

# NUCLEAR MONITOR

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AND THE NUCLEAR INFORMATION & RESOURCE SERVICE (NIRS)

## Editorial

Dear readers of the WISE/NIRS Nuclear Monitor,  
In this issue of the Monitor:

- Eloi Glorieux from Greenpeace Belgium writes about the Belgian government's plans to extend the lifetimes of the Doel-1 and 2 reactors;
- Martin Sedlák writes about the Czech government's plans for new reactors;
- Tim Judson celebrates some good news in the US, with nuclear power being all but ignored in the Clean Power Plan;
- Jim Green writes about a renewed push for Australia to become the world's nuclear waste dump.

The Nuclear News section has reports on plutonium separation in nuclear power programs (a detailed new report by the International Panel on Fissile Materials); the latest setbacks for Generation IV reactor R&D; and a nuclear insider's take on the myths advanced by the nuclear industry.

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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## Belgian government ignores EIA and public participation obligations

**Author:** *Eloi Glorieux – Senior Energy Campaigner, Greenpeace Belgium*

**NM808.4483** While at the moment five out of Belgium's seven reactors are not working – causing huge debates about both safety and security of supply – the Belgium Parliament on June 18 accepted a Bill that regulates lifetime extension of the Doel-1 and 2 reactors.

Both are 433 MW pressurized water reactors (PWRs), started up in 1975, and with an original lifespan of 30 years. Under the earlier phase-out law of 2003, they were allowed to run for 40 years. Doel-1 reached that age on 15 February 2015 and has been shut down since then. Doel-2 was to be taken out of service on December 1 of this year.

The now-accepted amendment allows both reactors to remain operational until 2025. This is if the national nuclear regulator (FANC) gives approval. FANC



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is currently investigating whether the “Long Term Operation” (LTO) plan of the owner of the reactors (Engie/Electrabel) offers sufficient security guarantees for extended operation. Meanwhile NGOs are fighting the lifetime extension through legal proceedings.

### FANC sets the bar very low

FANC in 1999 postulated that the old reactors could remain in service longer only if it could be demonstrated that they could match – if needed via upgrades – the safety levels of a new-build. However FANC has announced that weaker criteria will apply. According to FANC the reactors now only have to meet the standards of the current “youngest Belgian reactors.” These, however, date from 1985. All the lessons learned after

Chernobyl and Fukushima are not taken into account in these “youngest reactors”.

From the LTO synthesis report<sup>1</sup> one can learn that FANC is very lenient about the necessity to introduce and implement lessons learned after the “Fukushima stress tests”.

Standard safety measures that apply to new build reactors these days (like a core catcher) are not required. Nor is it required that the storage facility for spent nuclear fuel is bunkered.

Some of the required actions to improve safety only have to be implemented later; some as late as five years after the start of the 10-year period of life-time extension. For example, filtered ventilation systems will only need to be installed in the reactor buildings by the end of 2019, when half of the period of lifetime extension has already passed.

It is expected that FANC will announce its decision in the coming months. Given the fact that the regulator seems to have lowered the bar, it is likely that Engie/ Electrabel will get permission to run the Doel-1 and 2 reactors for 10 more years.

### **International obligations are ignored**

During the parliamentary debates that preceded the adoption of the Bill there has been much discussion about whether such a decision has to be accompanied with a full Environmental Impact Assessment and a (cross-border) public consultation process. The State Council – the highest legal advisory body of the Belgium Government – gave its opinion on 8 May 2015: Yes, both an EIA and public consultation are indeed obligatory under (inter)national law.

Also, a legal opinion commissioned by the internationally well-known law firm Stibbe clearly indicated that an EIA with public participation should take place before any decision on life-time extension can be taken. However the Belgium Minister for Energy, Marie-Christine Marghem, refuses to do so.

The State Council substantiates its opinion by referring to the “Convention on Environmental Impact Assessment in a Transboundary Context” (the Espoo Convention) and the “Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters” (the Aarhus Convention). Both international conventions are ratified by Belgium. In addition, the State Council referred to the European Directive 2011/92 / EU (the EIA Directive) as well as Directive 92/43 / EEC (the so-called Habitat Directive).

All these conventions force countries to organize such undertakings for “any activity that may have a significant impact on the environment”. The lifetime extension of nuclear reactors is clearly such an activity. A process to involve the public in decision making should not only be implemented in Belgium but also neighboring countries where a potential impact can be expected.

Reference:

1. [www.afcn.fgov.be/GED/00000000/3900/3910.pdf](http://www.afcn.fgov.be/GED/00000000/3900/3910.pdf)

### **More information:**

‘Belgium and the END of nuclear power’, 19 March 2015, Nuclear Monitor #800, [www.wiseinternational.org/nuclear-monitor/800/belgium-and-end-nuclear-power](http://www.wiseinternational.org/nuclear-monitor/800/belgium-and-end-nuclear-power)

The government fears that organizing both a full EIA and a transboundary consultancy process will take so much time that it cannot be completed before the start of the official period of lifetime extension of the reactors. This would mean that Doel-1 would not be available until 2016 and Doel 2 would have to shut-down in December. Also Tihange 1, whose lifetime extension has already been approved, would have to close in October, as an EIA was not done there either.

But it’s a bit strange to set aside international binding laws because you fear a possible result of applying those rules.

Greenpeace Belgium continues to fight the decision to not conduct an EIA and public consultation process in court. WISE is urging the Dutch national and local governments to urge the Belgians to indeed organize information– and debate sessions in the Netherlands (the Doel nuclear power stations are located just a few kilometers from the border with the Netherlands).

