NUCLEAR MONITOR

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A PUBLICATION OF WORLD INFORMATION SERVICE ON ENERGY (WISE) AND THE NUCLEAR INFORMATION &RESOURCE SERVICE (NIRS)

Dear readers of the WISE/NIRS Nuclear Monitor,

In this issue of the Monitor:

- A short summary of a new report on the economic costs of proposals for additional subsidies for the aging nuclear reactor fleet in the US.
- A huge push by government and industry to establish an international high-level nuclear waste dump in South Australia may have come to an abrupt end, with a Citizens' Jury overwhelmingly rejecting the proposal.
- Philippe de Rougemont from *Sortir du nucléaire* writes about the upcoming referendum on nuclear power in Switzerland
- Diet Simon writes about nuclear waste controversies and protests in Germany.
- We compare with growth of renewables with the decline of nuclear power.

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

Regards from the editorial team.

Email: monitor@wiseinternational.org

Monitored this issue:

US nuclear bailout could cost $280 billion

NM833.4595 A new report by the Nuclear Information and Resource Service (NIRS) finds that a national bailout of nuclear energy patterned on the model advanced this year in New York State would cost ratepayers and taxpayers more than US$280 billion (€254 bn) by 2030.

Based on an independent analysis that over half of existing nuclear power in the US will be unprofitable by 2020, a narrower bailout would still cost US$160 billion by 2030. In addition to the enormous expense, NIRS found that one major side-effect of bailing out nuclear power on a large-scale basis would be the starving of renewable energy of needed capital.

Former Nuclear Regulatory Commission (NRC) Commissioner Peter Bradford, currently adjunct professor at Vermont Law School, said: "This report illustrates that the subsidies now being sought for nuclear units that are already massively subsidized may pay far too much for relatively little climate benefit. Worse still, they may slow the evolution of the electric industry to a less concentrated and more customer friendly form."

The report notes that from 2002–2012, average operating costs for nuclear power plants rose by 50%.

A significant factor in rising operating costs is the aging of the reactor fleet. The US now has the oldest fleet in the world, averaging 35.6 years, with 37% older than their original licensed lifespan of 40 years; another 37% are between 31 and 40 years old.

The report debunks claims that nuclear plants are unsubsidized or "under subsidized", listing a wide range of existing subsidies.

The report recommends, among other things, creating "proactive plans to replace or phase out nuclear, in concert with emissions reduction and renewable energy goals, and grid modernization initiatives."

NIRS has launched a petition to the next President urging the new administration to say no to a national nuclear bailout, and to end subsidies for nuclear and fossil fuels. To sign the petition please visit www.tinyurl.com/nirs-petition

The report is posted online: Tim Judson / Nuclear Information and Resource Service, November 2016, "Too Big to Bail Out: The Economic Costs of a National Nuclear Power Subsidy", http://bit.ly/too-big-to-bail-out-nuclear

A summary of the report is posted at: www.tinyurl.com/nirs-nov-2016

South Australian Citizens' Jury rejects nuclear waste dump plan

Author: *Jim Green – Nuclear Monitor editor*

NM833.4596 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 high-level nuclear waste and 390,000 cubic metres of intermediate-level nuclear waste as a money-making venture.[1]

The Jury was a key plank of the government's attempt to manufacture support for the dump plan, and followed the SA Nuclear Fuel Cycle Royal Commission which released its final report in May 2016.[2]

The Royal Commission had a strong pro-nuclear bias[3] in its composition but still rejected – on economic grounds – almost all of the proposals it considered: uranium conversion and enrichment, nuclear fuel fabrication, conventional and 'Generation IV' nuclear power reactors, and spent fuel reprocessing.

Australia's handful of self-styled 'ecomodernists' or 'pro-nuclear environmentalists' united behind a push to import spent fuel and to use some of it to fuel 'integral fast reactors'. They would have expected to persuade the stridently pro-nuclear Royal Commission to endorse their ideas. But the Royal Commission completely rejected the proposal, noting in its report that advanced fast reactors are unlikely to be feasible or viable in the foreseeable future; that the development of such a first-of-a-kind project would have high commercial and technical risk; that there is no licensed, commercially proven design and development to that point would require substantial capital investment; and that electricity generated from such reactors has not been demonstrated to be cost competitive with current light water reactor designs.[2]

The ecomodernists weren't deterred. They hoped that the nuclear waste import plan would proceed and that it would lay the foundations for the later development of fast reactors in South Australia (SA). Now it seems that the waste import plan will be abandoned and the ecomodernists are inconsolable.

The SA government will come under strong pressure to abandon the waste import plan in the wake of the Citizens' Jury's vote. Roman Orszanski, climate and energy campaigner with Friends of the Earth Adelaide, said: "Three thousand people protested against the proposed nuclear waste dump outside Parliament House on October 15 and there will be more protests and bigger protests if the SA government attempts to push ahead."

