

# 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:

- We write about Vietnam's decision to abandon plans to introduce nuclear power, and the dim prospects for nuclear power in other south-east Asian countries.
- Vladimir Slivyak writes about the promotion of nuclear power at the recent UN climate conference in Morocco.
- We update the fast-moving story about whether South Australia might set itself up as the world's dump for high-level nuclear waste.

The Nuclear News section has reports on the US EPA's attempts to weaken guidelines on radiation in drinking water; a stinging attack on Engie Electrabel by Belgium's nuclear regulator; delays facing China's nuclear program; a critique of Westinghouse's AP1000 reactor design; a critical report by Canada's Office of the Auditor-General on the performance of the nuclear regulator; and an overview of recent debates about depleted uranium.

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.

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## Vietnam cancels nuclear power program

**Author:** *Jim Green* – Nuclear Monitor editor

**NM834.4600** Let's first imagine how this story might have unfolded, if the nuclear industry had its way. Construction would be underway on Vietnam's first nuclear power plant, and plans would be in train to build a total of 14 reactors by 2030. Russia would be building Vietnam's first reactor, giving it a foothold in south-east Asia (where it has nuclear cooperation agreements with seven countries). Japan and South Korea would also be gearing up to build reactors in Vietnam, a fillip for their troubled domestic nuclear industries and their ambitions to become major nuclear exporters. US nuclear vendors would also be heavily involved, salivating at the US Department of Commerce's estimate of US\$50 billion (€47.4 bn) of contracts for nuclear plants in Vietnam by 2030.

It hasn't unfolded like that. On November 22, Vietnam's National Assembly voted in support of a government decision to cancel plans to build nuclear power plants. An immense amount of resources have been wasted on the nuclear program over several decades. Nuclear vendor countries will have to look elsewhere for business. They will continue to try their luck in south-east Asia but they are wasting their time: not a single power reactor is in operation or being built in the region and none will be built in the foreseeable future.

First, a brief history of Vietnam's nuclear program:<sup>1</sup>

1958 Vietnam acquires a research reactor under the US Atoms for Peace program. It was dismantled by the US as the Vietnam / Second Indochina War escalated.

1976: Vietnam Atomic Energy Commission formed.

Early 1980s: Two preliminary nuclear power studies are undertaken.

1995: A study concludes that nuclear power should be introduced around the year 2015.

2006: The government announces that a 2 gigawatt (GW) nuclear power plant should be online by 2020. This target is confirmed in a plan approved by the government in August 2007, along with a target of 8 GW by 2025.

2008: An Atomic Energy Law is passed by the National Assembly.

2009: The National Assembly approves a resolution on investments for nuclear power plants in Ninh Thuan province.

2010: The government announces plans to build 14 nuclear reactors (15 GW) at eight sites in five provinces by 2030 (about 10% of total electricity generation), and outlines an aspiration to increase the nuclear share to 20–25% by 2050.

2010: Vietnam signs an intergovernmental agreement with Russia for the construction of two reactors (later increased to four) in Ninh Thuan province. Construction is to begin in 2014 and the first reactor is to be commissioned and connected to the grid by 2020. Russia's Ministry of Finance will provide loans covering at least 85% of the cost (in November 2011, an agreement for a US\$8 billion loan was signed). Progress is slow in the following years.

2010: An intergovernmental agreement with Japan is signed envisaging the construction of two reactors to come online in 2024–25, also in Ninh Thuan province. The International Nuclear Energy Development of Japan consortium will build the reactors, and the Japanese Ministry of Economy, Trade and Industry will provide financing and insurance for up to 85% of the total cost. Progress is slow in the following years.

2011: The government issues a master plan envisaging eight reactors at the two plants in Ninh Thuan, one reactor coming online each year from 2020–27, followed by two more in 2029.

2012: South Korea and Vietnam announce plans for a feasibility study for the construction of four Korean APR-1400 nuclear reactors, and sign an intergovernmental nuclear cooperation agreement.

A nuclear cooperation agreement was signed with Russia in 2002, and since 2006, others have been signed with France, China, South Korea, Japan, the US and Canada.

Numerous utilities express interest in constructing reactors in Vietnam: Atomstroyexport (Rosatom / Russia), JINED (the Japanese consortium), Westinghouse (Japan/US), GE (US), EDF (France), KEPCO (South Korea), and China Guangdong Nuclear Power Group.

2014: Ground breaking ceremony at the Ninh Thuan 1 (Russian) site. But the Vietnamese government says the project will be delayed for up to four years, due to continuing negotiations on technology and financing.

By 2015, the start-up date for the first reactor has been pushed back another four years, to 2028.

Early 2016: A revised National Electricity Development Plan confirmed the 2028 delay for Ninh Thuan 1, and reduced the 2030 nuclear target from 10.1% of electricity generation in the original plan down to 5.7%.<sup>2</sup>

## 2016 cancellation

On November 10, Duong Quang Thanh, CEO of state-run Electricity of Vietnam, said the government would propose the cancellation of plans for reactors at the two Ninh Thuan sites to the National Assembly. He added that nuclear power was not included (or budgeted for) in the power plan which runs until 2030 and had already been approved by Prime Minister Nguyen Xuan Phuc.<sup>3,4</sup> The National Assembly voted on November 22 to support the government's decision to abandon plans to build nuclear power plants.<sup>5</sup>

Energy analyst Mycle Schneider said: "Vietnam is only the latest in a long list of countries, including more recently Chile and Indonesia, that have postponed indefinitely or abandoned entirely their plans for nuclear new-build."<sup>6</sup>

