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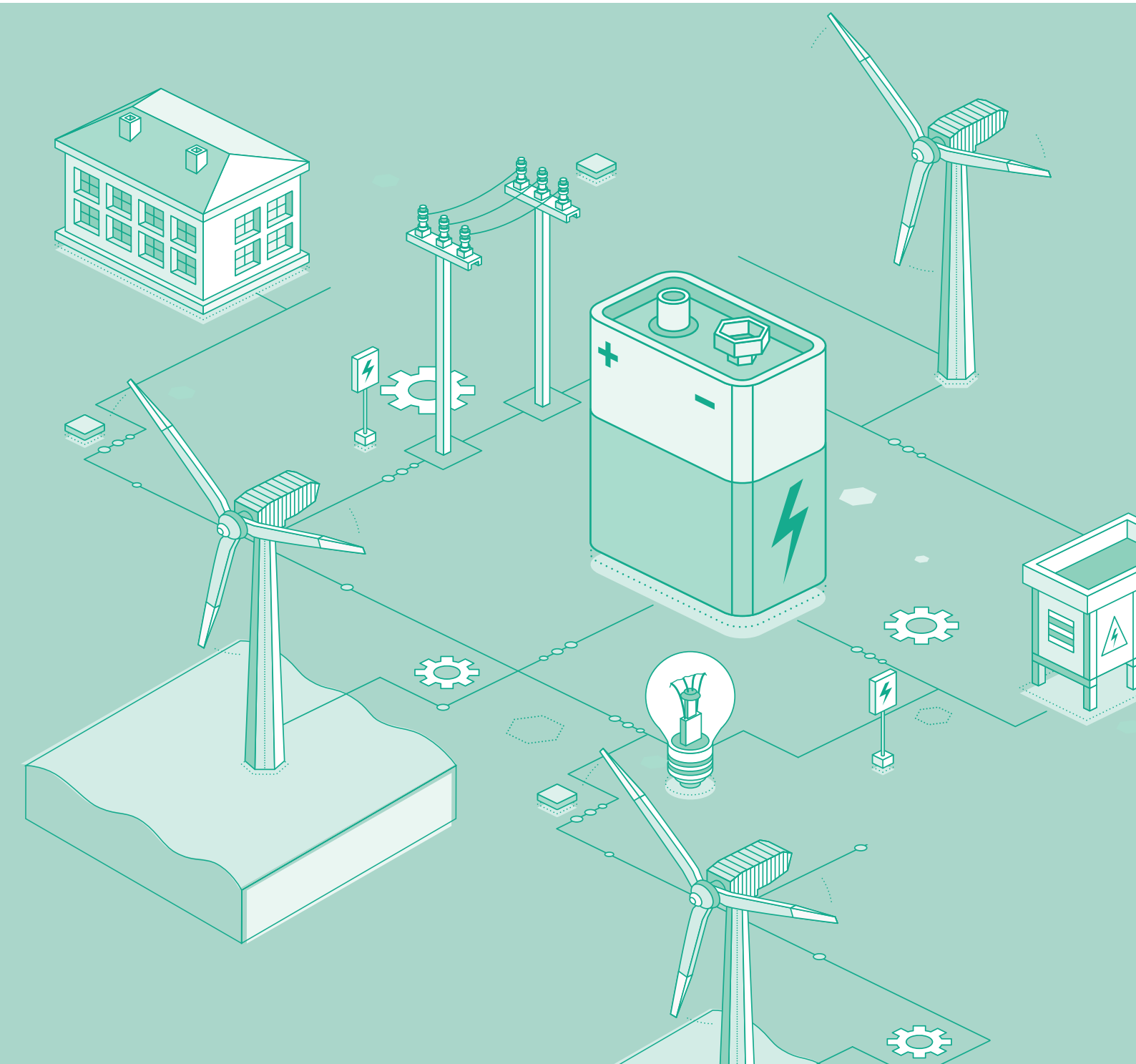
European Funds Provide the Power



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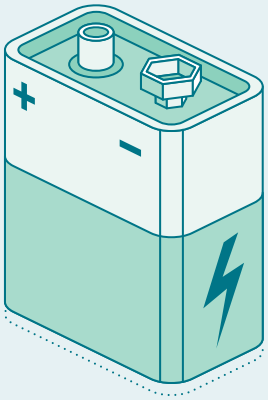

The publication was created in cooperation with the POLISH ELECTRICITY ASSOCIATION (PKEE). Polityka Insight has made every effort to ensure that the study is impartial and objective.

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Warsaw, December 2025

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Key Conclusions

1 **The energy transition in Poland is supported by a number of EU programmes and funds, including the cohesion policy and preferential interest rate loans from the European Investment Bank.** These funds finance the modernisation of grid infrastructure, the development of RES, the improvement of energy efficiency and the decarbonisation of heating systems, as well as the transformation of coal-mining regions. Poland uses substantial funds from the Modernisation Fund - a facility operating, which operates outside the main EU budget. Under the current energy transition financing architecture, the EU's Recovery and Resilience Facility, implemented through national recovery plans (NRP), is of particular importance, but its use in the implementation of large-scale investments poses a number of challenges.

2 **For EU funds to be used effectively, it is crucial that they help address the specific development needs of EU Member States and enable them to catch up, taking into account specific characteristics of their economies.** High emissions remain a structural feature of the Polish energy sector. As in other EU countries, the need for significant investment aiming to expand and digitise transmission and distribution networks a challenge as well. These networks need to be adapted to a radically changing energy system. For this reason, large energy projects should be treated as a priority area for EU funding.

3 **The structure of the NRP, linking successive tranches of investment funds to reforms, is intended to bring about a comprehensive improvement in the competitiveness of European economies.** In the case of Poland, this model contributed to a delay in the payment of the first tranche of support and, as a result, shortened the time available for the implementation of projects benefiting from subsidies, which forced some investors to revise their assumptions or withdraw from their investments. However, linking investments to reforms provided an impetus for efforts to improve the regulatory environment for priority investment areas.