SA Unions secretary Joe Szakacs said Premier Jay Weatherill must now "stand up for SA, and not be hoodwinked into becoming the fall-guy for the multinational nuclear industry. Everyday South Australians have concluded that the argument in favour of storing the world's nuclear waste is flawed, and a bad deal for our state. The magnitude of opposition from the jury shows just how politically damaging this could be for the Premier. People know a dud deal when then see it, and that's exactly what this is."[4]

Premier Weatherill said: "There's no doubt that there's a massive issue of trust in government, I could sense that, that's why we started the whole citizen's jury process because there is no way forward unless we overcome those issues."[4] The "massive issue of trust in government" will of course become all the more massive if Weatherill rejects the clear verdict of the Citizens' Jury.

Friends of the Earth Australia said: "Despite the pro-nuclear bias of the Royal Commission and SA government's so-called consultation process[5], the Citizens' Jury has had the good sense to send a clear 'no' message to Jay Weatherill. South Australians do not want the state turned into the world's nuclear waste dump. The Premier has repeatedly said that he will respect the Jury's decision and now he must rule out any further work on his ill-considered nuclear frolic. More than $10 million has already been wasted promoting the dump plan and any further expenditure of taxpayers' money should be ruled out."

South Australia's only mass circulation newspaper, *The Advertiser*, a Murdoch tabloid, has been heavily promoting the nuclear dump plan but there was no attempt to spin the Citizens' Jury's rejection of the plan. *Advertiser* journalist Daniel Wills wrote:[6]

"This "bold" idea looks to have just gone up in a giant mushroom cloud. When Premier Jay Weatherill formed the citizens' jury to review the findings of a Royal Commission that recommended that SA set up a lucrative nuclear storage industry, he professed confidence that a well-informed cross-section of the state would make a wise judgment.

"Late Sunday, it handed down a stunning and overwhelming rejection of the proposal. Brutally, jurors cited a lack of trust even in what they had been asked to do and their concerns that consent was being manufactured. Others skewered the Government's basic competency to get things done, doubting that it could pursue the industry safely and deliver the dump on-budget.

"It seems almost impossible now to see a way through for those in Cabinet and the broader Labor Party who have quietly crossed their fingers and backed the idea of taking the world's nuclear waste.

"With the party planning a special convention which must endorse changes to policy so the industry can be more deeply considered, internal critics now have an extremely potent weapon.

"Those outside the state party – including the SA Liberals, independent Senator Nick Xenophon and even senior federal Labor figures — now have clear public permission to start peeling away.

"Perhaps worse than that, if Mr Weatherill now elects to continue down the nuclear path, it would be by actively ignoring the public will uncovered by a process he personally put in place to test."

Four generations of the Lester family – Yami Lester (who was blinded by the British atomic bomb tests in South Australia in the 1950s) with daughter Rosemary, grand-daughter Kiah and great-grand-daughter Lucy

Aboriginal Traditional Owners

Friends of the Earth Australia said: "The Premier said he will respect the views of Aboriginal Traditional Owners and it is clear that an overwhelming majority of Traditional Owners are opposed to the high-level nuclear waste dump plan.[7] The Citizens' Jury should be congratulated for showing respect to Traditional Owners and the Premier must now do the same by abandoning the plan."

"Jay's jury has said no", said Tauto Sansbury, chairperson of the Aboriginal Congress of South Australia. "The Premier should now listen to the people and respect this clear decision."[8]

Karina Lester, chairperson of Yankunytjatjara Native Title Aboriginal Corporation, said: "This is a strong decision from randomly selected and very diverse group of South Australians who have had the benefit of studying the Royal Commission Report and hearing information from experts in various aspects of the proposal. It was positive to hear the jurors acknowledging the need for Traditional Owner's voices to be heard. I thank the clear majority of Jurors for this decision."[8]

The Citizens' Jury report said:[1]

"There is a lack of Aboriginal consent. We believe that the government should accept that the Elders have said NO and stop ignoring their opinions. The Aboriginal people of South Australia (and Australia) continue to be neglected and ignored by all levels of government instead of respected and treated as equals."

"The South Australian Government has a legacy of:

a. consulting indigenous people in flawed processes that does not allow Aboriginal people to exercise free, informed, and meaningful consent.
b. not receiving free, informed and meaningful consent from indigenous people in the past in all matters, including nuclear.
c. engaging in practices that lead to the disruption of trust in indigenous people; for example, Maralinga.
d. engaging in practices that disrupt indigenous people's connection to country, for example the stolen generation and construction of sites like Olympic Dam. A nuclear waste facility is inherently an imposition on connection to country.

"The consultation process that indigenous people have been involved with has been problematic. The consultation process has not been transparent, culturally inappropriate, held in inappropriate places with poor access, encountered language and literacy barriers, internet barriers, was directed by non-indigenous people, and did not recognise past wrongs and emotions.

"Many Aboriginal communities have made it clear they strongly oppose the issue and it is morally wrong to ignore their wishes. ... Jay Weatherill said that without the consent of traditional owners of the land "it wouldn't happen". It is unethical to backtrack on this statement without losing authenticity in the engagement process."

Bias exposed

The Citizens' Jury produced a raft of evidence to justify its distrust of government. The government's handling of the current nuclear waste debate is a case in point. The SA government repeatedly said it wanted a balanced, mature debate on the issue. But the government chose a nuclear advocate to head the Royal Commission, and the Royal Commissioner stacked his Expert Advisory Committee with three nuclear advocates and just one critic.

