' development process, whereas in the US, more investments were made in the scaling-up stages. This partly explains why the success and growth rates of the US start-ups are higher than in the EU. To bridge the 'valley of death' between research and commercialisation, high-risk, yet market-creating, innovative projects, which do not yet generate revenues, however of a prosperous outlook, need to be financially supported[245]. There is consequently an opportunity in unlocking financing for RDI in high-growth European SMEs with an emphasis on the scaling-up of the high-growth SMEs, which without an improved access to finance, may not be able to further commercialise their innovations. The following section analyses the main financing challenges experienced by SMEs when developed RDI-focused projects.

8.4 Barriers

To address the sectoral barriers constraining investment in the 'RDI in SMEs' sector, the following section:

- Analyses the financing challenges faced by SMEs undertaking innovative projects;
- Details the key barriers constraining investments in the sector, both from the perspective of the demand side and of the supply side stakeholders; and
- Assesses the barriers that hinder the uptake of ERDF / CF-supported financial instruments whose objective is to increase RDI activities in SMEs.

8.4.1 Challenges related to the financing of SMEs' research-intensive innovative projects

The differences in innovation output across the MS are first linked to economic, organisational and behavioural barriers. One of the main reasons behind SMEs' low probability to innovate and invest in RDI activities is the **limited availability of resources**, both financial and organisational / human. The RDI initiatives may be associated

[245] European Commission. A new Horizon for Europe. Impact Assessment of the 9th EU Framework Programme for Research and Innovation. 2018. Available here: https://ec.europa.eu/info/sites/info/files/research_and_innovation/contact/documents/horizon_europe_impact_assessment_book_web_version.pdf.

with high fixed costs and high minimum threshold of projects' sizes. These place a higher financial strain on small enterprises than on larger ones[246].

Among the main challenges of financing innovation are the limitations stemming from the **asymmetry of information** (*i.e.* the quality / profitability of the project is difficult to assess by financers / investors). Some SMEs may also have **limited experience and credibility in presenting business cases** to investors, which is related to the lack of reputation on the market. This changes when SMEs become successful or are led by entrepreneurs with successful track records in other companies or sectors. Less-established SMEs may also have **limited tangible assets**, which hinders their capacity to ensure / provide collateral when securing external financing[247].

Moreover, financing innovation frequently varies from financing investments in traditional, tangible assets. For example, innovation expenditure in German SMEs is financed from own resources in 82% of cases and only in 9% with bank loans. For comparison, when it comes to any other investment expenditure (not innovation related), this ratio is that 49% are financed by own financing and 34% by external financing[248]. As companies increase the share of R&D activities in their innovation projects[249], the share of bank loans to finance innovation expenditure falls from 11% to 3%. Effectively, SMEs are more likely to use internal funds to finance R&D projects[250]. Finally, to cover the initial high risks associated with the RDI projects, national / regional / local subsidies (*i.e.* grants) are also a commonly-used and provided financing source. The following boy details the example of innovation financing in Germany.

[246] KfW, SME Innovation Report, 2017.

[247] EIB, *Investment Report 2018/2019*, 2019.

[248] KfW Research, *How SMEs fund their innovation and investment expenditure – a comparison*, 2019. Available here: https://www.kfw.de/PDF/Download-Center/Konzernthemen/Research/PDF-Dokumente-Fokus-Volkswirtschaft/Fokus-englische-Dateien/Fokus-2019-EN/Fokus-Nr.-237-Januar-2019-Financing-innovation.pdf.

[249] Innovation projects (*e.g.* improving existing processes) tend to be perceived as less risky compared to the R&D projects, which are usually associated with higher uncertainty of success. This is developed in: KfW, SME Innovation Report, 2017.

[250] EIB, *Working Paper 2018/01, What Finance for What Investment? Survey-Based Evidence for European Companies*, 2018.

Box 7: Financing RDI in SMEs, the example of Germany (2017)

Innovation of SMEs in Germany: the reasons behind constrained investment in innovative activities

In a survey relative to SMEs' RDI activities conducted by KfW in Germany, 83% of non-innovative enterprises did not see a need to innovate, while 17% were not able to innovate due to existing barriers. As such, there is **an opportunity to foster innovation activities** in both groups. There is indeed, on one hand, the possibility to stimulate RDI in the SMEs that have not yet explored the value of innovation, and, on the other hand, the possibility to **unlock access to finance for SMEs willing to innovate**, yet facing financial barriers.

- For the SMEs not willing to innovate, the main constraints are related to market uncertainties regarding the future demand for their existing products, as well as for their innovations. Profitability outlook, dependent on economic environment is also an important hindering factor, especially for imitators[251].
- For the SMEs willing to innovate, among the main constrains, there are: (i) the lack of financial resources to commercialize innovative goods or services (68%), (ii) a market being dominated by established competitors (64%), and (iii) the cost or complexity of meeting regulations or standards (62%).

A similar pattern applies for commercializing non-innovative goods or services: (i) the lack of financial resources (56%), (ii) a market dominated by established competitors (53%), and (iii) the cost or complexity of meeting regulations or standards (52%) are also the main constraints[252]. As such, **difficulties in accessing finance seems consequently to be a significant barrier to innovation, which, in turns, represents an intervention area for potential financial instruments**. This matter is analysed in the following section.

Source: KfW, SME Innovation Report, 2017[253].

8.4.2 Barriers hindering investment in the 'RDI in SMEs' sector

The barriers to investment in the sector vary with the perspective of stakeholder (*i.e.* whether the stakeholder is working on / for the demand or supply side), as well as the stage of development, and the features of the innovation activities.

Challenges experienced by demand-side stakeholders

For demand side stakeholders, such as established SMEs willing to improve their processes, business models and marketing strategies, the key experienced barriers are: (i) difficulties to access early-stage finance, (ii) the limited availability of resources (*e.g.* human capital, organisational, and technological resources), and, (iii) the lack of international partnerships (or the difficulty to generate ones, along with the development of market knowledge).

SMEs and entrepreneurs intending to bring their innovative ideas to the market struggle with accessing the necessary finance to commercialise their ideas, a barrier directly related to unproven and more risky business models / products, which have not yet been market tested.

The following section dissects the key barriers faced by demand-side stakeholders gathered during the stakeholders' consultation and desk research.

[251] KfW, *SME Innovation Report*, 2017.

[252] European Commission, *FL394 Innobarometer – Final Report*, 2014.
Available here: http://ec.europa.eu/commfrontoffice/publicopinion/flash/fl_394_en.pdf.

[253] KfW, *SME Innovation Report*, 2017.

Need for finance before projects become bankable

Before innovation reaches a high-maturity, SMEs need to face a range of risks related with the development, demonstration and early-commercialisation phases. This may be a **long and capital-intensive process**, which requires grants, high-risk equity, and further on subordinated debt. At this stage, the **development costs are high, while returns are uncertain and limited.** Hence, obtaining commercial financing is challenging[254]. At the same time, without the necessary financing to support the development phase of the project, an emerging innovation cannot be brought to the market. This results in missed opportunities and potential loss of breakthrough innovations.

Insufficient capability to commercialise innovation

Apart from access to finance, **the lack of financial and legal expertise** within (innovative) SMEs act as a hindering factor for attracting potential investors. The supply side stakeholders prioritise investments in projects with **solid business cases** and sound business models with **reliable risk assessment** and **forecast of future cash-flows**. This type of business analysis is however key to commercialise innovation. It needs to be prepared by demand side stakeholders, which is often considered as a challenge: indeed, innovative entrepreneurs may be at ease with technologies, but less at ease with commercial and legal activities related to the development / commercialisation of their innovation. Business advisory services complemented with legal and technical sector-specific knowledge have the potential to address this barrier by supporting the development of a business model for an innovation.

Lack of cross-border networks and collaborative partnerships

The **lack of capabilities to foster and manage collaborative partnerships** is a constraining factor for the commercial uptake of innovative ideas. A study by the European Parliament, assessing the innovation gap between the MS, points to the **lack of necessary competences to form and manage international partnership networks** as one of the reasons for stalled RDI activities in Member States with scope to improve their innovation performance[255]. The **lack of capacity to tap into the international ecosystem** of start-up incubators, innovation / knowledge exchange platforms or cooperation between academia and businesses results in missed opportunities of developing and up-scaling innovative ideas.

[254] Government Chief Scientific Adviser, *Annual Report*, 2014. Innovation: Managing Risk, Not Avoiding It. Evidence and Case Studies. Available here: https://www.oxfordmartin.ox.ac.uk/downloads/reports/14-1190b-innovation-managing-risk-evidence.pdf.

[255] European Parliament, *Overcoming innovation gaps in the EU-13 Member States*, 2018. Available here: http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_STU(2018)614537.

Limited access to resources

RDI activities in SMEs are also affected by traditional challenges adversely influencing the competitiveness of SMEs. For example, **limited access to financial, information** and **human capital resources** faced by SMEs is reinforced by **organisational constraints**, as well as insufficient time and quality management. For established SMEs, the development and implementation of innovative activities also depend on the willingness to **overcome organisational inertia**, and **embrace behavioural change**[256].

Challenges for the supply-side stakeholders

Supply-side stakeholders investing in start-ups and established innovative SMEs face a set of challenges related technology and commercialisation risks, reinforced by uncertainties regarding returns on investment. Investors find it challenging to develop a pipeline of investment-ready projects and appraise projects in highly digitalised advanced technologies. A development of an ecosystem of investors willing to invest in high-risk innovations, and agreeing on the risk-sharing schemes suitable for the risk appetite of each of the participants can be a challenge. The paragraphs below point to three key hindering factors identified during the stakeholders' consultation and desk research.

Uncertain return on investment

The underlying risk of any investment in innovation is associated with an **uncertain return on investment**. This is inherent to the nature of RDI activities itself, and directly impacts the project's cash flows. The benefits of developing and implementing innovation are **speculative** and can be verified when the new processes or products are brought to the market. The development of a new technology is also **time-consuming**. This brings additional uncertainty of a similar innovation being developed faster by competitors in other territories, not only in Europe, but also globally.

Difficulties in the development of sufficient number (critical mass) of innovative projects

Investors tend to follow a **portfolio-based approach** to invest in innovation, which requires a **sufficient critical mass** of prospectively bankable projects. The **development of a projects pipeline** with sufficient amount of innovative and potentially viable projects is a challenge for investors operating and investing in RDI on smaller markets[257]. This barrier can be addressed by (i) developing cross-border partnerships between European incubators, (ii) fostering the development of stronger business to academia linkages, and (iii) enlarging the geographical and/or sectoral scope of action of the investors.

[256] European Commission, *Support to SMEs – Increasing Research and Innovation in SMEs and SME Development*, 2016. Available here: https://ec.europa.eu/regional_policy/sources/docgener/evaluation/pdf/expost2013/wp2_final_en.pdf.

[257] European Parliament, *Overcoming innovation gaps in the EU-13 Member States*, 2018. Available here: http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_STU(2018)614537.

Challenges in the appraisal of risks and profitability of the most innovative high-tech projects

The development of an attractive pipeline of projects in RDI requires sufficient **sectoral expertise to appraise projects in terms of risk and profitability**. This is particularly challenging in **emerging sectoral niches**, such as KETs, artificial intelligence and robotics. The **lack of adequate technical expertise** within the VC or PE funds to reliably assess the potential of disruptive technologies, as well as the associated financial, technological and demand / market risks, may result in missed innovation opportunities and/or projects' defaults.

8.4.3 Barriers hindering the uptake of ERDF / CF-supported financial instruments in the 'RDI in SMEs' sector

Given the barriers halting investment in the 'RDI in SMEs' sector in the EU, there is scope for the deployment of financial instruments, which would mitigate the risks stemming from sector-specific barriers. There is especially scope for public interventions aiming to unlock access to finance for RDI projects developed by SMEs in the case of innovative projects associated with a **high-level of return on investment uncertainty**, while at the same time holding a **potential for introducing breakthrough innovation** to the market.

The use of financial instruments using ERDF or CF can accelerate the development and market-testing of innovative business models, products and services created by SMEs, therefore contributing to the creation of a more innovative, sustainable and competitive economy. However, the wider use of financial instruments in the 'RDI in SMEs' sector is constrained by a number of hindering factors, such as (i) regulatory constraints related to ERDF funding, (ii) difficulties in integrating the financial instruments into existing local environment of grants (and of financial instruments), and (iii) perceived complexity of compliance requirements, including State aid requirements. The paragraphs below detail these hindering factors.

Regulatory constraints related to ERDF in regards to common market practice

Regulatory constraints related to ERDF in case of the 'RDI in SMEs' sector are related to the (i) **timing**, (ii) **geography**, as well as (iii) **monitoring and reporting** requirements. For example, the timeframe of the programming period may not be aligned with the equity market practices of investment rounds (*i.e.* the time needed for investment and divestment may exceed the timeframe of the programming period, and consequently the fund managers may not be able to use the ERDF funding to support such projects; making the ERDF-supported financial instrument inoperative). To mitigate this barrier, it is needed from the managing authorities to initiate the development of their ERDF-supported financial instruments as early as possible in the programming period. In terms of geographic constraint, the geographic focus defined in the investment strategy of the financial instrument specifies the area, where financing interventions can be made. This is a consequence of the geographical delimitation of ERDF; this funding being dedicated to specific territories (*i.e.* ERDF needs to be spent on its territory or in projects that may have a positive impact on the territory). This delimitation aims to facilitate demand from entrepreneurs in the less developed Regions or in territories not necessary under the radars of financers (such as equity funds in the case of RDI financing). In the meantime, it may be **difficult for financial instruments to secure a sufficient pipeline of investment-ready projects within a specific geographical scope**. This is particularly challenging for smaller markets / territories. The total number of

bankable projects is often too limited to justify the development of financial instruments and to attract private financers as co-investors. To achieve a sufficient critical mass of innovative and financially viable projects, it may be **important to go beyond borders** (the latter being regional or national), in order to find investment-ready innovations, to attract other private investors and to attract competent fund managers. Finally, the monitoring and reporting requirements related to ERDF resources (as public finance) are associated with **additional administrative responsibilities** (often taken by privately managed funds, which may not be used to conduct such operations and bear such responsibilities). **From the fund manager perspective** (especially if the latter is private)**,** such **additional responsibilities should be overcompensated by the opportunity to address new clients** (*i.e.* innovative SMEs) **and to develop new markets** (such as niches and innovative sectors not currently addressed); but this is not guaranteed, due to the timing and geography constraints linked to ERDF funding (as previously explained).

Difficulties in integrating ERDF-supported financial instruments into existing environments of grants and financial instruments

RDI activities of SMEs benefit from the **availability of grants that serve their extended financing needs** resulting from the development and implementation of innovations. It is difficult to shift the attitude of beneficiaries from non-revolving finance to financial instruments and in fact establish new standards on the market. It can be expected that as long as grants go beyond the proof of concept phase and are available for bankable projects, SMEs may prefer to opt for grants rather than financial instruments. This barrier can be addressed by **defining the boundaries and synergies between financial instruments and grants**. Additional guidance on how financial instruments can be integrated into the **current environment of grants and allowing for easier forms of combination** of grants and financial instruments could also address this challenge. The section on key enabling factors for financial instruments in the 'RDI in SMEs' sector outlines the possibility of how grants can be used as an enabling factor for the wider use of financial instruments in the sector during the 2021-2027 programming period.

In parallel, **many MS and regions have already financial instruments addressing the 'RDI for SMEs' sector**. The latter often do not use ERDF funding, but national or regional / local public funding. In these situations, the key barrier / challenge for an ERDF-supported financial instrument is to prove its added value (in regards to the 'ERDF constraints' attached to the funding, namely: timing, geography, and compliance requirements; *as detailed in the barrier above*). In this matter, **it may be relevant for the ERDF-supported financial instruments to take additional risks and/or to address niche /more risky sectors, then the ones (*i.e.* the risks and the sectors) that the national / regional public authority(ies) are ready to take with their 'own' resources**.

Compliance requirements perceived as over-complex

Even if they are not specific to the 'RDI in SMEs' sector, compliance requirements related to the setting-up and carrying-out of monitoring and reporting activities for ERDF-supported financial instruments are perceived as **too burdensome** by many stakeholders (among which the NPBIs and financial intermediaries in charge). Specific challenges relating to such **administrative burden** and **red tape** vary with (i) the stakeholders (being public or private), (ii) their experience with financial instruments (and especially ERDF-supported financial instruments), and (iii) market maturity. As a particular point of concern, many stakeholders pointed the **over-complexity of the public procurement requirements** governing the selection of financial intermediaries. For many, the latter is considered as not proportionate to the benefits of the financial instruments (and may then discourage the managing authorities to engage in the set-up process). Finally, for some of the managing authorities, the **reputational risks resulting from financial corrections** applied for non-compliance, also acted as a reason not to engage in financial instruments with the involvement of the ERDF; illustrating a **risk-adverse approach of public authorities that current regulation does not prevent**.

In parallel, since the 'RDI in SMEs' sector is among the sectors in which a certain number of ERDF-supported financial instruments have been developed during the 2014-2020 programming period, managing authorities could participate to / benefit from **peer-to-peer discussions** and **best practices** in the future; covering for instance the selection of financial intermediaries and the monitoring / reporting requirements. Such initiatives could **generate** '**commonly-agreed practices**' on a number of topics.

State aid compliance implications

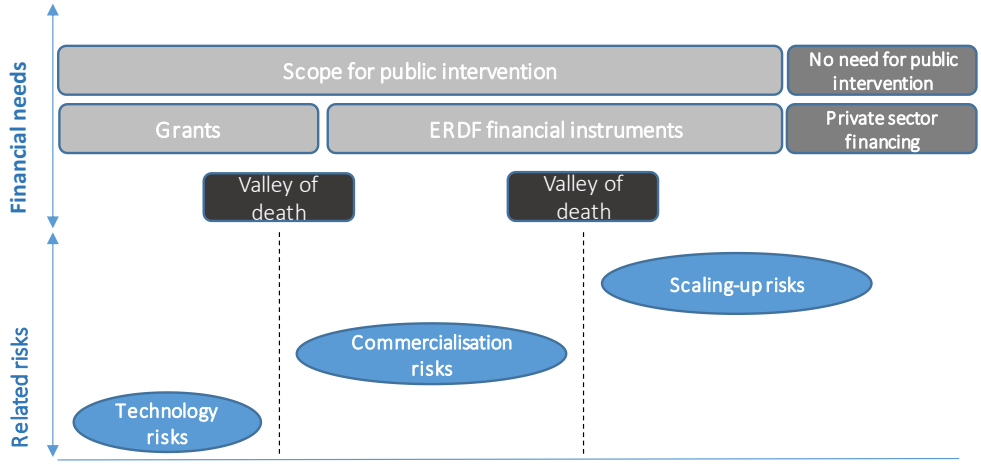
Even if this aspect appears less problematic in the 'RDI in SMEs' sector in comparison with the other four sectors studied, **State aid compliance implications** can act as a hindering factor for financial instruments in the 'RDI in SMEs' sector. Based on the stakeholders' consultation, Articles 21 and 22 of the General Block Exemption Regulation (GBER) and the *de minimis* regime facilitate implementation of financial instruments in the sector. Challenges arise where neither can be applied. For example in the case of subordinated debt, following the State aid Notification to the EC, one stakeholder reported that the resulting interest rate on the financial product provided by the financial instrument was not affordable for final recipients.

8.5 Potential for the use of financial instruments for RDI in SMEs

The financing needs of SMEs when developing and implementing RDI projects are dependent on the development stage of the company, as well as on the stage of the project. The RDI activities of start-ups are highly impacted by technology risks. When it comes to the financing needs of scaling-up RDI activities, the main risks are related to market risks, including commercialisation and scaling-up risks. The figure below illustrates the scope for public intervention in relation to RDI financing; the latter being under the form of grants and/or of financial instruments.

Grants remain a key financing instrument to cover the technology risks of RDI projects; when the project does not generate revenues. ERDF-supported financial instruments become then the most relevant form of finance when an innovative project reaches its commercialisation phase. Indeed, the role of a public intervention at this moment is to support the delivery of the new product to the market, and to unlock access to private sector investors by covering a part of risk considered too high. As soon as the RDI project reaches its market maturity and has a high degree of bankability, it can be fully financed by private sector financing, without any financial support of the public sector.

Figure 54: Scope for public financing intervention in the 'RDI in SMEs' sector



Source: PwC analysis, 2019.

Based on the scope for public financing intervention presented in the figure above, investment needs of SMEs' spending in RDI can be analysed according to the following development phases:

- **Proof of concept covering the development of a new technology, product or service**;
- **Commercialisation of a new technology, product or service**; and
- **Scale-up and further development of the business case for a new technology, product or service**.

These three development phases are detailed in the following paragraphs, along with their associated TA needs.

Proof of concept phase

SMEs' projects that are at the proof of concept stage mainly need access to **grants**. However, for well-established SMEs bringing new innovative ideas to the market, there is also an opportunity to provide **VC financing** that may benefit from a public support, including using ERDF funding.

Commercialisation phase

During the commercialisation phase, the risks associated with bringing innovation to the market are very high. Therefore, these investments will need access to **seed financing** that will support the final development stages of the project and its further implantation. These projects often need a **combination of grants, equity financing and subordinated loans**; again potentially supported by a public intervention.

Scale-up phase

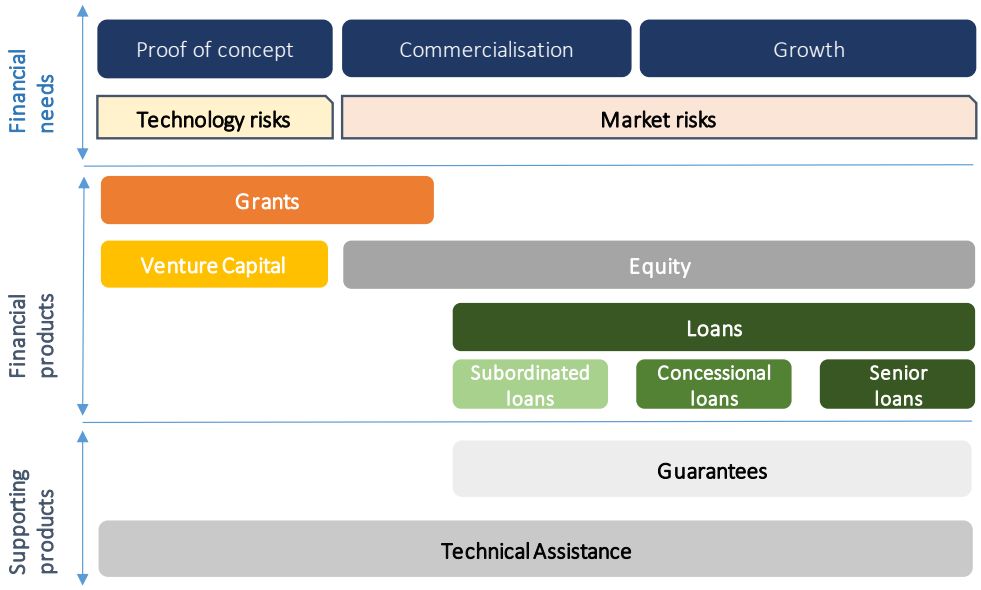
Finally, to scale-up business activities and to enter new markets, SMEs often need a proper access to **equity financing** and to **debt financing** (potentially with preferential conditions). Following that, depending on the maturity of the SME, the RDI project might either need an access to PE financing, and/or to debt financing. In both cases, this access may be supported by a public intervention.

Technical Assistance

Regardless of the stage at which the SME stands with its RDI project, there is often (or always) a need for TA in order to (i) support the development of viable business cases, as well as to (ii) facilitate the delivery of the innovation to the market. This need is present throughout the different development stages of each project, however may not be required by all SMEs. TA can be particularly beneficial for **early stage enterprises** (start-ups) and **highly innovative projects in emerging technologies** led either by start-ups or later-stage enterprises.

The figure below illustrates which financial products and non-financial services may be offered to SMEs in order to address their needs when developing RDI projects, depending on their development phase.

Figure 55: Classification of SMEs financial and non-financial needs by risk profile and maturity level



Source: PwC analysis, 2019.

8.5.1 Areas offering potential for the use of financial instruments

To address the diversified financing needs of SMEs developing RDI projects, a combination of the following financial instruments has been identified as relevant. As indicated in the following paragraphs, their selection / preferences mainly depend on the maturity and the risk profile of the SME and/or the project.

Equity financing for commercialisation and scaling-up of innovative activities

SMEs investing in RDI need an **access to equity** to finance the development costs of an innovation (*e.g.* purchase assets), as well as to fund their own operations. In the early stage of an enterprise or of an innovative project, the involvement of **experts** and an **access to the right technical capacity are critical to deliver innovation to the market**. In this context, access to equity for RDI in SMEs may limited due to the high risks associated with the innovative component of the project (*i.e.* technology risk). This is particularly the case in some MS where the **VC markets** are not developed enough. Financial instruments could address this market failure by **offering equity products to SMEs** that have developed innovation and would like to commercialise it. Furthermore, also in the case where the innovation is not fully established, financial instruments providing equity financing could support SMEs in expanding their activities.

Loans with different risk tolerance levels and conditions

When implementing new solutions and technologies to the market, SMEs need an easy **access to debt products**. Often, access to loans is restricted due to market risks related with untested business models. This leads to the uncertainty in cash-flows and results in a limited interest of private sector banks in financing SMEs' RDI projects. A financial instrument could unlock access to private sector financers by offering **subordinated debt** and/or **concessional debt**. Thanks to the use of public funding to (i) cover part of the risk and (ii) offer debt at better market conditions (*e.g.* with more flexible repayment conditions or longer maturity for instance), SMEs could commercialise their innovations, and, once they have reached a sufficient level of maturity, access private sector financing.

Guarantees to unlock access to commercial loans

An **additional driver to boost investments in RDI in SMEs** could be the deployment of dedicated **guarantee schemes** for innovation in SMEs. Guarantees could be offered in parallel with other loan instruments to involve more private sector stakeholders and unlock access to finance for innovative SMEs with limited collateral. Financers and investors could then accept higher risks due to the involvement of a guarantee in the funding scheme of the RDI project. The presence of guarantees for RDI activities in SMEs could incentivise private sector stakeholders to join the financing of the RDI project earlier on, and to support the growth of innovations. It is to be noted that guarantee schemes already exist at the EU level *via* InnovFin. Consequently, the development of national / regional guarantee schemes for RDI in SMEs should be considered with care in order not to duplicate what is already provided by InnovFin (and ensure, on the contrary, a complementarity with it).

A combination of financial instruments with grants

In addition to the different possible financial instruments presented above, a grant component may be considered, either to **make the innovative project bankable by covering the non-revenue generating part** of it, or to provide **Technical Assistance**. Indeed, the grant component could cover the part(s) of the innovative projects that cannot generate revenue (for instance the activities related to R&D or networking activities, both key operations for innovative SMEs), while the financial instrument would provide equity financing or loans with preferential conditions (such as subordinated debt) to cover the revenue-generating part(s) of the RDI project.

In that context, **the grant component would act as an enabling factor** for the financial instrument(s). It would support the highest risk component of the RDI projects (*i.e.* the non-revenue generating parts), while the financial instrument(s) finance the other part(s) and enable the fund manager and the managing authority to reinvest returns in other / new projects in the future. In that perspective, clear **boundaries** and **synergies between grants and financial instruments** need to be considered to leverage at best the key assets of both financing schemes; and especially the advantages of financial instruments, such as their revolving and leveraging nature. In parallel to its de-risking role, the grant component may also be used for Technical Assistance provided to the SMEs such as for market studies and/or for project *ex-ante* assessments.

8.6 Key enabling factors for the use of financial instruments

To accelerate the deployment of ERDF-supported financial instruments in the 'RDI in SMEs' sector, it is important to consider the following key enabling factors in view of facilitating the development of revolving finance mechanisms in the sector.

8.6.1 Strengthening the political support towards revolving finance for SME financing addressed to RDI projects

Innovation, as a driver for SMEs' competitiveness, has a **high priority on the economic and political agendas** of local, regional and national public authorities. Political consensus to support the use of revolving finance in the sector has been named as one of the key success factors for the wider use of financial instruments during the stakeholders' consultation.

In this context, it has been observed that, when the **political support** towards the use of revolving finance for RDI projects is **consistent and independent of the changes in the political landscape**, it acts as a success factor for the financial instruments. Indeed, the development of financial instruments requires **long-term political support**. Following this, there is a need to **increase awareness of public sector entities of the benefits of financial instruments**, in order to build consensus about their strengths and added value.

The willingness of the public sector to take the higher risk associated with RDI projects has an enabling effect for financial instruments in the sector as it encourages private sector financers / investors to join the scheme. The possibility to accept a certain degree of losses by the public investor during the operation of the instrument is of particular importance in the 'RDI in SMEs' sector, where an instrument may have a lower number of successful projects as compared to other '*less risky*' sectors.

Since the process of designing and implementing financial instruments in the 'RDI in SMEs' sector may be time-consuming, managing authorities need to consider the use of financial instruments **early on during the programming period**. Indeed, since the timeframe within which the managing authorities need to spend the EU funds is not aligned with the equity market practice (*e.g.* funding rounds and geographic coverage). Following this, in order to ensure that the resources are disbursed within the programming period, it is recommended to **deploy financial instrument sooner, rather than later**.

Learning from the experience of other managing authorities from other regions, and/or other Member States, which have successfully deployed ERDF-supported financial instruments in the 'RDI in SMEs' sector has also been mentioned during the stakeholders' consultation as one of the enabling factors for a more efficient set-up and implementation of the financial instruments.

8.6.2 Better aligning the ERDF regulation with the common practice of the sector

Once political support to develop financial instruments in the 'RDI in SMEs' sector is obtained, it is important that **the ERDF-supported financial instruments are designed and implemented in a way as close to common market practices as possible**. This is particularly valid in the case of the VC and PE markets when financing RDI in SMEs. The following elements are especially valid for the equity market since debt / guarantee financial instruments operate differently (and are financial instruments that are quicker to set up and ramp up). Moreover, as mentioned in the previous sections, (i) VC / PE funds are of particular importance for RDI in SMEs financing and, as illustrated in Section 8.2, (ii) equity instruments are often the preferred choice of financial instruments made by the managing authorities for the 'RDI in SMEs' sector during the 2014-2020 programming period.

There are several reasons behind the fact that the design and implementation of ERDF-supported financial instruments need to be close to common market practices. First, it facilitates the selection of financial

intermediaries (whose practices do not need to be radically changed to implement the ERDF instruments). Second, it increases the chances for the financial instruments to add value to the existing eco-systems. Indeed, if, as mentioned earlier, the objective of ERDF-supported financial instruments is to take additional risks and/or to address niche /more risky sectors, in the context of markets where financial instruments already exist (which is often the case for the 'RDI in SMEs' sector), then the managing authorities / Intermediate Bodies will require to the financial intermediaries to take additional care to ensure that these additional risks / niches are addressed. This translates into an '*extra-effort*' for the financial intermediaries. To counter-balance this extra-effort, the design and implementation of the financial instruments would need to be as much as possible in line with common practice for the financial intermediary.