4 **The support provided by European funding must take into account the needs of both small and large investors, with the latter group being the one that implements projects with the highest unit added value.** Large-scale investment programmes, such as grid modernisation or the construction of offshore wind farms, generate both measurable economic benefits for investors themselves and systemic advantages that will also be experienced by smaller entities in the long run. The contribution of EU funds will reduce the exposure of end users to the costs of these investments, thus contributing to the stabilisation of energy prices.

5 **Ability to rely on future support offered by European funding helps energy sector entities reduce their own contribution to projects requiring considerable financial, time-related, human and operating resources.** Investors are encouraged by the certainty of political and financial support for the project, which is not guaranteed by market conditions. This is why long-term programmes with stable investment priorities yield the best results. The implementation of the projects under those programmes often reaches far beyond the horizon of a single political cycle, and their continuation demonstrates that European funds work well as a catalyst for investment processes with cross-party support.

This report is the first in a series of publications devoted to financing investments aiming to transform Poland's energy sector. It underscores the role and importance of EU funds, with a particular emphasis on large-scale projects. The second part, entitled 'How Much Energy in the New EU Budget?', addresses issues related to the future EU budget, providing recommendations based on the experience of the Polish electricity sector to date.

List of Abbreviations

BGK	Bank Gospodarstwa Krajowego (National Economy Bank)
CF	Cohesion Fund
CEF	Connecting Europe Facility
DSO	Distribution System Operator
EBRD	European Bank for Reconstruction and Development
EC	European Commission
EFS+	European Social Fund Plus
EIB	European Investment Bank
ERDF	European Regional Development Fund
FENG	European Funds for a Modern Economy
FEnIKS	European Funds for Infrastructure, Climate and Environment
FWE	Energy Support Fund
IF	Innovation Fund
JTF	Just Transition Fund
KPEiK	National Energy and Climate Plan
LNG	Liquified Natural Gas
MEW	offshore wind energy
MF	Modernization Fund
MFF	Multiannual Financial Framework
NFOŚiGW	National Fund for Environmental Protection and Water Management
NGEU	NextGenerationEU
NRP	National Recovery Plan
PGE	Polska Grupa Energetyczna (Polish Energy Group)
PSE	Polskie Sieci Elektroenergetyczne (Polish Power Grid)
RES	Renewable energy sources
RRF	Recovery and Resilience Facility
TTF	Title Transfer Facility
URE	Energy Regulatory Office

Introduction

The pace of changes taking place in the Polish power system has accelerated. Over the last decade, the installed capacity of all power plants in Poland has increased by nearly 80 per cent, with RES alone increasing more than fivefold. This is due to the development of prosumer micro-installations, but also to investments by energy companies, including those aiming to expand and modernise power grids. At the same time, with the increasing popularity of the distributed energy model, the grid must be adapted to bidirectional transmission. This means that operators must seek solutions to increase the flexibility of the system.

Large energy companies are investing in offshore wind power, energy storage facilities and gas-fired power plants, which are set to play a key role in balancing the power system. At the same time, in connection with the transformation of the power sector, investments are underway in the decarbonisation of district heating systems that supply approximately half of Polish households.

Transformation of the electricity sector creates an opportunity to improve the competitiveness of the Polish economy. Reducing the carbon intensity of energy consumption will result in lower carbon emissions for all Polish industrial products. Increasing the share of RES in the energy mix may also reduce wholesale energy prices in the long run. However, the prices paid by end users will depend on system costs, which include the cost of expanding the electricity grid and maintaining current generation capacity. Constituting part of the supply chain that participates in rolling out leading technologies, domestic industry can support the energy transition.

Investments in the transformation of the electricity and heating sectors are also increasing spending on national energy security, understood as the ability to provide stable and affordable energy supplies from domestic sources. This applies, in particular, to electricity, as demand for this form of energy will continue to increase due to the electrification of transport, industry, individual heating and, to some extent, district heating. The growth in demand will be augmented even further by new sectors of the economy, with data centers playing a leading role in the process.

EUROPEAN FUNDS FOR ENERGY TRANSITION IN POLAND

COHESION POLICY (NATIONAL ENVELOPES):

grants loans guarantees

	EUROPEAN FUNDS FOR POLAND	ENERGY SECTOR	SELECTED OBJECTIVES
FENIKS	**EUR 24.2 bn** → **EUR 11.3 bn** from the Cohesion Fund → **EUR 12.9 bn** z EFRR	**PLN 6.08 bn**	RES electricity infrastructure gas infrastructure heating
EUROPEAN FUNDS FOR REGIONS	**EUR 33.4 bn** → **EUR 20.7 bn** from the ERDF → **EUR 8.9 bn** from the European Social Fund+ → **EUR 3.85 bn** from the Just Transition Fund	**EUR 9.5 bn**	RES heating energy efficiency climate adaptation
EUROPEAN FUNDS FOR A MODERN ECONOMY	**EUR 8 bn** from the ERDF	**EUR 0.63 bn**	energy efficiency research and innovation regarding smart grids and energy storage
EUROPEAN FUNDS FOR EASTERN POLAND	**EUR 2.65 bn** from the ERDF	**EUR 0.12 bn**	increasing the capacity to connect RES sources and boost the stability of energy supplies

WITHOUT DOMESTIC ENVELOPES

CEF ENERGY	HORIZON EUROPE	LIFE	INVEST EU	INNOVATION FUND
EUR 5.84 bn	**EUR 93.5 bn**	**EUR 5.43 bn**	**EUR 26.2 bn** (guarantees)	approx. **EUR 40 bn** between 2020 and 2030 (estimate)

MODERNISATION FUND (2021-2030)

EUR 4.3 BN
paid to Poland

SELECTED OBJECTIVES:

- co-generation in district heating, 'Clean Air',,
- energy storage facilities for distribution network operators,
- remotely read meters,
- development of EV charging infrastructure,
- energy efficiency
- RES for energy-intensive industries.

