advancing with ESIF financial instruments

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

Poland 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 Poland, 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
- Final and draft version of the National Energy and Climate Plan of Poland;
- EC assessment of the draft National Energy and Climate Plan of Poland;
- Odysee-mure, Poland country profile
- EU building stock observatory
- European Construction Sector Observatory, Country profile Poland, March 2018
- EU Energy Poverty Observatory Member State Report Poland
- Allocation of Cohesion policy funding to Member States for 2021-2027. European Court of Auditors. March 2019
- National Energy Efficiency Action Plan, Poland 2017
- Statistics Poland (GUS), Energy and Building sector statistics
- NAPE, Building Market Brief – Polska. 2019 (supported by Climate-KIC, European Institute of Technology)
- "2nd Round Table on financing Energy efficiency in Poland", Polish Banking Association (ZBP), Warszawa, 27 March 2019
- Supreme Audit Office (NIK). 2019, Effects of thermal modernisation of multi-family buildings"
- Financial Instruments to Support Energy Efficiency Measures in Single Family Buildings in Poland. Report prepared for EC, Ministry of Economics, Małopolska and Silesia Region and World Bank, 2017

The following interviews were conducted:

- Ministry of Climate
- National Fund for Environmental Protection and Water Management (NFOŚiGW)
- The Polish National Energy Conservation Agency (KAPE)
- National Energy Conservation Agency (NAPE)
- Bank Gospodarstwo Krajowego (BGK)
- BNP Paribas Polska

1. Context overview

Poland has about **38.0mln inhabitants** (8.5% of EU27). Over the last 10 years the population declined by 0.4%. Poland shows uneven population development with an increase in suburban areas and a decline in rural areas and cities[1]. **Real Gross Domestic Product** (GDP) **per capita** is about **EUR 12 430** (45% of the EU27 average) and has grown by 40% 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, Poland will suffer a sharp recession in 2020 with the gross domestic product **(GDP) expected to contract by 4.25%,** before rebounding and grow by 4% in 2021.

The **unemployment rate** is expected to increase from 2.9% in 2019 to 7.5% (2020). Unemployment rate is expected to drop again in 2021 to 5.3%. To support the national economy a strong public fiscal stimulus will be deployed, with the **Government deficit** expected to reach 9.5% of 2020 GDP and to be 3.8% in 2021.

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 increase from 46% in 2019 to 58% in 2020** while it is expected to remain on that level 2021. **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.**

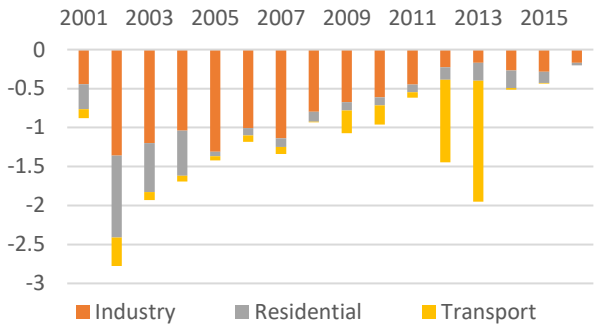
Final energy consumption (FEC) in 2018 was 71.9 Mtoe (7.3% of the EU27) and it has **increased by 23% since 2005,** while at the EU27 level it decreased by 5.9%[3]. This is mainly due to an increase in the manufacturing and transport sectors. **Energy consumption per capita** (1.9 toe/person) in 2018 was 15% lower than the EU average (2.2 toe/person) and it increased by 16% in the last 10 years (while at the EU27 level it decreased by 7%)[4].

Energy productivity (GDP over the gross available energy) in 2018 was 4.5 Euro per Kg of oil equivalent (55% of the EU average), showing a strong reliance on energy to generate GDP (this index increased by 12% in the last 5 years)[5].

Sectors contributing to FEC are: households (27% of total), industry (23%), transport (31%) and services (11%)[6]. Poland, compared to other EU Member States has a very carbon intensive energy sector.

In 2017 36% of all final energy consumption was from liquid fuels, 16.8% from electricity, 16.1% from hard coal and lignite and 13.4% from natural gas and 8.4% from district heating[7]. It is important to note that almost 77% of electricity and about 2/3 of heat is generated from hard coal and lignite[8].

Annual technical energy savings by sector (Mtoe)



Regarding **energy efficiency (EE):** during the **2001 - 2016** period, Poland reported about **19.36 Mtoe of cumulative (technical) final energy savings**[9] mainly related to the industry sector (58%), transport (21%), and residential (21%)[10].

