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Monitored this issue:

‘Away from reactor’ spent fuel storage plan rekindles protests against Kudankulam nuclear plant in India

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The Indian government has announced a public hearing on the Environmental Impact Assessment (EIA) for the Away-From-Reactor (AFR) storage facility for spent nuclear fuel from the reactors at the Kudankulam Nuclear Power Project (KKNPP). This public hearing will be held on July 10 at Radhapuram in the Tirunelveli district, on the southern-most tip of India where the nuclear plant is located. The facility hosts six reactors – four of which remain under construction. Two units were officially commissioned in 2013 and 2016 although they have been marred with unprecedented shut-downs and outages since the beginning.[1,2]

The announcement of this AFR storage facility has come as an unintended outcome of the local communities’ protest against the nuclear project, in a weird turn of events that is itself symptomatic of deep-seated problems of India’s nuclear sector.

Parallel to the intense grassroots agitations against the KKNPP in the immediate post-Fukushima years, a sympathetic environmental NGO named Poovulagin Nanbaragal filed a court case which, in its journey from the state high court to the country’s Supreme Court, took an increasingly narrow techno-legal character.

On the one hand, the court did not look at issues like loss of livelihoods for thousands of farmers and fisherfolks, absence of disaster preparedness by the local authorities and environmental issues that were initially raised in the petition. It did however deliberate on matters of nuclear technology in ways that gave an upper hand to the nuclear authorities by default. Not only did the Supreme Court go way beyond its purview in upholding the necessity of nuclear power for the overall development of the country, something that should be essentially a policy decision, it also put unquestioning faith in the nuclear establishment and allowed it to change the goalposts repeatedly.

The Nuclear Power Corporation of India Limited (NPCIL), the plant operator, and the non-independent Atomic Energy Regulatory Board, initially pledged, when the court case was at the state level, to implement the 17 recommendations of the post-Fukushima safety audit although it was conducted internally and was not comprehensive.[3] The Madras High Court gave them a clearance based on that affidavit.

Then, in 2013, when the case reached the Supreme Court, the Regulatory Board declared its own recommendations non-mandatory and said they could be implemented even after the reactor goes online. Similarly, the NPCIL also altered its previous commitments. Amid such jugglery, the Supreme Court gave a verdict in favour of the nuclear project with a few conditions. The court, evidently, had no other independent bodies to consult as the nuclear sector in India functions in complete opaqueness and has a monopoly on expertise on everything nuclear.

One of the crucial conditions on which the Supreme Court gave a go-ahead to the KKNPP in 2013 was finding a solution to nuclear waste within five years.[4] While the NPCIL had initially promised to find a Deep Geological Repository for nuclear waste from Kudankulam, it changed the fine-print and included an AFR facility for spent fuel as an interim measure. In 2018, when the five-year conditional period ended, the Supreme Court granted it a four-year extension to build an AFR facility.

As per NPCIL’s plans, the AFR facility being planned on-site at the Kudankulam nuclear plant and will be built on 0.35 hectares of land.[5] The plant will cost around US$77 million and its construction is planned to commence in September this year. The facility will store 4,328 fuel assemblies after they have cooled sufficiently inside the primary containment of reactor buildings for five years each. In the initial agreement signed between India and USSR in 1988, nuclear waste was supposed to be shipped back to Russia.

Public hearings: designed not to listen to the people

When it comes to environmental public hearings, especially in the case of nuclear facilities, the NPCIL’s conduct in earlier instances, as well as this time, does not invoke any confidence among people who are going to be potentially affected.

A hurriedly drafted EIA report for the AFR has been made available at District Collector’s and taluka office in Radhapuram, but the administration has not taken efforts to put the document online or actively distribute it among the people to invite informed discussion. The report is however available on the Tamil Nadu Pollution Control Board’s website.

The EIA study has been conducted by Mecon India, an entity notorious for carrying out plagiarized EIA reports to provide clearance for dubious projects. Mecon’s EIA has been rejected in the past for the Mithivirdi nuclear plant.

The People’s Movement Against Nuclear Energy (PMANE), a local umbrella organization spearheading the agitation for several years, rightly contends that “the Kudankulam nuclear power project has the length of 5.4 km and the width of 2.5 km. It is quite dangerous to pack in six to eight reactors, a reprocessing plant, desalination plants, and administrative offices, etc. so densely in this 13.5 square km area.”[6]

Local residents and independent experts have raised important questions. PMANE states: “Between 1-2 reactors and 3-4 reactors, there is only a gap of 804 meters. Similarly, between 3-4 nuclear power plants and 5-6 reactors, the distance is only 344 meters. How can the AFR facility be built in this already crowded campus? Even if it was built, it would pose great dangers to the local people, and to the people of Tirunelveli, Thoothukudi and Kanyakumari districts.”

