advancing with ESIF financial instruments

The potential for investment in energy efficiency through financial instruments in the European Union

Czechia in-depth analysis

May 2020

European Commission

European Investment Bank The EU bank

Disclaimer

Objective of the document

The objective of this report is to give an overview of the state and progress of energy efficiency developments in Czechia, and a preliminary assessment of investment needs and potential use of ESIF financial instruments to cover them. This report would serve as an input to the negotiations of operational programmes for the period 2021-2027.

This document is based on data and information released prior to the outbreak of the Coronavirus (COVID-19) pandemic. Although it is still not possible to properly estimate the impact of COVID-19, a severe economic recession is currently (May 2020) forecasted for year 2020 in the European Union (EU).

The recession may have deep repercussions in the years to come in the economic and financial systems of EU Member States (MS), therefore economic and financial context reported in the document may sharply deteriorate in the near future. Cohesion Policy resources, and public resources in general, are expected to play a crucial role to support the economic recovery in the next programming period.

Energy efficiency (EE) investments can play an important role to support the economic recovery, as (i) they have a considerable job creation effect; (ii) they contribute to reduce energy costs and greenhouse gas emissions; and (iii) they increase MS energy security.

There is a risk that, at least in the short run, the crisis will lead to lower energy costs due to a lower demand, thus can create lower incentives for EE investments. An appropriate use of financial instruments to support EE investments enables the use of Cohesion Policy resources in a revolving way and to generate leverage by crowding-in private co-financing in order to meet significant investment needs.

Information reported in the following sections is based on publicly available sources, in particular:

- Eurostat national statistics;
- Draft version of the National Energy and Climate Plan of the Czech Republic;
- EC assessment of the draft National Energy and Climate Plan of the Czech Republic;
- Final version of the National Energy and Climate Plan of the Czech Republic;
- Odysee-mure database;
- EU Energy Poverty Observatory; Member State Report Czech Republic;
- JRC; Science for Policy Report, Accelerating energy renovation investments in buildings. 2019;
- JRC; Science for Policy Report, Synthesis report on the assessment of member states' building renovation strategies. 2016;
- European Court of Auditors; Allocation of Cohesion policy funding to Member States for 2021-2027. 2019;
- Ministry of Regional Development, Housing in the Czech Republic in Figures, August 2018;
- European Court of Auditors, Energy efficiency in buildings: greater focus on cost-effectiveness still needed, Special Report 11. 2020;
- EC; Spring 2020 Economic Forecast; May 2020;

The following interviews were conducted:

- ČMRZB

- State Environmental Fund
- Komerčni Banka
- Ministry for Industry and Trade
- Šance pro budovy – Association of energy efficiency construction trade associations
- APES – ESCO association,
- DG REGIO – Czech desk

1. Context overview

Czechia has about **10.6m inhabitants** (2.4% of EU27). Over the last 10 years, the population increased by 2.6%. Czechia shows uneven population development with an increase in Prague and its surrounding and a decline in the former coal mining and rural areas[1].

Real GDP per capita is about **EUR 17 600** (64% of the EU27 average) and has grown by 14% over the last 10 years[2].

Impact of the COVID-19 crisis

Based on the European Commission 'Spring 2020 Economic Forecast', released in May 2020, due to the COVID-19 outbreak, Czechia will suffer a recession in 2020 with the gross domestic product **(GDP) expected to contract by 6.2%,** before rebounding and grow by 5.0% in 2021.

The **unemployment rate** is expected to increase from 2.0% (2019) to 5.0% (2020) and it is expected to slightly reduce in 2021 (4.2%).

To support the national economy a public fiscal stimulus will be deployed, with the **Government deficit** expected to reach 6.7% of 2020 GDP and to remain high in 2021 too (4%).

Due to the combined impact of the decrease of the GDP and the increase in the government deficit, the **debt/GDP ratio is expected to reach 38.7% in 2020** (it was 30.8% in 2019) and to remain at a similar level in 2021 (39.9%).

The crisis could have a dual negative impact on EE investments, by both **reducing the demand** (e.g. households and enterprises may decide/be forced to postpone investments) **and the financial supply** (e.g. financial intermediaries may become more selective in their lending activity) **therefore increasing the importance of EE related supporting schemes.**

Final energy consumption (FEC) in 2018 was 25.3 Mtoe (2.6% of the EU27) and it has **decreased by 3.2% since 2005,** while at the EU27 level it decreased by 4.9%[3]. The reduction of consumption in the industry sector is partly off-set by increased consumption in the transport sector. Energy consumption in households remained on the same level[4].

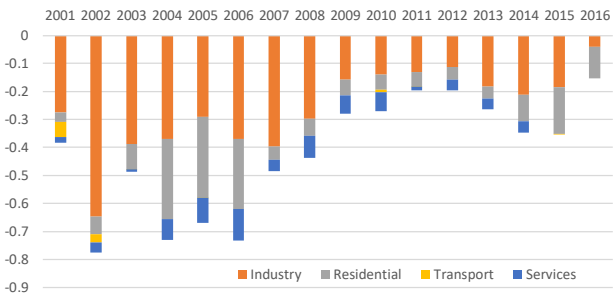
Energy consumption per capita (2.4 toe/person) in 2018 was 7.6% higher than the EU average (2.2 toe/person) and it decreased by 6.9% since 2005 (while at the EU27 level it decreased by 7.4%)[5].

Energy productivity (GDP over the gross available energy) in 2018 was 4.3 Euro per Kg of oil equivalent (53% of the EU average), showing a strong reliance on energy to generate GDP (this index increased by 19% in the last 5 years)[6].

