

Russia and the Nuclear Industry

Journal Issue**Author(s):**

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Publication date:

2011-08-01

Permanent link:

<https://doi.org/10.3929/ethz-a-006844272>

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Originally published in:

Russian Analytical Digest (RAD) 101



RUSSIA AND THE NUCLEAR INDUSTRY

■ ANALYSIS	
Russia and Fukushima	2
By Vladimir Sliviyak, Moscow	
■ ANALYSIS	
The Russian Anti-Nuclear Movement	6
By Alisa Nikulina, Moscow	
■ STATISTICS	
Nuclear Energy in Russia	9
■ OPINION POLL	
Russian Attitudes on Nuclear Energy	11

Russia and Fukushima

By Vladimir Sliviyak, Moscow

Summary

Since the accident in Japan's Fukushima power station, Russian officials have consistently reassured the public that Russian nuclear plants are safe. One reason for this position is Russia's desire to export nuclear power technology. The events in Japan might have a detrimental effect on Russian exports. However, the nuclear industry is also experiencing severe problems on the domestic front. According to reports by the "Ekoza-shchita!" (EcoDefense!) environmental group, Russian nuclear plants have numerous defects. The security situation will not improve as long as the presidential administration and the government continue to try and convince the world that there are no problems in Russia's nuclear power stations.

Fukushima in Russia?

In March this year, the nuclear power plant in Japan's Fukushima prefecture experienced a disaster that is still underway at the time of writing. While the earthquake failed to destroy the reactors and the cooling pond containing spent fuel rods, the energy supply was damaged to such an extent that the plant was cut off from external power and the cooling systems broke down. The nuclear disaster that followed was due to the lack of energy supply to the reactors. These are the facts of the matter that must be taken into consideration when dealing with the question of whether the Japanese scenario could repeat itself even in the absence of a similarly strong earthquake. If one assumes that security systems depending on an external power supply might fail, a contingency might arise in any nuclear plant—including a Russian one.

All of Russia's nuclear power plants are in proximity to cities with populations ranging from at least several tens of thousands to several hundreds of thousands of residents. These people would need to be evacuated. At issue here is not a hypothetical scenario, but very real points of fact: In 1993, a storm damaged power lines on the Kola Peninsula, the backup diesel generators of a nuclear power station failed to start, and the plant was on the brink of a disaster that could have reached the proportions of a second Chernobyl. In 2000, a disruption of the power grid caused a shutdown of the reactors in the Mayak industrial complex in the Chelyabinsk region as well as of the Beloyarsk nuclear plant 60km from Yekaterinburg. In both cases, a scenario similar to that currently seen in Japan's Fukushima Daiichi plant was only narrowly avoided.

Russia's Nuclear Discourse

In view of the Fukushima disaster, the situation in Russia appears increasingly ominous, as it closely resembles that in Japan. Until March this year, in Russia as well as in Japan, debates over the "insecurity" of nuclear power plants were perceived as a breach of etiquette. Sev-

eral times a year, leading government officials together with Rosatom chief Sergei Kiriyenko demonstrated their complete support for nuclear energy as one of Russia's safest, most economical, and most ecological technologies, which is also available for sale to other countries. The same reassurances are still heard today.

However, the reality is much more grim than political speechwriters would have one believe. Of Russia's 32 reactors, 22 are old and insecure. They are either at the end of the 30-year lifespan envisaged by their planners or have already exceeded it. Much like Japan, Russia wants to use these reactor blocks beyond the 30-year limit. The usage period is to be extended by 15 years—without consulting ecological surveys, as required by law. One would not hope to see a repeat of the Japanese events in Russia, but it seems that the chances of such a recurrence are increasing.

Notice of Defects for Russia's Nuclear Industry

The Russian nuclear industry, however, has already recovered from the shock of Fukushima. It went onto the offensive by announcing projects for new and highly secure reactors that are able to withstand any earthquake. The reality is different, however. In 2009 alone (the last year for which the records of the *Rostekhnadzor* watchdog agency are available), inspectors noted 491 violations of safety codes and laws in the structures charged with project planning and construction of nuclear power installations. Some companies were threatened with revocation of their licenses due to quality deficiencies in production. While all of the nuclear industry's projects appear to be safe on paper, the de facto situation is that safety begins not on paper but with the very real defects of material as well as human failures, which cannot be ruled out. It is also worth remembering that the Russian nuclear industry was issued with more than 3,000 notices of defects concerning assets delivered in the construction of the Tynvan nuclear power plant in China.

Russia's nuclear industry experiences no pressure that might force the operators to enhance safety. On the contrary, the full support extended by the prime minister and the president to the nuclear industry only enhances the complacency in the sector: If politicians are completely on the side of Rosatom, there is no reason for concern. There may be disagreements over which reactors are safer than others, or as to whether their construction in earthquake zones should be permitted, but it is patently obvious that the situation in Russia is the worst of all possible worlds in terms of nuclear safety.

New Construction and Marketing of Nuclear Power Plants

Rosatom is pursuing at least three projects in zones at risk of earthquakes—in Bulgaria, in Turkey, and in Armenia. There is also a project for a floating power station that is scheduled to be delivered next year to Kamchatka, in proximity to the tsunami zone. Not one of these schemes has so far been reconsidered. Instead, assurances are issued that all is completely safe. The Japanese heard the same assurances for decades and believed that their nuclear plants were designed to withstand earthquakes and tsunamis—as well as airplane crashes and all other manner of events.

Regarding the new VVER-1200 reactors that Rosatom wants to export to other countries, including EU members, it is claimed that construction problems are non-existent. In case of a disruption of the power supply to such a reactor, however, or if the heat removal should be severely affected (e.g., as a result of a disruption in the first cooling circuit), these reactors might also experience a major accident. However, Rosatom cannot discuss the shortcomings of the new reactor type, since that would mean a moratorium on all sales efforts. On the other hand, refining the reactor would be expensive and lead to a complete loss of return on investment.

