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SUCCESSFUL POLICIES FOR A JUST ENERGY TRANSITION: THREE SOLUTIONS FROM POLAND'S RESIDENTIAL ENERGY SECTOR

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The energy transformation of Poland's residential sector began in the early 1990s, transitioning from a centrally planned to a market-based economy. Many indicators suggest that it reached a tipping point in 2022 following Russia's invasion of Ukraine. The transformation of Poland's residential energy sector is critical to achieving the country's energy and climate policy goals for two reasons. First, households in Poland utilize 90 per cent of all coal consumed in the EU's residential sector.¹ Second, in 2020, almost 80 per cent of the coal used for individual heating in the residential sector in Poland was imported from Russia.

In this light, we examine the trajectory of change in Poland's residential sector during the decarbonization process from the 1990s to 2022, highlight how the Russian invasion of Ukraine may affect the process beyond 2022, and provide policy recommendations based on our findings.

The change

Changes in Poland's energy sector started in the 1990s, intending to achieve energy security through a stable energy supply. This phase mirrored the sharp transition to a market-based economy. It was focused on utilizing domestically extracted coal, increasing the competitiveness of energy companies, and encouraging international cooperation.² On the way to Poland's accession to the European Union in 2004, policymakers focused on following energy-related environmental targets. These targets became concrete commitments with the acceleration of European climate policy, implying the decarbonization of the industry and large-scale, coal-based energy plants.³ However, until the early 2020s, governmental policies in Poland did not stimulate transformation to the point where the residential sector could be decarbonized effectively. Only in 2021 did policymakers adopt a new energy policy to achieve a just (i.e. providing equal opportunities for regions and communities

negatively impacted by the process, and introduced through bottom-up initiatives) and low-emission energy transition, as well as complete coal phase-out in the residential sector by 2040.

In this context, the share of solid fossil fuel use declined from around 40 per cent in 1990 to about 30 per cent in 2019. Coal remained a significant energy source, and Poland has had the EU's most coal-intensive residential sector, lagging behind the

¹ Eurostat (2021), *Supply, Transformation and Consumption of Solid Fossil Fuels*.

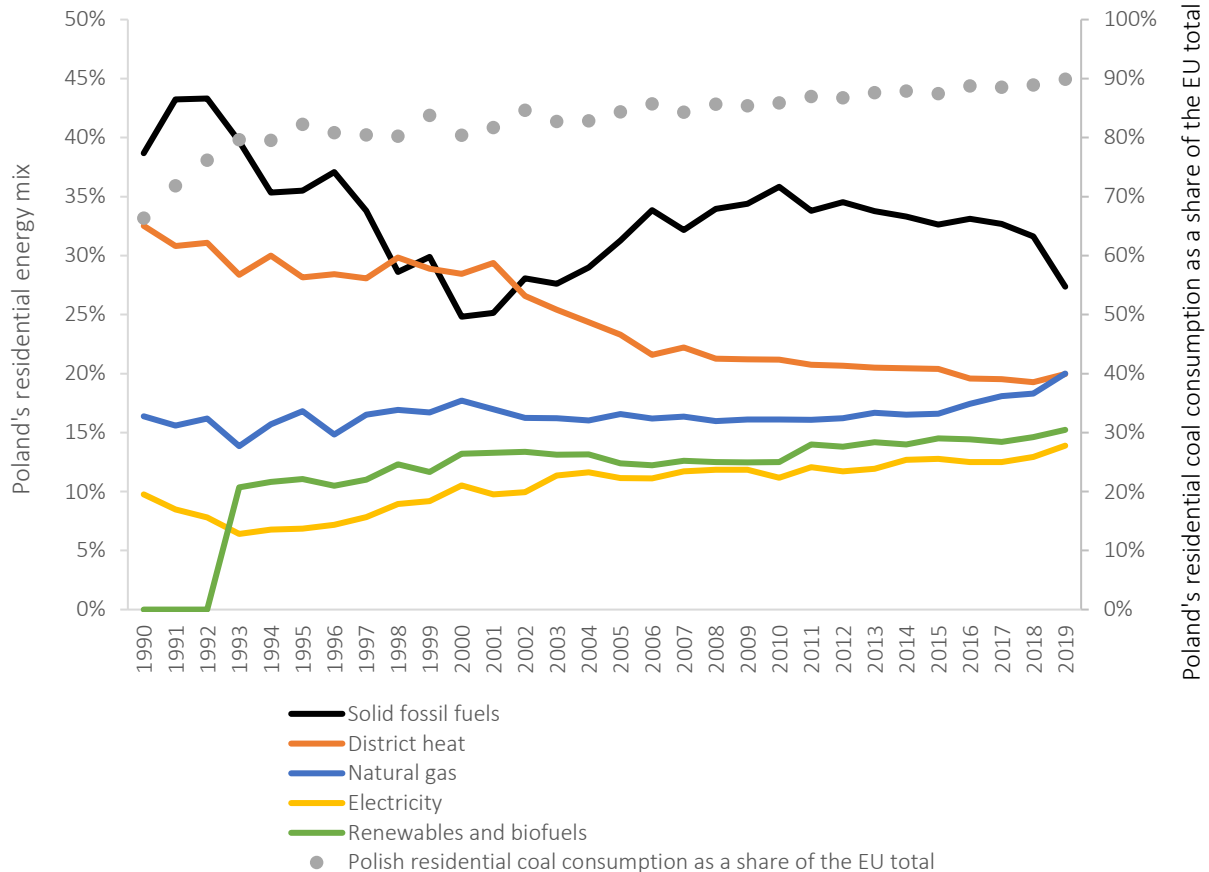
² Serafin, R., and Żebrowski, M. (1994), Environmental management in Polish economic and political reforms, in C. Carraro, A. Haurie, and G. Zaccour (eds.), *Environmental Management in a Transition to Market*.

