

NUCLEAR MONITOR

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A PUBLICATION OF WORLD INFORMATION SERVICE ON ENERGY (WISE)
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Dear readers of the WISE/NIRS Nuclear Monitor,

In this issue of the Monitor:

- A short report on the remarkable 50,000-strong 'human chain' protest in Belgium, Germany and the Netherlands, on June 25.
- A half-year report card on the nuclear power industry – it is shaping up to be one of its worst ever years along with 1986 (Chernobyl) and 2011 (Fukushima).
- Vladimir Sliviyak writes about the efforts of Russia's Rosatom to rebrand itself as a climate champion.
- A review of the plan to turn South Australia into the world's nuclear waste dump; the plan can now be officially declared dead.

The Nuclear News section has reports on the UN nuclear weapons ban treaty negotiations; Urenco's willingness to provide nuclear fuel to reactors in the US producing tritium for weapons; a useful Laka Foundation project listing all the accidents recorded by the IAEA since 1990 (the IAEA removes public records after one year); a bizarre plan by 'pro-nuclear environmentalists' to promote nuclear power in North Korea; and more.

Feel free to contact us if you have feedback on this issue of the Monitor, or if there are topics you would like to see covered in future issues.

Regards from the editorial team.

Email: monitor@wiseinternational.org



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50,000 join 'human chain' protest in Europe!

NM846.4656 Fifty thousand people joined hands in a 90-kilometre human chain through Germany, the Netherlands and Belgium on June 25 to demand the closure of two Belgian nuclear power stations – Tihange 2 and Doel 3 – which both have thousands of cracks in the reactor vessels.

The organisers of the action, WISE (Netherlands) AAA (Germany) and 11Maartbeweging and Fin du Nucleaire (Belgium) speak of a great success and "by far the largest anti-nuclear action in Europe since the meltdown disaster in Fukushima, Japan."

The chain reached from Aachen in Germany via Maastricht in the Netherlands to Tihange. Nuclear opponents from France and Luxembourg also joined, giving "a clear sign that not only the scandal-reactors

in Tihange and Doel, but also the reactors in France, the Netherlands and in Germany must be shut down."

The German federal government as well as the newly-elected North-Rhine Westphalian Provincial government, and the Lower Saxony Provincial government – who all want the Belgian nuclear power stations to be closed – must 'walk the talk' and stop the license for the production and export of nuclear fuel for the Belgian reactors.

Protests are to continue. Another supraregional and international demo is planned in Lingen, Germany on September 9 against fuel manufacture and exportation, the uranium enrichment in Gronau and ongoing operation of nuclear power stations in Lingen, Grohnde, Belgium, Netherlands, France and elsewhere.



For WISE, the biggest success of the human chain was the fact that we managed to get people in the southern region of the Netherlands – close to the Tihange reactor – organised and empowered. Hundreds of people joined local groups who took up mobilisation but who are now also willing to continue their work. In total, more than 10,000 Dutch people took part in the human chain – double the amount we expected. WISE director Peer de Rijk said: “This is so encouraging. We will continue to work with the people and groups and build a new movement in the region.”

Just two days before the human chain took place, protesters were invited by the management of the Tihange nuclear power stations for a meeting – to take

place at the same time as the human chain action. We responded by inviting them to come to the action and have a public debate. Thousands of activists were ready to listen to their view on the issue of the cracks in the reactor vessels. Of course, they did not show up. We will have this meeting soon, with one condition – it has to be a public meeting.

More information (reports, photos, videos):

www.ausgestrahlt.de/mitmachen/tihangemenschenkette/

Videos: <https://wisenederland.nl/kernenergie/50000-mensen-de-kettingreactie>

Nuclear power’s *annus horribilis*

Author: *Jim Green – Nuclear Monitor editor*

NM846.4657 This year will go down with 1986 (Chernobyl) and 2011 (Fukushima) as one of the nuclear industry’s worst ever – and there’s still another six months to go. Two of the industry’s worst-ever years have been in the past decade. And there’s plenty more bad years ahead as the trickle of closures of aging reactors becomes a flood.

Here we review the first half of the year, with an emphasis on developments in the past month. We won’t dwell on Westinghouse’s bankruptcy protection filing and the profound problems facing its parent company Toshiba (see Nuclear Monitors #841, #843, #845), or the glacial attempts to resurrect Japan’s nuclear power industry (just five reactors are operating, compared to 54 before the Fukushima disaster).

In January, the World Nuclear Association anticipated 18 power reactor grid connections this year. The projection has been revised down to 14¹ and even that seems more than a stretch. There has only been one grid connection in the first half of the year according to the IAEA’s Power Reactor Information System.²

The number of power reactors under construction is on a downward trajectory; 59 reactors are under construction as of May 2017 – the first time since 2010 that the number has fallen below 60.³

Pro-nuclear journalist Fred Pearce wrote on May 15: “Is the nuclear power industry in its death throes? Even some nuclear enthusiasts believe so. With the exception of China, most nations are moving away from nuclear – existing power plants across the United States are being shut early; new reactor designs are falling foul of regulators, and public support remains in free fall. Now come the bankruptcies. ... [T]he industry is in crisis. It looks ever more like a 20th century industrial dinosaur, unloved by investors, the public, and policymakers alike. The crisis could prove terminal.”⁴

Suvrat Raju and M.V. Ramana wrote on June 7: “By all accounts, nuclear power has had a bad year. In March, Westinghouse, the largest historic builder of nuclear power plants in the world, declared bankruptcy, creating a major financial crisis for its parent company, Toshiba. The French nuclear supplier, Areva, went bankrupt a few months earlier and is now in the midst of a restructuring that will cost French taxpayers about €10 billion. Its reactor business is being taken over by a clutch of companies, including the public sector Électricité de France, which is itself in poor financial health. In May, the U.S. Energy Information Administration announced that it expects the share of nuclear electricity in the U.S. to decline from about 20% in 2016 to 11% by 2050. The newly elected Presidents of Korea and France have both promised to cut the share of nuclear energy in their countries. And the Swiss just voted to phase out nuclear power.”⁵