Even before the Fukushima incidents, the cost of new reactors had reached high levels: while the average cost of a 1,000-MW block in the 1990s was about US\$1 billion, the asking price for Rosatom's VVER-1200 today is around US\$3–5 billion—depending on the geographic characteristics of the project and certain foreign-policy criteria. This price is close to that of the French EPR reactor, but still slightly below it. Nevertheless, expensive though the Russian reactors may be, even completely insolvent customers can still afford them these days, as sales are almost always accompanied by loans from Russia's national budget. This tradition of the seller financing exports of nuclear plants is a comparatively old one. In 2000, ahead of the G8 summit, a special report on export credits offered by developed countries in the area of nuclear energy described

the system of loans in support of reactor exports. At the time, the sum of all such “assistance” from Russia was about US\$5 billion. According to extremely conservative estimates, it is six to eight times as high today. Turkey alone has been promised a power plant at a cost of around US\$20 billion (fully financed by the Russian taxpayer). With all these loans, the conditions for purchasers of the reactors are extremely favorable—including very vague securities for funds whose repayment is deferred for decades to come.

The Development of Nuclear Energy in Russia

As far as the development program for nuclear energy in Russia itself is concerned, there are plans for construction of 20 to 40 new reactors, according to various sources. However, the real-world capabilities of the engineering sector currently only allow completion of one reactor complex a year, which makes it difficult to see how Rosatom can complete this ambitious plan. The question already arose last year when the comptroller's office, having audited the Energy Ministry, announced that 60 per cent of the reactors scheduled to go online by 2015 would not be started up until a later date (which was not specified). At the beginning of this year, Deputy Prime Minister Igor Sechin announced a reduction of funding for Rosatom's investment program. The reason is not, of course, that the Russian government has decided to stop subsidizing the nuclear industry. The problem was rather that the stated deadlines for plant construction inside and outside of Russia could not be met. Nevertheless, nobody intends to withdraw from the comprehensive nuclear planning schedule at this point—at issue is merely a delay, albeit quite a long one.

How is the program financed in Russia? The lion's share is paid from the state budget. Beyond this, Rosatom is to make use of private investors, who are to contribute a considerable part of the funding. Another source is the profit generated by state-owned companies. In 2009, for instance, Kirienko announced that the Baltic nuclear plant currently under construction in the Kaliningrad region, which is designed to export power to the EU, is being built on Rosatom's account and will not receive additional funding from the state budget. In effect, however, it will be subsidized—albeit not in the shape of a lump sum being allocated to the project, but by way of grants to various companies participating in its construction. There is, by the way, one basic factor that could cause the project to fail: a refusal on the part of the European countries to purchase electricity from this power plant. There is no shortage of power in the immediate Kaliningrad area, and even if power consumption were to increase, demand could be met from

non-nuclear sources. The energy generated would thus only be required for export. Therefore, should it transpire that nobody is interested in purchasing electricity, the project would almost certainly be stopped.

Export Problems Post-Fukushima

After Fukushima, Rosatom's prospects of raising private investment dropped to zero. It is very likely that the state company will lose a number of contracts, irrespective of the strong political support extended by the government and the president. At this point, Bulgaria has imposed a three-month moratorium on negotiations with Rosatom over construction of the Belene power plant, pending a review of the project by the HSBC bank. Continuation of this project suddenly seems very unlikely. However, even before the events in Japan, European investors actively boycotted the project: Belene is situated in a seismically active zone that was severely affected by an earthquake in 1977. Since 2008, 13 major banks have refused to issue loans for the project; the last of these was the French BNP Paribas, which is generally quite positively inclined towards the nuclear industry. In order to win contracts with third states, Rosatom is of course trying to convince the world that the new Russian reactors are able to withstand any earthquake. But is this claim based on anything else than purely commercial interests?

The project in Turkey is situated in a seismic zone that is no less dangerous than the Bulgarian one. On the one hand, Turkish Prime Minister Recep Tayyip Erdogan, prompted by his Russian counterpart, has voiced support for Rosatom. However, one would be seriously mistaken to believe that the fate of this project has already been decided. For the past 30 years, public resistance in Turkey has managed to prevent governments from beginning work on even a single nuclear plant. Furthermore, another nuclear plant in a seismically dangerous zone is being planned in neighboring Armenia. It is unclear so far whether the plans for that project will be reconsidered.

The reassessment of nuclear energy in many countries of the world creates problems not only for those plants that are planned in areas at risk of experiencing serious earthquakes. Other reversals are also to be expected. For Rosatom, this means dwindling profits and a loss of resources for the development of the industry in Russia itself. Of all the new plant projects announced, only the most lucrative ones will remain. These are mostly plants from which, owing to their planned sites being close to the EU borders, it is hoped that the Europeans can be convinced to purchase cheap energy. Much will depend on whether large volumes of nuclear power can be exported to Europe. If this is

not the case, the gradual rollback of nuclear energy in Russia itself may accelerate.

Nuclear Safety in Russia

In ten years at the latest, the share of nuclear power produced in Russian nuclear stations will decline due to the deactivation of obsolete reactors, while expenditures on these operations will grow comparatively quickly and reach a volume of several dozen billion US dollars. It will not be possible to replace the old reactors with new ones without a reduction of energy production. Furthermore, from a business point of view, it will be extremely difficult to replace the old reactors with blocks of the latest generation—especially if private investors fail to materialize. In terms of safety, therefore, the question is not which new developments the Russian nuclear industry will be able to present, but what state the currently operational reactors are in.

After Fukushima, many statements were heard in Russia to the effect that safety checks in the nuclear plants had confirmed that they were completely safe. Obviously, the government was afraid to discuss problems in order to avoid panic among Russians, who reacted quite vehemently to the events in Japan. Ultimately, however, information about the true state of the nuclear plants leaked out of government circles, revealing that matters were worse than ever.

