



Nuclear Power in Central Europe

a regional overview

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Introduction

Nuclear power has always had a strong position in Central Europe. The technique was seen as front-line engineering, giving it a heroic status under socialist development. Much of the nuclear lobby in Central Europe still has its roots in the Moscow- (or rather Obninsk- – the nuclear university near Moscow) driven nuclear networks. In this paper we will look at the status of nuclear power in the region stretching from the Baltic States to Bulgaria. It will address the situation in order of urgency concerning nuclear debates: Bulgaria, Slovakia, Hungary, Romania, the Baltics, Poland, the Czech Republic, Slovenia, Serbia, Macedonia, Croatia, Albania and Montenegro. I will not dwell on Eastern Europe. There are strengthening plans in Ukraine and Russia for a large amount of new nuclear power stations, and even Belarus put nuclear power in its energy plan. But the political, social and economic dynamics in that region are different than in the regions part of or moving towards the European Union. I will also not discuss nuclear research reactors.

This paper is not meant to discuss nuclear power in detail. It is meant to give a concise overview of the situation in the mentioned countries.

Recent developments on global level have been used by the nuclear lobby to give a new push to a technology that many already had thought with one leg in the grave. In spite of all the plans – also the ones described here – and in spite of all the PR talk about a nuclear renaissance, nuclear power still is a slowly dying technology, with more reactors going to be closed in the coming two decades than there will be opened.¹ Its safety problems have only been addressed partially and even the most modern reactor designs under construction, like the EPR in Finland, cannot promise full proof and fool-proof safety.² Even an EPR can deliver Chernobyl-like consequences. The chances may be small, but the consequences of Chernobyl should not be forgotten. Now 20 years after that catastrophe, it is estimated that between 10.000 and 100.000 people will die of Chernobyl-related causes.³ Greenpeace last April brought contaminated soil from a forest and a village 50 km away from the reactor in freely accessible areas into the offices of the International Atomic Energy Agency. The radioactivity of the soil was up to 25 times the limit of low radioactive waste in the EU. In the IAEA office precautions like a vessel with 20 cm concrete and 1 cm lead, as well as a 1 meter safety zone were needed to protect the public from the radiation. In Ukraine, this is the ground that people live on.⁴ The question of nuclear risk is not about the chance, not even about chance times extend – it is a qualitative question whether we want to run any risk with

1 Mycle Schneider, & Antony Froggatt, *The World Nuclear Industry Status Report 2004*, Brussels (2004), the Greens-EFA Group in the European Parliament,

http://www.greens-efa.org/cms/topics/dokbin/102/102943.the_world_nuclear_industry_status_report@en.pdf

2 Helmut Hirsch, Oda Becker, Mycle Schneider, Antony Froggatt, *Nuclear Reactor Hazards: ongoing dangers of operating nuclear reactors*, Amsterdam (2005), Greenpeace International,

<http://www.greenpeace.org/international/press/reports/nuclearreactorhazards>

3 Greenpeace (editor), *The Chernobyl Catastrophe - Consequences on Human Health*, Amsterdam (2006), Greenpeace International,

<http://www.greenpeace.org/international/press/reports/chernobylhealthreport>

4 Greenpeace, *Chernobyl sampling operation briefing (October 2005)*, Amsterdam (2006), Greenpeace International,

<http://www.greenpeace.org/international/press/reports/chernobyl-sampling-operation-b>

such large consequences. Nuclear accidents are not only a story of bad outdated Russian designs (though there are still power stations of that design operating in Russia and Lithuania!). Central Europe faces almost every year an incident that scores 2 of 7 on the INES scale. At a certain moment it could become 3 (where radioactivity is released into the environment) or more.

Nuclear power is at the moment pushed as an answer on climate change. We in Greenpeace have given this idea serious attention and found that nuclear power cannot deliver. For a decrease of CO₂ emission of only several percents, the amount of nuclear power stations would have to be tripled. In that case, available uranium stocks would survive one generation of power plants, most of which would come on-line after 2030 – which is far too late, there would be enormous amounts of CO₂ emitting fossil fuels needed to boost power station building, uranium mining and processing capacities, and the costs would far outweigh the costs for other alternatives like energy efficiency and the development of renewable energy sources like sun, wind, water and biomass.

Nuclear power is also pushed forward as solution to energy security. After Russia closed the tap on gas for Ukraine (and harmed the flow to Poland, Hungary, Slovakia and further), countries search for more independence in their energy sources. Nuclear power, however, is not going to give that independence. Nuclear technology is advanced technology in the hands of a small amount of companies and countries. Uranium is only available in larger amounts in a very small amount of countries. And especially the reactor types that seem to be affordable for Central European countries are Russian built and Russian fueled. Real energy security comes from energy efficiency and renewable resources. The wind in Poland is Polish, the biomass that can be grown on the plains of North Bulgaria is Bulgarian, the sun that shines on Romania is Romanian. Energy Security = Renewable!

