Chapter 6
Case study on national responses to the energy price hike – Poland

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1. Introduction

For various reasons Poland, out of all EU Member States, has been particularly vulnerable to recent energy shocks. It is an energy-intensive economy and its energy mix is dominated by fossil fuels, with considerable imports of gas and coal coming from Russia. In turn, the Polish government has been very active in developing measures that would shield households from the increased costs of electricity, gas and heating. The development of its policy, based first on taxes and only later on price regulation, provides lessons for other EU Member States which, to some extent, have followed a similar path. It also means that important lessons can be drawn from the effectiveness of the Polish case.

This chapter consists of four main sections. In Section 2 we demonstrate the most important features of the Polish energy system, to set a precise context for our further considerations. Section 3 investigates the actual dynamics of prices and quantity of energy use in Poland in 2021-22, based on Eurostat data. In Section 4, we describe in detail the policy measures developed by the Polish government and, in Section 5, provide a brief discussion of these.

2. The energy system in Poland and its vulnerabilities

The country’s energy accounts demonstrate the peculiar situation of the Polish energy system. On the one hand, production and consumption is, in per capita terms, relatively small compared to the country’s neighbours or to the EU average. This relates both to total energy use and at household level: households in Poland consume 12% less energy per capita than the average EU household in terms of total energy use and space heating (Table 1).

Table 1 Energy balances per capita, tonnes of oil equivalent, 2019

<table>
<thead>
<tr>
<th></th>
<th>Total energy supply</th>
<th>Final consumption – energy use</th>
<th>Households – total energy use</th>
<th>Households – energy use in space heating</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU27</td>
<td>3.16</td>
<td>2.09</td>
<td>0.55</td>
<td>0.35</td>
</tr>
<tr>
<td>Czechia</td>
<td>3.98</td>
<td>2.27</td>
<td>0.66</td>
<td>0.46</td>
</tr>
<tr>
<td>Germany</td>
<td>3.56</td>
<td>2.41</td>
<td>0.65</td>
<td>0.46</td>
</tr>
<tr>
<td>Poland</td>
<td>2.71</td>
<td>1.82</td>
<td>0.48</td>
<td>0.31</td>
</tr>
</tbody>
</table>

Source: Authors’ elaboration of Eurostat data (NRG_IND_ESC).
On the other hand, the Polish economy is characterised by high energy intensity, implying that it takes a lot of units of energy to generate a unit of GDP. In other words, the energy productivity of the economy is relatively low, which may reside in its backwardness and in its industrial structure but also in the low efficiency of the energy system. In 2021, it took 115 kilograms of oil equivalent to produce goods and services to a value of 1000 euros (in PPS), nearly 15% more than the EU average. This may result in a higher vulnerability of the Polish economy and society to adverse shocks in energy prices and in the availability of fuels which may also translate to higher costs of, for instance, exports and consumption.

As a result, energy-related expenditure constitutes a relatively high share of household budgets in Poland. According to Eurostat data (Table 2), in 2022 total expenditure on electricity, gas, solid fuels and heating amounted to 8.9% of the total consumption basket, higher by 0.6 percentage points than in the previous year. This is much more than in the EU27 (6.8%). This share is even higher among the poorest Polish households (the first quintile in the income distribution) which, in 2020, spent 10.5% of their budgets on energy. Conversely, for the top quintile of households this number was notably smaller, at 7.5% (Eurostat data). Polish households spend relatively significantly on solid fuels and heating, in both cases about four times more than the EU average. Yet another important category of high spending relative to the EU is fuel for personal transport (5.6% vs 4.5%), arguably due to the underdevelopment of public transport in Poland.