The international organization Nuclear Transparency Watch has brought the case to the attention of the European Commission.

### **Dependency on nuclear threatens security of supply**

The official justification for the plan to extend the lifetime of Doel-1 and 2 are identical to those used by previous Belgium governments, “to safeguard security of supply during the winters”. This is a so-called chicken-and-egg debate since it is actually the excessive dependence on unreliable nuclear reactors that has threatened the security of supply.

The nuclear industry in Belgium has been plagued by many incidents and accidents. The Doel 3 and Tihange 2 reactors (both 1000 MW PWRs) were out of order between July 2012 and June 2013 after thousands of cracks were discovered in the reactor vessels. After further research FANC gave “conditional permission to again start production” but in March 2014 both reactors had to close down again. Additional tests showed inexplicable problems with the ‘fracture toughness of the reactor vessels’. In the past 17 months these reactors have not produced any electricity.

Doel 4 (also 1000 MW PWR) was shut down after an act of sabotage in September 2014. The reactor started production again in December 2014 but investigations into the sabotage are still ongoing – more than 40 workers of the reactor are now forced to undergo a lie detector test. Forty of them so far refuse to do so.

Doel-1 was shut down in February this year as the official life-time was reached and legislation for lifetime extension was not (yet) in place.

Officially the nuclear phase-out law (in 2025) is still in place. But the current signal of postponed closure dates for Doel 1- and 2 undermines the energy transition and blocks investments in alternative, clean energy options.

# The Czech nuclear illusion

*The Czech Republic can serve as a textbook case of how decisions about the future of energy should not be made, explains Martin Sedláč of the Heinrich Böll Foundation.*

**NM808.4484** In the first week of June the Czech government adopted an action plan that is supposed to lead to the construction of four new reactors in the country – first in Dukovany and then in Temelín. The government's decision, however, is not the product of a rational political debate; it is the result of the long-term erosion of responsible governing. Therefore, the Czech Republic can serve as a textbook case of how decisions about the future of energy should *not* be made.

The National Action Plan for the Development of Nuclear Energy was drafted by the Ministry of Industry and Trade (MIT) along with the Ministry of Finance. It is based on this year's updated State Energy Policy, which is supposed to lead to the Czech Republic increasing its share of nuclear energy to up to 50% by 2040.

"In 2040 the fuel mix for electricity generation will comprise 46 to 58% nuclear, 18 to 25% renewables and secondary sources, 5 to 15% natural gas, and 11 to 21% brown and black coal," claimed Minister of Industry and Trade Jan Mládek (Social Democrat) upon publicly presenting the new energy policy.

If the scenario envisioned in the State Energy Policy actually plays out, nuclear energy will become the dominant source of electricity in the Czech Republic for a long time to come. In the decision-making process the Czech government rejected a policy based on renewables or natural gas. Politicians were particularly opposed to renewable energy due to its high price. However, as this paper demonstrates, Czech politicians' rejection of green energy was not founded on economic data but on ideology, as the high price of nuclear energy seems to pose no problem.

## Three investment models

The National Action Plan proposes three investment models for building new nuclear reactors. The MIT does indeed state that it prefers the model in which the current owner and operator of these nuclear power plant, ČEZ – or one of its fully-owned subsidiaries – will make the investment. However, the MIT has proposed two alternatives to this scenario: It may be possible to create a consortium of private investors, that is, a group of investors with the aim of reaching a certain goal (ČEZ, a financial investor, a large consumer, the company responsible for constructing the reactors, etc.). The MIT also proposes that the state could directly build the reactors through means of a newly established state-owned company.

After the National Action Plan was adopted by the Czech government, Minister Mládek was quoted by the economic daily *Hospodářské noviny* as saying he would prefer the creation of a state-owned company. He stated: "The government could simply order such a company to build the reactors." Paradoxically, the National Action Plan drafted by the MIT considers this option to be generally hypothetical. Minister of Finance Andrej Babiš, Hnutí ANO (ČEZ falls under the Ministry of Finance) is

against this option; he would prefer to see the creation of a joint-stock company and funding from ČEZ.

As the state owns a majority of stock in ČEZ, all three of these possibilities would involve the participation of the state (although in the case of the first two models the state would only be indirectly involved).

The schedule contained in the National Action Plan, however, assumes that until 2025 mainly ČEZ will be responsible for undertaking preliminary project work. This groundwork should come at an expense of 32 billion Czech crowns (€878 million). Only in 2025 will the decision be made whether this project will be publicly financed or not. The National Action Plan includes calculations with various base load energy prices. If base load prices grow to €80/MWh by 2035, the MIT assumes that these new reactors will be viable on the market without any subsidies. However, if today's low base load prices remain unchanged, the MIT estimates that nuclear power plants will need to receive additional annual funding, for example, through a contract for difference scheme.

## A radiant heritage

In the Czech Republic we call the MIT's methods salami tactics: The current government is having a project drawn up for the construction of new reactors in which billions of Czech crowns will be invested. There is thus a real threat that future politicians will inherit a grim inheritance from which they will have to work their way out of. Or they will have to commit themselves to massive subsidies from public sources – which (at least according to available public documents) have not yet been consulted with the European Commission over adherence to business competition rules.

Calculations made by independent analysts suggest that there may be a substantial threat to consumers in the future. For example, in a recent study Candole Partners, a consultancy group, has calculated that the economic impact on consumers could be as much as one billion euro per year.<sup>1</sup> The author of the study, economist Jan Ondříč, confirmed that the necessary guaranteed floor price for new nuclear reactors would have to be €115/MWh.