Remain the continuing problems that the nuclear industry is faced with:

There is no solution for nuclear waste and reducing the risk that the highly radioactive waste might leak into the environment in the coming 100.000 or so years is a question that seems to be unanswerable. The only ongoing project for long term storage in the Yucca Mountains in the USA is stalled indefinitely, all other projects, including an often mentioned one in Finland, are only in a study phase. We continue to produce dangerous nuclear waste without knowing what to do with it. Nuclear power is extremely expensive and puts a large financial burden on the countries dealing with it. Slovakia, Hungary and the Czech Republic already face shortages for their decommissioning and nuclear waste funds that run in the Hundreds of Millions of Euro's. A problem that the UK lately had to face by pumping in 23 Billion Euro of state aid into its nuclear industry to prevent it from going bankrupt. New nuclear power stations appear only feasible with either government incentives or loan guarantees – a practice that is under EU law not admissible for any grown-up energy industry.

And then there is the risk of terrorist attack. Each nuclear power station – and especially designs like the VVER 440 operated in many Central European countries, but also the most modern EPR¹ – is vulnerable to terrorism. Whether you think of people taking over the operator room with help of people within (two years ago a Romanian worker was arrested in the attempt to smuggle a machine gun into the Cernavoda NPP on order of unknown people), or an attack from outside on exposed operator rooms and electricity supplies, or an attack in the form of a hijacked passenger airplane as on 9/11, nuclear power stations and nuclear waste storages form an unacceptable risk for the public.

Greenpeace has not judged lightly over nuclear power. But nuclear power cannot deliver its promise of clean and cheap energy. In contrary, it is expensive, risky, anti-democratic, but above all, it is not necessary. Recent studies have shown that we can phase out nuclear power in Europe before 2025, and reach a goal of 70% CO₂ emission reduction in 2050 relying on a policy of decentralising our energy infrastructure, developing renewable energy sources and putting more efforts into energy efficiency.²

1 Large and Associates, *Assessment of the operational risks and hazards of the EPR when subject to aircraft crash*, Amsterdam (2006), Greenpeace International,

<http://www.greenpeace.org/international/press/reports/assessment-of-the-operational>

2 Sven Teske / Greenpeace, *Energy Revolution: a sustainable pathway to a clean energy future for Europe*, (2005)

<http://www.greenpeace.org/international/press/reports/energy-revolution-a-sustainable>

Bulgaria

Operating nuclear power plants: There are six nuclear reactors for electricity production in Bulgaria, all situated near the town of Kozloduy on the shores of the Danube. Two of these reactors of the type VVER 440/230 have been closed in 2002 and await dismantling, two more will be closed on 31 December 2006. This is done in cooperation with the European Union, because this type of reactor could not be upgraded to a satisfactory safety level. Two more VVER 1000/320 reactors will continue to operate in Kozloduy. Reactor block 5 had this year on March 1st an INES 2 incident, when 22 out of 61 control rods failed to fall into the reactor. A former Kozloduy director and at present researcher at the Institute for Risk Analysis in Vienna compared it to driving a train full speed without safety breaks.

Planned power plants: Bulgaria is planning to finish a project for two nuclear reactors near the town of Belene, around 150 km downstream the Danube from Kozloduy. Belene is situated in a seismic active area and for financial reasons, the Bulgarian government would like to see Russian reactor types built that either would never receive permission in Western Europe (e.g. the VVER 1000/320) or have not been licenced before in Europe (a VVER 1000/466). Bulgaria is to choose types and builder any moment while I am writing this paper.

Main nuclear debates: The closure of Kozloduy blocks 3 and 4 returns regularly in debates, but it is in practice an uncontested issue. For popularity reasons politicians raise the issue of keeping these two blocks open longer, but there is no chance that the EU would accept that. The Belene project is still hotly debated, especially on international level. Bulgaria has problems in convincing banks to finance the project and environmental groups are arguing that it is a bad investment. Especially because Bulgaria is the most energy inefficient country in Europe – even worse than Russia, and has not even started to develop its wealth of renewable energy sources. Bulgaria is currently looking for sites for nuclear waste storage. Most of the discussed places are heavily opposed. Recently, the Bulgarian government also started discussions to re-open uranium mining in Bulgaria, which could have heavy consequences for watersheds running towards Greece.