With allowance costs equaling **EUR 75/tonne** of CO_2, Poland could receive a total **of EUR 22 bn** between 2021 and 2030. Payments to date: nearly **EUR 4.3 bn.**

NATIONAL RECOVERY PLAN (NRP)*

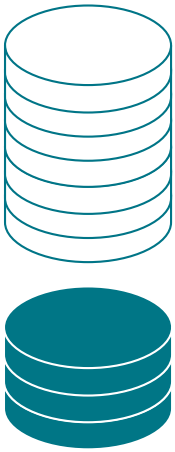
*before the revision in December 2025

41.39 per cent
of funds will be allocated to climate--related goals

2 out of 6
goals related to broadly understood decarbonisation in the energy sector

6 out of 10
largest NRP beneficiaries large energy companies

57 investments
54 reforms



GRANTS
EUR 25.3 BN

EUR 7.5 BN
for decarbonisation goals

30 per cent
of the grant pool

LOANS
EUR 34.4 BN

EUR 26 BN
for decarbonisation goals

75 per cent
of the grant pool

EUROPEAN INVESTMENT BANK

EUR 9.6 bn in financing for energy-related investments between 1990 and September 2025, with a total of nearly **EUR 102 bn**

EUR 102 BN
in total

KEY EU FINANCING INSTRUMENTS IN THE ENERGY SECTOR:

- Direct,
- Project Investment Loan, Framework,
- Programme Loan,
- REPowerEU-labelled loans,
- Project Finance Direct Loan.

EUR 9.6 BN
financing for energy investments

SELECTED TARGETS:

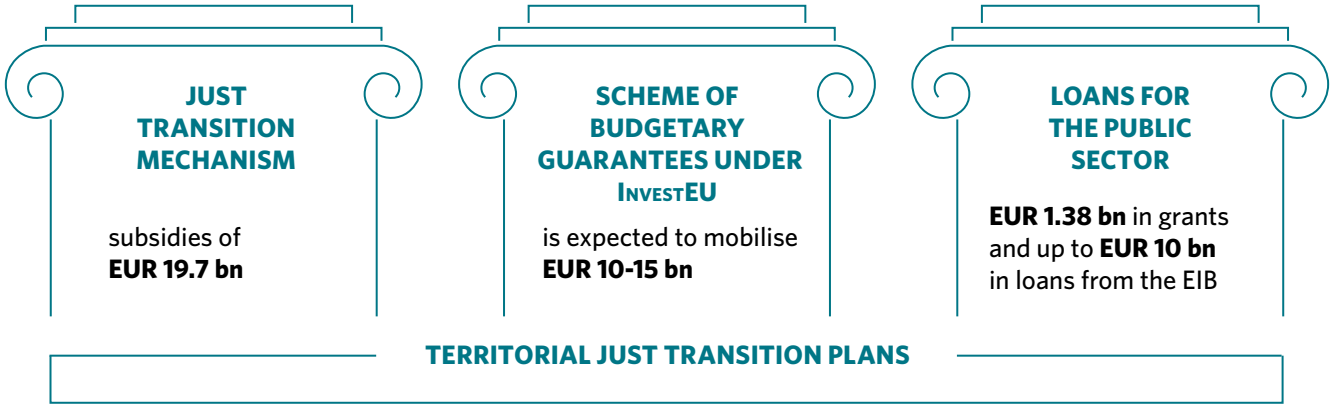
- expansion and modernisation of distribution networks,
- offshore wind farms,
- LNG terminal in Świnoujście,
- RES projects.

Why is the EU Accelerating the Energy Transition?

In 2019, the European Council endorsed the goal of achieving climate neutrality by 2050[1] and expressed its conviction that the energy transition will bring about significant economic growth potential by creating new markets and jobs, as well as contributing to technological development. However, EU leaders have stipulated that this will only happen if significant public and private investment is made. The EU's intention was to achieve a cost-effective, fair and socially harmonised energy transition. The goal of achieving climate neutrality by 2050 was approved in 2021 and gave rise to work on a legislative package known as 'Fit for 55'.

The energy transition was to be supported, in part, by funding from the Multiannual Financial Framework 2021-2027, but also the European Investment Bank (EIB), which has pledged to support investments concerned with protecting climate and the environment, totalling EUR 1 trillion. In its conclusions of December 2019, the European Council acknowledged that the transition should take into account the differences in the circumstances of individual countries. It expressed its support for the creation of a Just Transition Mechanism, which today provides additional support for coal-dependent regions.

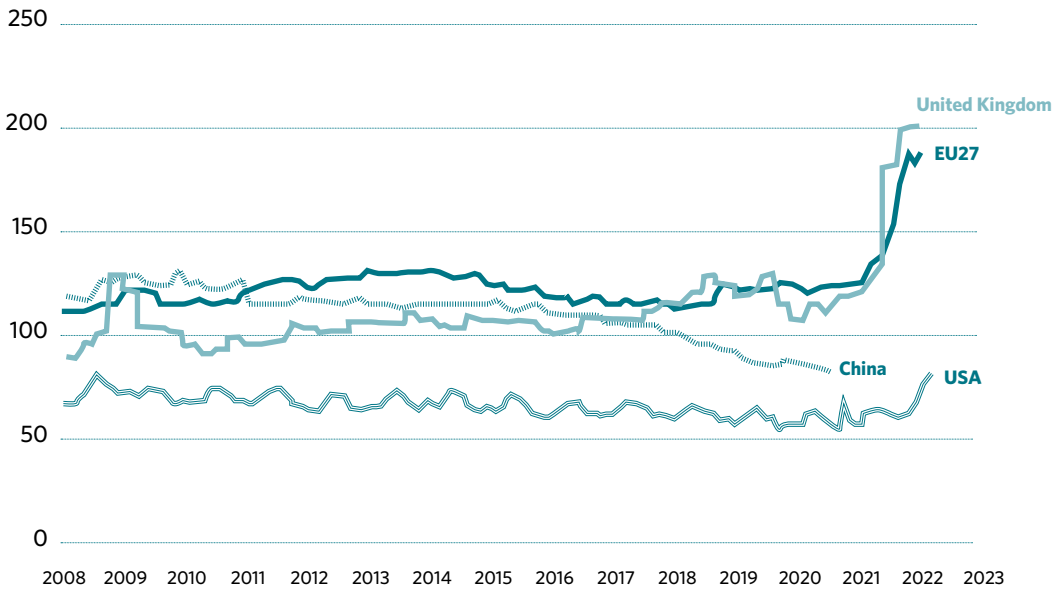
JUST TRANSITION MECHANISM



In the subsequent years, EU institutions negotiated 'Fit for 55', i.e. a package of regulations setting specific decarbonisation targets for individual sectors of the economy to be achieved by 2030. These negotiations coincided with the COVID-19 pandemic and then with Russia's declaration of a full-scale war on Ukraine, accompanied by a Europe-wide energy turmoil. At its peak, wholesale gas prices on the

Dutch TTF exchange reached EUR 320/MWh, average wholesale energy prices on European markets increased to around EUR 400/MWh, and the price of coal in ARA ports rose to EUR 380 per tonne[2]. These increases affected all energy consumers, but remedial measures such as price freezes limited the exposure of households as well as small and medium-sized enterprises to rising energy prices. Energy costs, however, became a serious challenge for energy-intensive industries, as rivals in China and US did not experience comparable price hikes.