The looming threat of massive subsidies is the reason that in early 2014 the government rejected guaranteed nuclear energy prices and ČEZ subsequently cancelled the call for bids for building new reactors. For the time being, Prime Minister Bohuslav Sobotka (Social Democrat) and Deputy Prime Minister Andrej Babiš have kept this line. The only government minister who is not against long-term public support for introducing guaranteed prices for energy produced by new reactors is Minister of Industry Jan Mládek.

His opinion copies the position of ČEZ: "New units can be built only with a guarantee from the government. This means using the same model as the British have," Ivo Hlaváč, chief external relations officer of ČEZ, explained to EurActiv last year.

Unfortunately, the National Action Plan will not help Czech politicians freely decide about the possible risks of proceeding along the nuclear energy path. In this plan the MIT has underestimated nuclear energy investment costs and in general only presents the positive aspects of the nuclear industry without addressing the possible negative impacts it might have on the economy. For example, the plan anticipates reactor investment costs of €4,500/kW, a far cry from the real expenses, which range from 6,000 to 9,750 €/kW. It also does not contain a contingency plan if construction is behind schedule or over budget. Current experience from Finland and France shows these risks to be very real, just as the construction of Temelín and other large infrastructure projects in the past have done. In 1993 the then prime minister, Václav Klaus, decided to complete the Temelín project: new reactors were supposed to be ready by 1995 for a price of 68.8 billion crowns (€2.6 billion in current prices). Instead of 1995, the reactors were connected to the grid six years later. The total price of both reactors at Temelín climbed up to 112 billion crowns (€4.2 billion in current prices).

### **Once again, we won't have enough electricity!**

The government's current steps contained in the National Action Plan for the Development of Nuclear Energy are not the first attempts to promote the construction of more reactors. Both in the present and the past, the same trick has been used to justify the expansion of nuclear energy: the MIT has repeatedly made the claim that we need new reactors because without them we will have nothing to power our light bulbs. For example, in 2007 Minister of Industry Martin Říman claimed that "at the turn of the decade we will be consuming more than we can produce." Now it is 2015, but we have yet to register any shortage of electricity. What is more, since Temelín went online, we have exported more energy than we produce annually.

The government used the same trick to defend the completion of the two reactors currently at Temelín. In late 1992 and early 1993, the MIT warned that if Temelín did not go online by 1995 that we could expect blackouts for three weeks to one hundred days in 1997. On the basis of this report, the government decided to complete the power plant. But there never was a problem with the electricity supply, and so the government began supporting the use of electric heaters. Consumption was artificially increased, and suddenly there was a reason for reactors.

The current MIT would not dare to use the same trick for a third time, considering the fact that the Czech Republic is a net exporter of 18 TWh annually. Therefore, this year the ministry has innovated its arguments somewhat. "So that we are able to ensure the energy self-sufficiency and security of our country, it is essential to commence preparations for building one reactor unit at Dukovany and one unit at Temelín, with the possibility of expanding both plants by two units," stated Minister of Industry and Trade Jan Mládek. In some media statements, he has also drawn connections to lowering emissions. In his opinion, the Czech recipe for doing so should involve nuclear energy.

*Reprinted from the Heinrich Böll Foundation: <http://cz.boell.org/en/2015/07/29/czech-nuclear-illusion>*

#### Reference:

1. Candole Research, November 2013, 'TEMELINOMICS 2', [www.candole.com/files/Temelinomocs%202.pdf](http://www.candole.com/files/Temelinomocs%202.pdf)

### **How to get out of this trap?**

The energy industry is going through a dynamic transformation. The price of renewables is constantly decreasing, and it can be expected that another revolution will occur once batteries and other systems for storing energy emerge. Due to the pace of change in the industry, guessing what the market will look like in 10 or 20 years is very complicated. One thing we know for sure though: The energy system will be different than it is today and will resemble the internet more closely, with electricity flowing in both directions. The question is: Will having giant nuclear power plants make any sense?

It is highly likely that the National Action Plan for the Development of Nuclear Energy will end up not being used, and with a new generation of politicians, the Czech Republic will escape from the nuclear energy trap it is stuck in. It will, however, be crucial that the European Commission not succumb to the Czech Republic's insistence on allowing support for nuclear energy by classifying it as a technology for protecting the climate.

In 2015 the Czech government decided in favour of more reactors, ignoring critical voices warning that in the future subsidies will be needed. But the government is already counting on some form of support. Therefore, it is interesting to compare the Czech government's approaches to nuclear and renewable energy. Since 2010 the MIT has repeatedly interfered with guaranteed support for renewable energy, for example, by pushing through a retroactive lowering of feed-in tariffs. The MIT is currently holding discussions with DG Competition regarding the possible overpayment of subsidies to solar plant operators. The Czech government is thus abusing the notification process for public support for renewable energy. Considering the fact that European Commission officials are not familiar with the Czech situation and its ideological context – in which Czech politicians uncritically accept nuclear energy but reject renewables – there is a threat that the European Commission might take the Czech government's bait hook, line, and sinker. The Commission might even end up helping the Czech Republic set up subsidies for nuclear reactors while at the same time destabilizing the modern renewable energy industry.