As mentioned previously, regulatory constraints related to the use of ERDF into financial instruments have been raised during the stakeholders' consultation. These constraints are linked to: (i) **timing**, (ii) **geography**, and (iii) **monitoring and reporting**. Adaptations to the regulation may be considered to facilitate the design and implementation of ERDF-supported financial instruments in order to:

- Ensure that the financial intermediaries can (i) build a pipeline of projects of good quality, and (ii) participate in several rounds of investment in the SMEs, by **having a longer time period of eligibility for the equity instruments** (a common practice being of 10 years in the equity market);
- **Be more open in the definition of 'geographical coverage'** so that an equity instrument may invest in an SME as soon as this investment as a positive impact on a given territory. This would (i) require a comprehensive definition of '*positive impact*', (ii) enable the financial intermediaries to deploy the equity instruments beyond the borders of a given OP, and so (iii) increase the number of potential bankable opportunities for the instrument; and
- **Adapt the monitoring and reporting requirements** to ensure that, as long as the objectives of the OP are fulfilled by the instruments, such requirements are not too burdensome for the FoF manager and/or the financial intermediary (considering that such requirements may sometimes currently prevent potential financial intermediaries to participate to the selection process). This would require to (i) clarify the nature and level of details of the documentation required by each stakeholder (*i.e.* the managing authority, the FoF manager when it exists, the financial intermediary, and the final recipient), and to (ii) ensure that the audit authorities are fully informed / knowledgeable about these requirements before initiating their procedures. If this last element is not specific to the 'RDI in SMEs' sector, adapting such requirements would particularly support the development of ERDF-supported financial instruments in the sector and increase the interest from private fund managers to bid for such instruments, and be selected to manage them.

8.6.3 Combining grants with financial instruments

Grants are currently the most widespread public support in the 'RDI in SMEs' sector and offer a '*perceived quick way*' for public authorities to disburse the ERDF resources compared to financial instruments. From the perspective of a managing authority, the development of a financial instrument is perceived as more time-consuming and complicated compared to the disbursement of ERDF resources by means of grants. As such, the wider use of financial instruments is constrained to a certain extent by a broad availability of grants, although bankable projects in the 'RDI in SMEs' could be supported by financial instruments instead, and offer possibility to reinvest the returned resources in the future (a key added value of financial instruments over grants in this sector). Definition of clear **boundaries** and **synergies between grants and financial instruments** may foster the use of the financial instruments and create incentives for managing authorities to consider them[258].

[258] For instance, such boundaries are already currently in discussion for other ESI Funds for the 2021-2027 programming period. In that context, some expenditures are predicted to be 'eligible' under ESF+ or EAFRD 'only' if they are financed by financial instruments (and consequently 'not eligible' if they are financed by grants).

Grants can also act as an enabling factor for financial instruments. They may **support the highest risk component of RDI projects**, for instance when there is a need to cover the initial development costs. Once the projects start generating revenues, they can benefit from financial products offered by financial instruments. The use of financial instruments gives public authorities the opportunity to reinvest returns in the future, and so to achieve more impact with the same initial amount. Following this, the stakeholders' consultation has clearly indicated that there is a **need to foster the knowledge of how financial instruments can be combined with grants** during the 2021-2027 programming period.

The CPR proposal of the EC for the 2021-2027 programming period allows for integrating ancillary grants, including investment grants, in financial instruments[259]. This means that both the **repayable and the non-repayable part of an investment could be governed under the financial instrument rules**. It is expected that this will significantly **simplify the combination of different forms of support** (*i.e.* the combination of grants and financial instruments) in comparison with the current 2014-2020 programming period.

8.6.4 Fostering collaborative partnerships between academia, businesses and governments

The cooperation between the '**triple helix**' components (*i.e.* research institutes, businesses and public entities) facilitates the development of projects pipelines with critical mass of innovative projects that may then be financed by financial instruments. In addition, leveraging on the links between the social and natural sciences improves the environment for knowledge-intensive SMEs and accelerates the impact of interdisciplinary research, which can be then commercialised. Therefore, it can serve as a source of high-quality innovative projects[260]. Such cooperation should be **promoted and stimulated by managing authorities when developing their Smart Specialisation Strategies for the 2021-2027 programming period**. Investments to be financed under Policy Objective 1 during this new programming period (promoting 'a *smarter Europe,* [through] *innovative and smart economic transformation* [including digitalisation and support to SMEs]') should be aligned with these Strategies, including under the form of financial instruments. In parallel to well-structured local ecosystems of investors (*see next enabling factor*), these **cooperative partnerships** between universities, private actors and governments help generate knowledge-intensive projects supporting local Smart Specialisation Strategies that can be then financed and commercialised.

8.6.5 Developing ecosystems of investors

In order to be successful in the development of ERDF / CF-supported financial instruments in the 'RDI in SMEs' sector, managing authorities may benefit from the local knowledge of (potential) financial intermediaries whose involvement is critical to reach the final recipients (SMEs) and to achieve the OP targets. The EC study related to R&I in SMEs underlines the **important role of financial intermediaries** in (i) accelerating the absorption of the funds, (ii) reducing the administrative costs to access funds for final recipients, and (iii) providing support to final recipients in developing their business plans[261]. Financial intermediaries often have the needed **knowledge of the local socio-economic and institutional context**, in which SMEs operate. It is in the interest of all stakeholders (*i.e.* the managing authority, the FoF manager when it exists, the financial intermediary, and the final recipient) that this knowledge is leveraged during the design and implementation phases of the financial instruments. Also, the professionalism and experience of the financial intermediaries is essential to **source the viable investment**

[259] European Commission, *COM (2018) 375 final*, 2018.
Available here: https://ec.europa.eu/commission/sites/beta-political/files/budget-may2018-common-provisions_en.pdf.

[260] European Parliament, Overcoming innovation gaps in the EU-13 Member States, 2018.
Available here: http://www.europarl.europa.eu/RegData/etudes/STUD/2018/614537/EPRS_STU(2018)614537_EN.pdf.

[261] European Commission, *Support to SMEs – Increasing Research and Innovation in SMEs and SME Development*, 2018.
Available here: https://ec.europa.eu/regional_policy/sources/docgener/evaluation/pdf/expost2013/wp2_final_en.pdf.

opportunities among innovative projects originating from various channels, such as the universities and incubators.

The uptake of financial instruments in the 'RDI in SMEs' sector needs to be supported by the development of an ecosystem of investors which can then co-invest in the projects financed by financial instruments supported by ERDF funding. Indeed, if the potential final recipients (SMEs) need to be aware of the financing opportunities offered by the financial instruments, it is also necessary to ensure that the supply side stakeholders are aware of the financial instruments that they can manage and/or with which they can co-invest. NPBIs, commercial banks, Business Angels' networks and VC / PE funds can be all interested in becoming co-investors with ERDF financial instrument deployed in the 'RDI in SMEs' sector. Moreover, once the highest risk component of a financial instrument is covered by ERDF funding and its national co-financing, other financers / investors (public and/or private) can be interested in joining the scheme, according to their own risk-appetite (this is notably the rationale that fuelled the development of ESIF-EFSI combinations under the Omnibus Regulation). **Key stakeholders of the supply side should be made aware of the potential to join a financial instrument at its design phase and the regulation for the 2021-2027 programming period should facilitate such combination / coordination of various financing sources within a financial instrument itself or in co-financing**.

8.6.6 Technical Assistance

TA is very often needed to **support RDI projects in their transition from an innovative idea to an investment opportunity**. Attracting equity financing is possible only for innovations which have the potential to be financially viable. To transform an innovative activity into a bankable project, entrepreneurs and SMEs often require business advisory support **to accelerate the development of a sound business case**, and conduct a comprehensive **risk assessment**, both from a financial, as well as a technical perspective. The **development of TA platforms providing advisory services to SMEs** at local level for the projects to be then financed by a financial instrument: (i) **increases the chances of reaching a sufficient critical mass of projects**, (ii) attracts interest of (co-)investors (since more advanced projects are presented to them), and (iii) enhances the possibility of **bringing more innovations to the market**. Such TA support is often relevant across the development stages of the SMEs – from the initial development of a business case to the further scale-up of the SME / project – and concerns all types of sub-sectors and technologies (*leveraging the more developed 'collaborative partnerships between academia, businesses and governments' mentioned earlier as another key enabling factor*).

TA programmes can also be designed to **support public authorities** in enhancing their capabilities related to the deployment of ERDF-supported financial instruments in the sector. Market sponsoring and **proactive approach** to the development of financial instruments **positively influences the successful tailoring of financial instruments** to address the local innovation needs of SMEs. The knowledge of managing authorities regarding the financial instruments' lifecycle and the understanding of the local ecosystem of key stakeholders, both on the demand and supply sides, can increase the use of financial instruments in the 'RDI in SMEs' sector by facilitating their design and implementation.

8.7 Overview – Key sectoral outputs for the 'RDI in SMEs' sector

The table below summarises the key outputs to consider for the further development of financial instruments in the 'RDI in SMEs' sector.

Table 32: Overview of the key outputs of the stocktaking study for the further uptake of financial instruments in the 'RDI in SMEs' sector

	RDI in SMEs	
	Factors	**Impact on the development of financial instruments**
Barriers	Need for finance before projects become bankable	
	Insufficient capability to commercialise innovation	
	Lack of cross-border networks and collaborative partnerships	
	Limited access to resources	
	Uncertain return on investment	
	Difficulties in the development of sufficient number (critical mass) of innovative projects	
	Challenges in the appraisal of risks and profitability of the most innovative high-tech projects	
	Regulatory constraints related to ERDF in regards to common market practice	
	Difficulties in integrating ERDF-supported financial instruments into existing environments of grants and financial instruments	
	Compliance requirements perceived as over-complex	
	State aid compliance implications	
Potential for the use of financial instruments	Equity financing for commercialisation and scaling-up of innovative activities	
	Loans with different risk tolerance levels and conditions	
	Guarantees to unlock access to commercial loans	
	A combination of financial instruments with grants	
Key enabling factors for the use of financial instruments	Strengthening the political support towards revolving finance for SME financing addressed to RDI projects	
	Better aligning the ERDF regulation with the common practice of the sector	
	Combining grants with financial instruments	
	Fostering collaborative partnerships between academia, businesses and governments	
	Develop ecosystems of investors	
	Technical Assistance	

Source: fi-compass*, 2019.*

Legend:

Barriers

 Barrier with a limited negative impact on the uptake of financial instruments in the sector.

 Barrier with a noticeable negative impact on the uptake of financial instruments in the sector (dissuading the managing authorities or other stakeholders from developing financial instruments in the sector).

 Barrier with an important negative impact on the uptake of financial instruments in the sector (almost preventing the use of financial instruments in the sector).

Potential for the use of financial instruments

☆ Potential for such financial instrument scheme exists.

☆☆ Potential for such financial instrument scheme is high.

☆☆☆ Such financial instrument scheme may provide critical added value to the sector.

Key enabling factors for the use of financial instruments

Key enabling factor that facilitates the use of financial instruments in the sector.

Important key enabling factor to facilitate the use of financial instruments in the sector.

Critical key enabling factor to facilitate the use of financial instruments in the sector.

9 Conclusions and recommendations

The present stocktaking study aimed to analyse in more depth the perception that '*more could have been done and/or could be done*' regarding the use of financial instruments supported by ERDF and CF in the current (2014-2020) and next (2021-2027) programming periods. It focused on five sectors:

- Renewable Energy (RE);
- Urban Development and Transport (UDT);
- Environment (including air, water and waste);
- Information and Communications Technology (ICT) infrastructure; and
- Research, Development and Innovation (RDI) in Small and Medium-sized Enterprises (SMEs).

In that respect, the analyses undertaken in the former chapters aimed to:

- Provide a clear picture of the policy context and of the use of financial instruments in the five sectors, underlining the barriers and hindering factors relative to this use;
- Analyse the market opportunities in the five sectors, still present in the 2014-2020 programming period and as anticipated for the future, indicating a rationale / need for (future) financial instruments support; and to
- Underline the facilitating and key success factors relative to the design, set-up and implementation of financial instruments in the five sectors.

Following this, the present chapter:

- Presents conclusions on the use of ERDF / CF-supported financial instruments in the five sectors studied;
- Provides an overview of the barriers experienced in the design, set-up and implementation of financial instruments in these sectors; and
- Formulate policy recommendations for the development of financial instruments in these five sectors for the current (2014-2020) but mainly for the next (2021-2027) programming periods.

9.1 The use of financial instruments in the five sectors

The EU-wide nominal amounts devoted to financial instruments in the five sectors are not minimal (representing in total EUR 3.3bn), but they still remain marginal in comparison with the total amounts devoted to 'all forms of finance' (*i.e.* grants and financial instruments altogether representing about EUR 108.3bn in the five sectors). This discrepancy is particularly striking in the UDT and the Environment sectors, where grants remain, by far, the main form of finance when using ERDF and CF funding. Overall, **thirteen Member States have developed financial instruments in the five sectors**. The choice of the sectors differs from one country to the other, and the amounts devoted to the financial instruments may differ quite importantly, even within the same sector. The 'RDI in SMEs' sector is the only sector supported by all thirteen Member States. When considering **the deployment of financial instruments in the five sectors** in the 2014-2020 programming period, the latter **is progressing in three sectors** (the RE, the 'ICT infrastructure' and the 'RDI in SMEs' sectors); while their deployment in the other two sectors (the UDT and the Environment sectors) seems to have just started and/or is progressing at a more slowly pace.

When considering elements influencing the managing authorities and the Intermediate Bodies in their decision-making process, **ERDF / CF-supported financial instruments related to SME financing** (and especially 'general SME financing' mobilizing Thematic Objective 3) **appear as an '*entry door*'** to the development of financial instruments supporting other sectors, including the five sectors studied. Indeed, in many cases, **the development**

of financial instruments in the five sectors studied often seems a decision from Member States and managing authorities that have past experience with ERDF / CF-supported financial instruments and wish to develop such form of finance in 'new' sectors (such as the ones analysed in the present stocktaking study).

It is consequently to be noted that the **'financial instruments strategies' designed and implemented differ by Member State and by sector**. For instance, **a Member State may decide to largely finance a sector through financial instruments if it considers it relevant and adequate** (as Greece in the RE sector). In other cases, **financial instruments are most probably considered as complementary to grants financing**. Indeed, in the Environment sector, the countries with the highest ERDF / CF amounts reported as eligible costs in the sector have not developed financial instruments in this sector; the most probable reason behind this being that they did not consider this financing option as a possibility for the sector, and/or favoured a 'grant-only' approach. On the opposite, it appears that managing authorities and Intermediate Bodies are aware of the added value of revolving finance mechanisms for the 'RDI in SMEs' sector. That is why it seems among the favourite / preferable sectors to consider when the managing authorities decide for which sectors financial instruments should be developed.

When considering the 'categories of regions', two of them (the 'less developed' and the 'more developed' regions) have implemented financial instruments in all five sectors. The 'transition' regions have developed financial instruments in four sectors. **The 'less developed' regions are the category of regions where the use of financial instruments is the most distributed among the five sectors**; **while the 'transition' and 'more developed' regions focus primarily on the 'RDI in SMEs' sector, followed by the UDT sector**.

Ten Member States have developed financial instruments in other sectors than the five analysed in the present stocktaking study. It may indicate a lack of interest or of conviction from these countries when it comes to develop financial instruments in these five sectors, despite their proven experience. These Member States and managing authorities may then consider these five sectors as (i) inappropriate for financial instruments and/or (ii) too far away from their comfort zone [and so the development of a financial instrument supporting such sector(s) would constitute a risk they are not keen to take]. From another perspective, this situation indicates potential for the design, set-up and implementation of financial instruments in '*other sectors*' – including the five sectors studied in the present stocktaking – that would **leverage their experience and lessons learnt** already acquired. This is particularly true if market opportunities in these '*other sectors*' were proven to these MS and managing authorities, as well as if appropriate **knowledge / experience sharing** and **technical support** were provided if / when needed. Following this, it is also to be assumed that **Member States that have experience with ERDF / CF financial instruments, but which have not developed financial instruments in the five sectors, still need to be convinced by the rationale, the relevance and the viability of financial instruments at least in four of the five sectors** (the exception being the 'RDI in SMEs' sector).

Overall, **room for improvement still exists for the development of financial instruments in the five sectors studied**. In that perspective, it is consequently key to (i) better understand the barriers and hindering factors that are common to the five sectors in the development of ERDF / CF-supported financial instruments, and (ii) consider for the future the key enabling factors and consequently the policy recommendations that can be made for the development of such financial instruments.

9.2 Barriers common to the five sectors

The interviews, the workshops and the online consultation have revealed the main barriers experienced by stakeholders working with ERDF / CF-supported financial instruments during the 2014-2020 programming period.

The **top five challenges experienced during the design / set-up phases of the financial instruments** implemented during the 2014-2020 programming period in one of the five sectors studied were: (i) [difficulty to

understand and/or comply with] State aid rules, (ii) [difficulty to understand and/or comply with the] regulatory framework at the EU level, (iii) [issues related to a] time consuming process given the sector specificities, (iv) [difficulty to understand and/or comply with] regulatory constraints at the local level, and (v) the administrative complexity given the sector specificities.

The **main challenge experienced during the implementation** of the financial instruments in the five sectors studied relates to: difficulties in integrating financial instruments into the current environment of grants. Differences between sectors also exist during this stage: for instance, while the challenges in the UDT sector relate to (i) projects pipeline development and (ii) ensuring the appropriate co-financing / leverage effect, they relate more to (i) compliance requirements (especially with ESIF and State aid rules) as well as (ii) capacity / involvement of the financial intermediaries in the 'RDI in SMEs' sector.

It is also worth noting that stakeholders that (i) 'did not consider the deployment of financial instruments in the five sectors' and those that (ii) 'considered such deployment but stopped the process and did not succeed in deploying them', faced the similar difficulties. **Their main issues concerned: (i) insufficient political support, (ii) lack of market sponsoring, and (iii) administrative complexity**.

In addition to these transversal barriers experienced during the development of financial instruments in the five sectors, or that prevented such development, the sectoral analyses undertaken for each sector have revealed a number of barriers whose relevance or impact varies from one sector to the other. The table below synthesises these barriers and indicates for each sector (i) if and (ii) to what extent each specific barrier is relevant, or with a high impact preventing the development / deployment of financial instruments in the sector.

Table 33: Overview of the main barriers for the uptake of ERDF / CF-supported financial instruments in the five sectors

Barrier	RE	UDT	Environment	ICT infrastructure	RDI in SMEs
Barriers hindering investments in the sectors – Part 1					
Uncertain sectoral regulatory framework	▲	▲ especially in transport	▲	▲	△
Administrative burden / complexity related to the sector (including permit regulations)	▲	▲	▲	▲	△
Regulatory constraints induced by other sectors	▲	▲	▲	▲	▲
Emerging technologies (leading to uncertain return on investment, appraisal challenges, uncertainty on commercialisation, and difficulties in sourcing financing)	▲	▲ especially in transport	▲	▲	▲
Competition with existing technologies proposed by incumbents	△	△	△	▲	△
High up-front development costs and long investment horizons	▲	▲	▲	▲	△
Limited revenue generation potential	△	△	▲	▲ in sparsely populated areas	△
Stranded assets risk (dependent on regulatory and technology changes)	▲	▲ especially in transport	▲	▲	▲
Municipal budgetary constraints	▲	▲	▲	N/A	N/A
Limited (but needed) incentives to invest	▲	△	▲	▲	▲
Limited experience and credibility in developing a project pipeline (critical mass)	▲	▲	▲	▲ especially smaller scale projects	△ or ▲ depending on the MS
Uncertain and limited future demand	▲	△	△	▲	▲
Lack of technical sectoral support (other than projects pipeline development)	▲	▲	▲	▲	▲

Legend:

N/A	Not applicable
△	No or insignificant impact of this barrier in the decision-making process or in deployment of a financial instrument in this given sector.
▲	Limited impact of this barrier in the decision-making process or in deployment of a financial instrument in this given sector.
▲	Noticeable impact of this barrier in the decision-making process or in deployment of a financial instrument in this given sector.
▲	Important impact of this barrier, potentially preventing the decision to deploy a financial instrument in this given sector.

Source: fi-compass*, 2020.*

Barrier	RE	UDT	Environment	ICT infrastructure	RDI in SMEs
Barriers hindering the uptake of ERDF / CF-supported financial instruments in the sectors – Part 2					
Difficulties in operationalising policy goals	▲	▲	▲	▲	▲
Insufficient political support to develop financial instruments in the sector	▲	▲	▲	▲	▲
Regulatory constraints related to ERDF in regards to market practice	▲	▲	▲	△	▲
Difficulties with State aid compliance and cumulation of State aid	▲	▲	▲	▲	▲
Misalignment between the EU-level and the national regulations	▲	△	▲	△	▲
Fragmentation of ESIF resources and unnecessary restriction in eligibility	▲	▲	▲	△	▲
Competition with grants, subsidies, and other financial instruments (and lack of effective combination with grants)	▲	▲	▲	△	▲
Limited awareness of financial instruments' potential among the key stakeholders	▲	▲	▲	▲	▲
Limited availability of financial advisory support	▲	▲	▲	▲	△
Difficulties in ensuring the appropriate co-financing / leverage effect	▲	▲	▲	▲	▲
Limited existence / capacity / involvement of financial intermediaries in sector	▲	▲	▲	▲	△ or ▲ depending on the MS

Legend:

N/A	Not applicable
△	No or insignificant impact of this barrier in the decision-making process or in deployment of a financial instrument in this given sector.
▲	Limited impact of this barrier in the decision-making process or in deployment of a financial instrument in this given sector.
▲	Noticeable impact of this barrier in the decision-making process or in deployment of a financial instrument in this given sector.
▲	Important impact of this barrier, potentially preventing the decision to deploy a financial instrument in this given sector.

Source: fi-compass*, 2020.*

In this context, if some of the barriers presented in the table above (i) may have prevented some managing authorities and/or the Intermediate Bodies from deploying financial instruments in the five studied sectors, and (ii) are beyond their control, some of these barriers are also in their control and may be influenced in view of an increased interest and use of financial instruments in these sectors in the future. These factors are for instance:

- **Administrative burden / complexity** related to the sector, when such complexity relates to national regulations (such as administrative procedures, organisation, and governance);
- **Regulatory constraints** induced by other sectors;
- **Limited (but needed) incentives** to invest, that are needed to consider in parallel to the financial instruments *per se*;
- **Limited experience and capacity in developing a projects pipeline**, often resulting from a lack of sufficient knowledge and technical capacity within the managing authority and/or the Intermediate Body;
- **Lack of technical sectoral support** (other than projects pipeline development), which also often results from lack of sufficient knowledge and technical capacity;
- **Difficulties in operationalising policy goals**, which require to align sectoral strategies and the OPs;
- **Insufficient political support to develop financial instruments in the sector**, which requires to develop a 'financial instruments strategy' covering all sectors (including the five sectors studied);
- **Fragmentation of ESIF resources and unnecessary restriction in eligibility**, which requires to draft OPs in a more pan-sectoral manner for financial instruments; and
- **Limited awareness of financial instruments' potential among the key stakeholders**, which requires to develop a communication strategy within the 'financial instruments strategy'.

Addressing these '*enabling barriers*' could lead to a higher prioritisation of the use of financial instruments in the five studied sectors during the 2021-2027 programming period.

Following this, **when considering the 2021-2027 programming period**, it is to reminded that almost 70% of the respondents to the online consultation considered the implementation of financial instruments under shared management with the support of the ERDF or CF. It may also be assumed that at least one third of the respondents to the online consultation currently consider financial instruments in four of the five sectors studied (except the 'ICT infrastructure' sector). It seems that the key stakeholders (*i.e.* mainly managing authorities and Intermediate Bodies) would base their **future decision to develop financial instruments in the 2021-2027 programming on technical aspects, as well as on their own (previous) experience in each given sector**. This illustrates a **rational decision-making process**. It however also illustrates that **extending the use of financial instruments to sectors where such use was limited in the past** (such as the RE, the Environment, and the 'ICT infrastructure' sectors in the 2014-2020 programming period) **would require substantiated technical arguments favouring such use, pedagogy in regards to local market environments, the development of awareness raising activities presenting the opportunities offered by financial instruments in these sectors, and probably technical support in the design and implementation of financial instruments in these sectors**. Such technical support would include for instance (i) knowledge-sharing between managing authorities and Intermediate Bodies, and in that vein, (ii) peer-to-peer learning, as well as (iii) capacity building towards various stakeholders (such as: managing authorities, Intermediate Bodies, financial intermediaries in some sectors, including NPBIs, and final recipients, including SMEs).

In order to facilitate the future decision-making process of the managing authorities and the Intermediate Bodies in relation to financial instruments for the 2021-2027 programming period, it is consequently important to know if, where, and to what extent, potential for financial instruments exists in the five sectors studied. This is the objective of the following section.

9.3 Opportunities and potential for financial instruments in the five sectors

Opportunities for a better uptake of financial instruments has been detected and analysed in the five sectors. If the needed financing schemes may differ from one sector to the other, common elements may be observed:

- **Financial instruments may (and sometimes should) be designed in a way that covers several sectors**. Such approach, for instance in order to address final recipients and projects in the RE, the UDT, the Environment, and the 'RDI in SMEs' sectors (together with other sectors not analysed in the present stocktaking study, such as the EE and the 'general SME financing' sectors) may (i) help achieve several policy and OP objectives at once, (i) help reach the critical mass needed to make the financial instrument(s) viable, and (iii) help raise better interest from potential (public and private) fund managers for them to apply to the selection [since the financial instrument(s) designed is (are) more viable]. The same approach is also valid for achieving several objectives within a single sector. The different sectors to 'include' in each financial instrument should, of course, vary and depend on local market needs and conditions, as well as on the policy objectives prioritised by the managing authority or the IB. Drafting financial instrument-friendly OPs, initiating multi-sectoral *ex-ante* assessments, engaging comprehensive market testing exercises with various stakeholders, as well as ensuring flexible FAs with the selected financial intermediaries would facilitate such initiatives.
- **The use of ERDF and CF funding into financial instruments may be the occasion to (financially) innovate**. For instance:
  - The use of ERDF / CF funding into innovative financing schemes such as EPCs, PPPs, and off-balance sheet solutions may be considered for the RE and the UDT sectors;
  - PPPs and off-balance sheet solutions may also be considered for the Environment sector;
  - Financing lease solutions could be designed for 'small projects' in the RE sector; and
  - The use of ERDF / CF funding into financial instruments may be an opportunity to address niches and sub-sectors perceived as more risky in the 'RDI in SMEs' sector.

  Such use of ERDF funding into financial instruments would leverage a number of key assets of this financing source, *i.a.*: (i) finance projects with higher risk profiles, (ii) structure financing schemes that require risk finance, (iii) facilitate the formulation of a demand for financing from project promoters and SMEs that would have not envisaged or received financing otherwise, and (iv) attract other public and private co-financiers in these new / more risky sectors and financing schemes.
- **Large infrastructure projects need long-term debt financing** in the RE (especially for established RES), the UDT, and the Environment sectors.
- In parallel to long-term debt financing for large infrastructure projects, **innovative financial instruments could be designed to provide a panel of financial products and** consequently **offer flexibility**. For instance:
  - 'Smaller projects' in the RE and the ICT sectors would need both loans at preferential conditions and equity financing;
  - Less-established RES in the RE sector would need guarantees, subordinated debt, and equity financing;
  - Innovative projects in the 'RDI in SMEs' sector (depending on various factors such as their maturity, risks, size, financial knowledge, and former experience with banks, VC and PE funds) may need (quasi-)equity financing, loans at preferential conditions (and subordinated debt), as well as guarantees; considering that these different financial products could be provided all together (of course under various conditions); and
  - As already mentioned, long-term loans and 'innovative financing' (such as PPPs and off-balance sheet schemes) may be relevant for the RE, the UDT and the Environment sectors.

- In the same context, but from a different perspective, **within a single sector, financial instruments may have different final recipients to address, and so should consider providing various financial products**. For instance:
  - Various financial products are needed – and so could be provided – in the context of the RE sector, depending on the RES technology used in the project (this technology being established or not); following this, while long-term loans could be considered for established RES, guarantees, subordinated debt, and equity financing for less-established RES would be more appropriate;
  - Equity financing could be provided to smaller projects in the RE and 'ICT infrastructure sectors', while, as already mentioned, large infrastructure projects may better need long-term debt financing; and
  - In the 'ICT infrastructure' sector, micro-loans for households and SMEs could be provided to finance the 'last mile connection' projects, while large infrastructure projects may better need long-term debt financing.

  Such initiatives would require to appropriately calibrate each financial product [in terms of (total volume and individual) amounts, conditions, and delivery process], while making the overall financial instruments viable for implementation from the point of view of the financial intermediaries. NPBIs may play here a key role as initiators of such innovative schemes.
- **Financial instruments should often be designed and implemented together with a grant component**. Such grant component would help de-risk the projects in all five sectors studied and facilitate the implementation and value added of the financial instruments, independently of the financial product provided or of the sub-sector addressed. It would also help integrate the financial instrument(s) into the existing sectoral financial eco-systems, where grants are often predominant. The CPR proposal of the EC for the 2021-2027 programming period (allowing for the integration of ancillary grants, including investment grants, into financial instruments) is expected to significantly simplify such combinations (*i.e.* the combination of grants and financial instruments) in comparison with the current 2014-2020 programming period.
- **Financial instruments may be designed with a TA component**. In addition to a grant component (that would help de-risk the financed projects, as mentioned above), financial instruments could be designed with a TA component. This TA support could address various types of stakeholders, such as: public authorities (including technical / local authorities), financial intermediaries (including NPBIs, banks and fund managers), and final recipients (*i.e. i.a.* municipalities, households, and/or SMEs), depending on the sector, the local sectoral needs, and the existing local TA support eco-systems. Such set-ups could leverage existing TA facilities or lead to the development of new ones. In both cases, they would imply communication with various types of stakeholders in order to reach an appropriate level of understanding (this level being different from one stakeholder group to the other) in order to favour the implementation, disbursement, and impact of the financial instrument(s).

When considering the potential for future financial instruments in each sector, it is to be noted that:

- The '**RDI in SMEs**' sector presents the highest potential for an increased uptake of ERDF / CF-supported financial instruments during the 2021-2027 programming period. It is the least constrained sector and specific schemes may be relatively easily considered as 'add ons' or sub-windows to more main stream instruments designed for 'general SME financing'.
- The **RE** sector also presents good potential for financial instruments. Specific market regulatory conditions however need to be addressed in some areas (technologies) / regions to favour such increased use. Moreover, some eligibility rules need to be more favourable to financial instruments in order to avoid competition with grants.
- The **UDT** and **Environment** sectors present potential in some areas for financial instruments. They are however constrained by issues like municipal borrowing limits and lack of technical capacity within public

administrations. Similar to the RE sector, competition with grants is also perceived as a major obstacle for a greater uptake of financial instruments.

- Among the five sectors analysed, the '**ICT infrastructure**' sector presents the least potential for a greater use of financial instruments. This is due to demand and technology risk uncertainties that both negatively impact the revenue generating potential of projects (reducing the relevance of the use of financial instruments).

As mentioned, the relevant financing schemes to be preferred may differ from one sector to the other. In the meantime, and as listed above, common characteristics of possible ERDF / CF-supported financial instruments may be considered to foster their uptake. Following this, and in order to facilitate the future decision-making process of the managing authorities and the Intermediate Bodies in relation to financial instruments for the 2021-2027 programming period, it is important to provide concrete technical recommendations to better facilitate the use of financial instruments in various sectors, including the five sectors analysed in the present stocktaking study. This is the objective of the following section.

9.4 Recommendations – Key enabling factors for the use of financial instruments

Common barriers to the development of financial instruments have been identified in the five sectors studied, as well as potential for financial instruments in the current (2014-2020) and future (2021-2027) programming periods. In order to address these barriers, and to foster this potential for a better uptake of financial instruments in the five sectors studied, a number of key enabling factors may be recommended in order to facilitate the decision-making process and the deployment of financial instruments in these five sectors (and potentially support the development of financial instruments in other sectors).

The following paragraphs detail these key enabling factors. A table at the end of the present section provides an indication of the different governmental levels (to be) involved in the implementation of the recommended key enabling factors. It indicates whether, and how, (i) the local / regional level, (ii) the national level, (iii) the managing authority level (when the latter is different from the regional and/or the national level), and (iv) the EU level (*i.e*. mainly the EC) should be involved in the implementation of the proposed recommendations to foster the uptake of financial instruments in the five sectors studied (and potentially in other sectors).