The biggest concern at this stage is the brazenness with which the government of India, the NPCIL and the local authorities deny the need for a comprehensive environmental impact assessment at Kudankulam. For Units 1 and 2, no EIA was ever done, on the spurious ground that India did not have a law mandating environmental clearances in place before 1994. The Supreme Court agreed to this illogic.

For Units 5 to 8, EIA hearings were orchestrated in 2007 in a farcical manner, with shabbily-conducted research upon which no open discussion was allowed for the local communities. The administration declared the hearing successful despite overwhelming opposition and crucial questions that remained unanswered.

It is also important to note that the initial design envisaged in 1988 has drastically changed, and desalination plants have been added to provide cooling water for reactors which will have their own additional environmental impacts. Hence, the legitimate demand for a long-term and comprehensive environmental study taking into account all reactor units and other facilities.

Spent fuel and renewed resistance

Spent fuel is anything but harmless waste. In fact, it is taken out of a reactor precisely because it becomes too radioactive to be used for producing electricity. It contains high levels of radioactivity and toxicity. However, India officially does not consider spent fuel as nuclear waste as it has massive reprocessing plans, at least in principle although actual progress in this direction has been tediously slow.

Even as the country’s nuclear establishment runs 24 nuclear reactors, Kudankulam will host its first declared spent fuel storage facility, and that only after getting strict instructions from the court. As admitted by the NPCIL itself in its legal affidavit, “the AFR facility is a challenging task on account of no previous experience with long storage requirements of high burnup Russian type PWR fuel and thereby being the first-of-its-kind facility in India.”[7]

The resistance to the Kudankulam nuclear plant is far from being a spent force although the government had its way in 2013 after brutalizing thousands of local people from the local population. This time, the district-level citizens’ groups have given a call to protest on June 25, while regional political platforms and leftist parties have also announced concerted protests on June 25.[8]

Rounds of intimidation have also started again, as movement leader Dr. S.P. Udayakumar notes in his recent open letter to India’s President.[9] His wife, children, parents, and comrades are facing threats on a daily basis and the police are creating every thinkable obstacle in the way of organizing protest gatherings and mobilizing people.

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A 2012 protest against the Kudankulam nuclear power plant.

Fallout from the HBO Chernobyl miniseries

Author: Jim Green – Nuclear Monitor editor

HBO's five-part miniseries *Chernobyl* has been watched by millions and it tops IMDB's list of the greatest TV shows of all time.[1,2] Visits to the Wikipedia 'Chernobyl disaster' page increased exponentially once the miniseries began screening, peaking at over half a million visits per day.[3]

Adi Roche, founder of Chernobyl Children International, said the miniseries "is helping us all to see Chernobyl with fresh eyes, ears, hearts, understanding, and with fresh compassion and solidarity, retelling the story as you do to a new and wider audience like never before. It truly, truly honors and gives justice to the many, many victims and the heroes of Chernobyl."[4]

Film critic Craig Mathieson had this to say in the *Sydney Morning Herald*:[5]

"With its sallow green hallways, brutalist concrete edifices, and rampant moustaches Chernobyl looks like another time, but it doesn't sound that different. "So I should leave now because of something I can't see at all," an 82-year-old farmer rhetorically asks the young soldier come to evacuate her after an explosion sends vast amounts of radiation spewing into the sky. "No," she concludes, and it's difficult not to see climate change as the allegory behind these repeated moments of intransigence.

""I prefer my opinion to yours," a local party boss dismissively tells Ulana Khomyuk (Emily Watson), a nuclear physicist who tries to raise the alarm about how serious the accident is. Chernobyl is an indictment on the official fictions of Russia's one party communist state, a system of crippling shortcuts and absurd obeisance to power, but the blank and bureaucratic system has a familiar feel. One dissenter is threatened not with the bullet but professional obliteration, so that there's no trace of their life's work. That's only more relevant now.

"Like all historic recreations it changes details and amalgamates characters into fictionalised representations such as Watson's Khomyuk, but it succeeds through a dry tone that has the bitterest of aftertaste. … The show is exceptional in revealing – in steady, shocking increments – how a large-scale disaster distorts everything it encounters. At first it is the truth, but the human casualties soon follow. Firefighters who pick up pieces of the reactor casing are so contaminated that their very cells tear themselves apart. "He's my husband," one desperate wife tells a nurse trying to evict her from the hospital. "He's something else now," the nurse replies, and horrific transformations are a recurring motif."