³ Kudelko, M., and Suwala, W. (2003), Environmental policy in Poland—current state and perspectives of development, *Energy & Environment* 14(5), 737–750; Sokołowski, M. M. (2018), Burning out coal power plants with the Industrial Emissions Directive, *Journal of World Energy Law & Business* 11, 260–269.



European general decarbonization trend.⁴ In 2004, Polish households accounted for 83 per cent of total coal consumption in the EU’s residential sector. In 2019, this share increased to 90 per cent. This stark disparity resulted from inadequate policies (e.g. lack of subsidies for low-carbon solutions), causing households to switch from old coal stoves to more energy-efficient but still coal-intensive heating systems.

Figure 1: Residential heating sources: Poland’s mix of different fuels and district heat (solid lines), compared with Poland’s share of EU residential hard coal consumption (dotted line), 1990–2019



Source: Sokołowski, J., and Bouzarovski, S. (2022), Decarbonisation of the Polish residential sector between the 1990s and 2021: a case study of policy failures, *Energy Policy* 163, 112848.

Following unsuccessful decarbonization attempts in the residential sector through local, bottom-up support programmes, in 2016 Poland’s first regions passed anti-smog legislation.⁵ These local laws, which restricted solid fuels and solid-fuel-based heating sources, had a slight positive effect on air quality and reduced the use of coal stoves.⁶ Moreover, two support programmes were launched in 2018 and 2019: Clean Air, offering subsidies for investments in more efficient heating technologies, and My Electricity, aimed at the growth of small-scale photovoltaic installations.

The Clean Air programme, with a nearly €20 billion budget, provides subsidies for investments in clean heating technologies and thermal retrofits. These subsidies cover up to 90 per cent of investment costs, depending on household income, since paying for this technology has been a challenge for low-income households. Additionally, until September 2021, the program allowed subsidies for investments in individual coal-fired central heating systems that were more energy efficient than the outdated individual coal stoves. By mid-2021, around 100,000 solid-fuel-based installations had been subsidized through the programme, accounting for about 40 per cent of all newly installed heating systems in the Clean Air programme.⁷

⁴ Süsser, D., Ceglaz, A., Gaschnig, H., Stavrakas, V., Flamos, A., Giannakidis, G., and Lilliestam, J. (2021), Model-based policymaking or policy-based modelling? How energy models and energy policy interact, *Energy Research & Social Science* 75, 101984.

⁵ Zyśk, J., Olkusi, T., Kogut, K., Szurlej, A., and Surówka, M. (2019), Assessment of the impact of the implementation of air protection programs, anti-smog resolutions and the ‘Clean Air’ program on CO₂ emission, *Polityka Energetyczna—Energy Policy Journal*, 133–154.