Defining integrated sectoral approaches / strategies and stabilising sectoral regulatory frameworks to guarantee political support

In order to **guarantee continuous political support** for the development of financial instruments in specific sectors, it is first important to ensure that these sectors are high in the political agendas, with a stabilised regulation, and easily complemented with an adapted financing scheme.

For instance, innovation, as a driver for SMEs' competitiveness, is often a **high priority on the economic and political agendas of local, regional and national public authorities**. Also, political consensus to support the use of revolving finance in the sector has been named as one of the key success factors for the wider use of financial instruments during the stakeholders' consultation. In that context, it has been observed that, when the political support towards the use of revolving finance for RDI projects is consistent and independent of the changes in the political landscape, it acts as a success factor for the financial instruments. Indeed, the development of financial instruments requires long-term political support. Following this, there is a need to increase awareness of public sector entities of the benefits of financial instruments, in order to build consensus about their strengths and added value.

In parallel, the RE sector requires **long-term regulatory stability** to establish a trusted framework for all stakeholders, including private sector investors. The stabilisation of the rules, their transparency and the alignment of national / regional / local plans with ESIF regulations would accelerate the implementation of RES interventions, and the use of financial instruments to support them. A continuous and strong political support towards both financial instruments and the uptake of RES in the energy mix is of key importance. The stakeholders' consultation has also revealed that the presence of long-term strategies dedicated to RES (implying for instance the definition of feed-in-premiums, feed-in tariffs, and dedicated investment grant schemes), which are not affected by governmental changes, have a catalyst effect on investments as they increase investors' confidence, which in return facilitates the development of financial instruments as financing means for the sector.

Moreover, investments in the Environment sector need to **be considered holistically** with the wider urban development and infrastructure agenda. **Integrating environmental projects in urban development portfolios** results in simultaneous economic and environmental benefits. Combining projects with lower and higher degrees of bankability can unlock financing for a greater number of projects, which are less attractive financially, yet are beneficial in terms of their environmental impact or policy objectives. Such an integrated approach also enables to achieve sufficient **critical mass of projects / investments**, which in turn increases the chances of attracting additional (public and private) co-investors, who are looking to maximize the ticket size of their investments. Such approach may also involve to set up **regulatory incentives** imposing the need to develop / finance new projects (such as in circular economy in the case of the Environment sector), where there might be, at first, a limited willingness to invest and/or engage voluntarily due to financial constraints, and other competing investment priorities.

In parallel to strategies, the studied sectors may also need the **development of ecosystems of future final recipients and of investors**, such as the 'RDI in SMEs' sector. Indeed, in this situation, both the potential final recipients (SMEs) and the potential financial intermediaries / co-investors (*e.g.* NPBIs, commercial banks, Business Angels' networks and VC / PE funds) need to be aware of the future financing opportunities offered by the financial instruments.

Such **integrated approaches support the operationalization of the sectoral strategies** by (i) focusing on several challenges at once, (ii) facilitating the constitution of projects pipelines, and (iii) considering key stakeholders' participation in the financing scheme from the start.

Facilitating the use of financial instruments for all sectors, including the 'general SME sector' by better aligning the ERDF regulation with the common practice of the sectors

Considering that ERDF / CF-supported financial instruments related to SME financing (and especially 'general SME financing' mobilizing Thematic Objective 3) appear as an '*entry door*' to the development of financial instruments supporting other sectors (including the five sectors analysed in the present stocktaking study), **facilitating the development of financial instruments in the 'general SME financing' sector would facilitate and incentivize managing authorities / Intermediate Bodies in developing financial instruments in other – potentially 'more complex' – sectors**.

In that perspective, it is important that the **ERDF-supported financial instruments can be designed and implemented in a way as close to common market practices as possible**, for any sector considered, including 'general SME financing'. There are multiple reasons supporting this key enable factor. First, it facilitates the selection of financial intermediaries (whose practices do not need to be radically changed to implement the ERDF-supported instruments). Second, it increases the chances for the financial instruments to add value to the existing eco-systems. Indeed, if, the objective of ERDF-supported financial instruments is to take additional risks and/or to address niche / more risky sectors, in the context of markets where financial instruments already exist (which is often the case for the 'RDI in SMEs' sector or the 'general SME financing' sector for instance), then the

managing authorities / Intermediate Bodies will require to the financial intermediaries to take additional care to ensure that these additional risks / niches are addressed. This translates into an '*extra-effort*' for the financial intermediaries. To counter-balance this extra-effort, the design and implementation of the financial instruments would need to be as much as possible in line with common practice for the financial intermediary. This reasoning is for instance particularly valid in the case of the VC and PE markets considered when financing RDI in SMEs.

In that perspective, and still in the context of facilitating the use of ERDF-supported financial instruments in the 'RDI in SMEs' sector, the regulatory constraints related to the use of ERDF that may hinder the development of financial instruments concern: (i) **timing**, (ii) **geography**, and (iii) **monitoring and reporting**. Adaptations to the regulation may be considered to facilitate the design and implementation of ERDF-supported financial instruments in order to:

- Ensure that the financial intermediaries can (i) build a pipeline of projects of good quality, and (ii) participate in several rounds of investment in the SMEs, by **having a longer time period of eligibility for the equity instruments** (a common practice being of 10 years in the equity market);
- **Be more open in the definition of 'geographical coverage'** so that an equity instrument may invest in an SME as soon as this investment as a positive impact on a given territory. This would (i) require a comprehensive definition of '*positive impact*', (ii) enable the financial intermediaries to deploy the equity instruments beyond the borders of a given OP, and so (iii) increase the number of potential bankable opportunities for the instrument; and
- **Adapt the monitoring and reporting requirements** to ensure that, as long as the objectives of the OP are fulfilled by the instruments, such requirements are not too burdensome for the FoF manager and/or the financial intermediary (considering that such requirements may sometimes currently prevent potential financial intermediaries to participate to the selection process). This would require to (i) clarify the nature and level of details of the documentation required by each stakeholder (*i.e.* the managing authority, the FoF manager when it exists, the financial intermediary, and the final recipient), and to (ii) ensure that the audit authorities are fully informed / knowledgeable about these requirements before initiating their procedures.

If reducing these regulatory constraints have been particularly mentioned to facilitate the development of ERDF-supported financial instruments in the 'RDI in SMEs' sector, they can also smoothen the design, set-up and implementation of financial instruments in other sectors.

Designing 'financial instruments friendly' Operational Programmes, and providing Technical Assistance support for it

Since the process of designing and implementing financial instruments in any sector may be time-consuming, managing authorities need to **consider the use of financial instruments early on during the programming period**; notably to be able to deploy financial instrument sooner, rather than later.

Moreover, financial instruments require a sufficient pipeline of investable projects in order to make it economically viable, and attract financial intermediaries implementing the instruments. To avoid multiple Funding Agreements, contributions from multiple Priority Axes, and the coordination with several managing authorities and/or Intermediate Bodies, it is advisable **to concentrate contributions to financial instruments within the OPs**. That would make these OPs more 'financial instruments friendly'.

To do so, managing authorities may benefit from (i) the **experience acquired by other managing authorities** when drafting such 'financial instruments friendly' OPs, (ii) reflect upon such documents among managing authorities during **workshops** (organised by sectors, or covering all / several Priorities of the 2021-2027 programming period), and (iii) may leverage the local knowledge of (potential future) financial intermediaries to ensure that the possible future financial instruments using OP's resources will be interesting for such entities

and correctly implemented by local stakeholders. In this respect, consideration should be given to preparing a short practical material, for managing authorities, setting out the key requirements for a financial instrument-friendly Operational Programme.

In that context, considering that the CPR proposal of the EC for the 2021-2027 programming period requires that a market assessment is undertaken before the OP is drafted, it is advisable to **prepare the *ex-ante* assessment for financial instruments in an early stage** (preferably in parallel to the 'OP market assessment'). In so doing, the findings of the OP market assessment can inform the design of the OP and its expected decisions, including in relation to financial instruments. This would also reduce the need to amend the OP in order to launch financial instruments in the future.

Differentiating eligibility criteria for grants on the one hand and for financial instruments on the other hand already in the Operational Programmes

Financial instruments are meant support a large number of projects. On the other hand, grants are meant to address specific market failures where a revolving mechanism would not be viable. It is therefore advisable to **differentiate** already in the OP between **eligibility criteria for grants**, which are meant to be stricter, **and those for financial instruments**, that should have a much broader eligibility. Through this, it is possible to support projects with the highest risks with grants (and where a revolving mechanism would not be viable), and other projects with repayable instruments, benefitting from the revolving and leverage features of financial instruments. This approach also makes it easier to use financial instruments and grants in a complementary way.

The market assessment to be undertaken at the OP level according to the CPR proposal for the 2021-2027 programming period is an opportunity for the managing authorities to develop a rationale for both this differentiation in the eligibility criteria, and for the complementarity between financial instruments and grants.

Integrating specialised / sectoral financial instruments into larger financial instruments

Leveraging ERDF-supported financial instruments designed for 'general SME financing' by including into them windows or specific schemes for SMEs' projects related to RE and/or Environment (for instance), would increase the number of projects supported in these sectors, and facilitate the development of financial instruments supporting such projects.

Integrating financial instruments for RE projects in enterprises, especially SMEs, into existing and/or standard 'general SME financing' financial instruments would (i) facilitate the access to finance of these RE projects, (ii) facilitate the chances to develop a pipeline of projects with an adequate critical mass, and (iii) reduce the need to apply for different financial instruments for a single project, or eventually to even different financial intermediaries depending on the purpose of their financing offers. In order to make investment more attractive, **the part of the financing addressing the RE component could even contain additional incentives, such as a lower interest rate or TA support**.

Similarly, financial instruments supporting environmental projects in enterprises, especially SMEs, could be integrated into existing and/or standard 'general SME financing' financial instruments. As for RE projects in companies / SMEs, this would (i) facilitate the access to finance for environmental investments in companies / SMEs, and would (ii) reduce the need to apply for different financial instruments, or eventually to different financial intermediaries depending on the purpose of the investment / financing. As for the RE projects, in order to make environmental investments more attractive, the part of the financing addressing environmental measures could contain additional incentives, such as a lower interest rate or TA support.

Apart from RE and/or environmental projects in companies / SMEs, large financial instruments devoted to urban development could also integrate RE and/or environmental measures. This would be in line with the need for municipalities to have a more holistic approach when establishing their urban development and infrastructure

agendas. In that perspective, **financial instruments for RE and/or environmental investments in municipalities**, for instance, **could be integrated into city funds having a broad urban development scope**. This would allow municipalities to access financing for their investment needs more easily, independent the sector they are supporting.

Tailoring the financial instruments to the specific needs of the sector(s) supported

A supportive ***ex-ante* assessment** for financial instruments, together with an **appropriate market test exercise**, and a **flexible investment strategy** have been designated as key success factors for the design and set-up of financial instruments in the five studied sectors. Another observed key success factor is the **capacity for the financial instruments to adjust** during their implementation.

Indeed, financial instruments are meant to address sectoral and national / local needs. To do so, it is a good practice to take advantage of experience accumulated within a given MS / region and to adapt it in other regions / countries (taking local characteristics and specificities into account). **Knowledge transfer** between MS (and sometimes within a MS between managing authorities), and **capacity building** across territories through **peer-to-peer learning** have been pointed out as one of the factors enabling the deployment of financial instruments, particularly at the design phase. Similarly, experience gathered when implementing financial instruments in one programming period offers a stock of specific lessons learnt, which can be successfully leveraged on during the following programming period. For instance, if a financial instrument has already been deployed in the field of EE, there is scope to build on its experience to date, and to develop it further with components devoted to investments in RE.

More specifically, in the case of the 'ICT infrastructure' sector for instance, financial instruments providing loans with smaller ticket size would (i) support the financing of smaller projects in remote territories, and in so doing (ii) increase the broadband coverage, but also (iii) support smaller telecom operators willing to develop projects in these sparsely populated territories, and finally (iii) boost the uptake of new technologies. Such new source of financing could also be an opportunity to finance broadband projects *via* project financing schemes; including through PPP models in case of joint interventions of the public and private sector entities.

Tailoring financial instruments to specific needs (either under specific instruments or in the context of 'larger instruments' as proposed in the previous recommendations) includes then: a detailed *ex-ante* assessment for financial instruments, an appropriate market test exercise, a flexible investment strategy, knowledge transfer processes / facilities between managing authorities – including peer-to-peer learning sessions, and capacity building sessions on the design and set-up of financial instruments that would, for instance, leverage the lessons learnt from past experience and/or from financial instruments developed in other sectors. This would facilitate the fine-tuning and adaption of the financial product(s) provided *via* the financial instruments to the needs of the market(s) addressed, including in an innovative or uncommon manner.

Combining financial instruments with grants

Since grants tend to be at the same time the most widespread public support scheme, and the preferred financing source for projects developed in the five sectors studied, **developing financial instruments in these five sectors needs to consider how the latter will / would integrate the existing sectoral grants eco-system**.

Indeed, from the perspective of a managing authority, the development of a financial instrument may be perceived as more time-consuming and complicated compared to the disbursement of ERDF resources by means of grants. As such, **the wider use of financial instruments is constrained to a certain extent by a broad availability of grants**, although revenue generating or cost-saving projects in the five sectors studied could be supported by financial instruments instead, and offer the possibility to reinvest the returned resources in future projects (a key intrinsic added value of financial instruments over grants).

Integrating financial instruments into existing sectoral grants eco-systems is however a challenge in the five sectors studied. In the meantime, grants can have an enabling effect on the wider use of financial instruments, if their use is complimentary to the use of financial instruments. **Grants can indeed act as an enabling factor for financial instruments**. For instance, they may **support the highest risk component of the projects and/or cover the part of the investment cost that is not repaid by revenue or cost-savings**, independently of the sector considered. On a more sectoral basis, grants could cover the initial development costs of an RDI project, or cover the heavy water / ICT infrastructure costs in less densely populated areas; or, in poorer areas, they can keep the fees to access the networks affordable for households. In the case of an environmental project for instance, grants can be used to cover operational risks during the investment phase of the project, and consequently improve its return on investment. Other combination options include for instance: (i) **loans with capital rebates**, where part of the loan is written off, in case specific results are achieved (such set-up is considered particularly attractive for final recipients in some sectors, such as the RE and the Environment sectors), and (ii) the **integration of ancillary grants**, including investment grants, in the financial instruments.

Following this, once the projects start generating revenues, they can benefit from financial products provide *via* financial instruments. The use of financial instruments then gives public authorities the opportunity to reinvest returns in the future, and so to achieve more impact with the same initial amount of public resources, including ERDF / CF resources.

In that context, stakeholders involved in the development of financial instruments in the five studied sectors expressed a **need to foster the knowledge of how financial instruments can be combined with grants during the 2021-2027 programming period**. Such considerations would also imply to set clear **boundaries** and **synergies between grants and financial instruments** in order to incentive the managing authorities in considering a more systematic and structured use of financial instruments in the context of sectors heavily-supported by grants.

The CPR proposal of the EC for the 2021-2027 programming period allows for integrating ancillary grants, including investment grants, in financial instruments. This means that both the repayable and the non-repayable part of an investment could be governed under the financial instrument rules. It is expected that this will significantly simplify the combination of different forms of support (*i.e.* the combination of grants and financial instruments) in comparison with the current 2014-2020 programming period. It should therefore act as an enabler for the uptake of financial instruments in many sectors (including the five sectors analysed in the present stocktaking study but not only), as it will simplify the combination of different forms of support. In this respect, consideration should be given to the development of further information material on combination for managing authorities to ensure that the new proposed possibilities are understood and will be maximised.

Providing specific Technical Assistance all along the financial instrument's lifecycle and to various types of stakeholders

According to all stakeholders involved in the design, set-up, and implementation of ERDF / CF-supported financial instruments in the five sectors studied, TA plays a key role at the different stages of the financial instruments' lifecycle and towards various stakeholder groups. In that context, it is generally agreed that the provision of technical support facilitates the smooth design, set-up, and implementation of financial instruments in all sectors.

Depending on the past / present experience of the actors with financial instruments, to be effective, such support should be provided at the level of **public authorities** (including managing authorities, Intermediate Bodies and/or technical / local authorities), **project promoters** (including NPBIs, and sometimes financial intermediaries), as well as **final recipients** (*i.e. i.a.* municipalities, households, and/or SMEs, depending on the sectors). The different forms of TA support to consider for the various stakeholder groups involved in the development of financial instruments are detailed in the following paragraphs.

Firstly, **public authorities** (including managing authorities and Intermediate Bodies) may sometimes need to be educated about the benefits of financial instruments and granted access to TA schemes focused on **capability building** in order to increase their interest in such financing schemes, and their willingness to deploy them. In many sectors, this education should **promote a shift from a grant-oriented approach towards a revolving finance mechanism**. In that perspective, **peer-to-peer discussions**, and **knowledge-sharing sessions** focusing on lessons to be learnt from previous experiences (in a specific sector but not only) could be proposed to managing authorities, Intermediate Bodies, but also to technical public authorities (such as technical ministries), and to municipalities when the latter are project promoters or final recipients. In addition to these individual TA schemes, support schemes facilitating **transversal capability building** and **knowledge transfer** could also be considered for the 2021-2027 programming period. Such TA support package would aim to:

- Influence / incentivise the public authorities in having a (more) **proactive approach** in the development of financial instruments;
- **Positively influence the successful tailoring of the future financial instruments** to address the local / sectoral needs of the markets and of the final recipients; as well as
- **Improve their knowledge of local sectoral ecosystems**, regarding both the demand and supply sides. This is particularly valid when the managing authorities and/or the Intermediate Bodies are 'transversal authorities' (*i.e.* not technical) and need to address all TOs and all sectors (notably in order to design comprehensive schemes implying **financing and non-financing incentive schemes encouraging investments** in sectors in which they have limited knowledge).

As a whole, such TA support is particularly relevant during the **early stages of the financial instrument's lifecycle**; especially in MS / sectors where past experience with financial instruments is limited (like in at least four out of the five sectors analysed in the present stocktaking study).

Secondly, also during the design and set-up phases of the financial instruments, **awareness needs to be built among the markets** to be soon supported by fine-tuned instruments (*i.e.* on both financing supply and demand sides):

- On the one hand, the **appointment of financial intermediaries** with experience and sufficient capacity to disburse the funds in the given sector is key (and considered sometimes challenging by the managing authorities). To facilitate this process, a specific **communication strategy** towards this stakeholder group (composed *i.a.* of NPBIs, commercial banks, specialised banks, as well as VC and PE funds) is to be established by the public authority that will develop the instrument.
- On the other hand, another communication strategy is to be developed for targeting the future final recipients (the latter being local public authorities, SMEs and/or households and household associations, depending on the instrument and the market addressed). Indeed, as a general argument, **the markets to be addressed need to be informed in advance about the existing and future opportunities offered by the use of financial instruments to apply for them**.

In that perspective, both future financial intermediaries and future final recipients need to become aware of the coming financing opportunities offered by the financial instruments and include them in (i) their financing supply package (in the case of the financial intermediaries), and (ii) in their choice-set of attractive financing options (in the case of the final recipients). This process may **involve technical experts** (such as legal experts, financial engineers specialised in the RE, the Environment and/or the ICT infrastructure sectors for instance, as well as sector-specific technical advisors) to ensure that the design and communication around the future instruments are eloquent / adapted to the addressed markets. This is a key enabling factor to **facilitate the future 'buy-in' of the instruments by key market stakeholders**.

Thirdly, **TA support may be provided to final recipients / projects in parallel to the implementation of the financial instruments**. Such support would aim to **address the individual projects' complexity needs** in order to

make them investment-ready. It would principally use ***ad'hoc* advice from external experts**, both from a technical and a financial perspective, and concern all types of final recipients (*e.g. i.a.* public authorities, SMEs and/or households and household associations, depending on the instrument and the market addressed). For instance:

- In the case of the RE, the UDT, and the Environment sectors, **small-sized municipalities** could benefit from an access to TA when preparing their business plans and/or preparing funding applications. Indeed, a proper assessment of the market potential and the preparation of accurate cash-flow forecasts are essential to receive funding for a project in these three sectors. By involving sectoral expertise early, projects originating from less experienced municipalities could be implemented. In that perspective, TA schemes developed in parallel to the financial instruments could support the design and management of funding applications procedures, and be made available to the less experienced, smaller public sector entities.
- Still in the case of these sectors and in order to foster the **use of PPP schemes**, TA could be provided to the less experienced public sector entities in the set-up and procurement phases.
- In the context of investment in smaller scale RE projects, TA support could be provided to **households**, **household associations**, and **SMEs**. For example, in the case of financial instruments aiming to finance the replacement of heating sources in households in the RE sector, a TA component could support the provision of consultation with technical experts to define the scope of intervention, and support them filing the financing applications.
- In the context of the 'ICT infrastructure' sector, a TA scheme could facilitate **collaborative relationships between local public authorities and operators** to increase (i) the number, and (ii) the quality of projects developed in broadband infrastructures. Thanks to such more strategic collaborations, the development of **ICT infrastructure projects could then be done jointly for multiple entities**, and could result in / create viable investments for streams of financing that are already available.
- In the context of the 'RDI in SMEs' sector, TA is very often needed to **support SMEs' RDI projects in their transition from an innovative idea to an investment opportunity**. Attracting financing for RDI projects is possible only for innovations that have the potential to be financially viable. In order to transform an innovative activity into a bankable project, entrepreneurs and SMEs often require business advisory support to ensure and accelerate the development of a sound business case, and conduct a comprehensive **risk assessment**, both from a financial and a technical perspective. In that view, the **development of TA platforms providing advisory services to SMEs** at local level for their RDI projects to be then financed by a financial instrument: (i) increases the chances of reaching a sufficient critical mass of projects, (ii) attracts interest of (co-)investors (since more advanced projects would be presented to them), and (iii) enhances the possibility of bringing more innovations to the market. Such TA support is often relevant across the development stages of the SMEs – from the initial development of a business case to the further scale-up of the SME / project – and concerns all types of sub-sectors and technologies.
- Finally, also in the 'RDI in SMEs' sector, **favouring cooperation between research institutes, businesses** (start-ups and SMEs)**, and public entities** facilitates the development of projects pipelines with a critical mass of innovative projects that may then be financed by financial instruments.

The key enabling factors that may then be recommended for a better uptake of ERDF / CF-supported financial instruments in the five sectors studied consequently mainly involve:

- A **political steer from a decision-making entity** (being the managing authority, an Intermediate Body or a technical public authority) that would have considered the added value of financial instruments in a given sector and would have integrated such financing scheme in an integrated approach supporting this sector.
- A translation of such political steer into a **'financial instrument-friendly' OP** that would:
  - Fully integrate these financial instruments into sectoral strategies;

  - Make sure to integrate these financing schemes in existing financing eco-systems composed of grants and financial instruments;
  - Differentiate eligibility criteria for financial instruments and for grants in order to fully leverage the advantages of the use of financial instruments (and in the context of a sound use of public financing resources); and
  - Combine them with grant schemes to facilitate the transition 'from grants to financial instruments', while making future projects bankable for the financial instruments.
- **European and national regulations that facilitate the use of ERDF and CF funding into financial instruments** by enabling the development of financing schemes as close to market standard practice as possible in order to:
  - Design financial products known by the respective markets;
  - Attract financial intermediaries with known products and uses;
  - Facilitate the development of projects pipelines of needed / appropriate critical mass to make the financial instruments viable; and
  - Answer the market needs as good as the private sector thanks to appropriate and tailored financing schemes (while addressing market failures).
- The **integration of financial instruments for 'new' sectors into larger financial instrument schemes** (mainly) at first designed for 'general SME financing' or urban development financing.
- The development of **TA all along the financial instrument lifecycle and for multiple stakeholder groups** (*i.e. i.a.* public authorities, project promoters, and final recipients).
- And, as a contextual element, improved **collaboration between various actors**, in order to ensure:
  - The support from public and/or para-public entities to develop a conducive regulatory framework for financial instruments, an easy access to TA, and the set-up of facilities favouring communication and knowledge-sharing between actors on financial instruments; and
  - The **implication of the financial sphere** (with the promotion of financial instruments by potential financial intermediaries) to prove that market opportunities exist in 'new' and 'old' sectors for financial instruments, and that they are ready to put '*skin in the game*' under the form of co-financing within these financial instruments.

These factors would facilitate the uptake of financial instruments in the 2021-2027 programming period, especially in sectors such as the five analysed in the present stocktaking study.

As mentioned in the introduction of the present section, the following table indicates whether, and how:

- The local / regional level;
- The national level;
- The managing authority level (when the latter is different from the regional and/or the national level); and
- The EU level (*i.e*. mainly the EC),

should be involved in the implementation of the recommendations proposed above to foster the uptake of financial instruments in the five sectors studied (and potentially in other sectors).

Table 34: Involvement of authorities, by geographical level, in regards to the recommendations of the stocktaking study

	Geographical level and degree of involvement			
	Local / regional level	**National level**	**Managing authority level (when different from regional or national)**	**EU level**
Defining integrated sectoral approaches / strategies and stabilising sectoral regulatory frameworks to guarantee political support	√ (to define sectoral strategies when in charge)	√ (to define sectoral strategies when in charge)		√ **(to stabilise sectoral regulation)**
Facilitating the use of financial instruments for all sectors, including the 'general SME sector' by better aligning the ERDF regulation with the common practice of the sectors				√ **(to better align regulation with sectoral common practices)**
Designing 'financial instruments friendly' Operational Programmes, and providing Technical Assistance support for it			√ (to design FI-friendly OPs)	√ **(to facilitate the OPs design)**
Differentiating eligibility criteria for grants on the one hand and for financial instruments on the other hand already in the Operational Programmes			√ (to differentiate criteria for grants and FIs in the OPs)	√ **(to facilitate the OPs' design)**
Integrating specialised / sectoral financial instruments into larger financial instruments			√ (to design the FIs)	√ **(to facilitate the FIs' design)**
Tailoring the financial instruments to the specific needs of the sector(s) supported			√ (to design the FIs)	√ **(to facilitate the FIs' design)**
Combining financial instruments with grants			√ (to design the FIs / grants combination)	√ **(to facilitate the FIs / grants combination)**
Providing specific Technical Assistance all along the financial instrument's lifecycle and to various types of stakeholders	√ (to receive and possibly channel TA)	√ (to receive and possibly channel TA)	√ (to receive TA along the FI lifecycle and facilitate the provision of TA to other stakeholders)	√ **(to facilitate the provision of TA)**

Source: fi-compass*, 2019.*

Annexes

Annex 1 – Methodological note

Objectives

As mentioned in in the introduction, the present stocktaking study notably aims to assist DG REGIO in gaining a better understanding of the sectors which have not yet, or only to a minor extent, been supported by financial instruments in the 2014-2020 programming period. In doing so, part of the analysis to be conducted aims to **provide the European Commission with a clear picture of sectors in which financial instruments have not been widely deployed** in the 2014-2020 programming period.

In order to provide the European Commission (EC) with such picture, various analyses have been undertaken. These analyses are presented throughout the present stocktaking study; mainly in Chapter 2 (under the form of an overview), in Chapters 4 to 8 (under the form of 'sectoral analyses' aiming to present the use of financial instruments supported by the Regional Development Fund (ERDF) and/or the Cohesion Fund (CF) in each of the five selected sectors), and in Annexes 2 and 3 hereafter (where national data are provided). Following this, the picture concerning the use of ERDF / CF-supported financial instruments in the five selected sectors is provided in the present stocktaking study under various views: (i) EU-wide and cross-sectoral, (ii) sectoral, and (iii) national.

Data collected and analysed

As mentioned in Section 1.2.1 in the introduction, the quantitative data analysis undertaken in the present stocktaking study consisted in using the financial data that Member States (MS) regularly send to the EC for monitoring / reporting purposes in relation to the implementation of their Operational Programmes (OPs). It is to be noted that European Territorial Co-operation programmes are excluded from the dataset.

The cut-off date of the data submitted by DG REGIO (and consequently analysed in the present stocktaking study) is 31 December 2017 (hence more than 18 months before the drafting of the study). This was the most updated data at the time of the drafting of the study. The data was extracted from the System for Fund Management (SFC) of the European Union (EU) on 15 June 2018.

This data (and consequently the analyses undertaken and the outputs obtained) is consistent with the data used in the EC report '*Financial instruments under the European Structural and Investment Funds – Summaries of the data*'[262].

Method and tools

Definition of financial instruments

The financial data obtained from DG REGIO covers both grants and financial instruments. For all ERDF and CF Priority Axes, the dataset was filtered to only consider the '*forms of finance*' that correspond to financial

[262] European Commission, Directorate-General for Regional and Urban Policy, *Financial instruments under the European Structural and Investment Funds – Summary of data on the progress made in financing and implementing financial instruments for the programming period 2014-2020 in accordance with Article 46 of Regulation (EU) No 1303/2013 of the European Parliament and of the Council, Situation as at 31 December 2017*, November 2018.
However, the European Commission's report uses the specific information for data quality verifications only. In particular, footnote 21 of the EC report clarifies that: '*There are significant differences (+/-20%) between the total eligible cost of selected projects for the relevant forms of finance (reported under Article 112), and the programme contributions committed in the Funding Agreements, for 54 Priority Axis and fund combinations in BG, DE, FI, FR, HU, IT, LT, LV, PL, PT, RO, SI and the UK*'.

instruments, *i.e.*: guarantees, loans, equity financing, and other financial instruments[263]. The latter form of finance includes either instruments that do not fit into the first three categories, or, more commonly, the grant element of a financial instrument (*e.g.* interest rate subsidy, and/or technical support).

Definition of sectors

The financial data provided by the MS is broken down by '*categories of intervention*'[264]. These individual categories can be gathered under '*macro-categories*' that may be considered as a sector (each sector being a '*macro-category*' composed of a number of categories selected according to their relevance for the given sector). Once 'created' these macro-categories (and so the sectors) may be analysed.

For each of the five sectors, the categories of intervention gathered and analysed are:

- For Renewable Energy (RE), the categories of interventions: 9, 10, 11, 12 and 15;
- For Urban Development and Transport (UDT), the categories of interventions: 24 to 44 and 49 to 55;
- For Environment, including air, water and waste, the categories of interventions: 17 to 23 and 83 to 89;
- For Information and Communication Technologies (ICT) infrastructure, the categories of interventions: 45 to 48; and
- For Research, Development and Innovation (RDI) in Small and Medium-sized Enterprises (SMEs), the categories of interventions: 56, and 61 to 65.

The following table details the categories of intervention gathered under each sector.

Table 35: Sectors (as collections of categories of intervention) analysed in the stocktaking study

	Definition of sectors based on intervention codes
Renewable Energy	• 009: Renewable energy: wind; • 010: Renewable energy: solar; • 011: Renewable energy: biomass; • 012: Other renewable energy (including hydroelectric, geothermal and marine energy) and renewable energy integration (including storage, power to gas and renewable hydrogen infrastructure); • 015: Intelligent Energy Distribution Systems at medium and low voltage levels (including smart grids and ICT systems).
Urban Development and Transport	• 024: Railways (TEN-T Core); • 025: Railways (TEN-T comprehensive); • 026: Other railways; • 027: Mobile rail assets; • 028: TEN-T motorways and roads — core network (new build); • 029: TEN-T motorways and roads — comprehensive network (new build); • 030: Secondary road links to TEN-T road network and nodes (new build); • 031: Other national and regional roads (new build); • 032: Local access roads (new build); • 033: TEN-T reconstructed or improved road; • 034: Other reconstructed or improved road (motorway, national, regional or local); • 035: Multimodal transport (TEN-T); • 036: Multimodal transport; • 037: Airports (TEN-T);

[263] To be more specific, the codes corresponding to the forms of finance that are considered as 'financial instruments' in the present stocktaking study are: 03 venture and equity capital, 04 loan, 05 guarantee, and 06 subsidy or technical support (the latter being in relation with financial instruments).