On the eve of 9 July, when a session of the State Council met together with President Dmitry Medvedev, the *Ekozashchita!* (EcoDefense!) environmentalist group published a report that had been prepared for that meeting. Usually, such documents are not for public distribution. The information disseminated by the environmentalists was neither confirmed nor denied by the presidential administration, which preferred to remain silent. The report contains data on flaws of Russian nuclear plants revealed during stress testing:

- “The strength (stability) of construction in a majority of nuclear plants does not meet existing requirements for force levels that may occur during extreme environmental events.” In other words: Russia's nuclear reactors are not strong enough to resist various possible natural disasters—including earthquakes.
- “Not all nuclear plants have an automatic emergency shutdown for the case of an earthquake of a given intensity.” This means there is no guarantee that the mandatory security systems would function as designed in order to prevent the type of nuclear disaster that occurred in the case of Fukushima. At issue here are earthquakes of a strength predicted as likely by scientists for the plant location in question.
- “Components of several reactor blocks (e.g., in the Balakovskaya and Kalininskaya nuclear plants) dis-

play evidence of material fatigue as well as unacceptable variations in pressure and temperature, which may lead to their destruction;” also, “the inclination in the foundation slab of the building housing the container for spent fuel rods in the Kursk nuclear power plant, revealed by geodesic observations, may lead to its destruction.” Some reactors and containers for spent fuel rods in Russia could therefore self-destruct all by themselves—without any external influence of earthquakes or other environmental disasters.

- During the crisis at the Fukushima Daiichi reactor, several hydrogen gas explosions occurred, and radioactivity continues to leak to this day. The “hydrogen issue” is also discussed in the report to the Federal Council: “The control systems for monitoring hydrogen concentrations, as well as the systems and elements designed to prevent hydrogen explosions, do not meet the regulations for prevention of hydrogen explosions in nuclear power plants.” This means that while Russia has regulations designed to prevent hydrogen explosions, the existing systems in the power plants do not meet these requirements and can therefore not prevent the occurrence of hydrogen explosions.
- In a separate section, the report of the Federal Council states that “construction flaws and errors” could cause accidents in RBMK-1000 type blocks (one of which exploded in 1986 in Chernobyl). Additionally, a number of specific flaws in various reactor types were identified.
- The report also notes the absence of “effective logging of the operational practices in nuclear plants” as expressed in terms of “quality, defects, failures, and exceedance”. Therefore, the information provided by *Rostechmadzor* about irregularities in nuclear plants can by no means be regarded as comprehensive.

Conclusion

What, then, are the implications? Officials at various levels, all the way up to the prime minister, have claimed

that investigations carried out after the start of the disaster in Japan confirmed the complete reliability of Russian nuclear power stations. These statements are based on nothing but wishful thinking. There is no evidence of Russian plants being sufficiently stable to withstand forces of nature. Instead, individual reactors are in danger of self-destructing even without any impact of natural hazards or major accidents—indeed, it may only be a question of time before this happens.

Today, the situation regarding nuclear energy is worse than even the greatest pessimists could have imagined. And there is no doubt that it will become even more aggravated through the silence on the part of the presidential administration and the government, which continue to try and convince the world that there are no problems in connection with Russian nuclear plants.

On 20 June, Rosatom chief Kirienko stated that the results of the stress testing had shown the advisability of installing new technology to ensure emergency cooling of reactors and emergency power supply. The total costs of such measures are estimated to lie at around 5 billion rubles (approximately €120 million). However, such a measure in no way resolves the problem of instability in various components of Russian power plants that would be unable to withstand an earthquake. Neither would this measure have any effect concerning the lack of emergency reactor shutdown systems in case of an earthquake. It must therefore be concluded that the decisions made in Russia in the wake of the Fukushima disaster are mainly cosmetic in nature. They are by no means sufficient for enhancing the safety of reactors or resolving the existing problems with older first- and second-generation reactors. Twenty-five years after Chernobyl, Russian nuclear plants still pose a great danger to humans and the environment, yet the Russian authorities seem to believe that this is a risk worth taking in the future as well.

Translation from German: Christopher Findlay

About the Author

Vladimir Sliviyak is the co-chairman of the *Ekozashchita!* (EcoDefense) environmental group, which has been advocating against risky nuclear power projects in Russia for 20 years.

Further Reading

On the overall topic of the nuclear industry in Russia, cf.:

- Andreev, Leonid: *The Economics of the Russian Nuclear Power Industry*. Bellona Report 2011, Oslo: Bellona Foundation 2011, 61 p. http://bellona.org/filearchive/fil_Economics-of-the-Russian-Nuclear-Power-Industry-English.pdf
- Kudrik, Igor; Nikitin, Aleksandr; Digges, Charles; Bøhmer, Nils; Larin, Vladislav; Kuznetsov, Vladimir: *Russian Nuclear Industry—The Need for Reform*. Bellona Report 4, Oslo: Bellona Foundation 2004, 198 p. http://bellona.org/filearchive/fil_Bellona_2004_RedReport.pdf

The Russian Anti-Nuclear Movement

By Alisa Nikulina, Moscow

Summary

The disaster at the Chernobyl reactor gave birth to the Russian anti-nuclear movement, which managed to gain a certain degree of influence and prevented the construction of a series of nuclear power plants. The economic troubles of the 1990s led to a reduction in the number of construction projects. This deprived the anti-nuclear movement of its *raison d'être*. At the same time, it too was affected by financial difficulties, in particular the lack of donations, which continues to be an issue today. During the presidency of Vladimir Putin, the Russian nuclear industry experienced a massive resurgence—however, individual projects such as the one in Kaliningrad show that the Russian anti-nuclear movement can still play a role today.

Chernobyl as a Turning Point

The anti-nuclear movement in Russia (or, at the time, the USSR) emerged a few years after the massive nuclear disaster at Chernobyl on 26 April 1986. This catastrophe, which is regarded as the worst accident in the history of mankind, harmed millions of people and irradiated a huge territory of fertile land. Chernobyl destroyed many of the myths surrounding the nuclear industry. More information became available, and the general public became aware that nuclear energy is dangerous, as well as being *de facto* dispensable, since it can be replaced by alternative energy and technologies for enhancing energy efficiency. By 1988, a number of groups had emerged in the Soviet Union that were actively engaged against nuclear testing and the construction of nuclear plants.