The Royal Commission relied on just one economic report, written by Jacobs MCM, a consultancy with deep links to the nuclear industry. The lead authors of the report were Charles McCombie and Neil Chapman from ARIUS, the Association for Regional and International Underground Storage.

ARIUS is a lobby group promoting nuclear waste dumps (which it calls "multinational facilities") and nuclear power. As the Australian Broadcasting Corporation (ABC) noted, ARIUS's motto is: "The world needs nuclear power – nuclear power needs multinational facilities".[9]

ARIUS is the successor to the infamous Pangea Resources, an international consortium that secretly developed plans to build an international high-level nuclear waste dump in Australia.[10] Pangea's existence wasn't known until a corporate video was leaked to Friends of the Earth in 1998.[11] Pangea set up an office in Australia but gave up in 2002 – A$600 million poorer – in the face of overwhelming public and political opposition.

Charles McCombie, co-author of the Jacobs MCM report, was heavily involved in Pangea Resources. Likewise, former Pangea chief Jim Voss is heavily involved in the current push for SA to accept foreign nuclear waste, as an 'Honorary Reader' at UCL Australia and a member of UCL Australia's Nuclear Working Group. In the late 1990s, Voss denied meeting with federal government ministers when he had in fact met at least one minister – Wilson 'Ironbar' Tuckey ('ironbar' because he once assaulted an Aboriginal man with a steel cable[12]). A Pangea spokesperson said at the time: "We would not like to be lying ... we very much regret getting off on the wrong foot."

Needless to say, the conflicted economic report produced by Jacobs MCM predicted that South

Three thousand people attended a protest in Adelaide, the capital of South Australia, on October 15 to voice their opposition to the government's nuclear waste dump plan.

Australia would become filthy rich if the state agrees to import vast amounts of nuclear waste.

The farcical and dishonest engineering of a positive economic case to proceed with the nuclear waste plan was neatly exposed by ABC journalist Stephen Long on November 8:[13]

"Would you believe me if I told you the report that the commission has solely relied on was co-authored by the president and vice president of an advocacy group for the development of international nuclear waste facilities? Charles McCombie and Neil Chapman of the consultants MCM head the advocacy group ARIUS – the Association for Regional and International Underground Storage.

"They prepared the report in conjunction with Jacobs, a global engineering and consulting firm which has a lucrative nuclear arm and boasts of its "more than 50 years of experience across the complete nuclear asset cycle".

"When I interviewed the royal commissioner last week, he initially denied that the consultants who prepared the modelling – that is the sole basis of the commission's recommendation in favour of a nuclear waste dump – faced any conflict of interest.

"He then said there would have been a conflict of interest had it been the only material the commission had relied upon, but said it was "reviewed by our team of experts and found to be an appropriate estimation of what the costs, risks and benefits might be if we were involved in the storage of waste".

"That is the same "team of experts" who, apparently, recommended the consultants in the first place."

The Citizens' Jury was deeply unimpressed by the economic propaganda produced by Jacobs MCM and promoted by the Royal Commission and the SA government. The Jury's report said:[1]

"It is impossible to provide an informed response to the issue of economics because the findings in the RCR [Royal Commission report] are based on unsubstantiated assumptions. This has caused the forecast estimates to provide inaccurate, optimistic, unrealistic economic projections. We remain unconvinced that estimates relating to the cost of infrastructure."

"The advice of two contributing authors to the Jacobs MCM economic and safety assessment, who are lobbyists for the organisation "Arius", has called into question the objectivity of elements of the RC report. Given the authoritative nature and optimistic outcome of the economic analysis in particular, concern has been expressed that RC decisions and recommendations may not be free from bias and manipulation. The issue with the inherent bias could have been abrogated by seeking additional independent economic and safety analysis. The jury is not calling into question the impartiality of the Commission but is concerned that advocates for international nuclear waste storage may have influenced RC outcomes and damaged the integrity of the RC process and may not permit an informed decision.

"The economic modelling has a number of flaws, including not accounting for negative externalities or opportunity costs, compared to other potential investments and relies on a very optimistic interest rate."

South Australian economist Prof. Richard Blandy said: "I congratulate the Second Citizens' Jury on their overwhelming decision against the proposed nuclear dump. They have shown courage and common sense. A large majority could see that the bonanza that the dump was supposed to bring to the State was based on very flimsy evidence. They saw that the real path to a better economic future for our State is based on our skills, innovative capabilities and capacity for hard work, not a bizarre gamble based on guesses. I am proud of my fellow South Australians on the Jury – including those who were in the minority. I would like to thank them all for their efforts on behalf of their fellow South Australians."[8]

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What is the half-life of the ‘Fukushima effect’ in Swiss politics?

Author: *Philippe de Rougemont – Sortir du nucléaire board member, Geneva, Switzerland.*

Promotion for the ‘yes’ campaign to limit the lifespan of reactors and hasten the nuclear phase-out in Switzerland.

NM833.4597 In Switzerland as in most western countries, citizens show a pattern of slowly shifting from initial enthusiasm towards nuclear power to resilience and now defiance. By Sunday November 27 we will know if defiance finally wins in Switzerland. It will be the country’s fourth citizens vote on a nuclear phase-out plan. Anti-nuclear organizations failed in similar votes in 1984, 1990 and 2003. All hopes rely now on the November 27 vote. Let’s take a look at how the campaign is doing.