Sectors contributing to FEC are: households (28% of total), industry (26%), transport (26%) and services (12%)[7].

Czechia, compared to other EU Member States has a very carbon intensive energy sector. In 2017, 33% of all primary energy consumption was from liquid fuels, 21% from natural gas, 18% from electricity, 11% from renewable sources (biomass, waste). 9% from lignite and hard coal and 8% from district

Annual technical energy savings by sector (Mtoe)



heating[8]. It is important to note that more than 50% of electricity and majority of heat is generated from lignite and hard coal.

Regarding **energy efficiency (EE):** during the **2001 - 2016** period, Czechia reported about **6.8 Mtoe of cumulative (technical) final energy savings**[9] mainly related to the industry sector (62%), residential (21%) and services (11%)[10].

1.1 Overview of the residential sector

The dwelling stocks in Czechia amounted to 4 327m of dwellings with the total useful floor area of 350 million m^2. The number of dwellings increased by 10.4% over the last 10 years[11]:

- 56% of the dwellings and 44% of the floor space are in multi-apartment buildings. Single family buildings make 44% of the dwellings (1.896 million dwelling) and 56% of the floor space (195 million m^2)[12];
- The majority of buildings was developed prior to 1980 (as reported for multi-apartment buildings in the following table);
- The homeownership rate in Czechia is about 67.5% (38.7% of households own a house, and 29.6% are flat owners), while renters make up 19% of households and 7.4% live in co-operative housing;
- Renting is more common in larger cities, in Prague almost one third of households are renting;
- Ownership is relatively equally distributed, only the 20% poorest households have an ownership rate below 65%. The remaining households have homeownership rates above 70%[13].

Multi-family buildings per year of construction

	No. of buildings	No. of dwellings	% of total number of dwellings	Floor space in thousand m^2
Pre-1919	26 077	166 271	7%	10 161
1920-1945	27 775	230 420	10%	14 202
1946-1960	30 573	250 141	10%	15 657
1961-1980	71 429	989 462	41%	64 518
1981-2000	38 042	569 804	24%	38 943
2001-2011	12 674	153 527	6%	9 435
Not determined	4 682	56 408	2%	3 310
Total	**211 252**	**2 416 033**	**100%**	**156 226**

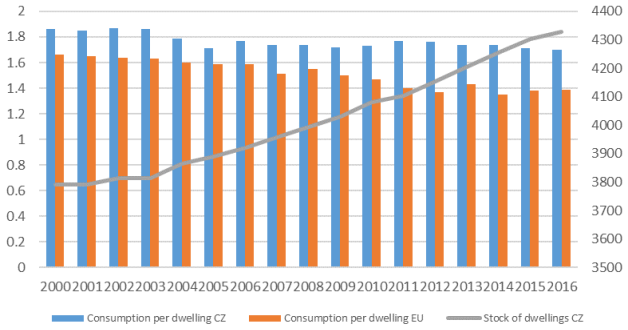
Energy **consumption in the residential (households) sector**:

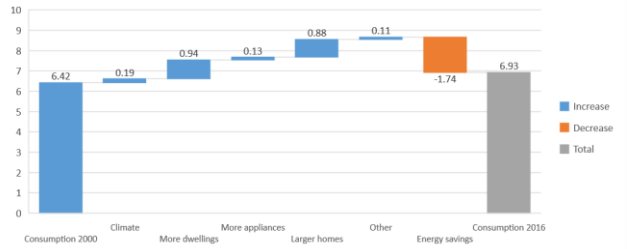
- In 2018, was 19.3Mtoe (7.9% of EU27)[14] decreasing by 1.8% over the last 10 years, a value much lower than the EU average decrease of 7%;
- Consumption per dwelling is 1.7toe (22% higher than EU average)[15], decreasing by 4% compared to 2006 (EU average 13%);
- Consumption is mainly driven by space heating (68%) and hot water preparation (17%) as well as electrical appliances and lighting (8%). The energy consumption of space heating per m^2 has gone up by 12% from 2007 to 2017 in line with the increasing total floor area;

- About 40% of all households are connected to district heating[16];
- The cost for electricity, heating and warm water preparation in 2017 constituted in average 26% of the total housing cost and 6.8% of total household expenses. In comparison to 2005 cost of electricity, heating and warm water has increases by 44%, but because of low energy prices their share of housing cost have declined from 29% to 26%[17].

For the period 2000-2016, 1.74 Mtoe energy savings were achieved in households. The savings effect has been balanced out by the increase of the number of dwellings (0.94 Mtoe) and larger homes (0.88 Mtoe). In combination with other factors this led to an overall increase of energy consumption.

Dwellings (thou) and consumption (toe/dw)[18]	Households consumption between 2000-2016 (Mtoe)[19]





The majority of dwellings in Czechia require comprehensive renovation, but the renovation rate remains low despite several incentive schemes. In the **coming years**, the activity in the construction sector is expected to be heavily influenced by the obligation (since 2020) that **all newly constructed buildings will be nZEB**.

In Czechia, **new housing construction** increased sharply in recent years. In 2018, a total of 33,800 dwellings were completed, the highest number since 2007 (the majority of these dwellings were single family houses) and 33,100 dwellings were under construction[20]. It is expected that this trend is continuing due to ongoing urbanisation (although the COVID-19 related economic crisis may have an impact on the trend).