RETAIL ELECTRICITY PRICES FOR INDUSTRIAL CUSTOMERS [EUR/MWH]



SOURCE: STUDY ON ENERGY PRICES AND COSTS: EVALUATING IMPACTS ON HOUSEHOLDS AND INDUSTRY – 2023 EDITION, TRINOMICS ET AL. COMMISSIONED BY THE EUROPEAN COMMISSION.

In light of these events, Europe decided to boost investment in resilience and economic recovery, including through the energy transition. And so, in parallel with the conclusion of negotiations on the Multiannual Financial Framework 2021-2027, the EU agreed on financing from new, joint debt for the NextGenerationEU (NGEU) instrument, which became the basis for the Recovery and Resilience Facility (RRF). In 2023, the national recovery plans implementing the RRF were supplemented by the REPowerEU chapter, i.e. additional support for accelerating the energy transition and moving away from hydrocarbon imports from Russia.

12.2020 — Multiannual Financial Framework 2021–2027

12.2020 — NextGenerationEU

02.2021 — Recovery and Resilience Facility

02.2022 — outbreak of full-scale war in Ukraine

03.2023 — REPowerEU

07.2025 — draft Multiannual Financial Framework 2028-2034

08.2026 — deadline for completing reforms and investments under the national recovery plan

Why Are Poland's Investment Needs Growing?

Investments in the energy sector are key to increasing the competitiveness of Polish companies. In its 2025 national report concerned with Poland[3] the European Commission acknowledged that Poland's financial needs related to energy transition are 'enormous' and that high energy costs limit the competitiveness of Polish enterprises, hamper electrification and negatively affect households. The Commission identified that increasing the capacity and flexibility of electricity grids, developing energy storage facilities and reducing dependence on fossil fuels would help to address the problem of high energy prices. The EC praised Poland for its rapid implementation of cohesion policy programmes, including the Just Transition Fund, but called for the timely implementation of NRP.

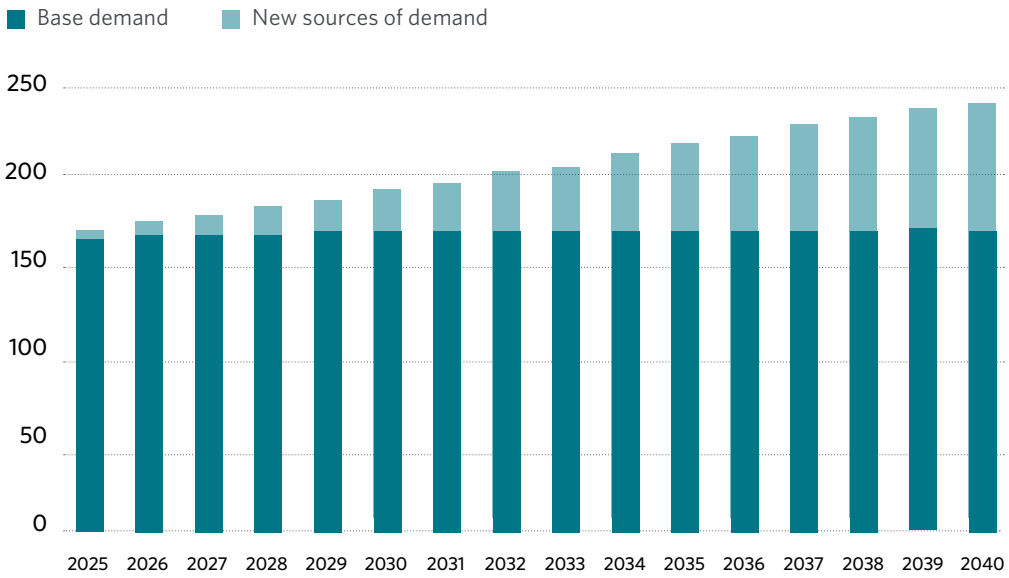
> Support from European funds helps to reduce the exposure of end users to investment costs. That is why it is particularly important in the case of projects that pursue public objectives.

The increasing pace of RES development requires adaptation of the power system, which generates costs. According to Polskie Sieci Elektroenergetyczne (Polish Power Grid), the installed capacity in the national system increased from 40.4 GW in 2015 to 72.2 GW at the end of 2024. The largest increase was observed in renewable sources[4] – their combined capacity increased more than fivefold during this period, from 5.7 GW to 31.8 GW. Industry, including energy-intensive sectors of the economy is reporting a need for further investment in RES[5]. However, maintaining the pace of renewable energy development requires both the expansion of electricity grids and the availability of gas-fired generation capacity to cover demand during periods of low generation from weather-dependent sources. These investments are strategic in nature, but they generate systemic costs which, without adequate public support, place an excessive burden on end users.

Investments in the grid increase the security of energy supply. The electrification of transport, heating, hydrogen production and certain industries, as well as the development of new energy-intensive sectors (e.g. data centres), will contribute to an increase in electricity demand. To ensure stable supplies, network operators must implement digitisation solutions and make infrastructure more resilient to physical threats, including by using underground cables instead of pole-mounted overhead

power lines). In this context, the modernisation of distribution networks will allow less developed regions of Poland to more efficiently attract new investments, including by facilitating access to low-carbon energy[6]. Poland has already made progress in this area – electricity-related emissions generated at end users' have fallen from 798 g CO_2 kWh in 2015 to 597 g CO_2/kWh in 2024.[7] However, if further investments translate into high distribution costs and system charges, consumers will not enjoy the benefits in the form of lower electricity prices.