What is Switzerland’s’ current energy mix?

Today electric power demand in Switzerland is covered by its national capacities, even though by the end of each year, Swiss utilities will have imported a considerable amount of electrons and exported as much. The country’s “white gold” – hydroelectric dams in the Alps – provide 60% of the power generation capacity, while 38% is provided by nuclear and the remaining 2% is mostly new renewables (solar, biomass) and cogeneration.

What does the public proposal ask for?

If a majority of Swiss citizens as well as cantons vote yes, a new article in the Swiss constitution will limit to 45 years the maximum duration of operation for its five nuclear reactors. This means a phase-out in three steps:

1. By 2017 the reactors connected to the grid in 1969, 1971 and 1972 will be shut down. These are the smallest and represent half of the country’s nuclear power output.
2. The Gösgen (1979) reactor will be taken off-grid by 2024.
3. The most recent and most powerful reactor, Leibstadt (1984), will be taken off-grid by 2029, closing the last reactor in operation.

The proposal states that replacement for nuclear power will have to come from renewables (domestic or imported) and energy savings.

How did this vote come about?

Days after Fukushima, the seven-person Swiss executive council (Federal Council) took the decision that Switzerland would not authorize the construction of other nuclear power plants. Parliament followed suit. This was a decision we celebrated. Before Fukushima, we had been preparing for a referendum against central states expected approval for the construction of at least one more nuclear power plant.

Federal elections were held a few months after the Fukushima meltdown. The ‘Fukushima effect’ created a boost in favour of moderately progressive candidates. The anti-nuclear movement was hopeful parliament was going to accelerate the development of renewables and energy efficiency. It was hopeful but not naive. This is why a public proposal (the one we are about to vote on) was crafted by the Greens, and officially validated by 100,000 signatures collected across the country, to serve in case of parliament’s failure.

With this proposal in the waiting list of upcoming votes, a solid Plan B was in place in case Parliament failed to pass the appropriate legislation. The proposal was to serve as a ‘Damocles-sword’ over parliament. And indeed, five years later the ‘Fukushima effect’ in Parliament had faded and passed its half-life. Parliament hadn’t scheduled a phase out of the countries’ reactors, it hadn’t boosted its feed-in tariffs,

it refused to make security retrofits mandatory for nuclear reactors and it scrapped the Federal Council's bill to set energy saving tax returns to encourage utilities to run demand-side-management programmes.

Finally, building retrofits would not be seriously encouraged through subsidies. The *energiewende à la Suisse*, prepared by the Federal Council, failed almost completely in Parliament. Because anti-nuclear people expected this outcome, they prepared the proposal that will now be voted upon.

What are the alliances in place?

In the "yes" alliance, there are political parties and NGOs. The Greens, the Liberal-Greens (right-wing secession from the Greens), the Socialists, and the small evangelist and red political parties. In some cantons, the local Christian Democratic section is campaigning for a yes vote. The youth chapters of most political parties, including, in Geneva, the rightist-populist-conservative party of M. Blocher, joined the yes campaign. With them, 40 environmental NGOs and citizens' groups. The main financial force is Greenpeace.

In the 'no' alliance are the wrongly-named "conservatives" of the political spectrum, as well as the energy giants Alpiq, Axpo and BKW who run the five nuclear reactors on behalf of their public shareholders (major cantons and city authorities). The main financer is Axpo, one of the three big energy corporations. Regretfully the confederation of small- and medium-sized enterprises is also in the no camp. Last but not least in a country where citizens' respect for state authorities is high, the Federal Council as well as parliament are in the no camp.

What are the pro-nukes saying?

They are framing the proposal as being "the Greens' proposal", omitting that several famous conservatives are in favour of the proposal – including personalities from the energy minister's own political party, the Christian Democrats.

The no camp says nuclear should indeed be phased out, but in "due time", not now; thus failing to note that parliament refused to schedule any date for a phase-out. Currently the Energy Minister Doris Leuthard claims that if there is a safety issue, nuclear plants will be shut. Why didn't anybody simply tell Tepco to "shut down" Fukushima when the tsunami struck?

When they turn aggressive, pro-nukes claim a yes to the proposal would create a blackout, and Switzerland would have to import coal- or nuclear-fired energy from the EU.

Finally, conservatives warn voters that utilities will claim damage reparations amounting to four billion swiss francs (US$4.1 billion).

What are the anti-nukes saying?

Switzerland is passively watching the energy transition being implemented in neighbouring countries. Germany has 14 times more solar panels installed per capita than Switzerland. Parliament has given in to pressure from the nuclear lobby and this is costing the countries industrial development.

The feed-in tariff is very weak. More than 40,000 solar power projects are awaiting co-financing from federal funds. These dormant projects amount to 50% of the Swiss nuclear output. No other sector has such a potential to boost the country's job creation, in an era where delocalization of jobs is running high due to cheaper wages in other countries and to rationalization of processes by IT and mechanization.