1.1 Overview of the residential sector

The dwelling stocks in Poland, as of 2017, amounted to 14.2 million of dwellings with the total useful floor area of 1,084.2 million m^2.The number of dwellings increased by 10.8% over the last 10 years[11]. More than 9.9 million dwellings are located in urban areas and 4.8 million dwellings are located in rural areas:

- The average dwelling size amounted to 74.2 m^2; (in rural areas dwellings were, on average 29.3 m^2 larger than in urban areas). The average useful floor area per 1 person is almost the same in urban areas is 27.7 m2 and in rural areas m^2[12];
- The majority of buildings was developed prior to 1978 (as reported in the following table);
- 79% of all dwellings are owned by natural persons, of which 20% are organised in housing associations in multi-apartment housing, 14% are owned by housing cooperatives and 7% are owned by municipalities and public buildings societies[13].
- The majority of buildings is owner-occupied (83.7%). Ownership is relatively equally distributed, as people earning 60% below the median income are not significantly less likely to be house owners as people earning above 60% of the median income[14].

Residential buildings per type and year of construction[15]

Year of construction	Buildings in 1000	%	Dwellings in million	%	Primary energy factor (kWh/m^2year)
pre-1918	405	7.30%	1.2	9.10%	>350
1918-1944	804	14.60%	1.5	11.20%	300-350
1945-1970	1364	24.70%	3.1	24.10%	250-300
1971-1978	660	12.00%	2.1	16.00%	210-250
1979-1988	754	13.70%	2.2	16.60%	160-210
1989-2002	671	12.20%	1.5	11.80%	140-180
2003-2007	322	5.80%	0.6	4.60%	100-150
2008-2011	205	3.70%	0.4	3.20%	
unknown	333	6.00%	0.4	3.30%	
Total[16]	**5,517**	**100.00%**	**12.9**	**100.00%**	

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

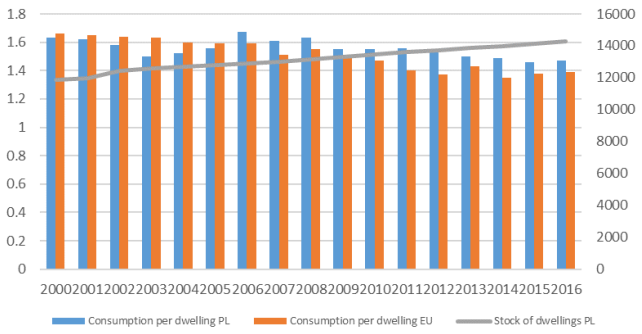
- In 2018 was 19.3Mtoe (7.9% of EU27)[17] decreasing by 1.8% over the last 10 years, a value much lower than the EU average decrease of 7%;
- Consumption per dwelling is 1.5toe (6% higher than EU average)[18] but decreasing by 12% over the last 10 years (EU average 13%);
- The EE of buildings has improved gradually. There is a significant difference in energy performance between multi-apartment buildings and single family houses. The energy consumption per square meter of single

family housing built before 1994 was about 83% higher than for multi-apartment buildings. This gap has reduced to 12% for buildings constructed between 2014-and 2016;

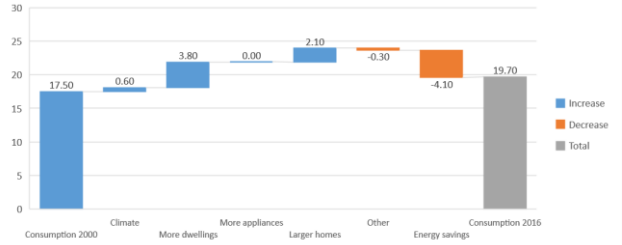
- Consumption is mainly driven by space heating and hot water preparation as well as electrical appliances and lighting;
- The source of space heating for 43% of dwellings was solid fuel (hard coal and firewood), 41% district heating and 9% gas.

For the period 2000-2016 1.39 Mtoe energy savings were achieved in households. The savings effect has been almost been fully eaten up the increase of the number of dwellings (0.58 Mtoe) and larger homes (0.77 Mtoe). In combination with other factors this led to a minor decline of energy consumption in the past.

Dwellings (thou) and consumption (toe/dw)[19]



Households consumption between 2000-2016 (Mtoe)[20]



The majority of dwellings in Poland require comprehensive renovation, as of 2016 only 1% is considered as **nearly-zero energy (nZEB**), but the renovation rate remains low despite several incentive schemes. The annual average of renovation from 2005 to 2015 was 0.65% and the renovation rate for comprehensive renovation 0.04%. With this limited progress Poland cannot meet its climate targets for 2030 or 2050[21]. This also means that for dwellings for which single modernisation measures were undertaken in recent years, there is further need of improving their energy performance through measures like modern gas boilers, ventilation, heat pumps or installation of renewable energy equipment.

In the **coming years**, the activity in the construction sector is expected to be heavily influenced by the obligation (since 2021) that **all newly constructed buildings will be nZEB**.

In Poland **new housing construction** continues to increase. In 2018 at total of 184,700 dwellings were completed, the highest number since 1989. It is expected that this trend is continuing due to ongoing urbanisation. In 2018 221,900 dwellings were under construction[22].

Employment in the construction sector has seen a steady decline over the last years, despite growth in the sector. Employment in the narrow construction sector has declined by 20% from 2010-2016[23]. This decline is mainly for machine operators and assemblers, but also elementary occupations. The number of higher skilled personnel like technicians and skilled workers in the construction material production sector has increased. Despite the shift from low skilled to higher skilled labour Poland has an **urgent need to attract specialist workers and to upskill unskilled workers** to realise its EE efforts.