Slovakia

Operating nuclear power plants: Slovakia has one closed nuclear power station near the town of Jaslavské Bohunice. The A1 reactor was closed in 1977 after two serious accidents. Two more reactors of the VVER 440/230 type, the Bohunice V1 block, will be closed down in 2006 and 2008 respectively. The newer VVER 440/213 type reactors in Bohunice block V2 will continue to operate, as well as the two VVER 440/213 reactors in Mochovce.

Planned power plants: Slovakia is putting pressure on operator ENEL which recently bought the privatised state utility Slovenske elektrárne (SE), to finish two blocks VVER 440/213 in Mochovce from which the building was stopped in 1992. ENEL works now on a feasibility study and it is already clear that it is not economically viable to build entire new NPPs – only finishing the existing structures is now under investigation. ENEL would like to get government guarantees for the financing, but environmental groups like Greenpeace have already pointed out that that is against EU free market regulations. The decision about Mochovce is expected in April or May 2007.

Main nuclear debates: Closure of Bohunice V1 is like with Bulgaria's Kozloduy 3 and 4 a recurring political debate with little practical consequence. Re-opening this discussion would need a unanimous support from the old EU 15 because the EU Accession Treaty of Slovakia would have to be re-opened. Several EU countries already have made clear that they will not support such a re-opening. Slovakia also looks at re-opening its uranium mines. Around the furthest developed project in Jahodná near Kosice heavy opposition arose over the last year. This includes opposition in downstream Hungary.

Hungary

Operating nuclear power plants: Hungary has one location with four VVER 440/213 blocks: the Paks NPP. At present there is a fierce debate around plant life time extension (PLEX) of these four blocks. VVER 440 reactors have no containment and the operator rooms are situated in an unprotected position. Therefore amongst others Greenpeace, Energia Klub and the Austrian state argue that these NPPs should rather be closed after having fulfilled their planned life-time. At present an Environmental Impact Assessment (EIA) is nearing its closing phase on this project. Paks block 2 suffered an INES 2 incident in 2004, when during a cleaning operation of fuel rods, because of a lack of cooling several rods broke and released part of their radioactive fuel in the cooling pond. In the coming weeks, a clean-up operation is starting that can be counted as one of the most complicated and risky operations in the history of nuclear power in Central Europe.

Planned power plants: In its energy plan, the Hungarian government mentions it would like to see new nuclear power development in Paks after the year 2020.

Main nuclear debates: In 2004, the Hungarian government signed a few days before EU entry a declaration of intend with the Russian government for the delivery of spent nuclear fuel from Paks to Russia. This project seems to have been abandoned after initial protests from environmentalists against the risks of such transports. The PLEX of the Paks reactors is a still ongoing debate, as well as the clean-up of Paks 2. Hungary furthermore is looking for a long term storage site for highly radioactive waste and has mentioned several sites, amongst which one, in Boda, is starting to create local opposition.

Romania

Operating nuclear power plants: Romania has one NPP operating in Cernavoda. Initially five reactors of the Canadian built CANDU 6 type were projected there.

Planned power plants: Romania is at present finishing tests of the 2nd reactor at Cernavoda. Also this is a CANDU 6 type reactor. The building is already years over time and loading of fuel is now expected somewhere at the end of this year or start of the next year – about a year later than still announced only one year ago. Next to that, Romania is planning to start procedures for finishing reactors number 3 and 4 in Cernavoda. It is currently looking for possible financing mechanisms.

Main nuclear debates: Nuclear power is little debated in Romania. There is stiff opposition against the Bulgarian Belene project, certainly in the provinces bordering to the Danube, but many people see the own NPPs as different. Still, the Canadian type reactors have also a history of problems and their own risks, a fact that is little known in Romanian society. The most important debate is around the necessity of Cernavoda 3 and 4. Romania wants to finish these reactors with an eye on the international electricity market and is hoping to be able to export electricity to Western Europe. Romania has a lot of hydro energy, but the discussion about energy efficiency or other renewable energy sources is only in a starting phase.

The Baltic States

Operating nuclear power plants: Lithuania has two Chernobyl type RBMK reactors in Ignalina. Under an agreement with the EU, these reactors will be closed in 2007 and 2009 respectively because they are deemed too unsafe.

Planned power plants: Lithuania is presently searching for support from the other Baltic countries and Poland for a new NPP in Ignalina. It looks at present most strongly to the French EPR design.

Main nuclear debates: The Baltic States are very scared for their dependency on Russia. This seems to be the major factor behind the drive for new nuclear. That they have a huge potential for renewable energy sources like wind and biomass and for energy efficiency gets a lot of attention in Latvia but less in Estonia (traditionally looking at pro-nuclear Finland) and Lithuania (struggling with what to do with its mainly Russian minority group of soon to be ex-Ignalina NPP employees).

