



Financing rural, agricultural and forestry infrastructure





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LIST OF ACRONYMS

Expression	Explanation
CAP	Common Agricultural Policy
CHP	Combined Heat and Power
EAFRD	European Agricultural Fund for Rural Development
EC	European Commission
EFSI	European Fund for Strategic Investments
EIB	European Investment Bank
EIF	European Investment Fund
EMFF	European Maritime and Fisheries Fund
EPC	Energy Performance Contracting
ERDF	European Regional Development Fund
ESCO	Energy saving company
ESIF	European Structural and Investment Funds
EU	European Union
FTTH	Fibre-to-the-Home
GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation
ISP	Internet Service Provider
JESSICA	Joint European Support for Sustainable Investment in City Areas
MBIL	Multi-Beneficiary Intermediate Loan
NCCF	Natural Capital Financing Facility
NPB	National Promotional Bank
OP	Operational Programme
PPP	Public Private Partnership
RDP	Rural Development Programme
SME(s)	Small and medium-sized enterprise(s)

1. INTRODUCTION





Financial instruments are included under European Structural and Investment (ESI) Funds legislation, including the European Agricultural Fund for Rural Development (EAFRD), as a form of intervention to support investments in rural areas and agriculture. Financial instruments aim to finance projects which are expected to generate revenues and/or costs-savings that can repay their financing. This enables ESI Funds (including EAFRD) to revolve and/or to leverage further private and public sector investment. Financial instruments can be used alongside grants or be combined with other measures and/or EU-level financial instruments, such as the European Fund for Strategic Investments (EFSI) guarantee.

Stimulated in part by the financial and economic crisis, the 2007-2013 programming period saw the first use of financial instruments supported by EAFRD. These were mostly targeted at small and medium-sized enterprises (SMEs).

During the 2014-2020 period, the scope of financial instruments under EAFRD has widened to all eligible sectors, including investment in infrastructure. Even larger-scale investments in broadband infrastructure and renewable energy, for example, are considered eligible and the scope also covers all categories of final recipients, including Public Private Partnerships (PPP).

Additional opportunities to finance investments in infrastructure, such as local markets and short supply chains, can involve a cooperative approach. These tap into the experience of local stakeholders and gather local investors, as exemplified by the EU Smart Villages Initiative¹.

EAFRD grant support for infrastructure may account for around 10% of total investment volume in the current programming period. The bulk of this is for developing basic services and infrastructure in rural areas (see Section 3 for details). Despite this high volume, no financial instruments dedicated to infrastructure have yet been implemented (there was no public information on any when this report was written), although they could greatly improve the efficiency and effectiveness of rural development policy and investment in rural infrastructure.

The objective of this report is to provide preliminary indications on the potential use of EAFRD financial instruments focusing on infrastructure investment. It is based on desk research of existing literature and on a review of 28 financial instruments and project examples that benefited from revolving investment (see Annex I – List of analysed projects) sourced primarily, but not exclusively, from the internal database of the European Investment Bank (EIB). Given the lack of experience with EAFRD financial instruments dedicated to rural infrastructure, the examples were selected from projects that indicate the potential for, and the challenges of, using financial instruments to support of rural and agricultural infrastructure investment.

In particular, the examples include:

- Financial instruments which do not target rural areas but which finance projects that fall under the scope of this report.
- Rural infrastructure projects not financed through financial instruments, but which could be suitable for such support.

The best examples are further detailed in the report.

The report covers the following sub-sectors of rural and agricultural infrastructure:

1. Renewable energy and building energy efficiency investment. This includes combined heat and power (CHP) generation plants, district heating, biomass plants, as well as energy efficiency renovation including insulation, efficient lighting systems and window replacements.
2. Smart services and infrastructure for rural villages. This includes smart parking, mobility, transport, security, sport and recreational infrastructure.

¹ The Smart Villages initiative is a sub-theme of the Smart and Competitive Rural Areas thematic work developed by the European Network for Rural Development, in place since September 2017. https://enrd.ec.europa.eu/enrd-thematic-work/smart-and-competitive-rural-areas/smart-villages_en.



3. Waste treatment, such as investments in collection equipment and greenhouse gas reducing technologies for waste treatment.
4. Supply chain infrastructure including storage facilities, distribution and warehousing, and agricultural market facilities.
5. Broadband and information and communication technology (ICT) infrastructure. This includes roll-out of the fixed broadband network and upgrading and extending the mobile telecom network.
6. Irrigation, water supply and purification.
7. Forestry infrastructure including improving access to natural facilities, as well as the sustainable use of forests and other natural assets.

Section 2 of this report focuses on infrastructure investment trends in the European Union (EU), whilst Section 3 analyses examples for investing in infrastructure. Section 4 then describes the main trends emerging from the various sub-sectors and identified projects, assessing the potential for financial instruments in each trend. Section 5 summarises the findings, including potential ways to stimulate the use of EAFRD financial instruments supporting rural and agricultural infrastructure going forward.



2. MARKET TRENDS AND FINANCIAL GAPS IN THE INFRASTRUCTURE MARKET





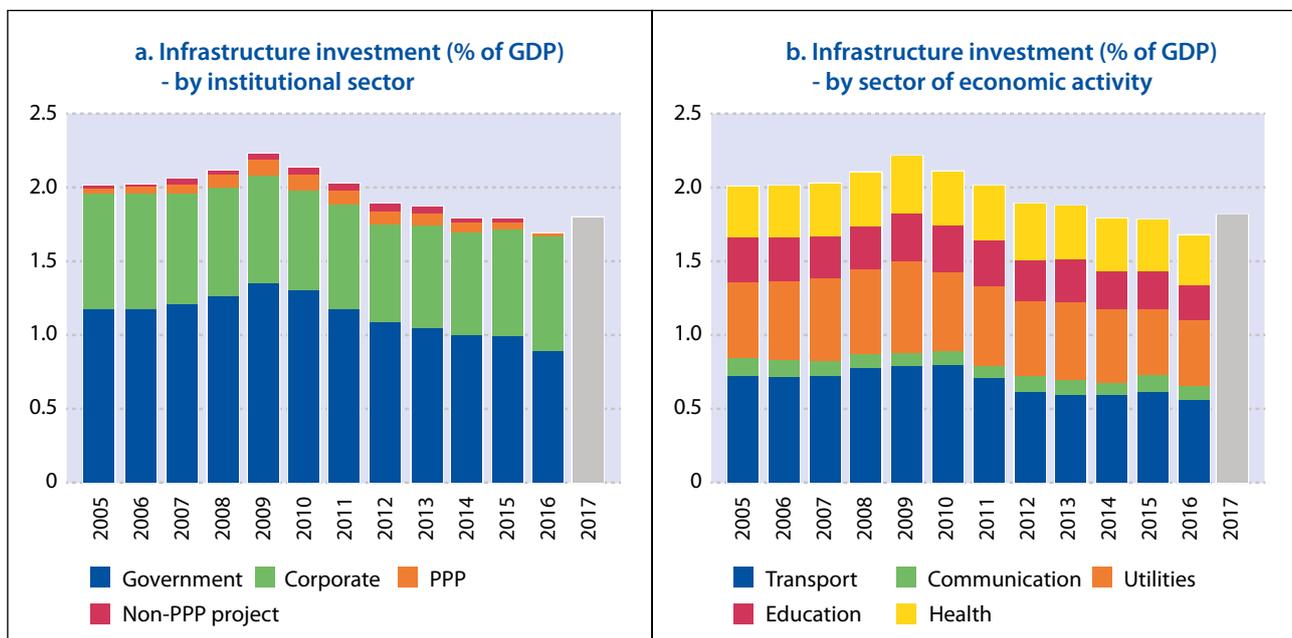
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All analysis and data in this Section are based on the EIB Investment Report 2018/2019², unless otherwise indicated.

General economic context

Based on EIB data, **infrastructure investment in the EU declined substantially from 2009, in line with the economic downturn and financial crisis.** Infrastructure investment is currently at about 75% of the pre-crisis level. For 2017, preliminary data suggest, at best, a modest pick-up in investment activity.

Figure 1: Infrastructure investment by sector and promoter



Source: Eurostat, Projectware, EPEC.

Note: Based on EIB infrastructure Database. Data are missing for Belgium, Croatia, Lithuania, Poland, Romania and the UK.

PPP: public-private partnership.

*Data for 2017 is a projection based on preliminary data.

Sluggish infrastructure investment risks undermining long-term productive capacity in the EU. Investment in infrastructure complements and supports non-infrastructure investment in the production of goods and services. A lack of investment causes crowded roads that slow the movement of goods from factory to factory and factory to market, as well as obsolete power plants that raise the cost of energy. EIB data confirms that firms grow less in regions with poor infrastructure.

Lower public infrastructure investment accounts for about 80% of the fall in infrastructure investment in the EU. Public infrastructure investment declined by 0.45 % of Gross Domestic Product (GDP) between 2009 and 2016, compared with 0.1% for the non-government sector. This particularly affected countries suffering strong adverse economic conditions and high fiscal constraints. **Tightened budgets for most countries resulted in a shift from investment, or gross fixed capital formation (GFCF), towards current expenditure.**

² EIB Investment report 2018/2019 – Retooling Europe’s Economy - <http://www.eib.org/en/infocentre/publications/all/investment-report-2018.htm>.



Government budgetary plans announced in 2018 stability and convergence programmes report a slight increase in public investment for 2018. According to the European Commission's 2018 Autumn Forecast, **public investment will however remain low**, and is expected to exceed long-term averages (2003–16) in only ten EU Member States³.

As a result, corporate infrastructure investment has remained stronger than government investment in recent years, and recently accounted for some 35% of infrastructure investment in Europe. In 2016, for the first time, corporate infrastructure investment (as a share of GDP) reached and even slightly exceeded 2009 levels.



3 Austria, Belgium, Denmark, Estonia, Finland, Germany, Hungary, Latvia, Poland and Sweden.



Infrastructure investment gap in Europe⁴

The investment gap is defined as the difference between investment needs and current investment levels. The annual infrastructure investment gap for the EU27 (i.e. all Member States except for the UK) is estimated at roughly EUR 155 billion. This corresponds to 1.2% of current EU27 GDP and 5.8% of GFCF (Figure 2). This annual infrastructure investment gap of EUR 155 billion is only part of the estimated overall investment gap of EUR 403 billion. Investment needs in innovation and energy efficiency are also substantial but are not included in Figure 2 since they are not classified as infrastructure.

Figure 2: Annual infrastructure investment gap for EU27

	EUR billion	% of GDP	% of GFCF
ICT (broadband and digitalisation)	50	0.38	1.86
Energy generation and grids	17	0.13	0.63
Water and waste	7	0.05	0.26
Social and affordable housing	6	0.05	0.22
Education	8	0.06	0.30
Health	17	0.13	0.63
Mobility	50	0.38	1.86
Total	155	1.19	5.77

Source: EIB estimates.

Note: GDP and GFCF refer to 2017. All numbers refer to EU27 (all Member States except for the UK).

Estimates of infrastructure investment gaps are based on EU policy targets and EIB expert opinions. EU policy targets for broadband (European Gigabit Society targets), energy (EU 2030 climate and energy targets) and water and sanitation (compliance with EU Directives) are taken into account. For mobility and social infrastructure, investment needs reflect past investment backlogs combined with higher future needs to accommodate demographic trends, migration and other megatrends.

The **need to invest more in Europe's infrastructure** has also been identified in the EU's post 2020 Multiannual Financial Framework⁵. It is clear that **more private investment (particularly from institutional investors) is critical to help fill this gap, and that the returns on such infrastructure investment must be sufficiently attractive for the private sector to invest**. Infrastructure assets have characteristics that should appeal to institutional investors. These include their long duration/economic life, which can match long-term liabilities (of pension funds for example) with cash flows, as well as portfolio diversification for institutional investors due to the low correlation of infrastructure returns with other asset classes.

⁴ From EIB Investment report 2018/2019.

⁵ "A new, modern Multiannual Financial Framework for a European Union that delivers efficiently on its priorities post-2020", COM (2018) 98 final, Brussels.



Infrastructure needs in rural areas

No data is available on trends and possible gaps specifically for investment in rural and agricultural infrastructure. These categories are not reported in official statistics and there is little literature on the topic.

However, some **qualitative considerations suggest that infrastructure investment needs in rural areas could be even higher than in other areas**, implying a considerable investment gap.

According to OECD⁶ data, **rural area economic and social conditions vary widely**. Some rural areas are disadvantaged and have limited capacity to adapt to change⁷, while others are performing well and can exploit the opportunities that changes offer.

According to Eurostat data⁸, EU rural areas have less access to services and less social infrastructure (including schools, hospitals and cultural facilities). So, people in rural areas are more likely to be deterred from seeking certain social services, especially health care, often as a result of lack of proximity, since medical services tend to be concentrated in urban areas. Compared to urban areas, the share of people in rural areas reporting unmet needs for health care is higher in Member States that joined the EU since 2003. Furthermore, for all but three EU Member States, the lowest proportion of people using the internet daily was in rural areas, mainly due to high-speed services being restricted to more densely populated, urban areas.

The need to provide disadvantaged rural areas with better services clearly implies higher investment needs in rural infrastructure. However, these needs do not necessarily refer only to disadvantaged areas. As mentioned above, **some rural areas show good economic and social development. These areas can also exploit opportunities stemming from new energy sources, innovation in food production for a growing population, or the provision of natural resources**, all of which normally require infrastructure investment.

Connections with urban areas are considered key to developing rural areas. Specifically, investment in infrastructure to enhance exchanges in goods and services, such as transport for agricultural products, seem to have a strong impact on productivity and economic performance in rural areas⁹. In general, ensuring sufficient social services (healthcare, education, etc.) can also increase the vitality of rural areas and reduce depopulation when people decide to benefit from a higher quality of life in these areas, even accepting lower salaries.



6 Rural 3.0, A framework for rural development, OECD, 2018.

7 OECD indicates six mega-trends which produce challenges as well as opportunities for rural areas: Population ageing and migration, urbanisation, global shifts in production, the rise of emerging economies, climate change and environmental pressure, as well as technological breakthrough.

8 Statistics on rural areas in the EU: https://ec.europa.eu/eurostat/statistics-explained/index.php/Statistics_on_rural_areas_in_the_EU.

9 Rural 3.0, A framework for rural development, OECD, 2018.

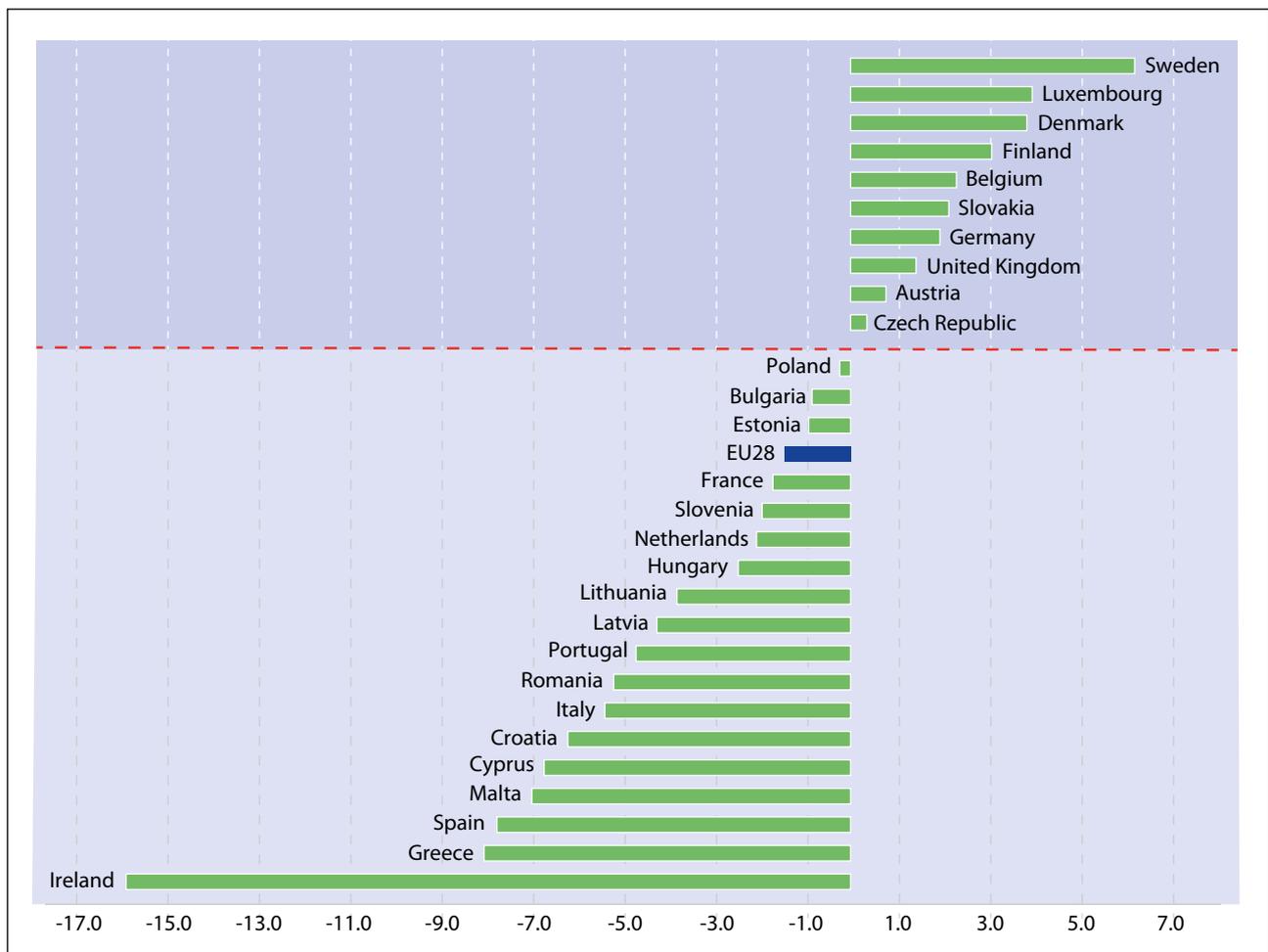


Despite the absence of information on investment expenditure in rural areas, some indications are offered by trends in local government investment expenditure since **small-medium infrastructure serving local communities is more likely to be financed by local government bodies (e.g. municipalities).**

Reductions in government infrastructure investment often produce an even larger reduction in sub-national expenditure¹⁰, normally due to cuts in transfers from the central government.