South Africa: An extraordinary High Court judgement on April 26 ruled that much of South Africa's nuclear new-build program is without legal foundation. The High Court set aside the Ministerial determination that South Africa required 9.6 gigawatts (GW) of new nuclear capacity, and found that numerous bilateral nuclear cooperation agreements were unconstitutional and unlawful.⁶ President Jacob Zuma is trying to revive the nuclear program, but it will most likely be shelved when Zuma leaves office in 2019 (if he isn't removed earlier). Energy Minister Mmamoloko Kubayi said on June 21 that South Africa will review its nuclear plans as part of its response to economic recession.⁷

South Korea: South Korea's new President Moon Jae-in said on June 19 that his government will halt plans to build new nuclear power plants and will not extend the lifespan of existing plants beyond 40 years.^{8,9} Speaking at a ceremony to mark the closure of the Kori-1 power reactor in Busan, Moon said: "We will completely re-examine the existing policies on nuclear power. We will scrap the nuclear-centered policies and move toward a nuclear-free era. We will eliminate all plans to build new nuclear plants."¹⁰

"The Fukushima nuclear accident has clearly proved that nuclear reactors are neither safe, economical nor environmentally friendly," Moon said. "South Korea is not safe from the risk of earthquakes, and a nuclear accident caused by a quake can have such a devastating impact."¹¹

The Moon government aims to begin by shutting down aging reactors and to eventually phase out the rest over the next 40 years. The role of coal-fired power plants is to be reduced, with gas and renewables to replace nuclear and coal. "So far, the country's energy policy focused on low prices and efficiency. But this should change now with our top priority on public safety and the environment," Moon said.¹² Yang Yi-wonyoung, head of the Korean Federation of Environmental Movement, said: "A bumpy road is also ahead for Korea. But small steps starting from closing older nuclear reactors and investing in green energy will help Korea change."¹³

Kori-1 was permanently shut down at midnight on June 18 after reaching the end of its 40-year lifespan, the first South Korean nuclear power plants to be closed permanently. Moon said on June 19 that he aims to close the Wolsong-1 reactor – grid connected in December 1982 – "as soon as possible after reviewing electricity demand."¹⁴

The fate of the partially-built Shin Kori 5 and 6 reactors remains in doubt.⁸ Moon said that the decision will be made "after reviewing how much of the construction has been completed, how much we will need to pay in compensation when halting it, and how much electricity is in reserve."¹⁴ On June 27, the government said it will suspend construction of Shin Kori 5 and 6 while it decides whether they should continue or be scrapped. The government said it will form a committee that will spend about three months investigating the options.¹⁵

Cancelling planned reactors will be less fraught than closing operating reactors and stopping partially-built reactors. Already there is movement in that direction –

in the aftermath of Moon's election on May 9, KHNP halted preparations for two planned reactors, Shin-Hanul 3 and 4.¹⁴

President Moon Jae-in's comments on June 19 attracted worldwide media coverage but important questions remain unanswered. A detailed energy roadmap needs to be established and implemented to turn the President's vision into reality. The future of South Korea's aspiration to become an exporter of reactor technology remains in doubt – an early test for the President is potential South Korean involvement in the NuGen reactor project in the UK.¹⁶ There are no clear, credible plans to manage the nuclear waste produced by South Korea's reactors.

South Korea's plan to develop reprocessing / pyroprocessing technology and fast neutron reactors remains in doubt. The President has reportedly pledged to reconsider the research program on pyroprocessing technology.¹⁷

Lami Kim wrote in the *Bulletin of the Atomic Scientists* on 27 June 2017:¹⁷

"The nonproliferation community may hail the Moon administration's nuclear-free energy policy, as some view South Korea as a potential nuclear aspirant given the nuclear threats coming from its northern neighbor. The country's advanced nuclear industry intensifies such concern. South Korea is the world's fifth largest nuclear electricity producer, generating more than 30 percent of its electricity with nuclear power.

Furthermore, South Korea's research on pyroprocessing, if successful, may allow the country to retain a stockpile of fissile materials for building nuclear weapons. ... Moon's promise to reconsider the pyroprocessing program and to phase out nuclear power may send a signal that Seoul is no longer pursuing a strategy of "nuclear hedging" that lies somewhere between nuclear pursuit and nuclear rollback, and is instead abandoning any future capacity to build nuclear weapons."

Taiwan: Taiwan's Cabinet reiterated on June 12 the government's resolve to phase out nuclear power. The government remains committed to the goal of decommissioning the three operational nuclear power plants as scheduled and making Taiwan nuclear-free by 2025, Cabinet spokesperson Hsu Kuo-yung said.¹⁸

France: The French nuclear industry is in crisis, its "worst situation ever" according to former EDF director Gérard Magnin.¹⁹ The French industry faces multiple serious problems domestically, and its EPR export ambitions are "in tatters" as *Bloomberg* noted in 2015.²⁰ EDF and Areva would both be bankrupt if not for the largesse of the French state. Vast, as-yet unfunded expenditure looms for reactor upgrades and possible lifespan extensions, decommissioning and waste management.

French environment and energy minister Nicolas Hulot said on June 12 that the government plans to close some nuclear reactors to reduce nuclear's share of the country's power mix. "We are going to close some nuclear reactors and it won't be just a symbolic move," he said. Share prices in utility EDF fell in response to the minister's comments.²¹

In what *Reuters* described as a “major blow” for EDF, the French nuclear regulator ASN is expected to rule that the cover of the reactor vessel EDF is building in Flamanville may not be able to function for more than a few years and EDF may have to replace it soon after the reactor’s scheduled start-up in 2018.²² Areva’s Creusot Forge foundry, which made the pressure vessel cover, is currently closed following the discovery of manufacturing flaws and falsification of documentation, and is awaiting ASN approval to restart.²²

Switzerland: Voters in Switzerland supported a May 21 referendum on a package of energy policy measures including a ban on new nuclear power reactors.²³ Thus Switzerland has opted for a gradual nuclear phase out and all reactors will probably be closed by the early 2030s, if not earlier.