ANNUAL NET ELECTRICITY DEMAND IN 2025–2040 – AVERAGE FROM THE CLIMATIC YEARS 1982–2019 [TWH]



SOURCE: PSE TRANSMISSION NETWORK DEVELOPMENT PLAN FOR 2025–2034.

Adapting the power system to the growing share of RES also requires greater flexibility. This is achieved through investments in energy storage facilities, including stand-alone large-scale installations, storage facilities accompanying RES sources, and small batteries supporting the balancing of distribution networks. Storage facilities serve a dual purpose: in addition to increasing consumers' access to low-carbon energy, they also limit price fluctuations, because they are capable of using cheap energy from wind and solar during periods when RES are not operating. They also have the potential to provide system services that increase the security of the grid.

What is Included in Poland's National Recovery Plan?

Investments related to decarbonisation are present in two of the six components of the Polish NRP. A total of nearly EUR 7.5 bn in grants and almost EUR 26 bn in preferential loans have been earmarked for energy transition activities, representing 30 per cent of the grant pool and 75 per cent of the loan pool, respectively. The funds are divided between individual investors, for example for the replacement of heat sources under the Clean Air programme, benefitting small and medium-sized enterprises, institutions as well as large enterprises. As of October 2025, six of the ten largest beneficiaries of the entire NRP are large energy companies. They received, by September 2025, a total of over EUR 16.4 bn in support.

The government's obejctives stated in the NRP aim to accelerate the development of onshore RES and offshore wind farms, as well as to improve the stability of electricity supply through the expansion and modernisation of transmission and distribution networks. EU support is also intended to accelerate the decarbonisation of district heating and individual heating systems through the replacement of heat sources and the thermal modernisation of buildings. Investments in energy storage and support for energy communities are expected to contribute to increasing the flexibility of the electricity system.

> The group of NRP's largest beneficiaries is dominated by energy companies that invest in the modernisation of power grids, including transmission and distribution networks, and offshore wind farm projects.

The European Commission assesses Poland's plans positively. In its analysis of the Polish NRP, following the changes made in June 2025, the Commission calculates that 41.39 per cent of the total financial allocation supports the implementation of climate objectives, and that further changes to the NRP do not significantly affect the level of national ambition for the transition[8]. The Polish chapter of REPowerEU, under which 67 per cent of funds will be allocated to investments supporting decarbonisation, has also been approved by the European Commission. It includes a loan for the construction of onshore infrastructure for a floating LNG terminal in the Gulf of Gdańsk (FSRU), which is in line with the objectives of diversifying import sources. Thanks to the design of the terminal, which allows for the addition of a second regasification unit, the FSRU has the potential to support Poland's neighbouring countries in moving away from gas supplies from the East.

Summary

EU funds limit the exposure of energy consumers to investment costs. Energy companies that implement investments with the support of EU subsidies and settle accounts with energy consumers using regulated tariffs pass on a smaller portion of their investment costs to the latter. In the case of preferential loans, this effect is weaker. However, the repayable nature of the support motivates beneficiaries to be disciplined in their use of the funds and allows public institutions to reuse the money once it has been recovered.

Support reduces the risk for investors, making it easier to obtain financing. This is illustrated by the example of offshore wind farms: in their case, the key advantage of EU funds is that they increase the credibility of the project for financial institutions. This helped to build the financial model for both the 1,498 MW Baltica 2 farm with a budget of PLN 30 bn, implemented by PGE and Ørsted, and the Bałtyk II and Bałtyk III farms with a total capacity of 1,440 MW and an investment of PLN 27 bn, built by Polenergia and Equinor. It is worth noting that EIB financing, reinforced by an InvestEU guarantee, played an important role in financing these projects, as well as the Baltic Power project implemented by Orlen and Northland Power.

Subsidising strategic investments encourages their consistent implementation. Support from EU funds strengthens the political consensus regarding strategic development paths. This is demonstrated by investments in offshore wind farms, the FSRU terminal in Gdańsk Bay, the LNG terminal in Świnoujście, the Baltic Pipe, and projects enabling the synchronisation of Lithuania, Latvia and Estonia with the continental European power grid. The Recovery and Resilience Facility has also provided an impetus for beneficial regulatory changes, as subsequent payments are approved only once reforms agreed with the European Commission have been implemented.

Investors require guarantees of political and financial support. The long-term nature of key cohesion policy programmes, such as the European Funds for Infrastructure, Climate and Environment 2021-2027, has helped beneficiaries plan activities supported by EU funds. The Recovery and Resilience Facility was designed as a rapid and precise response to strategic investment needs, but its architecture and implementation schedule limited the effectiveness of support in the case of large energy projects. Macroeconomic and political dynamics required that the Polish NRP be amended several times. The need to meet investment-related objectives by August 2026, coupled with a delay in the payment of the first tranche of support to Poland, meant that some of the funds earmarked for the energy transition were redirected to other investments, even though the needs in this area remain significant.

Case Studies

POWER GRIDS – THE FOUNDATION

PSE	
PLN 11.6 BN	NRP loan
PLN 2.1 BN	NRP subsidy
PLN 239.9 M	FEnIKS subsidy
PLN 428.8 M AND EUR 75 M	subsidies PSE as part of the implementation of joint projects with Baltic operators in connection with the synchronisation of the Baltic countries' power systems with continental Europe (CEF phases 1 and 2)

PGE	
PLN 13.2 BN	NRP loan
PLN 570 M	European Funds for Eastern Poland subsidy
PLN 337.5 M	FEnIKS subsidy
PLN 3.4 BN	EIB loan
PLN 237 M	Modernisation Fund subsidy

TAURON	
PLN 15.9 BN	NRP loan
PLN 118.8 M	FEnIKS subsidy
PLN 157.8 M	Modernisation Fund subsidy

ENEA	
PLN 10 BN	NRP loan
PLN 122.9 M	FEnIKS subsidy
PLN 0.9 M	FENG subsidy

ENERGA OPERATOR	
PLN 9.4 BN	NRP loan
PLN 116.6 M	European Funds for Eastern Poland subsidy
PLN 157.2 M	FEnIKS subsidy

WHY IS THIS IMPORTANT?