The decision to abandon nuclear power was primarily based on economics. Duong Quang Thanh said nuclear power is "not economically viable because of other cheaper sources of power".<sup>4</sup>

Le Hong Tinh, vice-chair of the National Assembly Committee for Science, Technology and Environment, said the estimated cost of four reactors at the two sites in Ninh Thuan province had nearly doubled to VND400 trillion (US\$18 bn; €17.9 bn). The estimated price of nuclear-generated electricity had increased from 4–4.5 US cents / kwh to 8 cents / kwh. Vietnam has spent millions of dollars on the project so far, Tinh said, but continuing the program would add more pressure to the already high public debt.<sup>7</sup>

Another media report states that Japanese and Russian consultants said that the cost has escalated from the original estimate of US\$10 billion to US\$27 billion (€9.5–25.6 bn). "The plants will have to sell power at around 8.65 cents a kWh, which is almost twice the rate approved in the project license and is not competitive at all," according to the *VN Express* newspaper.<sup>8</sup>

Vietnam's rising public debt, which is nearing the government's ceiling of 65% of GDP, was another reason for the program's cancellation, said Cao Si Kiem, a National Assembly member and former governor of the central bank.<sup>8,9</sup>

Another factor is that electricity demand is growing but not as rapidly as previously estimated. Duong Quang Thanh from Electricity of Vietnam said: "The latest survey predicted that power growth rate will be at 11% in the 2016–2020 period and fall to 7–8% in the 2021–2030 period. So there will be no power shortage in the country in the near future."<sup>3</sup>

Safety concerns have also influenced the decision to cancel the nuclear program. Tran Huu Phat, former head of the Vietnam Institute of Atomic Energy, said that Vietnam was not ready for project implementation

and that the Atomic Energy Law need amendments. He said: "The labor force is not prepared to ensure legal enforcement and operate a nuclear power plant. The Department of Radiation and Nuclear Safety, the agency which plays the most important role in state management, has not been ready yet, at least for the next five years."<sup>10</sup>

Vuong Huu Tan, the head of Vietnam's nuclear regulator, the Agency for Radiation and Nuclear Safety (VARANS), said in early 2016 that there remains much work to do, that Vietnam does not have clear regulations for agencies to inspect and examine the safety of nuclear power plants, and that nuclear power management was not licensed and was not an independent entity in accordance with international norms.<sup>11</sup>

The World Nuclear Association notes that the regulator VARANS is under the Ministry of Science and Technology, as is the Vietnam Atomic Energy Commission.<sup>1</sup>

Michiko Yoshii, a professor at Mie University in Japan, said in 2014 that concerns about nuclear safety in Vietnam became much more deep-rooted after the Fukushima disaster. "The former head of the [Vietnamese] national nuclear energy research institute called for a 10-year delay in the construction plan from the standpoint of safety and the lack of human resources," she said. "Quan, the science minister, has also repeatedly said the development of human resources would not keep pace with the construction plans."<sup>12</sup>

The absence of any clear pathway for the disposal of nuclear waste also influenced the decision to abandon the nuclear program.<sup>13,14</sup> Le Hong Tinh from the National Assembly Committee for Science, Technology and Environment said: "Nuclear waste always poses environmental threats, even for developed countries which boast good technology for this waste treatment."<sup>7</sup>

Russia offered to accept spent fuel for reprocessing but separated wastes would be returned to Vietnam "eventually" according to the World Nuclear Association.<sup>1</sup>

### Opportunity costs

It's impossible to quantify, but large amounts of time and resources have been wasted on Vietnam's perpetually stalled nuclear power program over several decades. The opportunity costs are all the greater because Vietnam is a developing country that can ill-afford to waste money and human resources on a failed project.

One aspect of the wastage is that hundreds of students have been trained to prepare for the nuclear power program. In 2014, 344 Vietnamese undergraduate and

graduate students were studying in Russia to prepare for the nuclear program, and 150 Vietnamese engineers were helping with the construction of the Rostov nuclear plant in Russia.<sup>1</sup> A much smaller number of students were sent to Japan.<sup>15</sup>

Le Hong Tinh from the National Assembly Committee for Science, Technology and Environment said that people trained for the nuclear program can be used for other power programs in Vietnam.<sup>7</sup> Perhaps so, to some extent, but resources will nonetheless have been wasted. Commenting on the decision to cancel the nuclear program, Tinh said that "this is a big lesson for us in energy development planning and forecast."<sup>7</sup>

### Vietnam's electricity mix

In 2013, Vietnam produced 127 terawatt-hours (TWh) gross of electricity, mostly from hydro (45%), gas (34%), and coal (20%).<sup>1</sup>

There is some scope for new hydro plants, but many available sites are already being exploited. A March 2016 media report states that the government plans to reduce reliance on hydro following a review of hundreds of existing and planned hydro plants. The review came after media reports that in central Vietnam, crops and houses were damaged and floods were worsened by water released without notice from hydropower dams.<sup>16</sup>

In mid-2016, the government increased the target for non-hydro renewables from 5.6% by 2020 to 9.9%.<sup>17</sup>

In addition to existing small solar systems, Quang Nam Province is working with investors to build the country's first large-scale (100 MW) solar plant at an estimated cost of US\$140 million.<sup>18</sup>

Wind power is growing, albeit from a low base.<sup>19,20,21</sup> Around 20 wind power plants are operating – including a large plant in Binh Thuan province with 99 MW capacity – and dozens more are planned. Vietnam's Ministry of Industry and Trade estimates the country's total land-based wind power capacity at 513 GW, which is 10 times greater than currently installed capacity from all sources.