UK: Horizon Nuclear Power’s plan to build two Advanced Boiling Water Reactors in Wylfa, Wales, has hit a hurdle. Japanese conglomerate Hitachi said on June 8 that it will curtail its financial risk in the project by divesting itself of the local subsidiary that will build and operate the reactors.²⁴ If Hitachi cannot attract partners to invest in Horizon, which it acquired in 2012 as a wholly-owned subsidiary, before construction is due to start in 2019, the project will be suspended. Hitachi is prepared to reduce its stake in Horizon to as low as zero according to *Nikkei Asian Review*.²⁵ In addition to new investors, the Wylfa project is dependent on government subsidies including a guaranteed price for the electricity generated, Hitachi said.²⁶

Hitachi recently booked a massive loss on a failed investment in laser enrichment technology in the US. A 12 May 2017 statement said the company had posted an impairment loss on affiliated companies’ common stock of 187.8 billion yen (US\$1.68 billion) for the fiscal year ended 31 March 2017, and “the major factor” was Hitachi’s exit from the laser enrichment project.²⁷ Last year a commentator opined that “the way to make a small fortune in the uranium enrichment business in the U.S. is to start with a large one.”²⁸

Wylfa is not the only nuclear new-build project in the UK in trouble. The only project with any momentum is Hinkley Point, based on the French EPR reactor design. The head of one of Britain’s top utilities said on June 19 that Hinkley Point is likely to be the only nuclear project to go ahead in the UK. Alistair Phillips-Davies, chief executive officer of SSE, an energy supplier and former investor in new nuclear plants, said: “The bottom line in nuclear is that it looks like only Hinkley Point will get built and Flamanville needs to go well for that to happen.”²⁹

Tim Yeo, a former Conservative politician and now a nuclear industry lobbyist with New Nuclear Watch Europe, said the compounding problems facing nuclear developers in the UK “add up to something of a crisis for the UK’s nuclear new-build programme.”³⁰ The lobby group pointed to delays with the EPR reactor in Flamanville, France and the possibility that those delays would flow on to the two planned EPR reactors at Hinkley Point; the lack of investors for the proposed Advanced Boiling Water Reactors at Wylfa; the acknowledgement by the NuGen consortium that the

plan for three AP1000 reactors at Moorside faces a “significant funding gap”; and the fact that the Hualong One technology which China General Nuclear Power Corporation hopes to deploy at Bradwell in Essex has yet to undergo its generic design assessment.³¹

Jeremy Warner, assistant editor of the *Daily Telegraph*, wrote on March 28:³²

“The costs of nuclear energy just keep on rising. If we could, we would stop this madness. Nuclear power, in its second lease of life, is once again proving a massively expensive, ongoing liability for virtually all involved. ...

“In Britain, the costs of Hinkley Point have escalated from an initially anticipated £5.6bn back in 2008 to £24.5bn at the last estimate. An internal assessment last year by the Department of Energy and Climate Change was more startling still, putting the total lifetime costs at closer to £37bn. EDF, the prime contractor and operator, originally estimated that the plant would generate electricity at £45 per megawatt hour. In the event, the UK Government has had to agree a “strike price” of a ruinous £92.50, or more than double the current wholesale price for electricity, inflation proofed and guaranteed for 35 years.

“And that’s just the half of it; events this week have demonstrated that it is perhaps the back end costs of decommissioning, clean-up and disposal of spent fuel we should be worrying about most. ... Back in 2005, the UK’s nuclear decommissioning costs were estimated at £55.8 billion; by 2008, this had risen to £73.6 billion, and by 2015 it had reached an eye-watering £117.4 billion. It is a fair bet that as more becomes known about the costs and risks of decommissioning, even this latest number will prove woefully short. ...

“In committing to new nuclear, we seem to have joined a runaway train, with no hope of getting off. Has not the time finally arrived for a fully fledged rethink of the merits of Britain’s nuclear energy strategy?”

Writing in the *Financial Times* on May 26, Neil Collins said that “nobody outside the industry now thinks the future of electricity generation is nuclear fission.”³³ On the UK nuclear program, Collins said: “EDF, of course, is the contractor for that white elephant in the nuclear room, Hinkley Point. If this unproven design ever gets built and produces electricity, the UK consumer will be obliged to pay over twice the current market price for the output. ... The UK’s energy market is in an unholy mess ... Scrapping Hinkley Point would not solve all of them, but it would be a start.”³³

The UK National Audit Office report released a damning report on June 23.³⁴ The Audit Office stated: “The Department for Business, Energy and Industrial Strategy’s deal for Hinkley Point C has locked consumers into a risky and expensive project with uncertain strategic and economic benefits ... Today’s report finds that the Department has not sufficiently considered the costs and risks of its deal for consumers. ... The government’s case for the project has weakened since it agreed key commercial terms on the deal in 2013. Delays have pushed back the nuclear power plant’s construction, and the expected cost of top-up

payments under the Hinkley Point C's contract for difference has increased from £6 billion to £30 billion."³⁵

And on it goes. Hinkley is one of the "great spending dinosaurs of the political dark ages" according to *The Guardian*.³⁶ It is a "white elephant" according to an editorial in *The Times*.³⁷

EDF said on June 26 that it is conducting a "a full review of the costs and schedule of the Hinkley Point C project" and the results will be disclosed "soon". The start-up date is expected to be pushed back from 2025 to 2027 and costs to rise by €1–3 billion.³⁸ In 2007, EDF was boasting that Britons would be using electricity from Hinkley to cook their Christmas turkeys in December 2017.³⁹

Sweden: Unit 1 of the Oskarshamn nuclear power plant in Sweden has been permanently shut down.⁴⁰ It was to be shut down on June 29, but an abnormal event on June 17 led to an automatic shut down and the reactor will not be restarted. Unit 2 at the same plant was permanently shut down in 2015. Ringhals 1 and 2 are expected to be shut down in 2019–2020, after which Sweden will have six operating power reactors.

Oskarshamn also houses a third reactor and its fate will be decided later this year by owners Uniper SE and Fortum Oyj.⁴¹ The workforce at the plant is to be cut by one-third, from 880 to 600.⁴¹

Ambjörn Pernius, chief operating officer at Oskarshamn-2, said the driving force is to carry out decommissioning and waste management as efficiently as possible, thereby increasing the likelihood of continued operation of the Oskarshamn-3 reactor.⁴² Of course, the risk is that staff cuts and the efficiency drive will compromise the quality of decommissioning and waste management operations, and the safe operation of the one remaining reactor.