Employment in the construction sector has seen a steady increase (11.2%). Employment in the narrow construction sector has increased more strongly by 13.5% from 2010-2018[21]. Despite this, the growth shortage of workers is a key barrier in the sector, especially for skilled workers, where the total number has declined. The increase of unskilled worker is strongly linked with immigration from Eastern European countries, especially Ukraine. Although the COVID-19 related economic crisis may have a negative impact on employment in the construction sector, it remains true that Czechia has an **urgent need to upskill unskilled workers** to realise its EE efforts.

The **NPL ratio** (amount of non-performing loans over total loans) in the **construction sector** has increased and reached 23% in 2018. Lending to the Czech construction sector is riskier than to other industries e.g. agriculture, manufacturing, mining and quarrying, electricity, gas and water, or the real estate sector. Late payment, mainly deliberate late payment, is one of the main financial problems in the construction sector and is considered the main cause of bankruptcy.

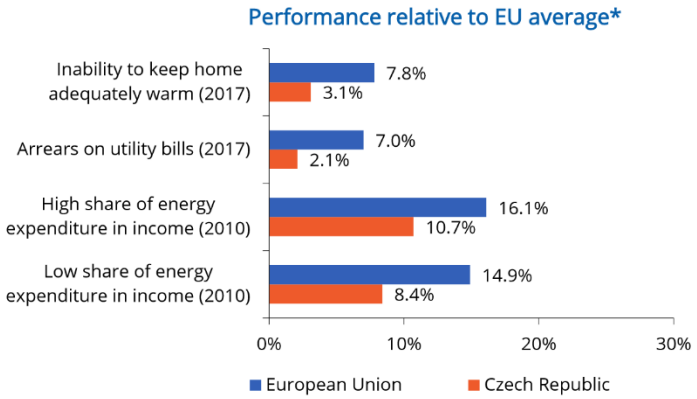
Rising net income and low mortgage rates are the most important drivers of **growth in housing demand**. Housing loans to households increased significantly by 82.3% from EUR 24.1 million in 2010 to EUR 44.0 million in 2018. The Czech National Bank has set recommendatory caps for loan-to-value (LTV) ratio to safeguard mortgage lenders against negative equity. The measure requires lenders to provide loans with LTV ratios up to 90%. Moreover, the volume of new loans with ratios of 80% - 90% should not exceed 15% in each quarter.

Transaction **prices of housing in Czechia grew at the fastest pace in the entire EU** in 2018. The house prices of existing and new dwellings increased by 29.3% and 34.9% respectively over the period 2015-2018. However, the housing rental prices increased by a moderate 2.9% in 2018. The growth in apartment price outpaced the growth of wages making housing affordability very difficult, particularly in Prague and Brno.

Energy poverty[22]

Circa 3% of households in Czechia are reported not be able to keep their homes adequately warm (in line with the EU data). The number has steadily decreased in recent years and significantly below EU average.

As presented in the adjacent figure, other indicators typically used to study the energy poverty phenomenon also show levels well below EU average.



Energy poverty is addressed mainly by social policy through heating and housing allowance provides financial assistance to households to pay their electricity bills.

Energy efficiency measures have no specific focus on energy poverty, especially that energy poverty is an issue in rented housing it is not expected to have wider effect. In rural areas there exists also the practise of burning of discarded furniture or plastic waste in low efficiency solid fuel boilers, which has negative impact on air quality. The current COVID-19 related economic crisis can have a severe impact on Czech households, potentially leading (at least in the short run) to an increase of households living in in energy poverty conditions.

1.2 Overview of the public sector

For Czechia, no comprehensive data on public sector buildings stock or energy consumption is available except for central government buildings. Central government institutions own and occupy 772 buildings (above 250 m^2) and surface area of 2.400m m^2. 586 buildings with 1.6m m^2 are not energy efficient (rating lower than C)[23]. Many of the buildings are historical or listed buildings.

1.3 Overview of services and industry sectors

The **services sector** account for 60.8% of the national GDP (in 2017)[24]. The energy consumption of commercial and public services in 2018 was 3.1 Mtoe, which represents 2.3% of the EU27 consumption in the sector. The energy consumption over the last 10 years has declined by 0.9%, but has increased my 3.9% over the last five years[25]. Energy savings of 0.72 Mtoe were achieved between 2001 and 2016 years period[26].

The Industrial sector accounts for 37% of real GDP (2017)[27]. In 2017, industry consumed 6.7 Mtoe (2.6% of EU27) with an increase of almost 17% in the last 10 years[28]. The industrial sector has 19,000 buildings with estimated floor space of 41.1 million m^2 (16% of all non-residential buildings)[29]. For the period 2001-2016, estimated energy savings of 4.2Mtoe where achieved (including the ETS sector), constituting 62% of the overall energy savings during this period[30].

2. EE targets, measures in place and proposed

Several policy measures are in place. Under the **Energy Efficiency Directive Article 7**, Czechia has chosen alternative measures to achieve savings instead of obligations on energy suppliers. Public intervention is based on investment grants from both the **EU funds** (ERDF, Cohesion Fund) and national resources as well as financial instruments. Beside this there is also a range of regulatory measures. Existing measures cover all sectors and they include investment grants combined with guarantees and soft loans. Czechia is relying heavily on ESIF grants or national grants and ESIF or non-ESIF financial instruments in their efforts to achieve their energy savings in the residential and public sector. In the industry sector, Czechia relies on non-financial measures such as energy audits, energy management and voluntary schemes.

For the 2020 - 2030 period, the NECP envisage the continuation of some existing measures and the implementation of new measures.

The overall primary energy savings envisaged in the NECP of 2 Mtoe for the 2021-2030 period, compared to the need to reach the 2030 targets were considered to be modest by the EC and were not revised in the final version.