[264] As *per* Article 112(2) of the Common Provisions Regulation (CPR), Regulation (EU) No 1303/2013.

Definition of sectors based on intervention codes	
	• 038: Other airports; • 039: Seaports (TEN-T); • 040: Other seaports; • 041: Inland waterways and ports (TEN-T); • 042: Inland waterways and ports (regional and local); • 043: Clean urban transport infrastructure and promotion (including equipment and rolling stock); • 044: Intelligent transport systems (including the introduction of demand management, tolling systems, IT monitoring, control and information systems); • 049: Education infrastructure for tertiary education; • 050: Education infrastructure for vocational education and training and adult learning; • 051: Education infrastructure for school education (primary and general secondary education); • 052: Infrastructure for early childhood education and care; • 053: Health infrastructure; • 054: Housing infrastructure; • 055: Other social infrastructure contributing to regional and local development.
Environment, including air, water and waste	• 017: Household waste management (including minimisation, sorting, recycling measures); • 018: Household waste management (including mechanical biological treatment, thermal treatment, incineration and landfill measures); • 019: Commercial, industrial or hazardous waste management; • 020: Provision of water for human consumption (extraction, treatment, storage and distribution infrastructure); • 021: Water management and drinking water conservation (including river basin management, water supply, specific climate change adaptation measures, district and consumer metering, charging systems and leak reduction); • 022: Waste water treatment; • 023: Environmental measures aimed at reducing and / or avoiding greenhouse gas emissions (including treatment and storage of methane gas and composting); • 083: Air quality measures; • 084: Integrated pollution prevention and control (IPPC); • 085: Protection and enhancement of biodiversity, nature protection and green infrastructure; • 086: Protection, restoration and sustainable use of Natura 2000 sites; • 087: Adaptation to climate change measures and prevention and management of climate related risks e.g. erosion, fires, flooding, storms and drought, including awareness raising, civil protection and disaster management systems and infrastructures; • 088: Risk prevention and management of non-climate related natural risks (i.e. earthquakes) and risks linked to human activities (e.g. technological accidents), including awareness raising, civil protection and disaster management systems and infrastructures; • 089: Rehabilitation of industrial sites and contaminated land.
ICT infrastructure	• 045: Backbone/backhaul network; • 046: ICT: High-speed broadband network (access/local loop; >/= 30 Mbps); • 047: ICT: Very high-speed broadband network (access/local loop; >/= 100 Mbps); • 048: ICT: Other types of ICT infrastructure/large-scale computer resources/equipment (including e-infrastructure, data centres and sensors).

Definition of sectors based on intervention codes	
RDI in SMEs	• 056: Investment in infrastructure, capacities and equipment in SMEs directly linked to RDI activities; • 061: RDI activities in private research centres including networking; • 062: Technology transfer and university-enterprise cooperation primarily benefitting SMEs; • 063: Cluster support and business networks primarily benefiting SMEs; • 064: Research and innovation processes in SMEs (including voucher schemes, process, design, service and social innovation); • 065: Research and innovation infrastructure, processes, technology transfer and cooperation in enterprises focusing on the low carbon economy and on resilience to climate change.

Source: fi-compass*, 2019.*

All the remaining codes corresponding to other 'categories of intervention' are grouped in a residual category. Such approach enables, for instance, to analyse the use of financial instruments in 'all the other sectors' (as presented in the various maps[265]).

Variable analysed

The variable analysed in the present stocktaking study is the '*total eligible cost of the operations*'. This variable is understood to be the best proxy for the amount from an OP committed by a managing authority to a financial instrument *via* a Funding Agreement (FA). This particular FA is then considered as the '*operation*' that enables the use of OP funding to one or several financial instruments.

The analysis of this variable has been used to produce various outputs, namely: graphs, maps, and tables.

Results

As mentioned above, the variable analysed is the '*total eligible cost of the operations*'. It is analysed in nominal values and as percentage *vis-à-vis* the total sources committed under each sector[266] (*i.e.* amounts for financial instruments in comparison with amounts for '*financial instruments + grants + repayable assistance + prizes*' committed to these sectors. This information is then analysed under different perspectives, such by:

- Geography (*i.e.* NUTS-0, and so MS level, NUTS-1, and NUTS-2), depending on the availability of data and their relevance by MS[267];

[265] Indeed, any amounts committed to financial instruments in other (residual) sectors (*e.g.* SMEs, and Energy Efficiency), are identified, since the knowledge / experience of managing authorities / Intermediate Bodies regarding financial instruments in these 'other sectors' may indicate a potential for financial instruments in the five studied sectors (notably if better rationale / relevance was provided to these stakeholders regarding financial instruments in these five sectors).

[266] It is however to be noted that the definition of an 'operation' in the CPR does not ensure that the related amounts are fully comparable under the different forms of finance.

[267] It is to be noted that a few changes were needed to harmonise the NUTS classification across the MS: France, Greece, Portugal and Slovenia NUTS codes were re-coded from NUTS 2010 to NUTS 2013 for the few cases where the two differ. Two codes for Slovakia refer to Czech Republic (CZ010 and CZ064), one to Poland (PL314) and one to Belgium (BE100). These four codes were re-coded to Slovakia (SK). Some codes for France, Hungary, and the United Kingdom (FRZZ, HUZZZ, UKZZ) were re-coded to MS level (FR, HU, and UK).
NUTS-2 codes were used for individual country maps, except for Denmark, Estonia, Germany, Ireland, the Netherlands, Sweden, and the United Kingdom (where NUTS-1 levels were used), as well as for Bulgaria, Croatia, Cyprus, Finland, Hungary, Latvia, Lithuania, Luxembourg, Malta, Romania, Slovakia, Slovenia, and Spain (where NUTS-0 levels, *i.e.* country level, where used). Amounts available at a more detailed geographical level were excluded from the individual country maps (due to the difficulty to map them on each country) but included in the EU map.

- Category of regions (*i.e.* less developed, transition, more developed, Outermost Regions, and 'Not Available'[268]); and by
- Financial product(s) provided by the financial instrument(s) (as mentioned, *i.e.* guarantees, loans, equity financing, and other financial instruments or grant component of the financial instrument).

This information enables the analysis of similarities and/or differences between MS and managing authorities relative to the uptake of financial instruments in each of the five sectors studied, as well as between sectors (as detailed throughout the present stocktaking study under the forms of graphs, maps, and tables).

For instance, as presented in Annex 3 hereafter, the national maps indicate, for each MS, whether (i) no financial instruments (in pink), (ii) financial instruments in 'other sectors' (*i.e.* in any sector but the five sectors studied in the present stocktaking study; in blue), or (iii) financial instruments in at least one of the five sectors studied (*in green*) have been set up by 31 December 2017.

Other considerations

As already mentioned in Section 1.2.1 in the introduction and in order to be comprehensive, it needs to be clearly mentioned in the present Annex that:

- The variable analysed in the present stocktaking study is an '*amount*' (the amount identified in the FA whose unit is in euro) and consequently not a '*number of financial instruments*' (this specific information being not available in a detailed manner that would have enabled a sectoral analysis using the 'categories of intervention').
- Only the financial data reported by the managing authorities under the considered categories of intervention composing the 'macro-categories' / sectors are analysed for each sector. This implies for instance that:
  - If a managing authority reports a single FA or a single financial instrument under several categories of intervention then this FA or this financial instrument may (i) be reported in various sectors (for instance in both RE and UDT), and/or (ii) be partly reported in one of the sectors studied in the present stocktaking (such as RE) and partly in another sector not studied in the present study (such as Energy Efficiency; EE). These situations do not present a risk of 'double reporting' (where the same amount would be reported several times in different sectors) since each amount is reported for each specific category of intervention. It may however indicate only a part of a larger FA or of a larger financial instrument (whose available amount is then larger since it covers several sectors). In the meantime, this does not prevent the sectoral analysis to be conducted since the 'amount devoted in the FA for financial instruments for this specific sector' is captured, and consequently can be analysed. That is why it is important to keep in mind that the variable analysed in the present stocktaking study is an amount reported for a specific category of intervention, and not a number of financial instruments.
  - If a managing authority decides to finance with financial instruments one of the sectors analysed in the present stocktaking study but reports under categories of intervention that are not covered by this specific '*macro-category*' / sector, such amount is then not captured in the analysis. This may be for instance the case of managing authorities reporting amounts devoted to financial instruments for '*general SME financing*' under categories of intervention that concern '*general SME financing*' (hence not '*RDI in SMEs financing*'), while the actual financial instrument also covers 'RDI in SMEs' in its investment strategy. Such reported amounts are consequently not captured in the '*macro-category*'

[268] This category identifies the Priority Axes funded by the Cohesion Fund. MS with a Gross National Income (GNI) *per* inhabitant below 90% of the EU average are eligible for funding from the Cohesion Fund. For the 2014-2020 programming period, the Cohesion Fund is available in Bulgaria, Croatia, Cyprus, Czechia, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia, and Slovenia.

'*RDI in SMEs*', even if the financial instrument finances RDI in SMEs. Such situation may however be considered marginal among the managing authorities and does not flaw the analysis conducted in the present stock-staking study.

- Since the cut-off date is 31 December 2017, the present stocktaking study does not capture the financial instruments that have been set-up and implemented in the meantime. This aspect is however mitigated by the online survey, the interviews, the focus groups and the case studies that are part of the qualitative data analysis conducted between December 2018 and May 2019 for the present stock-staking study.

As already mentioned, the outputs (*i.e.* graphs, maps, and tables) as well as the outcomes of the quantitative analysis undertaken for the present stocktaking study are presented in various sections and Annexes of the study; mainly in Chapters 2, 4, 5, 6, 7, and 8, as well as in Annexes 2 and 3 hereafter.

Annex 2 – Overview of the financial instruments developed in the five sectors by Member State

As mentioned in Section 1.2.1 in the introduction and in Annex 1 above, the financial data provided by the MS for reporting purposes have been used to produce tables. The following table presents an overview of the ERDF / CF-supported financial instruments developed in each Member State in the five sectors studied.

Table 36: Overview of ERDF and CF financial instruments in the five sectors by Member State

Member State	Renewable energy		Urban Development and Transport		Environment		ICT infrastructure		RDI in SMEs		Total (5 sectors)	
Name	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**
(AT) Austria	-	-	-	-	-	-	-	-	-	-	-	-
(BE) Belgium	-	-	-	-	-	-	-	-	-	-	-	-
(BG) Bulgaria	-	-	-	-	138.7	*73.1%*	-	-	51.0	*26.9%*	**189.7**	*100%*
(CY) Cyprus	-	-	-	-	-	-	-	-	-	-	-	-
(CZ) Czech Republic	-	-	-	-	-	-	-	-	-	-	-	-
(DE) Germany	-	-	-	-	-	-	-	-	221.9	*100%*	**221.9**	*100%*
(DK) Denmark	-	-	-	-	-	-	-	-	-	-	-	-
(EE) Estonia	-	-	-	-	-	-	-	-	-	-	-	-
(ES) Spain	-	-	-	-	-	-	-	-	-	-	-	-
(FI) Finland	-	-	-	-	-	-	-	-	-	-	-	-
(FR) France	-	-	-	-	-	-	-	-	13.0	*100%*	**13.0**	*100%*
(GR) Greece	25.7	*22.0%*	-	-	21.3	*18.2%*	-	-	70.0	*59.8%*	**117.0**	*100%*
(HR) Croatia	-	-	-	-	-	-	-	-	-	-	-	-
(HU) Hungary	196.7	*24.5%*	-	-	-	-	18.1	*2.3%*	587.5	*73.2%*	**802.3**	*100%*
(IE) Ireland	-	-	-	-	-	-	-	-	-	-	-	-
(IT) Italy	-	-	14.5	*3.0%*	-	-	-	-	470.9	*97.0%*	**485.4**	*100%*
(LT) Lithuania	-	-	-	-	-	-	-	-	-	-	-	-
(LU) Luxembourg	-	-	-	-	-	-	-	-	-	-	-	-
(LV) Latvia	-	-	-	-	-	-	-	-	-	-	-	-
(MT) Malta	-	-	-	-	-	-	-	-	-	-	-	-
(NL) Netherlands	-	-	-	-	-	-	-	-	88.1	*100%*	**88.1**	*100%*
(PL) Poland	53.4	*5.5%*	181.3	*18.5%*	-	-	281.3	*28.7%*	462.8	*47.3%*	**978.8**	*100%*
(PT) Portugal	-	-	33.0	*80.6%*	6.8	*16.5%*	-	-	1.2	*2.9%*	**40.9**	*100%*
(RO) Romania	-	-	-	-	-	-	-	-	57.7	*100%*	**57.7**	*100%*
(SE) Sweden	-	-	-	-	-	-	-	-	-	.	-	-
(SI) Slovenia	-	-	4.4	*6.8%*	1.5	*2.3%*	-	-	59.3	*90.9%*	**65.2**	*100%*
(SK) Slovakia	-	-	151.8	*80.3%*	-	-	-	-	37.2	*19.7%*	**189.0**	*100%*
(UK) United Kingdom	-	-	-	-	-	-	-	-	28.2	*100%*	**28.2**	*100%*

Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

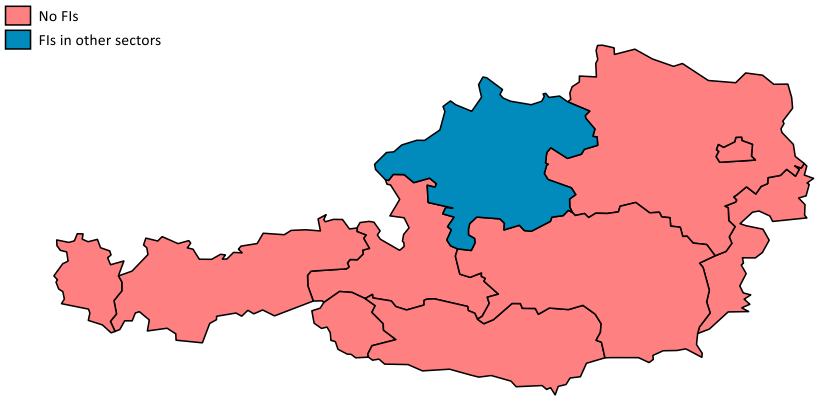
Annex 3 – Country maps of ERDF and CF financial instruments in the five sectors

As mentioned in Section 1.2.1 in the introduction and in Annex 1 above, the financial data provided by the MS for reporting purposes have also been used to produce country maps. These maps are provided in the present Annex in alphabetic order.

They indicate, for each MS, whether (i) no financial instruments (in pink), (ii) financial instruments in 'other sectors' (*i.e.* in any sector but the five sectors studied in the present stocktaking study; in blue), or (iii) financial instruments in at least one of the five sectors studied (*in green*) have been set up by 31 December 2017. For each country, a specific NUTS level (Nomenclature of Territorial Units for Statistics) has been selected to present the data, from NUTS-0 (MS level) to NUTS-2 (*see Annex 1 for details*). Where at least one financial instruments operation in at least one of the five sectors has been set up on the relevant territorial unit (*i.e.* on the relevant NUTS level), a pie chart indicates the contribution of each sector to the '*total eligible cost for financial instruments*' on that territory. In that process and for clarity purposes, data labels related to NUTS 2013 codes of the relevant geographical units have been indicated on the maps. Finally, when relevant (*i.e.* when at least one financial instruments operation in at least one of the sectors studied in the present stocktaking has occurred in the country), a table detailing the key information of the pie chart(s) have been added for each country.

Austria

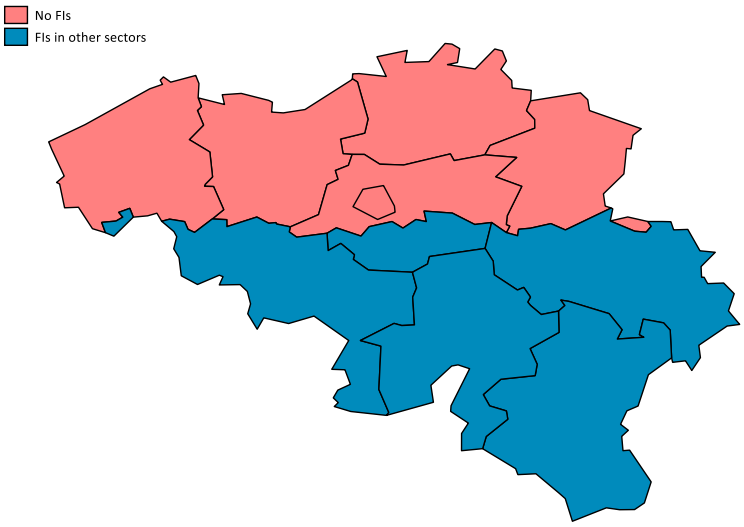
Figure 56: The use of ERDF and CF financial instruments in Austria



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Belgium

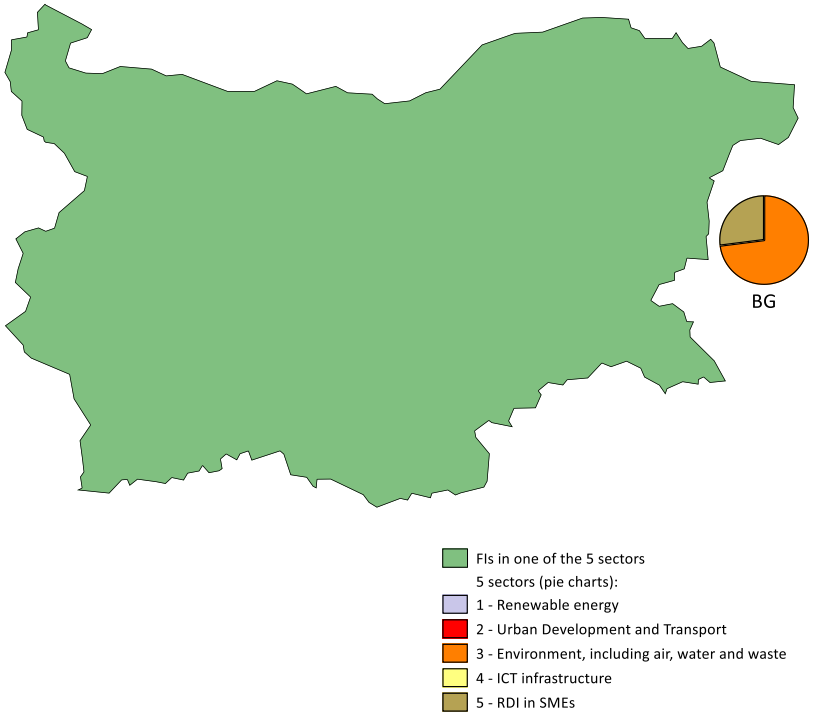
Figure 57: The use of ERDF and CF financial instruments in Belgium



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Bulgaria

Figure 58: The use of ERDF and CF financial instruments in Bulgaria



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

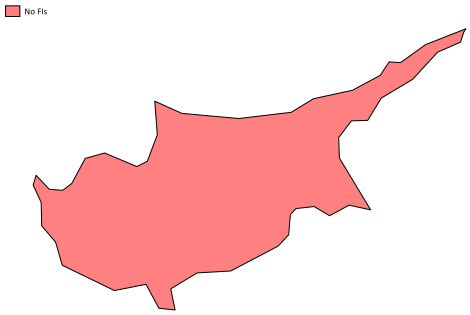
Table 37: Overview of the ERDF and CF financial instruments in the five sectors in Bulgaria

Member State		Renewable energy		Urban Development and Transport		Environment		ICT infrastructure		RDI in SMEs		Total (5 sectors)	
Code	**Label**	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**
BG	България (Bulgaria)	-	-	-	-	138.7	*73.1*	-	-	51.0	*26.9*	189.7	*100*

Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Cyprus

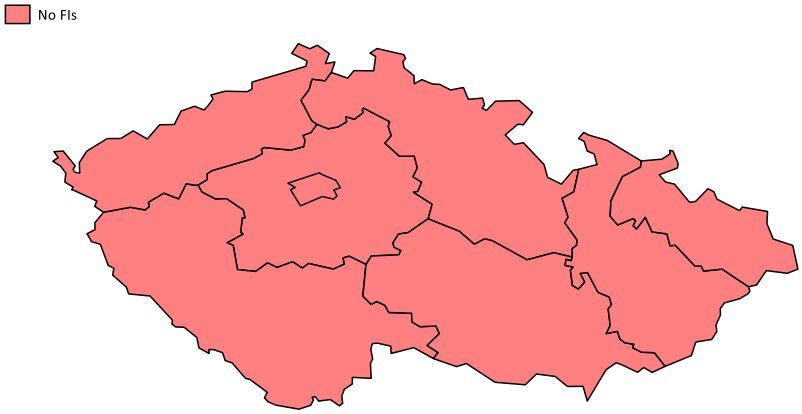
Figure 59: The use of ERDF and CF financial instruments in Cyprus



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Czech Republic

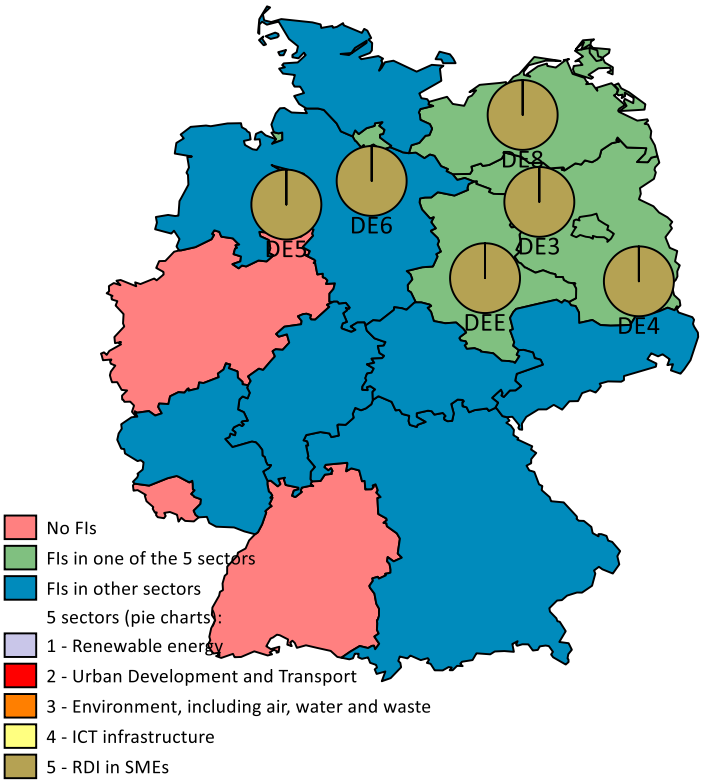
Figure 60: The use of ERDF and CF financial instruments in Czech Republic



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Germany

Figure 61: The use of ERDF and CF financial instruments in Germany



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass and t33 analysis, cut-off date 31 December 2017, 2019.

* Amounts were added up as reported at a more detailed level than NUTS-1 for the following NUTS codes: DE300, DE40, DE50, DE80, and DEE03.

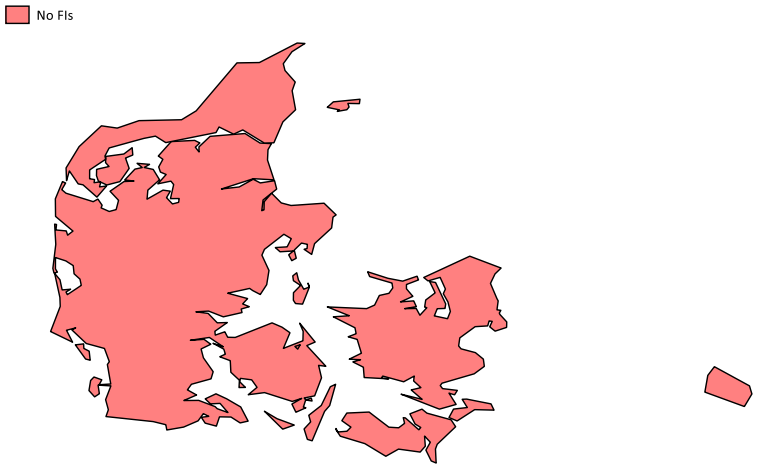
Table 38: Overview of the ERDF and CF financial instruments in the five sectors in Germany

NUTS 2013		Renewable energy		Urban Development and Transport		Environment, including air, water and waste		ICT infrastructure		RDI in SMEs		Total (5 sectors)	
Code	Label	mEUR	%	mEUR	%	mEUR	%	mEUR	%	mEUR	%	mEUR	%
DE3	Berlin	-	-	-	-	-	-	-	-	80.4	*100.0*	80.4	*100*
DE4	Brandenburg	-	-	-	-	-	-	-	-	28.6	*100.0*	28.6	*100*
DE5	Bremen	-	-	-	-	-	-	-	-	12.5	*100.0*	12.5	*100*
DE6	Hamburg	-	-	-	-	-	-	-	-	12.0	*100.0*	12.0	*100*
DE8	Mecklenburg-Vorpommern	-	-	-	-	-	-	-	-	22.4	*100.0*	22.4	*100*
DEE	Sachsen-Anhalt	-	-	-	-	-	-	-	-	66.0	*100.0*	66.0	*100*

Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Denmark

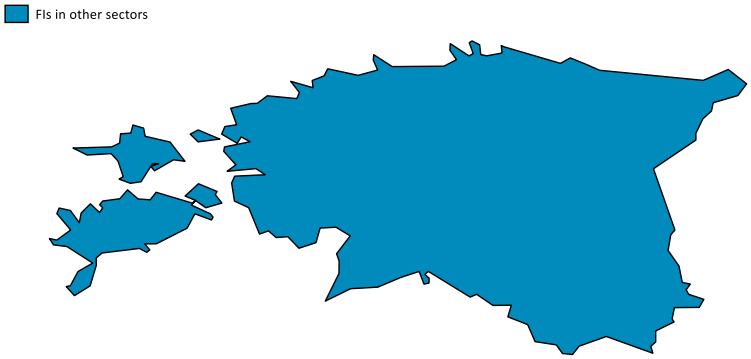
Figure 62: The use of ERDF and CF financial instruments in Denmark



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Estonia

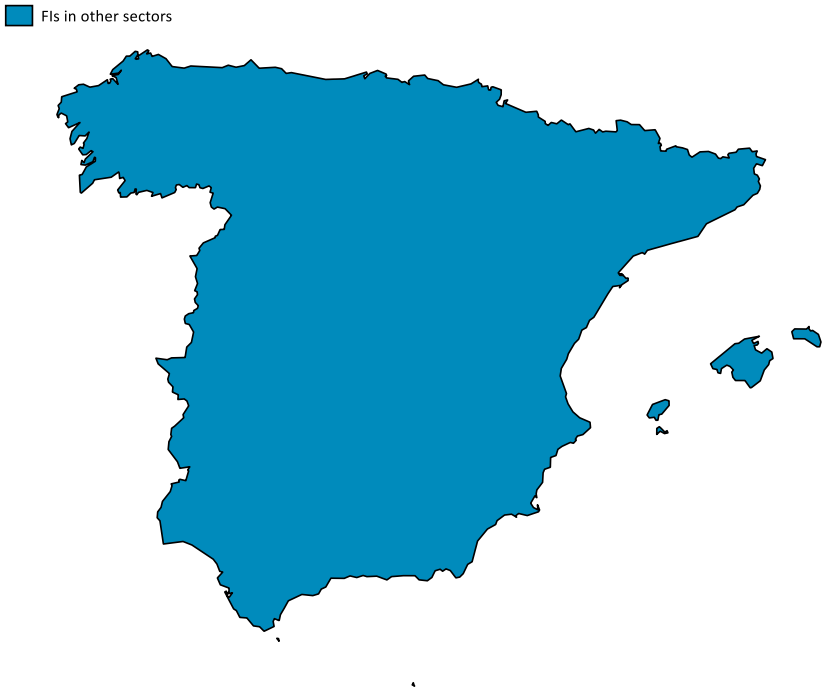
Figure 63: The use of ERDF and CF financial instruments in Estonia



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Spain

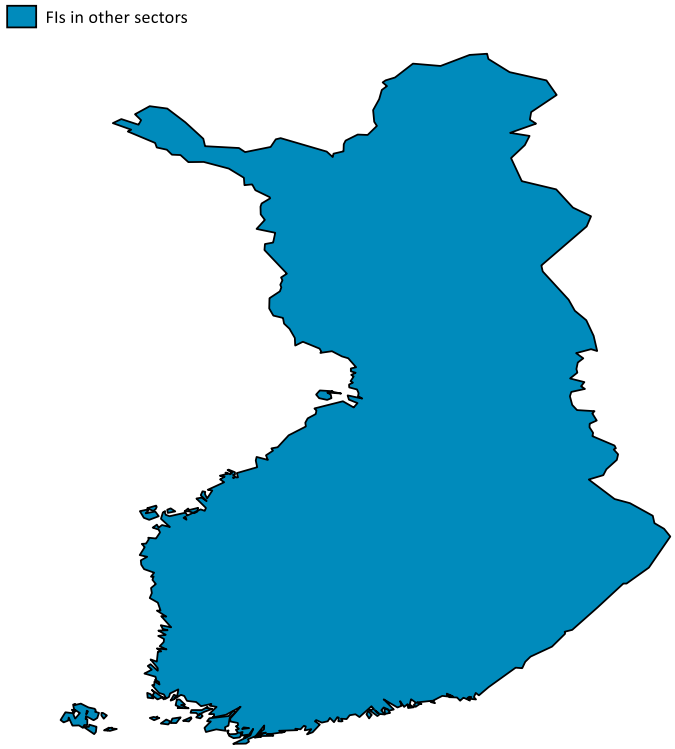
Figure 64: The use of ERDF and CF financial instruments in Spain



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Finland

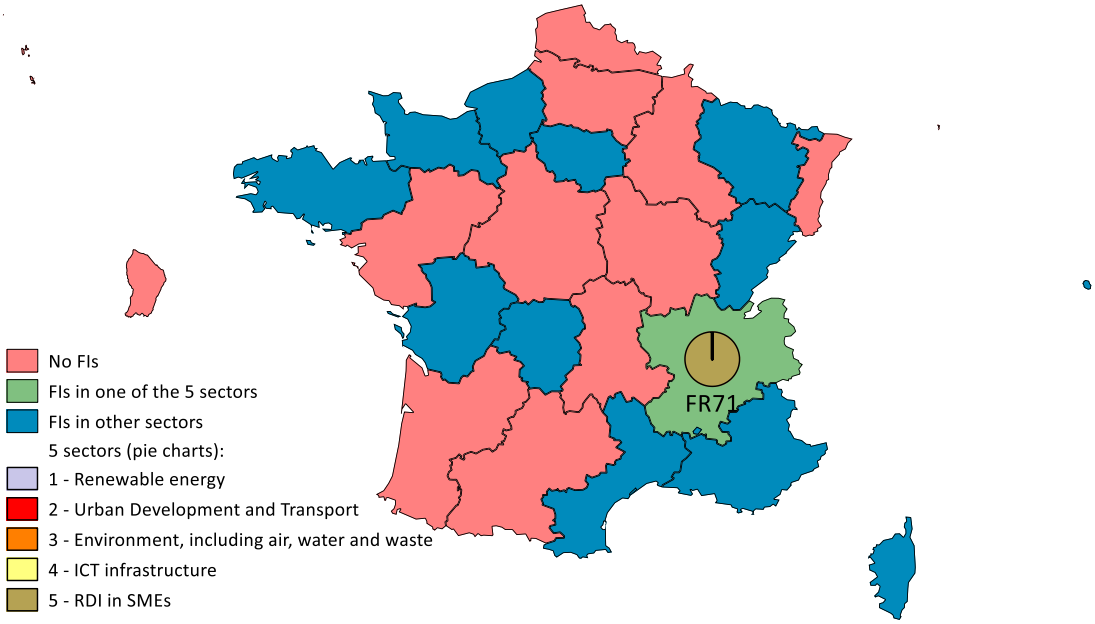
Figure 65: The use of ERDF and CF financial instruments in Finland



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass and t33 analysis, cut-off date 31 December 2017, 2019.