Russia: Rosatom deputy general director Vyacheslav Pershukov told the Technoprom-2017 forum in Novosibirsk in mid-June that the world market for the construction of new nuclear power plants is shrinking, and the possibilities for building new large reactors abroad are almost exhausted. He said Rosatom expects to be able to find customers for new reactors until 2020–2025 but "it will be hard to continue."⁴³

Rosatom is diversifying into new areas: small hydropower and wind generation, nuclear medicine, construction of nuclear science and technology centers, equipment for gas and petrochemical and thermal power generation, composite materials, etc. Rosatom's strategy is for revenue from new business areas to be at least 30% of total revenue by 2030.⁴³

USA: Exelon said on May 29 that the one operating Three Mile Island reactor will be permanently shut down in September 2019 if the State of Pennsylvania does not bail out the uneconomical generator.⁴⁴ The reactor hasn't been profitable for the past five years according to Exelon.⁴⁵ Already over 40 years old, the reactor has failed to auction its expensive power on the electric grid for three years straight, denying Exelon power sales out to 2021.⁴⁶

State bailouts are propping up aging reactors in New York and Illinois, but a proposed nuclear bailout in Ohio

is meeting stiff opposition. The nuclear debate in the US is firmly centered on attempts to extend the lifespan of aging, uneconomic reactors with state bailouts. The fate of Westinghouse and its partially-built AP1000 reactors are much discussed, but there is no further discussion about new reactors – other than to note that they won't happen.

Six reactors have been shut down over the past five years, and another handful will likely close in the next five years. How far and fast will nuclear fall:

- Exelon claims that "economic and policy challenges threaten to close about half of America's reactors" in the next two decades.⁴⁷
- A January 2017 piece, written by a nuclear industry PR consultant and published by World Nuclear News, states that "as many as two-thirds of America's 99 reactors could shut down by 2030".⁴⁸
- Nuclear Energy Insider claims that 38 reactors will be shut down upon reaching their end-of-licence terms by 2035.⁴⁹
- According to Michael Shellenberger's pro-nuclear lobby group 'Environmental Progress', almost one-quarter of US reactors are at high risk of closure by 2030, and almost three-quarters are at medium to high risk.⁵⁰
- In May, the US Energy Information Administration released an analysis projecting nuclear's share of the nation's electricity generating capacity will drop from 20% to 11% by 2050.⁵¹ The projection assumes no new reactors other than the four AP1000 reactors under construction, and it makes heroic / absurd assumptions about the longevity of existing reactors (retirements of just 29.9 GW of nuclear capacity from 2018 through 2050).

Clearly there is some disagreement about how far and fast nuclear will fall in the US – but fall it will. And there is no dispute that many plants are losing money. More than half of the country's reactors are losing money, racking up losses totaling about US\$2.9 billion a year according to a recent analysis by Bloomberg New Energy Finance.⁵² And a separate Bloomberg report found that expanding state aid to money-losing reactors across the eastern US may leave consumers on the hook for as much as US\$3.9 billion a year in higher power bills.⁵³

US nuclear lobbyists continue going around in circles with their debate about how to rescue nuclear power. Essentially, one side favours industry consolidation to help build more conventional, large reactors; their opponents favour innovation and small reactors (NuScale is the flavor of the month – a small modular reactor R&D project that hasn't yet collapsed).

The debate pits those impressed by the economies-of-scale offered by large reactors against those favoring the small, modular 'economy-of-the-assembly-line'. But they aren't mutually exclusive. Why not opt for modular, factory production of large reactors? That was the philosophy underpinning Westinghouse's AP1000 reactors – and of course it went ruinously wrong with cost overruns of about US\$13 billion, leading Westinghouse to file for bankruptcy protection on March 29.

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Russia's Rosatom: climate's new best friend

Author: *Vladimir Sliviyak – co-chair of the Russian environmental NGO Ecodefense*

NM846.4658 As Russia's economic crisis continues to hit budgets, the country's state nuclear corporation is going green to raise funds on the international level. The recent St Petersburg International Economic Forum¹ was widely covered by the Russian media, partly because of the eye-catching debates in which president Vladimir Putin himself took part.

In the general flood of news from the forum, the presentation given by Alexei Likhachev, the recently appointed head of Russia's state nuclear corporation², has made few waves. But Likhachev's speech³ is significant in that it reflects a new approach to promoting Russian nuclear power plants on the international scene. Russia's nukes will now be advertised as essential to mitigating climate change.

Rosatom is one of the most important instruments for promoting Russia's geopolitical interests in other countries.⁴ The issue with nuclear power is that when a client country buys a plant, it becomes dependent on fuel supplies, servicing agreements and specialists from the providing country. In almost every case, Russia stimulates interest in these technologies by providing major loans towards plant construction costs. And the list of states where Rosatom is planning to build reactors (among them Belarus, Hungary and Iran) is generally friendly to the Russian regime.

This is the first time that Rosatom has made climate change central to its advertising strategy – unlike its western counterparts, who got hooked on the idea of nuclear power as "climate's best friend" almost two decades ago. There was a serious message (albeit chiefly an economic one) behind those slogans: at that point, the nuclear energy industry in the west had been in a state of stagnation for many years. Power station construction had ground to a halt almost everywhere, partly due to high costs and partly due to the unresolved issue of nuclear waste.

Increasing concerns about climate change gave the nuclear industry a lifebelt: nuclear reactors, after all, emit hardly any greenhouse gases. However, it was quickly discovered that this is only half the truth. Berlin's Öko-Institute calculated that if you look at the complete fuel cycle (from extracting uranium to storing and

reprocessing radioactive waste), the emission levels of nuclear power plants were close to those of modern gas technology.⁵ The main reason for this is the enormously energy intensive process used to enrich uranium. Attempts to solve the economic problems of the nuclear industry at the expense of climate change have stimulated new research, which has led to an interesting conclusion – the use of nuclear power is an incredibly inefficient way of lowering greenhouse gas emissions at a global level.⁶

Russia's public purse has been seriously hit by its economic crisis, and perhaps this is the reason behind Rosatom's present reincarnation as a "climate-friendly" body

