



DI Analysis

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Poland Decarbonising Energy in Partnership with Denmark

Poland's ambitious energy policy requires large investments and efficient use of resources to realize the green transition.

In February 2021 the Polish government adopted, and later revised, the Energy Policy of Poland 2040 (PEP2040) which outlines Poland's ambitious targets for an energy transition to decrease GHG emissions, ensure energy security, and harness the economic growth potential within the transition. The transition of Poland's fossil fuel dependent energy mix requires significant investments, state of the art technologies, and efficient use of domestic resources. The Polish government estimates that the transformation of the fuel and energy sectors to achieve the goals will require investment of €200 billion.

Denmark is well-positioned, connected and committed to take part.

As a close neighbour, Denmark is well situated to contribute and take part in this transition. At 2,6 bill. DKK in 2022, Danish exports of energy technologies are strong and have grown six-fold since 2005 making Poland the 9th largest market for Danish energy technology. The interest from Danish investors for green energy projects in Poland is high. The Danish energy industry is already present in Poland with large manufacturing sites in a wide range of energy technologies. Further, the establishment of the Baltic Pipe gas connection in 2022 provides a strategically important infrastructure link between the countries.

Offshore wind and district heating are focus areas of Danish-Polish Energy Governance Partnership.

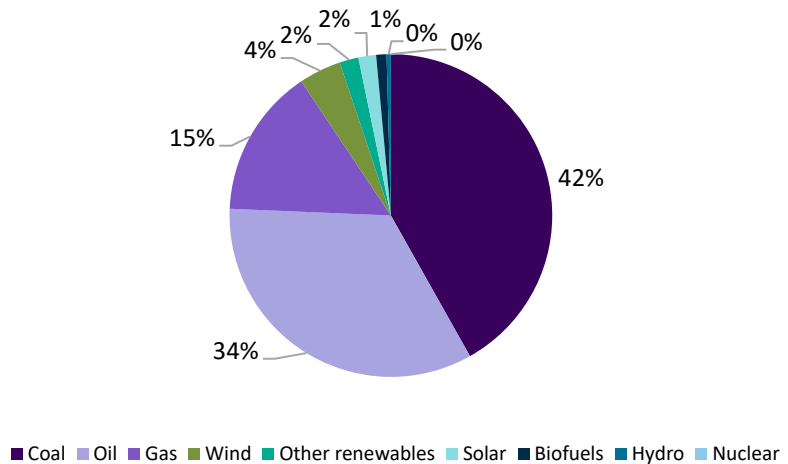
The policy collaboration is also growing. Not only as EU partners, but also a bilateral level underpinning common interests and synergies. Poland has since 2021 been part of the Danish government's Energy Governance Partnership (EGP) through which the energy authorities share knowledge, experiences, and facilitate cooperation to decarbonise the countries' respective energy sectors. Specifically, offshore wind and district heating are the focal points for the EGP.

Poland's energy mix is dominated by fossil fuels making up 91% of supply.

GDP, energy consumption, emissions, and trends

Fossil fuels constitute 91% of Poland’s current energy mix, while renewables make up 9%. At present, Poland has no nuclear energy. As outlined in PEP2040, Poland will invest significantly in particularly offshore wind and nuclear energy in the coming years.

Figure 1. Polish energy mix 2022

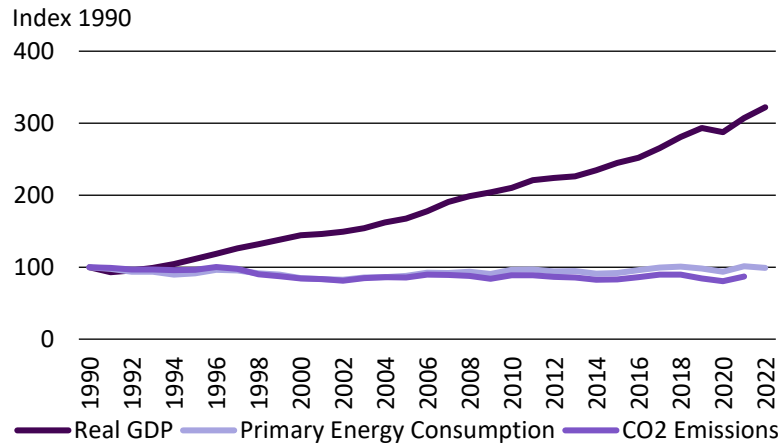


Source: Our World in Data

Poland has decoupled strong economic growth from energy use and CO₂ emissions.