A May 2016 report by WWF-Vietnam and Vietnam Sustainable Energy Alliance (VSEA) finds that 100% of Vietnam's power can be generated by renewable energy technologies by 2050.<sup>22</sup> There are many available renewable power sources in Vietnam including solar, wind, geothermal heat, biomass and ocean energy. The report contrasts three scenarios: business as usual (with only modest growth of renewables), a Sustainable Energy Scenario (81% renewable power generation by 2050) and an Advanced Sustainable Energy Scenario (100%).

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## Nuclear power in south-east Asia ... or not

**NM834.4601** A 2015 International Energy Agency report anticipates that nuclear power will account for just 1% of electricity generation in south-east Asia by 2040.<sup>1</sup> The report states: "All countries in Southeast Asia that are interested in deploying nuclear power face significant challenges. These include sourcing the necessary capital on favourable terms, creation of legal and regulatory frameworks, compliance with international norms and regulations, sourcing and training of skilled technical staff and regulators, and ensuring public support. ... The limited role for nuclear can be explained by the high upfront capital costs, limited access to financing, and uneven and tepid public support in the wake of the Fukushima Daiichi nuclear accident. Public opposition has been especially evident in Indonesia, Malaysia, Philippines and Thailand."

A June 2016 media article began: "Rosatom, Russia's state nuclear-energy agency, is bullish on the outlook of its business in Southeast Asia after the speedy development of a project in Vietnam and a range of agreements with every country in the region except Singapore, the Philippines and Brunei."<sup>2</sup> Nikolay Drozdov, director of Rosatom's international business department, said Rosatom is focusing a lot of attention on south-east Asia, reflected by the decision to establish a regional headquarters in Singapore.<sup>2</sup>

Russia has nuclear cooperation agreements with seven countries in south-east Asia – Vietnam, Indonesia, Malaysia, Thailand, Cambodia, Myanmar and Laos. But not one of those seven countries – or any other country in south-east Asia – has nuclear power plants (the

only exception is the Bataan reactor in the Philippines, built but never operated) and not one is likely to in the foreseeable future.<sup>3,4</sup> Nor are other nuclear vendors likely to succeed where Russia is failing.

Drozdov said that after the (stalled) nuclear power project in Vietnam, Indonesia and Malaysia would likely be the next countries in the region to develop nuclear power.<sup>2</sup> But Indonesia's situation is much the same as Vietnam's – decades of wasted efforts with little to show for it (and the same could be said about Thailand). Malaysia's consideration of nuclear power is preliminary.

Why would Russia be making such efforts in south-east Asia given that nuclear power prospects in the region are so dim? The answer may lie with domestic Russian politics. Given Rosatom's astonishing industry in lining up non-binding nuclear agreements with over 20 countries – 'paper power plants' as Vladimir Sliviyak calls them – we can only assume that such agreements are looked on favorably by the Russian government.<sup>5</sup>

Sliviyak writes: "These 'orders' are not contracts specifying delivery dates, costs and a clear timescale for loan repayments (in most cases the money lent by Russia for power plant construction comes with a repayment date). Eighty to ninety per cent of these reported arrangements are agreements in principle that are vague on details, and in the overwhelming majority of cases the contracts aren't worth the paper they're printed on. ... So it is clear that [former Rosatom head Sergey] Kirienko's team has been excellent at drawing up and signing non-binding nuclear agreements ... Actually building nuclear plants seems to be beyond them."<sup>5</sup>

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# Nukes at the UN climate conference in Morocco

**Author:** *Vladimir Sliviyak – co-chair of Ecodefence*

**NM834.4602** The United Nations' COP22 climate conference finished in Marrakech, Morocco last week and there were quite alarming signs with a strong push by the Russian delegation and others to promote nuclear power.

The Russians were quiet at the Moroccan negotiations until Thursday, November 17. Then two events happened on same day. First, the deputy director of Rosatom, Kirill Komarov, and the head of the World Nuclear Association, Agneta Rising, held a joint press conference where they talked mostly about the Russian nuclear experience.<sup>1</sup> They claimed that nuclear power is already saving the climate and has “postponed climate catastrophe for two years”. Rising was nearly screaming into the microphone, calling on all world governments to immediately follow Russia and develop nuclear power right now. They promoted the World Nuclear Association's goal of tripling global nuclear power capacity such that it generates 25% of electricity by 2050.<sup>2</sup>

The press conference was organized in a truly Russian way – very short, three questions allowed and it looked like the three people allowed to ask a question were brought there by Rosatom itself. Then, unexpectedly, UN police showed up and escorted Komarov to the exit. I don't think I've ever seen UN police at a press conference at a UN climate conference before.

Later on November 17, Russia organized a national side-event at COP22 which was formally about Russian strategy for low-carbon development and included Rosatom, an aluminum industry representative and a nanotechnology agency, as well as governmental officials. A lot of funny things were said, but Rosatom was the main player. Rosatom's video showed lots of people hugging each other, smiling and laughing in various countries of the world, as well as a nuclear ice-breaker and a sign: “Rosatom. Energy and More”.