New renewable power is intermittent but Switzerland has very large pumped-storage hydroelectricity capacity. Nuclear power is not reliable in Switzerland: since 2015, two reactors, including the large Leibstadt reactor, have been shut down due to safety reasons. This is half of the country's nuclear capacity down, for how long? The real blackout risk comes from our dependence on nuclear power.

These past 10 years have seen the constant rise of population, economic growth and market intake of new electronic gadgets; however electricity consumption has remained stable. In the canton of Geneva, the local utility SIG was even able to boast a 2% net demand reduction in 10 years, a result of pioneering programs aimed at helping customers reduce consumption.

Finally, damage reparations are not justified because nuclear operators are running their plants at a loss (low energy market prices).

What are the prospects for the vote?

Much better than in previous votes, but still not good enough for optimism. This is why: In a federal country like Switzerland, a majority has to be double – a majority of the country's population and a majority of the 26 cantons (states) need to be reached to pass proposals into the constitution.

Considering the vast majority of cantons are rural and mountainous, the values and thinking predominant in these isolated cantons outweigh urban cosmopolitan cantons such as Geneva, Basel and Zurich. Perhaps this factor explains why Switzerland is considered to be rather conservative by international comparison.

Someone said that between a physical impossibility (safe nuclear power) and a political impossibility (conservatives voting for a nuclear phase-out), the choice is easily made: go on and prove political impossibility wrong! Stay tuned to news from Switzerland, Sunday November 27 by 3pm (Central European Time). If we vote yes, this will be a boost for the nuclear phase-out campaigns in the other 32 countries still operating power reactors.

Germany: nuclear waste controversies and protests

Author: *Diet Simon*

NM833.4598 On October 20, the German coalition government of Social Democrats and Conservatives passed a new law on nuclear waste. The law was defended by a leader of the opposition Greens and former environment minister, Jürgen Trittin, outraging activists.

Trittin argued on national television that it is reasonable ("sinnvoll") for operators of nuclear power stations to pay €24 billion into a fund and after that to be cleared of all responsibility for the growing mountain of nuclear waste that will radiate for all eternity. All other costs are to be borne by society.

In the year 2000, Trittin negotiated the first nuclear power phase-out with energy utilities. This time, he's agreed with them on the €24 billion.

A Münster-based activist group wrote: "We're asking ourselves: Is that supposed to be Green nuclear policy for the population or the anti-nuclear movement? Shame on him who thinks that this might be about possible government coalitions to be formed in 2017 [when federal elections are held] or possible employers after Trittin's time as an MP ends."

A leading anti-nuclear campaigner, Jochen Stay of .ausgestrahlt, sees the law enabling the nuclear operators to buy their way out of their responsibility "while the general public will bear the predictable cost increases in waste storage – this is the exit from the polluter pays principle". A leading regional newspaper, the *Neue Osnabrücker Zeitung*, commented: "Rotten deal at taxpayers' expense".

Stay writes that Trittin touted the deal as if he were a government spokesperson: "Anyone hearing that asks themselves when was the last time the Greens raised a critical voice in nuclear policy decisions. What better can happen to a government than when it makes a highly controversial law and one of the most important opposition politicians talks it up on national television? That'll make the power companies happy, whose share prices rose steeply due to the law. For the stock exchange rates the risk – now shifting from RWE, Eon and others to the public – as much more serious than Jürgen Trittin does."

In the neighbouring state of North-Rhine Westphalia, Greens nuclear policy also looks dismal. Social Democrats and Greens share government there. In the Greens draft election program for next year, there are only simplistic descriptions of nuclear problems. The uranium enrichment plant at Ahaus, the only one in Germany, doesn't even get a mention. Nor is there a plainly expressed rejection of road transportation of waste caskets from Jülich to Ahaus, and the fact that the state government has already approved such transports also doesn't get a mention. The draft lacks specific demands, exit dates, and possible ways to make a nuclear exit complete. All of which leaves the electoral program falling far short of the decisions taken by the last Greens national congress.

Another worry for the anti-nuclear movement is the federal government's plan to stop taxing the power companies' nuclear fuel supplies. That's due to happen at the start of 2017. But the activist group .ausgestrahlt has found out that the companies are already tricking their way out of paying the tax, which would lose the federal coffers nearly €750 million this year. The finance ministry website notes that expected revenue from the fuel element tax this year is €1.1 billion, but only €355 million has been raised so far. The activist group called for protest action in Berlin directed at finance minister Wolfgang Schäuble as he was due to present his tax estimate. Calling for urgent signatures to a petition, .ausgestrahlt wants the minister to keep the fuel tax for at least another year.

Waste storage

On November 2, a vigil was held outside a nuclear research facility in Jülich to protest against trucking Castor waste caskets to Ahaus or for shipment to the USA. The supervisory board was meeting inside at the time.

Depending on the route chosen, the waste would roll on busy highways, through densely populated areas for 180–190 kms to Ahaus. Activists want the waste kept in Jülich.

A protest resolution to stop the Jülich to Ahaus shipments – the West Castor Resolution – has been signed by 68 groups, with more likely. They include International Physicians for the Prevention of Nuclear War and the Greens branch in Jülich. Activists demand the new construction of the safest possible interim storage in Jülich, a definite rejection of casket transports to Ahaus or the USA and the taking of responsibility by the nuclear industry. The resolution in German is posted at www.sofa-ms.de.