From 1990 to 2022, Poland has experienced a three-fold increase in real GDP. In this period, primary energy consumption has decreased by 1% and CO₂ emissions have decreased by 13%. Figure 2 below illustrate that the Polish economy has decoupled growth from energy consumption and GHG emissions. This is a positive trend which Poland aims to accelerate in the coming years.

Figure 2. CO₂ emissions, energy consumption, and real GDP

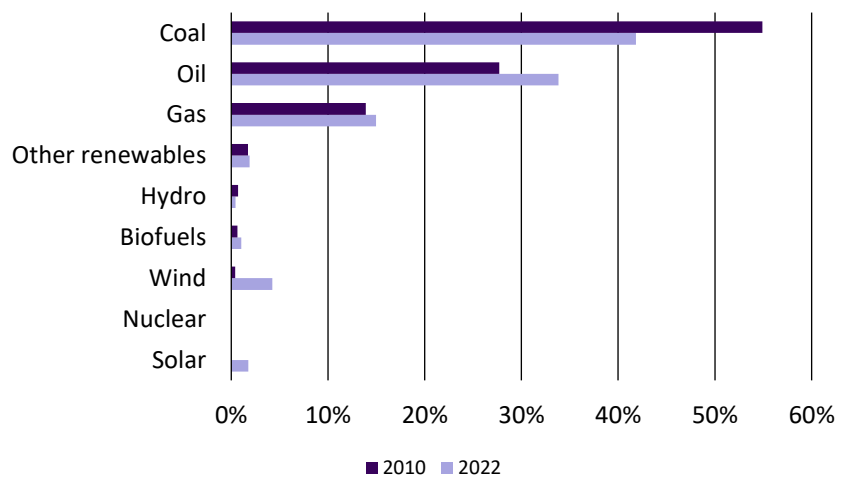


Source: Our World in Data and the World Bank

Polish energy transition is gradually advancing.

From 2010 till 2022, dependency of fossil energy sources decreased from 97 to 91%. The primary drivers of this development are wind and solar energy, now accounting for 4% and 2% of the energy mix, respectively. Notable shifts have also occurred between fossil fuels. Coal's share has decreased by 13 percentage points while oil has increased its share by 6 percentage points.

Figure 3. Share of energy consumption by source



Source: Our World in Data

Danish and Polish Energy Governance Partnership

Poland undergoing green transition - while not committed to EU's goal of climate neutrality.

Poland is the only EU Member State not to formally commit to the European Green Deal's stated goal of climate neutrality by 2050. However, Poland's revision of the PEP2024 includes a list of specific objectives that will contribute to the energy transition.

Good foundations for cooperation between Denmark and Poland.

Denmark and Poland have entered several cooperation agreements aiming at accelerating the energy transition and linking the Polish Ministry of Climate and Environment and the Danish Energy Agency and Ministry of Climate, Energy and Utilities. Poland and Denmark have entered an Energy Governance Partnerships (EGP). Through sharing of knowledge and facilitation of cooperation between the states' government agencies, private companies, and experts, the two countries cooperate to accelerate the transition.

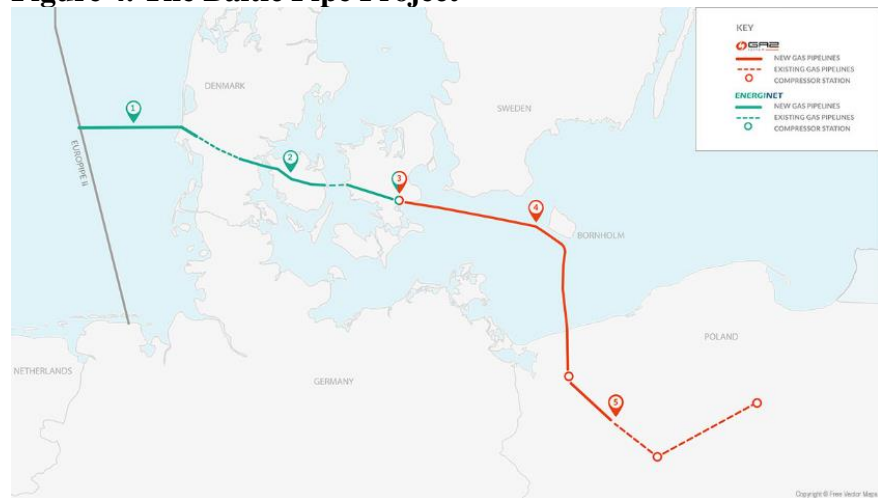
Geopolitical shifts have necessitated a Polish shift in transition strategy.