France

Figure 66: The use of ERDF and CF financial instruments in France



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass and t33 analysis, cut-off date 31 December 2017, 2019.

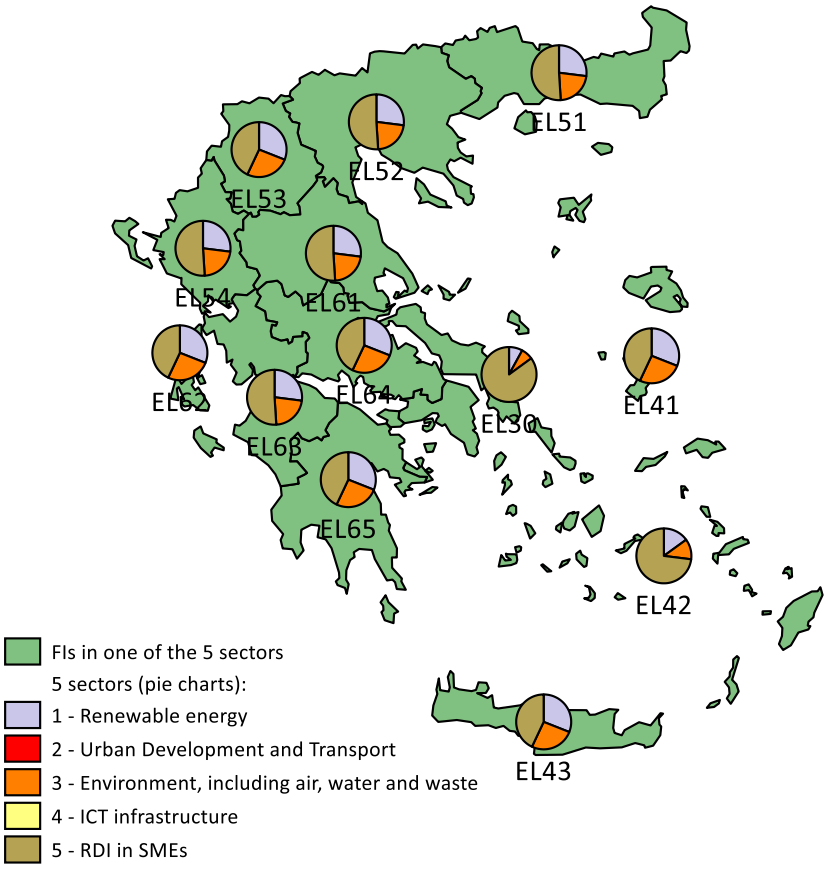
Table 39: Overview of the ERDF and CF financial instruments in the five sectors in France

NUTS 2013		Renewable energy		Urban Development and Transport		Environment		ICT infrastructure		RDI in SMEs		Total (5 sectors)	
Code	**Label**	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**
FR71	Rhône-Alpes	-	-	-	-	-	-	-	-	13.0	*100.0*	13.0	*100*

Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Greece

Figure 67: The use of ERDF and CF financial instruments in Greece



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass and t33 analysis, cut-off date 31 December 2017, 2019.

Table 40: Overview of the ERDF and CF financial instruments in the five sectors in Greece

NUTS 2013		Renewable energy		Urban Development and Transport		Environment, including air, water and waste		ICT infrastructure		RDI in SMEs		Total (5 sectors)	
Code	Label	mEUR	%	mEUR	%	mEUR	%	mEUR	%	mEUR	%	mEUR	%
EL30	Αττική (Attiki)	2.7	*7.9*	-	-	2.2	*6.6*	-	-	29.2	*85.5*	34.1	*100*
EL41	Βόρειο Αιγαίο (Voreio Aigaio)	1.2	*31.0*	-	-	1.0	*25.6*	-	-	1.7	*43.4*	4.0	*100*
EL42	Νότιο Αιγαίο (Notio Aigaio)	0.5	*15.1*	-	-	0.4	*12.5*	-	-	2.3	*72.5*	3.2	*100*
EL43	Κρήτη (Kriti)	1.2	*31.0*	-	-	1.0	*25.6*	-	-	1.7	*43.4*	4.0	*100*
EL51	Ανατολική Μακεδονία, Θράκη (Anatoliki Makedonia, Thraki)	3.0	*27.1*	-	-	2.5	*22.5*	-	-	5.6	*50.4*	11.1	*100*
EL52	Κεντρική Μακεδονία (Kentriki Makedonia)	3.0	*27.1*	-	-	2.5	*22.5*	-	-	5.6	*50.4*	11.1	*100*
EL53	Δυτική Μακεδονία (Dytiki Makedonia)	1.2	*31.0*	-	-	1.0	*25.6*	-	-	1.7	*43.4*	4.0	*100*
EL54	Ήπειρος (Ipeiros)	3.0	*27.1*	-	-	2.5	*22.5*	-	-	5.6	*50.4*	11.1	*100*
EL61	Θεσσαλία (Thessalia)	3.0	*27.1*	-	-	2.5	*22.5*	-	-	5.6	*50.4*	11.1	*100*
EL62	Ιόνια Νησιά (Ionia Nisia)	1.2	*31.0*	-	-	1.0	*25.6*	-	-	1.7	*43.4*	4.0	*100*
EL63	Δυτική Ελλάδα (Dytiki Ellada)	3.0	*27.1*	-	-	2.5	*22.5*	-	-	5.6	*50.4*	11.1	*100*
EL64	Στερεά Ελλάδα (Sterea Ellada)	1.3	*30.9*	-	-	1.1	*25.6*	-	-	1.9	*43.6*	4.3	*100*
EL65	Πελοπόννησος (Peloponnisos)	1.2	*31.0*	-	-	1.0	*25.6*	-	-	1.7	*43.4*	4.0	*100*

Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

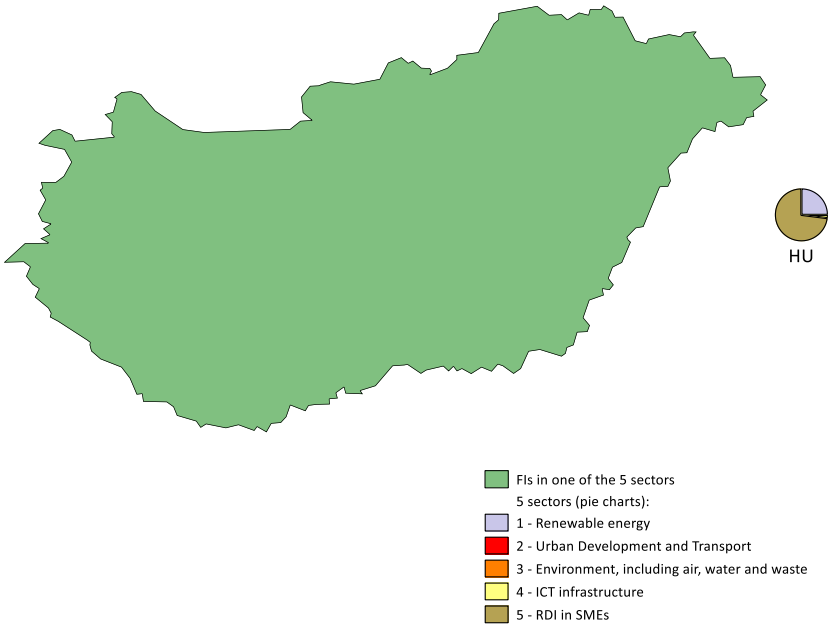
Croatia

Figure 68: The use of ERDF and CF financial instruments in Croatia

Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass and t33 analysis, cut-off date 31 December 2017, 2019.

Hungary

Figure 69: The use of ERDF and CF financial instruments in Hungary



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

* Amounts were added up as reported at a more detailed level than NUTS-0 for the following NUTS code: HU101.

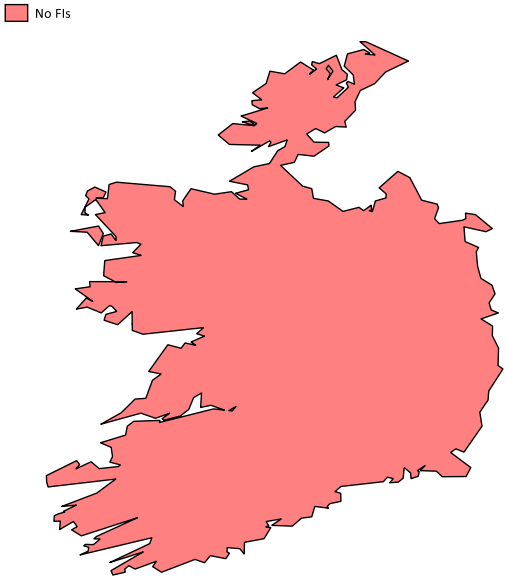
Table 41: Overview of the ERDF and CF financial instruments in the five sectors in Hungary

NUTS 2013		Renewable energy		Urban Development and Transport		Environment		ICT infrastructure		RDI in SMEs		Total (5 sectors)	
Code	Label	mEUR	%	mEUR	%	mEUR	%	mEUR	%	mEUR	%	mEUR	%
HU	Magyarország	196.7	*24.5*	-	-	-	-	18.1	*2.3*	587.5	*73.2*	802.3	*100*

Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Ireland

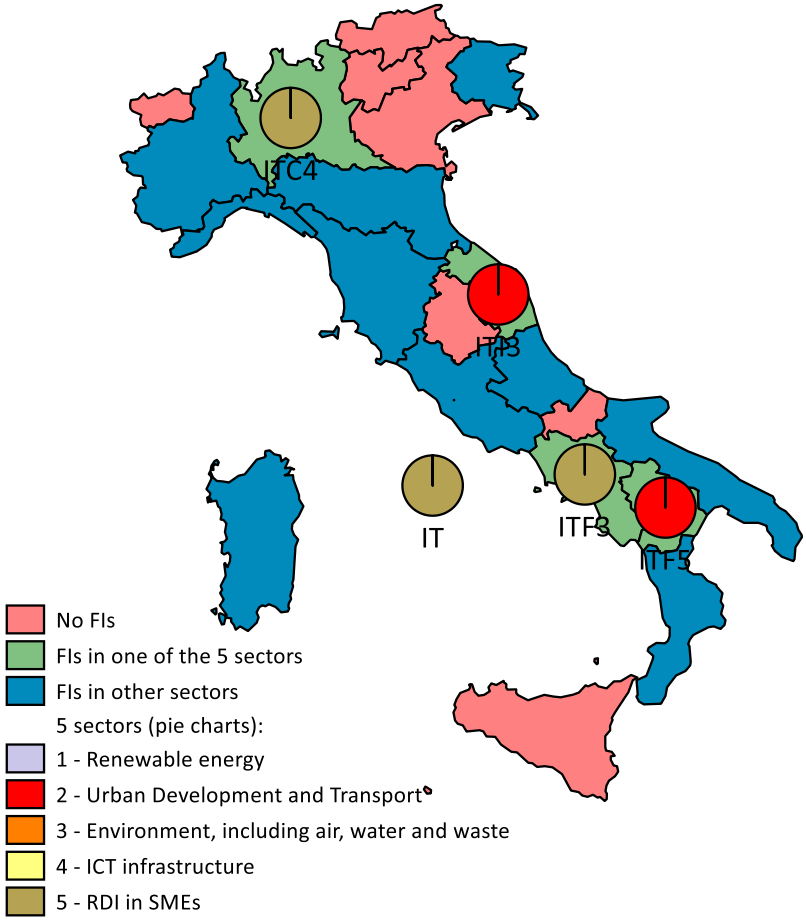
Figure 70: The use of ERDF and CF financial instruments in Ireland



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Italy

Figure 71: The use of ERDF and CF financial instruments in Italy



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

* Amounts were added up as reported at a more detailed level than NUTS-2 for the following NUTS code: ITC4C.

Table 42: Overview of the ERDF and CF financial instruments in the five sectors in Italy

NUTS 2013		Renewable energy		Urban Development and Transport		Environment, including air, water and waste		ICT infrastructure		RDI in SMEs		Total (5 sectors)	
Code	Label	mEUR	%	mEUR	%	mEUR	%	mEUR	%	mEUR	%	mEUR	%
IT	Italia	-	-	-	-	-	-	-	-	200.0	*100.0*	200.0	*100*
ITC4	Lombardia	-	-	-	-	-	-	-	-	67.0	*100.0*	67.0	*100*
ITF3	Campania	-	-	-	-	-	-	-	-	203.9	*100.0*	203.9	*100*
ITF5	Basilicata	-	-	7.1	*100.0*	-	-	-	-	-	-	7.1	*100*
ITI3	Marche	-	-	7.4	*100.0*	-	-	-	-	-	-	7.4	*100*

Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

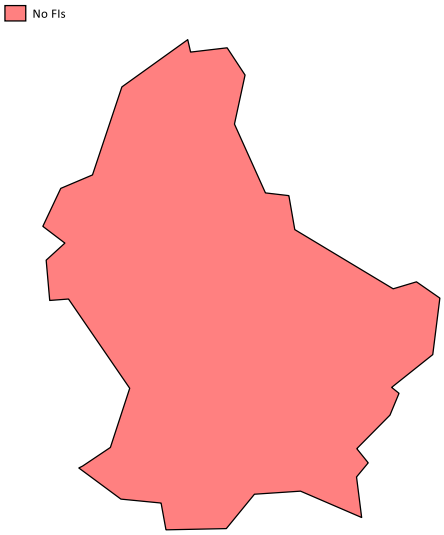
Lithuania

Figure 72: The use of ERDF and CF financial instruments in Lithuania

Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Luxembourg

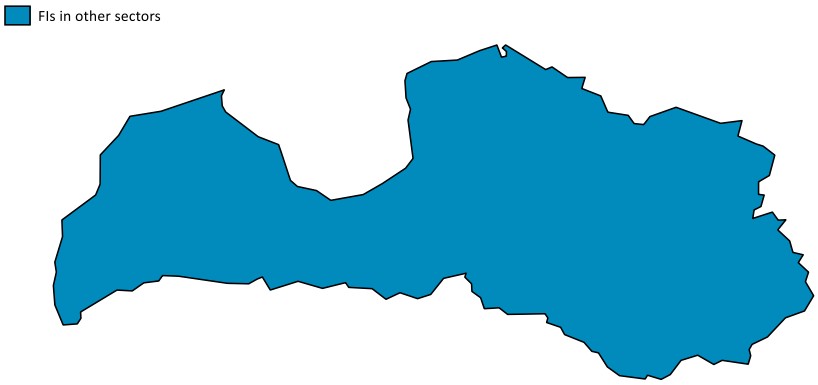
Figure 73: The use of ERDF and CF financial instruments in Italy



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Latvia

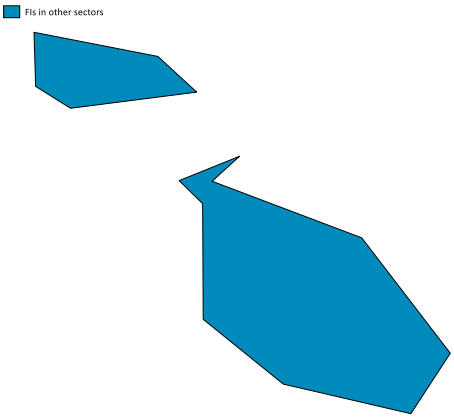
Figure 74: The use of ERDF and CF financial instruments in Latvia



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Malta

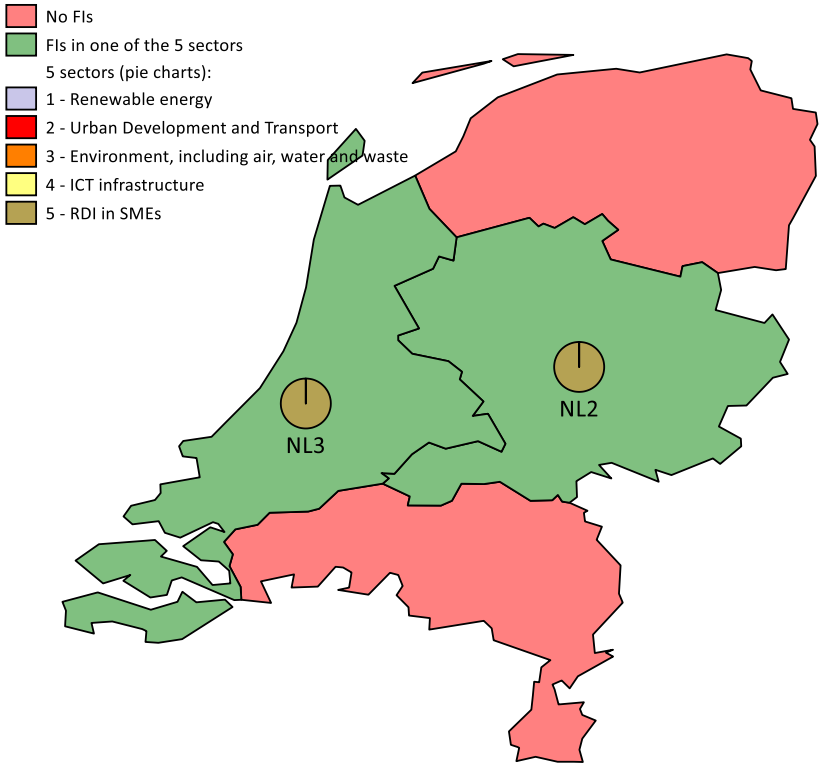
Figure 75: The use of ERDF and CF financial instruments in Malta



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Netherlands

Figure 76: The use of ERDF and CF financial instruments in the Netherlands



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

* Amounts were added up as reported at a more detailed level than NUTS-1 for the following NUTS codes: NL23, and NL33.

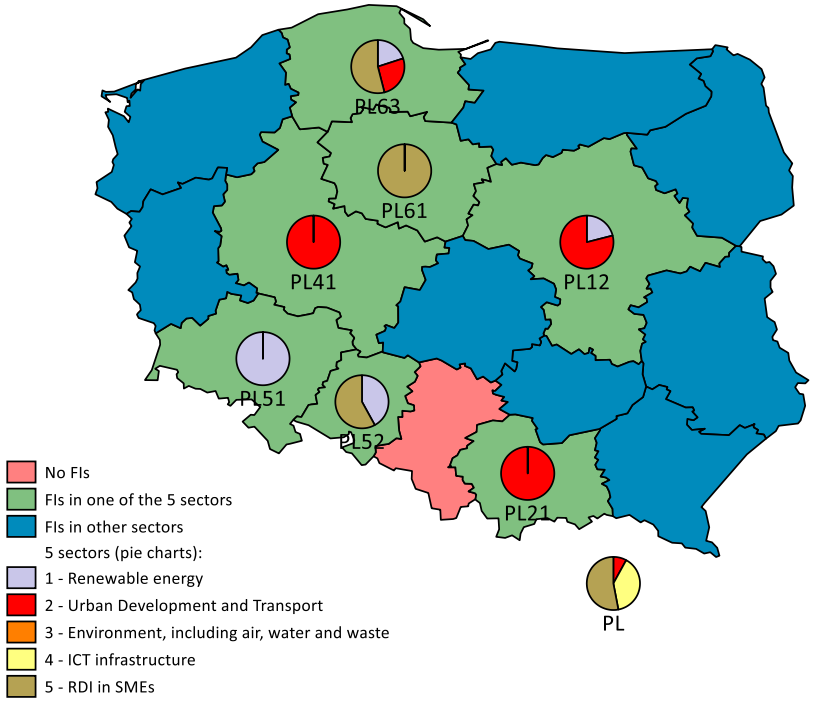
Table 43: Overview of the ERDF and CF financial instruments in the five sectors in the Netherlands

NUTS 2013		Renewable energy		Urban Development and Transport		Environment		ICT infrastructure		RDI in SMEs		Total (5 sectors)	
Code	Label	mEUR	%	mEUR	%	mEUR	%	mEUR	%	mEUR	%	mEUR	%
NL2	Oost-Nederland	-	-	-	-	-	-	-	-	15.0	*100.0*	15.0	*100*
NL3	West-Nederland	-	-	-	-	-	-	-	-	73.1	*100.0*	73.1	*100*

Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Poland

Figure 77: The use of ERDF and CF financial instruments in Poland



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

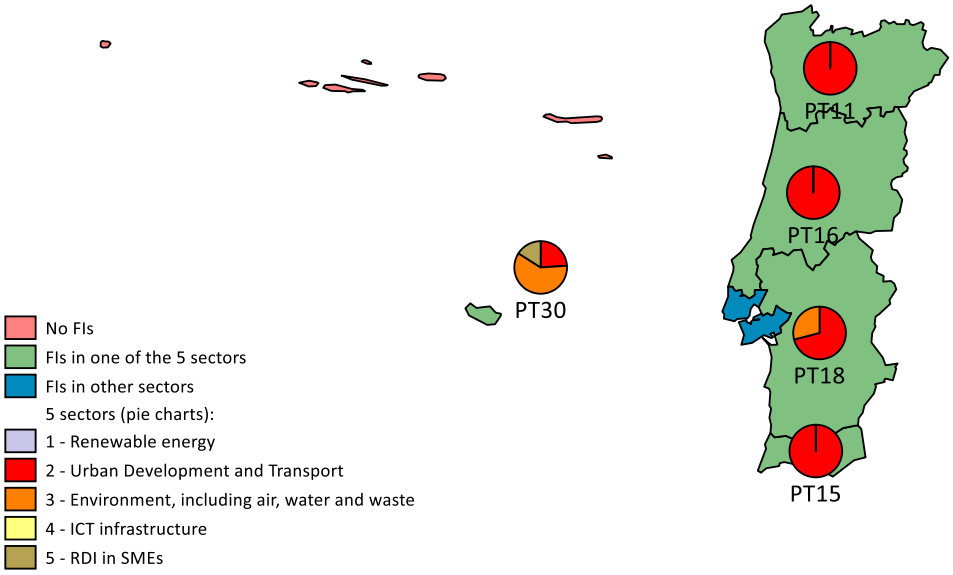
Table 44: Overview of the ERDF and CF financial instruments in the five sectors in Poland

NUTS 2013		Renewable energy		Urban Development and Transport		Environment, including air, water and waste		ICT infrastructure		RDI in SMEs		Total (5 sectors)	
Code	Label	mEUR	%	mEUR	%	mEUR	%	mEUR	%	mEUR	%	mEUR	%
PL	Polska	-	-	58.5	*8.2*	-	-	281.3	*39.4*	374.2	*52.4*	714.0	*100*
PL12	Mazowieckie	8.6	*20.6*	33.1	*79.4*	-	-	-	-	-	-	41.7	*100*
PL21	Małopolskie	-	-	37.4	*100.0*	-	-	-	-	-	-	37.4	*100*
PL41	Wielkopolskie	-	-	31.7	*100.0*	-	-	-	-	-	-	31.7	*100*
PL51	Dolnośląskie	15.8	*100.0*	-	-	-	-	-	-	-	-	15.8	*100*
PL52	Opolskie	13.0	*41.8*	-	-	-	-	-	-	18.1	*58.2*	31.0	*100*
PL61	Kujawsko-Pomorskie	-	-	-	-	-	-	-	-	26.9	*100.0*	26.9	*100*
PL63	Pomorskie	16.1	*20.0*	20.6	*25.7*	-	-	-	-	43.6	*54.3*	80.3	*100*

Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Portugal

Figure 78: The use of ERDF and CF financial instruments in Portugal



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

* Amounts were added up as reported at a more detailed level than NUTS-2 for the following NUTS codes: PT150, and PT300.

Table 45: Overview of the ERDF and CF financial instruments in the five sectors in Portugal

NUTS 2013		Renewable energy		Urban Development and Transport		Environment, including air, water and waste		ICT infrastructure		RDI in SMEs		Total (5 sectors)	
Code	Label	mEUR	%	mEUR	%	mEUR	%	mEUR	%	mEUR	%	mEUR	%
PT11	Norte	-	-	7.2	*100.0*	-	-	-	-	-	-	7.2	*100*
PT15	Algarve	-	-	17.2	*100.0*	-	-	-	-	-	-	17.2	*100*
PT16	Centro (Pt)	-	-	0.9	*100.0*	-	-	-	-	-	-	0.9	*100*
PT18	Alentejo	-	-	5.8	*71.4*	2.3	*28.6*	-	-	-	-	8.1	*100*
PT30	Região Autónoma Da Madeira	-	-	1.8	*24.3*	4.4	*59.8*	-	-	1.2	*15.8*	7.4	*100*

Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Romania

Figure 79: The use of ERDF and CF financial instruments in Romania

Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

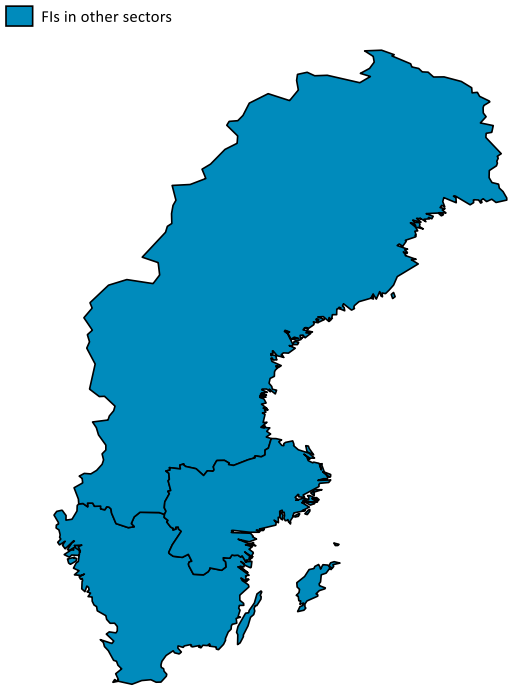
Table 46: Overview of the ERDF and CF financial instruments in the five sectors in Romania

NUTS 2013		Renewable energy		Urban Development and Transport		Environment		ICT infrastructure		RDI in SMEs		Total (5 sectors)	
Code	**Label**	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**
RO	România	-	-	-	-	-	-	-	-	57.7	*100.0*	57.7	*100*

Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Sweden

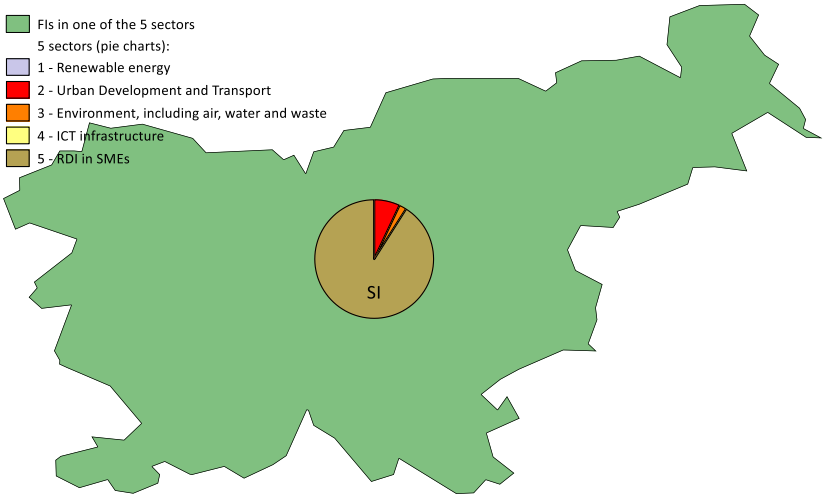
Figure 80: The use of ERDF and CF financial instruments in Sweden



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Slovenia

Figure 81: The use of ERDF and CF financial instruments in Slovenia



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass and t33 analysis, cut-off date 31 December 2017, 2019.

* Amounts were added up as reported at a more detailed level than NUTS-0 for the following NUTS codes: SI03, and SI04.

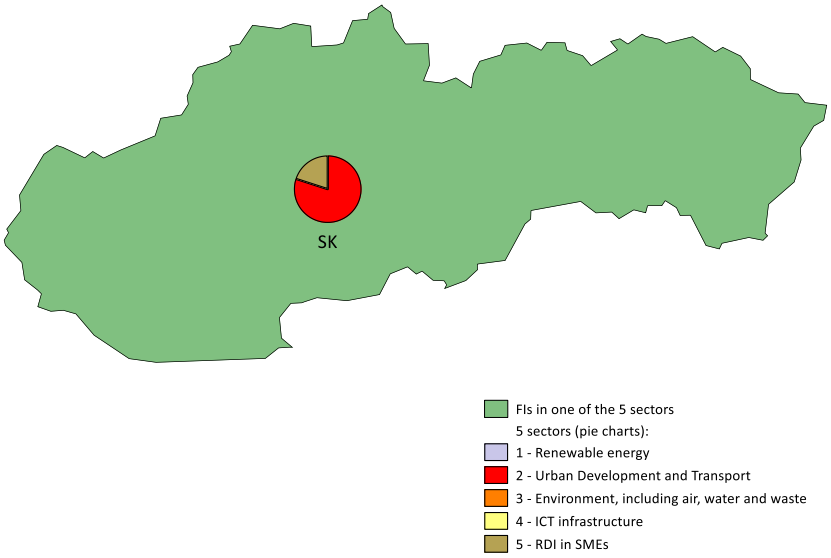
Table 47: Overview of the ERDF and CF financial instruments in the five sectors in Slovenia

NUTS 2013		Renewable energy		Urban Development and Transport		Environment		ICT infrastructure		RDI in SMEs		Total (5 sectors)	
Code	**Label**	**mEUR**	***%***	**mEUR**	***%***	**mEUR**	***%***	**mEUR**	***%***	**mEUR**	***%***	**mEUR**	***%***
SI	Slovenija	-	-	4.4	*6.8*	1.5	*2.3*	-	-	59.3	*90.9*	65.2	*100*

Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Slovakia

Figure 82: The use of ERDF and CF financial instruments in Slovakia



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

* Amounts were added up as reported at a more detailed level than NUTS-0 for the following NUTS codes: SK0, SK010, SK02, SK021, SK022, SK023, SK03, SK031, SK032, SK04, SK041, and SK042.

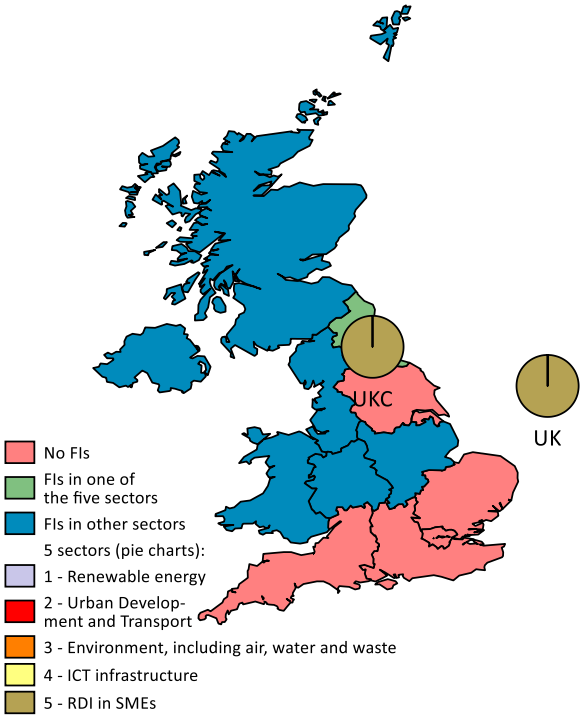
Table 48: Overview of the ERDF and CF financial instruments in the five sectors in Slovakia

NUTS 2013		Renewable energy		Urban Development and Transport		Environment		ICT infrastructure		RDI in SMEs		Total (5 sectors)	
Code	**Label**	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**
SK	Slovensko	-	-	151.8	*80.3*	-	-	-	-	*37.2*	*19.7*	189.0	*100*

Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

United Kingdom

Figure 83: The use of ERDF and CF financial instruments in the United Kingdom



Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Table 49: Overview of the ERDF and CF financial instruments in the five sectors in the UK

NUTS 2013		Renewable energy		Urban Development and Transport		Environment		ICT infrastructure		RDI in SMEs		Total (5 sectors)	
Code	**Label**	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**	**mEUR**	**%**
UK	United Kingdom	-	-	-	-	-	-	-	-	12.4	*100.0*	12.4	*100*
UKC	North East (England)	-	-	-	-	-	-	-	-	15.8	*100.0*	15.8	*100*

Source: Dataset on financial information provided by Member States to the European Commission for monitoring purposes, broken down by category of intervention, fi-compass *and t33 analysis, cut-off date 31 December 2017, 2019.*

Annex 4 – Population of online consultation respondents and questionnaire

The table below synthesises the population of respondents to the online consultation. This consultation was conducted between Monday 3 December 2018 and Friday 15 February 2019 and was addressed to all types of EU stakeholders involved in ERDF and CF financial instruments in the five sectors studied.