Rosatom's Komarov was again peddling falsehoods at the side-event, including things like Russia having achieved a closed nuclear fuel cycle (not true, spent fuel is mostly in storage with no chance for reprocessing), Russia is building over 70 reactors worldwide right now (not true, about 10% of that figure actually) and lots of other stuff. Any country in the world can order Russian reactors, he said (though few can afford to pay for them and Russia can't afford to build them). A few questions were allowed. A lot of people wanted to ask something from Rosatom but were ignored by the chairman who wanted to close down the side-event as soon as possible. In the end he just said we cannot continue because we

have food and drinks waiting for us outside. The event was in Russian and the translation was quite poor.

After all this, we (five Russians were at COP22 this time, with some Ukrainians supporting us) went to mobilize the environmental community, in particular the Climate Action Network (CAN). As a result, Russia was given CAN's “Fossil of the Day” anti-award on November 17, specifically for promoting nuclear. The award citation read: “The third Fossil of the Day award goes to Russia for promoting nuclear power as a feasible solution to climate change. We all know that this outdated and risky technology is too slow and expensive to contribute to climate efforts – and if deployed it will steal away resources needed to develop renewables. Not to mention the fact that nuclear is not even a zero-emissions technology – it produces massive amounts of greenhouse gases during the uranium enrichment. Then, of course, there is the question of safety. The Russian government really need to take a look at the long-term, widespread consequences of the Fukushima and Chernobyl, for a start.”<sup>3</sup>

The following day, Russia was given “Colossal Fossil” for being the worst offender throughout the COP22 conference and for its poor energy and climate policies. The award citation read: “This year's Colossal Fossil Award goes to Russia for peddling nonsense and generally being a massive drag on ambition. Throughout the UN climate change negotiations in Marrakech, Russia has blindly lobbied for nuclear power deployment, continued to abstain from ratifying the Paris Agreement, and said that they do not see phasing out fossil fuels as an element of their plan to reduce dangerous emissions.”<sup>4</sup>

COP22 may be the beginning of a serious attempt to promote nuclear by Russia jointly with the World Nuclear Association and maybe others. They probably want to recruit new customers among developing countries, even if they don't succeed in securing UN climate funds to subsidize those projects. We have to mobilize for the next COP and other UN climate meetings to put pressure on the Russian delegation.

Industry front groups were noisy at the COP21 conference in Paris last December<sup>5</sup>, and some of them were at Marrakech. ‘Nuclear for Climate’ was one of the front groups promoting nuclear power at both COP21 and COP22.<sup>6</sup> ‘Nuclear for Climate’ calls itself a “grassroots organization” but it is no such thing; it is a front group for more than 140 nuclear societies around the world.

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# Australian nuclear waste import plan dead, revived, dead again ... hopefully.

Author: Jim Green – Nuclear Monitor editor

**NM834.4603** We reported in the last issue of *Nuclear Monitor* that plans to use South Australia (SA) as a dumping ground for around one-third of the world's spent nuclear fuel was all but dead and buried.<sup>1</sup> Since then, the project has been revived by the SA government then buried again (hopefully) by opposition parties.

The first indication of major opposition to the dump plan was on October 15, when 3,000 people participated in a protest at Parliament House in Adelaide, the capital of SA. Then, on November 6, two-thirds of the 350 members of a South Australian government-initiated Citizens' Jury rejected "under any circumstances" the government's plan to import 138,000 tonnes of spent fuel and 390,000 cubic metres of intermediate-level nuclear waste as a money-making venture.

SA Premier Jay Weatherill previously said that he established the Citizens' Jury because he could sense that there is a "massive issue of trust in government". It was expected that when Weatherill called a press conference on November 14, he would announce that no further work would be carried out on the dump plan. But Weatherill instead announced that he wanted to hold a state-wide referendum on the issue, as well as giving affected Aboriginal communities a right of veto over nuclear developments on their land.

However, to hold a referendum enabling legislation would be required and cannot be passed without the support of political parties opposed both to a referendum and also to the nuclear waste import project. Those parties are the main opposition Liberal Party (favored to win the next state election in early 2018), the Nick Xenophon Team and the SA Greens. The conservative Liberal Party and the Nick Xenophon Team had not opposed the nuclear waste import proposal before the Citizens' Jury, and their opposition fundamentally alters the political dynamics of the debate.

Then the Labor Party government announced that it would not seek to repeal or amend the SA Nuclear Waste Storage Facility (Prohibition) Act 2000, which imposes major constraints on the ability of the government to move forward with the nuclear waste import proposal.<sup>2</sup> (Nor will the state government encourage the federal government to repeal laws banning nuclear power, "recognising that in the short-to-medium term, nuclear power is not a cost-effective source of low-carbon electricity for South Australia").

So we're back where we started – the waste import proposal seems to be dead in the water. Nevertheless the state government and SA's Murdoch tabloid, *The Advertiser*, along with some other supporters are fighting a furious rear-guard battle to try to revive the corpse. They are relentlessly attacking and undermining

the credibility of the Citizens' Jury. Those voices of those defending the integrity of the Jury<sup>3</sup> – or pointing to its pro-nuclear biases<sup>4</sup> – are being drowned out by the chorus of criticism in *The Advertiser*.