Figure 3¹¹ shows the reduction in local government investment expenditure in the EU from 2007 to 2017. This seems to have severely affected most of the EU, with the EU-28 average being negative.

Figure 3: Changes in subnational government direct investment in the EU28 (2007-2017)



There is little data on how local government, especially smaller and rural municipalities, finance their infrastructure investments. The EIB Municipal Investment Survey includes some information, although this refers to larger municipalities¹².

¹⁰ EIB Investment report 2018/2019.

¹¹ Reproduced from material of the conference: *Subnational finance and investment ten years after the crisis - Fiscal decentralisation and innovative public finance instruments as the way ahead?*, European Committee of the Regions and OECD, Brussels, 12 November 2018 - Presentation of Isabelle Chatry, OECD.

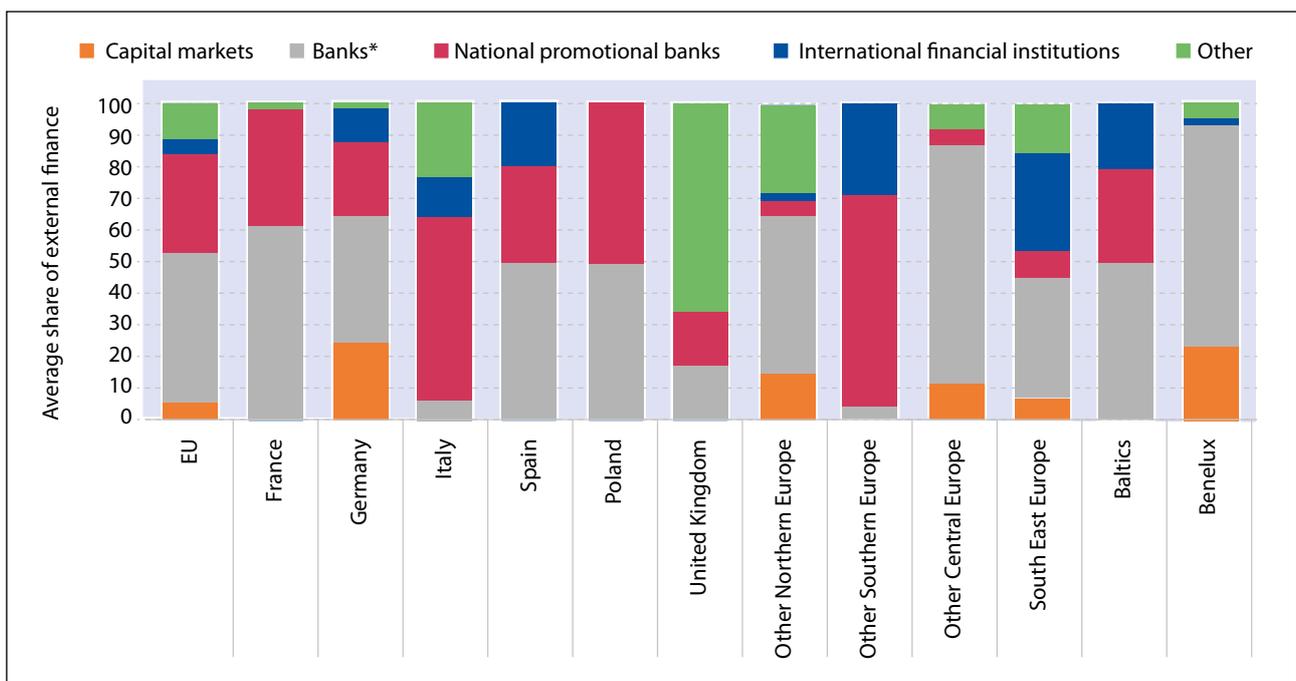
¹² The Municipality Infrastructure Investment Module of the EIB Investment Survey gathered information from key decision makers at local municipalities. It is based on telephone interviews with 555 municipalities across the EU. Interviews were carried out between May and August 2017.



Municipal resources account for more than 50% of infrastructure investment funding. This is followed by other transfers, often from national or subnational governments (23%), external finance, including bank loans (18%), and EU funding (8%). A breakdown by region shows significant variations in the funding mix, in particular for EU funds. For the Baltics and Central European countries, EU funds account for a much higher share (35% and 25% of total infrastructure funding, respectively) with Italy also falling into this category (more than 28%). Poland stands out as a Central European country with the highest share of own resources funding infrastructure investment.

Commercial banks provide almost half of all external financing for infrastructure projects (Figure 4). National Promotional Banks (NPBs) which account for about 30%, while international financial institutions and the capital markets together account for just 10%. Southern Europe and Italy, in particular, have the largest share of funding from NPBs, which provide as much as two thirds of their external finance.

Figure 4 : Type of external finance used for municipality investment activities by area

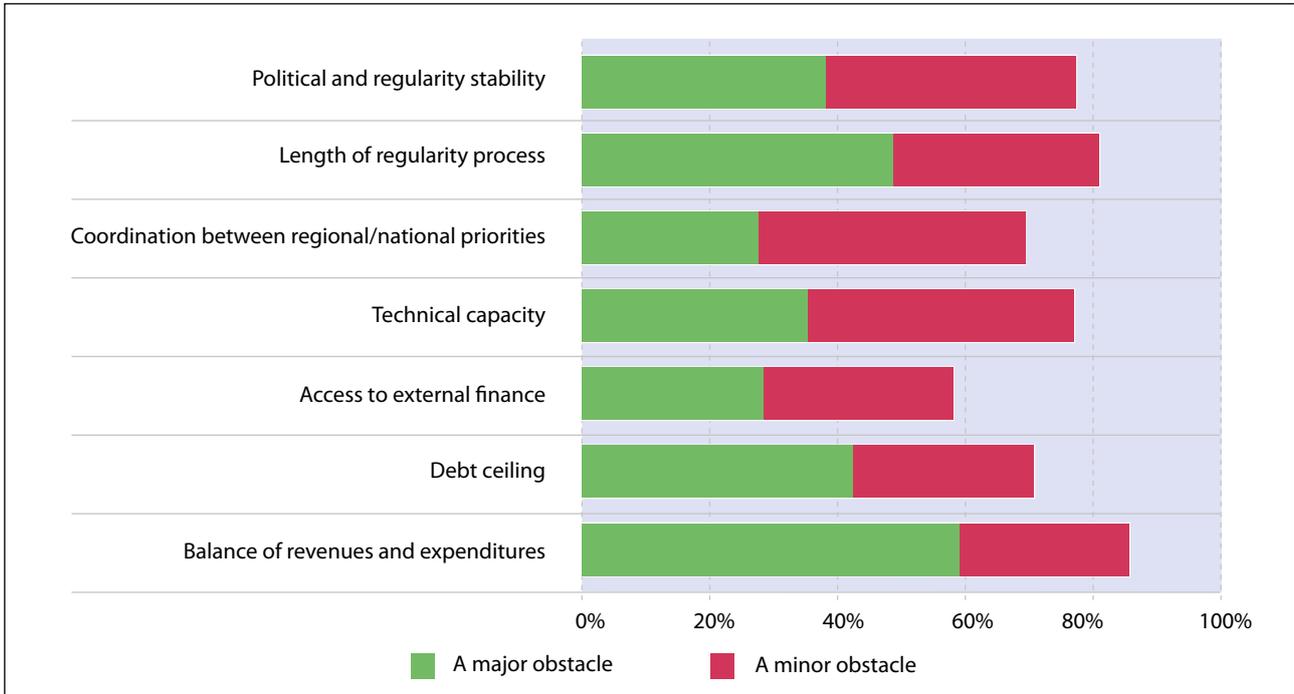


*Banks excluding national or international promotional banks.



Linked to this (Figure 5¹³), **around 60% of municipalities indicated access to external finance as a constraint to infrastructure investment.**

Figure 5: Obstacles to infrastructure investment



These elements highlight that financial instruments (including guarantees) may play a role in improving access to, or complementing, external finance.

Complementary technical assistance and advisory support could address a **lack of technical capacity which was reported as another constraint by around 80% of the municipalities.**

At the same time, indebtedness limitations (**debt ceilings**) which are a constraint for around 75% of the municipalities, might limit the potential for financial instruments, compared with grants for example. This could be addressed by combining grants and financial instruments.

13 Figure 3 and 4, reproduced from EIB Investment report 2018/2019.

3. INFRASTRUCTURE FINANCING AND THE ROLE OF FINANCIAL INSTRUMENTS





Definition, economic and financial characteristics

There is no standard definition for infrastructure, but this could be broadly defined as physical structures where goods and services are produced that are direct common inputs for many industries. This covers **economic infrastructure** but a broader definition would include also **social infrastructure** (including housing, education and health infrastructure¹⁴).

The main economic characteristics of infrastructure include:

- High barriers to entry.
- Economies of scale (e.g. high fixed, low variable costs).
- Inelastic demand for services (providing contractual power to the owner/manager of the infrastructure).
- Low operating costs and high target operating margins.
- Longer economic life.

These elements are **attractive for investors focusing on long-term stable returns**. Institutional investors especially look for:

- Attractive returns.
- Low sensitivity to economy fluctuations and market volatility.
- Low correlation of returns with other asset classes.
- Long-term, stable and predictable cash flows.
- Good inflation hedge.
- Natural fit with long-lasting, often inflation-linked pension liabilities.
- Low default rates.
- Socially responsible investing.

However, some **characteristics may prevent private investors from considering infrastructure investment**. For example, projects can be complex and time consuming to plan, procure and build. Information asymmetry and difficulties in assessing the risk (including political risk) may also be significant. Projects normally require significant resources upfront but generate a revenue stream only in the operational phase (which may mean only after several years). For this reason, public support is very often used to stimulate private investor participation¹⁵.

The available literature does not seem to include a common definition of **rural infrastructure**. For this report such infrastructure is defined as economic and social infrastructure providing benefit to individuals and enterprises in rural areas. **Agricultural infrastructure** can be defined as economic infrastructure providing benefit to farm production activities and other operators in the agricultural value chain (processing, distribution, etc.). These can be in rural areas, but also potentially in urban centres (e.g. logistics facilities linked to agri-food marketing and distribution).

Financing of infrastructure investment

Traditionally, infrastructure investment has been financed by governments with public funds based on revenue from taxes and public borrowing. As outlined in Section 2, public deficits and increased public debt to GDP ratios have, in many countries, led to fewer public funds being allocated to infrastructure investment. As a consequence, **alternative sources of financing from private or institutional investors are also needed**¹⁶.

¹⁴ Public and private financing of infrastructure, EIB Papers volume 15, N. 1, 2010, EIB.

¹⁵ Building Growth in Europe, Innovative Financing for Infrastructure, The Royal Institute of International Affairs, 2014.

¹⁶ Infrastructure Financing Instruments and Incentives, OECD, 2010.



Private financing for public infrastructure projects implies borrowing money from private investors to pay for specific projects. This is typically done through **project finance** and a specific company is set up to deliver an infrastructure project. That company organises finance and typically transfers responsibility for designing, building, operating and maintaining an asset to companies in which investors have managerial responsibilities. Such project finance is often in the form of a **PPP**¹⁷.

Infrastructure assets can also be privately owned. In some countries, utility infrastructure (e.g. water, gas and electricity) are owned by private companies. In this case, project finance is complemented by financing raised by the private owners. This **corporate finance** involves existing companies (rather than project-specific or special purpose companies) borrowing money based on the strength of their entire business activities ('on balance sheet' financing). Here, governments can also offer financial support for specific projects, including grants and/or guarantees.¹⁸ **Banks often play a major role in infrastructure financing**, although the financial crisis generally constrained the funding capacity of the banking sector. Additional support in many EU countries is provided by **NPBs/National Promotional Institutions and/or International Financial Institutions**.

Recently, **institutional investors have become a possible source of finance.** Such investors pool large sums of money to invest in securities, property and other assets. They typically include sovereign wealth funds, insurance companies, retirement or pension funds, hedge funds, investment advisors and mutual funds. These are a reliable source of long-term capital, as they need to match their liabilities with long-maturity assets. This makes institutional investors particularly suitable to undertake counter-cyclical, long-term investments in sectors of the real economy with high productivity that generate stable revenue streams. Despite these elements, **institutional investors still invest limited resources in infrastructure financing**, particularly where there is political or regulatory risk, so increasing their participation is key to boosting infrastructure investment¹⁹.

More recently, **specialised infrastructure funds** have also become significant actors in infrastructure financing²⁰, providing mainly equity (or quasi equity) financing to corporate and project finance infrastructure investment.

17 <https://www.instituteforgovernment.org.uk/explainers/financing-infrastructure>.

18 <https://www.instituteforgovernment.org.uk/explainers/financing-infrastructure>.

19 *Building Growth in Europe, Innovative Financing for Infrastructure, The Royal Institute of International Affairs, 2014.*

20 *Public and private financing of infrastructure, EIB Papers volume 15, N. 1, 2010, EIB.*



Public Private Partnerships

As mentioned before, **PPPs are often used as a form of project finance**. This financial structure is particularly suitable for projects that require large upfront investments, such as highways and hospitals, where the private sector is willing and able to take on certain project specific risks, such as demand or technology risk.

In a PPP private investors typically provide a portion of the funding needed to build a facility, after which they are entrusted with its operation, management and maintenance, normally for 20 to 30 years. At the end of the contract assets are usually transferred back to the government. During operation of the project, the private partner receives payments to cover the initial investment, as well as financing, operational and maintenance costs. These revenues come from user fees (e.g. a toll road), or payments by the public authority (e.g. for schools or hospitals). The latter type of remuneration is referred to as **availability-based payment**²¹.

PPP schemes can offer specific advantages to both public and private sectors. Governments can access additional funding and financing resources, as well as knowledge and technology expertise from the private sector as a supplier or operator. Private investors might also access public sector funding, through guarantees or subsidies, and be repaid from a long-term, relatively stable remuneration commitment for operating the infrastructure.

But PPPs can also have drawbacks when projects depend on political and financial commitments from the procuring public authority. Project effectiveness is also often affected by a lack of transparency in the procurement procedure and sometimes there is insufficient transparency on the returns being made by the private sector investors²². Problems can also occur during construction if unexpected delays generate extra costs.

²¹ *Public and private financing of infrastructure, EIB Papers volume 15, N. 1, 2010, EIB.*

²² *Building Growth in Europe, Innovative Financing for Infrastructure, The Royal Institute of International Affairs, 2014.*





EU funds to support infrastructure investment

Given the importance of infrastructure investment for long-term economic performance, EU policy also provides support including:

Connecting Europe Facility (CEF)

The **CEF**²³ is a key EU funding instrument specifically directing investment into European transport, energy and digital infrastructure to address missing links and bottlenecks.

CEF Regulation sets out the rules for granting EU financial support to priority projects of common interest and to programme supporting measures. It also defines maximum EU co-financing funding rates per type of project and per transport mode. The total budget of the instrument is EUR 30.4 billion (EUR 22.4 billion for transport, EUR 4.7 billion for energy, and EUR 0.3 billion for telecommunications).

CEF financial support primarily takes the form of:

1. Grants (non-reimbursable investments from the EU budget) which are implemented through a competitive process of 'calls for proposals'.
2. Programme Support Actions, which are dedicated supporting measures to Member State administrations, or bodies under their authority, to help them achieve TEN-T and CEF objectives, as well as studies and ICT support to the CEF programme.
3. EU contributions to innovative financial instruments. These instruments are developed together with entrusted financial institutions as implementing partners of the European Commission (EC). They take the form of risk sharing arrangements and typically include loans or guarantees.

²³ <https://ec.europa.eu/inea/en/connecting-europe-facility>.



European Fund for Strategic Investments (EFSI)

EFSI was created to stimulate investment in the EU-28, boosting economic growth and employment. In operational terms, EFSI aims to: (a) support investments in infrastructure and innovation and (b) increase access to finance for SMEs (up to 250 employees) and Mid-cap companies (up to 3 000 employees). These two objectives are reflected in EFSI's two investment windows, the Infrastructure and Innovation Window and the SME Window.

EFSI (prior to the recent extension at the end of 2017) was funded by a EUR 16 billion guarantee to the EIB Group from the EU budget and a EUR 5 billion capital contribution provided by the EIB. The guarantee was allocated as follows:

- Up to EUR 10.5 billion to the Infrastructure and Innovation Window debt portfolio.
- Up to EUR 2.5 billion to an Infrastructure and Innovation Window equity-type portfolio.
- Up to EUR 3 billion to a dedicated, EC fully guaranteed portfolio within the SME Window.

Indicatively, the EU Guarantee and the Bank's contribution were expected to enable EFSI to generate EUR 60.8 billion of additional financing by the EIB Group (an internal multiplier of approximately three). This, in turn, was expected to mobilise EUR 315 billion in total investment in the EU by July 2018 (an external multiplier of approximately five). The extension of EFSI on 30 December 2017 raised the EU Guarantee from EUR 16 billion to EUR 26 billion and the EIB contribution from EUR 5 billion to EUR 7.5 billion, and the target for investment mobilised from EUR 315 billion to EUR 500 billion.

EFSI support can also be delivered through financial instruments and in combination with resources from other EU Funds. In particular EFSI can support investment platforms, which pool smaller and higher-risk projects by geographic location or sector. This helps to better share risk, making it easier to attract private investors and eventually unlock financing for individual projects. A platform can combine EU funds, national support and financing from private investors. The platform itself can then provide loans and equity financing to projects, depending on their specific needs. Investment platforms are already available to support infrastructure investment, for example regenerating brownfield industrial sites or supporting broadband deployment²⁴.