Majority of **construction companies** are small and medium sized (SMEs) companies with a limited number of large enterprises. Poland sees a very gradual consolidation process with the number of enterprises in the sector was declining by 2.4% from 2010 to 2016.

After several years of stable cost of construction in Poland, prices have increased significantly in 2019 due to labour shortage and increase of prices for construction material as well as strong demand in the housing construction sector.

Polish **construction companies finance** themselves mostly through banks, trade credit and informal sources. Compared to other industries, the construction sector faces greater difficulties in accessing finance. Despite the boom in the construction sector in 2019 construction companies have low solvency and difficulties to access loans, working capitals and guarantees. In 2019 almost half of all construction companies had liquidity problems[24].

Mortgages to households have been growing steadily over the past years. The total **outstanding mortgages** issued by the major 10 Polish banks amounted to EUR 85.1 billion in 2019, and compared to EUR 70.3 billion in 2018. Loan disbursement has increased significantly, due record low interest rates for mortgages in Zloty[25].

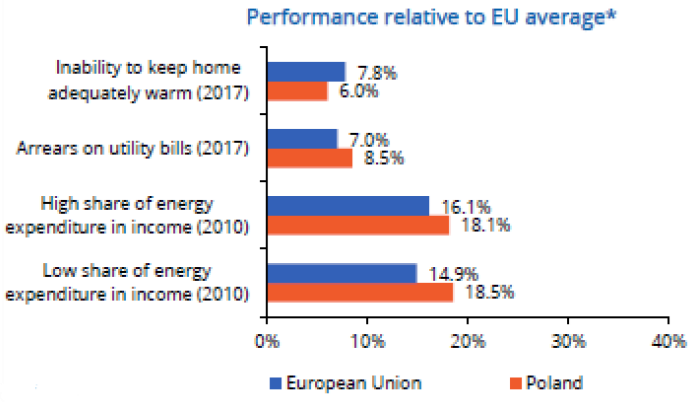
ENERGY POVERTY[26]

Circa 6% of households in Poland 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. This is in part a result of the '500+' benefit programme for families with children.

As presented in the adjacent figure, other indicators typically used to study the energy poverty phenomenon are higher than the EU average[27,28].

Energy poverty is addressed mainly on the national level through financial support, including energy bill and social support. The energy/housing allowance provides financial assistance to households to pay their electricity bills.

Some programmes aiming at **boiler replacement without other energy efficiency measures**, regional/local initiatives had unintended consequences and led to an increase of energy poverty. This is due to the fact that heating with gas and electricity is significantly more expensive than with substandard coal or as practice in rural areas the burning of discarded furniture or plastic waste.



1.2 Overview of the public sector

For Poland no comprehensive data on public sector buildings stock or energy consumption is available. A total floor area of 1.1m m^2 in 281 buildings owned by the central government does not fulfil EE standards[29].

Buildings constructed before 1994 have significant energy saving potential compared to buildings constructed between 2014 and 2018.

The **improved energy performance ranges from** 24% for public administration buildings and health care institutions, to **60% for educational institutions**. Generally, also buildings constructed in the mid-2010 have still energy efficiency potential through installation of ventilation, renewable energy and energy management systems. In central government buildings in 2018, EE measures of 425toe where achieved[30].

1.3 Overview of services and industry sectors

The **services sector** account for 57.4% of the national GDP (in 2017)[31]. Polish statistics do not provide information on the energy consumption in services, nevertheless there are data on energy savings achieved for the period 2012-2016. Energy savings of 1.54 Mtoe were achieved over the 5 years period.

The Industrial sector accounts for 40% of real GDP (2017)[32]. The industry production index increased by 32% between 2010 and 2017, compared to 9% for the EU. In 2017, industry consumed 16.4Mtoe (6.8% of EU27) with an increase by 17% in the last 10 years. For the period 2012-2016 estimated energy savings of 13.4Mtoe where achieved (including the ETS sector).

2. EE targets, measures in place and proposed

Several policy measures are in place, relying both on **EU** (ERDF, Cohesion Fund) and national resources, either as co-financing of EU funds, revenues of the national environmental fund NFOŚiGW and WFOŚiGWs or resources of the National Promotional Bank BGK (Bank Gospodarstwa Krajowego).

Existing measures cover all sectors and they include investment grants combined with soft loans for thermal insulation, white certificates and energy management. Poland is relying heavily on ESIF grants, in some cases combined with ESIF or non-ESIF financial instruments. Poland also uses the mechanism of tradable energy efficiency credits (white certificates) to incentivise energy efficiency measures in industry.

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 draft NECP compared to needs to reach the 2030 targets were considered to be modest by the EC and not increased in the final version.