Poland

Operating nuclear power plants: None. Poland stopped its only construction of an NPP after the Chernobyl catastrophe.

Planned power plants: In its national energy plan, the Polish government has taken up one NPP to be ready in 2022. Voices in the current government would like to speed up that process.

Main nuclear debates: The Polish population is traditionally strongly opposed against nuclear power. Poland suffered also from the Chernobyl catastrophe and a majority of the population would not like to see Poland choosing the nuclear pathway. Energy security, however, has given the small nuclear lobby in Poland an argument to put the issue on the political agenda. Next to this, there is a strong debate about nuclear fuel transports over Polish soil (or rather, rail) for the Czech Temelín NPP.

Czech Republic

Operating nuclear power plants: There are in total 6 NPPs operating in the Czech Republic. Four VVER 440/213 reactors are situated near the village of Dukovany in South Moravia and two VVER 1000/320 reactors were opened in the early 2000s near the village of Temelín in South Bohemia.

Planned power plants: The Czech government's energy plan foresees another 2 NPPs to be built most probably near Temelín around 2020. Czech utility CEZ wants to start investigations into that possibility somewhere in 2007.

Main nuclear debates: The Temelín NPP is an ongoing debate. The reactor is a thorn in the eye of neighbouring Austria and suffers many smaller incidents that each time revigourate the discussion. Greenpeace documented faulty welding work directly on the reactor vessel of block 1, and although the authorities so far successfully have been able to wipe that under the carpet by intimidation and manipulations of the legal system, the discussion keeps resurfacing. Next to this, there is a hot debate around possible sites for storage of highly radioactive waste, with a strong majority of the population around proposed sites opposing. The discussion about further expansion of the Czech nuclear programme is in a starting phase, with the entrance of the Green Party in parliament after the last elections postponing discussions for the moment.

Slovenia

Operating nuclear power plants: Slovenia operates one Westinghouse BWR (Boiling Water Reactor – a similar type as the Russian VVER) in Krsko. This was part of a deal between Croatia and Slovenia during the time that Yugoslavia was still existing, in which one NPP would be built in Slovenia and one in Croatia and both would be owned in a joint venture of both countries. Only Krsko was eventually built and when Yugoslavia broke up, both Croatia and Slovenia remained owner of this plant.

Planned power plants: The Slovenian parliament has several times voted in favour for full implementation of the nuclear agreement with Croatia, but Croatia is strongly anti-nuclear and

there is no real chance that that it will ever accept an NPP on its soil. As alternative, Slovenia now mentions a new reactor in its energy plan, most likely also to be situated in Krsko and to be built in the second half of the next decenium.

Main nuclear debates: There is some initial debate about a new NPP in Slovenia. Next to this there is an ongoing debate about possible storage of nuclear waste, which triggered a lot of emotion in neighbouring anti-nuclear Austria when sites were mentioned near to the Austrian border.

Serbia

Planned power plants: The Serbian government has mentioned the possibility of a nuclear power plant in its energy plan.

Macedonia

Main nuclear debates: Nuclear power is a completely new issue for Macedonia. Recently possible participation in the Bulgarian Belene NPP stirred some discussion, followed by interest by Macedonians to participate in the Environmental Impact Assessment of Belene, as a large accident in that power plant could also have consequences for Macedonia.

Croatia

Croatia counts to the anti-nuclear countries. The debate in Slovenia about a possible NPP in Croatia does not get much support in Croatia itself.

Albenia and Montenegro

In these two countries, nuclear power is no issue.

EPILOGUE

Nuclear power is an issue that cannot be seen apart from the issue of energy policy in general. Energy policy is no longer a national issue, but a regional one. Especially concerning electricity. Central Europe is to be seen and treated increasingly as one market. Greenpeace has concluded that a phase out of nuclear power is needed as soon as possible. Central Europe, as a region, offers an incredible potential of increase of energy efficiency. Also the development of renewable energy sources is only starting. The largest barrier against a progressive and future oriented energy policy seems to come from the centralised orientation of the energy expert elite in these former socialist countries. Still, we do not have much choice. Climate change forces us to think in a different way. If we are to keep temperature rise globally under 2° C, we in Europe will have to reduce CO₂ emissions with around 70% in 2050. If we continue longer with centralised structures – under pressure of the black (coal) and the nuclear lobbies, we still will have to change rigorously within a few decades anyway. And the longer it takes to go from the wasteful centralised energy system we know now to an efficient and renewable energy based system that we will need in the second half of this century, the more difficult and harmful it will be for our economies.

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