The main limitation of nuclear power is the fact that it is used almost exclusively to generate electricity, which accounts for less than 25% of global human-made greenhouse gases.⁷ Doubling the production of nuclear energy would reduce the emission of these gases by a mere 6%, and then only if all the reactors were replacing coal fired power stations. And there would be no climate benefit at all if nuclear replaced a combination of renewable energy and energy conservation.⁸ In that situation, to produce the same 6% reduction in greenhouse gas emissions would require around 500 new reactors on top of the existing ones, as well as more new reactors to replace those being decommissioned: according to the International Energy Agency, nearly 200 existing reactors will be out of service by 2040.⁹

A large modern nuclear reactor costs US\$5–15 billion to build, depending on type and manufacturer. This is obviously an enormous amount of money, which doesn't solve the problem at hand. The Intergovernmental Panel on Climate change (IPCC) believes that in order to avert the most catastrophic consequences of climate change, emissions need to be cut by at least a half by mid-century.¹⁰ So the question is not about new reactors at some stage in the future, but about a strict time limit on their construction. Nuclear power plants take longer to build than any other power stations (about seven to ten years on average) and some reactors, such as the Russian BN-800, the most powerful fast-breeder reactor in the world, have taken around 30 years to come online.¹¹

The western nuclear industry's most serious attempt to raise international finance on the back of the climate change issue was made at the UN-sponsored Hague Climate Change Conference in 2000. It was not a success. Since then, nuclear experts have concentrated their efforts on lobbying national governments – also, as we can see, without success: not a single country has decided to adopt nuclear power as the central element of their anti-climate change policy.

In 2017, Rosatom decided to seize the nuclear-climate flag from the weakening hands of their western colleagues. It was evidently not just a question of Russian nuclear specialists rushing to deal with the challenges of the day, nor was it an attempt to start a trend. They made a fundamental change in their international self-promotion strategy simply because their old approach to selling reactors wasn't working. Rosatom never tires of pointing out that its portfolio contains dozens of contracts for new power stations all over the world and is worth a total of 100 billion dollars.

But for some reason, reactors are actually only being built in three or four countries, and numerous agreements signed years ago remain only on paper. In the last six months alone, Vietnam pulled out of a contract¹² and a court in South Africa ruled that a contract with Russia for the development of nuclear power infringed its constitution.¹³ And in Russia itself, many more reactors have been planned than built. The irresistible spread of Russian nuclear power plants throughout the world seems to have been put on hold, and something needs to change. So why not

change your image? Anyone who refuses to purchase a Rosatom facility will become an enemy of the climate like Donald Trump.

Despite its climate change “coming out”, Rosatom is unlikely to be able to sell any more reactors. It will take some time even to fulfil those contracts that are already signed and sealed. And it's highly unlikely that all the orders in its portfolio will ever be completed.¹⁴ If there is anything behind Rosatom's new advertising campaign, it is the hope that Russia will be able to access international finance for the fight against climate change. The UN and 2016 Paris Agreement¹⁵ are putting together special funds for precisely this purpose.

In other words, Rosatom will try to do what its western counterparts did back in 2000. The state corporation doesn't need to apply for finance itself – the developing countries buying from it, short of cash and technology to mitigate the consequences of climate change, will do that. And perhaps Rosatom won't even need to finance the construction of nuclear power plants by borrowing from the Russian state budget, as it mostly did until now – although it will have to invest some money.

Russia's public purse has been seriously hit by its economic crisis, and perhaps this is the reason behind Rosatom's present reincarnation as a “climate-friendly” body. And the fact that nuclear energy is too expensive and inefficient for its stated goals is neither here nor there; it's just a question of survival.

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How South Australians dumped a nuclear dump

Author: *Jim Green – Nuclear Monitor editor*

NM846.4659 Last November, two-thirds of the 350 members of a South Australian-government initiated Citizens' Jury rejected "under any circumstances" the plan to import vast amounts of high-level nuclear waste from around the world as a money-making venture.¹

The following week, South Australian (SA) Liberal Party Opposition leader Steven Marshall said that "[Labor Party Premier] Jay Weatherill's dream of turning South Australia into a nuclear waste dump is now dead."² Business SA chief Nigel McBride said: "Between the Liberals and the citizens' jury, the thing is dead."²

And after months of uncertainty, Premier Weatherill has said in recent weeks that the plan is "dead", there is "no foreseeable opportunity for this", and it is "not something that will be progressed by the Labor Party in Government".³

So is the dump dead? The Premier left himself some wriggle room⁴, but the plan is as dead as it possibly can be. If there was some life in the plan, it would be loudly proclaimed by SA's Murdoch tabloid, *The Advertiser*. But *The Advertiser* responded to the Premier's recent comments – to the death of the dump – with a deafening, deathly silence.

Royal Commission

It has been quite a ride to get to this point. The debate began in February 2015, when the Premier announced that a Royal Commission would be established to investigate commercial options across the nuclear fuel cycle. He appointed a gullible nuclear advocate, former Navy man Kevin Scarce, as Royal Commissioner. Scarce said he would run a "balanced" Royal Commission and appointed four nuclear advocates to his advisory panel, balanced by one critic.⁵ Scarce appointed a small army of nuclear advocates to his staff, balanced by zero critics.

The final report⁶ of the Royal Commission, released in May 2016, was surprisingly downbeat given the multiple levels of pro-nuclear bias.⁷ It rejected – on economic grounds – almost all of the proposals it considered: uranium conversion and enrichment, nuclear fuel fabrication, conventional and Generation IV nuclear power reactors⁸, and spent fuel reprocessing.

The only thing left standing (apart from the small and shrinking uranium mining industry⁹) was the plan to import nuclear waste as a commercial venture. Based on commissioned research, the Royal Commission proposed importing 138,000 tonnes of high-level nuclear waste (spent nuclear fuel from power reactors) and 390,000 cubic metres of intermediate-level waste.

The SA Labor government then established a 'Know Nuclear' statewide promotional campaign under the guise of 'consultation'. The government also initiated the Citizens' Jury.