Table 50: Population of respondents to the online survey (organisation type and geographical coverage)

Member State	Managing Authority	Intermediate body	Public authority	NPB/NPI	Financial intermediary	Other	Total
(AT) Austria	0	0	0	1	0	0	1
(BE) Belgium	0	0	0	0	0	0	0
(BG) Bulgaria	1	1	3	2	3	0	10
(CY) Cyprus	1	0	1	0	0	1	3
(CZ) Czech Republic	1	0	0	0	0	0	1
(DE) Germany	4	1	3	2	1	1	12
(DK) Denmark	0	0	0	0	0	0	0
(EE) Estonia	0	0	0	0	0	0	0
(ES) Spain	0	0	1	1	1	0	3
(FI) Finland	3	0	3	1	1	0	8
(FR) France	0	0	0	3	2	1	6
(GR) Greece	5	0	3	0	1	0	9
(HR) Croatia	1	0	0	1	0	0	2
(HU) Hungary	1	0	0	0	1	0	2
(IE) Ireland	3	3	6	2	3	1	18
(IT) Italy	2	0	0	2	0	0	4
(LT) Lithuania	1	2	0	1	0	0	4
(LU) Luxembourg	0	0	0	0	0	0	0
(LV) Latvia	1	0	0	0	1	0	2
(MT) Malta	0	1	0	1	1	1	4
(NL) Netherlands	3	1	1	0	1	0	6
(PL) Poland	1	0	6	1	2	0	10
(PT) Portugal	4	0	0	0	2	1	7
(RO) Romania	1	0	1	1	0	0	3
(SE) Sweden	0	0	1	1	0	0	2
(SI) Slovenia	1	1	1	0	0	0	3
(SK) Slovakia	1	0	0	0	0	0	1
(UK) United Kingdom	1	2	1	0	3	1	8
Total	**36**	**12**	**31**	**20**	**23**	**7**	**129**

Source: fi-compass *and PwC, Results of the online consultation, Online consultation addressed to EU financial instruments stakeholders, 2019.*

The questionnaire used for the online survey is presented below.

Stocktaking on Financial Instruments by sector

Progress to date, market needs and implications for Financial Instruments

Survey Questionnaire

Introduction

This survey is carried out in the context of the project 'Stocktaking on Financial Instruments by sector - Progress to date, market needs and implications for Financial Instruments' currently being conducted by *fi-compass* on behalf of the European Commission. The overarching aim of the study is to gain a better understanding of the sectors which have not yet, or only to a minor extent, been supported by FIs, the reasons for this and the scope to expand FIs in the context of these sectors in the short- and medium-term. The secondary objective of the study is to gain an understanding of the sectors where there may be continued and anticipated future investment opportunities. The study focuses on five sectors:

- Renewable Energy,
- Urban Development and Transport,
- Environment, incl. air, water and waste,
- Information and Communication Technology (ICT) Infrastructure, and
- Research Development and Innovation (RDI) in SMEs.

This survey aims to collect information [at the level of managing authorities and other national authorities, financial intermediaries, including NPBIs, and final recipients] on the potential for better uptake of Financial Instruments across these five sectors in the short and medium term. In that respect, it aims to collect your views on the continued and anticipated funding needs in these five sectors, as well as the existing barriers you perceive for wider deployment of Financial Instruments in these sectors. Finally, it aims to collect your views on the key enabling factors that could foster the use of Financial Instruments in these sectors.

> As a reminder, **Financial Instruments** are 'measures of financial support provided on a complementary basis from the budget to address one or more specific policy objectives of the Union. Such instruments may take the form of equity or quasi-equity investments, loans or guarantees, or other risk-sharing instruments, and may, where appropriate, be combined with grants' (Article 2(p) Financial Regulation; Article 37(7)(8)(9) CPR).

This survey is confidential and will take approximately 15-20 minutes to complete. Please do not hesitate to contact *fi.study@lu.pwc.com*, should you have any questions.

Background questions

<table>
<tr><th>Q</th><th>Respondent</th><th>Question/Answer options</th></tr>
<tr><td>1</td><td>All</td><td>Organisation’s type:
Please select <u>one</u> answer:<table>
<tr><td>o</td><td>1.1</td><td>Managing Authority</td></tr>
<tr><td>o</td><td>1.2</td><td>Intermediate body</td></tr>
<tr><td>o</td><td>1.3</td><td>Public authority (other than Managing Authority or Intermediate Body)</td></tr>
<tr><td>o</td><td>1.4</td><td>National Promotional Bank or Institution</td></tr>
<tr><td>o</td><td>1.5</td><td>Financial intermediary (such as bank or investment fund)</td></tr>
<tr><td>o</td><td>1.6</td><td>Other, please specify: ____[*open field*]</td></tr>
</table></td></tr>
<tr><td>2</td><td>All</td><td>Organisation’s name:
Name: ……. *[open field]*</td></tr>
<tr><td>3</td><td>All</td><td>Organisation’s Member State:<table>
<tr><td>o</td><td>3.1</td><td>Austria</td></tr>
<tr><td>o</td><td>3.2</td><td>Belgium</td></tr>
<tr><td>o</td><td>3.3</td><td>Bulgaria</td></tr>
<tr><td>o</td><td>3.4</td><td>Croatia</td></tr>
<tr><td>o</td><td>3.5</td><td>Cyprus</td></tr>
<tr><td>o</td><td>3.6</td><td>Czech Republic</td></tr>
<tr><td>o</td><td>3.7</td><td>Denmark</td></tr>
<tr><td>o</td><td>3.8</td><td>Estonia</td></tr>
<tr><td>o</td><td>3.9</td><td>Finland</td></tr>
<tr><td>o</td><td>3.10</td><td>France</td></tr>
<tr><td>o</td><td>3.11</td><td>Germany</td></tr>
<tr><td>o</td><td>3.12</td><td>Greece</td></tr>
<tr><td>o</td><td>3.13</td><td>Hungary</td></tr>
<tr><td>o</td><td>3.14</td><td>Ireland</td></tr>
<tr><td>o</td><td>3.15</td><td>Italy</td></tr>
<tr><td>o</td><td>3.16</td><td>Latvia</td></tr>
<tr><td>o</td><td>3.17</td><td>Lithuania</td></tr>
<tr><td>o</td><td>3.18</td><td>Luxembourg</td></tr>
<tr><td>o</td><td>3.19</td><td>Malta</td></tr>
<tr><td>o</td><td>3.20</td><td>Netherlands</td></tr>
<tr><td>o</td><td>3.21</td><td>Poland</td></tr>
<tr><td>o</td><td>3.22</td><td>Portugal</td></tr>
<tr><td>o</td><td>3.23</td><td>Romania</td></tr>
<tr><td>o</td><td>3.24</td><td>Slovakia</td></tr>
<tr><td>o</td><td>3.25</td><td>Slovenia</td></tr>
<tr><td>o</td><td>3.26</td><td>Spain</td></tr>
<tr><td>o</td><td>3.27</td><td>Sweden</td></tr>
<tr><td>o</td><td>3.28</td><td>United Kingdom</td></tr>
</table></td></tr>
</table>

Q	Respondent	Question/Answer options
4	All	Have you been involved in the deployment of Financial Instruments in the current 2014-2020 programming period? *Please select <u>one</u> answer:* ○ 4.1 – 1 – No, not at all ○ 4.2 – 2 – Yes, to a small extent (e.g. engaged in preliminary discussions) ○ 4.3 – 3 – Yes, to a moderate extent (i.e. consulted for the design and/or implementation of the Financial Instrument) ○ 4.4 – 4 – Yes, to a great extent (i.e. participated in the design and/or implementation of the Financial Instrument) ○ 4.5 – 5 – Yes, to a very high extent (i.e. responsible for the design and/or implementation of the Financial Instrument)
5	If 4 = 4.2 – 4.5	Precise the Thematic Objective(s) in which these Financial Instruments have been proposed or deployed: *Please select <u>all</u> that apply:* □ 5.1 – Research, development and innovation (RDI) (Thematic Objective 1) □ 5.2 – Information and communication technologies (ICT) (Thematic Objective 2) □ 5.3 – Small and medium-sized enterprises (SMEs) (Thematic Objective 3) □ 5.4 – Investments in low carbon economy (Thematic Objective 4) □ 5.5 – Climate change adaptation, risk prevention and management (Thematic Objective 5) □ 5.6 – Environment and resource efficiency, incl. air, water and waste (Thematic Objective 6) □ 5.7 – Transport and key network infrastructures (Thematic Objective 7) □ 5.8 – Sustainable employment and labour mobility (Thematic Objective 8) □ 5.9 – Social inclusion, combating poverty and any discrimination (Thematic Objective 9) □ 5.10 – Education, training and lifelong learning (Thematic Objective 10) □ 5.11 – Institutional capacity of public authorities and stakeholders and efficient public administration (Thematic Objective 11)

Questions on the potential for the uptake of Financial Instruments in specific sectors

Q	Respondent	Question/Answer options
6	All	Have you ever considered (or been involved in) the deployment of Financial Instruments in one of the following sectors? Starting from here, you will be asked questions specific to the sector(s) you previously selected. If you selected several sectors in your previous answers, you will be asked several series of questions, targeting each of these sectors one by one. Thus, the same question(s) may be asked to you, each time for a different sector. Please answer the questions with the mentioned sector in mind so your answers to the same question may vary from one sector to the other. Thank you in advance for answering the questions related to each of the sectors you selected. *Please select <u>all</u> that apply:* □ 6.1 – Renewable Energy □ 6.2 – Urban Development and Transport □ 6.3 – Environment, incl. air, water and waste □ 6.4 – Information and Communication Technology (ICT) Infrastructure □ 6.5 – Research, Development and Innovation (RDI) in SMEs □ 6.6 – None of the above

<table>
<tr><th>Q</th><th>Respondent</th><th>Question/Answer options</th></tr>
<tr><td>6a</td><td>If 6= 6.1 to 6.5</td><td>To what extent has the deployment of Financial Instrument been considered for this sector? [sector name]
<table>
<tr><td>o</td><td>6a.1</td><td>A Financial Instrument is envisaged in the Operational Programme, but no ex-ante assessment has been conducted</td></tr>
<tr><td>o</td><td>6a.2</td><td>An ex-ante assessment has been conducted, but the further development and set up of the Financial Instrument has not been carried out</td></tr>
<tr><td>o</td><td>6a.3</td><td>A Financial Instrument has been developed and set up, but its implementation has not been undertaken so far</td></tr>
<tr><td>o</td><td>6a.4</td><td>The implementation of a Financial Instrument in this sector is underway</td></tr>
</table></td></tr>
<tr><td>7a</td><td>Only if Q6=6.1</td><td>For which of the following sub-sectors (within the Renewable Energy sector) has your organisation considered (or been involved in) the use of Financial Instruments?
Please select <u>all</u> that apply:
<table>
<tr><td>□</td><td>7a.1</td><td>Wind energy</td></tr>
<tr><td>□</td><td>7a.2</td><td>Solar energy</td></tr>
<tr><td>□</td><td>7a.3</td><td>Biomass energy</td></tr>
<tr><td>□</td><td>7a.4</td><td>Other renewable energy (including hydroelectric, geothermal and marine energy) and renewable energy integration (including storage, power to gas and renewable hydrogen infrastructure)</td></tr>
<tr><td>□</td><td>7a.5</td><td>Intelligent Energy Distribution Systems at medium and low voltage levels (including smart grids and ICT systems)</td></tr>
</table></td></tr>
<tr><td>7b</td><td>Only if Q6=6.2</td><td>For which of the following sub-sectors (within the Urban Development and Transport sector) has your organisation considered (or has been involved in) the use of Financial Instruments?
Please select <u>all</u> that apply:
<table>
<tr><td></td><td>7b.1</td><td>Transport: Railways</td></tr>
<tr><td>□</td><td>7b.2</td><td>Transport: Motorways</td></tr>
<tr><td>□</td><td>7b.3</td><td>Transport: Multimodal transport</td></tr>
<tr><td>□</td><td>7b.4</td><td>Transport: Airports</td></tr>
<tr><td>□</td><td>7b.5</td><td>Transport: Seaports</td></tr>
<tr><td>□</td><td>7b.6</td><td>Waterways</td></tr>
<tr><td>□</td><td>7b.7</td><td>Sustainable transport: clean urban transport infrastructure, intelligent transport systems</td></tr>
<tr><td>□</td><td>7b.8</td><td>Integrated approach to urban development</td></tr>
<tr><td>□</td><td>7b.9</td><td>Social infrastructure and related investment</td></tr>
<tr><td>□</td><td>7b.10</td><td>Health infrastructure and related investment</td></tr>
<tr><td>□</td><td>7b.11</td><td>Education infrastructure and related investment</td></tr>
</table></td></tr>
<tr><td>7c</td><td>Only if Q6=6.3</td><td>For which of the following sub-sectors (within the Environment sector, incl. air, water and waste sectors) has your organisation considered (or been involved in) the use of Financial Instruments?
Please select <u>all</u> that apply:
<table>
<tr><td>□</td><td>7c.1</td><td>Environmental infrastructure</td></tr>
<tr><td>□</td><td>7c.2</td><td>Air quality measures</td></tr>
<tr><td>□</td><td>7c.3</td><td>Integrated pollution prevention and control</td></tr>
<tr><td>□</td><td>7c.4</td><td>Biodiversity and nature protection, green infrastructure</td></tr>
<tr><td>□</td><td>7c.5</td><td>Adaptation to climate change measures</td></tr>
<tr><td>□</td><td>7c.6</td><td>Risk prevention and management of non-climate related natural risks</td></tr>
<tr><td>□</td><td>7c.7</td><td>Rehabilitation of industrial sites and contaminated land</td></tr>
<tr><td>□</td><td>7c.8</td><td>Waste management</td></tr>
</table></td></tr>
</table>

Q	Respondent	Question/Answer options		
		□	7c.9	Water management
7d	Only if Q6=6.4	For which of the following sub-sectors (within the ICT Infrastructure sector) has your organisation considered (or been involved in) the use of Financial Instruments? *Please select <u>all</u> that apply:*		
		□	7d.1	Backbone/backhaul network
		□	7d.2	High-speed and very high speed broadband network
		□	7d.3	Other types of ICT infrastructure/large-scale computer resources/equipment (including e-infrastructure, data centres and sensors)
7e	Only if Q6=6.5	For which of the following sub-sectors (within the RDI in SMEs sector) has your organisation considered (or been involved in) the use of Financial Instruments? *Please select <u>all</u> that apply:*		
		□	7e.1	Investment in infrastructure, capacities and equipment in SMEs directly linked to RDI activities
		□	7e.2	RDI activities in private research centres including networking
		□	7e.3	Technology transfer and university-enterprise cooperation primarily benefitting SMEs
		□	7e.4	RDI processes in SMEs
		□	7e.5	RDI in low carbon economy and resilience to climate change enterprises
7f	Only if Q6=6.6	Why have Financial Instruments not been considered in any of the sectors specified? *Please select <u>all</u> that apply:*		
		□	7f.1	Lack of sufficient market demand
		□	7f.2	Perception of these sectors not being fit for Financial Instruments
		□	7f.3	Lack of political support for the use of Financial Instrument
		□	7f.4	Sectors listed are not a policy priority
		□	7f.5	Limited past experience with the use of Financial Instruments
		□	7f.6	Lack of sufficient knowledge and technical capacity
		□	7f.7	Regulatory and legal barriers
		□	7f.8	Other, please specify: ____[*open field*]
8	All that answered Q6	Has your organisation participated in the development of Financial Instruments in this sector *[sector name]*? *Please select <u>one</u> answer:*		
		o	8.1	Yes
		o	8.2	No
8a	If 8=8.1	What was the role of your organisation in the development of Financial Instruments in this sector *[sector name]*?		
		□	8a.1	Sponsor of the development of Financial Instruments (e.g. Managing Authority involved in the definition of the sectoral strategy, design of the Financial Instrument, securing leverage and co-financing, monitoring the process)
		□	8a.2	Public financing body (providing leverage and/or co-financing to the Financial Instrument)
		□	8a.3	Fund of Funds manager
		□	8a.4	Financial intermediary
		□	8a.5	Sectoral advisory body providing expertise to facilitate the deployment of the Financial Instrument (e.g. for the sectoral strategy, the legal structuring of the Financial Instrument, facilitating the structuring of a pipeline of projects)

Q	Respondent	Question/Answer options
9	If 8=8.1 *Yes, participated*	Have these Financial Instruments been deployed (*i.e.* created and under implementation)? *Please select <u>one</u> answer:* o 9.1 Yes, to the full extent (created and under implementation) o 9.2 Yes, but not to the full extent (created but not yet under implementation) o 9.3 No
10	If 9=9.1 *Yes, deployed to the full extent*	Have you faced any challenges during the overall deployment of these Financial Instruments *[sector name]*? *Please select <u>one</u> answer:* o 10.1 Yes o 10.2 No
10a	If 10=10.1	Have you faced any challenges during the d*esign* and *set-up* stages o*f* these Financial Instruments? *Please select <u>one</u> answer:* o 10a.1 Yes o 10a.2 No
10b	If 10=10.1	Have you faced any challenges during the *implementation* stage of these Financial Instruments? *Please select <u>one</u> answer:* o 10b.1 Yes o 10b.2 No
11	If 10a=10a.1 And *Yes, deployed to the extent* *Yes, faced challenges (design, set-up)*	Which challenges did you face when *designing* and *setting-up* Financial Instruments in this sector *[sector name]*? *Please select <u>all</u> that apply:* □ 11.1 **Regulatory constraints at local level** (legal uncertainty, specific local/regional/national regulations preventing an easy deployment of Financial Instruments, e.g. procurement requirements) □ 11.2 **Regulatory framework at EU level** (limited understanding of ESIF regulation, perceived as complex and challenging to comply with) □ 11.3 **State aid rules** (uncertainty over adequate State aid regime to apply, State aid implications at sectoral level constrain the use of Financial Instruments) □ 11.4 **Lack of technical support** (lack of tailored technical assistance support) □ 11.5 **Limited capability and capacity** to manage the design and set-up processes of the Financial Instruments (lack of experience, lack of synergies among different kinds of expertise, limited experience with combining of public and private funding) □ 11.6 **Limited public support** (Financial Instruments and/or targeted sector were no longer a policy priority) □ 11.7 **Difficulties in integrating Financial Instruments into the current financial environment** (financing needs of the sector are already addressed by regional / national or Union-level Financial Instruments and private sector funding, no funding gap identified and subsequently no role for Financial Instruments envisaged) □ 11.8 **Difficulties in integrating the Financial Instruments into the current environment of grants** (grant dependency, difficulties in achieving combination of grants and financial instruments) □ 11.9 **Lack of interest from potential financial intermediaries** (inconclusive market testing towards potential financial intermediaries, limited appetite from potential private sector investors in providing leverage)

Q	Respondent	Question/Answer options		
		□	11.10	**Time consuming process given the sector specifics** (the preparation of the Financial Instruments required considerable time for the assessment of the market needs, the definition of the investment strategy, the procurement of the financial intermediaries and related contracting processes)
		□	11.11	**Administrative complexity given the sector specifics** (lack of internal capacity to address administrative challenges, e.g. procurement, other legal/technical aspects)
11a	If 6=6.1 Renewable Energy	□	11a.1	**Regulatory changes** (regulatory uncertainty or regulatory framework not conducive for FIs in the first place)
		□	11a.2	**Volatile market conditions** (market conditions may vary and depend on external factors such as market prices of other energy sources)
		□	11a.3	Other, please specify: ____[*open field*]
11b	If 6=6.2 Urban Development and Transport	□	11b.1	**Regulatory constraints in designing sufficiently flexible financing products** (Urban Development and Transport projects typically require access to long-term loans and grants, which necessitates to comply with various regulations)
		□	11b.2	**Lack of capability in designing flexible financing products** (designing a product mix to address a funding gap comprehensively through a combination of Financial Instruments with grants)
		□	11b.3	**Difficulties to align the Financial Instruments with the Thematic Objectives of the Operational Programme** (Urban development projects are multi-sectoral oriented and might fall under several Thematic Objectives of the Operational Programme)
		□	11b.4	**Lack of information regarding revenue-generating or cost-saving projects** (Urban development and transport projects may be very different from one another, so it may be unclear which ones will be able to generate revenue and be appropriate for a Financial Instrument)
		□	11b.5	**Lack of understanding of Public–Private Partnership types delivery models** (Limited knowledge and experience with such models, even if they may be a solution for projects in this sector)
		□	11b.6	Other, please specify: ____[*open field*]
11c	If 6=6.3 Environment, incl. air, water and waste	□	11c.1	**Lack of information regarding the revenue generating projects** (Environmental projects may be very different from one another, so it may be unclear which ones will be able to generate revenue and be appropriate for a Financial Instrument)
		□	11c.2	**Lack of public support** (Public authorities may wish not to support such projects as policy priorities)
		□	11c.3	**Lack of public incentives** (limited financial support and initiatives to influence the habits/behaviours of final recipients)
		□	11c.4	**Land ownership** (permits to exploit/use the land are unclear, legal uncertainty)
		□	11c.5	Other, please specify: ____[*open field*]

Q	Respondent	Question/Answer options		
11d	If 6=6.4 ICT Infrastructure	□	11d.1	**Unpredictable development scope** (innovative and integrated ICT projects require flexible financing terms to respond to the sector's dynamic needs)
		□	11d.2	**Financing needs of technological solutions not suited to Financial Instruments** (grants may remain more appropriate for innovative ICT infrastructure projects)
		□	11d.3	**Financing needs will require a complex set-up** (combination of grants and patient loans for ICT projects are frequent and complex; projects have long-term investment horizon and may need long time to reach investment readiness)
		□	11d.4	**Project promoters are potentially not eligible to ESIF Financial Instruments** (projects are often carried out by large companies, which may not eligible for ESI Funds or State aid schemes)
		□	11d.5	**Land ownership** (permits to exploit/use land are unclear, legal uncertainty)
		□	11d.6	Other, please specify: ____[*open field*]
11e	If 6=6.5 RDI in SMEs	□	11e.1	**Sector is already considered to be supported through Financial Instruments under Thematic Objective 3 (SME support)** (to facilitate the programming and simplify delivery, Financial Instruments supporting RDI in SMEs was considered under TO 3)
		□	11e.2	**Difficult or limited involvement of suitable financial intermediaries** (to facilitate the implementation of the Financial Instruments, *e.g.* specialists in venture capital, long-term loans, micro-loans and guarantees related to RDI in SMEs)
		□	11.e.3	**Difficulties in exploiting future cash flows/bringing innovation to market**
		□	11.e.4	**Insufficient collaboration between academia and industry**
		□	11e.5	Other, please specify: ____[*open field*]

<table>
<tr><th>Q</th><th>Respondent</th><th>Question/Answer options</th></tr>
<tr><td>12</td><td>If 10b=10b.1</td><td>Which challenges did you face when implementing Financial Instruments in this sector [sector name]?
<table>
<tr><td>□</td><td>12.1</td><td>Difficulties in ensuring national co-financing to ESIF
(limited financing sources to provide co-financing at fund/project level to ensure viability of the Financial Instrument, lack of interest from additional public and private investors, insufficient financial commitment from the project promoter)</td></tr>
<tr><td>□</td><td>12.2</td><td>Difficulties in reaching required leverage effect on public funds
(limited financing sources to provide co-financing, as well as lack of interest from additional public and private investors lead to challenges in mobilising a total level of investment exceeding the EU, national, regional and local contributions)</td></tr>
<tr><td>□</td><td>12.3</td><td>Difficulties in integrating Financial Instruments into the current environment of grants
(the existing grants availability did not facilitate the integration of Financial Instruments due to overlaps and coordination issues and competition)</td></tr>
<tr><td>□</td><td>12.4</td><td>Difficulties in defining and developing the projects pipeline
(limited assistance for technical and financial structuring of the projects to be supported, limited number of mature projects, difficulties to coordinate with other organisations to define a project pipeline)</td></tr>
<tr><td>□</td><td>12.5</td><td>Insufficient bankable projects
(Potential projects are not mature enough to be supported)</td></tr>
<tr><td>□</td><td>12.6</td><td>Misfit of the designed Financial Instruments
(in terms of financial product, size of the instrument, selection criteria for the projects, competition with other financial products available for the sector)</td></tr>
<tr><td>□</td><td>12.7</td><td>Difficulties to carry out the selection process of financial intermediaries (difficulties in identifying and procuring financial intermediaries with sufficient capacity and experience to deploy the Financial Instruments)</td></tr>
<tr><td>□</td><td>12.8</td><td>Lack of involvement of experienced financial intermediaries
(limited interest from financial intermediaries to implement the Financial Instruments)</td></tr>
<tr><td>□</td><td>12.9</td><td>Lack of specialised technical support to the financial intermediaries
(to support the implementation process)</td></tr>
<tr><td>□</td><td>12.10</td><td>Lack of understanding of ESIF and State aid requirements from financial intermediaries
(limited understanding of public funding environment)</td></tr>
<tr><td>□</td><td>12.11</td><td>Change in economic conditions
(market conditions have changed since the ex-ante assessment was conducted, funding gaps/market failures have changed over time due to improved/deteriorated market conditions)</td></tr>
<tr><td>□</td><td>12.12</td><td>Compliance requirements
(setting up and carrying out monitoring and reporting processes required by the regulation were perceived to be too restrictive)</td></tr>
<tr><td>□</td><td>12.13</td><td>Insufficient awareness of Financial Instruments
(lack of communication around the Financial Instruments targeted to final recipients and potential investors)</td></tr>
</table>
Please select <u>all</u> that apply:</td></tr>
<tr><td>12a</td><td>If 6=6.1 Renewable Energy</td><td>
<table>
<tr><td>□</td><td>12a.1</td><td>Limited interest from final recipients (grants dominate sector’s financing)</td></tr>
<tr><td>□</td><td>12a.2</td><td>Involvement of specialists (sectoral expertise is needed at various stages of the project’s implementation, e.g. project appraisal, calls for tenders, making the implementation process more complex)</td></tr>
<tr><td>□</td><td>12a.3</td><td>Other, please specify: ____[open field]</td></tr>
</table>
</td></tr>
</table>

Q	Respondent	Question/Answer options		
12b	If 6=6.2 Urban Development and Transport	□	12b.1	**Integrated projects** (urban projects are often multi-sectoral and are composed of individual projects with varying levels of bankability)
		□	12b.2	**Lack of experience** with more sophisticated schemes (financing transport infrastructure may require specific funding tools, *e.g.* concessions, Public-Private Partnerships)
		□	12b.3	Other, please specify: ____[*open field*]
12c	If 6=6.3 Environment, incl. air, water and waste	□	12c.1	**Difficulties to develop business models** (difficulties in developing bankable business cases due to limited streams of revenues and the cost-saving nature of the projects)
		□	12c.2	**Involvement of specialists** (sectoral expertise is needed at various stages of the project's implementation, *e.g.* project appraisal, calls for tenders, making the implementation process more complex)
		□	12c.3	**Lack of experience** with more sophisticated schemes (financing environmental infrastructure may require specific market tools, *e.g.* concessions, Public-Private Partnerships)
		□	12c.4	Other, please specify: ____[*open field*]
12d	If 6=6.4 ICT Infrastructure	□	12d.1	**Involvement of specialists** (sectoral expertise is needed at various stages of the project's implementation, *e.g.* project appraisal, calls for tenders, making the implementation process more complex)
		□	12d.2	**Lack of interest from large companies / incumbents** (such actors are not interested in receiving finance from Financial Instruments and focus their financial and own resources on the most profitable projects)
		□	12d.3	Other, please specify: ____[*open field*]
12e	If 6=6.5 RDI in SMEs	□	12e.1	**Limited number of investment opportunities** (time consuming identification of projects slows down the performance of the Financial Instruments)
		□	12e.2	Other, please specify: ____[*open field*]
13 *(FI deployed)*	If 10=10.1 *Yes, deployed* *Yes, faced challenges (design, set-up)* If 10a=10a.1	How have the challenges associated with the *design* and *set-up* of Financial Instruments been addressed? *Please select <u>all</u> that apply:*		
		□	13.1	***Ex-ante* assessment results** guided the design of the Financial Instruments appropriately and allowed to better tailor them to the market needs
		□	13.2	**Development of a tailor-made investment strategy** sufficiently flexible to respond to the changing market conditions and with capacity to be adapted to the available supply, as well as to the evolving demand
		□	13.3	**Market test exercise** guided the design of the investment strategy and enabled financial intermediary and private investor requirements to be appropriately reflected
		□	13.4	**Off-the-shelf Financial Instruments** 'inspired' the design of the Financial Instruments
		□	13.5	**Use of OP technical assistance or technical assistance** by the European Commission, for example *fi-compass*
		□	13.6	Establishment of a **team of experts** within my organisation responsible for the design of the Financial Instruments to provide additional dedicated capacity
		□	13.7	The **use of European Commission guidance** (e.g. Guidance Note on implementation options for financial instruments by or under the responsibility of the managing authority, Guidance on State aid in European Structural and Investment (ESI) Funds financial instruments in the 2014-2020 programming period, Guidance for Member States on the selection of bodies implementing financial instruments)
			If ticked above	Please specify which guideline(s): ____[*open field*]
		□	13.8	Introduction of **new/updated national legislation** (to align with the EU regulations and/or to facilitate the introduction of the Financial Instruments)

Q	Respondent	Question/Answer options		
		□	13.9	**Project development assistance** has been provided to stimulate demand
		□	13.10	Other, please specify: ____[*open field*]
14	*If 10=10.1 and 10b=10b.1 Yes, deployed Yes, faced challenges (implement ation)*	How have the challenges associated with the *implementation* of Financial Instruments been addressed? *Please select <u>all</u> that apply:*		
		□	14.1	**Appointed financial intermediaries** with experience and sufficient capacity to disburse the funds in the sector
		□	14.2	**Established technical assistance** support for project pipeline development
		□	14.3	**Adapted the Financial Instruments** to respond to the evolving economic context and market needs (e.g. amended the investment strategy, size of the financial products offered)
		□	14.4	**Developed a communication strategy** to raise awareness of both the final recipients and the financial intermediaries and to make them adapt their internal processes to the Financial Instruments
		□	14.5	**Provided external technical assistance/training/capacity building** to support the financial intermediaries in the process of implementing the Financial Instrument for example in relation to ESIF requirements
		□	14.6	**Adjusted the Financial Instrument during its implementation** (*e.g.* adjusted the delivery timetable, up/downscaled the Financial Instrument)
		□	14.7	**Developed Financial Instrument and grant combination structures or co-ordination mechanisms** (e.g. launch of joint project calls, shared project pipelines and other mechanisms)
		□	14.8	Other, please specify: ____[*open field*]
15	If Q9=9.3 *If FI not deployed, but an attempt was made*	Which factors have prevented the deployment of Financial Instruments in this sector *[sector name]*? *Please select <u>all</u> that apply:*		
		□	15.1	**Insufficient political support** (this sector was no longer perceived as a political priority)
		□	15.2	**Lack of public sponsoring** (Financial Instruments were not prioritised/ prioritised in other sectors)
		□	15.3	**Administrative complexity** (the design and set-up processes of the Financial Instruments were perceived as too complex, time-consuming and administratively inconvenient)
		□	15.4	**Lack of identified funding gap/sufficient investment volume from potential projects** (funding gap was not sufficiently substantial in size to make a Financial Instrument relevant)
		□	15.5	**Lack of support from the sectoral stakeholders** (sector-specific stakeholders were not interested in Financial Instruments)
		□	15.6	**Regulatory framework** (legal uncertainty, regulations perceived as unclear, uncertainty regarding the selection of the adequate State aid regime, lack of a necessary regulation facilitating the implementation of Financial Instruments)
		□	15.7	**Limited capability** to manage the design and set-up processes the Financial Instruments (lack of experience, limited access to technical assistance, lack of synergies among different kinds of expertise, lack of tailored advice and guidelines from the EC, limited experience with combining of public funds)