The Active Phase and Successes of the Anti-Nuclear Movement, 1988–1992

During the most active phase of the anti-nuclear movement in the Soviet Union and Russia—from 1988 to 1992—over 100 nuclear projects were prevented on the territory of the Soviet Union. These were not just reactors, but also infrastructure projects linked to the planned power stations and other nuclear enterprises. This social activism succeeded in stopping nearly all of the nuclear plants under construction in Russia, either temporarily or permanently. After active protests, the planned construction of nuclear plants in Tatarstan and Bashkortostan, as well as of nuclear heating plants (*Atomnye Stantsii Teplosnabzheniya*—AST) in Gorky and Voronezh were stopped (the AST project was to generate not only energy, but also usable heat; the idea was to pipe the radioactive reactor coolant water into the surrounding residential areas for district heating). Furthermore, construction freezes were imposed on the following projects: Block 4 of the Balakovsk nuclear plant in the Saratov region; Block 4 of the plants at Beloyarsk near Yekaterinburg; Blocks 1 and 2 of the Rostov plant; Blocks 3 and 4 of the Kaliningrad plant; Block 5 of the Kursk plant; Block 1 of the South Ural plant; and Block 1 of the Kostroma plant.

The nuclear industry likes to claim that construction of nuclear plants was only stopped during the late 1980s because of the difficult economic situation and not because of the protests. In this context, the case of the Balakovsk nuclear plant is worth examining in more detail. After vociferous protests in the 1990s, the regional parliament decided to stop construction of Block 4 of this power station. However, in 1992, this reactor was connected to the grid despite all of the economic difficulties at the time. The nuclear industry *de facto* illegally completed construction of the fourth block and began operations in spite of the regional government's decision. This shows that the nuclear industry managed to find the means to build reactors even during the most adverse periods, if it really wanted to.

The Nuclear Industry's "Rollback"

In the mid-1990s, as the wave of protests subsided, construction of the Rostov nuclear plant was resumed. Today, it has two power-generating reactors. Shortly thereafter, construction continued on the Kalinin power station, even though the government's environmental expertise had returned a negative verdict. As a condition for completion of Blocks 3 and 4 of this plant in Tver' district, government inspectors demanded that an alternative water source be found to cool the reactors. However, President Vladimir Putin demanded a quick reactivation of the nuclear program, which significantly boosted the continuation of the project.

Block 5 of the Kursk nuclear plant (an RBKM model—the same as the Chernobyl reactor) was not completed, due to technical reasons linked to a lack of capacity in the power grid. In the Kostroma region, a referendum was held in 1997 in which the population voted against construction of the nuclear plant. However, more recently, Rosatom has been considering restarting the project. The same is true for the South Ural nuclear plant. The project was stopped by a referendum in the city of Chelyabinsk in 1989. Nevertheless, Rosatom is now considering a continuation of the project. Several years ago, work was restarted

on the BN-type (fast breeder) Block 4 of Beloyarsk nuclear power station. Including delays, total construction time for this reactor currently stands at 26 years.

Rosatom and Democracy

Just as in the late 1980s, many Russians today believe in inalienable fundamental principles such as freedom of speech, freedom of information, and a healthy environment. However, democracy in Russia only exists in an embryonic state, and firm guarantees of fundamental democratic principles are still a long way off. This means that it is very important at this point to keep the nascent process alive. The nuclear industry has nothing positive to contribute to this effort. Having been developed during the Cold War and in the context of the arms industry, one of the fundamental tenets of civilian nuclear energy is secrecy. The Cold War is over, and an era of transparency and risk prevention has begun. For the nuclear industry, this means, for instance, that the population must be informed about the potential dangers involved in transporting material as part of the nuclear fuel cycle. While it has been 20 years since Russia's fundamental political transformation, the nuclear industry with its idiosyncratic penchant for secretiveness has so far failed to adapt to the democratic changes. For the future of the country, this means that either the nuclear industry will survive and the fundamentals of democracy will remain a fond dream, or nuclear plants will stop threatening our future.

A good example of how nuclear energy leads to violation of human rights is the case of Captain Aleksandr Nikitin. He was arrested by the FSB for allegedly passing on secret material on the nuclear elements of the navy's Northern Fleet to foreigners. In fact, Nikitin, a retired captain of the Russian navy, was working together with a Norwegian ecologist on a report about the dangers caused by the Northern Fleet's nuclear waste. Nikitin spent about one year on remand in an FSB jail. The results of the investigation were passed on to the public prosecution service on 1 July 1998. All of the information listed in the Norwegian report on nuclear waste and processed by Nikitin had been previously published in freely accessible newspapers in various countries. Nevertheless, the FSB spent years prosecuting Nikitin for revealing state secrets. On the other hand, FSB members involved in the investigation of Nikitin violated multiple constitutional rights guaranteed by the Russian Federation on several occasions. Nikitin was made to pay for his attempt to show how egregious nuclear problems in Russia are. Fortunately, he was acquitted.

In a similar case in the late 1990s, however, the outcome was significantly worse. Grigory Pasko, a journalist with the Pacific Fleet's newspaper, was prosecuted

and indicted for distributing information on radioactive waste storage. He was sentenced to several years in prison.

The Anti-Nuclear Movement Since the 1990s

Due to economic difficulties, the environmental movement dwindled in size during the 1990s. The anti-nuclear groups were dependent on support by the population, and when that support ceased, many organizations dissolved. Since almost no new nuclear plants were built in the 1990s and the state had no funds for new construction programs, the majority of anti-nuclear groups also lost their raison d'être. This factor also contributed to the decline in numbers among the anti-nuclear grassroots movements.

Nevertheless, the environmental movement managed to mobilize hundreds of organizations throughout Russian society in 2000, when a new threat arose. The nuclear industry, struggling with liquidity problems, proposed that a new law be passed permitting the commercial import of spent nuclear fuel—the most dangerous kind of highly-toxic waste. It was claimed that this business could generate US\$20 billion within ten years. The first reading of this draft law was held at the State Duma at the end of 2000, with more than 90 per cent of lawmakers voting in favor. After hundreds of public groups had engaged in just a few months of campaigning against this legislative proposal, more than 40 per cent of Duma delegates changed their stance. Unfortunately, the law was accepted, but the opponents were only three votes short of the quorum needed to reject it. At least the environmentalists managed to secure a significant tightening of the procedure for importing nuclear waste compared to the first draft of the law. This was one of the reasons why the entire proposal for importing nuclear waste to Russia ultimately failed.