²⁴ https://ec.europa.eu/commission/sites/beta-olitical/files/investment_platforms_factsheet_en.pdf





ESI Funds

The **five ESI Funds**, jointly managed by the EC and Member States, address infrastructure through a range of channels.

Under the **European Regional Development Fund (ERDF)**, infrastructure investment has a more horizontal character, broadly entering the various fund's thematic areas including the digital agenda, innovation and research and the low-carbon economy.

The **Cohesion Fund (CF)** has more direct relevance as it funds transport and environment projects, focusing on trans-European transport networks, rail and public transport, as well as projects supporting energy efficiency and the use of renewable energy.

Other funds, such as the **EAFRD** and the **European Maritime and Fisheries Fund (EMFF)** are still relevant, though more concentrated on their specific sectors.

Finally, the **European Social Fund (ESF)** could play an indirect role in infrastructure as it complements social infrastructure by investing in Europe's human capital.

ESI Fund support can be provided through financial instruments, including for infrastructure financing.

EAFRD support and possible contribution of financial instruments

For the 2014-2020 programming period, **EAFRD grant support for infrastructure accounted for around 10% of overall investment**, with the largest share earmarked for the development of basic services and infrastructure in rural areas.

Although EAFRD financial instruments are now being used, these so far focus mainly on SME access to finance, with no known examples focusing on rural or agricultural infrastructure. Some benefits of using financial instruments in rural infrastructure are:

- They could leverage private resources, increasing Rural Development Programme (RDP) impact.
- Their revolving nature enables the reuse of scarce public resources, with the potential to create more sustainable funding for infrastructure investment.





- They can also attract knowledge and skills from the private sector.
- Financial instruments can encourage better planning and more attention on the long-term sustainability of the projects.

Financial instruments, however, cannot support projects, which do not **generate revenue or cost savings** that can pay back the finance.

EAFRD financial instruments (as for any other ESI Fund) should be based on an ex-ante assessment demonstrating a financing gap and the rationale for such intervention.

In general, **implementing financial instruments focusing on rural areas can involve specific challenges that need to be considered**. These challenges do not imply that financial instruments are not suitable for rural areas, but specific mitigation actions/tools should be integrated into the design and deployment of the instrument.

The table below lists challenges and mitigation actions, based on EIB experience and indications from available literature²⁵.

Table 1: Constraints to infrastructure investment and possible mitigation

Constraints	Mitigation actions
Managing authorities lack knowledge about financial instruments, and their specific use for rural infrastructure.	Information/training/awareness raising.
Project promoters not skilled in finance and risk management.	Select reliable local intermediaries to originate projects, provide appropriate technical assistance/advisory support.
Critical mass/size of projects.	Project pooling or aggregation, through financial instruments, combining multiple smaller-scale projects of a single borrower.
Project management skills.	Capacity building through technical assistance and knowledge transfer to manage and coordinate projects during set-up, implementation and operation.
Low appetite of private and institutional investors for a dedicated 'rural' infrastructure instrument, due to lack of information and higher risk perception (compared with urban infrastructure).	Public resources to lower the overall risk, allow preferential treatment (layered structures) for private resources.
Reduced size and low population density may reduce profitability.	Grants/FI combination or guarantees may also be needed.

EAFRD resources offer the opportunity to implement mitigation actions, helping to attract private investors and financial intermediaries.

²⁵ EIB Investment Report 2018/2019; Rural 3.0, A framework for rural development, OECD, 2018; Municipal Infrastructure, EU Overview, EIB, 2018; Investing in Public Infrastructures in Europe, a local economy perspective, Council of Europe Development Bank, 2017; Putting Private Capital to Work in Rural Infrastructure, Bipartisan Policy Centre, 2017; Material of the conference: Subnational finance and investment ten years after the crisis - Fiscal decentralization and innovative public finance instruments as the way ahead?, European Committee of the Regions and OECD, Brussels, 12 November 2018.



For example, **combining grant support with support from financial intermediaries can reduce the cost and improve the profitability of investments** also in less populated areas. EAFRD resources can also be used in financial instruments to reduce the risk or to increase prospective remuneration.

EAFRD funds can also be used to provide technical assistance and support to project promoters, to build capacity and support the creation of a sufficient pipeline of good projects.

More generally, **EAFRD can support awareness raising and information for managing authorities and potential final recipients, such as municipalities, utility companies and local associations**. Given the lack of experience to date, this could be a first step to creating the necessary environment and awareness to enable setting up the first EAFRD financial instrument focused on rural infrastructure. By way of example, awareness about the possibility to use financial instruments to support agricultural and agri-food enterprises was limited at the beginning of the current programming period²⁶. Many elements suggest that awareness rising and capacity building conducted under *fi-compass* have contributed to creating interest amongst managing authorities and stakeholders and, more recently, the decision of a number of managing authorities to set up financial instruments. The possibility to showcase the first successful instruments has been a multiplier in terms of interest.

26 EAFRD financial instruments in 2014-2020 Rural Development Programmes, *fi-compass*, 2018.

4. TRENDS EMERGING FROM ANALYSIS OF THE CASE STUDIES





This section outlines and summarises trends highlighted by the projects and case studies, broken down by sub-sector. This section also analyses projects financed under major funds and platforms that invest in infrastructure using a multi-sector or sector specialisation approach. Such funds and platforms are listed and described in a separate Sub-section (4.10), while some of their underlying investments are briefly outlined in Sub-sections 4.1 to 4.8.

Projects funded under the Joint European Support for Sustainable Investment in City Areas (JESSICA) initiative are summarised separately in Sub-section 4.9. Investments under this initiative (which is a financial instrument according to the regulation) by nature cover several of the sub-sectors analysed in this study, including energy efficiency, renewable energies and waste management.

4.1 Renewable energy

In 2015, almost 27% of primary energy produced across the EU came from renewable sources. This grew by 71% over a decade from around 120 million tons of oil equivalent²⁷ (Mtoe) in 2005 to 205 Mtoe in 2015, while the production of primary energy from most other sources declined during the same period, in both absolute and relative terms²⁸. Funding for renewable energy under EAFRD can play a role in achieving EU and national renewable energy targets, though potential synergies between renewable energy policy and rural development remain largely underdeveloped²⁹.

Any analysis of renewable energy potential should also consider energy sources in rural areas, such as biomass and wind farms. On the other hand, many rural buildings are not connected to the electricity grid and use carbon intensive alternatives³⁰.

27 The tonne of oil equivalent (toe) is a unit of energy defined as the amount of energy released by burning one tonne of crude oil; it is approximately 42 gigajoules or 11 630 kilowatt hours.

28 See Eurostat Simplified energy balances – annual data [nrg_100a], last update 8.6.2017.

29 European Court of Auditors (2018), Renewable energy for sustainable rural development: significant potential synergies, but mostly unrealised, Special Report No 5/2018, p.10.

30 Groenenberg, H., van Breevoort, P., Deng, Y., Noothout, P., van den Bos, A., van Melle, T. (2011), Rural energy in the EU Country studies for France, Germany, Italy, Poland and the UK, p.2.





Energy production through biomass and biogas is a very important source of renewable energy in rural areas, although considerable efforts may be needed to pool local communities and their input resources. The viability of such projects largely depends on adequate and constant feedstock supply for the energy plant. This is best achieved via shareholding contracts and by committing local farmers to supplying biomass fuels such as crops or manure. In this respect, the ENVO BIOGAS project described below highlights how involving local farmers can be critical, as they are the primary supply source for the plant.

Deploying modern CHP technology in biogas plants can bring significant CO₂ savings and can also lead to increased economic returns. Such renewable energy projects are economically sound and investment in high efficiency CHP supports both energy efficiency and renewable power generation objectives of the EU.

Production of renewable energy from biomass or biogas can be combined with investment in district heating facilities and is very common in some northern European countries. Successful implementation of this efficient energy distribution system requires an alignment of several factors to be attractive for investors:

- A critical mass of demand/offtake is needed from established users, whose volume depends mostly on the plant capacity.
- A supportive and enabling regulatory environment. In Denmark, where it is widely used, customers in district heating zones are obliged to connect to the network, lowering the demand/market risk.
- Acceptable costs and time to convert an existing housing estate to district heating compared to connecting a new housing development.
- A recognition that long implementation periods are required, whilst capital is invested upfront³¹.

Eneo solar solutions (Sweden) – project under Infranode (see Section 4.10)

Infranode has entered a SEK 100 million (EUR 9.7 million equivalent³²) partnership in **Eneo**, a Swedish company providing solar panels and geothermal heat pumps for real estate owners. Infranode offers a full service from developing a strategy to subscribing to solar and geothermal heat pump energy as an uncomplicated service. Eneo finances the investments and receives inflation-linked payments under a long-term (20 years or more) lease or power-purchase agreement. The initial investment in Eneo, for a portfolio of newly constructed facilities and projects under construction, was SEK 22.1 million (EUR 2.15 million) with another SEK 78 million (EUR 7.55 million) reserved for future projects.

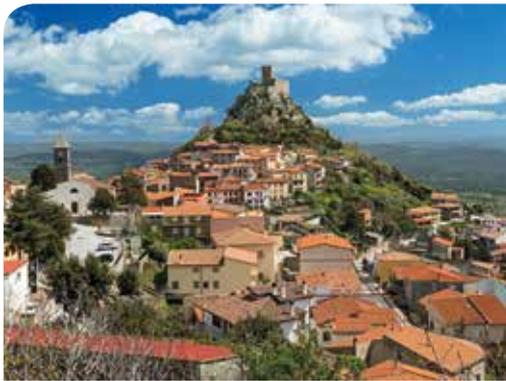


Infranode invests in Eneo alongside its holding and third party investors. Infranode's investment is in the form of preferential shares, carrying a dividend right up to a predefined percentage of the internal rate of return which, in the absence of refinancing, is expected to take place at the back-end of the initial customer contracts (i.e. beyond year 20). Infranode's investment carries strong minority protection, board representation, a veto right for investment decisions, and control over adding new debt to the portfolio.

This type of investment can also be based on an agreement with an Energy Supply Company (ESCO) which can provide upfront capital in return for a typical 10 to 15 year energy supply agreement. The ESCO can install and operate just the energy plant supplying the district heating system from various resources (e.g. biomass, geothermal heating) or can also finance and install the district heating piping as well.

³¹ A Report on District Heating as an Enabling Technology for Biomass in Public Sector Buildings and the Wider Community in the Western Region - September 2012 - RASLRES (Regional Approaches to Stimulating Renewable Energy Solutions) project led by Western Development Commission, funded under the Northern Periphery Programme of INTERREG IVB.

³² December 2018.



JESSICA Sardinia (Italy) installed renewable energy systems (photovoltaic) in municipal premises (school, town hall, sport venues).

Project promoter: Municipality of Burgos (ca. 1000 inhabitants)

Project total amount: EUR 287 000

Loan/equity investment by the financial instrument:
EUR 120 000

Other technologies, for example photovoltaic, could also be used in public buildings such as schools, kindergartens and sports halls, also in combination with initiatives addressing energy efficiency. This can be very beneficial for local communities, as heating public schools and sports facilities can be more than two thirds of heat consumption in a small municipality³³. In this respect, experiences from the JESSICA initiative in the 2007-2013 period (see box beside and Sub-section 4.9) provide concrete examples and case studies.

ENVO BIOGAS TØNDER (Denmark)

The project is to construct and operate a facility producing greenfield biogas as well as biogas to methane upgrading, including seven remote intermediate storage facilities for feedstock and digestate. The facility will produce a minimum of 61 million m³ of biogas per year and upgrade it to natural gas quality for the national gas distribution network.

The main feedstock will be cow and pig manure from 100 to 120 farmers within 20 km of the plant, as well as lignocellulose material from agricultural crops and green waste streams from the food industry within the limits under the Danish feed-in subsidy scheme for biogas.

Project revenues are mainly based on the sale of natural gas to the Danish utility company DONG and a national subsidy scheme administered by Energynet.dk (an independent public company owning the electricity and gas transmission systems) ensuring minimum prices for the biogas plant.

Farmers enter a supply agreement with the borrower (see below), to process their manure and, through its anaerobic digestion, reduce its environmental load before spreading the degassed digestate on their fields as a fertiliser.

Key financial information

Total investment cost: ca. EUR 93 million.

- EIB provides secured senior debt of up to EUR 32.5 million, for up to 12 years, on a *pari-passu* basis with other intermediaries.
- EUR 32.5 million from commercial banks.
- EUR 27.8 million from promoter own resources.

Revenues based on the sale of bio-natural gas to the off-taker utility company DONG.



Borrower

ENVO Biogas Tønder, a Danish non-rated special purpose vehicle (SPV).

Promoter(s)

Pyrsey S.A, one of the largest companies in Argentina with extended experience in electricity distribution, renewable energy, agriculture and food processing.

ENVO Group A/S

³³ Fiaschi, D., Bandinelli, R., Conti, S. (2012), A case study for energy issues of public buildings and utilities in a small municipality: Investigation of possible improvements and integration with renewables, *Applied Energy - Volume 97, September 2012, pp.101-114*.



Main financial and economic risks

- Regulatory risk, subsidy payment system and any amendments to the subsidy scheme.
- Offtake risk and contractual arrangements. The subsidy scheme includes a compensation mechanism which is expected to largely mitigate the risk of gas price fluctuations.
- Continuous supply of feedstock (especially manure and household waste) backed by acceptable contractual arrangements.

Project objectives and expected results

Natural gas accounts for about 20% of the country's energy consumption; biogas production is predicted to double by 2020. Denmark is committed to achieving 100% renewable energy sourcing by 2050.

Since 2012, a national subsidy scheme (Danish 2020 Energy Agreement) has supported the production and upgrading of biogas.

- Farmers receive processed manure, which is better fertiliser than the non-processed equivalent.
- Reduces methane emissions from 37 million tonnes of manure produced each year.
- Renewable gas.
- Better fertilising effect of manure.
- Reduces unpleasant odour during application.
- Uses domestic biomass and waste resources.
- Generates jobs in rural areas.

Rural infrastructure projects show potential demand, in particular for investment in local biomass plants (i.e. forestry and agricultural biomass), also in connection with district heating. Such investments usually require high initial capital upfront, while the projects demonstrate sufficient revenue generation or cost savings usually in the operational phase to repay financial instrument support.





Potential financial instruments could include a guarantee, longer term loans or senior debt and long-term implementation. Potential project promoters are mainly investment companies or local utility companies, though private and institutional investors might also be involved (see also Infranode, Section 4.10). Public incentives for less profitable projects in the form of a state subsidy can help tackle supply and regulatory (i.e. heat tariffs) related risks (see ENVO BIOGAS).

Vasa Värme district-heating – Sweden (project under Infranode see Section 4.10)

Vasa Värme is a district-heating specialised holding that owns 100% stakes in Sweden's district heating plants for Kalix, Malmköping, Krokek, Edsbyn and Alfta. Together these deliver approximately 180 GWh of district heating annually to more than 1 000 connections in both small and large properties in Sweden. Some 98% of the fuel is biofuel with only 2% fossil fuel used during peak load.

Infranode has a long-term partnership with Vasa Värme to jointly develop and expand district heating in Sweden over the coming years, via a SEK 150 million investment (EUR 14.5 million equivalent³⁴) in new preferred shares. The shares carry a preferred dividend for 25 years. The instrument can be redeemed (by Vasa Värme) between years five and 10 with a predefined premium but from year 11 onwards with a gradually reducing redemption schedule up to year 25. Infranode's investment carries minor voting rights and strong 'debt-like' protection as any further debt issued by Vasa Värme will be junior to Infranode's. Penalties can be waived if the preferred dividend is not paid in a particular year.

Vasa Värme has an active mergers and acquisition strategy in the small to mid-cap Swedish district heating sector and plans to add about three assets over the coming five years. In the pipeline are also municipal street lighting investments as well as renovation and exploitation of old road station assets (to be sold by the Swedish road maintenance company).



4.2 Energy efficiency

Energy efficiency levels are generally significantly lower in rural regions as many buildings are older and more dilapidated³⁵. The potential for energy efficiency improvement in rural areas includes rehabilitating building envelopes, renovating heating and cooling systems, changing inefficient service equipment and improving internal and external lighting systems. At the same time, there may be fewer and more geographically scattered renovation projects, with less benefit from economies of scale³⁶.

Investments in improved lighting tend to be relatively small, with high impact (from efficiency savings) and shorter payback periods, depending on the works required. On the other hand, investments in building renovation are much more complex and financially demanding, especially if combined with renewable energy sources. The payback period for building insulation envelope improvement is normally longer than 20 years and there are lower incentives to renovate buildings with potentially higher savings.

³⁴ December 2018.

³⁵ FREE (2012), Policy Recommendations for Sustainable Rural Communities in Europe White Paper, November 2012, p.105.

³⁶ Buildings Performance Institute Europe (2011), Europe's buildings under the microscope – A country-by-country review of the energy performance of buildings, p.41.



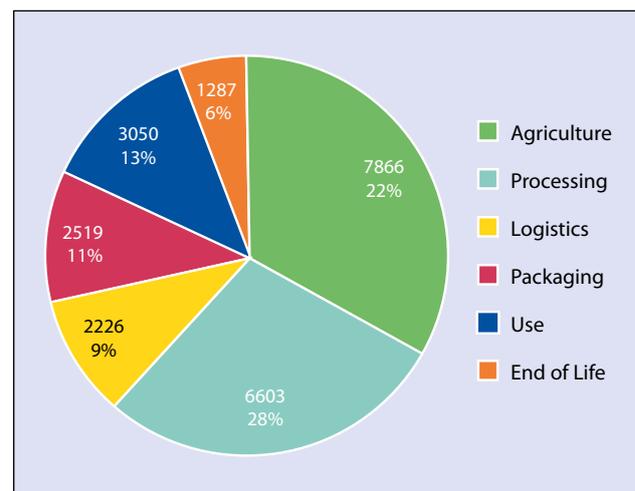
An important contribution to increasing energy efficiency investment can be provided by Energy Performance Contracting (EPC), where an ESCO undertakes and finances energy efficiency improvements in food processing enterprises, public buildings or street lighting on behalf of public authorities, including rural municipalities. When expected energy savings over the life of the contract cover the costs of such work, EPCs are a potentially interesting area of infrastructure investment for rural municipalities, schools and hospitals. Recent changes to the statistical treatment of such contracts in government accounts offer a (renewed) opportunity for more of these works to be undertaken and financed ' off the public balance sheet'. While there is a real need for experienced ESCOs, until recently there were few mature markets, such as in Germany, the Czech Republic, France and Austria³⁷.