⁶ Sokołowski, J., and Bouzarovski, S. (2022), Decarbonisation of the Polish residential sector between the 1990s and 2021: a case study of policy failures, *Energy Policy* 163, 112848.

⁷ Sokołowski, J., and Bouzarovski, S. (2022), Decarbonisation of the Polish residential sector between the 1990s and 2021: a case study of policy failures, *Energy Policy* 163, 112848.



The My Electricity programme, based on a one-time subsidy of about €1,000, has boosted Poland's renewable energy sector, yielding promising results. The programme sought to increase electricity production from photovoltaic micro-installations (2 to 10 kW). Individual households willing to generate electricity to meet their demand benefited from this incentive, and the direct subsidies provided through this programme significantly contributed to Poland's prosumer market development. [From 2020 to 2021, the number of prosumers rapidly grew from 50,000 to more than 750,000.](#)

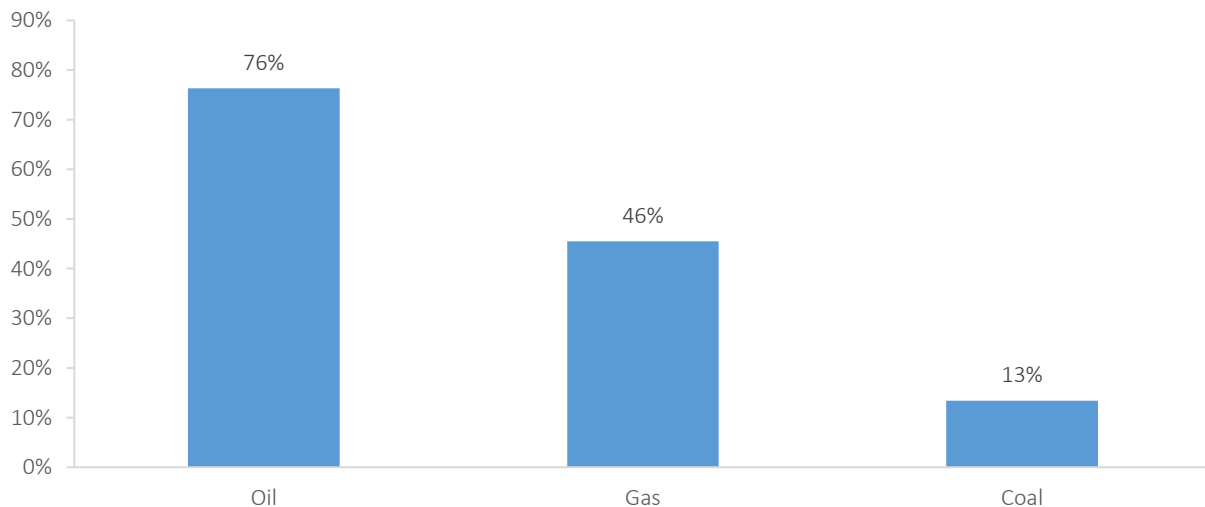
Up to 2021, these support instruments produced relatively positive outcomes, assisting in financing almost one million residential energy installations. Together with strengthened anti-smog resolutions encompassing the entire country, these programmes can support Polish households in moving towards decarbonization.

The crisis, the invasion, the future

The late 2021 energy price crisis, driven by increased demand for gas after the COVID-19 pandemic, shifted the focus of climate policy goals to mitigating energy price hikes. In Autumn 2021, in response to inflation pressure, the Polish government reduced the VAT rates for electricity (from 23 to 5 per cent), natural gas and district heating (from 23 to 8 per cent) and lowered the excise tax on energy products to zero. Since 2022, the Polish government has also provided substantial safety nets from the state budget for energy-poor households (about €1 billion per year). Although the tax breaks are regressive and favour more affluent households that consume more energy per capita, these solutions generally also help less affluent households affected by the energy crisis.

Russian aggression in Ukraine has pushed energy security further to the centre of Polish energy policy. [In 2020, Poland imported 35 per cent of its energy and 13 per cent of its coal from Russia.](#) Importantly, [80 per cent of imported hard coal was used in households](#), as domestic coal supplies district heating and electricity production. Poland stopped importing Russian coal by the end of March 2022, while Russia halted all natural gas exports to Poland at the end of April 2022, but the Polish stocks were sufficient to weather the gas shortage in 2022.