Surprisingly, despite the decline in numbers among the Russian anti-nuclear movement, the events of the year 2000 revealed that it remains strong enough to influence politics.

The Anti-Nuclear Movement Under Putin

After coming to power in 2000, Russian President Vladimir Putin immediately busied himself with the task of cutting back the influence of various groups that might have prevented the "power vertical" from extending its authority. Accordingly, he was very concerned with the influence of social movements. In the following years of his term in power, Putin promoted more stringent laws against non-governmental organizations and enhanced state control. This development dealt a serious blow to the anti-nuclear movement.

As a supporter of nuclear energy, Putin began a campaign to "re-conquer" the international market in nuclear technology in order to create a major business oppor-

tunity for the Russian nuclear industry. In 2008, the Russian government approved a plan to construct new nuclear plants in Russia. Under this scheme, between 20 and 40 new plants could be built over the following 20 years. Protests ensued in about a dozen Russian cities. A survey published on the eve of the plan's approval showed that 78 per cent of Russians opposed the construction of new plants in their region.

Despite severe pressure from the government, the anti-nuclear movement in Russia continues to be active. Between 2005 and 2009, one of the leading anti-nuclear groups, "EcoDefense!", organized a joint campaign with German environmentalists against exports of radioactive waste from a uranium factory in Gronau (North Rhine-Westphalia, Germany) to Russia. Due to this campaign, Rosatom and the Urenco company dropped their plans to transport nuclear waste to Russia. Groups from Moscow, St. Petersburg, Yekaterinburg, and Tomsk took part in the campaign. It was doubtless one of the biggest and most significant successes of the anti-nuclear movement in the 21st century. In autumn 2010, "EcoDefense!" played an important role in preventing a nuclear waste transport from the Rossendorf research reactor to Russia.

Another example was the campaign against construction of the nuclear power plant in the area of Nizhny Novgorod. According to opinion surveys, about 70 per cent of the population were opposed to the nuclear plant (the survey was conducted before the disaster in Japan). In the city of Murom, 20km from the site of the planned power plant, a local movement has been in existence for several years that has managed to delay construction of the plant. This movement was also responsible for organizing a demonstration of 5,000 people in autumn 2009—one of the largest protests against nuclear energy in Russia in the 21st century. The event was largely ignored by the Russian national media, although it was a unique event for the country. Of course, the boycott by nationwide government-controlled mass media has an effect on the development of the Russian anti-nuclear movement—it is growing a lot more slowly than would otherwise be the case.

In Kaliningrad, where Rosatom and the regional government would like to build a nuclear power plant for exporting electricity to the EU, environmentalists are trying to get a protest campaign started; however, these efforts are meeting with greater pressure from the government. According to surveys, 67 per cent of the population are opposed to the construction of the power plants. An initiative has been founded that plans to call a referendum against the nuclear plant. This group has twice submitted requests to conduct a referendum, both of which were refused. The plant is opposed not only by environmentalists of the EcoDefense! group,

which has a strong membership in this region, but also by the regional political opposition. In 2009–10, the local representatives intended to hold public hearings on the planned nuclear station in several regions of the Kaliningrad district. However, under pressure from the regional heads of Rosatom, the plans for public hearings were abandoned. Nevertheless, the opponents of the project are determined to continue their resistance.

On the Kola Peninsula, environmentalists have been protesting for several years against continued operation of the old first-generation reactors in the Kola nuclear plant. Two of the plant's four reactors have reached the end of their scheduled runtime. Nevertheless, Rosatom extended the runtime of the reactors without commissioning any environmental study, as the law would have required. In parallel, environmentalists succeeded in winning subsidies for wind power, which might replace the old power plant—two wind power projects have already been realized in this region.

Outlook

The anti-nuclear movement in Russia has good chances of once more becoming a mass movement as it was in the late 1980s. Surveys reveal that nearly 79 per cent of Russian respondents are opposed to the construction of new reactors. Between 52 and 57 percent are in favor of abolishing nuclear energy altogether, illustrating the extent of society-wide support for the anti-nuclear movement. In any case, the coming three to five years will be interesting times and may be crucial for the prospects of a Russian nuclear phaseout.

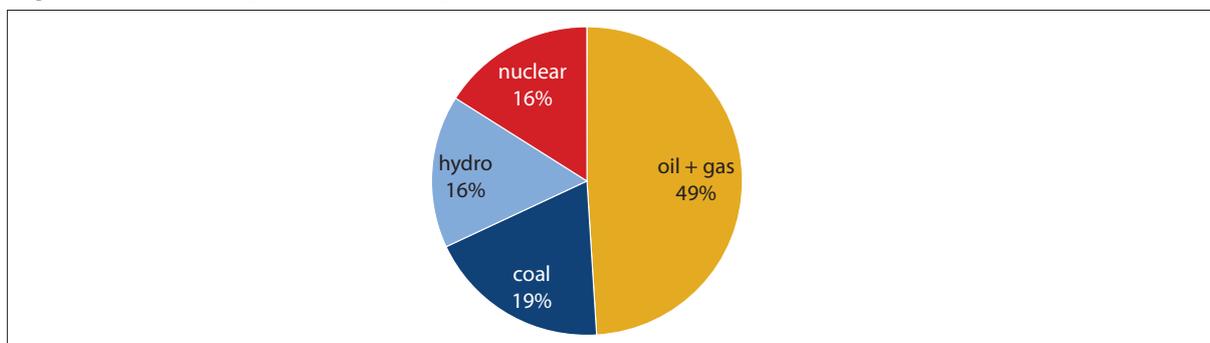
The greatest challenges for the anti-nuclear movement are the lack of funding (the general public is still unwilling to donate money to the environmentalists), the lack of resources, and the obstacles that the government creates to prevent any further development of this movement. To the extent that these problems can be resolved, and in particular if better access to funding can be ensured, the anti-nuclear movement will continue to grow.