Supporters of the proposal are being extraordinarily dishonest. A public opinion poll<sup>5</sup> commissioned by the *Sunday Mail* (the sister paper of *The Advertiser*), found that 35% of South Australians support the waste import proposal. Instead of reporting that result honestly – by noting that non-supporters outnumber supporters by almost two to one – the *Sunday Mail* conflated responses to two different questions and claimed: "Majority support for creating a nuclear industry in South Australia is revealed in an extensive Sunday Mail survey of public opinion, in a rebuff to moves to shut down further study of a high-level waste dump."<sup>6</sup>

Another example of blatant dishonesty concerned a Community Views Report reflecting a state-wide consultation process.<sup>7</sup> The Premier cherry-picked and misrepresented that report, claiming that it found a 43:37 margin in favor of further consideration of the waste import proposal. In fact, the consultation process found that 4365 people were opposed to further consideration of the proposal while only 3032 supported further consideration.<sup>8</sup>

The Premier completely ignored the other findings of the Community Views Report:

- 53% of respondents opposed the plan to import high-level nuclear waste while just 31% supported the plan;
- over three-quarters of Aboriginal respondents opposed the plan;
- only 20% of respondents were confident that nuclear waste could be transported and stored safely, while 70% were not confident;
- the number of people confident in the government's ability to regulate any new nuclear industry activities in SA (2125 people) was barely half the number who were not confident (4190 people);
- only 20% of respondents were confident that the government would consider community views while 70% were not confident; and
- 66% per cent of respondents were not confident that a nuclear waste import project would bring significant economic benefits to SA.

The state government and the Murdoch press have also been lying about an economic report<sup>9</sup> commissioned by a Parliamentary committee. The report, written by Nuclear Economics Consulting Group (NECG), was asked to evaluate an earlier study commissioned by a state

government-initiated Royal Commission. According to the *Sunday Mail*, the NECG report “backed Royal Commission findings that a nuclear dump could create A\$257 billion [US\$190 bn; €180 bn] in revenue for South Australia.”<sup>10</sup>

But the kindest thing the NECG report had to say was that the waste import project *could* be profitable *under certain assumptions*, and the NECG report then raises serious questions about most of those assumptions. The NECG report notes that the Royal Commission’s economic analysis didn’t even consider some important issues which “have significant serious potential to adversely impact the project and its commercial outcomes”; that assumptions about price are “overly optimistic” and if that is the case “project profitability is seriously at risk”; that the 25% cost contingency for delays and blowouts is likely to be a significant underestimate; and that the assumption the project would capture 50% of the available market had “little support or justification”.

SA Liberal Party economic spokesperson Rob Lucas said: “This [NECG] report is a severe embarrassment for Mr Weatherill as it makes it clear the Weatherill Government leaks to the media on the weekend were selective, deceptive and an attempt to grossly mislead the public.”<sup>11</sup>

How will this debate unfold? In all probability, nuclear waste proponents will, sooner or later, tire of banging their heads against a brick wall – particularly if, as expected, the Liberal Party wins the state election in early 2018. It seems that there is little or no internal dissent to the Liberal Party’s opposition to the dump – most or all Liberal parliamentarians think the project is too much of an economic gamble and/or they see the political advantage in taking a no-dump position to the next state election. That said, the Liberal Party is pro-

nuclear and it cannot be assumed that the party will retain its current no-dump policy.

Unnamed ‘sources’ told the Murdoch press that they plan to approach potential customer countries in an attempt to shore up the economic case (some reports suggest interest from Taiwan).<sup>10</sup> The state government cannot engage in negotiations with potential customers because of the constraints imposed by the SA Nuclear Waste Storage Facility (Prohibition) Act 2000, but private parties can do as they please.

However, potential customer countries will be reluctant to engage in serious discussions given that there is strong public and political opposition in South Australia. As an *Advertiser* journalist noted in May 2016: “The business model only works if there is long-term stability for countries like Japan and Korea, who would become likely sellers. The chance of political upheaval or legal changes in SA over a dump would spook any responsible country, and lead them to make other arrangements.”<sup>12</sup>

In the event that the Liberal Party backflips on its current no-dump policy, the SA Nuclear Waste Storage Facility (Prohibition) Act 2000 is amended or repealed, and a credible business case is developed including agreements with potential customer countries, then there is still the issue of the promised right of veto for affected Aboriginal Traditional Owners. Yet the Premier has acknowledged the “overwhelming opposition of Aboriginal people” and he should therefore abandon any further attempts to pressure Aboriginal people into accepting a high-level nuclear waste dump.

*Aboriginal people in South Australia are seeking international organizational endorsements for their statement of opposition:*  
[www.anfa.org.au/sign-the-declaration/](http://www.anfa.org.au/sign-the-declaration/)

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# NUCLEAR NEWS

## **US: Please act to stop EPA's new radiation guidance for drinking water**

Diane D'Arrigo, Radioactive Waste Project Director with the Nuclear Information and Resource Service, writes:

In July, thousands took action to stop dangerous new radiation guidance for drinking water. The US Environmental Protection Agency (EPA) refused to listen, and now this guidance could be approved anytime – unless we act now!

EPA Administrator Gina McCarthy is on the verge of approving radiation levels hundreds and thousands of times higher than currently allowed in drinking water and at cleaned-up Superfund sites. These mis-named "Protective" Action Guides for Drinking Water (Water PAGs) dramatically increase allowable radioactivity in water. Enormous levels of radioactive contamination would be permitted in drinking water for weeks, months or even years after a nuclear accident or "incident."

The PAGs are not for the immediate phase after a radioactive release but the next phase – which could last for years – when local residents may return home to contaminated water and not know the danger.