The first sign that things weren't going to plan for the government was on 15 October 2016, when 3,000 people participated in a protest against the nuclear dump at Parliament House in South Australia's capital, Adelaide.¹⁰

A few weeks later, on November 6, the Citizens' Jury rejected the nuclear dump plan.¹ Journalist Daniel Wills wrote: "Brutally, jurors cited a lack of trust even in what they had been asked to do and their concerns that consent was being manufactured. Others skewered the Government's basic competency to get things done, doubting that it could pursue the industry safely and deliver the dump on-budget."¹¹

In the immediate aftermath of the Citizens' Jury, the SA Liberal Party and the influential Nick Xenophon Team announced that they would actively campaign against the dump in the lead-up to the March 2018 state election. The SA Greens were opposed from the start.

Premier Weatherill previously said that he established the Citizens' Jury because he could sense that there is a "massive issue of trust in government".¹² It was expected that when he called a press conference on November 14, the Premier would accept the Jury's verdict and dump the dump. But he announced that he wanted to hold a referendum on the issue, as well as giving affected Aboriginal communities a right of veto. Nuclear dumpsters went on an aggressive campaign to demonise the Citizens' Jury though they surely knew that the bias in the Jury process was all in the pro-nuclear direction.^{13,14}

For the state government to initiate a referendum, enabling legislation would be required and non-government parties said they would block such legislation. The government didn't push the matter – perhaps because of the near-certainty that a referendum would be defeated. The statewide consultation process led by the government randomly surveyed over 6,000 South Australians and found 53% opposition to the proposal compared to 31% support.¹⁵ Likewise, a November 2016 poll commissioned by the *Sunday Mail* found 35% support for the nuclear dump plan among 1,298 respondents.¹⁶

Then the Labor government announced on 15 November 2016 that it would not seek to repeal or amend the SA Nuclear Waste Storage Facility (Prohibition) Act 2000, legislation which imposes major constraints on the ability of the government to move forward with the nuclear waste import proposal.¹⁷

Economic claims exposed

Implausible claims about the potential economic benefits of importing nuclear waste had been discredited by this stage.¹⁸ The claims presented in the Royal Commission's report were scrutinised by experts from

the US-based Nuclear Economics Consulting Group (NECG), commissioned by a Joint Select Committee¹⁹ of the SA Parliament.

The NECG report said the waste import project could be profitable under certain assumptions – but the report then raised serious questions about most of those assumptions.²⁰ The report noted that the Royal Commission’s economic analysis failed to consider important issues which “have significant serious potential to adversely impact the project and its commercial outcomes”; that assumptions about price were “overly optimistic” in which case “project profitability is seriously at risk”; that the 25% cost contingency for delays and blowouts was likely to be a significant underestimate; and that the assumption the project would capture 50% of the available market had “little support or justification”.

The farcical and dishonest engineering of a positive economic case to proceed with the nuclear waste plan was ridiculed by ABC journalist Stephen Long on 8 November 2016: “Would you believe me if I told you the report that the commission has solely relied on was co-authored by the president and vice president of an advocacy group for the development of international nuclear waste facilities?”²¹

The economics report was an inside job, with no second opinion and no peer review – no wonder the Citizens’ Jury was unconvinced and unimpressed.

Prof. Barbara Pocock, an economist at the University of South Australia, said: “All the economists who have replied to the analysis in that report have been critical of the fact that it is a ‘one quote’ situation. We haven’t got a critical analysis, we haven’t got a peer review of the analysis”.²²

Another South Australian economist, Prof. Richard Blandy²³ from Adelaide University, said: “The forecast profitability of the proposed nuclear dump rests on highly optimistic assumptions. Such a dump could easily lose money instead of being a bonanza.”²⁴

The dump is finally dumped

To make its economic case, the Royal Commission assumed that tens of thousands of tonnes of high-level nuclear waste would be imported before work had even begun building a deep underground repository. The state government hosed down concerns about potential economic losses by raising the prospect of customer countries paying for the construction of waste storage and disposal infrastructure in SA.

But late last year, nuclear and energy utilities in Taiwan – seen as one of the most promising potential customer countries – made it clear that they would not pay one cent towards the establishment of storage and disposal infrastructure in SA and they would not consider sending nuclear waste overseas unless and until a repository was built and operational.²⁵

By the end of 2016, the nuclear dump plan was very nearly dead, and the Premier’s recent statement that it is “not something that will be progressed by the Labor Party in Government” was the final nail in the coffin. The dump has been dumped.



Don’t mess with the McKenzies! Adnyamathanha Traditional Owners Heather McKenzie Stuart, Vivianne McKenzie and Regina McKenzie – pictured at a 3,000-strong protest in Adelaide in October 2016 – have seen off the plan to turn South Australia into the world’s nuclear waste dump but are still fighting the federal government’s plan to establish a national dump on Adnyamathanha land in the Flinders Ranges.

“Today’s news has come as a relief and is very much welcomed,” said Yankunytjatjara Native Title Aboriginal Corporation Chair and No Dump Alliance spokesperson Karina Lester. “We are glad that Jay has opened his ears and listened to the community of South Australia who have worked hard to be heard on this matter. We know nuclear is not the answer for our lands and people – we have always said NO.”

Narungga man and human rights activist Tauto Sansbury said: “We absolutely welcome Jay Weatherill’s courageous decision for looking after South Australia. It’s a great outcome for all involved.”

Reflections

The idea of Citizens’ Juries would seem, superficially, attractive. But bias is inevitable if the government establishing and funding the Jury process is strongly promoting (or opposing) the issue under question. In the case of the Jury investigating the nuclear waste plan, it backfired quite spectacularly on the government – jurors knew they were being pushed to vote ‘yes’ and they responded by voting ‘no ... not under any circumstances’.²⁶ Citizen Juries will be few and far between for the foreseeable future in Australia. A key lesson for political and corporate elites is that they shouldn’t let any semblance of democracy intrude on their plans.

The role of the Murdoch press needs comment, particularly in regions where the only mass-circulation newspaper is a Murdoch tabloid. No-one would dispute that the NT News has a dumbing-down effect on political and intellectual life in the Northern Territory. Few would doubt that the Courier Mail does the same in Queensland. South Australians need to grapple with the sad truth that the state’s Murdoch tabloids – *The Advertiser* and the *Sunday Mail* – are a blight on the state. Their grossly imbalanced and wildly inaccurate coverage of the nuclear dump debate was – with some honourable exceptions²⁷ – disgraceful. And that disgraceful history goes back decades; for example, a significant plume of radiation dusted Adelaide after one of the British bombs tests at Maralinga in the 1950s but *The Advertiser* chose not to report it.