The steps the Czech government has taken toward preparing the groundwork for possible public support for nuclear energy in the future and its attempts at disrupting the stability of investments in renewable energy will lead to green energy remaining marginal. Moreover, last year the Ministry of Industry was so busy thinking up its nuclear plans that it brushed aside its responsibility to update the National Action Plan for Renewable Energy. Solar energy is becoming cheaper by the day. Nonetheless, two years ago growth in this field was stopped dead in its tracks. Even if administrative rules are simplified, renewed interest in solar power is not expected as this year's amendment to the Energy Act has introduced new barriers. Support for wind energy was also eliminated two years ago and is not planned for the future. The Czech Republic also lacks a detailed, functional plan for utilizing the great potential energy efficiency measures offer.

# US EPA takes nuclear out of the Clean Power Plan

**Author:** *Tim Judson – Executive Director, Nuclear Information and Resource Service*

**NM808.4485** Thousands joined the nuclear-free, carbon-free contingent at last September's People's Climate March in New York City. The unexpectedly large turnout – followed by tens of thousands of comments and petitions to the Environmental Protection Agency (EPA) – helped open the agency's eyes to first understand our position and then realize it made a lot of sense.

On August 3, an amazing thing happened. President Obama released the first real climate action policy in the U.S. ever. But that's not all. The incredible thing – the one that will be most important in the years to come – is ... they got it basically right!

Including on nuclear power. President Obama just made it the policy of the United States that nuclear power is not a viable climate solution. And not just that, but renewable energy can replace nuclear power just like it can replace fossil fuels.

This is a game-changer, both for reducing carbon emissions in the US, and for discrediting the deceptive 'Nuclear Matters' greenwashing bailout campaign (nuclearmatters.com). What is more, going into December's global climate treaty negotiations in Paris, the U.S. government just declared that we are moving forward, and we are going to do it with renewables, not nuclear.

The upshot is that the EPA appears to have done a total 180 on nuclear in the Clean Power Plan (CPP), and their rationales reflect the concerns raised by the public in the streets of New York City, in tens of thousands of comments, letters, and petitions, and by NIRS and other clean energy groups in conversations and a key meeting with EPA officials who listened and ultimately agreed with our position. After all, with all due modesty, it was a pretty reasoned and well thought-out approach to the climate issue.<sup>1</sup>

## Clean Power Plan

Here is a quick synopsis of what the CPP rule actually does with respect to nuclear power:

1. Not only are nuclear reactors under construction not counted on in setting emissions goals, but neither are existing nuclear plants. By the same token, relicensing nuclear reactors won't count either.
2. Just as significantly, EPA recognized that there is no need to "preserve" nuclear reactors that are "at risk" of closure, because they can be replaced with renewables just as fossil fuels can.
3. EPA will only allow actual, new / increased nuclear generation to count toward complying with the emissions goals. That means, states can only count new reactors that actually operate before 2030 (the five in construction or any others) and power uprates of existing reactors toward meeting their emissions goals.

4. That means there is no incentive under the CPP to keep uneconomical reactors operating and no incentive to complete building new reactors. States can meet their goal with new nuclear (but not with existing nuclear), but they are given no justification for preferring nuclear over renewables. In fact, there are several statements in the rule that indicate just the opposite.
5. And only those new / additional amounts of nuclear can qualify to sell emissions offset credits in cap-and-trade programs. Existing reactors cannot qualify as emissions offsets for fossil fuel generation, because they do not actually reduce carbon emissions.
6. The CPP does not prevent states from creating subsidies for nuclear, but there is absolutely no incentive for them to do so.

The impacts of the EPA's decision are already being felt far and wide. The industry is upset, to put it mildly.<sup>2</sup> Pro-nuclear commentators don't seem to know how to react: absurdly try to claim victory despite the plain language of the regulation, like Forbes columnist James Conca<sup>3</sup>; or go on the attack against the Obama administration as a bastion of anti-nuclear activism<sup>4</sup>, as did Breakthrough Institute founder and propaganda film spokesman Michael Shellenberger.<sup>5</sup>

In contrast, another Forbes columnist provided a much more objective report on the changes to nuclear in the Clean Power Plan, noting in particular that it "does not include aid to existing nuclear power plants at risk of closing because they can't compete with cheaper natural gas and renewables."<sup>6</sup>

For over a year now, the Nuclear Information and Resource Service has detailed concerns about the draft version of the Clean Power Plan that the EPA put out last summer:<sup>7</sup>

- Promotion of nuclear power as a climate solution.
- Underselling the demonstrated potential of renewables.
- Continued overreliance on fossil fuels, especially natural gas.

We have reported most on how the rule deals with nuclear power and the nuclear industry's initial embrace of it, both because that is where our greatest expertise is, and it was the part most overlooked in the CPP.<sup>8</sup> But the draft rule's promotion of natural gas was a very real problem: it could have blocked renewables just as much or more than nuclear and it terribly underestimated the climate change impacts as well as the environmental impacts of fracking. The final rule addresses a number of those problems, as well. For instance, new natural gas plants will not count toward reducing carbon emissions, recognizing the global warming impact of methane releases and forcing states to rely on renewables and energy efficiency to meet most of their

emissions reduction goals. The natural gas industry is just as upset as the nuclear industry.<sup>9</sup>

And that is the other truly remarkable thing about the Obama administration's decision: essentially to take on the nuclear, coal, and natural gas industries head-on, rather than try to play favorites among them and pit powerful corporations against each other. Maybe the President recognized that, in the end, the whole energy system needs to change, so we might as well get on with it. Or maybe he realized that the fossil fuel and nuclear industries are all just different heads of the same hydra, and those corporations were going to resist change no matter what.