Table 2  Weight of energy expenditure in total consumer expenditure (% of total)

<table>
<thead>
<tr>
<th>Category</th>
<th>Poland</th>
<th>EU27</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2021</td>
<td>2022</td>
</tr>
<tr>
<td>Electricity, gas, solid fuels and heating</td>
<td>8.3</td>
<td>8.9</td>
</tr>
<tr>
<td>- Electricity</td>
<td>2.9</td>
<td>2.8</td>
</tr>
<tr>
<td>- Gas</td>
<td>1.2</td>
<td>1.5</td>
</tr>
<tr>
<td>- Solid fuels</td>
<td>1.4</td>
<td>1.9</td>
</tr>
<tr>
<td>- Heating</td>
<td>2.8</td>
<td>2.7</td>
</tr>
<tr>
<td>Fuels and lubricants for personal transport equipment</td>
<td>4.7</td>
<td>5.6</td>
</tr>
</tbody>
</table>

Source: Eurostat Harmonised Index of Consumer Prices (HICP).

In terms of the main energy poverty indicators used at EU level, Poland seems to be a country which has the problem under control. National surveys in which respondents self-assess their ability to keep their homes adequately warm shows that, in 2020, Poland, along with the Nordic countries and well-developed eastern EU countries, was among the Member States with the lowest rate of households experiencing problems (3%). In terms of arrears on utility bills – another indicator of energy poverty – Polish households are in an equally favourable situation (6%). This, however, remains in contrast with the results of a recent study which shows that, in 2021, the energy poverty level in Poland, in terms of ‘low-income, high actual cost’, reaches 11% of Polish households (Sokolowski et al. 2023).
Despite the continuing reduction of the role of coal (both hard coal and lignite) in the Polish economy, it is still the main source of energy. In two most important areas – heat and electricity generation – fossil fuels play a dominant role. In 2021, coal provided around 80% of heat and 72% of electricity, while natural gas had 9-10% in both mixes. Renewable sources, though gaining importance, still play a minor role in the energy system. Only recently has wind become relevant in electricity generation (10% of the total), while biofuels (mostly wood and wood pellets) have increased their share in heat generation to a level of 6-7%. Even taking into account the possible diversification and flexibility of energy systems, this considerable fossil dependency makes Poland’s energy system one of the most exposed to energy shocks among EU Member States.
According to data from 2018, solid fuel was the most frequent source of heating in Polish households: 45% of households used devices relying on this form of energy (mainly dual-function heating boilers). District heating was the second most widespread source of energy, used by 40% of households. Unlike in other EU Member States, the main solid fuel used in households is coal (37% of households). The next most frequently used sources of heating are firewood (29%), gas (14%) and electricity (5%).

While low energy efficiency and the high share of fossil fuel make Poland vulnerable, an import dependency which stands at a relatively low level provides greater resilience.
Overall, some 40% of energy needs are met by imports, one of the lowest values among all EU Member States, and one much smaller than the EU average of 55% (in 2021). As demonstrated in Figure 4, dependency on imports of fossil fuels has been increasing, although it varies by type of fuel:

- the consumption of coal is mostly satisfied by domestic production, despite the systematic growth over the last two decades of imports of coal which have now surpassed its exports;
- domestic production of natural gas has remained at the same level for many years and meets only one-fifth of domestic consumption. As gas is becoming a transition fuel, its consumption has been growing and so the role of domestic sources is even diminishing (in relative terms). However, certain political attempts have been made for years to diversify the sources of supply, including the construction of a liquefied natural gas (LNG) terminal in Świnoujście (which started operations in 2015), interconnectors with Slovakia and Lithuania, and the Baltic Pipe, a new pipeline connecting Poland with the North Sea gas deposits of Denmark and Norway. According to Eurostat data, in 2020 nearly 70% of the gas consumed came from Russia, resulting in a significant, but still lower, dependency than in other economies of the region. Other major suppliers included Qatar, Norway and USA;
- domestic production of crude oil is virtually absent while its consumption is (as in the case of gas) growing.

Figure 4  **Energy imports dependency (net imports as % of total consumption)**

The heavy reliance on fossil fuels of the major energy producers in Poland contrasts with the strong commitment to decarbonisation at EU level. Poland’s share of coal by far exceeds that of other EU Member States. With around 70% of electricity
generating energy coming from coal it dominates the next countries in the ranking – Czechia by 30 percentage points, Bulgaria by 31 and Germany by 41.1 In the course of domestic negotiations over the Just Transition Mechanism, the Polish government agreed in its Social Contract with hard coal mining unions the phasing out of thermal coal production by 2049 (Umowa Społeczna 2021). According to the plan, roughly one-third of thermal coal production, which in 2021 was 30 million tonnes, will be cut every decade until the 2050s. Lignite mining, according to another agreement, is to be phased out by 2044 (Umowa Społeczna 2022). But, as past experience with various governmental programmes for the mining sector shows, these agreements are merely a compromise between a realistic approach based on economic analysis and the expectations of the coal mining trade unions. In reality, production is always lower than projected in the programmes (Zasuń 2021).