The main lesson from the dump debate is a positive one: people power can upset the dopey, dangerous ideas driven by political and corporate elites and the Murdoch press. Sometimes. It was particularly

heartening that the voices of Aboriginal Traditional Owners were loud and clear²⁸ and were given great respect by the Citizens' Jury and by many other South Australians. The Jury's report said: "There is a lack of Aboriginal consent. We believe that the government should accept that the Elders have said NO and stop ignoring their opinions."¹

Conversely, the most sickening aspect of the debate was the willingness of the Murdoch press²⁹ and pro-nuclear lobbyists³⁰ to ignore or trash Aboriginal people opposed to the dump.

Another dump debate

Traditional Owners, environmentalists, church groups, trade unionists and everyone else who contributed to dumping the dump can rest up and celebrate for a moment. But only for a moment. Another dump proposal is very much alive: the federal government's plan to establish a national nuclear waste dump in SA, either in the Flinders Ranges or on farming land near Kimba, west of Port Augusta.³²

In May 2016, Adnyamathanha Traditional Owner Regina McKenzie, who lives near the Flinders Ranges site, wrote:³³

"Last year I was awarded the SA Premier's Natural Resource Management Award in the category of 'Aboriginal Leadership – Female' for working to protect land that is now being threatened with a nuclear waste dump. But Premier Jay Weatherill has been silent since the announcement of six short-listed dump sites last year, three of them in SA.

"Now the Flinders Ranges has been chosen as the preferred site and Mr Weatherill must speak up. The Premier can either support us – just as the SA government supported the Kupa Piti Kungka Tjuta³⁴ when their land was targeted for a national nuclear waste dump from 1998-2004 – or he can support the federal government's attack on us by maintaining his silence."

Perhaps Premier Jay Weatherill will find his voice on the federal government's contentious proposal for a national nuclear waste dump in SA, now that his position on that debate is no longer complicated by the parallel debate about establishing a dump for foreign high-level nuclear waste. He might argue, for example, that affected Traditional Owners should have a right of veto over the establishment of a national nuclear waste dump – precisely the position he adopted in relation to the international high-level dump.

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NUCLEAR NEWS

UN Draft Convention on the Prohibition of Nuclear Weapons

Reminiscent of the Cold War, escalating international tensions have fueled new rivalry among nuclear weapons states. As these countries rebuild their nuclear weapons arsenals, and their relations become progressively volatile, it is impossible to ignore the catastrophic humanitarian consequences and international security threats posed by nuclear weapons.

The United Nations' Draft Convention on the Prohibition of Nuclear Weapons¹, a treaty to ban nuclear weapons, could not be more timely. Led by 132 non-nuclear weapons States, the treaty mandate is to "negotiate a legally binding instrument to prohibit nuclear weapons, leading towards their total elimination," a historical moment on the path to global disarmament.

Treaty negotiations are currently underway with plans to conclude negotiations for final treaty language by July 7.

On June 20 and 21, Nuclear Information and Resource Service (NIRS), joined by allied groups Federation of American Scientists, Institute for Energy and Environmental Research, Natural Resources Defense Council, Physicians for Social Responsibility New York, and Western North Carolina Physicians for Social Responsibility, and hosted by the Permanent Mission of Austria to the United Nations, presented two side sessions: *Fission: Family, Community, Environment and Justice Impacts*; and *The Road Back to the Nuclear Brink*.

The first panel, *Fission: Family, Community, Environment, and Justice Impacts* included speakers Karina Lester, South Australia; Linda Cataldo Modica, Tennessee USA; Roland Oldham, Atomic Veteran, French Polynesia; and Mary Olson of NIRS who discussed the humanitarian impacts of nuclear weapons production, testing, and use on health, families, communities and human rights.

Women's March to Ban the Bomb, Melbourne, Australia, 17 June 2017.
www.womenbanthebomb.org



These first-hand accounts provided a glimpse inside the daily, lived experiences of communities effected by the production and testing of nuclear weapons – the attempts of governments to trade money for their health and humanity, the attempted erasure of their community's voices and agency, and the means through which their communities empower themselves and fight for their and future generation's right to a healthy and happy life.

Mary Olson of NIRS also highlighted the treaty's first time acknowledgement² of the disproportionate effects ionizing radiation has on women and girls, putting them, and future generations, at far greater risk than men and boys, a near ten-fold difference across the human life-span. Through her pioneering research³ she has discovered that women are 50% more likely than men to develop cancer or die after being exposed to the same level of ionizing radiation, a significant finding as we often find women's voices absent from disarmament discussions. The UN treaty text (a work in progress) notes that "the catastrophic consequences of nuclear weapons ... have a disproportionate impact on women and girls, including as a result of ionizing radiation".

The second panel, *The Road Back to the Nuclear Brink*, included speakers Matthew McKinzie, Natural Resources Defense Council; Hans Kristensen, Federation of American Scientists; Tilman Ruff, International Physicians for the Prevention of Nuclear War; and Arjun Makhijani, Institute for Energy and Environmental Research, who discussed the threats posed by nuclear weapons' targeting capability upgrades to international security.

Nuclear weapons states have begun modernizing their arsenals⁴ at a rapid pace, some of these nuclear weapons are "capable of being launched within ten minutes," (Mathew McKinzie) significantly increasing the world's vulnerability to human error and/or technological malfunctions that could result in destruction far greater than anything we've witnessed in human history.

Physicians, scientists, and other nuclear experts have been at the helm of treaty negotiations and their evidence overwhelmingly proves the production, testing, and use of nuclear weapons causes irreparable harm to humanity.

"There is groundbreaking scientific analysis showing that using less than half a percent of today's nuclear arsenals (less than a tenth of a percent of their total yield) on cities would cool, darken and dry the surface of the whole planet, decimating agriculture and putting billions in jeopardy from starvation. Britain, France, China, Israel, India and Pakistan have smaller arsenals, but even these pose a global threat," Dr. Tilman Ruff emphasized.

The overwhelming international support the Prohibition of Nuclear Weapons treaty has received assures us all that this treaty has the power to delegitimize nuclear weapons, while legitimizing the humanity of communities effected by nuclear weapons.