On Wednesday 2 November, the energy committee of the North-Rhine Westphalia state parliament discussed keeping the 152 Castor waste caskets in Jülich, where the waste was produced by an experimental reactor. It was decided to keep them in Jülich at least until the end of 2017, when there will be federal and several state elections. The Red-Green coalition government of North-Rhine Westphalia will be relieved that the controversial transport won't happen in a year when there will be elections in both the state and the nation.

"Under no circumstances" would it be possible to transport the waste by the end of next year, said Rudolf Printz, the technical manager of the Jülich-based nuclear facility disposal enterprise (Entsorgungsgesellschaft für Nuklearanlagen), because many issues remain unresolved. The company is responsible for dismantling the reactor.

The committee debated with experts about the future of the nuclear waste. Experts testified that all options for managing the waste pose risks. Outcome: no solution in sight.

Promotion for the November 12 soccer match in Aachen. Profits will be donated to the campaign to close the nearby Tihange nuclear power plant in Belgium.

Experts have been wrestling for years with the question of what to do with the Jülich waste. The storage in Jülich has to be emptied because it is regarded as potentially vulnerable to earthquakes. That has caused three other options to be examined. Storage in what is officially just a temporary repository in Ahaus, shipment to the USA, or new construction of a quake-proof repository in Jülich. It became clear in the committee session that all three options pose problems.

Transportation to Ahaus failed just before it was to be implemented, at least for the interim. In July this year, the Federal Office for Radiation Protection (Bundesamt für Strahlenschutz, BfS) licensed the operator of the Jülich repository to store the waste in Ahaus. But according to Printz, tighter new safety regulations for temporary holding of atomic waste rule Ahaus out. Among other things, an additional wall needed to be built there to secure it against terror attack and plane crashes. “Ahaus is obsolete,” reactor safety expert Rainer Moormann told the MPs.

Shipping the spent fuel to the USA has been discussed for years. The US energy authority had signalled that nuclear fuel which had been made available to other countries for research could be taken back to the USA to prevent any danger of it being spread further. But the devil is in the detail. How should the transportation be done? How would irradiation of the population be prevented? What would all that cost? Moreover, it is uncertain that the next US president will honour the promise to take the waste back.

A third option, building a new quake-proof repository in Jülich, would take especially long. It would take at least 10 years to have such a facility operable, explained Christian Küppers, expert in nuclear technology and reactor safety with the Freiburg-based NGO Institute for Applied Ecology (Öko-Institut). That makes the plan look unrealistic to many.

Social Democrat Garrelt Duin, North-Rhine Westphalia economics minister who is politically responsible for nuclear supervision, did not present to the committee. Nor was he asked anything.

Opposition Conservatives (CDU) and Liberals (FDP) demanded speedier action by the government. The nuclear supervision of the ministry said they’re looking “for the earliest possible solution” because the 152 Castors were only “tolerated” in Jülich for now.

Disposal of high-level waste

As reported in *Nuclear Monitor* #827 in July 2016, after more than two years of work, a commission considering the storage of Germany’s high-level nuclear waste submitted its final report to the government in late June. Repository projects like Gorleben, Morsleben and Asse have failed, and the waste commission was supposed to map out a path forward. But it failed to do so: it evades all decisive issues or is so vaguely worded that the nuclear lobby can already rejoice over its interpretational wriggle room.

The commission hopes that a decision on a site can be reached by 2031 and the repository opened in 2050 – but even that decades-long timetable was described by commission president Michael Mueller as “ambitious”, and the commission’s report says that the repository might not open until “the next century”.

Protests and more protests

About 700 anti-nuclear activists demonstrated on Saturday October 29 in the German town of Lingen, where French-owned Areva produces nuclear fuel for power stations worldwide (www.lingen-demo.de). They demanded immediate closure of nuclear power stations in Lingen, Grohnde (in Germany), Tihange, Doel (Belgium), Fessenheim, Cattenom (France) and all others.

Another main demand was immediate closure of the Areva fuel element factory in Lingen and Germany’s only uranium enrichment plant in Ahaus, trinationally owned by Germany, Netherlands and Britain.

It was the biggest anti-nuclear protest in Lingen in years and activists said they were very happy with the turnout. Around 100 activist groups called out to participate. Aktionsbündnis Münsterland gegen Atomanlagen, the major mobilisers, said “the mood was good and there was broad media coverage”, including by the major national TV news, *The Tagesschau*.

The activists see the demo as another important step towards exiting nuclear power, still produced by eight of the original 17 power stations. Chancellor Angela Merkel announced on May 30, 2011, that all 17 would be shut down by 2022, in a policy reversal following Japan’s Fukushima Daiichi nuclear disaster.

“We’re going to stay on it so that uranium enrichment and fuel element production will also have to be ended,” wrote the Münster-based group.

An expert opinion by lawyer Cornelia Ziehm, commissioned by International Physicians for the Prevention of Nuclear War (IPPNW), argued in July that it is illegal under German law to export fuel elements from Lingen to the fault-prone reactors at Doel, Cattenom and Fessenheim. Ziehm refuted the contrary legal stance of the federal government point by point. The IPPNW and allied civic action groups are demanding that the environment minister, Barbara Hendricks, a Social Democrat, take action at last.