Either way, the fight is on, and we have a real Clean Power Plan to fight for. We are sure as the dust settles, there will be things that need to be fixed to strengthen the CPP. When the German government first adopted its *Energiewende* plan to reduce emissions and phase out nuclear, the plan wasn't strong enough. The politicians weren't committed enough to really close nuclear

plants. The energy companies all resisted it, even putting new coal plants on order just to try and derail the government's plans.

But over a decade or more, the idea set in. Renewable energy became popular and affordable, created hundreds of thousands of jobs and new industries, and people got used to owning their own solar panels and making their own energy. And then, after the horror of Fukushima struck, even conservative leadership in the government realized that they just had to go for it.

To be sure, Germany still doesn't have it totally right, and it won't be an unqualified success until we actually get to a nuclear-free, carbon-free, sustainable energy world. Our counterparts in Germany still have to fight to keep the *Energiewende* on track. And the CPP is not an anti-nuclear policy. It's not even anti-fossil fuels, really. But it is a plan that promotes sustainable, renewable energy as the best solution to the climate crisis. And that is a good place to start.

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## Australian push to become the world's nuclear waste dump

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

**NM808.4486** In February, the Labor Party government of the state of South Australia (SA) established a Royal Commission<sup>1</sup> to consider options for an expanded role in the nuclear fuel cycle. Currently, the state has two operating uranium mines (Olympic Dam and Beverley Four Mile) but no other nuclear facilities. As the debate has progressed, it has become clear that the main interest is in the possibility of making billions of dollars by accepting spent fuel / high level waste from overseas.

There is a precedent to current discussions. Pangea Resources was an international consortium that was planning a high level waste repository in Australia.<sup>2</sup> Pangea set up an office in Australia in the late 1990s but gave up in 2002 in the face of overwhelming public opposition.

The existence of Pangea Resources was a closely-guarded secret until a corporate video was leaked to Friends of the Earth. Pangea chief Jim Voss denied meeting with federal government ministers when he had in fact met at least one minister. A Pangea spokesperson said: "We would not like to be lying ... we very much regret getting off on the wrong foot."

Ironically, the Association for Regional and International Underground Storage (ARIUS), the successor to Pangea, said in its submission to the Royal Commission that an "essential element of any approach is the open and complete flow of information."<sup>3</sup>

How much money might be made by taking nuclear waste from other countries? There is no precedent to base an estimate on. There may be countries that would be willing to send nuclear waste to Australia for storage and/or disposal but there are many reasons why countries may choose other options:

- About ~160 of the world's 194 countries have never operated power reactors and thus have no spent fuel or high level waste from nuclear power programs (although some have small quantities from the operation of research reactors).
- Some countries are advancing domestic or regional waste disposal plans.
- Some countries (and companies/utilities) would consider it irresponsible to entrust nuclear waste



Muckaty Traditional Owner Marlene Bennett and Nat Wasley from the Beyond Nuclear Initiative, celebrating the government's decision to abandon plans for a radioactive waste dump in the Northern Territory.

to a country that has very little or no experience or demonstrated competence – and a proven track record of incompetence (discussed below).

- Some countries (and companies/utilities) would consider it unethical to send nuclear waste to Australia given the pattern of Aboriginal land rights and heritage protections being sacrificed in order to advance radioactive waste repository projects (discussed below).
- Some countries are pursuing spent fuel reprocessing programs and would be unlikely candidates to send spent fuel to Australia (although they might pay to rid themselves of the high level waste stream from reprocessing).
- Some countries would be unwilling to rid themselves of spent fuel as they see it as a military asset (as it contains weapons-useable plutonium).

While proponents make absurd claims about the potential income – including claims that the income would allow the provision of free electricity to all South Australians and the abolition of all state taxes – they have had little to say about the costs. Since the volume of waste would presumably be relatively large (as a commercial venture), the cost of deep underground repository would likely be in the tens of billions of dollars. Plans for a high level waste repository in Japan may be comparable: the estimated cost is ¥3,500 billion (€25.2b; US\$28.1b).<sup>4</sup>

Many other significant costs would be incurred. ARIUS proposes transport by purpose-built ships; a dedicated sea port; a dedicated rail system; and support and maintenance facilities for ships, rail locomotives, rolling stock and transport packages.<sup>3</sup>

Some nuclear proponents believe that spent nuclear fuel is a “multi-trillion dollar asset”<sup>5</sup> – because it can be processed for reuse as reactor fuel – and they also believe that countries will pay “tens of billions of dollars”<sup>6</sup>

to rid themselves of this multi-trillion dollar asset. However, to the extent that countries regard spent fuel as an asset, they will:

- not be willing to send it to Australia;
- offer to sell spent fuel to Australia rather than paying Australia to take it; or
- they may pay Australia to take spent fuel but they will pay less to the extent that spent fuel is considered an asset.

Advocates of the waste-to-fuel plan are particularly keen on the idea of processing spent fuel for use as fuel in ‘integral fast reactors’ (IFRs). That proposal is unlikely to win support since no country operates IFRs. The UK and the US are considering building IFRs to manage stockpiles of separated plutonium – but both countries are likely to choose other options.