Fossil fuels as well as the electricity market in Poland are dominated by state-owned companies. Almost 80% of electricity in Poland is generated by four state-owned operators: PGE (42%), Enea (16%), Tauron (9%) and Orlen (7%), while the remaining 20% is produced by other companies (URE 2022). The level of concentration in the electricity market between 2007 and 2021 increased slightly overall, yet this encompasses two diverse trends – at first a steep downward trend which was then replaced after 2016 by an even steeper upward trend, reaching a peak in 2017 and 2018 when it exceeded the earlier record of 2008. Even greater concentration exists in energy distribution where four out of five companies are state-owned.

Political influence in state-owned enterprises, including in the energy and coal sector, can be observed in formal and informal institutions (Wasowska and Postula 2018), for example in the form of a ‘revolving door’ (Szulecki 2018). This influence has a negative impact on debt financing in the energy sector (Grabinska et al. 2021) which can potentially be attributed to the pursuit of political and social goals by the boards of companies. This is also the source of an aversion to risk which may undermine the use of external capital for development and, in consequence, delay transition. Political influence can also be observed in the coal sector in Poland (Brauers and Oei 2020). The particularly strong impact of trade unions and, at the same time, the economic effects of this impact are the result of inadequate social policy measures being taken in earlier transition processes.


2. On the other hand, the evolutionary strategy of energy companies towards transition may be defended as potentially reducing security threats and impact of external shocks in terms of social and energy security (see Wisniewski et al. 2022).
2.1 Major green and social objectives of energy policy

The government’s current energy policy (Energy Policy of Poland until 2040), published in 2021, builds upon the classic energy policy triangle; that is, energy security, competitiveness and the environment. Although decarbonisation is not a basic axis of this definition it remains the key indicator, both in terms of CO₂ emissions and the use of coal. The Polish government has decided to slow down the implementation of its anyway rather unambitious plan to close coal mines but it still kept the final target of phasing coal out by 2049. To that end, it foresees the replacement of current coal-fired power plants with other sources, particularly gas and photovoltaics in the short and medium-term; and offshore wind and nuclear in the medium and long-term. Coal is to be phased out also in individual and district heating.

In terms of the development of energy markets, the same principles of the energy triangle apply. Increasing the role of individual consumers of energy as active energy market participants, or ‘prosumers’, through the support of, amongst others, renewable energy systems, energy clusters and smart metering is intended to help keep the price of electricity under control. Investments in the replacement of old stoves with new heating devices (e.g. heat pumps) and thermal retrofitting also serve the reduction of the negative environmental and health impacts. Even with fresh programmes of support for prosumers or the introduction of new heating sources (see Section 4), Poland still does not fulfil the targets of the Renewable Energy Directive in terms of the share of renewables in heating and cooling or in district heating (Bacquet et al. 2022).

One of the explanations of Poland’s delays in implementing targets for renewables can be observed in public opinion polls which show that the majority of Polish society (regardless of political perspective) is not willing to pay more in energy bills for climate protection (Żółciak and Osiecki 2022). This corresponds with the social perception of global threats, analysed by the Pew Research Center (2022) and confirmed also by other studies (Micek 2021). Although in the most recent decade climate change has come higher and higher on the list of threats, it is still less feared than Covid-19, albeit it now comes close to the fear of cyber security threats.

3. Prices and amounts of energy use in 2021-23

The peculiar structure of the energy system in Poland can be translated into a distinct dynamic in terms of prices and the amounts of consumed energy against the background of the main trends in the European Union (see Figures 5-8). These can be summarised as follows:

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3. The EPP 2040 was updated in 2022 on the basis of the government document issued on March 29 2022, ‘Principles for the update of Energy Policy of Poland until 2040’. The major trigger of this document was the Russian invasion of Ukraine which pushed the Polish government to introduce the fourth element of energy sovereignty – energy independence from the supply of Russian fossil fuels. See, in English: https://www.gov.pl/web/climate/energy-policy-of-poland-until-2040-epp2040.