In conclusion, it should be noted that one important difference to the situation in the 1980s is that the state authorities today are aiming to prevent even the mere discussion in society of the dangers of nuclear energy. Around 30 years ago, when the anti-nuclear lobby came into existence as a mass movement, the state was simply not prepared for such a development and had no way of opposing the movement. Today, things are different. Nevertheless, if these obstacles should encourage the activists, as was the case at the end of the 1980s, the anti-nuclear movement will experience a renaissance in the coming years.

Translation from German: Christopher Findlay

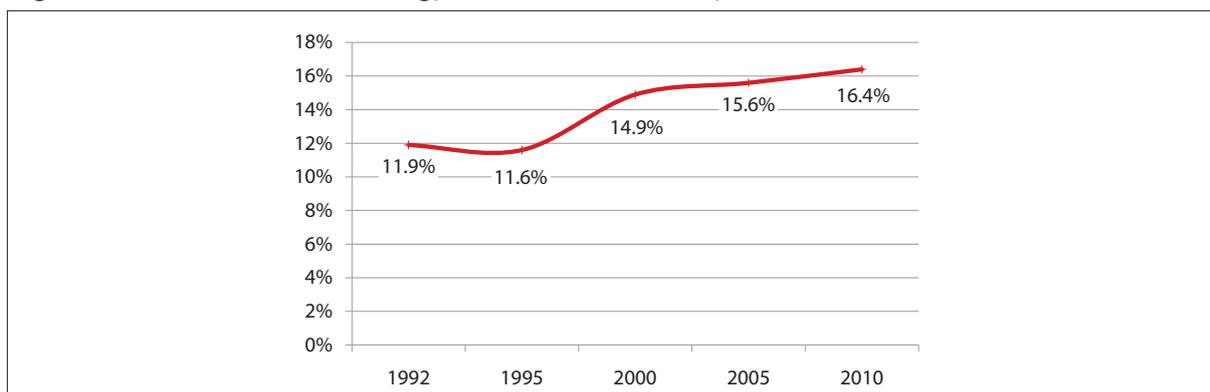
Nuclear Energy in Russia

Figure 1: Electricity Production by Source (share in %)



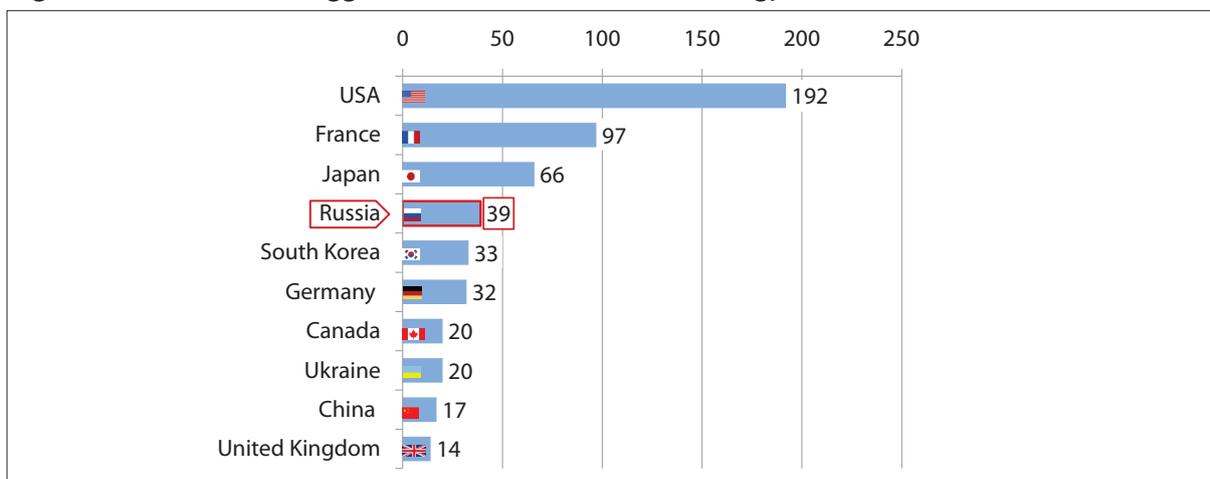
Source: International Energy Agency, http://www.iea.org/stats/electricitydata.asp?COUNTRY_CODE=RU

Figure 2: Share of Nuclear Energy in Russian Electricity Production (in %)



Source: Rosstat (Russian State Agency for Statistics), http://www.gks.ru/free_doc/doc_2011/rusfig/rus11.rar

Figure 3: World's Ten Biggest Consumers of Nuclear Energy (mtoe, 2010)



Source: BP Statistical Review of World Energy 2011, http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2011/STAGING/local_assets/pdf/nuclear_energy_section_2011.pdf

Table 1: Operational Nuclear Power Stations in Russia

Reactor	Type V=PVR	MWh/year	Location	Connection to grid	Operating time in years (until 06/11)	Planned shutdown
Balakovo 1-4	V-320	988	Saratov	05/1986, 01/1988, 01/1989, 12/1993	25, 23, 21, 17	2015, 2017, 2018, 2023
Beloyarsk 3	BN600 FBR	560	Sverdlovsk	11/1981	29	2025
Bilibino 1-4	LVGR EGP-6	11	Chukotka Autonomous Okrug	04/1974, 02/1975, 02/1976, 01/1977	37, 36, 35, 34	2019-21
Kalinin 1-2	V-338	950	Tver Oblast	06/1985, 03/1987	26, 24	2014, 2016
Kalinin 3	V-320	950	Tver Oblast	12/2004	6	2034
Kola 1-2	V-230	432, 411	Murmansk	12/1973, 02/1975	37, 36	2018, 2019
Kola 3-4	V-213	411	Murmansk	12/1982, 12/1984	28, 26	2026, 2014
Kursk 1-2	RBMK	971	Gebiet Kursk	10/1977, 08/1979	33, 31	2021, 2024
Kursk 3-4	RBMK	925	Gebiet Kursk	03/1984, 02/1986	27, 25	2013, 2015
Leningrad 1-2	RBMK	925, 971	St. Petersburg	11/1974, 02/1976	36, 35	2018, 2020
Leningrad 3-4	RBMK	925	St. Petersburg	06/1980, 08/1981	31, 29	2024, 2025
Novovoronezh 3-4	V-179	385	Voronezh	06/1972, 03/1973	39, 38	2016, 2017
Novovoronezh 5	V-187	950	Voronezh	02/1981	30	2035, after major overhaul
Rostov 1	V-320	990	Rostov Oblast	03/2001	10	2030
Rostov 2	V-320	990	Rostov Oblast	03/2010	1	
Smolensk 1-3	RBMK	925	Smolensk Oblast	09/1983, 07/1985, 01/1990	27, 25, 21	2028, 2015, 2020
Total: 32 reactors		Total output: 23,084 MWh		Average operating time: 27.4 years		