	EE targets (Mtoe)	2017 data	Target 2020	Target 2030
NECP overall targets	Primary energy consumption	**40.1**	**44.3**	**41.4**
	Final energy consumption	**25.5**	**25.3**	**23.6**

In the following table more details of current and planned measures are reported, based on the NECP.

	Context/targets	Existing and planned actions/priority objectives
Residential Sector	• From 2020, all new buildings to be near Zero Energy Buildings (nZEB)[31] – NZEB from 2020 for government buildings. More specific requirements will come into force in 2022. <u>In 2021 – 2030 is expected:</u> • The estimated annual savings of the measures proposed are 310.5 ktoe for single family houses and 119.4 ktoe for multi-apartment buildings	• **New Green Savings** (2014-2020) **grants** for energy efficiency and other environmental measures in single family buildings and multi-apartment buildings (in Prague only). In total CZK 17 200 million (EUR 688 million) are allocated. It is financed from revenues from carbon allowances and managed by the State Environmental Fund (SEF). • **Panel 2013+ soft-loans** for complex renovation of pre-fab multi-apartment buildings. The State Housing Development Fund (SHDF) has allocated CZK 4,500 million (EUR 180m) to the scheme[32]. • **Integrated Regional OP (IROP 2014-2020)** – grants for renovation in the residential sector (multi-apartment building). EUR 298m have been allocated to the programme of which 55% have been invested so far.[33] An interest rate free **loan financial instrument** has been set up with the SHDF in 2020 for energy efficiency measures in multi-apartment housing outside of Prague with minimum 20% energy savings. It can be combined with ESIF grants[34]. • **Boiler replacement programme** SEF is managing grants for replacing old boilers with less polluting heat resources. The programme is mainly aiming at reducing air pollution but has also energy efficiency effects[35].

		• **The Reasonable Energy Savings Programme** *(available for all sectors)* – is promoting best practise and of energy efficiency investments. It aims at increasing quality of projects[36]. • **EFEKT** *(available for all sectors)* promoting awareness of energy efficiency investments in the broader public and measures of energy consultancy[37]. <u>New planned measures/priority objectives in the NECP:</u> • Continuation of existing measures. • Information campaigns. • Banning low emission class boilers. • Upscaling of **New Green Savings** with resources of the **Modernisation Fund** • Improvement of housing conditions and EE, combined with revitalisation of degraded areas. To be supported by using national and **EU funds**. Support to residential buildings from ERDF shall come from OP Environment in the 2021-2027 period
Public Sector	• Obligation to renovate (every year) 3% of the total floor area of central government buildings • From 2020, all new buildings to be near Zero Energy Buildings (nZEB)[38] – NZEB from 2020 for government buildings. More specific requirements will come into force in 2022. • The estimated annual savings of the measures proposed are 262 ktoe for public and commercial buildings.	<u>Existing measures:</u> • **OP Environment** – grants for energy efficiency in public buildings from ERDF and CF. Total allocation are EUR 549m 135 projects are realised and paid to beneficiaries. In terms of output indicator 22% of the target for 2023 have been achieved. And loans for energy efficiency in public buildings. Allocation is EUR 19m. Both schemes are managed by SEF[39]. • **New Green Savings 2014-2020** is providing grants for public building renovation and can be used to co-finance projects receiving grants from OP Environment or providing grants to OP Environment loans[40]. • **EFEKT 2 Programme** – investment grants for small-scale projects primarily in municipalities such as street lighting or projects realised via EPC[41]. • **OP Prague** – grants for energy efficiency, smart energy management and renewable energy use in public infrastructure and in public buildings. The grants are complementary to OP Environment grants, both are managed by SEF. <u>New planned measures/priority objectives in the NECP:</u> • **Grant support from OP Environments** is expected to focus on public entities not covered by central government (state budgetary organisations) such as regions, municipalities, universities, hospitals. Central government entities should receive support from New Green Savings. • A **financial instrument for Energy Performance Contracting (EPC)** is currently under development by ČMZRB with support

		from the EIB. The instrument aims at providing long-term financing to projects with funding from OP Enterprises, Innovation and Competitiveness [42]. ČMZRB has applied for ELENA support to finance project preparation cost of the programme.
Industry	• No sector specific targets identified	<u>Existing measures:</u> • **OPEIC -** for support of energy savings for enterprises. Allocations to instrument are EUR 1.1bn. Under the **grant scheme** 412 projects have been supported so far and EUR 214m EUR have been paid to beneficiaries. Under the **loan scheme** EUR 74m have been allocated. The instrument offers preferential loans, in combination with support for energy audits and an interest rate subsidy. Managed by ČMZRB[43]. • **The ENERG Programme** provides soft-loans to enterprises located in Prague. Managed by ČMZRB[44]. • Energy audits and energy management obligation. <u>New planned measures/priorities in the NECP:</u> • Continuation of existing measure and support from **New Green Savings.**

3. Market failures, main issues and barriers to investment

A number of specific issues hindering EE activities in Czechia are briefly reported in the following table. The information is based on interviews with various stakeholders and the National Energy Action Plan 2017[45].