4. Other indicators include targets on renewable energies, energy efficiency and nuclear energy.

5. In this analysis, a combination of two Eurostat datasets was utilised in order to obtain a full picture of price dynamics and their impacts on households (Harmonised Index of Consumer Prices and Energy Statistics).
the aggregate growth in the prices of electricity, gas and other energy fuels in 2021-2023 amounted to over 60%, which is very close to the European average. Yet, its sequence and structural composition was different from most other economies. Tax reductions and the regulatory control of gas and energy prices restrained the growth of energy expenditure by households throughout 2021 and 2022. This was most visible in the case of electricity but also – to a lower extent – in gas prices where large, state-owned enterprises dominate the markets; conversely, heating energy and solid fuels exhibited substantial, above average price increases. This could be ascribed partially to the weaker impact of regulators and to the smaller presence of state-owned enterprises in these segments of the energy sector. Average retail prices for both coal and firewood went up dramatically in 2022: the coal price grew by 130% and wood by 52% annually, which is reflected also in the analysis of household budget spending (Statistics Poland data); the government has strongly influenced the consumer price of energy by means of the tax system. Consumption taxes were already reduced or altogether suspended in January 2022 (see Section 4) which mitigated the impact on households of the imbalances in energy markets. The total beneficial impact ranged from 11 percentage points (in the case of gas) to as much as 27 points (electricity) off of the annual price growth rates, much more than the European average. However, the abrupt withdrawal of these measures in January 2023 led to steep increases in energy prices which brought aggregate energy inflation rates close to EU27 levels; despite the threats of substantial shortages of energy fuels, the supply of fossil fuels was maintained and consumption decreased only slightly throughout 2022 in Poland. An important decrease was observed only in the case of the consumption of gas, amounting to nearly 18% compared to the previous year (March-December only). The reduction took place mostly in the summer months when it was a quarter lower than in 2021. This suggests that cuts in gas consumption and its substitution by other inputs took place mostly in industry and not in household heating; both electricity and coal supply saw only miniscule changes: 2.6% and 3.6% respectively (compared to the same period in 2021). This suggests that the relatively low import dependency and the substitution of imports in the electricity mix with other sources (including renewables) allowed for a generally resilient functioning of the energy system during the period of price hikes; non-household consumers were protected from price hikes to a much lower extent, due to most being subject to market-based tariff setting. Here, the reaction of the Polish power sector to the war in Ukraine differed from the reaction of many other EU Member States. The main reason was the high share of coal and thus the relatively high impact on CO₂ emission prices rather than the scarcity of supplies. For that reason, electricity prices were already rising dramatically in 2021, prior to the full-scale Russian invasion. According to Eurostat, the average electricity price for non-household users increased in the first half of 2022 by 23% (while it decreased by 7% for households), while the respective growth in the gas price reached 35% (23% for households). Arguably, this may have resulted indirectly in a higher consumer inflation rate via the business costs-price transmission channel.
Figure 5  Price indices in energy expenditure (January 2021=100)

Source: Authors' elaboration of Eurostat HICP data.

Figure 6  Tax impact on price indices in energy expenditure, Poland and EU27 (in percentage points)

Source: Authors' elaboration of Eurostat HICP data.
Response measures to the energy crisis: policy targeting and climate trade-offs

Figure 7  Natural gas consumption, 2019-23 (million cubic metres)

Source: Authors’ elaboration of Eurostat data.