Film critic Dani Di Placido wrote in *Forbes*:[6]

"As Chernobyl's reactor explodes, condemning the surrounding area and its citizens to radiation poisoning, the first instinct of the men running the nuclear plant is to downplay the severity of the crisis. As the death toll rises, the effort to conceal the truth becomes ever more desperate.

"Much like the climate crisis we face today, Chernobyl's conflict wasn't really about facts; the terrible nuclear accident was right there for the world to see. But the scale of the problem was deliberately concealed, the wellbeing of not only the citizens of the Soviet Union, but of Europe and beyond, completely disregarded in favor of maintaining the illusion of control. …

"Chernobyl shows that despite the terrible, inescapable tragedy that was unfolding, the countless lives lost, the only action that the institution was motivated to act upon was self-preservation and denial. Sound familiar?"

The miniseries also received a positive review from UK-based radiation biologist Dr. Ian Fairlie, author of the comprehensive 'TORCH' reports[7] on the adverse health impacts of the Chernobyl disaster. Fairlie writes:[8]

"I have yet to see the final episode, but the first four are pretty accurate in their portrayal of the accident and the suffering which followed. Some dramatic licences have been taken in collapsing large events into easy-to-digest sequences or single characters, but overall, it is remarkably truthful and reliable in its depictions.

"Perhaps the most important aspect of the programmes is that they inform a new generation about the potential dangers of nuclear reactors. The UK still has 15 of them operating, with 2 more under construction and the Government thinking about more.

"Another aspect is that they educate people about the dangers of radiation, a subject on which most people are very poorly informed, and which the Government and its agencies avoid discussing honestly."

In a perceptive and well-worth-reading critique, which we won't attempt to summarize here, Masha Gessen, author of the book 'The Future Is History: How Totalitarianism Reclaimed Russia', argues that the miniseries falls back on disaster-movie clichés and thus fails to explore and explain the systemic causes of the Chernobyl disaster.[9]

Reactionary reactions in Russia

The miniseries has generated a great deal of interest and discussion in former Soviet states. The Belarussian Nobel laureate Svetlana Alexievich – whose book 'Voices from Chernobyl' was used by the filmmakers for information and inspiration – said the miniseries is having a positive effect:[10]

"We are now witnessing a new phenomenon that Belarusians, who suffered greatly and thought they knew a lot about the tragedy, have completely changed their perception about Chernobyl and are interpreting this tragedy in a whole new way. The authors accomplished this, even though they are from a completely different world – not from Belarus, not from our region. It's no accident that a lot of young people have watched this film. They say that they watch it together in clubs and discuss it."

Vladimir Putin has reportedly dismissed the HBO miniseries as American misinformation.[11] Dmitry Yevseyev, leader of a local branch of the Communist Party of the Russian Federation, said the miniseries "is packed with petty anti-Soviet filth, which poisons viewers' brains, thus becoming a deliberate, well-thought-out distortion of Soviet reality."[12]

Leonid Bershidsky wrote in *Moscow Times*: "The pro-Kremlin daily *Komsomolskaya Pravda* published a column suggesting that the series is an attempt to undermine Russia's leadership in nuclear reactor exports, one of the few areas in which Russia is ahead of the U.S. and actively competing for European and Asian markets. The idea, *Komsomolskaya Pravda* journalist Dmitry Steshin wrote, is to incite the European public against Russian nuclear projects. I've read plenty of similar comments on social media; the series has been accused of that ultimate sin, "Russophobia.""[13]

Bershidsky added: "The question that keeps popping up in my mind is why none of the three ex-Soviet countries most affected by Chernobyl has produced such a powerful re-creation of the 1986 events for the world's edification. It would have made sense for Russia, with its current nuclear leadership, to show that it has learned the lessons … It would have made sense for Ukraine, too; when I visited the Chernobyl zone in 2012, an illicit trade in potentially contaminated scrap metal was flourishing there amid the ruins and overgrown, abandoned villages. Belarus, heavily victimized by the Chernobyl fallout, would have been a fitting messenger, too."[13]

In fact, a miniseries about the Chernobyl disaster is being made by the Russian pro-government TV channel NTV, with the assistance of a grant of 30 million rubles (US$475,000) from the Ministry of Culture.[12,14,15] The plot revolves around a CIA agent dispatched to Pripyat to gather intelligence on the Chernobyl plant, and the Russian counterintelligence agents sent to track him down! NTV director Alexey Muradov said the show "will tell viewers about what really happened back then", adding: "There is a theory that the Americans had infiltrated the Chernobyl nuclear power plant and many historians do not deny that on the day of the explosion an agent of the enemy's intelligence services was present at the station."[15]

Pro-nuclear responses to the miniseries

Pro-nuclear propagandists – inside and outside the industry – have used the interest generated by the HBO miniseries to repeat their tired old lies about Chernobyl (dissected in some detail in Nuclear Monitor #821[16]).