Figure 2: Imports from Russia in gross available energy, 2020 (% of Poland's total supply)



Source: Authors' elaboration based on Eurostat (2022), [EU Energy Mix and Import Dependency](#).

Antosiewicz, Lewandowski, and Sokołowski, in *The Economic Effects of Stopping Russian Energy Imports in Poland* (2022), calculated the impacts of price hikes on the Polish economy and households following the Russian invasion of Ukraine. It is predicted that GDP will decrease by 1.3–4.2 per cent by the end of 2023. The most significant negative impact would be caused by a spike in oil prices, which would decrease GDP by an average of over 80 per cent across all scenarios. Rising coal and gas prices would have a more negligible impact on GDP, causing a decrease of only 0.5 per cent if they increased sharply by the end of 2023. The effects of these price increases would be felt more significantly by low-income households in relative terms, while high-income households would be most affected in absolute terms. If energy prices rise by about 30 per cent by the end of 2025, the impact on households would be about 1 per cent of their monthly income. If energy prices rise significantly, the impact on disposable income for low-income households (first decile) could be as high as a 6 per cent drop after paying energy and fuel bills, while the impact on high-income households (tenth decile) would be about 1.5 per cent.



Discussion and policy conclusions

We propose to address the energy crisis's distributional repercussions through tax and benefit incentives aimed primarily at low-income households. To tackle the 2022 crisis, exacerbated in Poland by domestic coal shortages, the Polish government introduced a new set of relief measures for the residential sector. One of these measures was a coal allowance (a one-time payment of about €640) for individuals who heat their homes with coal.

The proposition was countered with a civic initiative to support low-income people regardless of their heating source. The measures introduced by the Polish government should be improved by introducing [either a lump-sum transfer for all households](#) that would help reduce income inequalities or a targeted allowance for low-income households (e.g. in the form of an energy voucher⁸).

Furthermore, we argue that realizing end-user potential is critical to achieving residential sector decarbonization by 2040. However, this is unlikely to happen with a bottom-up approach because end-users rarely examine their beliefs about energy use and choose to upgrade their heating source based on personal initiative alone. On the one hand, fuel price rises (e.g. via the emission trading system) can motivate better-off households to decarbonize. On the other, energy-poor households should be safeguarded from increased fuel prices because avoiding a carbon lock-in is more difficult for those who cannot afford thermal retrofits or investments in clean heating sources.

Seen in this light, public institutions should play an essential role in guiding end-users through the energy transition, supporting those who are likely to fall behind. This is a crucial requirement for a just energy transition.⁹ Without adequate institutional support, some individual households may be reluctant or unable to participate in the energy transformation to climate neutrality. Others may switch from coal to gas heating, resulting in a similar future fossil-fuel lock-in, and we assume that in the next decade, gas will be treated in climate-energy policies in the same way that coal is now. All of these scenarios would result in the overall failure of the country's energy policy.

From this perspective, we propose three policy solutions to improve housing and heating conditions during the energy transition. Their application is not limited to Poland and may extend to other countries experiencing similar challenges. These solutions are as follows:

1. Prioritize thermal retrofit programmes and district heating connections, as well as the full financing of energy-related investments for energy-poor households.
2. Provide direct compensation for higher energy expenditure for end-users who invest in new low-carbon and energy-efficient heating sources, and recognize the needs and issues faced by these residents in energy-related policies.
3. Instead of replacing old and rundown individual housing units, raise funds and investments for the renovation of social housing stock.

These actions complement each other, comprise a broad framework of transformative activities, and follow attempts by the Polish government to incentivize social buildings (e.g. via social housing initiatives or the multifamily buildings prosumers programme, launched at the end of 2022).

⁸ Sokółowski, J., Frankowski, J., and Mazurkiewicz, J. (2021), *The Anti-inflation Shield or an Energy Voucher: How to Compensate Poor Households for Rising Energy Prices?* IBS Policy paper 5/2021.

⁹ Sokółowski, M. M., and Heffron, R. J. (2022), Defining and conceptualizing energy policy failure: the when, where, why, and how—the search for the just solutions, *Energy Policy* 161, 112745; Sokółowski, M. M., and Kurokawa, S., 2022, Energy justice in Japan's energy transition: pillars of just 2050 carbon neutrality, *Journal of World Energy Law & Business* 15, 183–192.