"Deny your approval of export of the fuel elements to the unsafe power station close to the border. The lives and health of us citizens here in Germany and in Belgium and France have to take priority over any entrepreneurial interests," declared Dr. Angelika Claussen of IPPNW in a communication to the minister.

On Sunday November 6, activists against the uranium enrichment plant at Ahaus, near Münster, celebrated the 30th anniversary of their "Sunday stroll" around the plant. Since 1986 the protest walk has taken place on the first Sunday of every month at 2 p.m. "The object remains immediate closure of the plant," the activists said.

And on Sunday November 12, a very unusual anti-nuclear action will start at 2pm in Aachen, where Belgium, Netherlands and Germany abut. The Alemannia Aachen soccer club will dedicate its home game against the second team of FC Cologne to opposition to the nearby Belgian nuclear power plant at Tihange. Both teams will have "Stop-Tihange" written on their jerseys and profits will flow to anti-nuclear protests. Up to 33,000 people fit into the stadium and all involved are hoping for a full house.

Nuclear, renewables, and the maverick nuclear industry insider

Author: *Jim Green – Nuclear Monitor editor*

NM833.4599 In July, *Nuclear Monitor* published a summary[1] of the latest *World Nuclear Industry Status Report* (WNISR) and a critical review[2] of the World Nuclear Association's (WNA) feeble attempt to match WNISR with the publication of its own report, the *World Nuclear Performance Report 2016*.

Steve Kidd has recently reviewed the two publications for *Nuclear Engineering International*.[3] Regular readers of *Nuclear Monitor* will know Kidd as the nuclear industry insider (formerly with the WNA) who says out loud what everyone else in the nuclear industry keeps to themselves – the nuclear renaissance is dead, the uranium industry is probably in for a long-term slump, reprocessing is "environmentally dirty", etc.

Kidd writes that while the WNISR authors are "unashamedly in the anti-nuclear camp", the report contains "a lot of good information ... while many of the points made are worthy of reflection". He questions the failure to discuss hydro and fossil fuels in detail.

Kidd writes: "The growth rates of wind and solar are certainly hugely impressive and way ahead of what most analysts were expecting only a few years ago. And with the exception of China, South Korea and a few other countries, the nuclear situation on this measure looks bleak."

He notes that WNISR's "complaint that the nuclear sector is far too optimistic on the possibility of reactors getting established in new nuclear countries ... is entirely valid. The fact that only Belarus and the UAE seem set to reach there in the next five to ten years makes the point perfectly."

On the WNA's report, Kidd writes:

"The report, unlike WNISR, is also commendably honest about the status of the industry it is trying to promote. Statements such as "the situation facing the nuclear industry globally is challenging" and "the recent history of the global nuclear industry has been mixed" are understatements, but welcome all the same. Nevertheless, as with WNISR, one has to read the report with the expectation that the best gloss will be put on facts and figures to suit the authors' case. In particular, the few crumbs of comfort (such as any positive mention of nuclear in a prominent international report) are highlighted and accorded more significance than they deserve. ...

"[T]he statement that industry prospects seem brighter than they have been for a while is not supported by the facts and figures in the chapter on nuclear industry performance. In terms of power output, the world nuclear sector is still stuck where it has been for the last 20 years.

"Although the near future should at least see more reactors starting up than shutting down, the revival rests on shaky foundations. These include the Japanese restarts, where there remains huge uncertainties, a range of new technologies such as small modular reactors, advances in development (still many years away), several major nuclear build programmes about to get under way (where and when?), and a positive shift in public support for nuclear energy in many Western countries (where?)."

Kidd notes that there is a "huge mismatch" between the WNA's 'harmony' vision – a near-tripling of nuclear capacity to 1,000 gigawatts by 2050 – and where the industry is today. He questions whether the WNA's 'harmony' vision is "a scenario, a vision, an aspiration, a target or merely a fantasy?"

Kidd argues that the nuclear industry should abandon its vision of 'harmonious' growth of both nuclear and renewables and should instead wage war against renewables – in his words, the nuclear industry should

adopt "a more aggressive stance" and start pointing out the "pitfalls" of renewables. Whether or not that is good advice (from his pro-nuclear perspective) is a moot point: the nuclear industry is already waging war against renewables.[4,5]

Renewables

Commenting on the "hugely impressive" growth of renewables, Kidd warns that "this has been the easy phase for renewables" and ongoing strong growth depends on the resolution of "a number of difficult issues".[3]

That's a fair comment – but it's also true that strong growth of renewables can be confidently predicted at least for the next 5–10 years (beyond which there are too many uncertainties to confidently predict the trajectory of any power source – few predicted the doubling of renewable energy generation or the decline of nuclear power over the past decade).

The International Energy Agency's (IEA) October 2015 *Renewable Energy Medium-Term Market Report* predicted 700 gigawatts (GW) of new renewable power capacity from 2015−2020, with renewables accounting for almost two-thirds of new power generation capacity over that period.[6]

And the IEA has just released the 2016 version of its *Renewable Energy Medium-Term Market Report* and it is considerably more bullish than last year's report:[7] Last year's estimate of 700 GW of new renewable capacity over the next five years has been upped to 825 GW from 2016–21.