A review of EPC in rural areas highlights an example from Slovenia for the renovation of three public buildings in the Municipality of Brda with a population of 5 700 inhabitants. This increased the energy efficiency and use of renewable energy for GOLEA, the Energy Agency of Primorska municipalities³⁸. Comprehensive renovation of the buildings was completed via EPC including energy supply contracting, use of renewable energy and biomass fuel. Financing was provided by ERDF grants, the municipality's own resources and ESCO (25%) with a total investment cost of EUR 2.5 million. The ESCO is going to finance itself from savings over 15 years. Building on the positive experience of the EPC model, Slovenia is preparing a financial instrument for ESCO financing.

There is high potential for energy efficiency investment in the agri-food supply chain. As Figure 6 shows, the amount of energy embedded in producing food consumed in the EU-27 in 2013 was estimated to be 283 Mtoe³⁹, or 17% of the gross energy consumption and 26% of final energy consumption⁴⁰.

One-third of energy embedded in the production of food consumed in the EU-27 is related to the primary agricultural production phase (including livestock breeding and the management of agricultural waste), followed by more than a quarter related to industrial processing, which together with logistics and packaging add up to almost half of all the energy involved. In addition, about 60% of the energy embedded in European food production derives from agriculture and logistics, two sectors largely dominated by fossil fuel usage.

Figure 6: Energy embedded in food consumed by the average EU-27 citizen (in MJ), by food production (step. 2013 estimates)



Food production systems vary substantially in their energy use and their potential for energy efficiency measures, depending mainly on the particular activity involved, combined with agro-ecological conditions. The food chain is characterised by different production processes and equipment, resulting in varying demand on energy supply. Besides heat and electricity, which are covered in the classic EPC model, other transformed energies, e.g. steam, cooling, process heat or compressed air play an important role and offer many possibilities for implementing energy efficiency measures. This means that opportunities for energy savings are numerous⁴¹. With decreasing battery and fuel cell prices, it is also likely that electricity will become a key energy source for the majority of the machinery used in agriculture and other mechanical processes.

37 Boza-Kiss, B., Bertoldi, P., Economidou, M., Energy Service Companies in the EU - Status review and recommendations for further market development with a focus on Energy Performance Contracting, Publications Office of the European Union, Luxembourg, 2017.

38 <https://www.golea.si/primer-iz-prakse/>.

39 European Commission - Joint Research Centre - Energy use in the EU food sector: State of play and opportunities for improvement. Monforti-Ferrario et al., 2015.

40 Gross energy consumption is the quantity of energy necessary to satisfy all consumption in the area, while final energy consumption is the energy consumed by end users, such as households, industry and agriculture and excludes the energy sector itself.

41 OECD (2017), Improving Energy Efficiency in the Agro-food Chain, OECD Green Growth Studies, OECD Publishing, p.8.



JESSICA Sardinia (Italy)

Various energy efficiency interventions on public buildings (solar heating, lighting, photovoltaic platform roofs).

Project promoter: Municipality of Baradili (83 inhabitants)

Project total amount: EUR 120 000

Loan/equity investment by the financial instrument:
EUR 120 000

Project reviews show that energy efficiency measures in rural areas tend to be smaller compared with investments in public or residential buildings. This may relate to a lack of sufficient scale to mobilise funding on a stand-alone basis. Financial intermediaries invest in a portfolio, pooling smaller projects (see box beside and then JESSICA model at Sub-section 4.9).

Financial models such as EPC that support energy efficiency in public buildings in small municipalities could also be financed 'off the public balance sheet'. In addition, energy savings in the Greek Existing Housing Programme co-funded by the ERDF⁴² during 2007-2013 also provides an example of a national financial instrument supporting energy saving investments in residential buildings in all Greek regions, including rural areas. Financing was provided to 51 152 households as a reduced interest rate loan combined with a grant at the end of implementation in March 2017. The financial instrument included a combination of resources and pooled relatively small-scale projects addressing considerations related to less populated areas, attracting private investment into such areas.

In conclusion, although there is no experience of financial instruments dedicated to energy efficiency in rural areas in the EU, this section highlights similar projects and challenges for EAFRD financial instruments supporting energy efficiency in rural infrastructure. The projects show that different types of project promoter can operate at local level (e.g. municipalities, facility management companies, ESCOs) and that private financial intermediaries can co-finance projects alongside EAFRD financial instruments.

4.3 Smart services and rural villages

Many European rural areas are locked into a 'circle of decline' by two mutually reinforcing trends. Firstly, a shortage of jobs and sustainable business activity and secondly, inadequate and declining services⁴³. The emerging concept of 'smart villages' aims to reverse this trend by developing opportunities that build on the existing strengths and assets of rural communities. These include, for example, the natural and cultural heritage of villages and rural landscapes, with a value for tourism, as well as agricultural and forestry holdings willing to expand their markets, through product diversification and innovation along the supply chain. All this contributes to improve the attractiveness of rural areas and improved rural infrastructure. In smart villages traditional and new networks and services are enhanced by digital, telecommunications technology, innovations and the better use of knowledge, which benefits inhabitants and businesses⁴⁴.

42 See *fi-compass Case Study 'Energy Savings in Existing Housing Programme, Greece'*, 2019.

43 *European Network for Rural Development (2017)*, ENRD Smart Villages Thematic Group: Revitalising rural services through social and digital innovation - Scoping Paper and Work plan, working draft.

44 *European Commission (2017)*, *EU Action for smart villages*, p.3.



Trento Public Infrastructures Framework Loan (Italy)

A regional framework loan for multi-sector investment schemes to renovate and rehabilitate municipal, provincial and other public facilities and infrastructure included in the Province's Development Programme.

The EIB loan (EUR 174 million, up to 20 years maturity) accounts for 48% of the total Framework Loan investments (EUR 361 million). 393 projects in multiple municipalities were financed by 2018, of which 225 have been already completed. The average project size was around EUR 1 million.

The loan, through the financial arm of the Province of Trento, Cassa del Trentino, supports provincial and municipal projects, i.e. urban infrastructure (including streets, transport and public open spaces), education and sport, social and health infrastructure, social housing and cultural heritage.

Sectors involved - projects

Transport: New stations for public transport (buses, hydrogen technology), upgraded rail tracks, newly constructed or upgraded bus maintenance centres, parking, video surveillance and control system, upgraded rolling stock (both trains and buses) and cycling paths.

Urban infrastructure: Rehabilitation and renovation of historical buildings, museums, historical centres, as well as public spaces (parks), fair halls and congress centres.

Infrastructure for public services: Public buildings used for public services; town halls, civil protection and other public institutions.

Environmental infrastructure: Upgraded infrastructure for drinking and waste water, solid waste and energy distribution (electrification).

Education: Reconstruction and extension of schools and other training facilities, as well as sport facilities.

Social care: Reconstruction and renewal of social care facilities dealing with elderly, youth and people with limited mobility.

Information technology: A newly-constructed ICT centre for the Province and extension of the broadband network infrastructure.

The borrowers are Cassa del Trentino SpA, Patrimonio del Trentino SpA and Trentino Trasporti SpA, which in turn implement the investments according to their specialisation.

Although the three borrowers are legally independent entities the Province of Trento (project promoter) has full controlling power over their processes and finances. The Province of Trento also acts as guarantor. Following this experience, the EIB has provided further credit lines including Multi-Beneficiary Intermediate Loans (MBILs) and global loans for investment programmes to these entities (either together or alone), focusing on sectors such as transport and energy efficiency.



Successful roll out and deployment of the smart villages concept requires using different tools and mechanisms to ensure funding for diverse smaller projects. Project promoters could involve public and private stakeholders, as well as cooperatives, local associations and supply chain companies.

Smart villages encompass a wide range of different services, projects and activities, including smart parking, mobility and transport infrastructure, sports and recreational facilities, energy efficiency investment in buildings, water management and waste treatment, which are usually delivered in clusters. Initiatives need strategic approaches enabling local innovation, supportive governance, integrated and targeted funding, as well as coordinated investments in people and infrastructure⁴⁵.

While dealing with local projects, financial intermediaries with strong knowledge of the context, play an important role in deploying resources to final recipients and ensuring the compliance of each investment with the local development strategy. Experience shows that when deploying many targeted, low volume investments in specific territories, the greatest impact is achieved by relying on local financial intermediaries to assess the viability of each project and link them with local development strategies.

BELFIUS SMART CITIES

A multi-scheme operation in Belgium including investments in urban renewal and development, social and affordable housing, energy efficiency, renewable energy, sustainable transport, water, solid waste and ICT.

Key financial information

- Intermediated framework loan. EIB funds: EUR 200 million; BELFIUS own funds: EUR 200 million.
- All schemes are expected to be economically viable and are appraised according to their cost-effectiveness and ability to meet objectives and targets.
- Sub-projects are included in the budget and strategic plans of local and/or regional governments.

Project objectives and expected results

- Innovative and integrated investments contributing to Smart Cities, Circular Economy and Climate Action Enabling sustainable growth.
- Improved quality of life.
- Improved quality of environment.
- Enhanced conditions for businesses.



Borrower

Belfius is the recipient bank of the EIB loan. Belfius on-lends to local, regional or inter-communal public authorities, public service companies, organisations and ESCOs (matching EIB funds with own resources).

To date, some 1 million inhabitants have benefited from investments under the Smart City Belfius facility.

More than 30 projects worth some EUR 282 million have been successfully completed across the Belgian territory covering urban regeneration, energy efficiency, and sustainable mobility.

⁴⁵ European Network for Rural Development (2017), ENRD Thematic Group on Smart Villages - Highlights of the 1st meeting.



Projects examples



Heer-sur-Meuse (<6 000 inhabitants): transformation of a dangerous crossroad into a communal square with modern street furniture and LED lighting.



Dour (<17 000 inhabitants): first organic swimming pond in Belgium, as part of transforming the disused Belvédère site into a unique recreational and sports centre, focused on swimming and tennis, relaxation and education about the environment. Combined with grants.



Sint-Amands (<8 000 inhabitants): transformation of former shoe factory in Sint-Amands, closed in 2011, into a sustainable multipurpose community centre for citizens and local associations.

Although there are currently no examples of financial instruments directly addressing investment needs in smart villages, the projects reviewed in Sub-section 4.9 (e.g. Belfius, Trento public infrastructure and JESSICA Sardinia) provide an indication of how similar investments were financed. The projects include small operations in a wide range of sectors such as village renewal and development, social and affordable housing, energy efficiency, renewable energy, sustainable transport, water, waste, local markets, broadband and ICT. These were driven by various stakeholders including local, regional or inter-communal public authorities, public service companies, organisations and ESCOs.

In the projects all investments are financed through loans (with JESSICA at preferential conditions), which indicate the possibility to set up financial instruments. JESSICA Sardinia is an interesting example as this structure allowed project pooling to provide private investors with critical mass and risk diversification. Financial intermediaries also provided technical assistance to the project promoters, tackling a possible lack of knowledge which could be a constraint in rural areas. This helps develop a pipeline of 'bankable' projects, ensuring this financial instrument achieves its financial and strategic objectives.

4.4 Waste treatment

A proper waste management and resource recovery strategy requires considering technical, social, legal, environmental and economic issues. These factors are quite different in rural and urban areas⁴⁶. Remote and rural areas often face additional challenges due to difficult access to centralised municipal treatment systems, or a dispersed population⁴⁷.

⁴⁶ Mihai, F. C. (2017), Solid Waste Management in Rural Areas.

⁴⁷ Hidalgo, D., Martín-Marroquín, J. M., Corona (2017), F., Innovative Waste Management Practices in Remote Areas, *World Academy of Science, Engineering and Technology International Journal of Environmental and Ecological Engineering* Vol:11, No:7, 2017, pp.571-575.



Most solid waste technologies are expensive and require critical mass or scale for them to be sustainable, which is more difficult to achieve when solid waste management services cover only rural areas. This may imply facilities covering multiple small municipalities in a relatively large area. However, identifying the critical mass for a municipal waste management system always depends on multiple factors and local circumstances. These include the systems and technologies used for waste collection and treatment, as well as household income, which affects affordability.

Small municipal facilities may already exist. For example, community composting is a typical in rural areas. This involves collecting biodegradable waste from householders and processing it centrally, within the local community. The end product is used by householders participating in the scheme. Composting can be based on very labour or capital-intensive technologies as well as specific siting requirements.

Example projects financed by financial instruments (see Infranode or Marguerite Fund, Sub-section 4.10) normally refer to larger facilities serving urban centres. Such projects often have economic and financial characteristics which make them suitable for private investment and the use of financial instruments.

The example in the box highlights how PPPs could be useful when dealing with larger amounts of finance and with experienced stakeholders. Financing waste sector infrastructure in general tends to be complex and requires specific sectoral knowledge highly dependent on local regulations. Similar to renewable energy investments, this requires significant upfront financial resources and high risk tolerance from potential investors. Municipal budget cuts also limit public investments in the sector and this is more likely in rural areas. In addition, rural areas often have lower population density and lack technical capacity and financial knowledge for both public authorities and private project promoters. Institutional investors might be attracted to provide long term finance and larger scale rural investments by large EU level investment facilities (see Marguerite Fund, Sub-section 4.10).

The use of financial instruments combined with grants could improve the bankability of smaller projects, reducing the cost of an investment and helping to overcome reduced profitability from a lack of critical mass. The analysis could not, however, provide any conclusive indications.

Clearly, investment in small municipal facilities, such as the community composting plants mentioned above, can be financed through financial instruments under a Smart Village Initiative (see Sub-section 4.3).



ITPOK - Poznań energy-from-waste (Poland) – Marguerite Fund (Section 4.10)

The project covers the financing, design, construction and operation of a municipal waste incineration plant with a capacity of 210 000 tonnes per year. The plant was procured through a PPP between the City of Poznań and SUEZ Zielona Energia (founded by SUEZ Polska and Marguerite, which own 50% of shares each) including a 25 year operating period following construction. The financing of ITPOK in Poznań is innovative and the project is one of the first undertakings of this type in Europe. The PPP contract has been drafted to allow for a combination of funds from the private partner with EU funds. At the same time the private partner guarantees to cover the entire project financing. Some of the project's key features include:

- A project cost of PLN 725 million (EUR 170 million equivalent⁴⁸).
- Financing from SUEZ Zielona Energia's own funds (the City will not bear any additional costs), in the form of 20% as capital from shareholders (including Marguerite Fund), and long-term loans granted by three Polish banks: Pekao SA (PZU Group), PKO BP and the NPB Bank Gospodarstwa Krajowego (BGK) for the remaining 80%.
- The project has been co-financed by PLN 352 million (EUR 80 million equivalent) of EU funds under the Infrastructure and Environment Operational Programme (OP).
- The plant was opened in 2016 and reduces municipal waste going to landfills in accordance with EU directives and Polish law.
- Thermal energy from waste incineration will be collected by VEOLIA Energia Poznań, which manages the district heating network, while electricity will go to the power grid. Revenue from the sale of energy will go to the City.

Obligations of SUEZ Zielona Energia:

- Design, financing, construction and management of the plant.
- Transfer of revenues from the sale of electricity and thermal energy to the City.
- Management of the plant in accordance with the permits and the law.
- Maintaining the plant in good technical condition.
- Hand-over of ITPOK to the City after the expiry of the contract.

Obligations of the City:

- Hand-over the land for the plant construction.
- Covering the costs of disposal for 210 000 tonnes of waste per annum.



Project promoter

City of Poznań, Poland

Project total amount

PLN 725 million

Implementation of the project through a PPP (design, financing, construction and operation) between the City of Poznań and SUEZ Zielona Energia allowing for a combination of funds from the private partner with EU funds.

4.5 Supply chain and short supply chain infrastructure

During the last two decades, the offer and availability of commodities has increased significantly with an increased variety of goods, just-in-time delivery, low load rates, specialised and centralised production systems, as well as globalised marketing and trade. This has resulted in the need for continuous improvement in logistics services and related infrastructure⁴⁹.

⁴⁸ December 2018.

⁴⁹ Gebresenbet, G., Bosona, T. (2012), Logistics and Supply Chains in Agriculture and Food, Pathways to Supply Chain Excellence, Dr. Ales Groznik (Ed.), ISBN: 978-953-51-0367-7, InTech, p.1.



Connections with urban centres are key for the development of rural areas. In particular, investment in infrastructure to enhance exchanges in tradable goods and services can strongly impact productivity and the economic performance of rural areas⁵⁰.

Supply chain infrastructure investments can strengthen the competitiveness of rural/agricultural enterprises by diversifying markets, optimising logistics costs, increasing capacity for (cold) storage and warehousing as well as increased ripening facilities, enabling seasonally independent distribution and longer shelf-life.

Furthermore, emerging technological breakthroughs associated with digitalisation (including automation and artificial intelligence), decentralised energy generation and cloud computing have an impact on production possibilities and access to goods and services. Using new technology to map the availability and location of existing physical infrastructure can support effective distribution and enhance rural-urban links and access to markets. Mobile equipment such as mobile drying, abattoir equipment or wine bottling can also support the rural supply chain.