The energy transition is changing and increasing the role of distribution networks. Both transmission and distribution networks were designed for unidirectional energy transmission from large power plants to end users. However, the development of distributed energy sources, including those operated by prosumers, has meant that networks must now operate bidirectionally. This poses a particular challenge for distribution infrastructure operators who need to adapt very quickly to the realities of the energy transition, as the process assigns a significant degree of responsibility to them. Their investments also serve additional climate transition objectives, such as the expansion of infrastructure for charging electric vehicles[9].

Investments made by distribution system operators (DSOs) benefit network users. The main objectives of the projects include increasing the capacity to connect new consumers and generation sources[10] as well as improvement of energy distribution stability. In this context, low-voltage (LV) lines in particular require further modernisation: they supply energy directly to end users, including households, small and medium-sized enterprises and farms, which are increasingly willing to invest in RES and energy storage solutions. LV lines are the longest segment of the cable infrastructure – their total length is almost 463,000 km, of which over 40 per cent are overhead and uninsulated lines[11]. However, grids are interconnected systems, which is why investments in medium and high voltage grids are also necessary for the efficient operation of low voltage lines.

> By investing in distribution networks, DSOs are paving the way for the implementation of new generation sources and energy storage projects, which will maximise the share of zero-emission energy in the generation mix, simultaneously mitigating its waste.

WHAT KIND OF SUPPORT WORKS BEST?

Grants from the Cohesion Fund and the Modernisation Fund are crucial for the implementation of projects based on innovative solutions or projects of high systemic importance but low business potential. The latter include, for example, the modernisation of networks in rural areas with low population density, where low infrastructure utilisation limits the profitability of investments and, at the same time, affects the tariff structure. In similar projects, subsidies remain a key support tool. They also allow investors to take advantage of real support in the form of loans.

NRP loans supplement the support offered by grants, providing long-term financing on attractive terms. As part of the Energy Support Fund, which collects funds from the loan portion of the NRP earmarked for supporting energy transition projects[12], PLN 67.2 bn has been earmarked for network construction and modernisation. Nearly PLN 61 bn has already been contracted[13]. Investors can count on a nine-year grace period, a 25-year repayment period, a fixed interest rate of 0.5 per cent, and no fees or commissions for granting and servicing the loan. The deadline for using the loan funds and settling the projects is 2036. The repayable nature of the support encourages the optimisation of the use of funds in the case of developed technologies, where the investment risk is lower. However, the call for applications conducted by BGK revealed a shortage of grid-related funds under the NRP – the value of the applications submitted reached approximately PLN 150 bn, which is more than twice the available pool.

HOW TO MAXIMISE THE BENEFITS?

Investments are supervised and supported by the regulator. Transmission and distribution network operators invest in accordance with five-year plans, approved in two-year cycles by the head of URE[14]. This enables the regulator to ensure that investment activities are transparent, remain in line with the needs and roles of the operator, and that company stakeholders know what investments will be made in the near future. This regulatory inner circle helps the regulator balance the interests of DSOs and end users by setting adequate tariffs for energy distribution and allows operators to be entrusted with more public funds for capital expenditures. URE also supports operators through the 'Charter for the Effective Transformation of Polish Energy Distribution Networks', which provides recommendations for necessary regulatory changes and analyses investment scenarios in terms of new opportunities and sources of financing. In order for the head of the URE to continue the implementation of their tasks, they should receive adequate funding from the state budget.

> European funds should limit the exposure of energy consumers to investment costs related to the modernisation of transmission and distribution networks. In the long term, they should contribute to the stabilisation of energy costs.

Regulatory changes may increase the effectiveness of DSO investments. Investment needs resulting from the energy transition have so far been financed primarily from distribution tariffs. However, in recent years, the share of system costs generated by these investments in energy bills has been growing significantly, and public debate on energy prices has resulted in calls to reduce distribution charges through further optimisation of investment plans. This could be achieved through a reform of network regulations, which would make forecasts of the capacity awaiting connection more realistic, thus allowing operators to shape the generation mix in the areas they control[15].

OFFSHORE WIND FARMS – MEGAPROJECTS

BALTICA 2 (PGE and Orsted)

PLN 3.9 BN AND EUR 0.39 BN	NRP loan
EUR 0.4 BN	EIB loan
EUR 0.2 BN	EBRD loan

BALTIC POWER (Orlen and Northland Power)

PLN 0.9 BN	NRP loan
EUR 0.61 BN	EIB loan
EUR 0.14 BN	EBRD loan

BAŁTYK II i III (Polenergia and Equinor)

PLN 0.75 BN	NRP loan
EUR 0.7 BN	EIB loan
EUR 0.45 BN	EBRD loan

BALTIC EAST (Orlen)

PLN 2.6 BN	NRP loan

WHY IS THIS IMPORTANT?

Offshore wind farms are the most stable among weather-dependent RES. Under Polish conditions, the capacity factor of offshore wind farms can reach 43.7 per cent[16], compared to approximately 11.4 per cent for solar systems and around 34.9 per cent for onshore wind turbines[17]. The total capacity of the four farms being built in the Baltic Sea as part of the first phase of offshore development is 4,080 MW, which gives a production potential of 15.6 TWh per year. PSE forecasts that in 2028, when all projects currently under construction are operational, domestic electricity demand may reach 174 TWh. Offshore wind farms could therefore account for nearly 9 per cent of the energy mix. When there is no wind at sea, the turbines can still provide system services such as reactive power compensation.

INVESTOR	PROJECT(S)	DECLARED *LOCAL CONTENT* LEVEL
PGE + ØRSTED	Baltica 2+3	At least 20 per cent
ORLEN + NORTHLAND POWER	Baltic Power	21 per cent
POLENERGIA + EQUINOR	MFW Bałtyk II + MFW Bałtyk III	23-38 per cent
RWE RENEWABLES	FEW Baltic II	No declaration
OCEAN WINDS	BC-Wind	25-30 per cent

SOURCE: INVESTOR ESTIMATES.