### Hazards

Professor John Veevers from Macquarie University wrote in *Australian Geologist* about the serious public health and environmental risks associated with a high-level nuclear waste repository: “Tonnes of enormously dangerous radioactive waste in the northern hemisphere, 20,000 kms from its destined dump in Australia where it must remain intact for at least 10,000 years. These magnitudes – of tonnage, lethality, distance of transport, and time – entail great inherent risk.”<sup>7</sup>

Proponents of Australia becoming the world's waste dump claim that Australia has uniquely suitable geology. However Dr Mike Sandiford from the School of Earth Sciences at University of Melbourne writes: “Australia is relatively stable but not tectonically inert, and appears to be less stable than a number of other continental regions. Some places in Australia are surprisingly geologically

active. We occasionally get big earthquakes in Australia (up to about magnitude 7) and the big ones have tended to occur in somewhat unexpected places like Tennant Creek. ... Australia is not the most stable of continental regions, although the levels of earthquake risk are low by global standards. To the extent that past earthquake activity provides a guide to future tectonic activity, Australia would not appear to provide the most tectonically stable environments for long-term waste facilities.”<sup>8</sup>

### Australia’s track record

There are social as well as technical dimensions to risk assessments. Australia has a history of mismanaging nuclear waste. Nuclear engineer Alan Parkinson states: “The disposal of radioactive waste in Australia is ill-considered and irresponsible. Whether it is short-lived waste from Commonwealth facilities, long-lived plutonium waste from an atomic bomb test site on Aboriginal land, or reactor waste from Lucas Heights. The government applies double standards to suit its own agenda; there is no consistency, and little evidence of logic.”<sup>9</sup>

In the late-1990s, the Australian government carried out a ‘clean up’ of Maralinga, the site in SA where the British government tested nuclear weapons in the 1950s. The ‘clean up’ was done on the cheap and many tonnes of plutonium-contaminated debris remain buried in shallow, unlined pits in totally unsuitable geology – a breach of Australian guidelines for the management of long-lived nuclear waste.<sup>9</sup>

A number of scientists with inside knowledge of the Maralinga project complained about deficiencies:<sup>10</sup>

- Alan Parkinson said of the ‘clean up’: “What was done at Maralinga was a cheap and nasty solution that wouldn’t be adopted on white-fellas land.”
- US scientist Dale Timmons said the government’s technical report was littered with “gross misinformation”.
- Geoff Williams, an officer with the Commonwealth nuclear regulator ARPANSA, said the ‘clean up’ was beset by a “host of indiscretions, short-cuts and cover-ups”.
- Nuclear physicist Prof. Peter Johnston said there were “very large expenditures and significant hazards resulting from the deficient management of the project by DEST [the Department of Education, Science and Training].”

Barely a decade after the Maralinga ‘clean up’, a survey revealed that 19 of the 85 contaminated waste pits have been subject to erosion or subsidence.<sup>11</sup>

### Radioactive racism

Former Prime Minister Bob Hawke said Australia could end the disadvantage endured by Aboriginal people by opening up traditional lands as dumping sites for nuclear waste. But there are simpler and safer methods to close the gap. For example, the federal government could reverse planned cuts of \$500 million from Aboriginal spending over the next five years.

Attempts to establish a national radioactive waste repository in Australia have involved crude racism. From 1998–2004, the federal government attempted to impose a dump on Aboriginal land in SA. The project came unstuck when the Federal Court ruled that the government had illegally used the *Lands Acquisition Act 1989* to seize land for the dump and to annul Aboriginal Native Title rights and interests.<sup>10</sup>

From 2005–2014, the federal government tried to impose a dump on Aboriginal land in the Northern Territory, and the racism was even cruder. The government passed legislation overriding the Aboriginal Heritage Act and the Aboriginal Land Rights Act, and allowing the imposition of a radioactive waste dump without any consultation with or consent from Aboriginal people. Muckaty Traditional Owners launched a legal challenge against the nomination of the dump site, and the government abandoned the waste dump proposal during the court case.<sup>10</sup>

Aboriginal people are deeply concerned about the Royal Commission and in particular renewed proposals for nuclear waste dumps on their land. A meeting held in May in SA released the following statement:

*South Australian Traditional Owners say NO!  
We oppose plans for uranium mining, nuclear reactors and nuclear waste dumps on our land.*

*We call on the SA Royal Commission to recommend against any uranium mining and nuclear projects on our lands.*

*We call on the Australian population to support us in our campaign to prevent dirty and dangerous nuclear projects being imposed on our lands and our lives and future generations.*

*Endorsed by members from the following groups, present at the Port Augusta meeting: Kokatha, Kokatha-Mirning, Arabunna, Adnyamathanha, Yankunytjatjara-Pitjanjatjara, Antikirinya-Yunkunytjatjara, Kuyani, Aranda, Western Aranda, Dieri, Larrakia, Wiradjuri.*

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# NUCLEAR NEWS

## Plutonium separation in nuclear power programs

The International Panel on Fissile Material has produced an important report on plutonium separation / reprocessing programs around the world. The 182-page report has contributions from 11 experts around the world.

The report considers reprocessing programs in China, France, India, Japan, Russia and the UK. It also considers the rise and fall of reprocessing in Germany, and the agitation in South Korea for starting a reprocessing program. There are also three technical chapters assessing: the utility of reprocessing for managing spent nuclear fuel; the economics of reprocessing and plutonium use; and the radiological risk from reprocessing plants.