	EE targets (Mtoe)	2017 data	Target 2020	Target 2030
NECP overall targets	Primary energy consumption	**99.1**	**96.4**	**91.3**
	Final energy consumption	**71.0**	**71.6**	**67.0**

Among the **main measures** for EE for the post 2020 period is the following cross-sectoral measures are important to mention:

- **White certificates** – energy providers are obliged to invest directly or via white certificates in EE measures, ESCOs can aggregate smaller projects to reach minimum size of white certificates (minimum 10 toe). Expected EE savings from white certificates 2016-2020 is 2.6Mtoe;
- **Advisory support** for EE and RES across all sectors financed by OP Infrastructure and Environment (OPEI), around 100 energy advisors and power engineers on local self-government level, which were trained by energy advisors.

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	• After 2020 all new buildings to be nZEB[33] In 2021 – 2030 is expected: • Renovation targets: by 2030 70% of buildings thermally renovated, compared to 59% in 2015 • People living in sub-standard conditions to decrease to 3.3mln in 2030 from 5.4mln in 2011 • By 2040 all households shall be covered by district heating networks or by	• **'Clean Air'** – grants for replacement of coal/wood boilers with low emission heat sources, PV, thermal insulation in residential buildings – **grants of 15% - 90% of cost,** depending on income **combined with soft-loans**. Planned volume PLN 103bn (EUR 24bn) [34] . **Target: 3 million buildings**. [35] (2018-2029). The programme is currently financed with revenues of NFOŚiGW. The use of ERDF and Cohesion Fund resources is considered for next MFF, but some measures (e.g. high efficiency coal boilers) are not going to be eligible[36] • **'My electricity' –** PV for *prosumer*s (production for own consumption) to be installed on buildings. **Grant** up to 50% of investment cost, maximum PLN 5 000 (EUR 1 200). Available budget EUR 235m (PLN 1bn) from national resources[37]

	(near) zero emission heating sources	• Norway and EEA Funds 2014-2020 EUR 112m for energy efficiency in buildings, geothermal heating and small scale hydropower – **grants** • **Tax rebate** on personal income tax for EE measures in single family houses not covered by aid programmes[38] • **'Stop smog'** – **grants** of up to 100% for boiler replacement, thermal insulation and connection to district heating or gas network for poor households. Implemented by local governments with State budget subsidy of 70% of investment. PLN 1.2bn (EUR 280m) available in State budget[39] • **Thermal insulation and renovation fund –** since 1998 BGK is providing soft-loans combined with grants through commercial banks (up to 20% of loan) from government resources. Total volume of the fund is PLN 2.575bn (EUR 606mln). More than 45,000 buildings have profited from the programme, 95% are multi-apartment buildings[40] • **National and regional OP contributions** through grants and financial instruments – almost EUR 800m[41] • Banks have delivered, during 2010-2019, almost PLN 23bn (EUR 5.4bn) [42] for the thermal renovation of residential buildings across different support schemes and also without public support. Three commercial banks use **ELENA support** to pay energy audits and project documentation linked to lending for the renovation of residential housing <u>New planned measures/priority objectives in the NECP:</u> • Continuation of existing measures • Improvement of housing conditions and EE, combined with revitalisation of degraded areas. To be supported by using national and EU funds
Public Sector	• Obligation to renovate (every year) 3% of the total floor area of central government buildings • NZEB: from 2019 for government buildings • By 2030 at least 85% of district heating and cooling system shall fulfil criteria for efficiency systems	<u>Existing measures:</u> • **National and regional OP contributions** through grants and financial instruments – almost EUR 1.5bn[43] • **'Energy efficient building' –** grants up to 95% combined with soft-loans for hospitals, cultural institutions, historic buildings, church entities EE measures and small scale RES. Financed from resources of NFOŚiGW PLN 1.65bn (EUR 388mln) [44] • Various support programmes for local governments from the Regional environmental and water management funds (WFOŚiGW)

		New planned measures/priorities in the NECP: • Current measures are expected to be extended to post 2020, in particular support for EE in public buildings, drawing upon ERDF and Cohesion Fund resources • Priority being given to ESCOs. Measures will be undertaken in the period 2021-2030 to support also SME-sized ESCOs with ERDF and Cohesion Fund resources
Enterprises	• No sector specific targets identified	Existing measures: • Mandatory **energy audits** and energy management systems for large enterprises • **National and regional OP contributions** through grants and financial instruments – of EUR 186m for SMEs and EUR 160m for large enterprises[45] • One commercial bank uses ELENA support to pay energy audits, project documentation and advice on available grants linked to lending for the renovation of commercial buildings New planned measures/priorities in the NECP: • Continuation of existing measures • Support from ERDF and Cohesion Fund for Building Energy Management System and Demand Side Response technology • Improvement of heat consumption, through thermal insulation, change of heating technology, alternative heating systems, heat recovery to be supported with public funds, e.g. ERDF and Cohesion Fund • Linking energy management systems with demand side response tools in industry

3. Market failures, main issues and barriers to investment

In the following table some information about the main (financial and non-financial) barriers preventing EE investments are reported per each sector[46].

