

'The Atom is the Energy of the Future' - Hanna Trojanowska - Gazeta Wyborcza

We need nuclear power for growth of the Polish economy. The atom is the energy of the future. For a couple of weeks, Gazeta Wyborcza has offered an interesting exchange of views on the idea of developing nuclear power in Poland.

Supporters of producing electric power from nuclear fuel base their opinions on strong grounds, including Poland's strategic energy security, profitability of electric power generation and strict environmental protection regulations.

They do not negate other technologies, as they are aware that the condition of the coal-based Polish electric power sector requires practical actions involving coal-based clean technologies and renewable sources to diversify the fuel basis for the needs of the electric power sector. A lot has to be done to improve the productivity of electric power generation and to reduce consumption. However it is nuclear power that is becoming more and more attractive in terms of economy and ecology, after a long period of stagnation.

Thus it was interesting for me to read articles criticising nuclear power by Prof. Krzysztof Żmijewski of Warsaw University of Technology and Prof. Steve Thomas of Greenwich University. Unfortunately, the articles contain statements that must be clarified and corrected. The atom is safe At the very beginning of his article 'The Atom is Unnecessary', Żmijewski writes, 'We do not know how to tackle the consequences of a massive nuclear catastrophe.' If the safety of a nuclear plant is perceived in terms of its potential failure, a lot of readers associate it with the Chernobyl incident. However, it must be borne in mind that the Chernobyl reactor was based on construction developed for military purposes, which is unusual for reactors used to generate electricity.

The Chernobyl reactor's construction and physical properties were such that its capacity was able to increase during the failure. Indeed, the reactor's capacity grew as much as a thousand-fold during the accident! Nothing like that is possible in the water reactors currently built and operated all over the world. Good use was made of the stagnation in the nuclear power sector after the failures of the Three Mile Island nuclear power plant (1978, in the US) and the Chernobyl nuclear power plant (1986, in the former Soviet Union).

That period saw development of new concepts and designs for safe third-generation nuclear reactors, including sophisticated safety systems. The reactor will be turned off and cooled automatically by nature itself in case of even the most serious failure (without the need for human intervention). Indeed, Żmijewski's statement that nuclear power will bring economic independence is true. Therefore nuclear power plants are built in countries that care about their own future. That is how it is in the European Union and in the US – the most market-oriented country in the world. A long time ago the Americans found that they could not solve two key problems – energy security and ecological protection – without nuclear power plants.

Therefore nuclear power engineering is flourishing in America today. Applications for erection of 15 nuclear power plants have been filed with the US Nuclear Regulatory Commission (as of June 2008) and another 15 applications are being prepared. It may appear that the White House is promoting development of the nuclear power sector in the US. Indeed, by signing the Energy Policy Act in August 2005, President Bush adopted a programme of governmental incentives for development of the nuclear power sector. However, the incentives are only for the first 6 plants, and the remaining 24 will have to take on the American economic reality without any help. There is more and more of the atom According to International Atomic Energy Agency data as of 24 July 2008, there are 439 nuclear reactors in operation all over the world, with a total capacity of more than 372,000 MW. Another 35 reactors with a combined capacity of nearly 30,000 MW are under construction. In 2007, three new reactors became operational, and construction of 7 new blocks began. Last year no reactor was closed down.

Nearby countries such as Finland, Bulgaria, Romania and Switzerland are among those constructing new nuclear power reactors. Finland is building a new nuclear power plant in Olkiluoto. The investment is not supported by the state with any form of subsidies, guarantees, incentives or preferences. It is hard to believe that 70 private investors expect anything other than financial benefits after start-up of the plant. The future benefits will be based on low costs for generating power. Aware of the reasons for an increase in the costs of the pioneering construction of a modern EPR reactor in Olkiluoto, the pragmatic Finns know that once they overcome the problems related to the construction of this block they will not have to solve them again when erecting new ones.

Three more Finnish investors have requested authorisation to build more reactors – the sixth, seventh and eighth – with no government subsidies, because no EU Member State subsidises the nuclear power sector. Another statement by Żmijewski is far from the truth, namely, that financial studies for nuclear power plant construction fail to reflect the true cost of 'reactor dismantling and cool-down, and protection of radioactive material for the period of transportation and storage'. The example of France, a nuclear world power, shows that the company dealing with dismantling the nuclear power plant and radioactive waste utilisation is fully independent from the operator of the nuclear power plant.