Figure 8  Gross inland deliveries of coal and coke, 2019-22 (thousand tonnes)

Source: Authors’ elaboration of Eurostat data.
4. Instruments and their outcomes

4.1 First wave (early 2022): focus on taxes

Based on the information in Table 3 it is evident that, from the beginning of 2022, measures to alleviate the cost of the energy crisis were focused on controlling prices for end users through fiscal means, with the strongest input from decreases in indirect taxes, amounting to some 10 billion euros, and reduced price dynamics in sources of energy for consumers (see Figure 6). The tax cuts in Poland were one of the most generous in the whole of the EU. The second part of the fiscal package amounted to direct transfers to compensate for the rise in the prices of energy for heating (coal and electricity), amounting to about five billion euros distributed in the last quarter of the year. As Figure 9 shows, overall, the energy assistance proved to be relatively low, both nominally and in relation to GDP, and did not seem to have a big impact on the quantities of energy consumption, which proved to be lower throughout 2022 than in previous years (see above: Figures 7 and 8).

The side beneficiaries of these anti-inflationary shields, as the government has called the measures, were energy providers with the profitability indicators of mining firms skyrocketing to almost 20% (see National Statistics Data): the EBITDA to revenue ratio of the national oil and petrol state monopolist Orlen jumped from 8% in 2019 to 14.6% in 2021 and 18.1% in 2022.
### Table 3  
**Policy measures introduced in Poland in early 2022**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Detailed description</th>
<th>Timeframe</th>
<th>Green outcomes</th>
<th>Beneficiaries and social outcomes</th>
</tr>
</thead>
</table>
| Anti-inflationary shield 1.0 | – reduction of VAT on electricity from 23 to 5% (from January to March 2022)  
– reduction of VAT on natural gas from 23% to 8% (from January to March 2022)  
– VAT reduction for so-called system heating (from radiators) from 23 to 8% (from January to March 2022)  
– reduction of excise duty on motor fuels and electricity to the lowest level possible under EU regulations (until May 2022)  
– exemption from electricity excise duty for households  
– exclusion of sales of motor fuels from retail tax (from January to May 2022)  
– implementation of heating financial support for the most vulnerable households (from January until May 2022) | Finally, all measures were extended until the end of 2022 | Hard to estimate but, in general, directly targeting energy prices should raise demand, so also greenhouse gas emissions | Households and firms; this was mostly not a targeted measure, except direct transfers for heating |
| Anti-inflationary shield 2.0 | – reduction of VAT on fuel from 23% to 8%  
– extension of the 5% VAT rate on electricity  
– lowering the VAT rate for heating to 5%  
– introducing a zero VAT rate on fertilisers and other selected products used in agriculture  
– introducing a zero VAT rate on natural gas | Finally, all measures were extended until the end of 2022 | Hard to estimate but, in general, directly targeting energy prices should raise demand, so also greenhouse gas emissions | Households and firms; not a targeted measure |
| Coal Allowance           | Act on Coal Allowance prescribed in 2022 a transfer of 3000 złoty (637 euros) to every household heating the house primarily with coal. The budgetary expenditure forecast by the government is 11.5 billion złoty (2.44 billion euros).                                                                                                                                   | One-off measure distributed by the end of November 2022 | Hard to estimate but, in general, direct transfers for coal users should increase demand, so also greenhouse gas emissions | Households heating with coal *                                                                 |
| Electric heating allowance | A measure to compensate for the rise in electric energy prices for households heating with electricity to an amount of 1000 złoty (220 euros)  
One-off payment, disbursed before the end of March 2023 | One-off measure distributed by the end of November 2022 | Hard to estimate but, in general, direct transfers for electricity users should raise demand, so also greenhouse gas emissions | Households |

Notes:  
* Although choosing coal users as beneficiaries of the transfer had some merit (they consist to a large extent of energy and cash poor households), public opinion was quick to notice the environmental impact and that a lot of rich households would also benefit from it. This led to announcement of an extension of the allowance system so that it covered households using different heating fuels, including so-called system heating (which would benefit from price regulation linked to a system of compensation to energy providers).  
Source: Authors’ elaboration.
4.2 Second wave (late 2022/23): tariff controls and subsidies