Since Russia's invasion of Ukraine in February 2022, the Polish government has had to pivot their transition plans from Russian natural gas to other energy sources. Building on the positive experience from the completion of Baltic Pipe inaugurated in September 2022, Denmark and Poland have a strong basis for further close energy cooperation.

The completion of Baltic Pipe has cemented the close cooperation between Denmark and Poland.

The Baltic Pipe Project's completion is proof that Denmark and Poland are committed in their joint efforts in decreasing emissions. The Baltic Pipe allows natural gas to flow from Norway through Denmark to Poland ensuring security of supply and lower GHG emissions. The project, a collaboration between Danish Energinet and Polish Gaz-System co-funded by the EU will allow 10bn m³ of gas to pass through the pipeline to Poland every year and 3bn m³ from Poland to Denmark. Thus, the project delivers a concrete energy integration between Denmark and Poland and lays the foundation for further cooperation and scale-up within all parts of the energy transition.

Figure 4. The Baltic Pipe Project



Source: Baltic Pipe Project

Offshore wind as focal point for Danish-Polish Energy Governance Partnership.

Poland plans to produce 5.9GW offshore wind in 2030 and 18GW in 2040.

Ørsted and Vestas are involved in Polish offshore wind farms. The first Polish offshore wind farm, Baltic Power, is to be operational in 2026.

Offshore wind

A central part of the EGP between Denmark and Poland is cooperation regarding the establishment of Polish offshore wind farms. The Polish government has identified offshore wind along with nuclear power as important new sources of future energy supply. Offshore wind will contribute to the green transition as well as to the Polish economy and energy security by creating jobs, attracting investments, and increasing domestic energy production.

Denmark’s expertise in this area can benefit both countries. With no current offshore wind farms, Poland is working towards the establishment of 11.9 GW and 18 GW offshore wind by 2030 and 2040 respectively. According to the PEP2040, offshore wind energy will provide approximately 18% of Polish electricity production in 2040. The Polish offshore wind plans make up the largest energy investment in the country’s history whereby the potential for further cooperation and development between the two countries is strong.

The Baltic Sea represents a vast potential for Polish offshore wind farms with an estimated 33 GW potential within Poland’s exclusive economic zone. With the Baltic Power project having reached final investment decision (FID) in October 2023, Poland will have its first offshore wind farm operating by 2026 – with 76 turbines supplied from a Danish manufacturer. Further, a Danish developer is involved in the Baltica offshore wind farm which is set to be operational by 2030 and will become the largest Polish offshore wind farm with an estimated capacity around 2.5 GW.

District heating another important area of Danish-Polish EGP.

Green district heating will reduce Polish GHG emissions and ensure better air quality.

Energy efficiency holds great potential for reducing GHG emissions.

Poland has reduced energy consumption per capita and seeks to accelerate the development.

Denmark and Poland are already cooperating with regards to biogas and its future role in Poland's energy supply.

District heating

Another important area of EGP cooperation between Denmark and Poland is district heating and green heating. Poland already has an expansive district heating network with around 40% of households connected. Coal remains the central energy source for Polish district heating. Therefore, the transformation of the Polish district heating is an important step in the country's green transition.

Denmark has successfully converted much fossil fuel-based district heating to renewable energy sources. Thus, Danish expertise within the expansion and green transformation of district heating systems can help Poland transition away from a coal-fired heating sector. This transition will ensure reductions in GHG emissions as well as greatly improving air quality in Poland. Thus, Danish-Polish cooperation within district heating will contribute to two of the three main pillars of PEP2040, namely the achievement of a zero-emission energy system and of good air quality.

Energy efficiency

Energy efficiency is another important tool for Poland to reduce GHG emissions whilst ensuring a cheaper energy supply and better air quality. Through PEP2040, Poland is committed to reducing households' primary energy consumption by 23% from 2020 to 2030. This is an important focus area as households currently account for 38% of total Polish energy consumption and around 25% of GHG emissions.

As the Polish economy has grown significantly in the last decades, the demand for energy has risen with industry and transport as the main drivers. Improvements have been made to increase the energy efficiency which has resulted in a 5.4% decrease in the primary energy consumption per capita from 31.8 kWh in 1990 to 30.1 kWh in 2022. Danish-Polish cooperation can help accelerate this positive development especially when working to secure synergies between the transformation of the district heating sector, cogeneration, and energy efficiency.