Q	Respondent	Question/Answer options		
15a	If 6=6.1 Renewable Energy	□	15a.1	**Long commercialisation phase** (upfront development phase is time-consuming, implementation requires working capital when cash flows are not generated reducing the viability of a Financial Instrument)
		□	15a.2	**Unproven technology** (high-risk associated with the new technology and the business model has not been sufficiently market-tested)
		□	15a.3	**State aid** (competition law constraints provision of State aid)
		□	15a.4	Other, specify: ____[open field]
15b	If 6=6.2 Urban Development and Transport	□	15b.1	**Long-term investments reducing the viability of a Financial Instrument** (high up-front investment and long payback periods, e.g. depollution of soil for the regeneration of area)
		□	15b.2	**Problems in combining grants with Financial Instruments** (considering grants may be needed to make the projects affordable, their combination with the Financial Instruments was perceived too complex)
		□	15b.3	Other, specify: ____[open field]
15c	If 6=6.3 Environment, incl. air, water and waste	□	15c.1	**Affordability of projects** (large waste and water infrastructure projects may not affordable without grant support)
		□	15c.2	**Challenges in combining grants with Financial Instruments** (considering grants may be needed to make the projects affordable, their combination with the Financial Instruments was perceived too complex)
		□	15c.3	Other, specify: ____[open field]
15d	If 6=6.4 ICT Infrastructure	□	15d.1	**State aid** (law constraints provision of State aid)
		□	15d.2	**Lack of interest from large companies / incumbents** (such actors are not interested in receiving finance from Financial Instruments and focus their financial and internal resources on the most profitable projects)
		□	15d.3	Other, specify: ____[open field]
15e	If 6=6.5 RDI in SMEs	□	15e.1	**Alternative existing financing** (other EU-level/national/regional/local Financial Instruments are already available and address the market needs of the sector)
		□	15e.2	Other, specify: ____[open field]

Q	Respondent	Question/Answer options
16	*If FI not deployed, but an attempt was made*	Which factors could have made it possible to deploy Financial Instruments (both at *design* and *implementation* stages)? *Please select <u>all</u> that apply:* □ 16.1 **Availability of tailored technical assistance from the EC and/or Managing Authority** (additional support on the legal, technical and financial aspects related to the deployment of Financial Instruments) □ 16.2 **Political support for the deployment of Financial Instruments** (political willingness to initiate Financial Instruments in the sector, better alignment of interests across stakeholders, presence of sectoral strategy defining investment priorities) □ 16.3 **Knowledge of and communication on Financial Instruments** (increased awareness across economic operators potentially benefitting from the Financial Instruments, such as investors and final recipients on the advantages of Financial Instruments) □ 16.4 **Availability of national co-financing and additional resources** (additional sources of private and public financing to ensure the viability of the Financial Instruments to reach the desired leverage) □ 16.5 **Market opportunity for Financial Instruments** (stronger rationale for the use of Financial Instruments, *i.e.* better understanding of the market gap between the demand and supply of available financing and how the Financial Instrument could fit into the existing financing environment, strong pipeline of mature projects) □ 16.6 **A regulatory framework more conducive to the development of new financing schemes** (facilitated combinations with grants, sector-specific off-the-shelf instruments, State aid solutions) □ 16.7 Other, specify: ____[open field]

Questions from a forward-looking perspective in regards to the 2021-2027 programming period

Q	Respondent	Question/Answer options
17	All	Is your organisation considering the implementation of Financial Instruments under shared management with the support of ERDF or Cohesion Funds in the 2021-2027 programming period? *Please select <u>one</u> answer:* o 17.1 Yes o 17.2 No o 17.3 Do not know
18	If 17=17.1	Is your organisation considering the implementation of Financial Instruments under shared management with the support of ERDF or Cohesion Funds in the 2021-2027 programming period in any of the following sectors? *Please select <u>all</u> that apply:* □ 18.1 Renewable Energy □ 18.2 Urban Development and Transport □ 18.3 Environment, incl. air, water and waste □ 18.4 ICT Infrastructure □ 18.5 RDI in SMEs □ 18.6 Other

<table>
<tr><td>19</td><td>If 17=17.1</td><td>What are the key factors behind the interest of your organisation in the deployment of Financial Instruments in the 2021-2027 programming period in this/these sector(s)?
Please select <u>all</u> that apply:
<table>
<tr><td>□</td><td>19.1</td><td>Experience with Financial Instruments in the selected sector(s)</td></tr>
<tr><td>□</td><td>19.2</td><td>Experience with Financial Instruments in other sectors and political willingness to initiate Financial Instruments in this/these sector(s)</td></tr>
<tr><td>□</td><td>19.3</td><td>Presence of financing gap in the sector, increased market demand and interest from final recipients</td></tr>
<tr><td>□</td><td>19.4</td><td>Revolving character of Financial Instruments and more efficient use of public financing</td></tr>
<tr><td>□</td><td>19.5</td><td>Other, specify: ____[open field]</td></tr>
</table></td></tr>
<tr><td>20</td><td>If 17=17.2
Not considering future deployment</td><td>Please explain what are the main reasons why you are not considering the implementation of Financial Instruments with the support of ERDF or Cohesion Funds in the 2021-2027 programming period?
[Open field]</td></tr>
<tr><td>20a</td><td>If 17=17.3
Not sure about the future deployment</td><td>Please explain what are the main reasons why you do not yet know if the implementation of Financial Instruments with the support of ERDF or Cohesion Funds in the 2021-2027 programming period will be considered?
[Open field]</td></tr>
</table>

Annex 5 – List of interviews

Table 51: List of interviews conducted in the context of the feasibility study

Interviews in relation to the RE sector	
HBOR – Managing Director, EU funds and financial instruments	Marina MARASOVIC
HBOR – Specialist	Josip GRGIC
HBOR – Specialist	Ana PASICEK
Amber Infrastructure – Fund Manager	Peter RADFORD
MDB – CEO	Rene SALIBA
BGK – Head of Energy Sector	Mariusz SAMORDAK
Greek Ministry of Economy and Development – Special Secretary	Nicos MANTZOUFAS
PMV – Senior Investment Manager	Johan REYNAERT
PMV –Group Manager Infrastructure and Real Estate	Werner DECREM
Interviews in relation to the UDT sector	
Marguerite Fund – Vice-president	Jakub NALAZEK
SIH – Advisor to the CEO	Roman DOJCAK
PMV – Senior Investment Manager	Johan REYNAERT
PMV – Group Manager Infrastructure and Real Estate	Werner DECREM
FMFIB – Head of Unit Financial Instruments	Kamen SLAVOV
BGK – Head of Transport and Infrastructure	Pawel SZACILLO
FMFIB – Financial Instruments Officer	Iliana IVANOVA
FMFIB – Director at Fund Manager of Financial Instruments	Lazar PETROV
Interviews in relation to the Environment sector	
NFOŚIGW – Director	Ewa KAMIENSKA
NFOŚIGW – Specialist	Filipek MICHAL
SBCI – Sectoral Solutions Specialist	Brian COLGAN
Slovenian Eco Fund – Acting Director	Mojca VENDRAMIN
Czech Ministry of Environment – Head of the Financial Instruments Unit	Jan KOCHAN
Czech Ministry of Environment	Jan HLAVACEK
Czech Ministry of Environment	Magda FRANKOVA
Czech Ministry of Environment	Tomas CAZMIERSKI
Marguerite Fund – Managing Director	Laurent CHATELIN

Interviews in relation to the 'ICT infrastructure' sector	
Marguerite Fund – Managing Director	Laurent CHATELIN
Greek Ministry of Economy, Development and Tourism – Special Secretary	Nicos MANTZOUFAS
Ministry of Economy, Development and Tourism	Alexandra DOGA
BGK – Head of TMT (Technology, Media and Telecom, Innovation Sector)	Adam KOSTRZEWA
Cube Infrastructure Managers – Managing Director	Izzet GUNEY
BEREC – 2018 Chair	Johannes GUNGL
BGK – Manager in Telecom, Media, Technology and Innovation Sector	Anna SOCIK
Interviews in relation to the 'RDI in SMEs' sector	
Banco di Sardegna – Head of Corporate	Paola DEL FABRO
ICF – Director, European Structural Funds	Marc LLOVERAS
Investitionsbank Schleswig-Holstein – Corporate Clients and Equity Products Officer	Christian PLENGE
INVEGA – Head of Project Management Division, Deputy CEO	Inga BEILIUNIENE
Almi Invest – Fund Manager	Markus HOEKFELT
Cross-sectoral interviews	
Caisse des Dépôts et Consignations	Sophie BARBIER
Caisse des Dépôts et Consignations	Laurent LEGER
Bpifrance – EU Public Affairs Officer	Lola MERVEILLE
Bpifrance – ESIF specialist	Céline NGUYEN
Interviews with EIB Group representatives	
EIB – Loan Officer for Portugal	Pedro GONZALEZ COUTO ALMEIDA (27/02/2019)
EIB – Loan Officers for Western Europe (Belgium, France, Luxembourg, the Netherlands, the United Kingdom)	Jean-François LEPRINCE, Lubomir JANOS (01/03/2019)
EIB – Loan Officer for Iberia (Spain and Portugal)	Juan Carlos FERNANDEZ DOBLADO (12/03/2019)
EIB – Loan Officer for Greece	Elias PAPAGEORGIOU (13/03/2019)
EIB – Loan Officers for Poland	Piotr SKIBA, Pawel PASZCZYK (26/03/2019)
EIB – Loan Officer for Adriatic Sea (Croatia, Italy, Malta, Slovenia)	Andrea BUA, Christoph LASSENBERGER (10/04/2019)
EIB – Projects analyst – Mobility	Neil VALENTINE (27/02/2019)
EIB – Projects analysts – Urban development	Gerry MUSCAT, Patricia LLOPIS, Mesut AKBAS (05/03/2019)
EIF – InnovFin expert	Tomasz KOZLOWSKI (11/03/2019)
EIF – Mandate Managers	Aubin BONNET, Alfio LO CASTRO, Vincent FLOREANI (13/03/2019)
EIF – Equity specialist (life sciences, technology transfer, impact investing)	Patric GRESKO (09/04/2019)

Source: fi-compass*, 2019.*

Annex 6 – Interview guide

Thank you for agreeing to participate in the stakeholders' consultation being carried out in the context of the study 'Stocktaking on Financial Instruments by sector'. This study is currently being conducted by *fi-compass*[269], on behalf of the European Commission and with the advisory support of PwC.

Objectives of the study

The overarching objective of the study is to gain an understanding of the potential barriers and opportunities in relation to the wider use of financial instruments using European Structural Investment Funds in five sectors[270]:

- Renewable Energy;
- Urban Development and Transport;
- Environment (including air, water and waste);
- Information and Communication Technology (ICT) Infrastructure; and
- Research Development and Innovation (RDI) in SMEs.

Objective of the phone interview

The aim of the interview will be to collect your views on the following aspects related to the identification of market opportunities conducive to the wider deployment of financial instruments:

- **Investment opportunities** and **market conditions** present in the sector;
- The **current use** of Financial Instruments in this sector;
- **Existing barriers** for wider deployment of Financial Instruments; and
- **Key enabling factors**, which could foster investment in the sector.

We expect each interviewee to have his/her own unique insights on the topic at hand, reflecting his/her own particular experience associated with his/her sectoral expertise. You will therefore be able to direct the discussion to the sub-sectors or the issues / challenges that you consider most relevant.

> As a reminder, financial instruments are 'Union measures of financial support provided on a complementary basis from the budget to address one or more specific policy objectives of the Union. Such instruments may take the form of equity or quasi-equity investments, loans or guarantees, or other risk-sharing instruments, and may, where appropriate, be combined with grants' (Article 2(p) Financial Regulation; Article 37(7)(8)(9) CPR).

[269] *fi-compass* is a platform for advisory services on Financial Instruments mobilising European Structural and Investment Funds (ESIF) provided by the European Commission in partnership with the European Investment Bank (EIB).

[270] Please refer to the Appendix for the list of sub-sectors within the scope of the study.

Interview questionnaire

The interview is meant to be an informal discussion that will allow *fi-compass* to capture your experience, ideas and any other information you think may be relevant to the study. The following topics and related questions will be used as a support to guide the discussion:

Discussion topics	Questions
Experience with Financial Instruments	1) *Has your organisation deployed or supported the deployment of Financial Instruments (using ESI Funds or not) in the sector?* 2) *What was the role of your organisation in the deployment of Financial Instruments in the sector?*
Market opportunities	1) *According to you, what are the key **financing needs** of the sector (in terms of specific investment areas, suitable financial products and optimal investment size)?* 2) *What are the key features of investments in the sector in terms of **associated risks and investment return?*** 3) *Do you consider Financial Instruments to have the **potential to meet the financing needs** of the sector?* 4) *What would you consider as **prerequisites** for the set-up of Financial Instruments in the sector?*
Risks	1) *Where do you see the **key risks** in the sector at the moment?* 2) *How is your organisation addressing these risks? How could these risks be further mitigated?* 3) *Do you consider that the involvement of **public resources to cover the highest risk component of investments** could facilitate the uptake of Financial Instruments in the sector?*
Funding and access to finance	1) *How do you perceive the **investment dynamic** in the sector?* *If your organisation invests in the sector:* 2) *Can you specify the investment policy of your organisation?* 3) *What is your appreciation of investment opportunities?* 4) *Is the market providing acceptable conditions to **access finance** to project promotors/corporate clients/public entities?* 5) *Is there a need for **public sector intervention** in the sector? Do you consider grants/subsidies as a relevant financing source for the sector?* 6) *Do you consider that **revolving finance mechanisms** supported by the public sector **have potential to boost the uptake of investments** in the sector?*
Barriers	1) *What are the **key barriers** in the market hindering investments in the sector?* 2) *Which of the following options (if any), do you consider as a barrier to the wider use of Financial Instruments in the sector?* a. ***Regulatory and legal barriers**, such as specific national regulatory constraints/legal uncertainties;* b. *The **high-risk profile of projects** in the sector (i.e. high-risk associated with new technologies and business models);* c. ***Volatile market conditions**, which vary with external factors;*

d. ***Long period required to get the desired rate of Return on Investment*** *(time-consuming upfront development phase /long commercialisation phase);*
e. *Availability of subsidies and grants or a competition with existing instruments (partially addressing the sector);*
f. *Insufficient* ***level of awareness*** *among the project promoters of the financing opportunities offered by Financial Instruments;*
g. ***Lack of Technical Assistance*** *(sectoral expertise is needed at various stages of the project cycle but is not easily available);*
h. ***Competition law constraints*** *(such as State aid).*

3) *What could be the* ***enabling factors*** *to address the potential barriers identified?*

Political support

1) Is there a visible political support for the use of Financial Instruments in the sector?
2) Is there a shift within the policymaking environment towards supporting revolving finance mechanism as opposed to grants?

Recommendations

1) What would be your proposals for maximising the future opportunities related to the use of Financial Instruments in the sector?
2) Following this, do you have any recommendations, which would be conducive to the development of new Financial Instruments?

Recommendations could potentially focus on the following themes:

- Changes in the regulatory framework at the national level;
- Availability of Technical Assistance (provided to project promoters/financial intermediaries/Managing Authorities);
- Availability of additional co-financing (from public or private co-financers);
- Increased political support for the deployment of Financial Instruments in the sector;
- Better alignment of interests of various stakeholders and coordination of these actors (from the decision-making, supply and demand sides) to accelerate the process of designing and setting-up Financial Instruments in the sector;
- Facilitation of the integration of the Financial Instruments into the existing financing environment of the sector.

Appendix to the questionnaire: List of sub-sectors within the scope of the study

Renewable Energy

- Wind energy;
- Solar energy;
- Biomass energy;
- Other renewable energy (including hydroelectric, geothermal and marine energy) and renewable energy integration (including storage, power to gas and renewable hydrogen infrastructure);
- Intelligent Energy Distribution Systems at medium and low voltage levels (including smart grids and ICT systems).

Urban Development and Transport	• Transport: Railways; • Transport: Motorways; • Transport: Multimodal transport; • Transport: Airports; • Transport: Seaports; • Waterways; • Sustainable transport: clean urban transport infrastructure, intelligent transport systems; • Integrated approach to urban development; • Social infrastructure and related investment; • Education infrastructure and related investment.
Environment	• Environmental infrastructure; • Air quality measures; • Integrated pollution prevention and control; • Biodiversity and nature protection, green infrastructure; • Adaptation to climate change measures; • Risk prevention and management of non-climate related natural risks; • Rehabilitation of industrial sites and contaminated land; • Waste management; • Water management.
ICT	• Backbone/backhaul network; • High-speed and very high speed broadband network; • Other types of ICT infrastructure/large-scale computer resources/equipment (including e-infrastructure, data centres and sensors).
RDI in SMEs	• Investment in infrastructure, capacities and equipment in SMEs directly linked to RDI activities; • RDI activities in private research centres including networking; • Technology transfer and university-enterprise cooperation primarily benefitting SMEs; • RDI processes in SMEs; • RDI in low carbon economy and resilience to climate change enterprises.

Annex 7 – Focus groups - Agendas and participants lists

Renewable Energy, 7 March 2019

Agenda of the 'RE' focus group

Session	*Moderator*	*Start time*	*Indicative duration*
Welcome coffee		08:30	30 minutes
Introduction: Context, scope and objectives of the study; Presentation of the current uptake of financial instruments supported by ERDF and Cohesion Fund in the sector.	*fi-compass*	09:00	15 minutes
Presentation of the preliminary results of the study: Investment opportunities in the sector; Sector-specific risks and investment barriers; Key hindering factors and key enabling factors for the use of financial instruments in the sector.	PwC (investment opportunities) *fi-compass* (risks, barriers, hindering / enabling factors)	09:15	10 minutes
Open discussion on preliminary results	*fi-compass*	09:25	60 minutes
Coffee break		10:25	20 minutes
Group sessions on market opportunities and potential for use of the financial instruments in the sector (from here the participants will be split into two groups for 75 minutes):			
PwC & *fi-compass*		10:45	60 minutes
Group 1: 1. Market opportunities in the Renewable Energy sector in view of greenhouse gas emission reduction goals What are the market opportunities combining both the potential to repay financing (with associated risks) and greenhouse gas emission goals? 2. Financing needs for investments in Renewable Energy sources and corresponding adapted financing schemes What could be the most suitable typology of financing for investments in renewable energies? Which financing schemes have the highest potential to boost investments in Renewable Energy sub-sectors (*e.g.* in wind, solar, biomass, geothermal and other Renewable Energy sources)?		**Group 2:** 1. Supportive regulatory environment for increased investments in Renewable Energy sources (production and distribution) Which constraints currently limit investments in the Renewable Energy sector at local, national and EU levels? Could modifications in the regulatory framework boost the uptake of investments in the Renewable Energy sector? 2. Role for financial instruments in supporting / boosting investments in the Renewable Energy sector Could publicly-supported financial instruments (including supported by ESI Funds) provide adequate solutions to boost investments in the Renewable Energy sector? What currently prevents the use of financial instruments (especially supported by ESI Funds) to finance investments in the Renewable Energy sector?	
Recap and key takeaways from the group sessions	PwC & *fi-compass*	11:45	15 minutes
Potential scope for financial instruments: Discussion on recommendations to foster the uptake of financial instruments using ESI Funds in the sector	*fi-compass*	12:00	45 minutes
Next steps and closing remarks	*fi-compass*	12.45	15 minutes
End of the focus group		13:00	

Participants list to the 'RE' focus group

Name	Organisation	Country
Boris Gyllhamn	Almi Invest	Sweden
Peter Radford	Amber Infrastructure	United Kingdom
Mariusz Samordak	BGK	Poland
Axel Badrichani	DG REGIO	EU
Alain Kauffmann	EIB	EU
Emily Smith	EIB	EU
Robert Pernetta	EIB	EU
Thomas Garabetian	European Geothermal Energy Council (EGEC)	EU
Irene di Padua	European Solar Thermal Industry Federation (ESTIF)	EU
Santiago González Herraiz	Institute for Diversification and Saving of Energy (IDAE)	Spain
Gianluca Tondi	Innovation and Networks Executive Agency (INEA)	EU
Bruno Erbel	Marguerite Fund	EU
Samartzis Sotiris	Ministry of Economy, Development and Tourism Managing Authority of the OP 'Competitiveness and Entrepreneurship'	Greece
Marcin Janiak	Ministry of Energy	Poland
Johan Reynaert	Participation Company Flanders (PMV)	Belgium
François-Xavier Chevallerau	PwC	Luxembourg
Fabio D'Aversa	PwC	Luxembourg
Olivia Lonkeu	PwC	Luxembourg
Aleksandra Szymańska	PwC	Luxembourg
Sandra Wieliczko	PwC	Luxembourg

Urban Development and Transport, 8 March 2019

Agenda of the 'UDT' focus group

Session	*Moderator*	*Start time*	*Indicative duration*
Welcome coffee		08:30	30 minutes
Introduction: Context, scope and objectives of the study Presentation of the current uptake of financial instruments supported by ERDF and Cohesion Fund in the sector	*fi-compass*	09:00	15 minutes
Presentation of the preliminary results of the study: - Investment opportunities in the sector - Sector-specific risks and investment barriers - Key hindering factors and key enabling factors for the use of financial instruments in the sector	PwC (investment opportunities) *fi-compass* (risks, barriers, hindering/enabling factors)	09:15	10 minutes
Open discussion on preliminary results	*fi-compass*	09:25	60 minutes
Coffee break		10:25	20 minutes
Group sessions on market opportunities and potential for use of the financial instruments in the sector (from here the participants will be split into two groups for 75 minutes):			
PwC & *fi-compass*		10:45	60 minutes
Group 1: 1. Financing of integrated (multi-sectoral) urban development projects What could be the most suitable typology of financing schemes for integrated urban investments? 2. Financing of (innovative) urban mobility/transport solutions How to facilitate investments/financing in new models of urban transport?		**Group 2:** 1. Barriers and constraints for the uptake of Urban Development and Transport projects (including regulatory and financing) Which regulatory elements may hinder investments in the Urban Development and Transport sector at local, national and EU levels? To what extent the financing of such projects represent a challenge? 2. Role for financial instruments in supporting/boosting investments in the Urban Development and Transport sector Could publicly-supported financial instruments (including supported by ESI Funds) provide adequate solutions to boost investments in Urban Development and Transport sector? What currently prevents the use of financial instruments (especially supported by ESI Funds) to finance investments in the Urban Development and Transport sector?	
Recap and key takeaways from the group sessions	PwC & *fi-compass*	11:45	15 minutes
Potential scope for Financial Instruments: Discussion on recommendations to foster the uptake of financial instruments in the sector	*fi-compass*	12:00	45 minutes
Next steps and closing remarks	*fi-compass*	12.45	15 minutes
End of the focus group		13:00	

Participants list to the UDT focus group

Name	Organisation	Country
Piotr Rapacz	DG MOVE	EU
Antongiulio Marin	DG MOVE	EU
Katerina Fortun	DG REGIO	EU
Manuel Valenciano-Marx	DG REGIO	EU
Alain Kauffmann	EIB	EU
Emily Smith	EIB	EU
Robert Pernetta	EIB	EU
Thomas Willson	Eurocities	EU
Zuzana Nehajova	EY	Slovakia
Kamen Slavov	Fund Manager of Financial Instruments in Bulgaria (FMFIB)	Bulgaria
Gauthier Clar	Innovation and Networks Executive Agency (INEA)	EU
Jakub Nalazek	Marguerite Fund	EU
Johan Reynaert	Participation Company Flanders (PMV)	Belgium
François-Xavier Chevallerau	PwC	Luxembourg
Fabio D'Aversa	PwC	Luxembourg
Olivia Lonkeu	PwC	Luxembourg
Aleksandra Szymańska	PwC	Luxembourg
Sandra Wieliczko	PwC	Luxembourg

Environment, 7 March 2019

Agenda of the 'Environment' focus group

Session	*Moderator*	*Start time*	*Indicative duration*
Welcome coffee		08:30	30 minutes
Introduction: Context, scope and objectives of the study; Presentation of the current uptake of financial instruments supported by ERDF and Cohesion Fund in the sector.	*fi-compass*	09:00	15 minutes
Presentation of the preliminary results of the study: Investment opportunities in the sector; Sector-specific risks and investment barriers; Key hindering factors and key enabling factors for the use of financial instruments in the sector.	PwC (investment opportunities) *fi-compass* (risks, barriers, hindering / enabling factors)	09:15	10 minutes
Open discussion on preliminary results	*fi-compass*	09:25	60 minutes
Coffee break		10:25	20 minutes
Group sessions on market opportunities and potential for use of the financial instruments in the sector (from here the participants will be split into two groups for 75 minutes):			
PwC & *fi-compass*		10:45	60 minutes
Group 1: 1. Market opportunities in the Renewable Energy sector in view of greenhouse gas emission reduction goals What are the market opportunities combining both the potential to repay financing (with associated risks) and greenhouse gas emission goals? 2. Financing needs for investments in Renewable Energy sources and corresponding adapted financing schemes What could be the most suitable typology of financing for investments in renewable energies? Which financing schemes have the highest potential to boost investments in Renewable Energy sub-sectors (*e.g.* in wind, solar, biomass, geothermal and other Renewable Energy sources)?		**Group 2:** 1. Supportive regulatory environment for increased investments in Renewable Energy sources (production and distribution) Which constraints currently limit investments in the Renewable Energy sector at local, national and EU levels? Could modifications in the regulatory framework boost the uptake of investments in the Renewable Energy sector? 2. Role for financial instruments in supporting / boosting investments in the Renewable Energy sector Could publicly-supported financial instruments (including supported by ESI Funds) provide adequate solutions to boost investments in the Renewable Energy sector? What currently prevents the use of financial instruments (especially supported by ESI Funds) to finance investments in the Renewable Energy sector?	
Recap and key takeaways from the group sessions	PwC & *fi-compass*	11:45	15 minutes
Potential scope for financial instruments: Discussion on recommendations to foster the uptake of financial instruments using ESI Funds in the sector	*fi-compass*	12:00	45 minutes
Next steps and closing remarks	*fi-compass*	12.45	15 minutes
End of the focus group		13:00	

Participants list to the 'Environment' focus group

Name	Organisation	Country
Jonathan Denness	DG REGIO	EU
Katerina Fortun	DG REGIO	EU
Manuel Valenciano-Marx	DG REGIO	EU
Alain Kauffmann	EIB	EU
Emily Smith	EIB	EU
Frank Lee	EIB	EU
Robert Pernetta	EIB	EU
Nikos Mamalougkas	Ministry of Economy, Development and Tourism Managing Authority of the OP 'Environment and Sustainable Development'	Greece
Fabio D'Aversa	PwC	Luxembourg
Olivia Lonkeu	PwC	Luxembourg
Aleksandra Szymańska	PwC	Luxembourg
Sandra Wieliczko	PwC	Luxembourg

Information and Communication Technologies infrastructure, 6 March 2019

Agenda of the 'ICT infrastructure' focus group

Session	*Moderator*	*Start time*	*Indicative duration*
Welcome coffee		08:30	30 minutes
Introduction: Context, scope and objectives of the study; Presentation of the current uptake of financial instruments supported by ERDF and Cohesion Fund in the sector.	*fi-compass*	09:00	15 minutes
Presentation of the preliminary results of the study: Investment opportunities in the sector Sector-specific risks and investment barriers; Key hindering factors and key enabling factors for the use of financial instruments in the sector.	PwC (investment opportunities) *fi-compass* (risks, barriers, hindering/enabling factors)	09:15	10 minutes
Open discussion on preliminary results	*fi-compass*	09:25	60 minutes
Coffee break		10:25	20 minutes
Group sessions on market opportunities and potential for use of the financial instruments in the sector (from here the participants will be split into two groups for 75 minutes):			
PwC & *fi-compass*		10:45	60 minutes
Group 1: 1. Sectoral specificities of investments in ICT infrastructure (high investment costs, long and limited return) and access to finance To what extent do the specificities of the sector prevent the latter from easy access to finance? What could be the most suitable typology of financing schemes for investments in infrastructures related to Information and Communication Technologies? Especially in rural areas? 2. Risk mitigation to boost access to finance How to mitigate the risks stemming from investments in new technologies in the ICT infrastructure sector? To what extent mitigating these risks are necessarily prior to consider more investments in the ICT infrastructure sector? (Technical Assistance)		**Group 2:** 1. Barriers and constraints for the uptake of projects in infrastructures for Information and Communication Technologies Which constraints currently limit investments in the ICT infrastructure sector at local, national and EU levels? Could modifications in the regulatory framework boost the uptake of projects and investments in this sector? 2. Role for financial instruments in supporting/boosting investments in the ICT infrastructures sector How can publicly-supported financial Instruments (including supported by ESI Funds) provide adequate solutions to boost investments in the ICT infrastructure sector? Including for investments in new technologies (e.g. 5G)? What currently prevents the use of financial instruments (especially supported by ESI Funds) to finance investments in this sector?	
Recap and key takeaways from the group sessions	PwC & *fi-compass*	11:45	15 minutes
Potential scope for Financial Instruments: Discussion on recommendations to foster the uptake of financial instruments in the sector	*fi-compass*	12:00	45 minutes
Next steps and closing remarks	*fi-compass*	12.45	15 minutes
End of the focus group		13:00	

Participants list to the 'ICT infrastructure' focus group

Name	Organisation	Country
Adam Kostrzewa	Bank Gospodarstwa Krajowego (BGK)	Poland
Sébastien Martin	DG CONNECT	EU
Alexandra Rotileanu	DG CONNECT	EU
Manuel Valenciano-Marx	DG REGIO	EU
Alain Kauffmann	EIB	EU
Emily Smith	EIB	EU
Robert Pernetta	EIB	EU
François-Xavier Chevallerau	PwC	Luxembourg
Christophe Mazand	PwC	Luxembourg
Olivia Lonkeu	PwC	Luxembourg
Aleksandra Szymanska	PwC	Luxembourg

Research, Development and Innovation in Small and Medium-sized Enterprises, 6 March 2019

Agenda of the 'RDI in SMEs' focus group

Session	*Moderator*	*Start time*	*Indicative duration*
Introduction: Context, scope and objectives of the study Presentation of the current uptake of financial instruments supported by ERDF and Cohesion Fund in the sector	*fi-compass*	14:00	15 minutes
Presentation of the preliminary results of the study: Investment opportunities in the sector; Sector-specific risks and investment barriers; Key hindering factors and key enabling factors for the use of financial instruments in the sector.	PwC (investment opportunities) *fi-compass* (risks, barriers, hindering/enabling factors)	14:15	10 minutes
Open discussion on preliminary results	*fi-compass*	14:25	60 minutes
Coffee break		15:25	20 minutes
Group sessions on market opportunities and potential for use of the financial instruments in the sector (from here the participants will be split into two groups for 75 minutes):			
PwC & *fi-compass*		15:45	60 minutes
Group 1: 1. SMEs' innovation trends and related financing needs What are the new trends/niches of RDI investments and their related needs for investment? To what extent are these financing needs already covered by the market? And what could be the current financing gaps despite existing financing? How do you perceive the market opportunities for SMEs' investment in RDI projects? 2. Existing barriers to SMEs' investment in RDI How to assess the risks and opportunities related to investments in RDI in SMEs? To what extent have these risks a negative impact on the access to finance of innovative SMEs and projects? How can these risks and uncertainties be mitigated in order to facilitate the access to finance of such SMEs and projects?		**Group 2:** 1. Role for financial instruments in supporting/boosting SMEs' investments in RDI How do you perceive the existing role/added value of financial instruments (including supported by ESI Funds) in support to SMEs' investment in RDI? How can publicly-supported financial Instruments (in particular supported by ESI Funds) provide solutions to boost SMEs' investments in RDI to a greater extent? 2. Role for Technical Assistance in supporting/boosting SMEs' investments in RDI Do you perceive a need for Technical Assistance in order to boost SMEs' investment in RDI? If yes, which type of Technical Assistance? How could/should this Technical Assistance be coordinated with/complementary to financial instruments? What are the current elements that prevent such coordination/complementarity? And what elements could foster such coordination/complementarity?	
Recap and key takeaways from the group sessions	PwC & *fi-compass*	16:45	15 minutes
Potential scope for Financial Instruments: Discussion on recommendations to foster the uptake of financial instruments in the sector	*fi-compass*	17:00	45 minutes
Next steps and closing remarks	*fi-compass*	17.45	15 minutes
End of the focus group		18:00	

Participants list to the 'RDI in SMEs' focus group

Name	Organisation	Country
Adam Kostrzewa	Bank Gospodarstwa Krajowego (BGK)	Poland
Victorien Blondeau	Bpifrance	France
Wojciech Furmanski	DG REGIO	EU
Alain Kauffmann	EIB	EU
Emily Smith	EIB	EU
Robert Pernetta	EIB	EU
Justina Bieliauskaite	European DIGITAL SME Alliance	EU
Wolfgang Wittke	Eurostars funded by Eureka Programme	EU
Aleška Korenčič	Government Office for Development and European Cohesion Policy	Slovenia
Marc Lloveras	Institut Català de Finances (ICF)	Spain
Ausma Bartkute	INVEGA	Lithuania
Sonia Raquel Silva	Madeira Region	Portugal
Branka Bugarin	Ministry of Economic Development and Technology	Slovenia
François-Xavier Chevallerau	PwC	Luxembourg
Christophe Mazand	PwC	Luxembourg
Olivia Lonkeu	PwC	Luxembourg
Aleksandra Szymanska	PwC	Luxembourg
Sandra Wieliczko	PwC	Luxembourg
Victoriia Denysova	Zagrebadka Banka, Unicredit Group	Croatia
Josip Josipović	Zagrebadka Banka, Unicredit Group	Croatia

Annex 8 – Bibliography

Regulation

- Regulation (EU) No 1303/2013 of the European Parliament and of the Council of 17 December 2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) No 1083/2006 (the Common Provisions Regulation – CPR).