Offshore offers also general economic benefits. In accordance with the sectoral agreement[18] for phase I of offshore development, Polish companies are to account for at least 20-30 per cent of the overall value of investment projects, and 45 per cent in phase II. This involves the supply of components for the farms themselves, including their onshore components, but also the production of boats used for installation and maintenance, and services for offshore farms. NRP funds support investments in an installation terminal in Gdańsk and three service ports: in Łeba, Ustka and Darłowo, which will build a Polish value chain in offshore. According to the sectoral agreement, the Polish offshore wind energy sector could create 30,000 jobs by the end of the decade and generate PLN 2 bn in average annual exports of its products and services[19]. This means that Polish companies will be able to compete for foreign projects and contribute to building a strong European clean technology industry.

WHAT KIND OF SUPPORT WORKS BEST?

Low-interest loans reduce the cost of capital. The terms and conditions of offshore loans granted by BGK as the administrator of NRP funds are determined on a case-by-case basis and are not as favourable as those for network modernisation[20], but may still be considered preferential when compared to commercial market offers. They can also provide contributions to loans obtained from the market. The NRP component has a significant share in the financing of offshore projects – in the case of PGE, the PLN 5.5 bn obtained in this way represents over 1/3 of the group's share in the project and nearly 1/5 of its total budget.

The involvement of development institutions helps to manage risk. The financing of offshore wind farm projects is based on loans granted by consortia of financial institutions. In the case of the Baltic Power and Baltica 2 farms, the consortia comprise 25 entities, and for the Bałtyk II and III projects – as many as 30. It is not difficult to attract banks' interest in offshore projects, but agreeing on the terms of cooperation takes many months. However, this model is necessary to manage the high investment risk associated with the implementation of a megaproject such as an offshore wind farm, especially since the only collateral for the loans is the future profits generated by the farms. The participation of the EIB and the EBRD increased the credibility of the projects and made it easier for investors to secure financing.

HOW TO MAXIMISE THE BENEFITS?

Poland enjoys favourable conditions for offshore development, but it needs the know-how. According to the draft 'National Energy and Climate Plan' (KPEiK)[21] Poland has the potential to build 5.9 GW of offshore wind farms up to 2030, and in the subsequent decade it may increase their capacity to 18 GW. The Baltic Sea is an attractive area for investors as it is characterised by high wind density, shallow waters, relatively low waves and low tides. This allows for the optimisation of capital expenditure, including through the use of mature technologies such as monopiles. Partnerships between Polish investors and foreign companies with extensive experience in the construction of offshore farms should result in an increase in know-how and a strengthening of supply chains on the Poland side, so that the involvement of the domestic economy in the implementation of subsequent projects can grow.

EU support can help optimise costs. The profitability of farms is guaranteed by contracts for difference, which give investors 25 years of stable energy sales prices, indexed for inflation. This support is essential, but it is in the state's interest to keep the price in contracts for difference as low as possible. EU funds structured in a way that reduces costs and investment risk can help in this regard. In the case of Poland, which is only just developing its OWF sector, it is also crucial to exchange experiences with countries with a developed offshore industry, e.g. within the framework of European forums such as the Baltic Energy Market Interconnection Plan.

FLEXIBILITY – A NEW PRIORITY

PGE	
PLN 160 M	NRP subsidy
PLN 222 M	Modernisation Fund subsidy
EUR 0.2 BN	EBRD loan

ENEA	
PLN 10 M	NRP subsidy
PLN 163 M	Modernisation Fund subsidy
EUR 0.14 BN	EBRD loan

TAURON	
PLN 310 M	NRP loan
PLN 37.5 M	NRP subsidy
PLN 181 M	Modernisation Fund subsidy
PLN 0.7 M	Digital Europe Programme subsidy

ENERGA	
PLN 297.6 M	Modernisation Fund subsidy

In this section, we consider smart meters, energy storage facilities and projects related to network digitisation, provided that they are separate from network projects.

WHY IS THIS IMPORTANT?

Flexibility is key to increasing the share of RES in energy consumption. On a nationwide scale, the ratio of installed RES capacity to peak demand, which was recorded in January 2024 and amounted to 29.5 GW, has already reached 114 per cent. Locally, in the distribution network areas managed by Energa Operator and Enea Operator, it exceeds 200 per cent[22]. RES are weather-dependent, do not utilise their full installed capacity, and require dispatchable sources to balance them during periods when generation is not sufficiently high. The gradual increase in RES capacity allows for an increase in the share of green energy in final consumption.

However, this increase is conditioned upon making consumption more flexible so that consumption grows in line with generation. It also depends on the development of energy storage facilities capable of transferring energy from high generation and low demand periods to peak usage hours. That is why DSOs should develop services and products that boost the flexibility of the system.

> Flexible energy consumption is supported by smart meters, as these enable consumers to take advantage of dynamic tariffs. Flexible supply is promoted by the development of energy storage facilities that support the balancing of a grid with a high share of RES.

Grid digitisation increases the security of energy supply. Data gathering and processing tools give operators remote access to real-time information about the status of the network infrastructure. This allows them to analyse the impact of external factors, such as temperature, on the technical parameters of the network and dynamically adjust the load to prevent failures. If a failure occurs, remote access to data will make it easier for the operator to locate and diagnose it, reducing repair lead time. A prerequisite for safe and effective network automation is ensuring a high level of cybersecurity for the devices and software used.

WHAT KIND OF SUPPORT WORKS BEST?

The Modernisation Fund provides grants for the most urgent projects. Some of the investments in digitisation and network flexibility are part of the DSO's development plans approved by the head of URE and may be financed using funds earmarked for network modernisation, including NRP loans. The National Fund for Environmental Protection and Water Management (NFOŚiGW) has launched a call for applications for non-repayable support for investments in large-scale energy storage facilities with a capacity of 0.9 GWh and an operating time of 4 to 5 hours. An important source of financing for flexibility is the Modernisation Fund (MF), from which subsidies for smart meters[23] and construction of energy storage facilities originate[24]. The advantage of MF lies in its ability to dynamically allocate funds from subsequent tranches and adjust investment objectives to the realities of Polish transformation and EU regulatory requirements. A good example is the installation of smart meters, performed to comply with the applicable, EU-imposed obligations[25].