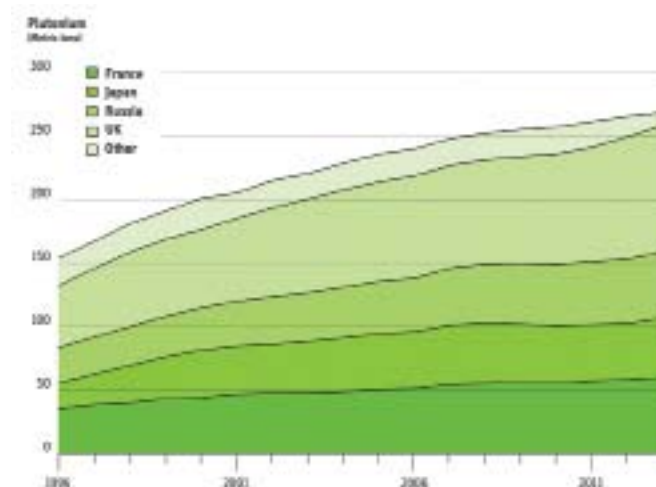
The report considers related issues such as fast breeder reactors, noting that 'demonstration' breeder reactors in France, Germany, Japan, Russia and the UK were found to be both more costly than conventional reactors and less reliable, with most operating only a small fraction of the time. Only India and Russia have continued with demonstration breeder reactor programs. Reprocessing continued in France, Japan and the UK, however, and China built a pilot reprocessing plant that operated briefly in 2010.

The UK built a reprocessing plant for foreign customers, but virtually no customers renewed their contracts and the UK expects to end its reprocessing program as soon as its existing contracts are fulfilled – around 2020. France is continuing to reprocess for the time being, but its government-owned utility, Electricite de France, has been demanding cost reductions and this has made more gloomy the financial prospects of AREVA, the government-owned company that operates France's reprocessing plant.

Japan, the only non-weapon state that reprocesses today, has built a large reprocessing plant at Rokkasho whose operation has been delayed two decades by various technical problems. It has become hugely costly and, if it operates, is expected to increase the electricity bills of Japan's ratepayers by about US\$100 billion (€90b) over the next 40 years.

The report also discusses efforts to revive and reinvent reprocessing:

*"In recent decades, an additional rationale has been offered for reprocessing: that it would facilitate spent-fuel management. The argument is that plutonium and the other transuranic elements in spent fuel should be fissioned into mostly shorter half-life radioisotopes to reduce the long-term hazard from spent fuel. The reactors being proposed are modified versions of the costly and unreliable sodium-cooled reactors that previously were proposed for plutonium breeding because they would efficiently fission all these isotopes – not just some, as water-cooled reactors do. This argument for continued reprocessing has been challenged, however, by radioactive waste experts in France and Japan and*



Growth of stocks of separated civilian plutonium, 1996–2013

*by a comprehensive study by the U.S. National Academy of Sciences. A risk assessment for Sweden's proposed spent fuel repository found that the radioactive doses on the surface from hypothetical leakage 100,000 years after burial would not be dominated by plutonium because transuranic elements are relatively insoluble in water that is found deep underground where the water's oxygen content is depleted due to chemical reactions with the surrounding rock.*

*"Reprocessing, in fact, increases rather than reduces the risk from the radioactivity contained in spent fuel because of routine releases to the environment during reprocessing and the possibility of potentially catastrophic releases from reprocessing plants as a result of accidents or attacks on their huge spent fuel intake pools or the tanks in which the liquid high-level waste from reprocessing is stored. Reprocessing also leaves two costly and dangerous legacies: reprocessing complexes that are contaminated with radioactive materials, and a steady build-up of a global stockpile of separated civilian plutonium that is currently estimated as being sufficient for more than 30,000 nuclear bombs.*

*"As all these problems with reprocessing have become more widely appreciated, there has been a steady decline in the number of countries that reprocess – currently six – and this trend is likely to continue. The decline has not been as rapid as warranted by the magnitude of the problems confronting reprocessing because of resistance from entrenched bureaucracies that have sought to sustain national commitments to separating plutonium and, often, breeder reactors. Nevertheless, as this global overview of reprocessing shows, the world is closer to the end of separating plutonium and the associated security, economic and environmental dangers."*

*International Panel on Fissile Material, July 2015, 'Plutonium Separation in Nuclear Power Programs. Status, Problems, and Prospects of Civilian Reprocessing Around the World', [http://fissilematerials.org/library/2015/07/plutonium\\_separation\\_in\\_nuclea.html](http://fissilematerials.org/library/2015/07/plutonium_separation_in_nuclea.html)*

## Funding decrease for Generation IV R&D

Funding has decreased for some Generation IV reactor systems, notably gas-cooled fast reactor (GFR) systems, and progress has slowed, according to the 2014 annual report of the Generation IV International Forum (GIF).

“Funding for some of the Generation IV reactor systems has decreased, thereby slowing down progress,” the report states.

GFR R&D made little progress in 2014, in part because of “significantly decreased budgets supporting the system,” the report states. Countries involved in GFR research are now discussing ways to continue R&D, possibly through synergies with other systems.

GIF was created in January 2000 by nine countries. It now has 12 member countries plus Euratom, though three of the countries are inactive members.

GIF chair John Kelly said there had been progress in 2014 on five of the systems and progress had also been made on “the implementation of evaluation methodologies” and on “a new course of outreach” with the international regulatory community that will eventually licence Generation IV reactors.

In April, France’s Institute for Radiological Protection and Nuclear Safety (IRSN) said the sodium-cooled fast reactor system is the only one of six being considered by GIF that has reached a degree of maturity compatible with the construction of a prototype during the first half of the 21st century.

GIF said earlier this year that for real long-term progress to be made in Generation IV development, advanced research facilities need to be built and the industry must become more involved.