	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 **large number of national, regional and local 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 housing owners to identify the best programmes for their project.	• Continued s**hortage of highly qualified and reliable staff** to deliver quality construction works; • Increased labour and material cost in most recent years; • Many **renovation measures** in multi-apartment buildings are undertaken **without energy audit** (48%). There are significant differences between regions ranging from 73% (Kujawo-Pomorskie) to 26% (Lubuskie) [47] . In many support programmes energy audits are a prerequisite for ESIF financial instruments.
Residential Sector	• Many house owners have a **lack of own resources** (80% of all respondents of not undertaking renovation measures [48]), 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 very 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 Poland still a catching up to richer European countries regarding consumption of capital goods can be observed; • The **high collateral requirements** for soft loans provided by NFOŚiGW deter people of taking soft loans and grants combined with them. The 'weksel in blanco' is bill of exchange with an	• Comprehensive renovation requires for inhabitants to move out. Difficult in multi-apartment buildings with individual ownership of flats; • Difficulties for all members of the housing association or cooperative to agree on investment; • Difficulties to refurbish historic buildings ('kamienice') in cities with many low income households. Need for complex revitalisation of buildings. • **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; • **Administrative burden**, e.g. energy audits, complex administrative requirements to access ESIF financial instruments.

	irrevocable payment obligation to secure the loan; • **Banks lend against the credit worthiness of the client** and not the investment. This makes the access to bank financing difficult for low income or highly indebted households as well as for dwellings owned by individuals in housing associations; • In Poland there is a high share of **low income households** which own their dwellings[49]; • In **Poland commercial banks** have experience in energy efficiency lending since the early 1990s from on-lending soft loans from NFOŚiGW or BGK. The high level of grant support from EU and national resources are crowding out commercial banks from lending for energy efficiency; • Many support programmes concentrate on the **lowest performing buildings**. This excludes buildings that already undertook energy efficiency measures, such as wall insulation for ESIF support for additional measures such as heat pumps, rooftop photovoltaics, further insulation of the building envelope.	• **Savings (energy and financial) not achieved** due to energy certificates not fulfilling standards and poor quality installation[50]; • According to a performance audit on several energy efficiency schemes for multi-apartment buildings conducted by the Polish Court of Auditors (NIK). Savings, both in terms of energy and finance are not achieved due to energy certificates not fulfilling standards and poor quality execution of the works[51]
Public Sector	• **Public authorities tend to rely on grants**, EU or national, to finance energy efficiency investments; • Smaller public authorities prefer national support schemes over ESIF support due to the less rigid application of rules, such as procurement or State aid. This applies to ESIF grants and financial instruments; • **Restrictions on taking** debt for regional and local governments; • **ESCOs have difficulties to access to finance**. This refers to access to equity and debt for long-term growth, to short-term financing for project implementation and for long-term financing for the performance period[52];	• The Polish ESCO market is not very developed only few successful projects realised via **Energy Performance Contracting (EPC)** exist. There is generally low awareness and trust in this implementation method. • There is an **insufficient number of ESCOs** in the market offering complex renovation as a service. • **Complexity of procuring EPC** for public entities, which are procured under PPP rules and there is lack of qualified consultants that can support public authorities in this process[53].

	• **Difficulties to combine ESIF** grants and implementation of the project by an **ESCO**, because ESCO's contribution does not count as co-financing of the grant.	
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 interesting to do borrowing from several different institutions. • 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, • 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. This hampers the ESCO market development, and makes it difficult to finance projects.	• 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 y actual investments. • The main tool to support energy efficiency measures in industry are **white certificates**, which provide additional cash flow (around EUR 450 per toe) to the issuer and can be used as collateral for loans. White certificates are not accessible for SMEs as the minimum size is 10 toe. Aggregation mechanism like ESCOs are underdeveloped[54]. • **ESCO services** in enterprises **are not well known** for small and medium sized enterprises. • Since **changes of IFRS accounting rules** investment financed by ESCO count as debt for client. This is a disincentive for outsourcing energy management.

4. Investment needs, gaps and implications for financial instruments

The NECP includes estimates for investment needs, summarised in the following table.

Investment needs (EUR bn in 2016 prices)	2021 - 2025	2026-2030	2021-2030	2031-2035	2035-2040	2021 - 2040
Total	**100 251**	**95 527**	**195 778**	**86 562**	**74 368**	**356 708**
Energy generation and distribution	**45 178**	**45 810**	**90 988**	**52 712**	**48 174**	**191 874**
of which Electricity generation	*11 706*	*12 229*	***23 935***	*23 879*	*22 880*	***70 694***
of which renewable energy for electricity	*6 419*	*11 192*	***17 611***	*9 401*	*14 225*	***41 237***
of which District heating	*4 244*	*4 350*	***8 594***	*3 227*	*2 042*	***13 863***
Non-energy sectors	**55 073**	**49 717**	**104 790**	**33 850**	**26 194**	**164 834**
industry	*5 636*	*4 575*	***10 211***	*3 722*	*3 040*	***16 973***
transport	*25 470*	*22 894*	***48 364***	*14 370*	*11 553*	***74 287***
households	*15 867*	*14 543*	***30 410***	*9 478*	*6 772*	***46 660***
services	*3 251*	*3 145*	***6 396***	*2 057*	*966*	***9 419***
agriculture	*4 849*	*4 560*	***9 409***	*4 223*	*3 863*	***17 495***
Modernisation of buildings across all sectors	**7 372**	**7 532**	**14 904**	**4 619**	**1 518**	**21 041**