Support for network digitisation contributes to the development of Polish digital innovations. The needs of individual operators vary depending on the condition of their network infrastructure, generation mix and the potential of consumers to actively participate in balancing the network. Solutions can be tailored to specific needs thanks to research projects co-financed under EU R&D funds. In this regard, the National Centre for Research and Development, which manages funds available under the FENG facility, is involved in the modernisation of the network. Projects co-financed by the National Recovery Plan (NRP) and implemented by Enea Oper-

ator, consisting in digitising the process of analysing, calculating and monitoring the condition of power grid components, are a good example of such an undertaking. Sometimes operators also participate in international projects. An example is the ECLIPSE project, which aims to launch a mobile app encouraging customers to manage their energy consumption. It brings together 23 entities from the EU, including Tauron, and is co-financed under the Digital Europe programme.

HOW TO MAXIMISE THE BENEFITS?

Investments in network digitisation can and should limit its physical expansion. The process of managing a decentralised electricity system is more effective when operators have access to tools that aggregate system data and optimise network operation in real time. Such tools also facilitate planning investments in network expansion and modernisation by enabling better use of existing infrastructure. Optimised investment plans reduce pressure on domestic contractors and manufacturers of network equipment and cables.

> Flexibility on the demand side can be built (most effectively) by the largest energy consumers first. In the future, the electrification of transport, individual heating and small industry will increase the benefits that smaller entities may enjoy from playing an active role in balancing the system.

Investments must go hand in hand with the activation of network users. The dynamics of the energy transition mean that investments in grid flexibility should be made in advance in order to respond to future needs (the so-called grid anticipatory investments). Operators should combine them with the development of the flexibility services market in order to promote, among energy consumers, behaviours that are in line with forecast trends. First and foremost, the active role of the largest industrial energy consumers, with high consumption and great potential for making production processes more flexible, will be crucial. Flexibility is also essential on the part of producers, especially those using RES, who should adjust production to demand by responding to price signals. In a distributed power system, their potential is greater when they form larger groups, for example through aggregators, clusters or energy communities.

ENDNOTES

1 European Council conclusions, 12 December, 2019, https://www.consilium.europa.eu/media/41768/12-euco-final-conclusions-en.pdf.

2 Based on the European Commission's report on energy prices. Source: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX%3A52024DC0136.

3 https://economy-finance.ec.europa.eu/document/download/12885764-f4ee-4449-b188-3c2daa838b9b_en?filename=PL_CR_SWD_2025_221_1_EN_autre_document_travail_service_part1_v3.pdf.

4 Based on PSE annual reports.

5 An open letter from business owners, the energy sector and non-governmental organisations to the president of Poland regarding the bill liberalising investments in onshore wind energy has been signed by several business organisations, including the Chamber of Industrial Energy and Energy Consumers.

6 Assumptions of the European Funds for Eastern Poland 2021-2027 programme estimate that overhead lines account for 76 per cent of the total in the six voivodeships covered by the programme. According to data from URE for 2020, the share of overhead lines in the whole country was 64 per cent for low-voltage lines and 72 per cent for medium-voltage lines. The authors of the programme also stated that most of the distribution lines in eastern Poland are over 25 years old.

7 Source: National database on greenhouse gas emissions and other substances, KOBiZE.

8 Executive decision of May 27, 2025, https://commission.europa.eu/document/download/7754074a-1fda-40ba-b5dd-028aa8008a43_en?-filename=COM_2025_284_1_EN_ACT_part1_v3.pdf

9 The OSDs received subsidies for this purpose from the Modernisation Fund. As part of the programme implemented by NFOŚiGW, agreements were concluded for a total amount of PLN 227 million.

10 For example, in the PTPiREE report for 2024, Tauron Dystrybucja states that it executes an average of 45,000 connection agreements annually.

11 PTPiREE report for 2024.

12 In addition to the expansion and modernisation of electricity networks, these funds support investments in heating networks, RES, energy storage facilities, infrastructure for biogas and biomethane and energy efficiency in businesses.

13 Data from Bank Gospodarstwa Krajowego as of 28 October, 2025.

14 This obligation arises from Article 16 of the Energy Act.

15 Such solutions were included in the draft amendment to the Energy Law (UC84) of 9 October, 2025.

16 This coefficient was adopted to calculate the maximum price for electricity generated by offshore wind farms that will benefit from the second phase of offshore support. It was adjusted for the wake effect, i.e. the reduction in wind speed caused by the mutual interaction of turbines. By way of comparison, the British government uses 49 per cent in similar calculations for its own support system.

17 Own calculations based on the assumptions of the 'PSE transmission network development plan for 2025-2034'. However, in other documents, PSE draws attention to possible changes in the RES capacity utilisation factor related to technological progress and equipment degradation during operation.

18 Sectoral agreement for the development of offshore wind energy in Poland of 15 September, 2021.

19 GUS data for 2023.

20 For example, in the case of PGE, a loan for own contribution in the amount of PLN 3.9 bn has an interest rate calculated on the basis of a variable interest rate based on WIBOR 6M plus a margin, and the final repayment date has been set for 20 December, 2036.

21 July 2025 version, prepared by the Ministry of Climate and Environment, https://www.gov.pl/web/klimat/projekt-krajowego-planu-w-dziedzinie-energii-i-klimatu-do-2030-r-z-perspektywa-do-2040-r-wersja-przekazana-do-dalszego-procedowania-na-poziomie-rady-ministrow.

22 PTPiREE report for 2024, p. 21.

23 Agreements concluded under the programme implemented by NFOŚiGW for a total amount of approximately PLN 667 million.

24 Operators have so far concluded agreements with NFOŚiGW for a total amount of approximately PLN 63 million.

25 DSOs had to replace 15 per cent of meters by the end of 2023. By the end of 2025, the share of remotely read meters is to be 35 per cent, by the end of 2027 – 65 per cent, and by the end of 2028 – at least 80 per cent. According to EU law, by the beginning of July 2031, the share of remotely read meters must equal 100 per cent.