The 2016 IEA report states:

- annual renewable electricity capacity growth reached an all-time record in 2015 at 153 GW;
- renewables accounted for more than half of net annual additions to power capacity in 2015, and will account for over 60% of total electricity generation growth from 2016–21;
- record deployment was accompanied by "continued sharp generation cost reductions", with further cost reductions of 15% for onshore wind and 25% for utility-scale solar PV anticipated over the next five years;
- global renewable electricity capacity is expected to grow by 42% (825 GW) by 2021; and
- the share of renewables in overall electricity generation is expected to rise from over 23% in 2015 to almost 28% in 2021.

Keep in mind that the IEA isn't an advocacy organization with a track record of publishing over-optimistic renewable energy forecasts. On the contrary, the Agency has a track record of consistently underestimating renewable energy growth.[8]

The IEA's latest report notes that there is considerable potential for far more rapid growth than it projects. The report identifies additional policy initiatives which would result in growth 29% higher than the projection of 825 GW. That would mean around 1,060 GW over the next five years to add to the 912 GW added from 2004–14[9] and the 153 GW added last year.[10]

The 'additional policy initiatives' the report discusses are:

- Addressing infrastructure challenges and market design issues to improve grid integration of renewables.
- Implementing stable and sustainable policy frameworks that give greater revenue certainty to capital-intensive renewables and reducing policy uncertainties.
- Developing policy mechanisms that reduce cost of financing and lower off-taker risks especially in developing countries and emerging economies.

IEA executive director Dr Fatih Birol said: "We are witnessing a transformation of global power markets led by renewables and, as is the case with other fields, the center of gravity for renewable growth is moving to emerging markets."[11]

Nuclear comparisons

How does the spectacular growth of renewables compare to nuclear power? There is no comparison.
A decade ago, nuclear and renewables produced roughly equivalent amounts of electricity; now, renewables produce more than twice as much as nuclear.

Nuclear power has been stagnant over the past decade if measuring by installed capacity.[12] And to achieve that underwhelming conclusion of stagnant nuclear capacity, you need to include 40 idled reactors in Japan even though a significant fraction will likely never restart. Kidd states that the inclusion of idled reactors in the calculations presented by the WNA and the International Atomic Energy Agency is "misleading" and "clearly ridiculous".[3]

If we measure by actual electricity generation, nuclear power is clearly in decline. The latest *World Nuclear Industry Status Report* provides the following facts:[13]

- nuclear electricity generation in 2015 was 8.2% below the historic peak in 2006;
- nuclear power's share of global commercial primary energy consumption was 4.4% in both 2014 and 2015 – the lowest level since 1984;
- nuclear's share of global electricity generation – 10.7% in 2015 (compared to renewables' 23.7%) – has declined from a historic peak of 17.6% in 1996; and
- since 2000, countries have added 646 GW of wind and solar capacity (combined) while nuclear capacity (not including the idled reactors in Japan) fell by 8 GW.

The *World Nuclear Industry Status Report* concludes: "In short, the 2015 data shows that renewable energy based power generation is enjoying continuous rapid growth, while nuclear power production, excluding China, is shrinking globally. Small unit size and lower capacity factors of renewable power plants continue to be more than compensated for by their short lead times, easy manufacturability and installation, and rapidly scalable mass production. Their high acceptance level and rapidly falling system costs will further accelerate their development."[13]

Yellowcake blues

Kidd recently weighed in – once again – on the uranium industry's protracted slump.[7] He writes:[14]

"Underlying demand for uranium in 2015, represented by calculated reactor requirements, was around 60,000 tonnes. Production in 2015 was close to this, but was almost double the level of the trough in 1999, when it was just over 32,000 tonnes. The missing factor here is of course secondary supplies. With the end of the HEU deal between Russia and the West in 2013 the level is not as high as it was during the late 1990s to early 2000s. But it is not much lower, as the enrichment companies have become adept at "creating" uranium through underfeeding and re-enriching it. ...

"Secondary supplies in total are still contributing about 15,000 tonnes, meaning that total supply is now running at about 75,000 tonnes. With demand at 60,000 tonnes, inventories held by the producers and their customers must be rising by about 15,000 tonnes per year. ...

"So overall, uranium production has risen by half over the past 10 years at a time when underlying demand has stayed constant. Abundant secondary supplies are coming to the market so the level of uranium inventories has naturally risen sharply. The market has clearly been production-driven. The question now is what happens if some of today's high inventory levels begin to hit the market? The only possible response is significantly lower production and possibly prices too."

As if to prove Kidd's points, the uranium spot price has been in free-fall recently. The spot price in late October ranged from US$18.75 to $20.00 / lb U3O8. That's a big fall from the spot price in January 2016 ($34.70); it's one-third of the pre-Fukushima price; and it's one-seventh of the price at the peak of a bubble in 2007. The long-term price ($35.50) is down 19% this year and down 44% compared to five years ago.[15]

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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.

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Contact us via:

WISE International
PO Box 59636, 1040 LC Amsterdam, The Netherlands
Web: www.wiseinternational.org
Email: info@wiseinternational.org
Phone: +31 20 6126368
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