The transformation of Poland's economy to a low carbon economy requires very large investments across the energy infrastructure and on the demand side across all economic sectors. The estimated amount of EUR 356 billion (84% of Poland's 2016 GDP) is almost equally distributed between investment in energy generation and distribution infrastructure on the one side and investment in energy efficiency across all sectors on the other side. **Building renovation related investments,** require for the 2021-2030 period investment of EUR 14.9 billion, of which the majority needs to be invested in the residential sector.

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

Horizontal implications for financial instruments
• 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 Infrastructure and Environment, Regional OPs, future ELENA programme or national sources.
• Poland has a **large number of support schemes** for energy efficiency on national and regional/local level in form of grants and revolving support, mainly soft-loans; either funded from EU funds or national resources. In order to make it easier for beneficiary to access support and to avoid 'cannibalisation'

between the different support schemes a clear demarcation between grants and financial instruments as well as national and regional schemes is required.

- Financial instruments supported by regional OPs are **implemented often by non-bank institutions**, such as local debt funds or regional development agencies. These institutions do not always have sufficient capacity to deliver larger and more sophisticated financial instrument or financial resources to contribute co-financing or the leverage required to mobilise sufficient investment. Therefore it is advisable standardise the way how these local institutions provide support to households, SMEs and public sector entities. Also regional Managing Authorities should strive to attract increasingly commercial or cooperative banks into the delivering financial instruments through standardisation of eligibility criteria and funding agreements across regional OPs.
- **Pure grant schemes should be phased out**, with the exception of areas like energy poverty, 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,** and in particular the banking sector's offer financing similar activities. *According to research by the Central Statistical Office (GUS): 37% of multi-apartment building renovations were undertaken with bank loans combined with capital rebates, 15% loans without grants, in comparison 8% loans or repayable assistance and 6% grants from OPs and NFOŚiGW resources*[55]. Corresponding to the Polish Banking Association (ZBP) commercial banks can multiply public funds by factor 6 to 50, depending on the programme[56]. Therefore a shift from soft-loan instruments to guarantee funds, with capital rebates should be contemplated.
- Considering the lack of skilled workers for energy efficiency investments, specific training programmes could be supported.

Residential sector	Public sector	Industry
• **Integrating financial instrument combined with investment grants and technical assistance** (energy audits, project preparation, supervision of project implementation and dispute settlement with builders) into a one-stop shop scheme for residential buildings; • For 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 measures should receive financial instrument, but with low or no grant element;	• Financial instruments could support the **development of the EPC** model in the public sector, providing **technical support and financial support** both directly to Public Sector Entities (e.g. municipal lending) and to private or public-private entities (loans, guarantees and/or equity financing).	• **TA support for energy audits and advisory** for the preparation of EE measures in combination with renewable energy; • **Allowing for TA for banks,** as it is used in PF4EE (not possible as a part of ESIF financial instruments) to build up the experts internally or externally; • The **financial instrument should have sufficient scale,** be simple regarding eligibility and State aid check; • EE measures should be integrated in mainstream SME financing, with additional incentives for achieving EE savings or greenhouse gas reduction;

• Financial instruments could support innovative project implementation solutions (e.g. **ESCO model**), not developed in the residential sector also due to the reluctance of banks to finance them (mainly due to exposure to double risk – payment risk of housing owner and performance risk of ESCO).		• 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

Poland is the largest beneficiary of **ESIF funding. It will receive EUR 86bn** (circa EUR 2.262 per person) during the 2014 – 2020 period. For the **low carbon economy, EUR 11.6bn** has been allocated (EUR 6.7bn from ERDF; EUR 4.9bn from CF and EUR 31m from EMFF)[57].

The **EE related support** comes through the national Operational Programme Infrastructure and Environment (OPIE) and 16 regional OP, the total amount is estimated to be **EUR 2.6bn**[58].

In OPIE more than EUR 1bn is allocated to energy efficiency in energy efficiency in large enterprises, public buildings and multi-apartment buildings. The 16 regional OPs have allocated EUR 1.5bn to energy efficiency, of which EUR 826m are allocated to the residential sector[59]. In the 2014–2020 period, Poland contributed **EUR 2.8bn**[60] **of its ESIF** (circa 4% of its budget) **to financial instruments** (ERDF and ESF).

Support is provided for EE measures in the residential sector, for public buildings, SMEs and to a limited extent for large enterprises. The EE support is provided by one national OP and all 16 Regional OPs. There are large differences regarding the eligibility of final recipients and measures between regional OPs[61].