EPA is expanding the kinds of radioactive 'incidents' that would be allowed to give off these dangerously high levels and doses. PAGs originally applied to nuclear disasters like the nuclear power meltdowns at Fukushima or a dirty bomb but now they could also apply to less dramatic releases from nuclear power reactors or radiopharmaceutical spills, nuclear transport accidents, fires or any radioactive "incident" that "warrant[s] consideration of protective action."

These PAGs are a bad legacy. Approving them now is a deceptive way to circumvent the Safe Drinking Water Act, Superfund cleanup levels, and EPA's history of limiting the allowable risk of cancer to 1 in a million people exposed (or at most 1 in 10,000 in worst-case scenarios).

The PAGs don't just affect water, they also markedly relax long-term cleanup standards; set very high and outdated radiation levels allowable in food; eliminate requirements to evacuate people vulnerable to high radiation doses to the thyroid and skin; eliminate limits on lifetime whole body radiation exposures; and they recommend dumping radioactive waste in municipal garbage dumps not designed for such waste.

Please take action now to protect drinking water from dangerous radiation levels! There are two quick actions to take:

- Tell EPA Regional Administrator to ask EPA Administrator Gina McCarthy why she is raising radiation levels allowed in drinking water.
- Send a message to Administrator McCarthy asking her not to approve these dangerous radiation levels in drinking water.

To take action, please visit [www.tinyurl.com/epa-water-action](http://www.tinyurl.com/epa-water-action)

We have stopped PAGs like these from being approved before – and we can do it again. EPA insiders attempted to push these dangerous guides through in the waning days of the Bush administration, and public pressure like this got the agency to pull them back. Now we have to do it again!

For more information, contact Diane D'Arrigo at NIRS: [dianed@nirs.org](mailto:dianed@nirs.org)

## **Belgium: Regulator says Engie Electrabel is 'shameless' over lax nuclear safety standards**

The Director-General of the Belgium nuclear regulator FANC condemned Engie Electrabel, the owner of the Doel and Tihange nuclear power plants. According to FANC director Jan Bens, once director of an Electrabel nuclear power station himself, the company is far too lax in tackling several safety issues. Electrabel promised, once more, improvements.

The FANC director expressed his discord towards Engie Electrabel in two harsh letters, which the French newspaper *La Libre* got hold of. The first letter (July 2016) concerns a study of fire safety in Doel and Tihange. According to Bens, Electrabel doesn't take the mandatory study seriously and this indictment of the company's lax attitude shows extreme impertinence.

In a second letter in September, Bens shows his concern about inadequate safety standards in Tihange. And this is not the first time. Several months ago, FANC rapped the board of directors on the knuckles because of a complacent company culture and tolerating inadequate safety standards. Personnel ignored safety regulations and procedures constantly. Often incidents were not discovered or reported, which they are legally required to do. Therefore FANC filed a complaint with the court system.

Electrabel promised improvements. But little came of it, hence the harsh words from Bens. In his letter he condemns Electrabel's inability, for over a year, to react structurally, quickly and efficiently to significantly increase safety standards. It became clear during a recent FANC inspection of the Tihange plant that an earlier action plan to improve safety standards was only partly implemented.

The two letters are ammunition for the growing opposition of organisations and governments that want to – at least – see the closure of Doel 3 and Tihange 2 (the reactors with cracks in their pressure vessels) as soon as possible. Among them, concerned local Dutch governments, the federal German government and the German community in Belgium.

Engie Electrabel responded by saying that they take FANC's suggestions "very seriously."

– *Werner Rommers, www.nieuwsblad.be/cnt/dmf20161119\_02580631. Translated by Thessa Meijlis / WISE Amsterdam.*

## **Belgium: Legal action to close Tihange 2 reactor**

Some 90 municipalities from border regions in Germany, the Netherlands and Luxembourg are taking legal action to have the nuclear plant Tihange 2 (Liège) closed. They are making preparations to take energy suppliers Electrabel, who manage the plant, and the Belgian nuclear watchdog FANC to court, according to press reports in *De Standaard*, *Het Nieuwsblad* and *Het Belang van Limburg*.

The recent spate of ominous reports on Tihange 2 has been sparking unrest and major concerns in Belgium's neighboring countries for several months. Now, it turns out they are preparing legal action to have Tihange 2 taken offline. Enough is enough, is the argument.

Tihange 2 has made the headlines various times as the reactor vessel contains many small cracks. This has mainly sparked concerns in the Aachen region in western Germany and in the Dutch Limburg region. A study by the Vienna Institute of Safety and Risk Sciences shows that these regions, apart from Belgium, are exposed to major risk in the case of a nuclear accident. Large parts of Dutch Limburg province – 50–60% – would become inhabitable. For Aachen this is 10%.

Local municipalities have decided they can't take this risk, labelling it as "unacceptable". Professor Wolfgang Renneberg, head of the German nuclear watchdog, says that the doubts surrounding the safety of the reactor vessels in Doel 3 and Tihange 2 haven't been eliminated.

Tihange 2 was offline for months to allow research into the problem, but was deemed safe enough to be restarted by the regulator FANC.

<http://deredactie.be/cm/vrtnieuws.english/News/1.2810262?devicetype=mobile>

## **China's nuclear roll-out facing delays**

China may scale down plans for nuclear power because of slowing demand for electricity and construction setbacks, writes Steve Thomas, emeritus professor of energy studies at the University of Greenwich, London, in *China Dialogue*. Key points are summarized here:

For China's nuclear industry, 2016 has been a frustrating year. So far, construction has started on only one new plant, and its target of bringing 58 gigawatts of nuclear capacity in service by 2020 seems impossible to meet.

