



Krzysztof Waśniewski

PhD, Andrzej Frycz Modrzewski Krakow University
<https://orcid.org/0000-0003-0076-4804>

Anna Bałamut

PhD, Andrzej Frycz Modrzewski Krakow University
<https://orcid.org/0000-0001-7300-7367>

Transformation of the energy sector, environmental factors and national security in Poland: highlights from the Krynica Forum '22, Krynica-Zdrój, 19–21 October 2022

This paper selectively discusses the content of two conference panels held at the “Krynica Forum '22 – Growth and reconstruction” conference, which took place in Krynica Górska, Poland, from 19 until 21 October 2022.

The aim of the Krynica Forum was to work collectively on solutions for strengthening security, prosperity, social cohesion and the economic position of Poland and the countries of Central and Eastern Europe. Discussions were grouped into panels, which followed five thematic paths: “Security and geopolitics”, “Change economy”, “Energy and climate”, “Future society” and “Health trends”. The panel meetings gathered political leaders at many levels of government, business people, scientists and the media. The Kościuszko Institute was the host of the event, with Nowa Konfederacja as exclusive partner, and the local government of the Małopolskie Voivodeship as the titular partner. The conference received the support of other institutions and business entities, such as: Orlen S.A. as strategic partner, PGNiG

S.A., Małopolska Development Fund, Małopolska Regional Development Agency and Kraków Technology Park.

The two panels being discussed were held on 20 October 2022, and were both focused on the national security of Poland in the context of technological change in the energy sector.

A brief outline of the scientific background seems useful before highlighting the content of the discussion panels. Poland is currently facing a contradiction in the national energy strategy: the need to comply with climate-friendly policies of the European Union has to be balanced against the imperative of energy security, with hard coal and lignite remaining the main sources of energy.¹ Even before the war in Ukraine, there was substantial evidence for the imperative of maintaining that difficult balance. Transition from coal to natural gas, thus to a cleaner fossil fuel, would significantly increase the hidden energy poverty in Polish households, as the providers of energy would transfer onto final users the amortisation of the corresponding investment in new assets.² The dependence of Poland on imported crude oil has been significant for decades and therefore has created a crucial threat to national security.³ That dependence has been extending beyond just crude oil, into 42 key, 24 strategic and 17 critical minerals indispensable for the Polish economy.⁴ Some research suggested that speeding up the transition to new technologies in the energy sector could improve the overall energy security of Poland.⁵

Strategies for technological change in the energy sector differ greatly among the member countries of the European Union. Geography, both physical and economic, seems to be the prime factor of those idiosyncrasies. In the case of Poland, assuring proper energy security is the key factor of success in effectively transforming the energy sector, whilst environmental and social factors are somehow instrumental.⁶

¹ B. Igliński, M.B. Pietrzak, U. Kielkowska *et al.*, 'The assessment of renewable energy in Poland on the background of the world renewable energy sector', *Energy*, vol. 261, 2022, 125319, <https://doi.org/10.1016/j.energy.2022.125319>.

² L. Karpinska, S. Śmiech, 'Will energy transition in Poland increase the extent and depth of energy poverty?', *Journal of Cleaner Production*, vol. 328, 2021, 129480, <https://doi.org/10.1016/j.jclepro.2021.129480>.

³ J. Kamyk, A. Kot-Niewiadomska, K. Galos, 'The criticality of crude oil for energy security: A case of Poland', *Energy*, 220, 2021, 119707, <https://doi.org/10.1016/j.energy.2020.119707>.

⁴ K. Galos, K., E. Lewicka, A. Burkowicz *et al.*, 'Approach to identification and classification of the key, strategic and critical minerals important for the mineral security of Poland', *Resources Policy*, vol. 70, 2021, 101900, <https://doi.org/10.1016/j.resourpol.2020.101900>.

⁵ A. Aminpour, 'Energy security in Poland: Where the energy sector falls short and where it can go', *Georgetown Scientific Research Journal*, vol. 2, no. 1, 2022, pp. 7–13, <https://doi.org/10.48091/gsr.v2i1.26>.

