

World view



By Nicolas
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Use nuclear power to end reliance on Russian oil

Russia's invasion of Ukraine has highlighted the need to improve energy security.

Last month, after weeks of negotiations, European Union leaders agreed to ban 90% of Russian oil imports by 2023. Until then, Russia will be able to continue to sell millions of barrels of oil a day to the EU, with some of the proceeds continuing to fund the war. Reliance on this fuel delayed a dignified, united condemnation of the invasion of Ukraine, and continues to interfere with the EU's response.

There is a lesson in this for both the rest of Europe and the rest of the world: independence from Russian energy is the way to avoid another Ukraine.

France – where I live and work as an energy researcher at the Foundation for Strategic Research in Paris – was unusual among EU nations in calling for speedy, firm action. Although a now-concluded electoral campaign meant that French President Emmanuel Macron took a particularly tough stance on Russia, France's relative independence of oil and gas certainly made this easier. This independence stems from consistent investment in nuclear energy since the 1960s; France produces 70% of its electricity from nuclear sources.

That has brought critics – especially after the 2011 Fukushima Daiichi accident in Japan. German policymakers are instead calling for a slow transition to electricity made from a mix of renewable energy sources, coal and gas.

Because of squeamishness about investing in nuclear power, thanks to Fukushima – as well as the Chernobyl disaster in 1986, which took place in what is now Ukraine – the West has not developed a clear strategy on nuclear power. The Generation IV International Forum, established in 2001, was the last major attempt to create a global nuclear research agenda. After the Fukushima accident, the forum faded into the background.

In the meantime, a small number of countries have advanced their nuclear technologies. Russia builds more than 30% of the new reactors worldwide, mostly in Eastern Europe, the Middle East and the Indian subcontinent. China also builds around 30% of reactors, most of them in China itself.

New nuclear technologies are more practical and more agile than those that were around when the Generation IV forum was established. Small modular reactors – those with a total capacity of up to 300 megawatts – are particularly promising. They offer flexibility in terms of plant design and maintenance, because they can be replaced module by module. Small reactors could work alongside green power and fill gaps in capacity.

Further advancement in nuclear technology is more

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fundamental, both in terms of the physics and the change it could represent for the industry. Fast neutron reactors operate with enough energy to cause fission of many heavy atoms, potentially eliminating both nuclear waste material and reliance on uranium as the sole fuel source. These are just one of a host of fourth-generation nuclear reactor systems that together overcome some of the shortcomings of conventional installations.

Russia and China are currently alone in operating commercial power plants using these technologies – at China's Shidaowan power plant in Shandong, and Beloyarsk-3 and -4 in Sverdlovsk Oblast, Russia.

Without clear political will, the EU risks sleepwalking into a world where Russia has a technological grip on nuclear technologies, as well as physical control over much of Europe's fossil fuels.

Nuclear technologies could help the world to move away from hydrocarbon fossil fuels, speed up the transition to cleaner sources of power and end the grip some undemocratic states have on the world's energy markets. But building a nuclear power plant is time-consuming. It might take ten years to build nuclear capacity in a country, especially when using new technologies. The construction of Beloyarsk-4 began in 2006; operations started in 2016.

Long-term thinking, consistent public support and political willpower – both national and international – is needed. This willpower must outlast any individual electoral campaign or political term and will be the only way to enable the construction of fourth-generation technologies in democratic nations.

Many Western countries have both know-how on nuclear power and experience in international cooperation. Together, they must build a cooperation framework to achieve the commercial operation of fourth-generation power plants to foster energy independence, while ensuring that citizens are both safe and informed about the safety of modern commercial nuclear power plants.

This cooperation would also send positive signals to both the nuclear industry and the finance sector that nations are serious about developing nuclear power. Such a signal would precipitate funding for construction and new investment in nuclear technologies, and would serve as a boon to a sector that has stagnated since Fukushima. This private interest must be accompanied by greater public investment in the sector.

Engagement in this major nuclear policy can be done only alongside a full consultation with the public over issues such as mining, waste management and safety.

To avoid another situation like that in Ukraine, the Western world needs to attain permanent energy independence. One day, green technologies alone might achieve that, but we cannot afford to wait.

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