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## WHAT DOES THE AUTUMN AND WINTER OF 2022 HAVE IN STORE FOR US?

Certain decisions have already been made. We will start to gradually reduce the demand for thermal coal. The petrologist from the University of Silesia emphasises that this is the right direction to take – the era of fossil fuels is coming to an end, and we should make a shift towards renewable energy. The most important thing, however, is to ensure that the difficult transition does not take place abruptly, under time pressure. In light of the recent events, the key decisions for the whole Europe will now have to be taken much more quickly.

The forecast for this year is not optimistic. We will likely have to face another energy crisis. The European Union is already working to secure gas supplies. We should also prepare for energy shortages. In practice, this means that our country and other EU countries may have to resort to rationing energy supplies in the coming autumn.

According to Prof. Iwona Jelonek, a reasonable way out of the current situation could be to partially awaken the already dormant mining sector in Poland to cope with the current, difficult reality. Naturally, she stresses, only until we are fully independent from powerful economies such as Russia's and have sufficiently developed our renewable energy sources.

'We are prepared for it, considering that Poland still has huge deposits of hard coal', comments the researcher.

However, a return to the past would bring certain serious challenges. This is first and foremost a social problem. It is not difficult to imagine the reaction of Europeans who keep saying: *no more hard coal, no more brown coal, oil, or gas*. Reopening the mines would entail financial penalties from the European Union, and probably also the need to return some of the money obtained from EU funds.

'This is all true, but let me repeat: I believe that changes are being introduced too abruptly', says the scientist.

'Let me tell you a story about a thing as black as tar, which warms you up and comes in a boxcar... But is it worth its price? I hope the readers will want to answer this question for themselves after reading the article', says Prof. Iwona Jelonek from the University of Silesia, who deals with, among other things, the assessment of solid fuel quality, as well as the topics related to the coal carbonisation process and the production and combustion of biomass. The organic petrology expert talks about the energy crisis, the importance of fossil fuels and an alternative transformation model for thermal coal mining.

## WHY ARE WE IMPORTING COAL FROM RUSSIA?

One of humanity's main needs has been, is, and will continue to be, the need to secure a good life on Earth – primarily in terms of energy security. Most countries do not have sufficient reserves of fossil fuels, which are currently the basis of the world's energy supply. The specifics of the use of thermal coal are complicated by the fact that, despite having adequate reserves of this fuel, in the case of the European Union, societal conditions are adding an additional burden to this state of affairs, indicating a move away from fossil fuels for the sake of environmental protection and due to the high costs of extracting this raw material.

'Why did we start to close mines? Because we were told that operating them was unprofitable. Despite this, we continue to import coal in huge quantities', says Prof. Iwona Jelonek.

The data collected by the Forum Energii [Energy Forum] think tank shows that 11 million tonnes of coal was imported to Poland from Russia in 2020, including more than 9 million tonnes mined in Russia. This country was our main supplier not only of this energy resource but also of gas and oil. Russian coal ended up mainly in households, heating plants, and industrial plants.

As the expert emphasises, from this perspective the arguments about environmental protection or social aspects seem more like political games than any real action towards the betterment of the planet and people. It is also worth mentioning that according to research conducted by scientists, coal imported from abroad is usually of lower quality than domestic coal, and does not meet the specifications required by the European Union. Furthermore, in many of the world's mines, people work in appalling conditions where no safety standards are respected. It is the economic calculus that decides.

'I have seen such mines with my own two eyes. These activities have nothing to do with sustainable development. What is more, supporting the Russian Federation at the time of war in Ukraine by purchasing hard coal from them is reprehensible. Today we are witnessing the consequences of financing economies governed by non-democratic regimes', points out Prof. Iwona Jelonek.

However, if we were to give up on imports altogether, would then the crisis-stricken Polish mines be able to cover our country's demand for this raw material? It is unlikely.

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## WHICH TRANSFORMATION MODEL SHOULD WE ADOPT?

Drawing on her knowledge and experience, Prof. Iwona Jelonek suggests developing a model for the transformation of mining plants into the so-called pro-ecological energy production and storage enterprises.

'I believe that rational changes to the production profile of former mining plants would not only ensure an environmental breakthrough in the energy sector, but also create new jobs for miners, who would have the opportunity to undergo retraining.'

The expert from the University of Silesia is of the opinion that such a strong and quick reaction to this year's energy scarcity threat could, metaphorically speaking, help us warm up in the winter and avoid sudden social upheaval.

'Such a scenario is not hard to imagine. Why are we getting rid of the existing underground and aboveground min-

ing infrastructure (excavation sites, shafts, drifts, crosscuts) by filling it with water, hydraulic backfill, and concrete?' It could make a good space for energy storage. We could establish there pumped storage power stations, or sites for biogas plants and biomass or bio-waste collection facilities. The natural processes occurring in biomass release huge amounts of methane, which can be captured, stored, and later used, e.g. for heating housing estates. These are just a few examples', says the researcher.

Prof. Iwona Jelonek also emphasizes the importance of coking coal, which was entered on the list of EU's 27 critical raw materials. We should keep in mind the fact that Poland is the only European country mining this raw material. Recently, renewable energy installations based on the conversion of solar energy have come

to the forefront in many discussions about the future of energy security. The petrologist poses a rhetorical question: can this type of installations be currently built without using coking coal?

'Coking coal is used to produce coke, which is then transported to the steelworks, where steel is smelted in blast furnaces. There is no steel without coking coal mines. What is the use of "aluminium trains" if they have nothing to ride on? We cannot currently use aluminium or wooden rails for the purposes of the above-mentioned transportation. There isn't any available cost-effective technology and a cheap raw material which could replace coke. If somebody were to find a suitable solution, then we would witness a gigantic civilisational step forward. Let's hope we won't have to rely on import here as well', says the researcher.

## IF NOT FOSSIL FUELS, THEN WHAT?

The widely-adopted climate policy involves a departure from fossil fuels. However, they will still account for a certain percentage of energy production. How large? It is hard to say. We also need to take into account the energy coming from nuclear power plants. Perhaps in Poland? That remains to be seen. We also know that there are plans to increase the rate of renewable energy sources. Unfortunately, these technologies develop relatively slowly, and it will be difficult to reach the planned increase in their share of energy production by 2030.

Photovoltaics is certainly an intriguing proposition, but we need to be aware of the energy waste involved. We still

do not have an effective way of storing it. This is a growing industry, therefore, we do not know how long the search for effective solutions will last. Biomass is an interesting option as well. According to Prof. Iwona Jelonek, it is an excellent, underutilised source of energy. Interestingly, our country is currently the fifth largest producer of a solid biofuel, namely wood pellets. They are a sustainable energy source with the potential to become our main fuel in the future.

'Let us hope we won't ruin this product, as was the case with "black gold" and its reputation', says Prof. Iwona Jelonek. Nowadays, she wonders if perhaps we should have invested in researching pos-

sible solutions to reduce carbon dioxide and pollution emitted into the atmosphere as a result of burning fossil fuels. Instead, large sums of money were put into the development of renewable energy sources.

'We will move away from fossil fuels in the future – that is a fact. However, we do not yet know what environmental, economic, and social decisions await us. Certainly, difficult choices will have to be made. We do know one thing: without energy, the world as we know it will not survive. There would be no energy today without the much-hated coal, whether we like it or not', concludes the researcher.