	Financial issues and gaps	Non-financial issues
Across all sectors	• The **upfront investment cost** for energy efficiency building material and the cost of works are very high. As calculations on the savings are not made over the life-cycle of the asset there is the tendency to lower the energy efficiency targets • There is a **several national or local (Prague) initiatives for energy efficiency measures** using grants or revolving forms of support from national and EU resources. Resources are scattered over overlapping and competing programmes. This also makes it difficult for building owners to identify the best programmes for their project	• Continued **shortage of highly qualified and reliable staff** to deliver quality construction works
Residential Sector	• Many house owners have a **lack of own resources**, especially for dwellings built since 1990 where the owners are repaying mortgages, in particular in larger cities where housing has been built since 2000 mortgage payments compared to income are high, limiting the ability to take additional debt for renovation • Investments in building renovation have a **very long repayment time**. Energy efficiency investments compete with other capital investments. In Czechia still a catching up to richer European countries regarding consumption of capital goods can be observed • **Banks are comfortable lending for energy efficiency measures from own resources through consumer loans against the credit worthiness of the client** and not the investment. This makes the access to bank financing difficult for low income or highly	• **Low awareness** and understanding of EE measures among households • High **administrative burden** to receive grants; • Most **measures are undertaken** without State support, resulting in generally shallow and partial EE measures, e.g. only 30% of projects for thermal insulation and 6% of heat pumps received State support[46]. **Partial renovation** (e.g. only windows, boiler exchange, solar collectors) leads to lock-in effect and delays future comprehensive renovation • **Lack of information** among building owners on the benefits (financial and non-financial) of energy efficiency measures also the benefits on the society as a whole, especially regarding air quality are underestimated

	indebted households and in general also for long-term investments • **Lending to housing associations** is not attractive for commercial banks, as they are lending to several individuals, with individual payment risk and high administrative cost. This is only partly compensated by the risk coverage from financial instruments	
Public Sector	• **Public authorities tend to rely on grants**, EU or national, to finance energy efficiency investments. There is little interest in taking loans for EE measures, despite their low level of debt of Czech public entities	• Low level of political commitment on central government level to renovation of central government's own buildings, in contrast to regions and cities • **Budgetary law** prohibits the use of third party financed EPC projects for state budgetary organisations • **Lacking familiarity and perceived complexity of procurement** for EPC projects
Industry	• A combination of **low profitability**, low attractiveness of bank loans, and limited own resources have resulted in companies being largely unwilling to implement EE improvements in their production processes • Financial instruments for energy efficiency are often provided by other institutions than commercial banks or leasing companies. For enterprises it is not attractive to do borrowing from several different institutions with different administrative procedures • As EE investments are not the core budgeting priority for many companies. Companies do not have are no sufficiently-developed projects or long-term project portfolios • **Difficulties to combine ESIF financial instruments and grants** • Due to the **limited experience in EE investment,** banks tend to consider them high risk and are either not willing to provide project finance or offer it at high interest rates, limited maturity of loans, and high collateral requirements	• Industry tends to **replace outdated equipment** with new equipment with the purpose of higher productivity, **energy efficiency investments are a side effect** • **Energy audits** for manufacturing have high upfront cost, often enterprises do not think they can be quickly recovered by actual investments • **ESCO services in enterprises** are not well known for small and medium sized enterprises

4. Investment needs, gaps and implications for financial instruments

The NECP does not provide overall estimates for investment needs, but information on specific sectors and sub-sectors and some information on the sources of financing is provided. The information is summarised in the following table.

Sector and sub-sector / EE programme	Total investment in million EUR	of which public aid in million EUR
Renewable energy		**2 064.0**
of which biomass boilers and stoves		447
heat pumps		479
solar thermal collectors		110
photovoltaic installations in buildings		512
photovoltaic plants		254
wind power plants		264
Energy efficiency financial sources	**22 897**	**6 030**
of which OP Enterprises, Innovation and Competitiveness	760	320
OP Environment	1 400	560
Integrated Regional OP (for investment in transport)	800	320
New Green Savings and successor programme	4 720	1 600
EFEKT	200	186
Panel 2013+	600	600
Modernisation Fund	0	2 000
Prohibition of high emission boilers	1 760	440
Voluntary schemes	5 400	0
Transport related measures	7 257	4
Energy infrastructure	**26 040**	
Power plants	16 720	
Distribution	7 240	
Transmission	2 080	

The transformation of the Czech economy to a low carbon economy requires very large investments across the energy infrastructure and on the demand side across all economic sectors. **Energy infrastructure and investment in EE** from 2021 to 2030 alone amount to almost EUR 49 billion (23% of Czechia's 2018 GDP), of which **EUR 25.4 billion will be needed for energy efficiency alone**. On the side of renewable energy the amount of public investment aid of EUR 2.1 billion, will be dwarfed by operating aid of estimated EUR 20.4bn, in the form of feed in tariffs or similar schemes, for existing and new installations. The majority of investment aid for renewable energy goes to building related investments. Building related renewable energy investments are expected to receive support of EUR 1.5 billion investment aid. In energy efficiency, EUR 15.5 billion should be invested, which

is expected to be supported by EUR 5.7 billion of national public and ERDF / CF support in form of grants and financial instruments.

The possible **implications for financial instruments** are summarised in the following table.