⁶ R. Wisniewski, P. Daniluk, A. Nowakowska-Krystman, *et al.*, 'Critical success factors of the energy sector security strategy: The case of Poland', *Energies*, vol. 15, no. 17, 2022, 6270, <https://doi.org/10.3390/en15176270>.

Energy-related policies in Poland seem to be rooted in the imperative of national energy security rather than going towards quick transformation of the energy sector.⁷ A series of mergers and acquisitions in the Polish energy sector seem to have been triggered as an institutional response at the level of business structures after the beginning of the war in Ukraine.⁸

The first of the two discussion panels summarised in this paper was titled “The resilience of Poland to the outcomes of Russian aggression in Ukraine – conclusions for the energy sector”, and gathered three participants: Paweł Szczeszek (the CEO of TAURON Polska Energia), Robert Kuraszkiewicz (entrepreneur, columnist, former CEO of Bank Pocztowy) and Anna Bałamut, PhD (Assistant Professor at Andrzej Frycz Modrzewski Krakow University). The first issue discussed in that panel revolved around the thus far predominance of cheap natural gas from Russia as the core of technological change in the energy sector. That model has failed. How deep is the dependency of European countries on Russian gas? How was Poland prepared to face the present energy crisis? What is the connection between low-carbon economy and resilience to Russian energy blackmail?

In response to that line of discussion, Anna Bałamut stated that the progressive winding down of coal mining in Poland was short-sighted and obviously assumed the best-case scenario, without turbulence. We have been too slow at transitioning to distributed, renewable energy resources. Mr Paweł Szczeszek developed his commentary starting from the fact that successive Polish governments have been implementing climate-related agreements with a priority on energy security, when the cutting of emissions is maximised within the limits of proper energy security.

However, in the specific case of Poland, 1990 being taken as base year in climate-related agreements is a big problem. In 1990, the Polish economy was in deep recession after the transition from communism to market economy. The year 1990 is simply not representative of anything like a baseline state in the Polish industry. In a further development, Paweł Szczeszek asserted that climate-related agreements need to be specific and pragmatic to be implementable. Programmes such as “Fit for 55” in the EU are too general in that respect. As regards the current energy crisis, Paweł Szczeszek insisted that in 2022, those who had been importing cheap coal from Russia before the war in Ukraine have lost all their thus far accumulated gains. In that context, it is worth noting that for the last seven years, Polish state-owned companies have been buying coal from domestic mines, not from Russia.

⁷ K. Rabciej-Sienicka, T.J. Rudek, A. Wagner, ‘*Let it Flow, Our Energy or Bright Future: Socio-technical imaginaries of energy transition in Poland*’, *Energy Research & Social Science*, vol. 89, 2022, 102568, <https://doi.org/10.1016/j.erss.2022.102568>.

⁸ J. Toborek-Mazur, K. Partacz, M. Surówka, ‘Energy security as a premise for mergers and acquisitions on the example of the multi-energy concern PKN Orlen in the face of the challenges of the 2020s’, *Energies*, vol. 15, no. 14, 5112, <https://doi.org/10.3390/en15145112>.

As regards renewable sources and their relative importance, Paweł Szczeszek argued that investment in the distribution and storage of energy is crucial for the practical utility of the renewable energy sources, probably even more important than investment in the generation capacity based on those sources. In photovoltaics, we need to be realistic. The nominally provided peak capacity in photovoltaic installations are not realistic. When synchronising photovoltaic installations with the power grid, it is more realistic to plan for average capacity or even for the minimum one.

For his part, Robert Kuraszkiewicz contended that the war in Ukraine was virtually impossible to predict a few years ago, and thus it was impossible to take that war into account in long-term energy policies. Independently from both the war and the drive towards low carbon emissions, a dual technological revolution is going on, namely that which is digital-electricity related. The global economy progressively focuses on electricity as the directly useful form of energy, to the expense of heat or natural gas. The war in Ukraine has demonstrated how dependent Poland is on Russian coal. Compared to other European countries, Poland derives an exceptionally large proportion of its thermal energy from coal. From Robert Kuraszkiewicz's perspective, Europe needs to develop sources of energy other than fossil fuels simply because we do not have sufficient domestic reserves of fossil fuels. Renewable sources of energy are one possible option in that respect. The intermittence of their power supply is an attribute, not a drawback. We simply need to adapt to that attribute. In the context of technological change, Robert Kuraszkiewicz remarked that Poland is lagging behind significantly as regards the technology of power distribution and storage.

