Q&A: Poland’s Progress on the Road to New Nuclear

NucNet

Conflicting reports have emerged from Poland about plans for its first reactors, but Professor Grzegorz Wrochna of the Polish National Centre for Nuclear Research says the programme is on track and a business model is expected soon.

NucNet: There have been various media reports in Poland about the country’s nuclear new-build project, with some saying it has been postponed. Could you tell us more about the current project status?

Grzegorz Wrochna: If you depend on the media you will get a confused picture. The situation is rather straightforward. There is a delay. PGE EJ1, the company responsible for building the first nuclear plant in Poland, announced that a tender would be started in December 2015, but this has not happened. Based on this delay, some media has speculated that the programme is on hold, but that is not true. It is just the tendering procedure which has been suspended while all the other work – site surveys, preparation of the nuclear regulatory body, changing the nuclear law – is all going ahead and going well.

The programme prepared by the previous government [in office from November 2011 until October 2015] is still valid. The cabinet accepted this programme, but asked the ministry of energy to present a new schedule and business model by spring 2017. So I hope soon we will have a plan ready to be shown to the government by the minister of energy.

NucNet: Have any of the conditions for the nuclear programme changed?

Grzegorz Wrochna: The global economic situation has changed. When the previous government prepared the nuclear programme, it was difficult to get financing for this kind of investment. Therefore, the condition was that the tender should concern all elements, including reactor design, construction, the first few years of operation, fuel and, finally, financing, which was the most important part. The organisations pitching for the contract would be asked to present everything, including the financing.

Now conditions are different. The cost of borrowing money has decreased and it is easier to find loans at low interest rates. The new government decided to split the tender into a technical part and a financial part, each to be considered separately. The detailed model has not been decided, but this, most probably, will be the new direction.

NucNet: What about the schedule?

Grzegorz Wrochna: The original plan assumed the project would take 10 years from the investment decision to the actual operation of the first reactor. This was based on International Atomic Energy Agency (IAEA) documents, which were in turn based on the experience of other nuclear countries.

Many countries have managed to build nuclear power units in 10 years. In Poland, it turned out to be impossible under existing Polish laws, which did not allow many of the regulatory processes to run in parallel to each other. In other words, to get each consecutive decision, we first needed to get feedback from authorities on previous decisions. When PGE EJ1 and the NCBJ (Polish National Centre for Nuclear Research) recalculated the schedule, it turned out that Poland would need 16 years to have its nuclear programme operational, six years longer than originally anticipated. The media took this as a delay, but rather it was just a ‘procedural discovery’.

We can now aim for commercial operation some time around 2028, but have to wait for the ministry of energy to officially present its schedule.

NucNet: What is the government’s vision of the country’s energy mix? What roles do coal and nuclear play?

Grzegorz Wrochna: In the not so distant past Poland was 100% independent concerning its sources of electric supply, but this was based almost entirely on coal. More than 90% of electricity was produced from coal. This has changed a little, with the increased but still limited participation of renewables and gas. Coal will continue to dominate the energy landscape for many years, because it is our domestic resource, essential for our security of supply.

But this is not enough, because we hope the Polish economy will grow along with the demand for energy. And we will not have any means other than nuclear and energy imports to meet this growing demand. If we want to maintain our energy independence, nuclear remains the only viable option. This does not mean there is competition between nuclear and coal. We do not have to choose between the two. We still need to build new coal-fired plants to replace old, inefficient ones. But the investment timeframe for coal-fired plants is a few years, while for nuclear it will be more than 10 years. Even if the government decides overnight to go for 100% nuclear, nothing will change for coal for a few decades.

NucNet: Is the introduction of nuclear energy a politised issue in Poland or is there a sense of consensus among different parties and stakeholders?

Grzegorz Wrochna: There is no consensus between the political parties. But there is a consensual understanding that our energy mix is too dependent on domestic resources. We do not have much wind or solar potential in Poland, hydro is being used but cannot be expanded much further, and we have some domestic gas, but it is far from sufficient to meet our needs. The only sufficient domestic resources are coal and then nuclear. We have no other choice.