Likewise, network building among stakeholders across the supply and marketing chain, including collaborative governance, can reduce costs significantly. This could promote transport coordination and integration for distribution, or develop stakeholder platforms based on shared values to enhance marketing and tourism. Additionally, investment in alternative marketing channels can improve integrated processing and marketing while reducing transport demand and cost. Supply chain efficiency also depends on road infrastructure quality and connectivity, especially with consumers, markets and processing operations and better transport infrastructure would result in lower transport costs for rural road users.

Supply chain infrastructure investments can cover the optimisation or upgrade of existing logistics infrastructure through efficient warehousing and storage or distribution centre management, as well as new locations. In the United States, for example, grain farmers initially benefited from low-interest loans for storage facilities⁵¹ which were then extended to fruit and vegetable producers for cold storage. Furthermore, changes to these loans in recent years have made them also available for washing and packing sheds and portable storage equipment. Investments financed through the loans should improve the ability of farmers to sell in local and regional food markets, generating sufficient returns to finance the facilities they need to keep food fresh and safe prior to marketing.

⁵⁰ Rural 3.0, A framework for rural development, OECD, 2018.

⁵¹ See <http://sustainableagriculture.net/publications/grassrootsguide/credit-crop-insurance/farm-storage-facility-loans/>.



Different RDP measures and tools can be used at the different development stages in the agri-food supply chain. Various opportunities to add value in these supply chains use different combinations of finance for investment, including financial instruments or resources under EFSI. The European Network for Rural Development (ENRD) Thematic Group on Smart and Competitive Rural Areas also recommends using integrated packages of support to respond to market trends.

In Europe, Italy's Lombardy Region has set-up a financial instrument (EAFRD Credit Fund under the RDP 2014-2020) to support better integration within the agri-food chain through product quality schemes. These add value to agricultural products in local markets, short supply chains and associations as well as producer and inter-branch organisations⁵² (focus area 3A⁵³). The Lombardy Region managing authority programmed an operation under the RDP providing a combination of grants and low interest rate investment loans for a total of EUR 54 million. Eligible expenditure includes the construction or improvement of processing or marketing facilities, the acquisition of new plant and machinery, as well as the acquisition of new information technology equipment directly related to the investments aimed at promoting the territorial, economic and social development of local rural systems.

Whilst the global flow of goods seamlessly reaches well established markets and hubs, it has fewer possibilities to penetrate at local and rural levels. In Lombardy, short supply chains are important and need to be enhanced as they suffer chronic disadvantages. In rural areas, scattered settlements lead to relatively high logistics costs for agricultural enterprises and particularly for small-scale producers transporting goods to consumers, markets or processing operations. The small quantities demanded by the consumer or available from the provider increase the relative and absolute cost of distribution. Therefore, distribution and logistics for a short supply chain need to be simple, quick, flexible, cheap, transparent, integrated and reliable.

The projects below are examples from the JESSICA initiative in Bulgaria and Sardinia, with evidence from the 2007-2013 period. These show how market infrastructure investments in urban areas were financed through financial instruments that helped mobilise funding for modernisation. This highlights the potential for similar support to develop rural and local markets in small municipalities.



JESSICA Bulgaria financed the reconstruction and modernisation of the central municipal open-air marketplace in Stara Zagora. Initially the market was open-air, unprotected from the weather, without ventilation or heating and has worn out stalls of different types and sizes. After reconstruction, the market has been covered and closed with a metal construction and glass windows, as well as new electrical, water supply and sewage networks. The premises are ventilated and heated, stall sizes and types were unified and the outer appearance and attractiveness of the market was improved.

Project promoter: Municipality of Stara Zagora (Bulgaria)
Project total amount: EUR 1.4 million

52 See *fi-compass Case Study EAFRD Credit Fund Lombardy 2014-2020*. As at the end of 2017, resources allocated to the financial instrument were EUR 33.2 million, of which EUR 14.3 million were the EAFRD contribution and EUR 18.9 million the national contribution to be implemented under sub-measure 4.2 'Processing, marketing and development of agricultural products' through integrated supply chains and integrated territorial projects.

53 EAFRD focus area 3a: 'Improving the competitiveness of primary producers by improving their involvement in the food chain through quality schemes, increasing the value added of agricultural products, promoting sales for local markets and short supply routes, producer groups and organisations and trade associations.'



JESSICA Sardinia (Italy) is financed the refurbishment and expansion of the public marketplace and underground parking facility.

Project promoter: Municipality of Oristano (Italy)

Project total amount: Total project costs of EUR 4.1 million (of which EUR 1.1 million were financed under JESSICA, while the remainder was financed by public resources and to a lesser extent by private partners).

Some energy efficiency solutions mentioned in Sub-section 4.2, and their related financial schemes, are suitable for the supply chain where they can increase efficiency and generate savings in production processes, logistics and storage facilities. In this respect, investments in renewable energy, energy efficiency and supply chains offer inherent synergies.

Based on the above, EAFRD can be used to enhance the bankability of projects with an acceptable level of risk and able to generate a commensurate return for investors and lenders.

4.6 Broadband and ICT

Digital technologies are important in the everyday lives of most Europeans. The internet has made it possible for people, businesses and governments to transform the ways in which they communicate and engage with one another. In 2016, less than two thirds of the EU population living in rural areas accessed the internet on a daily basis, compared to three quarters of city-dwellers. There are widespread differences between EU Member States, often along geographical lines with Northern and Western European countries generally using the internet more than their Southern or Eastern counterparts⁵⁴. The *Study on Broadband Coverage in Europe 2017*⁵⁵ shows that, by mid-2017 nationally, 80.1% of households had Next Generation Access⁵⁶ broadband, compared to 46.9% of rural households. The 33.2% difference was 3.5% lower than in the 2016 study, but the difference remains sizeable. To achieve a Digital Single Market, substantial investments in building and expanding high-capacity broadband infrastructure are required. While most of this investment must come from private operators, it is clear that in remote and rural areas some form of public financing will be necessary.

Broadband and ICT investments in remote areas typically yield lower returns and therefore have much longer payback periods. This makes them less attractive for private or revolving forms of investment (such as financial instruments). In all Member States, roll-out costs and commercial viability are highly correlated with population density, especially for fixed line networks. For instance, the cost of deploying a Fibre-to-the-Home (FTTH) connection can easily vary by a factor of four between a dense urban cluster and a remote farming area, which can explain why rolling out broadband infrastructure can be particularly difficult in sparsely populated rural areas⁵⁷.

Demand aggregation is important, as usually at least 2 000 household connections are needed to make such projects viable. Socio-economic analysis provides for a more thorough understanding of demand, especially so-called 'non-line', age structure, average income, persons per household, possible high-end users for extra revenue, etc.

⁵⁴ European Commission (2017), Eurostat regional yearbook 2017 edition, p.264-265.

⁵⁵ European Commission (2018), Study on Broadband Coverage in Europe 2017 carried out by IHS Markit and Point Topic.

⁵⁶ Next Generation Access describes modern forms of superfast broadband access commonly defined as at least 30 Megabits per second (Mbps). This is a step change in speed and quality of internet access compared to standard broadband services.

⁵⁷ European Commission (2014), Ex-ante assessment on the potential use of financial instruments within the Connecting Europe Facility.



For providers, Fibre-to-the-Building or FTTH in rural areas can involve lower operational expenditure. Various factors, including soil classification, availability of cost-saving technologies, and possibilities to use existing infrastructure, affect deployment cost.

In any case, successful realisation of Broadband and ICT projects in less populated areas are likely to require substantial public support in the early phases of the project (assessment and development in particular). Projects will also have longer payback times and lower returns. To mitigate these risks and make projects financially viable from the outset and attractive for private sector investment, public support (usually in the form of capital grants) or a partial guarantee to investors may encourage investment in projects with a low financial yield but high economic and social value added returns.

The need for public support for broadband roll-out in remote areas, and the potential to attract private capital, is well explained in the Greek case study below. This project provides a useful and potentially replicable example of a PPP with EAFRD resources.



Broadband Network Development in White Rural Areas of Greece

The project provides broadband infrastructure and affordable connectivity services to citizens in areas of Greece which are mountainous or insular, remote and lagging behind that are not connected to the digital world. The project develops a broadband infrastructure network that covers such areas in the Northern, Central and Southern regions of Greece. These make up almost 45% of Greek territory and private providers alone would not invest due to a lack of commercial interest in catering for only 6% of the country's population. The project also concerns the network's operation for 15 years. The network offers wholesale broadband services to retail internet service providers (ISPs), while the latter provide retail services to end-users.



The project is being implemented following the PPP model of build, operate, transfer. The private partner will not offer commercial services to end users but will provide wholesale services to all third party ISPs, following an open access model. The ISPs will offer retail services to end users (citizens, enterprises and the public sector), using the network services and facilities. Third party ISPs will pay a fee for using the infrastructure and wholesale services. Fees (wholesale prices) will be defined and monitored by the Greek authorities. Ownership of the network infrastructure will remain public and at the end of the operational period all network assets and rights will be transferred back to the Greek authorities.

Development of the broadband infrastructure relies on two approaches which are sometimes combined:

- Wireless, a network solution based on technologies such as Long-Term Evolution.
- Wire-line approach, a network solution based on fibre optics (xDSL technology). Here, the existing copper network (last mile passive infrastructure) will be used through local loop (or sub-loop) unbundling.

The project is divided into two phases:

- During a first two-year phase (implementation), the new network is deployed and broadband services are launched.
- During a second 15 year phase, the network is operational and the services available for use.

Development of the network, as well as its management and operations were awarded through an open tender process. At the end of the 15-year operational period, Greek authorities may initiate a new awarding procedure to choose a new operator.

Achievements

More than 5 000 villages and 525 000 inhabitants in rural mountainous and insular areas of the country are targeted. The benefits of such broadband access are improved living, work and communication conditions, as well improved quality of digital services such as e-government, e-health and e-skills. Specifically, the following benefits are expected:

- Reduced digital divide among Greek citizens.
- Contribution to the Next Generation National Broadband Access Plan.
- Contribution to the objectives of the Digital Agenda 2020.
- More employment by stimulating local entrepreneurship.
- Increased competitiveness of SMEs.
- Strengthened tourism in covered areas.
- Strengthened e-Government.
- Retained population in rural remote areas.

Key information

- The project promoter is the General Secretariat of Telecommunications and Post of the Ministry of Digital Policy, Telecommunications and Media.
- Total cost for implementing the project is EUR 199 million. EUR 161 million is eligible for co-financing by 2007-2013 and 2014-2020 ERDF and EAFRD programmes (of which around 80% is from ERDF and 20% from EAFRD) while the remainder is covered by national private funds.
- The cost for the operation period (including reinvestment) is covered by private funds.
- Private partner selected to operate the network (including maintenance and reinvestment).
- Special Purpose Vehicles look for external debt financing during the operation period.



An instrument at EU level to address the growing demand for financing of smaller-scale broadband projects across Europe is the Connecting Europe Broadband Fund (CEBF), which uses resources from the CEF. The Fund (further described in Sub-section 4.10) is the first investment platform to support broadband infrastructure under EFSI, targeting typically rural regions with scattered settlements and areas where private investment needs to be reinforced.

The experiences mentioned in this paragraph, and others reviewed for the analysis, show that financing structures combining private capital with public resources in the form of grants or equity, can be particularly effective in attracting private investors. ICT companies can be project promoters and contribute to funding for the project.

As already indicated by the EC,⁵⁸ grant financing is often needed for broadband in the most remote areas, which may otherwise be unprofitable. However, a public contribution through financial instruments can attract additional long-term private investment by reducing short-term risks where the business case can be positive only in the long term. By blending (i.e. combining both forms of public financing) in areas with commercial potential for very high capacity networks, grants are needed only to build a business case in unprofitable sub-areas, while maximising private sector involvement across wider areas.

Investment in large networks can clearly be complemented at local level, with small-scale projects enabling rural communities to take full advantage of broadband connections. Such investments clearly fall within the scope of the Smart Village Initiative.

58 *Connectivity for a Competitive Digital Single Market - Towards a European Gigabit Society - COM(2016) 587 final.*





4.7 Irrigation, water supply, and purification

In the EU, significant investment is still needed to replace, renovate or upgrade existing water utilities and improve their resource efficiency so they can provide water security in the future and remain compliant with EU Directives. The EC estimates that the EU investment need in this sector is some EUR 25 billion annually⁵⁹.

Climate change is, especially in Southern Europe, already impacting water resource availability and demand which will most likely worsen and extend to other areas in the future. This implies increased investment needs in almost all rural regions to improve the efficiency of water management systems to cater for changing climate conditions⁶⁰.

The Mediterranean region is expected to be most affected by climate change in terms of water availability. More precisely, a +2°C global warming scenario implies water availability in the region falling by 20-30%⁶¹. As a result, investments in climate change adaptation have become a priority in the EU. For example, Cyprus and Malta are constructing seawater desalination plants to ensure a reliable and continuous drinking water supply and mitigating the dependency of cities and tourist centres on rainfall.

Spain, which also suffers from a chronic structural water deficit, has stepped up its activities dealing with water reuse and desalination in recent years. In the region of Murcia, which forms part of the most water-stressed river basin in Spain, the reuse of water in agriculture has been a key priority and 65% of irrigable land uses water from wastewater treatment plants⁶². Large investments have also been made in modern irrigation technology. The provincial government in Albacete (Spain), for example, developed an irrigation scheduling service to provide farmers with weekly forecasts of crop water requirements⁶³.

59 European Commission, *Eighth Report on the Implementation Status and the Programmes for Implementation of Council Directive 91/271/EC concerning urban waste water treatment* (2016).

60 See for example *European Landowners' Organisation* (2015), *Climate change and the rural economy Managing land in the face of climate change*.

61 IPCC (2007), *Climate change 2007: the physical science basis*, S. Solomon et al. eds., *Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, UK: Cambridge University Press.

62 Navarro, T. (2018), *Water reuse and desalination in Spain—challenges and opportunities*, *Journal of Water Reuse and Desalination*.

63 Montoro, A., López-Fuster, P. & Fereres, E. (2011), *Improving on-farm water management through an irrigation scheduling service*, *Irrigation Science* 29, 311–319.





Water management projects require very diverse long-term investment. Incentives to undertake such investment are also diverse, as service providers may operate only in rural areas, or in suburban and urban areas, affecting their respective cost structures. More generally, local legal frameworks for water supply services and local characteristics of water resources, can lead to different economic and managerial efficiency⁶⁴. This also implies that any economic potential for a PPP to develop smaller scale, for example village level water treatment plants strictly depends on local conditions. There are different financing models in the sector including PPPs. However, specific legislative frameworks mean that the financing option in each Member State will reflect local conditions.

In addition, water management investments should consider that residential water demand is relatively inelastic, but not totally unresponsive to changes in price. From this perspective, the literature highlights that any public subsidies and grants should focus on reducing connection charges rather than water tariffs, which could result in unwanted overconsumption.

Modernising existing irrigation systems and reinforcing pumping capacity can bring water and fossil fuel energy savings, where substantial increases in irrigable areas may positively impact the rural economy but lead to increased demand for irrigation water. Irrigation planning should take into account the major crops and cropping pattern as water requirements vary across crop types⁶⁵. At the same time, farm or district irrigation scheduling decision support systems can generate additional water savings and profit margins compared to traditional technologies^{66,67}.

64 See for ex. Sauer, J. (2005), Economies of scale and firm size optimum in rural water supply, *Water resources research*, Vol. 41.

65 This includes example of farmers abandoning irrigation due to a lack of economic motivation, for example Cuesta, T.S., Cancela, J.J., Dafonte, J., Valcarcel, M., Neira, X.X., (2005), *Social aspects influencing water management in the Lemos Valley Irrigation District, Spain*. *Irrigation and Drainage* 54, pp. 125-133.

66 For a discussion of these systems see Giannakis, E., Bruggeman, A., Djuma, H., Kozyra, J., Hammer, J. (2016), Water pricing and irrigation across Europe: opportunities and constraints for adopting irrigation scheduling decision support systems, *Water science & technology: water supply* 16.1, pp.245-252.

67 For example, in Emilia-Romagna, Italy, the regional government co-funded a web-based irrigation scheduling tool to ensure efficient use of water resources in the agricultural sector. See Mannini, P., Genovesi, R., Letterio, T. (2013), *IRRINET: large scale DSS application for on-farm irrigation scheduling*, *Procedia Environmental Sciences* 19, pp.823-829.



A difficulty in determining the appropriate levels of water tariffs, and in collecting them, may lead to significant delays in works and maintenance when funds are scarce, which is a specific risk for irrigation investment projects. Additionally, important private farm investments are required to fully exploit the production potential of new irrigated areas and rehabilitated sites. However, these additional investments at farm level can also magnify the impact of projects.

An example of an irrigation project financed in this way is the *MBIL to Comunidades de Regantes*. The 'Comunidades de Regantes' are a collective group of farmers managing agricultural land in a defined area. They are accredited, monitored and supervised by the local river basin authorities and comply with procedures and rules established by the Spanish Water Act. Spanish legislation recognises the activities of the Comunidades de Regantes as the outcome of a series of delegated administrative powers.

According to their statutes, they are entrusted by the public authorities and their members with managing, maintaining and, if needed, building the infrastructure required for an efficient and coordinated use of water for farming. Their activities are deemed to be in the general interest as they are not directed towards profit-making, since the entities are not acting in a normal market and as the entities are not bearing the losses from their activities. The central role of such water user associations as a catalyser of finance and direct link with local needs is the real added value of the project.

MBIL FOR COMUNIDADES DE REGANTES (Spain)

EIB provision of an MBIL (i.e. targeting multiple financial intermediaries) to credit institutions which on-lend to Comunidades de Regantes (i.e. Water User Associations - WUA) across Spain. The projects aim at upgrading and modernising irrigation water infrastructure, managed and owned by the WUA.