That first issue discussed in the panel opened on the question: what kind of stable, non-intermittent source of energy, other than fossil fuels, is best for Poland from the perspective of near future? In that thread, the dominant voice seems to have been that of Paweł Szczeszek. He claimed that two strands of investment are of capital importance in the Polish energy sector: renewables and nuclear. We should keep investing in renewable sources of energy. It is important to develop small modular reactors (SMR) based on nuclear energy. TAURON, together with KGHM Polska Miedź S.A., is initiating such a project. For now, the technology of SMR is too expensive for industrial use. On the other hand, supplies in nuclear fuel are a strategic issue if we want to invest in SMR. However, with that long perspective in mind, Poland still heavily relies on local systems of central heating, attached to local thermal power plants, and, therefore, we still need coal.

The second energy-related panel held on the same day, 20 October 2022, was titled "Transformation of the energy sector and national security", hosting Krzysztof Wojczal (lawyer, geopolitical analyst, columnist), Karol Wolff (Head of Strategy and Strategic Projects at PKN Orlen S.A.), and Arkadiusz Sekściński (Deputy CEO of PGNiG S.A., in charge of development projects). The discussion started

around the question of how technological change in the energy sector can help the national security of Poland. This thread of debate seems to have been dominated by Krzysztof Wojczal, who warned that deficits in the supply of natural gas will make Germany consume and import a lot of electricity. Poland will have to compete against Germany as a buyer in the market of electricity. The Baltic Pipe project, i.e., natural gas from Norway, is an improvement as regards the energy security of Poland, and yet it is another case of an imported energy source, as well as another piece of critical infrastructure, exposed to attacks. We should develop our own, domestic sources of energy in Poland, independent of imports. Furthermore, we should invest in our capacity to export energy. Taking on the issue of energy security from another angle, Krzysztof Wojczal propounded that Poland needs to develop better connections between the domestic power grid and those in other countries. That will improve both our capacity to export energy and to import it. Poland should actively build influence in Ukraine, also in the perspective of energy security.

The second thread developed in that panel revolved around the possible ways of speeding up technological change in the Polish energy sector, with a particular focus on accelerating the implementation of nuclear. Karol Wolff claimed that we need to combine an efficient response to a dual challenge. We need a generation-long transformation in our energy sources, and a much more immediate transformation towards greater energy security. A combination of renewables and nuclear seems to be the right response to that dual challenge. Both assure low carbon emissions and independence in energy supply. Small modular reactors (SMR) will find their first practical applications in the powering of industrial plants, as they can supply both electricity and industrial heat. There is a chance to have such first applications in Poland by 2030. Orlen S.A. has created an affiliated company oriented towards both renewables and SMR.

Further discussion in the panel focused on the role of renewable energy sources (RES) in transforming the energy sector in Poland, with the provocative question: why do we have such a small share of RES in the Polish energy mix? Karol Sekściński argued that transition towards renewables is ongoing in Poland: Orlen S.A. is developing offshore windfarms in a PLN 140 billion project. Still, new drillings for natural gas are being developed into exploitation in Poland. Further in his statement, Karol Sekściński asserted that local communities need to be consulted regarding investment in the energy sector, and this is just one step. Projects in the energy sector require extensive preparation, inclusive of realistic business plans. That facilitates effective implementation, which, incidentally, is just as important as setting strategic goals. Drifting slightly onto another topic, Karol Sekściński pointed out the importance of developing biogas installations. We have too little capacity in that field in comparison with the amount of biogas we generate.

The discussion reported in this paper seems to show an underlying common thread as regards energy security, namely the importance of diversity in the sources of energy. Combining a core power infrastructure based on non-intermittent sources with a broader network of distributed energy resources (e.g. solar, wind, biogas) seems to be the best solution. At the core, progressive transition from fossil fuels towards nuclear appears as the soundest strategy.