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Financial instruments need to include (or to be supported by) a technical assistance component (to promote EE benefits, to facilitate the decision making process, and to prepare/monitor EE projects). The funding may come from the OP Environment, OP EIC, the future ELENA programme or national sources, particularly EFEKT;
Currently four OPs are providing support to energy efficiency. Especially for financial instruments, in order to reach economies of scales and to have flexibility in case of low absorption or unexpected high demand, this should be reduced. It is advisable not to have a separate OP for Prague, but to integrate this into national OPs and to make the City of Prague, where applicable an intermediate body.
Czechia has several support schemes for energy efficiency or measures, that can be combined with energy efficiency from national and EU funds. Several grant schemes and financial instruments address the same projects which leads to ‘cannibalisation’. The different support schemes should have a clear demarcation between grants and financial insturments as well as national EU schemes.
There are several support schemes for air quality, like boiler exchange and small scale renewables. In the future these measures should be combined with energy efficiency. Synergies from works on the building envelope, like the roof can be combined with solar collectors or the size of new gas or biomass boilers can be adapted to energy efficient houses.
Pure grant schemes should be phased out, with the exception of areas like energy poverty or historic buildings, and be replaced with financial instruments combined with grants. Existing grant and financial instrument combination schemes should be simplified using the new rules under the Common Provision Regulation.
The intervention supported by cohesion policy measures should take into account the broad context of financial markets conditions. The Czech banking sector is strong, with sufficient liquidity, and competitive in comparison to other EU countries (although the COVID-19 related economic recession may have a negative impact on the sector). Banks see energy efficiency as a growth market and are already providing loans for energy efficiency from own resources. Nevertheless, majority of EU and national FIs are loan schemes, provided directly by ČMZRB, SEF or SHDF, therefore attracting very limited private resources. On the other side, banks show little interest in implementing financial instruments. A shift towards guarantee financial instruments with capital rebates should be contemplated, with standardised and simplified eligibility and reporting requirements.
Considering the lack of skilled workers for energy efficiency investments, specific training programmes could be supported.

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<tr><th>Residential sector</th><th>Public sector</th><th>Industry</th></tr>
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Integrating financial instruments combined with investment grants, advisable in form of capital rebate, and technical assistance (energy audits, project preparation, supervision of project implementation and dispute settlement with builders) into

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Financial instruments could support the strengthening of the well-developed Czech EPC market in the public sector, by providing technical support and debt via ESCOs to public building owners, for example via forfaiting loans.

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TA support for energy audits and advisory for the preparation of EE measures in combination with renewable energy.
Allowing for TA for banks to build up the experts internally or externally for advising client and appraising projects.
The financial instruments should have sufficient scale and be

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a one-stop shop scheme for residential buildings. • **Eligibility measures under financial instruments should be widened** to the City of Prague and single family housing, which were so far not eligible under ESIF. • Buildings for which **partial renovation measures** have been undertaken in the past, still should receive support to undertake additional energy efficiency or renewable energy measures. These non-comprehensive should receive financial instrument, but with low or no grant element.	• Projects, where the energy savings potential is sufficient to repay a substantial amount of the investment costs should **only receive ESIF support if choosing the EPC procurement route**. Investment grants should be provided to the building owner for comprehensive renovation.	designed to be as simple as possible regarding eligibility and State aid checks. • EE measures should be **integrated in mainstream SME financing,** with additional incentives for achieving EE savings or greenhouse gas reduction, via capital rebates. • Financial instruments could also **support the development of the EPC model in the industry sector** and in the business sector at large. The financial instrument should not only provide affordable financing, but also de-risk the transactions, e.g. coverage of performance risk on the side of the ESCO and activity risk on the side of the client.

5. ESIF resource, existing financial instruments and main grant programmes

Czechia benefits from **ESIF funding of EUR 23.9 billion** (circa EUR 2 270 per person) during the 2014 – 2020 period. For the **low carbon economy, EUR 4.3bn** has been allocated (EUR 3.8bn from ERDF; EUR 0.5bn from CF and EUR 13m from EAFRD)[47]. The **EE related support** comes from four Operational Programmes and it is estimated to be **EUR 1.46bn**[48]. Support is provided for EE measures mainly for public buildings and to a lesser degree the residential sector and enterprises (incl. large enterprises).

5.1 Overview of services and industry sectors

In the 2014 – 2020 period, Czechia contributed so far **EUR 479.07m**[49] **of its ESIF** (circa 2% of its budget) **to financial instruments,** mainly ERDF, and to a smaller degree ESF, but several additional financial instruments have been launched recently or are under preparation.

There are four **ESIF financial instruments for EE** active or in preparation. Under OP EIC, there are '**Energy Savings'**, providing loans to SMEs and under preparation an **EPC financial instrument** that provides long-term debt to ESCOs. A **preferential loan** instrument under OP Environment for **public sector** entities. And the '**Heating Programme'** for **multi-apartment building renovation** under IROP.

Generally, the performance of ESIF financial instruments is below expectations and the absorption is low. Also the grant programmes have lower than expected absorption rates especially in the residential sector.

Further non-ESIF financial instruments and other sources of financing available for EE are:

- **Czech commercial banks** are comfortable with lending to energy efficiency investments and through the competitive market situation rates are attractive. The three major Czech banks received EIB loans with energy efficiency objectives for on-lending to SMEs.
- **PF4EE** (Private Finance for Energy Efficiency) transaction was signed between the EIB and *Komerční Banka*. It aims to finance EE measures in enterprises (and is not limited to SMEs). As of July 2019, *Komerční Banka* originated 71 loans and EUR 5m were in the pipeline. The signing period of this agreement is expected to expire in August 2020. The agreement between EIB and *Komerční Banka* may however be cancelled in the near future as it is not possible to combine PF4EE with grants from OP EIC (which the MIT intended to do in order to use ERDF resources as grants to co-finance expenditures not covered by PF4EE)[50].
- The **ENERG Programme** provides preferential loans to enterprises independent of their size located in Prague. Loans are provided for up to 70% of the expenditure and maximum CZK 20m (EUR 800,000) without fees and without collateral. The instrument is combined with a subsidy for energy audits and performance grant.[51]

Detail is provided on three of the ESIF financial instruments, **Energy Savings**, the **Heating Programme** and as an example for grant and financial instrument combination, the **Environmental Risk Management** financial instrument.