As beneficiaries of modernisation or rehabilitation of irrigation infrastructure, WUA typically chose between two models:

- Support from the National Irrigation Infrastructure Development Company (SEIASA) or its regional equivalents. This implies that SEIASA takes full control of the infrastructure, project design and implementation through its associated public Engineering, Procurement and Construction Management Company, *Tragsa*. If sub-projects are funded by SEIASA, payments to contractors are by the state body during the implementation period of up to five years, to contain any slippage in the initial budget. To meet payments, SEIASA progressively calls for 50% of the investment costs, provided by WUA private funds and provides a 50 year amortisation loan with a 25 year grace period. The 50% not financed by SEIASA may benefit from EAFRD support. The balance is typically debt financed by the WUA. Under this model, loans by private banking entities to the WUA can be optionally guaranteed by the Sociedad Anonima Estatal de Caución Agraria (SAECA), the Spanish guarantee scheme for agricultural investments.
- The project is promoted by the WUA itself, with *Tragsa* support in the design, permitting, procurement and implementation of infrastructure modernisation. The WUA may benefit from direct EAFRD or other grant support at the level of regional governments. Maximum grant support from the EAFRD is expected to average 50% of the project investment costs.



Borrower

- Comunidades de Regantes.
- Financial institutions, which appraise each sub-project individually, through a dedicated and experienced team across their branches.

Promoter(s)

Comunidades de Regantes.



The MBIL benefits from pre-identified borrower rural outreach as well as experience in the agricultural sector and in financing WUAs. Financial intermediaries under this facility usually have teams in place for originating, appraising and managing agricultural loans, including loans to WUA. The pre-identified borrowers have a portfolio of unsecured lending operations with WUA, which have allowed them to build convincing credit risk mitigation policies for risks from direct lending to these associative public entities. Sub-projects are selected on the basis of lists of financing requests under the RDPs at regional level, and on the pipeline of projects promoted by SEIASA and/or equivalent regional organisations.

At sub-project level, EIB resources may not exceed 50% of the total costs. Financing provided by the EIB loan and other EU resources (e.g. EAFRD grants) shall not exceed 90% of the sub-project cost in less-developed regions and 70% in developed regions, respectively.

Key financial information

- Estimated total investment of EUR 300 million.
- EIB loan: EUR 150 million with long tenor (20 years).
- The total loan for a sub-project from EIB resources may not exceed 50% of the total sub-project costs.
- Possible combination with EAFRD support at project level.

Financial and economic risks

- Insufficient pipeline.
- Ability of the intermediaries to appraise the projects.

With the support of EU policies and the National Rural Development Programme in Spain, modernisation plans facilitated the transition from surface to sprinkler and drip irrigation.

This modernisation has already impacted 1.5 million hectares out of 3.5 million hectares of irrigated land in Spain.

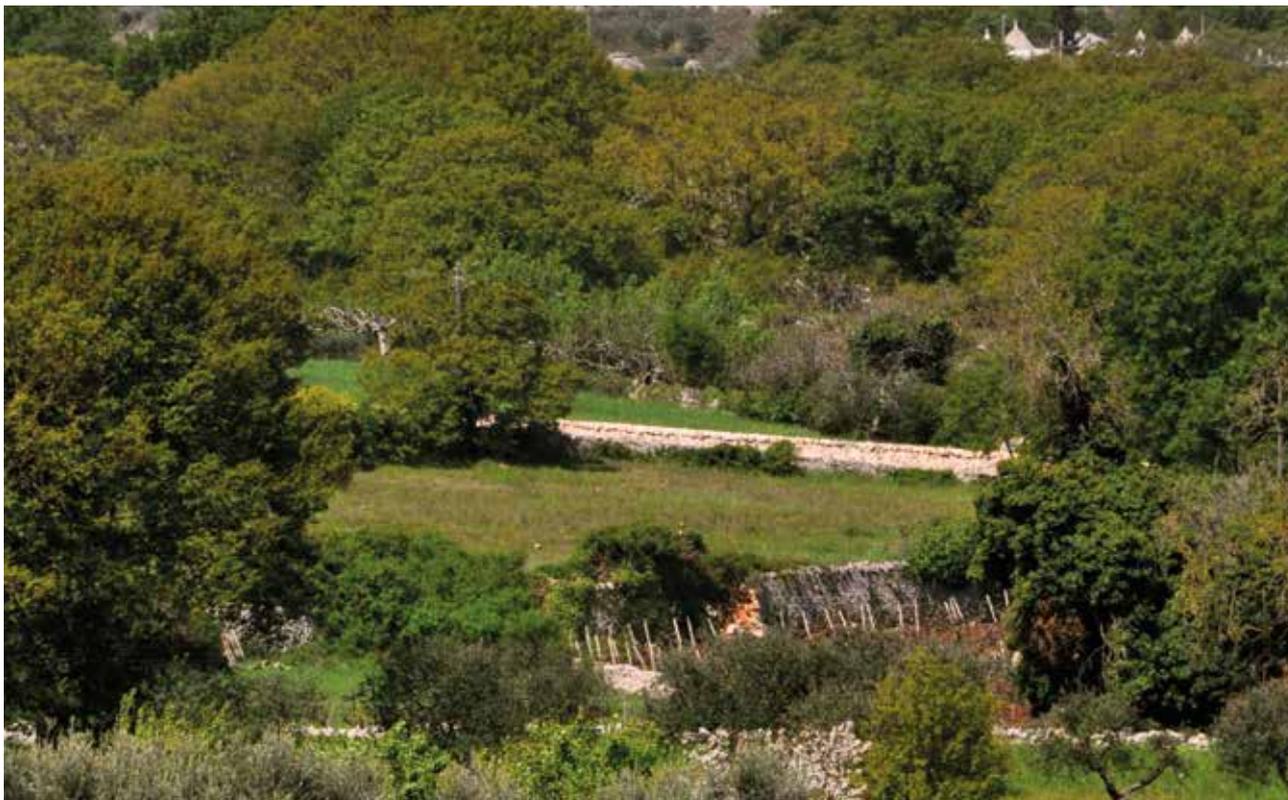
Project objectives and expected results

- The loan aims at improving the resource footprint of agricultural production and is expected to have positive spill-over effects on households in rural areas.
- The modernisation of irrigation infrastructure will result in water savings and enable improved business continuity.

Project insights

- Around 80% of sub-project allocations are expected to target the modernisation and upgrade of irrigation infrastructure that was designed for a different agricultural context. These projects will result in significant savings of water that are currently wasted through leakage and evaporation. This change in the water distribution network will also encourage farmers to invest in efficient irrigation methods (sprinkler or drip irrigation) as they will receive irrigation water at pressure at their farm hydrants. Together with conveyance system water savings, these associated investments will result in further water efficiency for farms.
- The remaining 20% sub-project allocations are expected to be modernisation for energy efficiency gains and the use of renewable energy in existing pressurised irrigation water conveyance systems. Such systems already supply water at pressure to farms in sprinkler or drip irrigation systems without additional pumping stations. A good proportion of these projects aim at benefitting from the elevation difference between water intakes and the irrigation areas to save or even completely remove pumping energy requirements. For the remainder, projects aim to replace pumping systems with new and more energy efficient ones, or systems that link pumping stations with renewable energy generation facilities built specifically for this purpose.

In conclusion, no relevant projects were found for water management and purification for residential use in rural or less populated areas. Some projects were found relating to irrigation. The one presented above highlights the potential to attract private investors and is financed through bank loans in combination with EAFRD grants. Although the Comunidad de Regantes are specific to Spain, public or private bodies managing irrigation facilities in other countries could play a similar role.



4.8 Forestry

Alongside built and human capital, natural capital contributes to Europe's competitiveness, economic prosperity and human well-being, while also contributing to the environmental sustainability of human activities. Its impact on competitiveness and growth includes lowering the costs of strategic inputs (e.g. water) or increasing productivity of key factors (e.g. land). Sustainable forest management and well-designed forestry investments are fundamental to environmental benefits including climate change mitigation and adaptation. Forests are a major carbon sink, forest assets can be managed as a renewable energy source and forests are expected to be an important raw material for second generation biofuels. Other benefits are improved management of soil and water resources (watershed protection against erosion, flood prevention) and biodiversity protection (habitat protection, wildlife corridors, riparian zone preservation).

However, forestry investment has long been considered excessively risky. Financial support for natural capital and biodiversity lagged behind in the recent years, contributing to the failure to reach EU and global biodiversity targets for 2010. To preserve the health of natural ecosystems and deliver positive measurable outcomes, significantly more capital investment is required than the public funding currently allocated to natural capital. Private sector investment needs to be leveraged to supplement traditional funding sources which have been impacted by the global economic downturn.

For the purpose of this document, forestry infrastructure includes:

- A facility easing the exploitation of natural assets and recovering natural biodiversity.
- Sustainable commercial exploitation of forestry/natural facilities.



Roughly EUR 10 billion per year is available in the EU for the protection of natural capital. This is equally shared between financing for protected areas (Natura 2000⁶⁸) and support for green agriculture practices from the CAP budget. The EIB estimated that at least EUR 50 billion per annum is necessary for the next 15-30 years to reverse the trend towards deterioration and to protect and enhance the EU's natural capital⁶⁹.

European forestry is a mix of different landscapes, with small-scale and large-scale forest holdings as well as private and public ownership. Most private investments in forestry concern wood production, and compete with alternative land use such as agriculture, amenities and recreation. According to EIB analysis, timber and biomass demand is expected to increase in EU developed and developing countries driven by an increased use of wood as a recyclable and biodegradable material in developed countries (construction and green building, bio-energy) as well as demographic and economic growth in emerging economies.

Irish sustainable forest fund – project under Natural Capital Financing Facility (NCF) (see Section 4.10)

This fund promotes a transition from traditional monoculture forests (even-aged, regularly clear cut and unable to improve biodiversity) to Continuous Cover Forestry which have diverse, mixed-aged species that are selectively thinned every 4-5 years (harvesting single trees or groups of trees) and then allowed to regenerate naturally.

The project promoter has purchased some 5 000 hectares of forest and is transforming them to Continuous Cover Forestry, improving biodiversity and environmental sustainability. Such a transformation also has a positive economic impact for the project promoter's business, as wood production is stabilised and maintenance costs are reduced. Therefore, the Irish sustainable forest fund business plan combines economic appeal with positive externalities.



Main financial data

- The fund size is EUR 50 million.
- EIB equity participation in the fund is EUR 12.5 million, 10-year term (40% of which is guaranteed by NCF).
- Expected internal rate of return of 6.5%.
- Comprehensive technical assistance paid by the NCF facility for the fund manager.
- No co-investment, the fund will typically acquire 100% ownership of forest assets.

Rationale

- Private forest owners do not have the capacity to professionally manage their assets, therefore an equity-type investment and a portion of technical assistance are beneficial.
- Other forms of support to farmers for afforestation (payments under CAP) are ending.
- Good market demand - round wood and biomass supply fall short of Irish demand.

Scale differences between private and public forest holdings may be associated with the availability of investment capital. This has led some countries to establish grants and/or soft loan schemes for forestry investment projects. In a similar way, profitability differences based on forestry know-how and fixed costs can be overcome with efficient co-operation, and by using contractors and service contracts for consultants or wood buyers.

68 http://ec.europa.eu/environment/nature/natura2000/index_en.htm.

69 Costing the environmental needs related to rural land management – Institute for European Environmental Policy - 2011.



Public support for large-scale forestry needs to consider the risk of crowding-out private investment, mostly in a market as well developed and dynamic as the EU. Moreover, small-scale forestry usually has high transaction costs and, for economically profitable investments, needs to be larger scale. Profitable project types in forestry include acquisition, afforestation/reforestation, forestry measures (biodiversity, carbon sequestration, impacts on water systems), depending on local conditions. Furthermore, restitution in former socialist countries and reorganised boundaries require mapping or land surveys to help develop the good governance structure necessary for implementing successful projects.

Rewilding Europe – project under NCF (see Section 4.10)

In this project, the EIB provided a loan of EUR 6 million to Rewilding Europe Capital, a microfinance institution that supports nature-based businesses in rewilding areas and which has already raised EUR 500 000 in its incubation phase. It identifies local entrepreneurs and businesses and connects with environmentally minded investors or potential business partners.



Rewilding Europe Capital will lend to small enterprises investing in commercial activities or businesses that generate economic or social benefit in ways that catalyse, support or achieve environmental (rewilding) outcomes and impacts. Rewilding Europe targets enterprises willing to integrate rewilding objectives into their business plans, meaning enterprises generating direct or indirect finance, incentives or engagement for rewilding, with a positive impact on nature or the comeback of wildlife. Of course, this is all based on a viable business that operates sustainably.

Rewilding Europe also offers technical assistance to promote the financed enterprises commercially.

Financial and economic risks

- Small and high risk projects are not financed without a risk-protection mechanism (guarantee).
- Target operations are expected to be risky (sub-investment grade) due to their innovative profile.
- Small-scale investors do not necessarily have experience in generating revenues from the new eco-services and businesses they are investing in.
- Project objectives and expected results.

Project objectives and expected results

- Contribute to competitiveness and growth.
- Lower the cost of providing strategic inputs (e.g. water).
- Increase productivity of key factors (e.g. increase land productivity).
- Improve the lack of financial resources to support natural capital and biodiversity.
- Leverage private sector investments to supplement traditional funding.

In conclusion, the analysis shows that investments in forestry infrastructure can be supported through financial instruments.



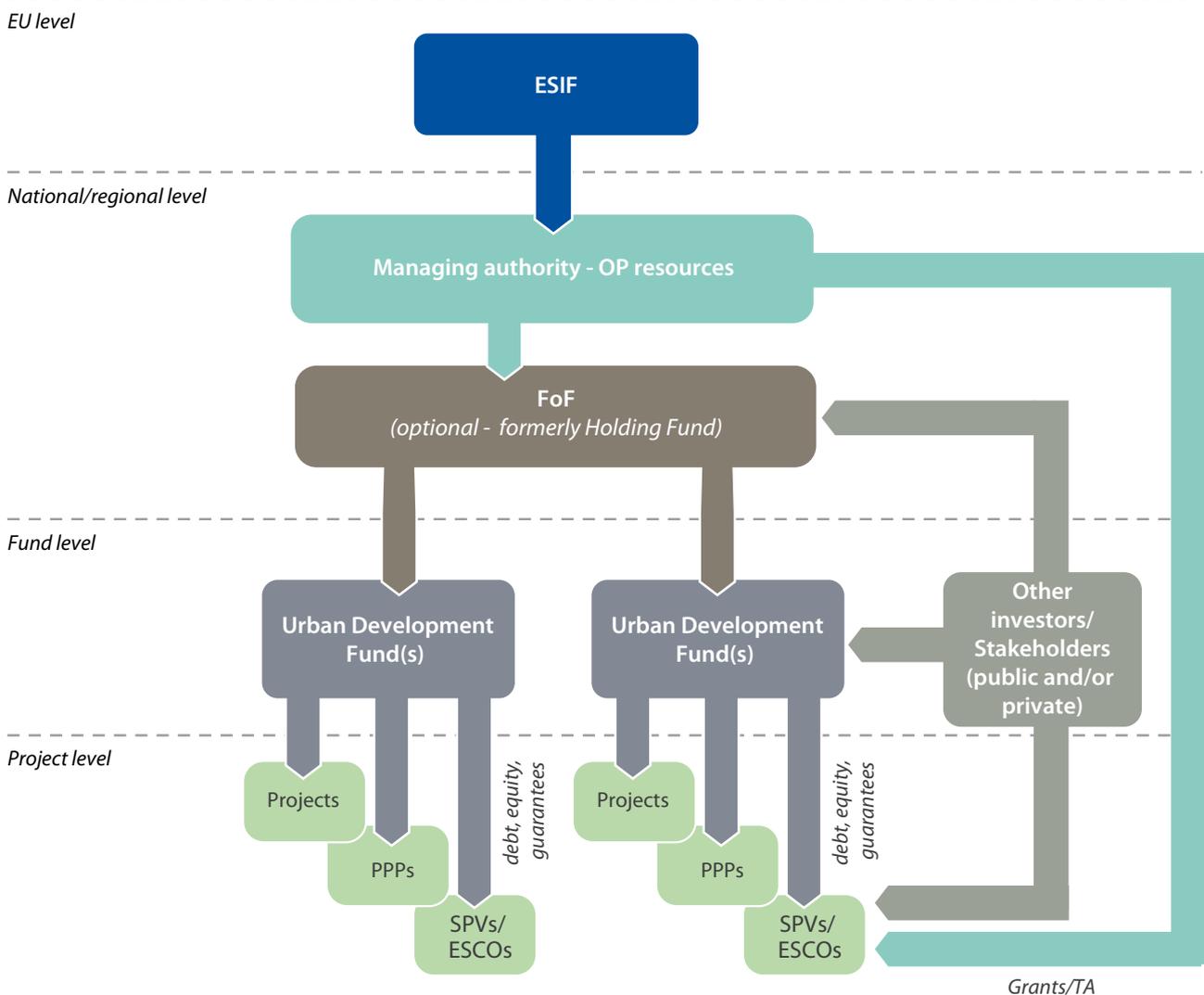
4.9 JESSICA experiences

JESSICA was a policy initiative of the EC, developed jointly with the EIB and in collaboration with the Council of Europe Development Bank. JESSICA was launched in 2006 to promote the use of financial instruments in support of sustainable urban development.

According to eligibility rules of the European Structural Funds, and of OPs providing financial support to JESSICA initiatives around Europe, projects typically included:

- Urban infrastructure, especially transport, water/waste water, energy, etc.
- Energy efficiency improvements.
- Heritage or cultural sites, for tourism or other sustainable uses.
- Requalification of brownfield sites, including site clearance and decontamination.
- Office space for SMEs, ICT, R&D.
- University buildings, including medical, biotech and other specialised facilities.

Figure 7: Typical JESSICA financial instrument delivery structures





ESI Fund contributions were allocated to urban development or energy efficiency funds investing in public-private partnerships or other projects included in an integrated plan for sustainable development. Urban development funds provided equity, loans and/or guarantees that, owing to their revolving nature, could promote the sustainability and impact of EU and national public money. At project level, combination with non-repayable forms of financial support, including grant schemes, often mitigated project risks and attracted private capital.