Under OPIE there is a repayable assistance scheme which is implemented by NFOŚiGW and addresses energy efficiency in large enterprises. It consists of a repayable and a non-repayable part, which is depending on energy savings achieved between 5% and 15% of eligible expenditure[62]. The scheme has met limited interest as it involves complex calculations of the financial gap for the non-repayable part. The original allocations of EUR 150m have been reduced to EUR 78m. Support to ESCO implemented projects was considered, but never implemented.

For energy efficiency in multi-apartment buildings, a national repayable assistance scheme is implemented by NFOŚiGW, originally it was supporting buildings in the capital cities of the regions and cities covered by integrated territorial development. The support combines a repayable and non-repayable part, depending on energy savings achieved between 25% and 45%. The scheme was less successful than expected. In response the eligibility was extended to the whole country, which led to overlap with regional OPs and allocations were reduced from EUR 225m to EUR 83m. .

In the **OP Smart Growth** there is the guarantee instrument Biznesmax, which supports beside innovative investments also investment in energy efficiency, renewable energy and circular economy. The instrument is combined with an interest rate subsidy. The instrument is reported as TO3 (SME competitiveness) and not TO4 (low carbon economy). One of the financial intermediaries, PNB Paribas Polska, combines Biznesmax with project development support form ELENA[63] to provide a global package of services (energy audits, preparation of the technical documentation, technical advice and advice related to available grants) to enterprises for undertaking energy efficiency investments (above 30% energy savings) and renewable energy investments in buildings.

In regional OPs EUR 204m, 13% of the total allocation, is allocated to financial instruments for energy efficiency. The Financial instruments in the regional OPs are implemented by BGK or EIB, acting as fund of funds manager and a very large number of financial intermediaries implementing under fund of funds. These financial intermediaries are commercial banks operating on a national scale or many small agencies, debt funds or foundations operating on a local scale.

There are in particular three financial instruments dedicated to EE that could be of interest: (i) a financial instrument operating in the multi-apartment building sector in Pomerania, Mazovia and Kujawsko-Pomorskie; (ii) a financial instrument operating in the SME sector in Lower Silesia and (iii) PF4EE in Poland, which financed multi-apartment building through a one-stop-shop approach. All three cases are presented in the following boxes.

Multi-apartment building sector in Pomerania, Mazovia and Kujawsko-Pomorskie[64]

Based on the **success of financial instruments managed under the JESSICA** Initiative during the 2007-2013 programming period, three Polish regions (i.e. Pomerania, Mazovia and Kujawsko-Pomorskie) have each established their respective financial instruments for which the EIB was selected as a Fund of Funds Manager.

The EIB signed three operational agreements for the total amount of PLN 273m (EUR 64.2m) with Getin Noble Bank, one of the leading banks in the Polish housing sector, which will provide PLN 48m (EUR 11m) from own resources. The **operational agreements and eligibility criteria are standardised across the OPs**. The goal is to provide loans for the much-needed thermo-modernisation of multi-family residential buildings in three Polish regions, with a duration of up to 20 years. Projects with energy savings of 25%-60% will receive a soft loan from ESIF resources and above 60% an interest free loan.

The Programme is **dedicated to the housing cooperatives and associations**, social housing associations, local government entities and entities that they control, and other institutions or bodies. The financing will support projects designed to reduce heat losses, eliminate individual sources of heat in conjunction with connecting to district heating networks, modernise local heat sources, energy upgrades in heating and ventilation systems, internal installations, installation of energy monitoring and management systems.

It is estimated that at least eight thousand households will increase their energy efficiency thanks to support from this Programme and at least 250 multi-apartment buildings will be modernised in all three regions.

The instrument is combined with **support to Getin Noble Bank from ELENA** for energy audits and project documentation[65]. ELENA supports loans under the aforementioned financial instrument but also for banks regular residential renovation loans. With a project development service grant of EUR 2.1m, the bank is expected to mobilise investments of EUR 81.8m from 2019-2022.

Financial instruments for EE in enterprises in Lower Silesia[66]

The Polish region Lower Silesia contributes from its OP 'Investment, Innovation, Energy' EUR 756m (EUR 178m) to financial instruments across different priority axes of the regional OP:

- Entrepreneurship and innovation
- Low carbon economy
- Labour market

Under the priority Low carbon Economy three areas are supported with PLN 269m (EUR 63m): renewable energy, energy efficiency in SMEs and energy efficiency in residential housing. In 2016 the Managing Authority has signed a funding agreement with BGK, to implement as fund of funds manager several financial instruments. BGK has selected financial intermediaries for the individual financial instruments.