In 2015, nuclear power accounted for only 3% of China's electricity and at any plausible rate of building nuclear plants, it is unlikely that nuclear would achieve more than 10% of China's electricity supply. The challenge for the Chinese nuclear industry is to do what no other nuclear industry worldwide has been able to do; to bring the cost of nuclear generation down to levels at which it can compete with other forms of generation, particularly renewables. If it is unable to do this, China cannot afford to carry on ordering nuclear plants and nuclear will retain a small proportion of the electricity mix.

All the plants started between 2008 and 2010 are online except for six imported reactors. These include four AP1000 reactors designed by Westinghouse, based in the USA but owned by Toshiba of Japan; and two European Pressurised Reactors (EPR), developed by

Areva, a French multinational group specialising in nuclear power. The EPR and AP1000 reactors have been problematic to build. The two EPRs are 3-4 years late although there is little available information detailing why. The four AP1000s are also running 3-4 years late.

Another challenge is the strain placed on China's nuclear regulators in the face of such an ambitious target. The National Nuclear Safety Administration is under particular pressure to oversee the operation of 36 plants and the construction of 20 plants, as well as being the first regulatory authority to review six new designs. A senior official from China's State Nuclear Power Technology Company said in 2015: "Our fatal weakness is our management standards are not high enough." To build up the capabilities to support such a large construction programme a pause in ordering new plants and equipment may be necessary.

*Steve Thomas, 26 Oct 2016, 'China's nuclear roll-out facing delays', [www.chinadialogue.net/article/show/single/en/9341-China-s-nuclear-roll-out-facing-delays](http://www.chinadialogue.net/article/show/single/en/9341-China-s-nuclear-roll-out-facing-delays)*

## **AP1000 reactor design is dangerous and not fit for purpose**

Peter Roche, an energy consultant based in Edinburgh and policy adviser to the UK Nuclear Free Local Authorities, has written a 22-page critique of the AP1000 reactor design. The AP1000 reactor is a pressurized water reactor (PWR) designed and sold by Westinghouse Electric Company, now majority owned by Toshiba.

Construction has so far commenced on ten AP1000s, six in the US and four in China, and another three are scheduled to begin soon. However two of the ten have been suspended, presumed abandoned, and the other eight are all running several years late and hugely over cost. Not one has ever been completed.

Roche summarizes the problems:

"The AP1000 advanced passive nuclear reactor design has a weaker containment, and fewer back-up safety systems than current reactor designs. Conventional reactors rely on defence-in-depth made up of layers of redundancy and diversity – this is where, say, two valves are fitted instead of one (redundancy) or where the function may be achieved by one of two entirely different means (diversity). In contrast advanced passive designs rely much more on natural processes such as natural convection for cooling and gravity rather than motor-driven pumps to provide a backup water supply.

"The AP1000 appears to be vulnerable to a very large release of radioactivity following an accident if there were just a small failure in the steel containment vessel, because the gasses would be sucked out the hole in the top of the AP1000 Shield Building due to the *chimney effect*.

"Recent experience with existing reactors suggests that containment corrosion, cracking, and leakage is more common than previously thought, and AP1000s are more vulnerable to containment corrosion than conventional reactors.

In addition the AP1000 shield building lacks flexibility and so could crack in the event of an earthquake or aircraft impact.

“A thorough review of the AP1000 design in the light of the Japanese accident at Fukushima has shown that:

- Ongoing nuclear fission after a reactor has supposedly been shutdown continues to be the source of significant pressure inside the containment. The AP1000 containment is extraordinarily close to exceeding its peak post accident design pressure which means post accident pressure increases could easily lead to a breach of the containment.
- At least seven ways in which an AP1000 reactor design might lose the ability to cool the reactors in an emergency have been identified. These include damage to the water tank which sits on top of the shield building and some sort of disruption to the air flow around the steel containment.
- The accidents at Fukushima, especially the overheating and the hydrogen explosions in the Unit 4 Spent Fuel Pool showed that the calculations and assumptions about the AP1000 Spent Fuel Pond design were wholly inadequate.
- Fukushima showed that when several reactors share a site an accident at one reactor could damage other reactors. In the AP1000 the water tank on top of the reactor, and the shield building could be vulnerable to damage.
- Westinghouse assumes that there is zero probability of an AP1000 containment breach. But the accidents at Fukushima have shown that there is a high, probability of Containment System failure resulting in significant releases of radioactivity directly into the environment.”

Pete Roche, Nov 2016, ‘The AP1000 Nuclear Reactor Design’, [www.theecologist.org/\\_download/402328/ap1000-report.pdf](http://www.theecologist.org/_download/402328/ap1000-report.pdf)

Peter Roche, 21 Nov 2016, ‘AP1000 reactor design is dangerous and not fit for purpose’, [www.theecologist.org/blogs\\_and\\_comments/commentators/2988356/ap1000\\_reactor\\_design\\_is\\_dangerous\\_and\\_not\\_fit\\_for\\_purpose.html](http://www.theecologist.org/blogs_and_comments/commentators/2988356/ap1000_reactor_design_is_dangerous_and_not_fit_for_purpose.html)