JESSICA SARDINIA

JESSICA Sardinia was a financial instrument in the 2007 to 2013 programming period. EIB manages the Holding Fund (fund of funds) which oversees two Urban Development Funds, one devoted to urban regeneration and another to energy efficiency. The funds are managed by specialised financial intermediaries with a solid local presence, enabling the deployment of JESSICA support to projects in Sardinia.



JESSICA Sardinia is financed by ERDF resources.

21 local authorities are the largest **final recipient** of the Fund, although JESSICA Sardinia could also be delivered through PPP.

Banks and special purpose entities act as **financial intermediaries** and appraise the projects.

Key financial information

- Established in 2011 with ERDF resources of some EUR 80 million; with co-financing at financial intermediary level possible.
- Investments in urban regeneration projects and energy efficiency or renewable energy projects promoted by the public sector and PPPs.
- EUR 200 million total investments.
- Full disbursement by June 2016.
- 37 projects financed.

Financial and economic risks

- Strict eligibility requirements meant that many projects were rejected.
- Inadequate project quality and implementation due to lack of technical assistance.
- Rigid investment strategy (e.g. initially excluding private promoters).

The portfolio included both niche operations (projects of about EUR 90 000, mostly in small villages) and major infrastructure projects (e.g. a gas network).

Strong partnership (intermediary bank and their advisors) aimed at scouting projects across the territory and creating a pipeline of feasible projects.

Project objectives and expected results

- Generating high social impacts.
- Reducing external energy dependency.
- Improving energy efficiency.
- Ensuring lower heating bills for residents.
- Generating lower carbon emissions.
- Fighting climate change.
- Reducing environmental impact.



Lessons from urban development funds operating under the JESSICA initiative are that their success in investing in sustainable urban projects, flexibility, and leverage of private resources, depended to some extent on the capacity of intermediaries, fund managers or other stakeholders to raise awareness of the instrument and undertake project scouting, selection and due diligence, within the context of ESI Funds and other regulatory constraints (such as eligibility and State aid rules).

Initially conceived for urban and sub-urban contexts, some interesting projects were financed in smaller municipalities and rural areas (examples from Bulgaria and Italy on supply chain, renewable energy and energy efficiency are provided in Sub-sections 4.1, 4.5 and 4.6).



Biogas plant serving the town of Ozieri (12 000 inhabitants). More than 2 000 MWh per year; CO₂ emission reduction of more than 1 000 tonnes per year.

Project promoter: Chilivani Ambiente S.p.A. (public-private special purpose entity)

Project total amount: EUR 4.8 million

Loan/equity investment by the financial instrument: EUR 0.9 million

Particularly within the experience of JESSICA in Sardinia Region, several projects have been promoted by (and implemented in) small municipalities (remote/rural villages). The projects highlight the ability of the JESSICA scheme to cater to smaller municipal financing needs, helping also to overcome fiscal and budget constraints in case a PPP structure is foreseen. Moreover, when no private resources are involved in the financial structure of the projects, there is nevertheless a positive outcome for the municipalities: the energy efficiency solutions put in place form a new, stable asset of the borrower, leading to important savings that allow the repayment of the initial investment.



Renovation of a municipal building, transformed into a commercial activity (restaurant) managed by young local entrepreneurs selected via public procurement.

Project promoter: Municipality of Borutta (ca. 300 inhabitants)

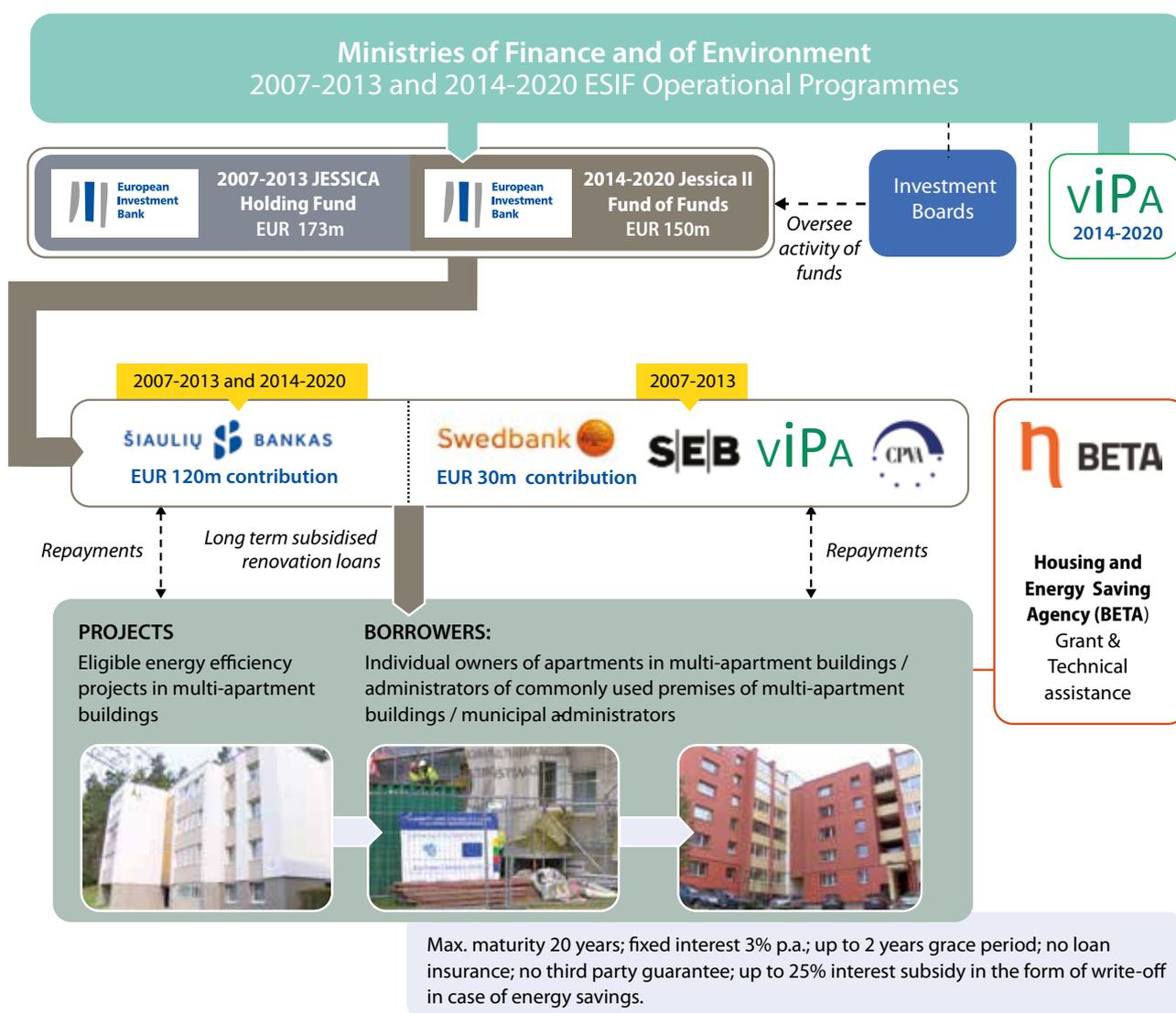
Project total amount: EUR 265 000

Loan/equity investment by the financial instrument: EUR 251 000

Figure 8 below illustrates the Lithuanian experience with JESSICA, implemented through ERDF resources in the 2007-2013 and 2014-2020 periods and aimed at financing improved energy efficiency in residential buildings. Although the example was applied to urban areas, so areas with many apartments, a scheme delivering energy efficiency for residential and commercial buildings could be replicated in a rural context. Moreover, single ownership which is typical for rural households or agricultural holdings would facilitate such schemes.



Figure 8: JESSICA Lithuania's functioning scheme⁷⁰



4.10 Funds and Investment Platforms

Analysis of the sub-sectors highlights several ways to finance infrastructure investment and crowd-in financial resources and knowledge (for further detail, see Section 5). In addition to financing stand-alone projects, one way to finance infrastructure is through investment platforms or funds. Those are usually managed by professional teams, who pool resources from different sources (own, public and private resources) and invest them in specific, medium to long-term infrastructure projects (via equity, quasi-equity, loans, etc.). According to the scope and mission of each fund and investment platform, they could invest in a wide range of projects spanning several sectors (like Marguerite Fund and Infranode) or may target a specific sector (NCFE, Connecting Europe Broadband Fund).

All the examples below envisage the involvement of the EIB as an investor, fund manager, or both.

The boxes describe the functioning and rationale for two investment platforms or funds with multi-sectorial approach.

⁷⁰ Reproduced from presentation on JESSICA II in Lithuania in the 2014-2020 Operational Programme delivered by Agnė Kazlauskaitė, Ministry of Finance, Lithuania and Junona Bumelytė, European Investment Bank at fi-compass seminar FIs for energy efficiency in the programming period 2014-2020, Vienna, 20 October 2016, https://www.fi-compass.eu/sites/default/files/publications/presentation_20161020_vienne_agne_kazlauskaitė_1.pdf.



INFRANODE (Nordic Countries)

EIB investment in an investment platform to provide capital for implementing medium-sized, local, privately promoted infrastructure projects.

Infranode aims at making equity and quasi-equity investments in companies active in infrastructure sectors such as energy, transport, waste, water, telecommunications and social infrastructure. Investments are restricted to North-Western Europe with a focus on Nordic countries (Sweden, Finland and Norway).

The fund intends to build a diversified portfolio of 10 greenfield and brownfield equity investments of EUR 10 to 60 million. The investment period is three to five years and the fund duration is 25 years.

The fund follows a 'buy, grow and hold' strategy, to develop infrastructure assets by investing through existing operators and enhancing growth through new capital expenditure.

Key financial information

- Total investment: EUR 415.54 million.
- EIB loan share: 20%.
- Portfolio of equity/quasi-equity long-term operations.
- The target internal rate of return on the loan is 6-9% over the life of the investment platform.
- The Economic Rate of Return across the portfolio is expected to exceed 7%, including the benefits of avoided greenhouse gas emissions.



Financial and economic risks

- Potential markets, sourcing strategy and strategic positioning.
- Stability of the regulatory framework.
- Exposure to market and resource risk.
- Fund management and team experience.
- Potentially conflicting interests between fund compartments.

The public sector in the Nordic countries is under heavy pressure to curb its debt burden despite a current low cost of financing.

A shortage of internal resources pushes the public sector to involve private investors in infrastructure construction and operation.

The need to invest in modern infrastructure remains high.

Project objectives and synergies

- Climate change agenda.
- Sustainable transport (urban and inter-urban).
- TEN-T complementarity.
- The digital agenda for Europe initiative of the Europe 2020 strategy.
- EU security of energy supply objectives.

Projects in which Infranode has invested are presented in boxes under Sub-sections 4.1.



MARGUERITE FUND I & II (EU)

Marguerite is an investment platform providing equity to transport, energy, renewable energy, energy efficiency, ICT / broadband and water treatment infrastructure projects.

Marguerite I was established in 2010 to invest in transport, energy and renewable energy infrastructure projects and companies. Marguerite II continues this and has expanded the scope to the energy efficiency, ICT/ broadband and water sectors. Contrary to the first edition and thanks to EFSI contributions, Marguerite II also participates in early project phases (the riskiest ones), acting more as a 'project enabler'.

Marguerite is targeting market segments with a recognised equity financing gap, in particular greenfield and expansion projects. More specifically, Marguerite invests in medium and large greenfield infrastructure projects, in particular for development, construction and ramp-up risk, where equity is still scarce and where most private investors still prefer 'brownfield' investments that already generate income.

Marguerite's strategy is to sell its assets shortly after construction and ramp-up. This addresses the significant interest of institutional investors in operational infrastructure assets once they are de-risked and have demonstrated a stable cash yield flow.

Key financial information

- Marguerite I is fully invested (over EUR 700 million in commitments for equity and quasi equity capital to 20 investments in 13 Member States).
- Marguerite II has a target size of EUR 700 million, with an EIB investment of up to EUR 200 million.
- Institutional investors: Caisse des Dépôts et Consignations France, Cassa Depositi e Prestiti Italy, Instituto de Credito Oficial Spain, KfW Germany, and Bank Gospodarstwa Krajowego Poland (EUR 100 million each).
- Segments with recognised equity financing gap.

Financial and economic risks

- Market potential and specific project risks.
- Fund management.
- Project eligibility criteria.
- Legislation and regulation changes in target sectors and countries.

Fund investments are expected to contribute to EU priority objectives for transport, energy, renewable energy, energy efficiency, ICT/broadband and water treatment.

The market potential of these sectors is expected to be substantial as demand for such investments is growing significantly.

Project objectives and expected results

- Enhance energy supply security and independence for EU Member States.
- Contribute to greenhouse gas emissions reduction and preservation of the environment.
- Reduce transmission/transportation costs or increase the integration of EU economies.

A project in which Marguerite has invested is briefly presented in the box under Sub-section 4.4.



Borrower

Special purpose entity/fund.

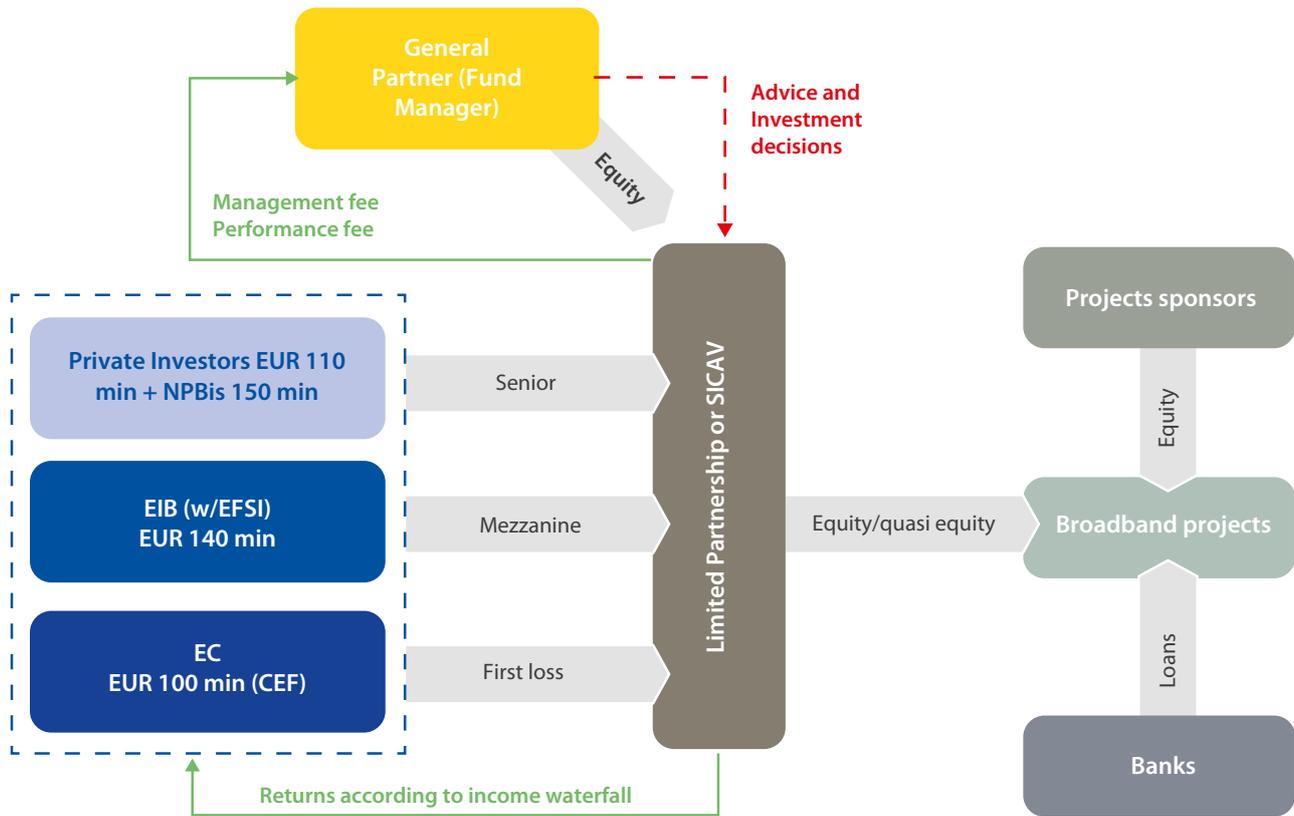
Promoter(s)

Special purpose entity/fund.



As noted earlier, an innovative instrument being developed to address the challenge of connectivity in remote areas across the EU is the **CEBF**.

Figure 9: CEBF envisaged functioning scheme



This fund targets rural and sparsely populated areas where private investment needs to be reinforced using resources from the CEF. A EUR 100 million contribution from the CEF aims at unlocking investments of EUR 500 to EUR 600 million, by providing first loss credit protection to the EIB which, also using the EFSI guarantee, provides credit protection to private investors and NPBs. Investments by the fund are expected to be minority equity participations in some 50 smaller greenfield broadband projects, mostly in less-densely populated areas, and therefore with a higher risk profile. Target investments are expected to be private sector mid-caps or SMEs, PPPs, and financial intermediaries.

The CEBF was in its start-up phase as this report was being written and no further information on its implementation was available. Nevertheless, Figure 9 shows that the facility reflects investor interest in a layered structure with waterfall returns, as traditional debt does not always attract private money into this sector. The CEBF structure has similar principles to other EAFRD financial instruments, where the EAFRD contribution covers the riskiest share of the investment portfolio.

Finally, another example of a fund with a well-defined sector orientation is the NCCF, which financed some examples above.