NucNet: How does the Polish public see the new-build programme? Are there concerns about safety?

Grzegorz Wrochna: Public opinion is reasonably positive about nuclear. The most recent polls showed more than 60% in favour of nuclear in Poland and, surprisingly even for us, about 48% said they would have a reactor close to their homes. People see this as an opportunity for economic prosperity.

I think we, the scientists, have done a good job telling the public about nuclear energy. The way we communicated what happened in Fukushima was very important. People are now well aware that we do not have tsunamis or earthquakes of these magnitudes in Poland.

NucNet: Poland has pledged to build four to five units with combined output of 6 GW, by the mid-2030s. Is this realistic?

Grzegorz Wrochna: The previous government’s programme calls for 6 GW in two locations. The number of reactors per site would have depended on the technology choice.

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The government recently published a strategy for responsible development which calls for the nuclear programme to be sped up. However, no capacity figures were included. The industry should not be bound by a rigid number. In time, maybe we will speak of 4 GW or 12 GW, but it will depend on market needs and financial possibilities. The first reactor will be the most challenging. I believe...
it is possible to complete this first unit by 2027-2029 and then we could go for a total of 6 GW by the early-2030s. 

**NucNet:** The Polish Nuclear Roadmap includes a plan to deploy a high-temperature gas-cooled reactor (HTR). Can you elaborate on these plans?

**Grzegorz Wrochna:** The Polish nuclear programme is in nature a light-water reactor (LWR) investment project. The Polish industry will be part of the supply chain, but not much will be gained in terms of intellectual property and technological know-how. Fundamentally, we will order existing reactor designs, pay for them and build them.

But once we have spent so much money on building a nuclear plant it might be better to spend a little bit extra and make even greater gains for the economy. We could invest in R&D, which would have lasting benefits for us.

Poland has an extensive chemical industry, which consumes a lot of heat, produced from coal or imported natural gas. If we want to become more independent, we need an alternative source of heat for industry. And it is here that high temperature reactor HTR nuclear technology could play a big part.

HTRs produce high-temperature steam at about 550 °C. We could safely and easily replace an old gas or coal-fired boiler at a chemical plant with an HTR which would produce the same amount of heat. We are talking about 6 GW, but this time in heat rather than in electricity, distributed among the same amount of heat. We are talking about 6 GW, but we could safely and easily replace an old gas or coal-fired boiler at a chemical plant with an HTR which would produce the same amount of heat. We are talking about 6 GW, but this time in heat rather than in electricity, distributed among the same amount of heat. We are talking about 6 GW, but we could safely and easily replace an old gas or coal-fired boiler at a chemical plant with an HTR which would produce the same amount of heat. We are talking about 6 GW, but this time in heat rather than in electricity, distributed among the same amount of heat. 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The HTR programme is also mentioned in government policy. Last year the ministry of energy established a committee for HTR deployment. That committee is preparing an intermediate report and this year we are planning to establish a company to start designing an HTR, based on international experience. Preparation for the first demonstrator will be supported by the Gemini+ initiative, which is being funded by Euratom. Within the framework of the € 4 million project, NCBJ scientists will be co-ordinating international preliminary works aimed at implementing HTRs. This could eventually help the first European HTR become a reality in Poland.

**NucNet:** Finally, what are the challenges and risks for the new-build programme?

**Grzegorz Wrochna:** The biggest risks do not come from cancellation or public opinion. They come from delays. In Europe, all major investments, power stations and other infrastructure, experience cost overruns and take longer than expected. In the past, the designs were several thousand pages long and the investment agreements a few pages. Today it is the opposite – designs are general and often standardised, while investment agreements have become long and cumbersome. Nuclear is no exception. This is a malaise that has affected all major investments in Europe. I hope the time spent preparing the nuclear programme in Poland will help avoid delays.