*Generation IV International Forum, Annual Report 2014, [www.gen-4.org/gif/jcms/c\\_74053/gif-annual-report-2014](http://www.gen-4.org/gif/jcms/c_74053/gif-annual-report-2014)*

## Nuclear industry myths

Nuclear ‘insider’ Steve Kidd has written an interesting article about some of the nuclear industry’s self-serving myths in the Nuclear Engineering International magazine. Now an independent nuclear consultant and economist, Kidd worked for nearly 18 years with the World Nuclear Association and its predecessor organisation, the Uranium Institute.

Kidd states: “Examining the agendas at nuclear conferences and the speeches of key leaders shows that many people in the industry are somewhat deluded. They either don’t think carefully about the key issues or else simply choose to ignore many years of evidence that fails to support their beliefs.”

He then debunks the following four myths:

Financing barriers:

*“[T]here is no unique financing mechanism that the relevant institutions can come up with to rescue a nuclear project that has questionable returns or too high a degree of risk for investors. This is the real problem: nuclear projects have largely become too expensive and risky to offer lenders the degree of assurance they*

*require. ... Even with government incentives such as loan guarantees, fixed electricity prices and certain power offtake, nuclear projects today struggle to make economic sense, at least in the developed world. ... World interest rates are currently low, which removes one disadvantage of capital intensive projects. These low rates indicate that there is funding available but a possible shortage of viable projects.”*

Small modular reactors:

*“Assuming they are technically viable, the smaller capital expenditure needed to build a largely factory-built smaller unit and the shorter construction period are certainly attractive features. ... Lower cost, however, doesn’t necessarily mean better economics. ... The jury is still out on SMRs, but unless the regulatory system in potential markets can be adapted to make their construction and operation much cheaper than for large LWRs, they are unlikely to become more than a niche product. Even if the costs of construction can be cut with series production, the potential O&M [operating and maintenance] costs are a concern. A substantial part of these are fixed, irrespective of the size of reactor.”*

Nuclear growth in the developing world:

*“[M]any developing countries have expressed a wish to establish nuclear power programmes. ... But on current trends very few of them are likely to do so and for the same reasons that nuclear power has stalled in the most of the rest of the world. Although there are additional issues with new countries identified by the IAEA, such as the need to establish an independent regulator and to develop adequate human resources, these can be overcome if a country is determined to do so. The United Arab Emirates (UAE) is showing what can be achieved, but in most of the so-called emerging nuclear countries, the effort is rather half-hearted. ... The fundamental problem is that nuclear in these countries suffers from the same public acceptance and economic problems as elsewhere. ... The problems experienced in getting the Indian nuclear programme to the level desired by the national planners are instructive and are just as relevant to the Middle East and South East Asia, the most promising regions for potential new nuclear countries. ... Maybe only three or four countries will get their first operating nuclear stations by 2030.”*

Environmental credentials:

*“The final myth is that the world will start building lots of nuclear power stations to help counter climate change, as it becomes accepted as a green technology. The industry is grasping at a very thin straw. That may be because the COP-21 conference will be held in Paris this December, aiming to establish a legally binding and universal agreement on climate from all the nations of the world, but it is hardly excusable. All past evidence (which the industry chooses to ignore) demonstrates that nuclear will once again get chewed up and marginalised in the process.”*

Steve Kidd, 11 June 2015, ‘Nuclear myths – is the industry also guilty?’, [www.neimagazine.com/](http://www.neimagazine.com/)

[opinion/opinionnuclear-myths-is-the-industry-also-guilty-4598343/](http://www.neimagazine.com/opinion/opinionnuclear-myths-is-the-industry-also-guilty-4598343/)



In March 2014, about 60 Greenpeace activists from 14 countries protested at Fessenheim against the risk posed by ageing nuclear power plants in Europe. Photo by Daniel Mueller / Greenpeace.

### Don't Nuke the Climate – the lies of EDF

Among the industry sponsors of the UN COP21 climate talks in Paris (December), one especially deserves an award in greenwashing, namely Electricite de France (EDF). The company runs all the French nuclear power plants, including Fessenheim. This oldest French nuclear power station, close to the border with Germany in the Alsace region, has been criticized for many years on both banks of the Rhine for its lack of safety. In response, EDF had been displaying since 2011 a piece of greenwashing on its website: an illustration describing 100% of the electricity produced in the Alsace as carbon-free, thanks to Fessenheim and renewables.

To debunk this lie, the French antinuclear network "Sortir du nucléaire" and four Alsatian groups filed a complaint by the "Jury de déontologie Publicitaire", a committee on advertisement ethics.

On July 3, this panel issued a notice ruling that EDF's statement was too ambiguous and potentially misleading: even if the CO2 emissions in Alsace were low, nuclear electricity is not carbon-free.

Even if EDF is not yet forced to give up using the 'carbon-free' argument, the advertisement has been withdrawn since. This victory will help us fight the big pro-nuclear propaganda we are expecting during COP21

More information (in French): [www.sortirdunucleaire.org/Greenwashing-Fessenheim](http://www.sortirdunucleaire.org/Greenwashing-Fessenheim)

Sign the petition demanding the closure of the Fessenheim reactor:

In French: [www.sortirdunucleaire.org/Fermer-Fessenheim-Maintenant](http://www.sortirdunucleaire.org/Fermer-Fessenheim-Maintenant)

In German: <https://fukushimanievergessen.wordpress.com/petition/>

## 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)

### Subscriptions:

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