NATURAL CAPITAL FINANCING FACILITY – NCFE (EU)

NCFE is a joint EC-EIB instrument addressing the gap that existing funding (principally public grants) does not fill. Target projects would likely not be financed without a dedicated facility because of a lack of financial resources, market failures, the novelty of projects and perceived risks. NCFE complements existing sources of financing, including funding for agriculture and rural development, fisheries, regional policy and climate change. The facility aims at highlighting opportunities for the private sector to invest in natural capital. It looks to demonstrate that natural capital projects, currently perceived as small and high risk, can be scaled up and attract additional funding to complement public budgets and EU grants, without impairing public environmental protection objectives.



The NCFE supports projects delivering on biodiversity and climate adaptation through tailored loans and investments, backed by an EU guarantee. Projects need to generate revenues or cost savings.

The NCFE envisages blending EIB own resources with EC funds. The EC funds are subordinated to EIB finance to provide risk protection for the bank at portfolio level. The NCFE flexible mechanism provides direct and intermediated financing, including debt and equity products.

Eligible operations

Natural capital and nature-based adaptation projects that are eligible for NCFE are classified under four categories, of which two would best fit financial instruments:

- Payments for ecosystem services (e.g. programmes to protect and enhance forestry, biodiversity, or to reduce water or soil pollution).
- **Green infrastructure** (green roofs, green walls, ecosystem-based rainwater collection / water reuse systems, flood protection and erosion control).
- Biodiversity compensation beyond legal requirements (e.g. pools for on-site and offsite compensation projects).
- **Pro-diversity and adaptation businesses** (e.g. sustainable forestry, agriculture, aquaculture, ecotourism).

Key financial information

- EC provides risk coverage to EIB lending at portfolio level.
- NCFE thresholds: 75% of project costs for direct debt or 33% for equity.
- Tenor up to 25 years.
- An EIB contribution of up to EUR 75 million and an EC commitment of EUR 50 million (first loss guarantee); cap EUR 15 million per operation.
- Technical assistance for project promoters (EUR 10 million) managed by EIB.

Projects in which NCFE has invested are briefly presented in boxes under Sub-section 4.8.

5. MAIN FINDINGS





The infrastructure investment gap in the EU has increased in recent years due to a substantial decline in public investment primarily as a consequence of the financial crisis. Although specific data **for rural areas** is not available, a backlog **of infrastructure investment could be even higher in these areas** compared to urban areas.

Fiscal constraints still affect many EU Member States, so an increase of public investment is unlikely in the medium term. This means that **attracting private capital becomes key to tackling the current investment gap**.

As shown in the analysis, infrastructure as an asset class has specific characteristics that could make it attractive for private investors, particularly for institutional investors looking for long-term assets and a constant and relatively low risk revenue stream. At the same time, infrastructure investments are complex and construction periods normally lengthy. They require significant upfront financial resources while the payback is delayed. This could generate information asymmetries and a negative risk perception for investors. Public resources in the form of grants or guarantees are often used in all sectors to attract private financing (and expertise) for infrastructure projects. In some cases, this type of public support is provided through EU funds, under central or shared management.

Although the situation across the EU varies, **attracting private resources for infrastructure investment in rural areas implies additional challenges**:

- Projects in rural areas are normally smaller scale and the number of potential users is limited due to lower population density. These elements imply reduced economies of scale and lower revenues from operating the facilities, with a consequent **reduced profitability**. In addition, smaller projects, characteristic of rural areas, are also less likely to attract funding from large private investors (e.g. institutional investors).
- **Technical capacity is more likely to be a constraint** in rural areas, for both public authorities and private project promoters.
- The two elements above make **creating a pipeline of projects more difficult**.
- In addition, a lack of specific information on infrastructure investment performance in rural areas, means **the risk perception of private investors is higher than for urban infrastructure**.
- A proper use of public resources (including EAFRD support), particularly through **financial instruments, may address these challenges**. For example:
- Financial instruments **allow for project pooling**, providing private investors with critical mass and risk diversification to attract their funding.
- Public resources can be used to **increase awareness and build capacity in both public authorities and private project promoters**.
- Public resources can be used to **reduce risk and improve 'bankability' (e.g. with guarantees or combined with grants or interest rate subsidies)**, attracting private investment in rural infrastructure.

Public policy actions to promote the use of financial instruments and the participation of private investors in rural infrastructure projects can build on a number of positive indications which emerge from this report. **The analysis highlights projects in various infrastructure sub-sectors suitable for financing through financial instruments, primarily with debt. The analysis also shows that several projects actively involve financial intermediaries, including NPBs, contributing with own resources, providing technical assistance, or a combination of both.**

Investment potential in the different infrastructure sub-sectors

The analysis of projects provides preliminary suggestions of sectors which show more potential for using financial instruments and private investment related to rural infrastructure. It is important to note that the analysis is based on a limited number of projects and cannot provide conclusive evidence of investment potential and market gaps in the different sectors.



The table below summarises **sub-sectors that appear to have the highest potential for using financial instruments** as well as those with further, albeit more limited, potential:

Table 2: Potential for investing in rural infrastructures, by sector

Sectors with higher investment potential:
<ul style="list-style-type: none">• Energy efficiency (primarily in buildings).• Renewable energy (primarily biomass, wind and solar).• Rural Broadband (almost always in combination with grants).• Smart investments in medium/small municipalities.
Other sectors with some investment potential:
<ul style="list-style-type: none">• Irrigation.• Forestry.

Financing models

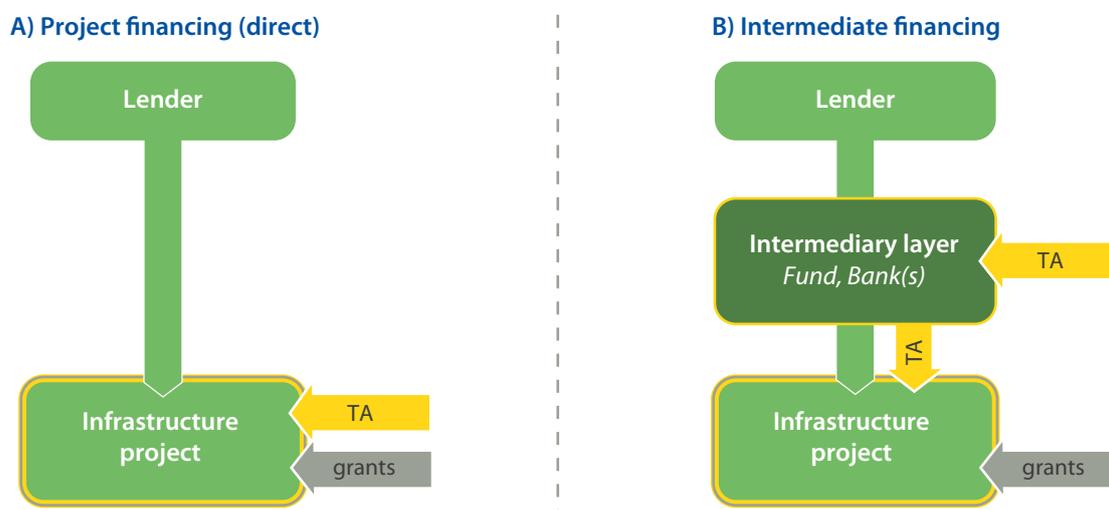
Although **infrastructure facilities in rural areas tend to be smaller**, findings from this report suggest that **larger infrastructure projects may also be needed in rural areas (for example renewable energy, broadband or irrigation network projects)**. Based on the analysis in Section 4 and graphically illustrated in Figure 10, two financing models emerge which are primarily determined by the size and creditworthiness of projects:

1. **Direct** financing on a stand-alone basis (i.e. project finance), with individual or stand-alone assessment of financing terms and project viability based on the creditworthiness of the project. Such projects usually generate revenue or cost savings that can be used to repay financial support on a stand-alone basis.
2. **Intermediated** financing for projects which do not have the creditworthiness or scale to be financed on a stand-alone basis. In such scenarios financing is provided by a financial intermediary to a portfolio of smaller projects.



Both models often reveal the need for capital grant funding alongside financial instrument support, as well as technical assistance to identify, appraise and prepare infrastructure projects for financing.

Figure 10: Financing options of rural infrastructure projects



There is also a **hybrid** type of financial instrument, i.e. a combination of the above, for financing multiple projects promoted by the same counterpart, a 'framework' loan. For example, a public authority (e.g. a region or municipality) is the borrower, then uses the funding to support multiple smaller-scale infrastructure projects. This form of financing is often seen as a relatively simple form of aggregating smaller-scale infrastructure projects, some of which may not be individually financially self-sufficient and where the credit risk for financial intermediaries is based on the municipality (or similar borrower) as a whole.

Scope and structure of existing financial instruments

The analysis shows existing financial instruments which, although not focused on rural areas, support rural infrastructure investments. **Two main structures reflect the financing models outlined above:**

- **EU level funds support large projects**, mainly renewable energy plants and broadband networks. The Marguerite Fund (see Section 4.10) supports larger scale renewable power plants and broadband projects. Under the CEF a specific fund was also recently established to promote the financing and development of broadband networks in less populated areas (CEBF, see Section 4.10). These funds normally finance projects directly, often through project finance.
- Other **national or regional funds focus on smaller infrastructure investments proposed mainly by local project promoters**. Some JESSICA funds established under the ERDF in the 2007-2013 programming period have continued as urban financial instruments in the current period. Although the JESSICA initiative was dedicated to urban projects, some of these financial instruments (e.g. Sardinia) successfully deployed the JESSICA model to a pool of smaller municipalities that may have easily classified as rural municipalities. **These financial instruments operate typically through financial intermediaries, which contribute additional resources and technical expertise**. The financial intermediaries normally help to identify and develop a pipeline of projects and, in some cases, provide technical assistance/support to project promoters. In some cases, this support is provided by a separate but complementary body or agency (as with the JESSICA fund for apartment block renovations in Lithuania).

Suggestions for policy actions

Policy indications **for a possible EAFRD financial instrument, imply that national and regional funds would be more appropriate** for a first initiative to promote the use of financial instruments for rural infrastructure.

Smaller scale local infrastructure projects could be a focus of EAFRD support. **The JESSICA initiative has shown the potential to attract financial intermediaries with knowledge of the specific territories that can provide expertise and technical support in addition to private financial resources.** Financial intermediaries who take ownership of the initiative at local level are also helpful for communication, awareness raising and building a pipeline of projects.

The possibility to create a platform at national or EU level to target larger rural projects should not be excluded as a policy option. As shown in this report, rural infrastructure potentially includes large projects with examples that are already financed or targeted by existing EU financial instruments and investment facilities. While a dedicated rural infrastructure platform would ensure more focus on rural areas, **'rural windows' in EU facilities for infrastructure may be an interesting policy option, potentially offering more synergies and efficiencies.** Given the **current low level of knowledge and awareness about financial instruments for rural infrastructure, it may be difficult to build a pipeline of projects and attract potential investors** for a dedicated EU level platform. Experience with financial instruments for SMEs shows that successful deployment of even one or two financial instruments at local (e.g. regional) level may be the best way to promote the use of these instruments.

Any initiative should be accompanied by a **horizontal communication and awareness raising campaign targeted at managing authorities, potential project promoters and financial intermediaries as well as RDP stakeholders generally.** EAFRD financial instruments for farmers and agri-food enterprises in this programming period have demonstrated that awareness raising and capacity building activities can be very effective with managing authorities and other stakeholders.

Financial instruments can only work when designed to tackle an existing financing gap in a given territory. Any suggestions on setting up a financial instrument and its potential structure can only be based on a **specific ex ante assessment, or feasibility study that assesses the market gap as well as enabling factors at the local level.**

Finding **project promoters with sufficient knowledge** may be an issue in rural areas. Considering potential public final recipients (e.g. municipalities), **indebtedness (debt ceilings) and fiscal constraints** may also be critical in some Member States and could even hinder the development and use of financial instruments.

Finally, the **presence and interest of financial intermediaries which can take ownership** and promote the instrument on the territory also has to be carefully assessed.





ANNEX I – LIST OF ANALYSED PROJECTS

The following projects were initially selected from the EIB's project database and other sources for further analysis in accordance with the objectives of the study. The projects were considered representative of their sub-sector and/or financed using financial instruments or other innovative financing means. This makes them representative of the types of rural and agricultural infrastructure projects that could be financed using financial instruments (potentially also combined with grants). A screening of the European Investment Project Portal, a public portal hosted by the EC and part of the Investment Plan for Europe initiative did not identify any projects relevant for this study.

#	Sector (cfr. §1)	Project name	Country
1	RE/EE, waste treatment	ENVO BIOGAS TONDER	Denmark
2	Broadband and ICT	EIR IRISH RURAL BROADBAND AND NETWORK INVESTMENT	Ireland
3	Waste treatment, irrigation, water supply and purification	MADRID WATER MANAGEMENT	Spain
4	Supply chain	NORMANDY DAIRY PRODUCTION FACILITY	France
5	RE/EE	ENERGY EFFICIENCY GUARANTEE INSTRUMENT LITHUANIA	Lithuania
6	RE/EE	LAHTI BIOMASS CHP PLANT	Finland
7	Waste treatment	URBASER WASTE MANAGEMENT RDI AND INVESTMENT	Spain
8	Irrigation, water supply and purification	PORTUGAL IRRIGATION PLAN	Portugal
9	Irrigation, water supply and purification	MBIL FOR COMUNIDADES DE REGANTES	Spain
10	Smart services and rural villages	SOMACYL URBAN AND RURAL INFRASTRUCTURE	Spain
11	Irrigation, water supply and purification	WATER SUPPLY OASEN	The Netherlands
12	RE/EE, waste treatment; smart services and rural villages	INFRANODE	Nordic countries
13	Broadband and ICT	RURAL BROADBAND (MGF)	United Kingdom
14	Smart services and rural villages	LOWER SILESIA REGIONAL ROADS PPP	Poland
15	Smart villages and rural villages	POZNAN MUNICIPAL RECREATIONAL CENTER	Poland
16	Smart services and rural villages	D4R7 SLOVAKIA PPP	Slovakia
17	Supply chain	FRENCH ANIMAL HEALTH R&D INVESTMENTS	France



#	Sector (cfr. §1)	Project name	Country
18	RE/EE	ELECTRICITY GENERATION WITH THE USE OF RENEWABLE ENERGY SOURCES	Hungary
19	Broadband and ICT	RURAL BROADBAND PPP IN GREECE	Greece
20	Broadband and ICT	CONNECTING EUROPE BROADBAND FUND (CEBF)	EU
21	Broadband and ICT, RE/EE, waste treatment	MARGUERITE FUND I	EU
		MARGUERITE FUND II	EU
22	Forestry, irrigation, water supply and purification, smart services and rural villages	NATURAL CAPITAL FINANCING FACILITY (NCFF)	EU
22a		IRISH SUSTAINABLE FOREST FUND (NCFF)	Ireland
22b		REWILDING EUROPE (NCFF)	Romania, Bulgaria
22c		HBOR NATURAL CAPITAL MBIL (NCFF)	Croatia
23	RE/EE	LOAN FUND FOR ENERGY EFFICIENCY IN HOUSEHOLDS	Greece
24	Forestry	DASOS TIMBERLAND FUND II	Finland, Baltic States, Romania and Poland
25	Smart services and rural villages	SMART CITIES BELFIUS – EIB PARTNERSHIP	Belgium
26	RE/EE, Smart services and rural villages	Joint European Support for Sustainable Investment in City Areas (JESSICA) – JESSICA HF Sardinia, JESSICA HF Lithuania and JESSICA HF Bulgaria	EU
27	Smart services and rural villages	Province of Trento PUBLIC INFRASTRUCTURES FRAMEWORK LOAN	Italy
28	Supply chain	EAFRD Credit Fund Lombardy 2014-2020	Italy



ANNEX II – MAIN FINDINGS OF THE WORKSHOP ON THE USE OF FINANCIAL INSTRUMENTS FOR RURAL, AGRICULTURAL AND FORESTRY INFRASTRUCTURES

Within the scope of this study, a workshop was organised in Brussels on 19 June 2018 by the EIB and the EC/ DG AGRI. The workshop aimed at:

- Presenting the preliminary findings of this study.
- Introducing the possibilities for rural infrastructure investment under the EAFRD.
- Raising discussion among practitioners and stakeholders on ways to match EAFRD requirements with expectations of financial intermediaries and private investors.
- Identifying actions to facilitate rural infrastructure investments under the EAFRD through financial instruments.

The workshop included presentations of:

- The EC proposal for the post 2020 CAP budget, and the potential use of financial instruments for infrastructure financing under the current CAP, by DG AGRI.
- EIB group experience of supporting infrastructure in rural areas and small municipalities: in addition to EIB staff, representatives of two of the case studies, namely the JESSICA Holding Fund in Sardinia (Italy) and the EIB-BELFIUS partnership in Belgium, presented findings and lessons learnt from their experience.
- Results from the ENRD Smart Villages Thematic Group on revitalising rural services through social and digital innovation.

Participants from managing authorities, national and regional governments as well as financial intermediaries and other stakeholders were also involved in two parallel knowledge café sessions, aimed at interactively exchanging on two topics:

- *Investing in rural areas and small villages: constraints and opportunities*, moderated by DG AGRI.
- *How to finance rural infrastructure? Models and schemes*, moderated by the EIB.

A final plenary session pulled together the inputs from presentations by experts and practitioners and from the knowledge café sessions, which substantially confirmed preliminary findings of this study. The closing remarks from DG AGRI and the EIB reasserted the following:

- EAFRD legal framework enables the use of financial instruments for infrastructure already in the current programming period.
- Involvement of private counterparts could help scale-up and crowd-in additional resources.
- A widespread lack of technical capacity and financial skills in rural areas, which is still hindering the unlocking of infrastructure investments, has to be addressed via technical assistance for both project promoters and final recipients.
- Reliable financial intermediaries with a strong local presence are essential for scouting and originating a pipeline of eligible projects.
- A combination of financial instruments and subsidies may be essential when projects are not entirely or immediately bankable.
- There is a need to raise awareness among managing authorities, financial intermediaries, and final recipients of financial instruments and their potential.

More information and presentation from the event are available from the www.fi-compass.eu website.