Table 4  **Policy measures introduced in Poland in late 2022 and in 2023**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Detailed description</th>
<th>Timeframe</th>
<th>Green outcomes</th>
<th>Beneficiaries and social outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity price freeze</td>
<td>Price cap of 693 złoty/MWh for household electricity use up to 2 MWh of use in 2023 (up to 3 MWh in some special circumstances), coupled with a new mechanism of compensation for energy providers</td>
<td>2023</td>
<td>Might slightly decrease energy consumption of households</td>
<td>Households</td>
</tr>
<tr>
<td>Electricity price freeze for firms and vulnerable institutions</td>
<td>A cap on the electricity price of 785 złoty/MWh for firms and institutions, coupled with a new mechanism of compensation for energy providers</td>
<td>2023</td>
<td>Will not decrease energy consumption</td>
<td>Firms, public service providers, some NGOs</td>
</tr>
<tr>
<td>Gas price freeze</td>
<td>Price cap of 200.17 złoty/MWh for gas use in household heating in 2023, coupled with a new mechanism of compensation for energy providers</td>
<td>2023</td>
<td>Will not decrease energy consumption</td>
<td>All households heating with gas</td>
</tr>
<tr>
<td>Subsidies for industry</td>
<td>Up to 5 billion złoty in compensation disbursed among the c. 1000 most energy intensive companies for the higher costs incurred in 2022</td>
<td>2023</td>
<td>Will not decrease energy consumption</td>
<td>For companies with the following characteristics: 1. The costs of purchasing electricity and natural gas accounted for at least 3% of the value of production in 2021 or 6% of the value of production in the first half of 2022. 2. At least half of their revenues or production value came from activities in the PKD * codes included on the list of sectors particularly vulnerable to the effects of the crisis, developed by the European Commission</td>
</tr>
<tr>
<td>Suspension of coal norms</td>
<td>In August 2022 a new government regulation suspended environmental norms on burning solid fuels for 60 days. It was extended in October for another 6 months (i.e. until April 2023)</td>
<td>2022/23</td>
<td>Potential drop in average quality of the fuels used for heating</td>
<td>All entities subject to the suspended regulations of the act on the system of fuel quality monitoring and control</td>
</tr>
<tr>
<td>Orlen inflation ‘massage’</td>
<td>Stabilising liquid fuel prices after lapse of anti-inflationary shields, through lowering of mark-ups by the state petrol monopolist Orlen</td>
<td>2023</td>
<td>Will not decrease energy consumption</td>
<td>Prices for end consumers did not jump at the beginning of the year; while for businesses (subject to VAT deduction) they were substantially reduced</td>
</tr>
</tbody>
</table>
The increasing fiscal strain of the measures introduced in 2022, together with the notable deterioration in budgetary revenue prospects due to the impact of the slowdown in GDP, an acknowledgment of the high profits of (mostly state-owned) energy companies and growing impatience on the part of the European Commission, which was questioning the compatibility of important parts of the ‘anti-inflationary shields’ with EU legislation, convinced the government to let the shields lapse. As shown in Table 4, new regulatory measures were introduced which have put the strain of shielding households and small firms from higher energy prices on the energy providers, which would have to accommodate freezes in the prices of gas and electricity but with the provision of budgetary assistance to compensate for losses in individual cases. Moreover, without a formal legal provision, the state-owned petrol monopolist Orlen did not increase the gross prices of oil and petrol for transport use after the lapse of the shields. The company also announced at the end of February that, starting on 15 March, gas prices for companies serviced by another big state-owned enterprise, PGNiG (which had recently been bought by the oil giant) would be reduced by more than 50%.

4.3 Structural long-term measures

The programme measures to increase energy sustainability and resilience currently in place (see Table 5) are mostly aimed at making structural changes to the energy mix coupled with energy efficiency and financial aid for electricity prosumers. The biggest programme to date, ‘Clean air’, is officially directed at reducing smog and air pollution but, as a side benefit, has reduced CO₂ emissions. The programme remains very popular and has contributed to Poland becoming one of the fastest growing markets in Europe for heat pumps. It became more generous in mid-2022, when ‘Clean air plus’ was introduced with subsidies for thermal modernisation increased to a maximum of 90% of the cost. Equality-wise, this substantial programme is strongly biased towards the current owners of single-family houses which receive the bulk of total aid. Multi-family units receive a small fraction of the total support directed towards heat source replacement (the umbrella programme ‘Warm apartment’, which covers both owners and tenants, currently has an allocated value of 1.4 billion złoty (310 million euros)). Heat pumps are also subsidised for those currently building new units. It is worth mentioning additionally that clean air subsidies are designed in a progressive manner (the maximum aid of 90% of the cost is devoted to households whose income is well below the subsistence minimum) with a cap on the annual income of beneficiaries of