Future areas of cooperation: biogas and PtX

Cooperation between Denmark and Poland could expand further in other areas in the near future. One of these areas is biogas in which Denmark is an international frontrunner with biogas making up app. 40% of gas consumed in Denmark. Danish and Polish companies,

agencies and authorities are already sharing experiences within biogas. Through this knowledge-sharing, Danish success with scaling up the production and use of biogas as well as with connecting biogas to the existing gas infrastructure can inspire a similar positive development in Poland. Further, the Baltic Pipe has provided the necessary infrastructure for possible Danish exports of biogas to Poland in the future.

PtX holds potential for future Danish exports to Poland.

Power-to-X is undergoing rapid development and is another area of great potential for cooperation between Denmark and Poland. The Polish demand for green hydrogen is expected to increase as the Polish industrial sector transitions to low-carbon energy sources. Therefore, Poland could become an important market for development of local PtX capacity and for export of green hydrogen, especially in sectors where the possibility of large-scale electrification is limited. Poland is a significant producer of hydrogen, being EU's third-largest and the world's fifth-largest producer of hydrogen. This hydrogen is generated almost exclusively by steam methane reforming. Hydrogen applications in Poland include the industry (chemical, petrochemical, steel) and the food sector. This leaves great potential for Danish producers to supply the Polish existing and increasing market for the future.

Donald Tusk is new PM of Poland – with policy changes expected ahead.

Political changes

The new Polish government headed by Donald Tusk's centrist Civic Coalition (KO) will likely affect the outlook and prospects for the energy transition in Poland. KO has a more amenable approach towards the EU than the former government. This pro-EU pivot will likely have implications for Poland's energy transition as well as cooperation within the EU.

A better Polish-EU relationship is important as EU-funds are central to the financing of Poland's energy transition.

Tusk has proclaimed that he will seek to resolve the dispute between Poland and the EU which has led to the freezing of €35.4 billion in grants and loans to Poland from EU's recovery fund. This is important because Poland has based most of the funding for its PEP2040 on EU funds, including EU's Just Transition Fund, European Development Fund, and Cohesion Fund. Therefore, the EU plays a central role in Poland's green transition and a positive relationship between the Polish government and the EU will smoothen this process with important implications for the energy sector and its decarbonisation.

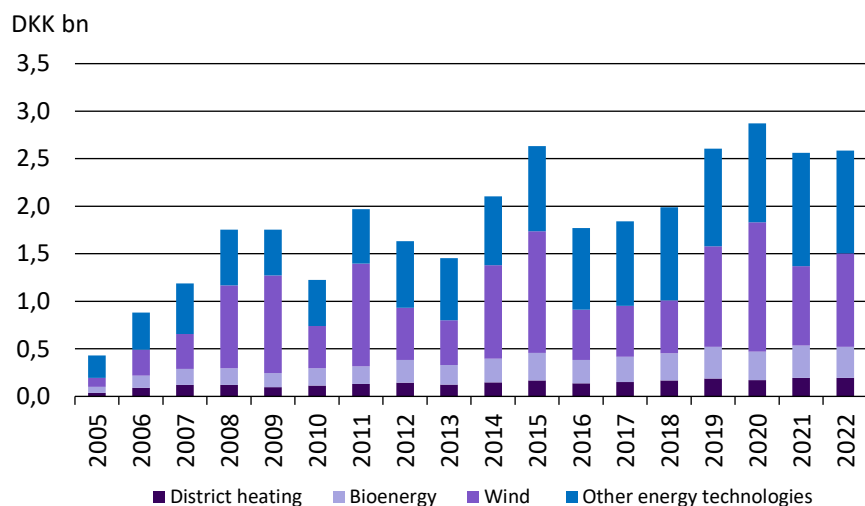
Danish export of energy technologies to Poland has increased six-fold since 2005.

Exports and investment in energy technologies

Danish exports of energy technologies to Poland have increased six-fold from 430 million DKK in 2005 to 2.6 billion DKK in 2022. The two largest export categories are wind technology and ‘other energy technologies’ – a category which covers energy production, energy storage, energy efficiency and various components.

Meanwhile, Poland has grown to become an important production platform for the Danish energy industry with large direct investments in manufacturing plants in Poland within a broad range of energy technologies including wind energy, energy efficiency and district energy.

Figure 5. Danish exports of energy technologies



Source: Eurostat and calculations by Danish Energy Industries

With large exports and investments and the recent establishment of Baltic Pipe as a physical energy infrastructure between the two countries, the commercial energy relations are solid and firm.

With Poland’s growing commitment to decarbonisation, strong plans for green investments and priorities in a range of areas of Danish competencies, the outlook for further commercial collaboration in energy is strong – and backed up by an energy partnership between the two governments.