'Energy Savings'[52]

Preferential 'Energy Savings' loans help entrepreneurs finance projects that aim to save energy and must be co-financed by a commercial loan of the contractual partner of **ČMZRB** , at least 20% of the investment. The program is financed with EUR 76m by OP EIC.

The **loan,** funded by ERDF, **is offered without interest and no fees**, financing amounts from CZK 500,000 to 60 million (EUR 20,000 to 2.4 million) with up to 90% of eligible project expenditure. The maturity is up to 10 years with grace periods of up to 4 years. Cost of energy audits can be covered by grants for up to CZK 250,000

(EUR 10,000). To lower the cost of implementation an interest rate subsidy can be provided for the co-financing loan.

The loans from 'Energy Savings' have a **very broad range of eligibility**, they can be used for energy efficiency measures on the building envelope, modernisation heating, ventilation or cooling equipment, modernisation of lighting, co-generation and small scale renewables for own consumption, energy management systems, replacement of energy intensive machinery by high efficient equipment, electricity storage and recovery from waste heat. All SMEs eligible under the OP EIC are eligible under this product.

Loans are granted either under ***de-minimis*** or under the **General Block Exemption Regulation** rules.

The financial instrument was set up in 2017, but market response was very weak as the instrument had overlapping eligibility criteria with grants. The instrument was revised and its eligibility was widened and the financial conditions aligned with the general SME instrument *Expanze.* Therefore, it can easily be combined with a preferential loan for non-EE measures. Nevertheless, the absorption remains low. As of July 2019, 30% of the total amount allocated to the financial instrument has already been committed to 6 projects, but not fully paid out.

A project example is the china producer *Český Porcelán,* which plans to use waste heat from its furnaces to heat office and residential buildings. The project is going to be implemented by an ESCO with guaranteed energy savings. The project is going to be fully financed by the EPC client.

It is planned that around EUR 20m of the allocations for 'Energy Savings' are going to be reallocated to the new EPC instrument to be established in 2020.

'Heating Programme'[53]

Under IROP, a financial instrument was set up in 2020 that is managed by the SHDF for the **renovation of multi-apartment buildings**. The loans is provided directly by SHDF without interest and fees. The loan can be used for EE measures of the building envelope, ventilation with recuperation, switching the heating to natural gas or renewable energy sources, connection to district heating, installation of solar thermal collectors, renovation of the heating system, change of the lift and modernisation of the heating system. Conditions for energy savings are at least 20% of energy savings compared to baseline.

Loans can range from CZK 500,000 (EUR 20,000) to CZK 3.2 million, which may not more than 90% of eligible expenditure under *de-minimis* or 76% under GBER. Loan maturity may reach 20 years.

The **implementation of the financial instrument was delayed** as the managing authority (Ministry of Regional Development) had originally intended to select a bank as a financial intermediary, but encountered difficulties as no bank applied. With the changes introduced by the Omnibus Regulation in 2018, it then became possible to directly award the instrument to the SHDF. The fund has already experience with other soft-loan programmes such as Panel-2013, which has overlapping eligibility criteria. It is possible to combine the loan with investment grants.

By March 2020, 5 application have been received with a value of CZK 26.4 million (EUR 1.1m), but no loan contracts have been signed yet.

During the current programming period a financial instrument has also been set up to address environmental risks that allows for the combination of loans and grants. This may be used for energy efficiency for complex renovation in different sectors.

Environmental risk loan instrument[54]

The **environmental risk loan** instrument covers the refurbishment of cooling systems, including ice hockey rinks; reconstruction of facilities producing or storing hazardous chemical substances and reconstruction and purchase of technologies for monitoring of industrial pollution. The final recipients are enterprises, independent of their size as well as public entities, such as municipalities or municipal enterprises. Projects located in the City of Prague are not eligible for the instrument as the capital city is covered by a separate OP.

The instrument became operational in 2017. It has a financial allocation of **EUR 18.5 million for the loan component from OP resources and about EUR 6 million for the grant component** from the SEF's own resources. SEF was chosen as financial intermediary as it is the main body managing grants for environmental investments from ESIF and national resources. SEF also manages several loan schemes.

The instrument provides soft loans 35% to 100% of the eligible expenditure. The loan is provided without fees, with an interest-free grace period of up to 14 months. The repayment period of the loan is up to 10 years, for which a 0.45% per annum interest rate is charged. The loan can be combined with a grant from SEF's resources for up to 25% of the investment. Loans are provide under *de-minimis* or different articles under GBER.

As of July 2019, **eight projects have been approved under the scheme**. The total amount of investment of the projects financed is of EUR 7.8 million, with EUR 5.7 million provided through loans and EUR 2.1 million by grants. Six of these projects are ice hockey rinks that need to refurbish their cooling systems in order to replace environmentally harmful coolants. Two industrial projects have applied successfully, one food processing company, investing into a new water treatment system and a chemical factory, rebuilding its storage facilities for inflammable substances.

The strength of the financial instrument is that there is no overlap with pure grant programmes, so there is no 'grant-shopping' possible. A lesson learned from the instrument is that TA for project preparation would have been beneficial to have more possible projects to invest in.