V-320 is the basic model, usually VVER-1000; V-230 and V-213 are usually VVER-440; V-179 and V-187 are prototypes. Rostov was formerly known as Volgodonsk.

Sources: World Nuclear Association: *Nuclear Power in Russia*, <http://www.world-nuclear.org/info/inf45.html> and International Atomic Energy Agency IAEA: *Power Reactor Information System (PRIS)*, <http://www.iaea.or.at/programmes/a2/>, download on 23 June 2011.

Table 2: Nuclear Power Stations Under Construction in Russia

Reactor	Type	MWh/year	Location	Start of construction	Planned date of connection to grid
Akademik Lomonosov 1–2	PVR	32	Kamchatka	15 Apr. 2007	01.12.2013
Beloyarsk-4 (BN-800)	FBR	804	Sverdlovsk	18 July 2006	
Kalinin-4	PVR	950	Tver Oblast	01 Aug. 1986	
Kursk-5	LVGR	915	Kursk Oblast	01 Dec. 1985	
Leningrad II-1, II-2	PVR	1085	St. Petersburg	10/2008, 04/2010	
Novovoronezh II-1	PVR	1114	Novovoronezh	24 June 2008	31.12.2013
Novovoronezh II-2	PVR	1114	Novovoronezh	12 July 2009	
Rostov-3, 4	PVR	1011	Rostov Oblast	09/2009, 06/2010	
Total: 11			Total output: 9,153 MWh		

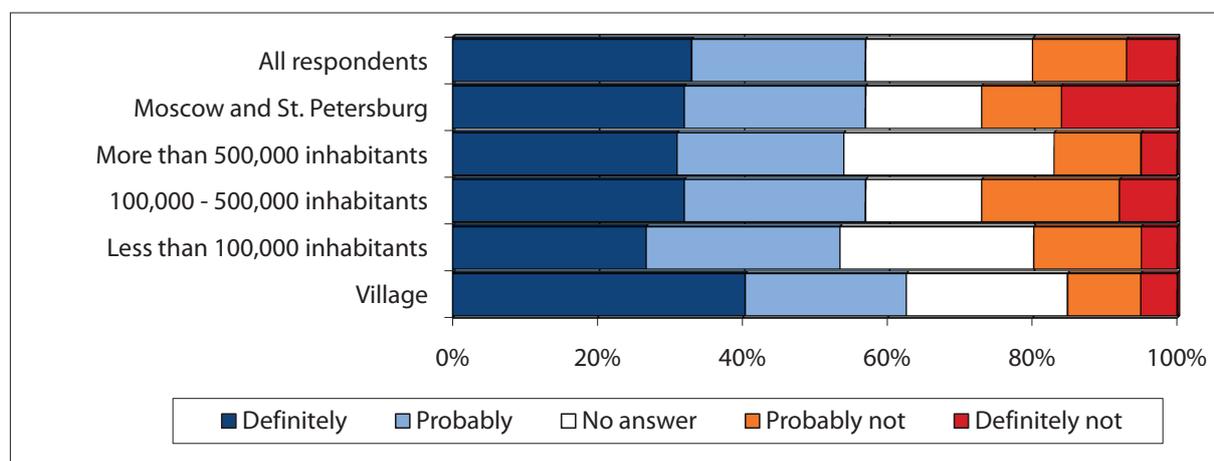
Rostov was formerly known as Volgodonsk, construction of reactor blocks 3 and 4 was initiated as early as 1983, but was postponed indefinitely and hardly progressed until renewed initiation of construction.

Sources: World Nuclear Association: Nuclear Power in Russia, <http://www.world-nuclear.org/info/inf45.html> and International Atomic Energy Agency IAEA: Power Reactor Information System (PRIS), <http://www.iaea.or.at/programmes/a2/>, download on 23 June 2011.