Literature on financial instruments in general

- European Commission, Directorate-General for Regional and Urban Policy, *Financial instruments under the European Structural and Investment Funds – Summary of data on the progress made in financing and implementing financial instruments for the programming period 2014-2020 in accordance with Article 46 of Regulation (EU) No 1303/2013 of the European Parliament and of the Council*, *Situation as at 31 December 2017*, November 2018.

  Available here:
  https://www.fi-compass.eu/sites/default/files/publications/EC%20summary_data_financial_instruments_2017.pdf.
- European Commission, Directorate-General for Regional and Urban Policy, Directorate-General for Employment, Social Affairs and Inclusion, *Summary of data on the progress made in financing and implementing financial engineering instruments reported by the managing authorities in accordance with Article 67(2)(j) of Council Regulation (EC) No 1083/2006*, *Programming period 2007-2013, Situation as at 31 March 2017 (at closure)*, 2017.

  Available here:

  https://ec.europa.eu/regional_policy/sources/thefunds/fin_inst/pdf/closure_data_fei_2017.pdf.
- European Parliament Research Service, Briefing, *Financial instruments in cohesion policy*, December 2016.

  Available here:
  http://www.europarl.europa.eu/RegData/etudes/BRIE/2016/595863/EPRS_BRI(2016)595863_EN.pdf.

Literature on the 'Renewable Energy' sector

- Energy Transition. The Evolution of Renewable Energy Sources (RES) in Greece: A Synopsis of the Legal Framework, 2019.

  Available here:
  https://energytransition.org/2016/06/the-evolution-of-renewable-energy-sources-res-in-greece-a-synopsis-of-the-legal-framework/.
- EurObserv'ER. Renewable Energy Policy Factsheet – France, 2018.

  Available here:
  https://www.eurobserv-er.org/eurobserver-policy-files-for-all-eu-28-member-states/.
- EurObserv'ER. Renewable Energy Policy Factsheet – Germany, 2018.

  Available here:
  https://www.eurobserv-er.org/eurobserver-policy-files-for-all-eu-28-member-states/.

- EurObserv'ER. Renewable Energy Policy Factsheet – Malta, 2018.
  Available here:
  https://www.eurobserv-er.org/eurobserver-policy-files-for-all-eu-28-member-states/.
- EurObserv'ER. Renewable Energy Policy Factsheet – Netherlands, 2018.
  Available here:
  https://www.eurobserv-er.org/eurobserver-policy-files-for-all-eu-28-member-states/.
- EurObserv'ER. Renewable Energy Policy Factsheet –Lithuania, 2018.
  Available here:
  https://www.eurobserv-er.org/eurobserver-policy-files-for-all-eu-28-member-states/.
- European Commission. *Market study on ocean energy*, September, 2018.
  Available here:
  https://publications.europa.eu/en/publication-detail/-/publication/e38ea9ce-74ff-11e8-9483-01aa75ed71a1.
- European Commission. Clean Energy for All Europeans.
  Available here:
  https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/2030-energy-strategy.
  Accessed on 25 February 2019.
- European Commission. *Energy Strategy 2030*. Accessed on 25 February 2019.
  Available here:
  https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/2030-energy-strategy.
- European Commission. Impact Assessment for the amendment of the Energy Efficiency Directive, SWD (2016) 405, 2016.
  Available here:
  https://ec.europa.eu/energy/sites/ener/files/documents/1_en_impact_assessment_part1_v4_0.pdf.
- European Commission. PRIMES model: the EU Reference Scenario 2016 Energy, transport and GHG emissions Trends to 2050.
  Available here:
  https://ec.europa.eu/energy/sites/ener/files/documents/ref2016_report_final-web.pdf.
- European Commission. Study to support investment for the sustainable development of the blue economy, 2019.
  Available here:
  https://publications.europa.eu/en/publication-detail/-/publication/aee1a34c-3b0c-11e9-8d04-01aa75ed71a1/language-en.
- European Forum for Renewable Energy. *EU Tracking Roadmap*, 2015.
  Available here:
  http://www.keepontrack.eu/contents/publicationseutrackingroadmap/eu_roadmap_2015.pdf.
- European Forum for Renewable Energy. EU Tracking Roadmap. Keeping Track of Renewable Energy Targets Towards 2020, 2015.
  Available here:
  http://www.keepontrack.eu/contents/publicationseutrackingroadmap/eu_roadmap_2015.pdf.

- Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. *Climate Change Report*, 2017.

  Available here: https://www.bmu.de/fileadmin/Daten_BMU/Pools/Broschueren/klimaschutzbericht_2017_aktionsprogramm.pdf.
- Geoffrey A Moore. Crossing the chasm: marketing and selling disruptive products to mainstream customers, 1991.
- Government Offices in Sweden. Draft integrated national energy and climate plan, 2017.

  Available here: https://www.government.se/48ee21/contentassets/e731726022cd4e0b8ffa0f8229893115/swedens-draft-integrated-national-energy-and-climate-plan.
- Government Offices in Sweden. Government making broad investments in energy, 2017.

  Available here: https://www.government.se/press-releases/2017/09/government-making-broad-investments-in-energy/.
- International Energy Agency Website. Accessed on 25 February 2019.

  Available here: https://www.iea.org/renewables2018/.
- International Renewable Energy Agency. *Unlocking Renewable Energy Investment*, 2016.

  Available here: https://www.irena.org/documentdownloads/publications/irena_risk_mitigation_and_structured_finance_2016.pdf.
- Ministry of Energy of Republic of Lithuania. *Sector Overview*, 2018.

  Available here: https://enmin.lrv.lt/en/sectoral-policy/renewable-energy-sources/sector-overview-1.
- Ministry of Energy of the Republic of Poland. *The Energy Policy of Poland until 2040 (EPP2040*), 2018.

  Available here: https://www.gov.pl/web/energia/polityka-energetyczna-polski-do-2040-r-zapraszamy-do-konsultacji1.
- Ocean Energy Europe. Press Release: 12.8M€ awarded to demonstrate ocean energy farms, 2019.

  Available here: https://www.oceanenergy-europe.eu/12-8me-awarded-to-demonstrate-ocean-energy-farms/.
- Official Journal of the European Union. Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty.

  Available here: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02014R0651-20170710.
- Official Journal of the European Union. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank regarding the Clean Energy for All Europeans, COM(2016) 860 Final.

  Available here: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2016:0860:FIN.

- Official Journal of the European Union. Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast).

  Available here:
  https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L2001&from=EN.
- Official site of Sweden. *Energy use in Sweden.* Accessed on 25 March 2019.

  Available here:
  https://sweden.se/society/energy-use-in-sweden/.
- Planned investments in European Structural and Investment Funds (ESIF) data (ERDF, CF, ESF and YEI) based on the ESIF Operational Programmes (OP) (retrieved on 20/01/2017 from the SFC2014/Infoview database).

  Available here:
  http://s3platform.jrc.ec.europa.eu/esif-energy.
- Rademaekers, K et al, 2017a. *European Energy Industry Investments*. Study for the European Parliament, ITRE Committee.

  Available here:
  http://www.europarl.europa.eu/RegData/etudes/STUD/2017/595356/IPOL_STU(2017)595356_EN.pdf.
- Rademaekers, K. et al 2017b. Assessing the European clean energy finance landscape, with implications for improved macro-energy modelling. Study for the European Commission, DG Energy.
- Swedish Energy Agency. Energy and climate advisors – the Swedish model.

  Available here:
  http://www.lvif.gov.lv/uploaded_files/sadarbiba/seapplus/F_Ekander_Energy_and_Climate_Advisors.pdf.
- The Climate Policy Info Hub. Renewable Energy Support Policies in Europe.

  Available here:
  https://climatepolicyinfohub.eu/renewable-energy-support-policies-europe.
- The State of Renewable Energies in Europe' published annually by EurObserv'ER.

  Available here:
  https://www.eurobserv-er.org/18th-annual-overview-barometer/.
- Wishlade, Michie and Vernon. *Financial instruments for energy efficiency and renewable energy*, 2016. Study for European Parliament's REGI Committee.

  Available here:
  http://www.europarl.europa.eu/RegData/etudes/STUD/2017/601992/IPOL_STU(2017)601992_EN.pdf.
- World Bank. Population growth (annual %) data.

  Available here:
  https://data.worldbank.org/indicator/SP.POP.GROW?locations=DE.

Literature on the 'Urban Development and Transport' sector

- EIB, Urbis Initiative.

  Available here:
  https://eiah.eib.org/about/initiative-urbis.htm.
- EIB Investment Survey, Municipal Infrastructure, 2017.

  Available here:
  https://www.eib.org/en/publications/econ-eibis-2017-municipal-infrastructure-eu-overview.htm.

- European Commission, Europe 2020, A European strategy for smart, sustainable and inclusive growth, 2010.

  Available here: http://ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20%20%20007%20-%20Europe%202020%20-%20EN%20version.pdf.
- European Commission, Green Paper 'Towards a new culture for urban mobility', 2007.

  Available here: https://ec.europa.eu/transport/sites/transport/files/themes/urban/urban_mobility/green_paper/doc/2007_09_25_gp_urban_mobility_memo_en.pdf.
- European Commission, Guidance for Member States on Integrated Sustainable Urban Development (Article 7 ERDF Regulation), 2016.

  Available here: https://ec.europa.eu/regional_policy/en/information/publications/guidelines/2015/guidance-for-member-states-on-integrated-sustainable-urban-development-article-7-erdf-regulation.
- European Commission, Simplification Handbook – 80 simplification measures in Cohesion Policy 2021-2027, 2018.

  Available here: https://ec.europa.eu/regional_policy/en/information/publications/factsheets/2018/simplification-handbook-80-simplification-measures-in-cohesion-policy-2021-2027.
- European Commission, Together towards competitive and resource-efficient urban mobility, 2013.

  Available here: https://ec.europa.eu/transport/sites/transport/files/themes/urban/doc/ump/com%282013%29913_en.pdf.
- European Commission, Urban Agenda.

  Available here: https://ec.europa.eu/futurium/en/urban-agenda.
- European Commission, White Paper on Transport, Roadmap to a Single European Transport Area, 2011.

  Available here: https://ec.europa.eu/transport/sites/transport/files/themes/strategies/doc/2011_white_paper/white-paper-illustrated-brochure_en.pdf.
- European Union, European Urban Mobility, Policy context, 2017.

  Available here: https://publications.europa.eu/en/publication-detail/-/publication/8262a9e0-da37-11e7-a506-01aa75ed71a1/language-en/format-PDF/source-53063025.
- *fi-compass* case studies; CAP *Troisième Révolution Industrielle* Nord-Pas de Calais, France; London Green Fund, the United Kingdom.

  Available here: https://www.fi-compass.eu/publication/case-studies/case-study-cap-troisieme-revolution-industrielle-nord-pas-de-calais-france.
- Germany's Federal Debt Brake, Ministry of Finance, 2015.

  Available here: https://www.bundesfinanzministerium.de/Content/EN/Standardartikel/Topics/Fiscal_policy/Articles/2015-12-09-german-federal-debt-brake.pdf?__blob=publicationFile&v=6.
- UIA Initiative. Available here: https://www.uia-initiative.eu/.

- URBACT. Available here: https://urbact.eu/.
- World Economic Forum, The Global Competitiveness Report, 2018.

  Available here:
  http://www3.weforum.org/docs/GCR2017-2018/05FullReport/TheGlobalCompetitivenessReport2017%E2%80%932018.pdf.

Literature on the 'Environment' sector

- Bondarouk, Elena, Mastenbroek, Ellen. Reconsidering EU Compliance: Implementation performance in the field of environmental policy. 2018. 28 Env. Pol. Gov. 15-27.

  Available here:
  https://onlinelibrary.wiley.com/doi/full/10.1002/eet.1761.
- Commission Implementing Decision (EU) 2018/210 of 12 February 2018 on the adoption of the LIFE multiannual work programme for 2018-2020. 2018.

  Available here:
  https://eurlex.europa.eu/legalcontent/EN/TXT/?qid=1518531793134&uri=CELEX:32018D0210.
- Decision No 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 'Living well, within the limits of our planet'.

  Available here:
  https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32013D1386.
- Deloitte for Plastics Recyclers Europe. Increased EU Plastics Recycling Targets: Environmental, Economic and Social Impact Assessment. 2015.

  Available here:
  https://www.plasticsrecyclers.eu/sites/default/files/BIO_Deloitte_PRE_Plastics%20Recycling%20Impact_Assesment_Final%20Report.pdf.
- Ecorys. Assessing drinking water affordability in the EU. 2018.

  Available here:
  https://www.safe2drink.eu/wp-content/uploads/2018/09/Ecorys_Assessing-drinking-water-affordability-in-the-EU_27092018.pdf.
- EPEC. Poznan Waste-to-Energy Project, Poland. 2012.

  Available here:
  https://www.eib.org/attachments/epec/epec_using_eu_funds_in_ppps_case_study_en.pdf.
- European Commission, DG Environment Website. *Urban Waste Water Directive Overview.*

  Available here:
  http://ec.europa.eu/environment/water/water-urbanwaste/index_en.html.
- European Commission, DG Environment, *Environment Action Programme to 2020.*

  Available here:
  http://ec.europa.eu/environment/action-programme/.
- European Commission. Air Quality Directive Fitness Check.

  Available here:
  http://ec.europa.eu/environment/air/quality/aqd_fitness_check_en.html.

- European Commission. EU Reference Scenario 2016. Energy, transport and GHG emissions. Trends to 2050. 2016.

  Available here:
  https://ec.europa.eu/energy/sites/ener/files/documents/20160713%20draft_publication_REF2016_v13.pdf.
- European Commission. Factsheet – Questions and answers on EU and Climate finance. 2017.

  Available here:
  http://europa.eu/rapid/press-release_MEMO-17-5224_en.pdf.
- European Commission. Press release: New Report on EU Waste Water Treatment shows significant improvement in EU-13 Member States. 2017.

  Available here:
  http://ec.europa.eu/environment/pdf/15_12_2017_news_en.pdf.
- European Commission. Regional policy: The EU's main investment policy.

  Available here:
  https://ec.europa.eu/regional_policy/index.cfm/en/policy/what/investment-policy/.
- European Commission. Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the implementation of the Circular Economy Action Plan. 2019.

  Available here:
  https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1551871195772&uri=CELEX:52019DC0190.
- European Commission. Regional policy: The EU's main investment policy.

  Available here:
  https://ec.europa.eu/regional_policy/index.cfm/en/policy/what/investment-policy/.
- European Commission. Study: The costs of not implementing EU environmental law. 2019.

  Available here:
  http://ec.europa.eu/environment/eir/pdf/study_costs_not_implementing_env_law.pdf.
- European Economic and Social Committee. *No more water privatisation*. 2018.

  Available here:
  https://www.eesc.europa.eu/en/news-media/news/no-more-water-privatisation-says-eesc-0.
- European Environment Agency report. Report No 13/2017 of 11.10.2017 on Air quality in Europe 2017. 2017.

  Available here:
  https://www.eea.europa.eu/publications/air-quality-in-europe-2017.
- European Environment Agency. *Air quality in Europe – 2018.*

  Available here:
  https://www.eea.europa.eu/publications/air-quality-in-europe-2018/download.
- European Environment Agency. *Urban Waste Water Treatment.*

  Available here:
  https://www.eea.europa.eu/data-and-maps/indicators/urban-waste-water-treatment/urban-waste-water-treatment-assessment-4.
- European Investment Bank. Restoring EU competitiveness. 2016.

  Available here:
  https://www.eib.org/attachments/efs/restoring_eu_competitiveness_en.pdf.

- European Parliament. Briefing. *Environmental implementation review*. 2017.
  Available here:
  http://www.europarl.europa.eu/RegData/etudes/BRIE/2017/599344/EPRS_BRI(2017)599344_EN.pdf.
- European Parliament. Briefing. Revision of the Drinking Water Directive. 2019.
  Available here:
  http://www.europarl.europa.eu/RegData/etudes/BRIE/2018/625179/EPRS_BRI(2018)625179_EN.pdf.
- European Parliament. Challenges in the implementation of EU Law at national level. 2018.
  Available here:
  http://www.europarl.europa.eu/RegData/etudes/BRIE/2018/608841/IPOL_BRI(2018)608841_EN.pdf.
- European Parliament. Drinking water in the EU: better quality and access. 2018.
  Available here:
  http://www.europarl.europa.eu/news/en/headlines/society/20181011STO15887/drinking-water-in-the-eu-better-quality-and-access.
- European Parliament. Waste management in the EU: infographic with facts and figures. Accessed on April 10, 2019.
  Available here:
  http://www.europarl.europa.eu/news/en/headlines/society/20180328STO00751/eu-waste-management-infographic-with-facts-and-figures.
- European Parliament's Committee on the Environment, Public Health and Food Safety. *Report on the implementation of the 7th Environment Action Programme.* 2017.
  Available here:
  http://www.europarl.europa.eu/doceo/document/A-8-2018-0059_EN.html.
- European Water Association. *EWA Water Manifesto.* 2014.
  Available here:
  http://www.ewa-online.eu/tl_files/_media/content/documents_pdf/Publications/Water-Manifesto/EWA_WATER_MANIFESTO_2014_FINAL.pdf.
- Eurostat. Statistics explained. Classification of environmental protection activities.
  Available here:
  https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Classification_of_environmental_protection_activities_(CEPA).
- International Institute for Applied Systems Analysis. Costs, benefits and economic impacts of the EU Clean Air Strategy and their implications on innovation and competitiveness. 2017.
  Available here:
  http://ec.europa.eu/environment/air/pdf/clean_air_outlook_economic_impact_report.pdf.
- Marguerite Fund Website.
  Available here:
  http://www.marguerite.com/2017/03/energy-from-waste-plant-in-poznan-starts-operations/.
- National Fund for Environmental Protection and Water Management Website.
  Available here:
  http://nfosigw.gov.pl/oferta-finansowania/srodki-krajowe/informacje-ogolne/umorzenia/.

- Proposal for a Directive of the European Parliament and of the Council on the quality of water intended for human consumption (recast). 2018.

  Available here:
  http://eur-lex.europa.eu/legalcontent/EN/TXT/?qid=1519210589057&uri=CELEX:52017PC0753.
- Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the implementation of EU waste legislation, including the early warning report for Member States at risk of missing the 2020 preparation for re-use/recycling target on municipal waste. 2018.

  Available here:
  https://eur-lex.europa.eu/legalcontent/EN/TXT/?qid=1537873850842&uri=COM:2018:656:FIN#document2.

Literature on the 'Information and Communication Technologies infrastructure' sector

- Analysys Mason. Costing the new potential connectivity needs. SMART 2015/0068. 2016.

  Available here:
  https://publications.europa.eu/en/publication-detail/-/publication/e81ae17f-9d27-4b68-8560-7cd45dbe21d8.
- Analysys Mason. The socio-economic impact of bandwidth. 2017.

  Available here:
  https://ec.europa.eu/digital-single-market/en/news/study-socio-economic-impact-bandwidth-smart-20100033.
- BCO Network. *Report for Futurium*. 2018.

  Available here:
  https://ec.europa.eu/digital-single-market/en/news/bco-network-2018-activity-report.
- CERRE. State aid for broadband infrastructure in Europe. 2018.

  Available here:
  https://www.cerre.eu/sites/cerre/files/CERRE_StateAidBroadband_FinalReport_0.pdf.
- Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty Text with EEA relevance.

  Available here:
  https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_.2014.187.01.0001.01.ENG.
- Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code (Recast) Text with EEA relevance.

  Available here:
  https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_.2018.321.01.0036.01.ENG.
- Directive 2014/61/EU of the European Parliament and of the Council of 15 May 2014 on measures to reduce the cost of deploying high-speed electronic communications networks Text with EEA relevance.

  Available here:
  https://eur-lex.europa.eu/legal-content/en/TXT/?uri=celex%3A32014L0061.
- EIB Papers - Productivity and growth in Europe: ICT and the e-economy
- European Commission. Broadband Competence Offices Network.

  Available here:
  https://ec.europa.eu/digital-single-market/en/broadband-competence-offices.

- European Commission. Communication. *5G for Europe: An Action Plan*. COM (2016)588.
  Available here:
  https://ec.europa.eu/transparency/regdoc/rep/1/2016/EN/1-2016-588-EN-F1-1.PDF.
- European Commission. Commission Staff Working Document. Connectivity for a Competitive Digital Single Market - Towards a European Gigabit Society. SWD (2016) 300. 2016.
  Available here:
  https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A52016SC0300.
- European Commission. Communication. *A Digital Single Market Strategy for Europe*. COM (2015) 192.
  Available here:
  https://ec.europa.eu/digital-single-market/en/news/digital-single-market-strategy-europe-com2015-192-final.
- European Commission. Communication. Connectivity for a Competitive Digital Single Market - Towards a European Gigabit Society, COM (2016) 587.
  Available here:
  https://ec.europa.eu/digital-single-market/en/news/communication-connectivity-competitive-digital-single-market-towards-european-gigabit-society.
- European Commission. Communication. *Digital Agenda for Europe*. COM (2010) 245.
  Available here:
  https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0245:FIN:EN:PDF.
- European Commission. DESI Report 2018 – Connectivity. 2018.
  Available here:
  http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=52245.
- European Commission. Guide to High-Speed Broadband Investment, Release 1.1 – 22 October 2014.
  Available here:
  https://ec.europa.eu/regional_policy/sources/docgener/presenta/broadband/broadband_investment.pdf.
- FTTH Council. *Europe Panorama*. 2018.
  Available here:
  https://www.ftthcouncil.eu/documents/FTTH%20Council%20Europe%20-%20Panorama%20at%20September%202018.pdf.
- H. Gruber, EIB investment in digital infrastructure. 2018.
- L. Holt, M. Jamison. Broadband and contributions to economic growth: lessons from the US experience. Telecommunications Policy v. 33 p. 575-581; Global Industry Leaders' Forum, Broadband enabled innovation, ITU, 2011.
- Schneir & Xiong. A cost study of fixed broadband access networks for rural areas. 2016.
  Available here:
  https://www.researchgate.net/publication/303635532_A_cost_study_of_fixed_broadband_access_networks_for_rural_areas.
- Vantage Point. Evaluating 5G wireless technology as a complement or substitute for wireline broadband. 2017.
  Available here:
  https://www.ntca.org/sites/default/files/legacy/images/stories/Documents/Press_Center/2017_Releases/02.13.17%20fcc%20ex%20parte-ntca%20letter%20submitting%202017%20technical%20paper%20wc%2010-90.pdf.

Literature on the 'RDI in SMEs' sector

- Baragheh, Rowley, Sambrook. Towards a multidisciplinary definition of innovation. 2009.
  Available here:
  https://www.researchgate.net/publication/41104662_Towards_a_Multidisciplinary_Definition_of_Innovation.
- Bravo-Biosca, Criscuolo, Menon. *What drives the dynamics of business growth*, Nesta Working Paper 14/03. 2014.
- EIB, Working Paper 2019/03, *Financing and obstacles for high growth enterprises: the European case*. 2019.
- European Commission, *SME Performance Review.* 2018.
- European Commission, A new Horizon for Europe. Impact Assessment of the 9th EU Framework Programme for Research and Innovation. 2018
  Available here:
  https://ec.europa.eu/info/sites/info/files/research_and_innovation/contact/documents/horizon_europe_impact_assessment_book_web_version.pdf.
- European Commission. A renewed European Agenda for Research and Innovation - Europe's chance to shape its future. 2018.
  Available here:
  https://ec.europa.eu/info/sites/info/files/com-2018-306-a-renewed-european-agenda-_for_research-and-innovation_may_2018_en_0.pdf.
- European Commission. COM (2018) 375 final.
  Available here:
  https://ec.europa.eu/commission/sites/beta-political/files/budget-may2018-common-provisions_en.pdf.
- European Commission. *DG GROW website*.
  Available here:
  https://ec.europa.eu/growth/industry/innovation/funding/esif_en.
  (Accessed on March 29, 2019)
- European Commission. DG GROW Website. Industry – challenges for Europe.
  Available here:
  https://ec.europa.eu/growth/industry/policy/key-enabling-technologies/challenges_en.
  (Accessed on March 29, 2019).
- European Commission. *Digital agenda for Europe*. 2014.
  Available here:
  https://europa.eu/european-union/file/digital-agenda-europe_de.
- European Commission. EU support for business – COSME infographics.
  Available here:
  https://ec.europa.eu/docsroom/documents/32041/attachments/1/translations/en/renditions/native.
- European Commission. Europe 2020 Strategy Website.
  Available here:
  https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/eu-economic-governance-monitoring-prevention-correction/european-semester/framework/europe-2020-strategy_en.

- European Commission. Financing Programmes for SMEs.
  Available here:
  https://ec.europa.eu/info/business-economy-euro/growth-and-investment/financing-investment/financing-programmes-smes_en.
- European Commission. FL394 Innobarometer – Final Report 2014.
  Available here:
  http://ec.europa.eu/commfrontoffice/publicopinion/flash/fl_394_en.pdf.
- European Commission. Horizon 2020 in full swing. Three years on. 2018.
  Available here:
  https://ec.europa.eu/programmes/horizon2020/sites/horizon2020/files/h2020_threeyearson_a4_horizontal_2018_web.pdf.
- European Commission. Horizon 2020 mid-term evaluation. 2017.
- European Commission. Regional policy: The EU's main investment policy.
  Available here:
  https://ec.europa.eu/regional_policy/index.cfm/en/policy/what/investment-policy/.
- European Commission. Science, Research and Innovation Performance of the EU 2018. 2018.
  Available here:
  https://ec.europa.eu/info/sites/info/files/rec-17-015-srip-report2018_mep-web-20180228.pdf.
- European Commission. State of the Innovation Union. 2015.
  Available here:
  https://publications.europa.eu/en/publication-detail/-/publication/0487b7b9-b5d6-11e5-8d3c-01aa75ed71a1/language-en/format-PDF/source-71238593.
- European Commission. Support to SMEs – Increasing Research and Innovation in SMEs and SME Development. 2016.
  Available here:
  https://ec.europa.eu/regional_policy/sources/docgener/evaluation/pdf/expost2013/wp2_final_en.pdf.
- European Commission. *VentureEU Factsheet.* 2018.
  Available here:
  http://europa.eu/rapid/attachment/IP-18-2763/en/Factsheet%20VentureEU.pdf.
- European Investment Bank. Evaluation of the European Fund for Strategic Investment.
  Available here:
  https://www.eib.org/attachments/ev/ev_report_evaluation_of_efsi_en.pdf.
- European Investment Bank. *Restoring EU Competitiveness*. 2016.
  Available here:
  https://www.eib.org/attachments/efs/restoring_eu_competitiveness_en.
- European Parliament. Overcoming innovation gaps in the EU-13 Member States. 2018.
  Available here:
  http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_STU(2018)614537.
- Eurostat, OECD. The Measurement of Scientific and Technological Activities. Oslo Manual. 2005.
  Available here:
  https://circabc.europa.eu/sd/a/ba5badd1-f834-4677-81f0-a1a6138c7f1a/Oslo%20Manual.pdf.

- Eurostat. Europe 2020 indicators – R&D and innovation

  Available here: https://ec.europa.eu/eurostat/statistics-explained/index.php/Europe_2020_indicators_-_R%26D_and_innovation.
- Eurostat. First estimates of Research & Development expenditure. 2019.

  Available here: https://ec.europa.eu/eurostat/documents/2995521/9483597/9-10012019-AP-EN.pdf/856ce1d3-b8a8-4fa6-bf00-a8ded6dd1cc1.
- Eurostat. Glossary: Innovation.

  Available here: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Innovation.
- InnovFin. EU Finance for Innovators.

  Available here: https://www.eib.org/attachments/thematic/innovfin_eu_finance_for_innovators_en.pdf.
- KfW Research. How SMEs fund their innovation and investment expenditure – a comparison. 2019.

  Available here: https://www.kfw.de/PDF/Download-Center/Konzernthemen/Research/PDF-Dokumente-Fokus-Volkswirtschaft/Fokus-englische-Dateien/Fokus-2019-EN/Fokus-Nr.-237-Januar-2019-Financing-innovation.pdf.
- KfW, SME Investment and Innovation – France, Germany, Italy and Spain. 2015.

  Available here: https://www.kfw.de/PDF/Download-Center/Konzernthemen/Research/PDF-Dokumente-Studien-und-Materialien/SME-Investment-and-Innovation-October-2015.pdf.
- OECD. Glossary of Statistical terms. Research and development. Last updated on June 1, 2013.

  Available here: https://stats.oecd.org/glossary/detail.asp?ID=3111.

www.fi-compass.eu
contact@fi-compass.eu

European Commission
Directorate-General
Regional and Urban Policy
Unit B.3 "Financial Instruments and IFIs' Relations"
B-1049 Brussels

European Investment Bank
Advisory Services *fi-compass*
98-100, bd. Konrad Adenauer
L-2950 Luxembourg