5.2 Financial Instruments

In section 2 an overview over the different grant based national support schemes from ESIF and non-ESIF resources is given. Here some key information from the **European Court of Auditors' (ECA) Special Report** on the multi-apartment residential **housing renovation scheme** set-up under the **Integrated Regional OP** is given. The grant scheme covers 30% to 40% of the incurred cost, depending on the achieved energy savings. ECA concludes that the scheme does not sufficiently encourages comprehensive renovation, as projects with 20% energy savings can already receive a 30% grant rate, whereas projects with at least 40% energy savings and a 'B' rated energy performance certificate after the works receive 40% of the grant. This results into a relatively short average simple payback time of the supported projects of 9 years.

Projects have been selected through open calls on the base of eligibility and there was no selection on the base of cost efficiency. The Czech scheme does not have cost ceilings for grant eligibility, but the low EU co-financing rate (30-40%) reduces the risk of cost inflation. ECA remarks that the scheme does not report any indicators other than final household energy consumption, but not any information to assess the cost-effectiveness of the scheme.

ECA recommends that the planning and targeting of investments should be improved in the future. It also states that financial instruments should be employed as savings from energy efficiency create a business case. The financial instruments accompanying the grant scheme became only operational in 2020. Additionally ECA recommends to improve the project selection criteria especially regarding the cost effectiveness and the achieved savings. Finally, ECA advises for the next programming period to make the performance framework more result oriented.

NOTES

[1] EUROSTAT; Population on 1 January by age and sex [demo_pjan]; extracted on 13/02/2020
[2] EUROSTAT; Real GDP per capita [SDG_08_10]; extracted on 13/02/2020
[3] EUROSTAT; Final energy consumption (Europe 2020-2030); Energy efficiency [nrg_ind_eff]; extracted on 13/02/2020
[4] National Energy and Climate Plan. 2019
[5] Ratio between: EUROSTAT; Final energy consumption (Europe 2020-2030); Energy efficiency [nrg_ind_eff] and EUROSTAT; Population on 1 January by age and sex [demo_pjan]; extracted on 13/02/2020
[6] EUROSTAT; Energy productivity [T2020_RD310]; data in Euro per kilogram of oil equivalent (KGOE); extracted on 13/02/2020
[7] EUROSTAT; Final consumption - other sectors - households - energy use; Complete energy balances; extracted on 13/02/2020;
[8] https://www.iea.org/data-and-statistics?country=CZECH&fuel=Coal&indicator=Coal%20production%20by%20type
[9] This data refers to technical final energy savings
[10] Odyssee database, Technical Energy Savings, year 2016
[11] Odysse; Stock of dwellings (permanently occupied); www.indicators.odyssee-mure.eu/online-indicators.html
[12] National Energy Efficiency Action Plan, 2017
[13] Czech Statistical Office Household Income and Living Conditions - 2019 Code: 160021-20
[14] EUROSTAT; Final consumption households - energy use; Complete energy balances [nrg_bal_c]; extracted on 13/02/2020
[15] Odyssee database, Consumption per dwelling with climatic corrections, year 2016
[16] National Energy Efficiency Action Plan, 2017
[17] Ministry of Regional Development, Housing in the Czech Republic in Figures, August 2018
[18] Odyssee database
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[20] ECB, SHI - Structural housing indicators, retrieved 14/03/2020
[21] European Construction Sector Observatory, Country profile Czechia, November 2019
[22] EU Energy Poverty Observatory; Member State Report; Czechia. June 2019
[23] Long-term Strategy for Renovation of Building 2017
[24] Central Intelligence Agency, the world fact book
[25] EUROSTAT; Final consumption commercial and public services; Complete energy balances [nrg_bal_c]; extracted on 13/02/2020
[26] Odyssee database
[27] Central Intelligence Agency, the world fact book
[28] Odyssee database
[29] National Energy Efficiency Action Plan, 2017
[30] Odyssee database
[31] The requirement of “nearly zero energy building” is a requirement coming from the Energy Performance in Buildings Directive (EPBD)
[32] State Housing Development Fund http://www.sfrb.cz/programy-a-podpory/program-panel-2013/
[33] Information from DG REGIO
[34] State Housing Development Fund,
[35] Update of the National Energy Efficiency Action Plan of the Czech Republic, 2017
[36] Update of the National Energy Efficiency Action Plan of the Czech Republic, 2017
[37] Update of the National Energy Efficiency Action Plan of the Czech Republic, 2017
[38] The requirement of “nearly zero energy building” is a requirement coming from the Energy Performance in Buildings Directive (EPBD)
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[40] State Environmental Fund, https://www.novazelenausporam.cz
[41] Ministry of Industry and Trade, https://www.mpo.cz/cz/energetika/dotace-na-uspory-energie/program-efekt
[42] https://www.fi-compass.eu/event/5384/implementation-financial-instruments-czech-republic-and-slovakia
[43] Information from DG REGIO
[44] Update of the National Energy Efficiency Action Plan of the Czech Republic, 2017
[45] National Energy Efficiency Action Plan for Czechia, 2017
[46] Update of the National Energy Efficiency Action Plan of the Czech Republic, 2017
[47] https://cohesiondata.ec.europa.eu
[48] Data provided by DG Regio based on an analysis of fields of intervention
[49] www.fi-compass.eu/financial-instrumentsCzechRepublic
[50] Interview with Komerční Banka
[51] https://www.cmzrb.cz/podnikatele/uvery/energ/
[52] https://www.cmzrb.cz/podnikatele/uvery/uspory-energie/

[53] http://www.sfrb.cz/programy-a-podpory/program-zateplovani/
[54] *fi-compass* "Stock-taking study on financial instruments by sector – Environmental risk loan in Czechia". May 2020

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