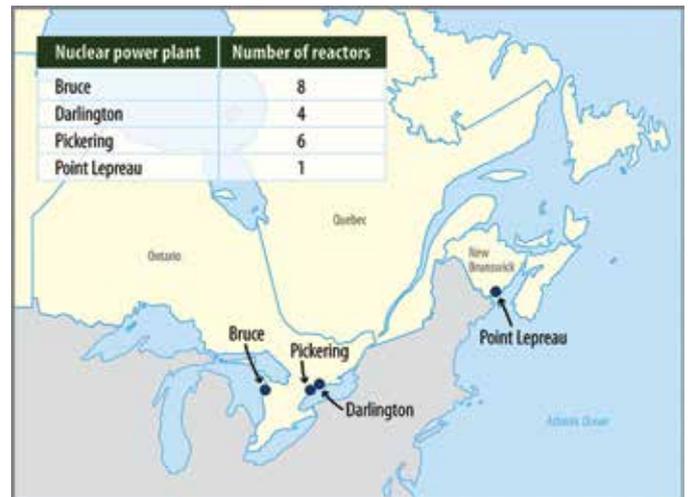
### Canada: Auditor slams nuclear regulator

Canada’s Commissioner of the Environment and Sustainable Development, part of the Office of the Auditor-General, has released a damning report following its ‘performance audit’ of the country’s nuclear regulator, the Canadian Nuclear Safety Commission (CNSC).<sup>1</sup>

Some of the report’s findings were as follows:

*“We concluded that the CNSC could not show that it had adequately managed its site inspections of nuclear power plants. The CNSC could not demonstrate that its inspection plans included the appropriate number and types of inspections and that it had the staff needed to verify that nuclear power plants were complying with all applicable requirements or that site inspections were carried out according to the CNSC’s procedures.*

*“Overall, we found that the Canadian Nuclear Safety Commission (CNSC) had insufficient or incomplete documentation to support or explain its planning decisions. For example, it could not show how it had taken risks into account when making decisions about*



*which inspections it would and would not carry out each year. The CNSC could not show that it had determined the minimum number and types of inspections needed to verify that nuclear power plant operators were complying with regulatory and licensing requirements.*

*“Overall, we found that the Canadian Nuclear Safety Commission (CNSC) could not show that inspectors always followed CNSC procedures when carrying out and documenting inspections of nuclear power plants. This has led to inconsistencies, gaps in documentation, and missed opportunities for identifying improvements in conducting inspections. For example, although the CNSC requires that inspection guides be developed and approved before inspections take place, we found that this was done for only one quarter of inspections during the 2013–14 and 2014–15 fiscal years.”*

Commenting on the CNSC’s inadequate and irregular safety inspections, Commissioner of the Environment and Sustainable Development Julie Gelfand, who has a background in the mining industry, told a press conference: “I think it’s pretty serious. This kind of lack of precision in a precision industry I think is really not acceptable. These mistakes should not happen when we’re dealing with nuclear power plants.”<sup>2</sup>

On a positive note, the Commissioner’s report found that CNSC “followed up on instances of non-compliance identified through site inspections and confirmed that the nuclear power plants involved had taken corrective action or were in the process of doing so.”

The report notes that previous audits have also found fault with the CNSC. An audit in the year 2000 found that “the CNSC’s regulatory activities were not based on a rigorous, well-documented system of risk analysis; the ratings it assigned for regulatory performance were unclear; and the compliance and enforcement system was not complete. As a result, the CNSC could not adequately demonstrate that it was achieving its safety objectives for the regulation of nuclear power reactors.”

An audit in 2005 noted satisfactory progress in response to the recommendations from the December 2000 audit but “progress had been slower than planned in developing a formal, well-articulated, systematic risk-management approach to the regulation of nuclear power reactors.”

As we reported in *Nuclear Monitor* #827 in July 2016, whistleblowers at the Canadian Nuclear Safety Commission released a letter detailing allegations of inadequate safety standards.<sup>3</sup> Writing anonymously, because of inadequate whistleblower protections, the experts point to five separate cases in which the commission's staff sat on relevant information about risk or non-compliance that might have called the safety of a nuclear plant into question. They say nuclear hazards have been underestimated, plant operators have been permitted to skip requirements of the licensing regime, and assessments outlining what could happen in the event of a major nuclear disaster have been withheld from the commissioners and the public.

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## UN General Assembly's First Committee votes on DU

On November 1, 146 states voted in the UN General Assembly's First Committee in favour of the sixth resolution on DU weapons since 2007.<sup>1,2</sup> This year's text paid particular attention to the technical difficulties that affected states face in tackling DU contamination to internationally recognized radiation protection standards.

Just four states voted against the text, which will be voted on again by the General Assembly in early December. The US, UK, France and Israel remain the only four governments to continuously oppose the resolutions, while 26 states abstained.

The resolution also took note of the ongoing concerns from states such as Iraq, and from health experts and civil society over the effects of the weapons on civilians. With the vote coming a week since the US admitted firing DU in Syria in 2015<sup>3</sup>, concern over the health and environmental consequences of the use of the weapons is once again on the international agenda.

In October, the International Coalition to Ban Uranium Weapons and PAX released an analysis of declassified military data showing that the US military ignored its own guidelines for the use of DU ammunition in the 2003 Iraq War, firing the DU weapons at unarmoured targets, buildings in populated areas and troops.<sup>4</sup> The data also tripled the number of sites known to be contaminated in Iraq to more than 1,000. While the UK released information to the UN on where it fired 1,900kg of DU, the US is still withholding data on where it fired 62,000kg of the weapons. This is hampering clearance work.

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2. [www.un.org/press/en/2016/gadis3566.doc.htm](http://www.un.org/press/en/2016/gadis3566.doc.htm)
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## 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](http://www.wiseinternational.org)

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