<table>
<thead>
<tr>
<th>Measure</th>
<th>Detailed description</th>
<th>Timeframe</th>
<th>Green outcomes</th>
<th>Beneficiaries and social outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decreasing consumption</td>
<td>In 2023, all units within the public finance sector are mandated to decrease energy consumption by 10%</td>
<td>2023</td>
<td>Could decrease total domestic energy consumption by 0.5–1% (IEA 2020)</td>
<td>Some decrease in consumption which could potentially lower prices for other energy users</td>
</tr>
</tbody>
</table>

Note: * Polska Klasifikacja Działalności (Polish Classification of Activities) based on NACE and fully comparable with NACE Rev 2.0. Source: Authors’ elaboration.
135 000 złoty (29 800 euros). During 2022, two contracts were signed to make up for the lost gas imports from Russia and a preliminary agreement was reached with American Westinghouse to build a nuclear plant in Poland.

Table 5  **Structural long-term measures**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Aim</th>
<th>Description</th>
<th>Budget</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean air and stopping smog</td>
<td>Increase energy efficiency of buildings and provide cleaner heat</td>
<td>Thermal modernisation and furnace replacement</td>
<td>103 billion złoty</td>
<td>2018-2030</td>
</tr>
<tr>
<td>My electricity</td>
<td>Increase dispersed energy provision</td>
<td>PV panels</td>
<td>1.1 billion złoty</td>
<td>2019-2023</td>
</tr>
<tr>
<td>Rural energy</td>
<td>Increase dispersed energy provision</td>
<td>Photovoltaic, water and wind installations, biogas plants and energy storage facilities</td>
<td>1 billion złoty</td>
<td>2022-2030</td>
</tr>
<tr>
<td>Measures within National Recovery and Resilience Plan</td>
<td>Green energy and reduction of energy intensity</td>
<td>New heat sources in single-family buildings; increasing the energy efficiency of school buildings; modernising and extending electricity grid; new waterworks connections; construction of offshore wind farms; building new low energy buildings (for low and medium-income households); thermal modernisation of single-family houses and flats; improvement of water retention in rural areas</td>
<td>25.5 billion złoty</td>
<td>2020-2026</td>
</tr>
<tr>
<td>Building nuclear capacity</td>
<td>Introducing nuclear energy in the Polish energy mix</td>
<td>According to Energy Policy of Poland until 2040, 'The first nuclear power plant power unit with a capacity of about 1-1.6 GW will be commissioned in 2033. Further power units will be commissioned every 2-3 years, and the entire nuclear programme assumes the construction of 6 power units.'</td>
<td>N/A</td>
<td>2021-2040</td>
</tr>
<tr>
<td>Replacing natural gas providers</td>
<td>Two new contracts for gas deliveries from Norway and USA</td>
<td>From 2023, Norway's Equinor and Poland's PGNiG entered into a contract with the former supplying Poland with 2.4 billion cubic metres of gas for 10 years. From 2027, the supply of LNG from the USA will amount to 4.2 billion cubic metres per year for 20 years. Together this will amount to one-third of current Polish gas consumption</td>
<td>N/A</td>
<td>2023-2047</td>
</tr>
<tr>
<td>Increasing LNG capacity</td>
<td>Expansion of the Świnoujście and Gdańsk terminals</td>
<td>The annual capacity of the Świnoujście LNG terminal is scheduled to be increased from 5 billion cubic metres in 2021 to 8.3 billion by the end of 2023. The capacity of the regasification terminal in Gdańsk is to double to 12 billion cubic metres per year by 2027-2028</td>
<td>N/A</td>
<td>2022-2028</td>
</tr>
</tbody>
</table>

Source: Authors’ elaboration.