For **energy efficiency in SMEs** eligible investments are deep energy modernisation of facilities, including replacement or modernisation of energy sources resulting in increased energy efficiency, with the possible consideration of renewable energy sources. Furthermore, projects involving the use of energy-efficient technologies in enterprises (including modernisation and extension of production lines for more energy-efficient ones) and support for installations recovering waste heat can be supported. Minimum energy efficiency is 25% for all investments except for the change of heating source where minimum 35% are required. The instrument is providing soft loans ranging from PLN 200 000 (EUR 47 000) to PLN 3m (EUR 705 000) for up to 15 years with a grace period of 6 months[67]. Interest rates can be as low as 0.5%.

The financial instrument is implemented by three financial intermediaries, two development agencies covering only parts of the Lower Silesia region and the Poland-wide operating social economy fund TISE, implementing

several ESIF financial instruments on regional and national level. By end of 2018 only 4 loans with enterprises have been signed (planned 121)[68].

In parallel to the **loan instrument there is also grant programme,** which has supported 52 projects and 82% of the OP allocations have been disbursed. The grant programme is very successful with the second call being 4 times oversubscribed. It can be expected that the financial instrument will become more successful when the grants are fully absorbed.

During the **current programming period** one Polish bank has joined the EU level financial instrument, PF4EE that in Poland is focused on multi-apartment building. The instrument is briefly described as it presents a **one-stop approach** that could be replicated with ESIF in the 2021-2027 programming period.

Energy Efficiency Finance Facility for Residential Buildings backed by PF4EE

Private Finance for Energy Efficiency (PF4EE) instrument is a joint agreement between the EIB and the EC which aims to address the limited access to adequate and affordable commercial financing for EE investments. The instrument is managed by the EIB and funded by the Programme for the Environment and Climate Action (LIFE programme). The PF4EE instrument provides:

- A portfolio-based credit risk protection provided by means of cash-collateral;
- Long-term financing from the EIB (EIB Loan for Energy Efficiency); and
- Expert support services for the Financial Intermediaries (Expert Support Facility).

PF4EE operates through financial intermediaries across the EU: currently, ten national banks provide PF4EE credit lines. In Poland PF4EE was launched in 2019 and it is managed by BNP Paribas Bank Polska SA, that created a loan product for multi-apartment renovation - **Energy Efficiency Finance Facility for Residential Buildings (EEFFRB**)[69].

It consists of the package of different services including technical assistance (i.e. energy audits, energy advisory and consultations) from ELENA, a loan backed by PF4EE and an investment grant provided by BGK of up to 21%. The initiative is designed in such a way to help housing association in all the stages of the investment process especially in the initialisation phase. The energy specialist of the bank will help clients in filling out the grant application to BKG and administer the request for payment of the grant which will be used as a capital rebate writing off part of the outstanding loan.

The EEFFRB supports different types of investments which include, among others, thermal insulation of buildings, replacement of windows and external doors, reconstruction of heating, ventilation and AC systems, installation of RES in the retrofitted buildings. It is assumed that the EEFFRB will help to mobilise investments worth EUR 78 million which would generate the annual total savings in the final energy consumption of 184 GWh and the annual total emission reductions of 47 900 t CO_2 eq.

There are several non-ESIF financial instruments combining soft-loans and grants managed by BGK and NFOŚiGW, described in chapter 2.

The EBRD also offers the GEFF (Green Economy Finance Facility) a EUR 350m credit line to leasing companies for investments in energy efficiency, renewable energy and resources efficiency. This facility bases on the successful POLSEFF 1 and 2, which phased out in 2019 and it is successful without investment grants and very limited technical support to financial institutions[70].

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[5] EUROSTAT; Energy productivity [T2020_RD310]; data in Euro per kilogram of oil equivalent (KGOE); extracted on 13/02/2020
[6] EUROSTAT; Final consumption - other sectors - households - energy use; Complete energy balances [nrg_bal_c]; extracted on 13/02/2020; EUROSTAT; Final consumption in industry; Complete energy balances [nrg_bal_c]; extracted on 13/02/2020; Final consumption commercial and public services; Complete energy balances [nrg_bal_c]; extracted on 13/02/2020: EUROSTAT and Final consumption - transport sector - energy use; Complete energy balances [nrg_bal_c]; extracted on 13/02/2020
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[11] Główny Urząd Statystyczny Gospodarka mieszkaniowa i infrastruktura komunalna w 2018 r.l
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[25] Raport PRNews.pl: Rynek kredytów hipotecznych – 3rd quarter 2019
[26] EU Energy Poverty Observatory; Member State Report; Poland. April 2020
[27] A new set of indicators to measure energy poverty in Poland was proposed by a study undertaken for SRSS in 2018. Some of the indicators are already measured whereas for others no data are available:
Indicators to identify households at the risk of energy poverty:
-Low Income High Costs, and
- Twice the median share of energy expenditures.
Indicators applicable to measure the severity of energy deprivation:
- Inability to pay utility bills on time;
- Living in a dwelling with a leaking roof; damp walls, floors, or foundations; or rot in the window frames or floors; and
- Inadequate thermal comfort in winter
[28] Jakub Sokołowski, Aneta Kiełczewska, Piotr Lewandowski, Defining and Measuring Energy Poverty In Poland, IBS Research Report 2019
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