OPINION POLL

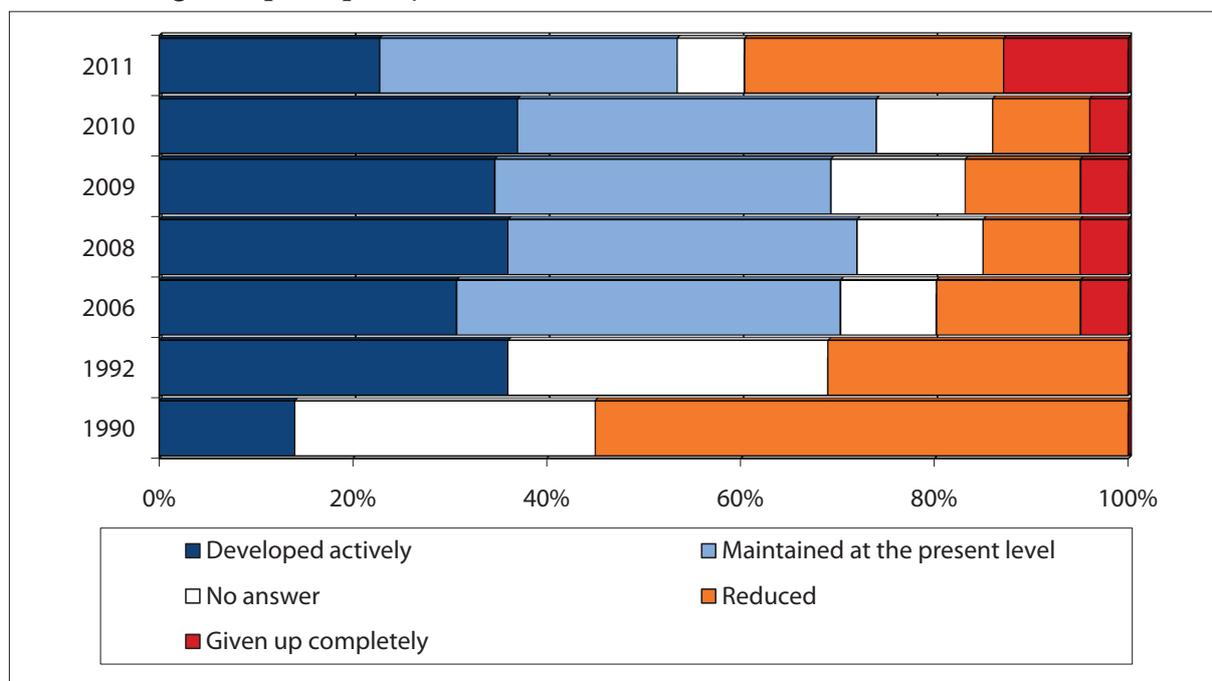
Russian Attitudes on Nuclear Energy

Figure 1: Germany is planning to shut down all nuclear power stations within the next ten years and to switch to other sources of energy. If Russia were to make the same decision, would you support this decision or not?



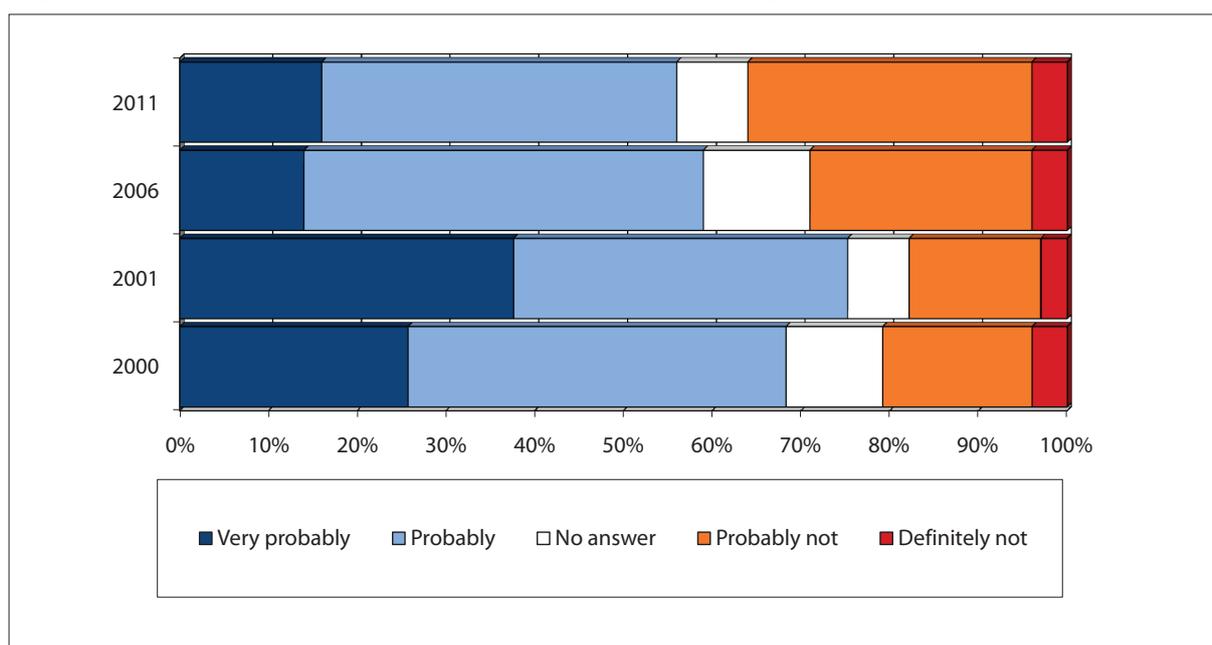
Source: representative opinion polls by VTsIOM 11–12 June 2011, <http://old.wciom.ru/novosti/press-vypuski/press-vypusk/single/111693.html>

Figure 2: Should nuclear energy be actively developed, maintained at the present level, reduced or given up completely?



Source: representative opinion polls by Levada Center, 18–21 March 2011, <http://www.levada.ru/press/2011032803.html>

Figure 3: Could a catastrophe similar to Chernobyl occur again in Russia?



Source: representative opinion polls by Levada Center, 18–21 March 2011, <http://www.levada.ru/press/2011032803.html>

ABOUT THE RUSSIAN ANALYTICAL DIGEST

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The Russian Analytical Digest is a bi-weekly internet publication jointly produced by the Research Centre for East European Studies [Forschungsstelle Osteuropa] at the University of Bremen (www.forschungsstelle.uni-bremen.de), the Center for Security Studies (CSS) at the Swiss Federal Institute of Technology Zurich (ETH Zurich), the Resource Security Institute, the Institute of History at the University of Basel (<http://histsem.unibas.ch/seminar/>) and the Institute for European, Russian and Eurasian Studies at The George Washington University. It is supported by the German Association for East European Studies (DGO). The Digest draws on contributions to the German-language *Russland-Analysen* (www.laender-analysen.de/russland), the CSS analytical network on Russia and Eurasia (www.res.ethz.ch), and the Russian Regional Report. The Russian Analytical Digest covers political, economic, and social developments in Russia and its regions, and looks at Russia's role in international relations.

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Layout: Cengiz Kibaroglu, Matthias Neumann, Michael Clemens

ISSN 1863-0421 © 2011 by Forschungsstelle Osteuropa, Bremen and Center for Security Studies, Zürich

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