– *Jasmine Bright, Nuclear Information and Resource Service*

1. Working (non-final) version of the treaty text: www.reachingcriticalwill.org/images/documents/Disarmament-fora/nuclear-weapon-ban/documents/CRP1-Rev1.pdf
2. www.nirs.org/wp-content/uploads/2017/06/NIRS-IEER-Draft-Ban-Treaty-Statement-F.pdf
3. www.nirs.org/category/radiation/health-effects/
4. www.nirs.org/wp-content/uploads/2017/06/At-UN-Press-Briefing-Experts-Explain-Why-A-Treaty-Banning-Nuclear-Weapons-Is-In-the-Works-and-What-It-Could-Achieve.pdf

Urenco enrichment consortium to help US nuclear weapons program

The German-Dutch-British uranium enrichment company Urenco is to support the US nuclear weapons program in tritium production, German public television's Tagesschau news has reported. According to the Tagesschau, Urenco was contracted in May to supply low enriched uranium from its plant in New Mexico to the US power utility TVA.

TVA's two nuclear power stations 'Watts Bar' and 'Sequoyah' are to be supplied to the value of US\$500 million. These plants not only produce electricity but in normal operation also tritium, which is needed for the constant routine maintenance of US nuclear bombs. Tritium is a radioactive isotope of hydrogen with a half-life period of only 12 years.

Because the US no longer has a military uranium enrichment plant of its own – or any enrichment plant at all – this means Urenco is keeping the US nuclear weapons program going. That would be a clear breach of the Treaty of Almelo which allows Urenco to deliver enriched uranium only for civilian purposes.

The "joint committee" governing Urenco, comprising representatives of the German, Dutch and British governments, has failed completely, German anti-nuclear activists charge.

The convoluted, disingenuous justification is that tritium is a 'by-product material' and not a 'special nuclear material' if produced in reactors used 'principally' to produce electricity.

– *Diet Simon*

More information:

– 19 May 2017, 'US nuclear weapons: Military tritium with support from URENCO?', www.hubertus-zdebel.de/?p=6186

– John R. Harvey and Franklin C. Miller, 6 March 2017, 'Commentary: The looming crisis for US tritium production', www.defensenews.com/articles/white-house-trade-adviser-deficit-undermines-us-security

– United States Government Accountability Office, Oct 2014, 'Department of Energy: Interagency Review Needed to Update U.S. Position on Enriched Uranium That Can Be Used for Tritium Production Report to Congressional Requesters', www.gao.gov/assets/670/666505.pdf

Laka Foundation releases IAEA's complete list of accidents

Earlier this month, the Laka Foundation released a list of almost 1,000 incidents, accidents and near-misses at nuclear power plants and other nuclear facilities.¹ Accidents and technical and human errors are reported by national nuclear regulatory agencies to the International Atomic Energy Agency (IAEA). But the IAEA only releases reports from the previous twelve months to the public.² After twelve months, accident reports are hidden from the IAEA website.

By releasing the full IAEA list with all reported incidents and accidents since 1990, Laka, an Amsterdam based research group on nuclear energy, makes this safety-relevant information accessible.

1. www.laka.org/docu/ines/

2. www-news.iaea.org/EventList.aspx?ps=100

Pro-nuclear environmentalists' prescription for world peace ... nuclear power

James Hansen and numerous other self-styled pro-nuclear environmentalists have written to political leaders in the US, South Korea and North Korea advocating a "new framework" involving support for the development of nuclear power in North Korea in return for North Korea accepting IAEA inspections of its nuclear program, ending its missile tests and limiting its nuclear arsenal.

The "new framework" is much the same as the old 1994 Agreed Framework ... which was a complete failure. If the power reactors had been completed before North Korea terminated IAEA safeguards during the collapse of the Agreed Framework, those reactors might now be used for weapons production in addition to North Korea's small 'experimental power reactor' and its enrichment program. Other reasons to reject the proposal include the possibility that reactors in both North and South Korea could be deliberately or inadvertently struck in the event of military conflict.

1 June 2017, 'US-Korea Letter', www.environmentalprogress.org/us-korea-letter

Resistance Camp, August 7–16, Gedelitz/Wendland

The Resistance Camp will involve workshops and an action day on the subject of nuclear waste, nuclear transports, uranium mining and human rights. We hope to live the integration of the issues and activists of the Wendland and to carry out some networking covering all continents and issues.

The people around Gorleben, Germany, have experienced 40 years full of anti-nuclear resistance against the plans of the atomic industry. The temporary nuclear waste disposals threaten to become permanent disposals. The nuclear power plants continue to produce nuclear waste and the German nuclear industry is still allowed to supply fuel rods to nuclear power plants on a worldwide scale.

Joint actions will take place at the nuclear facilities on Saturday, August 12, from 11am.

Website: www.bi-luechow-dannenberg.de/summercamp

Contact: summercamp-info@bi-luechow-dannenberg.de

Symposium on Human Rights, Future Generations & Crimes in the Nuclear Age

A Symposium on Human Rights, Future Generations & Crimes in the Nuclear Age will be held at the University of Basel, Switzerland on 14-17 September 2017. Organizers include the Uranium Network and the Swiss chapter of the International Physicians for the Prevention of Nuclear War. The Symposium program and other details are posted at www.events-swiss-ippnw.org

– Akio Matsumura

WISE/NIRS Nuclear Monitor

The World Information Service on Energy (WISE) was founded in 1978 and is based in Amsterdam, the Netherlands.

The Nuclear Information & Resource Service (NIRS) was set up in the same year and is based in Washington D.C., US.

WISE and NIRS joined forces in the year 2000, creating a worldwide network of information and resource centers for citizens and environmental organizations concerned about nuclear power, radioactive waste, proliferation, uranium, and sustainable energy issues.

The WISE / NIRS Nuclear Monitor publishes information in English 20 times a year. The magazine can be obtained both on paper and as an email (pdf format) version. Old issues are (after 2 months) available through the WISE homepage: www.wiseinternational.org

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Contact us via:

WISE International
PO Box 59636, 1040 LC Amsterdam, The Netherlands

Web: www.wiseinternational.org

Email: info@wiseinternational.org

Phone: +31 20 6126368

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