While functioning in accordance with rigorous security procedures, the company requests fees sufficient to cover all costs. And nuclear power plants do pay. They pay not only for waste management, but also for a nuclear power plant 'shutdown fund'. Nuclear power plants also pay high taxes to local districts; for example, the nuclear power plant in Flammanville (in operation since 1986, with a new block containing a modern EPR reactor now under construction) pays more than EUR 60 million annually to the local district. There is no need to convince anybody of the importance of such support for the region,

new jobs in the nuclear power plant, and lots of work for local companies. Despite such huge costs, electricity generated in French nuclear power plants is among the cheapest in Europe! According to Żmijewski, development of nuclear power will not affect the level of emissions from Polish electric power plants in 2013 and the next few years. However, the problem of reducing CO₂ emissions extends beyond 2013 and even beyond 2020. In accordance with the draft Energy and Climate Package, enterprises covered by the Emission Trading Scheme will have to lower CO₂ emissions by 21% from 2005 levels, by 2020.

First of all, this concerns the energy sector. Further, Poland will have to adopt even stricter reductions of CO₂ emissions. Therefore, it is necessary to think about the future of the Polish economy today, if Poland is to remain competitive on the world market for goods and services. Its development and condition are closely connected with a growing demand for electricity. In this context the nuclear power sector cannot be treated as unnecessary, as the title of the article suggest. Nuclear power is a potential element of the country's energy security system. The atom is simply profitable. The article by Prof. Steve Thomas is full of inaccuracies. He states, for example: 'In the West, so far only two nuclear power plants have been ordered in accordance with the latest designs, and ... in France no work has been started yet.' First, work related to construction of a new EPR reactor in Flamanville, France, is highly advanced.

After a long preparatory period, the first concrete was poured for the technical buildings on 3 December 2007. The same day was also entered in the International Atomic Energy Agency's register as the official start of the investment. Second, with respect to contracts in the West for nuclear power plants in accordance with the latest designs, apart from investments in Finland and France, in the US, Westinghouse's contracts with South Carolina Electric & Gas for construction of two AP1000 reactors at Summer nuclear power plant in Jenkinsville, South Carolina, and two reactors of the same type at the Alvin W. Vogtle plant, near Waynesboro, Georgia, should also be mentioned. Thomas criticises the competitiveness of nuclear power plants and tries to convince readers that they are a bad idea. Naturally he has a right to express his opinion, but he misleads readers when he writes that 'due to such high costs, British Energy declared bankruptcy in 2002'. He does not add that the problems of British Energy, which has nuclear power plant assets, were similar to those experienced by other electricity producers.

The problems resulted from a decrease in wholesale prices for electricity by 40% at the turn of the 21st century, as a result of intensive use of newly discovered layers of natural gas under the North Sea, which were used to produce electricity in the UK. Cheap natural gas meant financial losses for the whole British energy sector, except for gas power plants. Today the British gas under the North Sea is about to run out, and Britain is again thinking about building new nuclear power plants. According to Thomas, the basic stumbling block for growth of the nuclear power sector is that nuclear power 'from the economic point of view is simply too expensive and poses too much risk'.

Objective data from international energy institutions, including the OECD, say otherwise. According to data from 2005, the average cost of producing electricity, excluding the costs of reducing CO₂ emissions or buying CO₂ emission permits, is USD 30-50/MWh for a nuclear power plant, USD 35-65/MWh for a coal power plant, and USD 40-63/MWh for a gas power plant. Including CO₂ emission costs improves the competitiveness of nuclear power plants by 50-100%, depending on the technology used for comparison.

Despite apparent approval for electricity from renewable sources, it is expensive. Even the wind, which blows for free, can produce energy at a cost that is twice that of nuclear power plants, mainly because it is an irregular natural phenomenon. The owners and operators of wind farms recoup surplus costs in various ways, e.g. through government tax breaks, subsidies, preferential credit, bank guarantees, and in Poland through 'green certificates.' Subsequently, the costs of such bonuses are passed on to electricity users and included in energy prices.

This way all of us pay for 'green' energy. It is our contribution as citizens to the development of renewable energy sources. Electricity generated by nuclear power plants is a product that protects their market position on well-organised markets all over the world. In some countries nuclear power plants even have to support the development of renewable energy sources. For example in Sweden nuclear power plants pay SEK 55 per MWh of electricity. The funds thus collected are allocated by the government to the development of the windmill power sector.

Although nuclear power plants in Sweden are charged additional costs, their operation is still so profitable that the amount of energy projected to be produced there is going to grow. Swedish nuclear power plants operate on the Scandinavian electric power market, which is one of the best-organised in the world. According to a public opinion poll conducted by Synovate and published on 14 December 2007, 77% of Swedes support the operation of nuclear power plants. Poland needs nuclear power. It is a rational answer to the needs of electricity consumers under the present and future conditions of the Polish economy.

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