The development of renewable energy sources has, however, been prone to significant political obstacles. The expansion of wind energy infrastructure was virtually stopped in 2016, when prohibitive regulations on the required distance of turbines from residential...
buildings were introduced. Only recently has this been relieved, under serious pressure from the European Commission and as part of a larger resolution aimed at ending the conflict between the Polish government and Brussels. In March 2023, a new law was passed which allows for a decrease of the maximum distance of onshore wind turbines from residential buildings which will unlock some land for bigger onshore wind investment.

Legislative changes surrounding the development of PV capacity are also worth mentioning. In 2016 a system of prosumer-grid barter exchange was put in place, based on the possibility of households reclaiming 70-80% of the energy input into the system (‘net metering’). This, together with the ‘My electricity’ programme of subsidies, generated a small PV boom that then put pressure on the grid, which was becoming unable to distribute the energy surplus accumulated during sunny days. This unsustainable arrangement was abandoned in 2022 in favour of a ‘net billing’ rule, with prosumers receiving and paying contractually determined sums of money when they are, respectively, in energy surplus and deficit. Coupled with the increasingly beneficial subsidies for heat pumps, this has contributed to a subsequently ballooning demand in Poland for this type of energy storage.

5. Discussion and conclusions

In overall review, we consider the measures taken in 2022 by the Polish government to alleviate the consequences of the energy crisis were not out of scope of the instruments utilised by other EU countries both in terms of their breadth and their design. What constitutes a specificity of the Polish approach is the focus on households (a strong bias towards lowering indirect taxes), with firms generally supposed to pay market prices. This approach might have had negative consequences for the embedding of inflation were higher input energy prices to have structurally increased the inflation expectations of firms. However, it seems it has not increased bankruptcies among firms which, in general, have been able to pass on the costs to consumers (GUS 2023).

That said, one has to conclude that individual measures were broadly defined and not particularly targeted towards shielding the most vulnerable parts of the population. This has resulted in relatively high fiscal costs which, at least in part, were avoidable. Moreover, unknown demand elasticity notwithstanding, it does not seem farfetched to assume that interventions directly affecting final prices have increased consumer demand for energy and, given the Polish energy mix, fossil fuel use. Also, policy attention was paid early on to the stabilisation and diversification of gas and coal supplies rather than to accelerated decarbonisation and energy savings.

In 2023, the government, facing strongly deteriorating macroeconomic conditions which were bound to have a negative effect on budgetary revenues, has reverted most of the fiscal measures and turned towards putting price caps on energy use for households.

and small companies. These are supposed to be borne by energy providers (with some fiscal assistance for those most strongly affected by the regulation). Moreover, firms (especially in transport but basically all those buying liquid fuels) have benefited from the price policy of Polish state energy giant Orlen, which has maintained gross prices at gas stations despite the VAT reduction being allowed to lapse.

We can therefore see some evolution in the ways the Polish government has managed the acute phase of the energy crisis, extending the breadth of measures to include small firms and, at the same time, shifting the burden of financial costs from the budget towards energy providers. In that way, Poland seems to have paved the way for other EU Member States which introduced tax cuts with a certain delay. From an environmental point of view, however, both modes of intervention (fiscal and regulatory) amount to a lowering of the prices for all households (and a considerable number of companies). Even though price caps are connected to some incentives to save energy, on balance it is hard to imagine a net reduction in fossil fuel use as a reaction to current policies.

At the same time, it has to be acknowledged that the government has made some bolder steps towards decarbonisation, including liberalising the law regulating the conditions for building onshore wind farms and striking a preliminary deal to build nuclear energy capacity.

Altogether, Poland’s policy approach seems to have been developed in an ad hoc manner in response to direct pressures and demands from the incumbent energy sector and the financial situation of households. The major exception is the longstanding political determination to diversify sources of gas imports, motivated by geopolitical reasons. The overall social effectiveness of the policy has, so far, been moderate since the cost of price hikes for households has only been delayed and hidden within broad inflation. Energy security and the stability of supplies have had priority over decarbonisation and international commitments, and this has limited the actual environmental benefits of the potential reduced use of fossil fuels. Only financial motives and direct pressure from the European Commission were able to enact certain policy changes by the end of 2022 and during early 2023.

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