The World Nuclear Association (WNA) states that the HBO miniseries has resulted a large increase in traffic to its online 'information paper' about the Chernobyl disaster where "viewers are taking the opportunity to learn more about modern nuclear safety practices and just how important nuclear energy is for addressing climate change and meeting sustainable development objectives."[17]

A separate article published by the WNA blathers on about 'modern nuclear safety practices' and states that "an effective nuclear safety culture requires well-informed and empowered operators and transparency as well as competent, independent oversight."[18] But it is silent about inadequate nuclear safety cultures and regulation

The Chernobyl #4 reactor pictured soon after the April 26 explosion.

in Russia[19], the US[20], China[21], India[22] and elsewhere. It is silent about South Korea's corrupt 'nuclear mafia'[23] and the post-Fukushima resurrection of Japan's corrupt 'nuclear village'.[24] The article[18] claims that "Ukraine has made huge progress in its approach to nuclear safety" … which is dangerous nonsense.[25,26]

Matt Wald from the US Nuclear Energy Institute, in a response to the *Chernobyl* miniseries, blames the nuclear disaster on "self-deception and cutting corners" in the Soviet nuclear industry and also takes aim at the "poor industrial safety record … shared by the other nominally communist player in international nuclear markets, China."[27] Happily, the US "doesn't work that way" and a nuclear disaster "can't happen here".

Wald demonstrates the hubris that partly explains the Chernobyl disaster, partly explains the Fukushima disaster, and presumably explains some of the 50+ nuclear accidents in the US that have resulted in more than US$50,000 of property damage.[28]

Notorious pro-nuclear liar Michael Shellenberger[29] says "it's obvious that the mini-series terrified millions of people" about nuclear power and that it "runs across the line into sensational in the first episode and never looks back."[30]

Shellenberger claims that "under 200" people have died and will die from the Chernobyl disaster.[31] Likewise, in its commentary on the HBO miniseries the World Nuclear Association states that "fewer than 100 people are believed to have died from radiation as a result of the Chernobyl accident to date".[17]

In fact, as noted at the end of the HBO miniseries, the very lowest of the estimates of the Chernobyl death toll is 4,000 eventual deaths among the higher-exposed populations, and credible estimates of the death toll across Europe range up to 93,000.[16,32]

Shellenberger dismisses estimates of thousands of deaths on the basis of the views of one contrarian scientist.[33] By that logic, we could ignore climate change, and speculation that planet Earth may be spherical, on the basis of one contrarian opinion.

Shellenberger states: "In the end, HBO's "Chernobyl" gets nuclear wrong for the same reason humankind as a whole has been getting it wrong for over 60 years, which is that we've displaced our fears of nuclear weapons onto nuclear power plants."[30] But Shellenberger has himself written at length about the connections between nuclear power and nuclear weapons proliferation.[35] He notes that "at least 20 nations sought nuclear power at least in part to give themselves the option of creating a nuclear weapon"[36] and that "having a weapons option is often the most important factor in a state pursuing peaceful nuclear energy".[37]

More information

The HBO website has the miniseries trailer, scripts and other information (and the miniseries can be streamed online for those with an HBO subscription): https://www.hbo.com/chernobyl

A companion podcast for the miniseries hosted by Craig Mazin (writer and executive producer of the miniseries) and Peter Sagal: https://podcasts.apple.com/us/podcast/the-chernobyl-podcast/id1459712981

The Nuclear Information & Resource Service has a resources webpage on the Chernobyl disaster: https://www.nirs.org/chernobyl-resource-page/

Following the success of miniseries, Sky (which collaborated with HBO in its production) released a 49-minute documentary featuring people involved in responding to the Chernobyl nuclear disaster in 1986. It is freely available online: www.youtube.com/watch?v=Xw3SFOfbR84

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International Energy Agency promotes nuclear power, downplays renewables

Author: Jim Green – Nuclear Monitor editor

The International Energy Agency (IEA) – which advises 30 member countries, and describes itself as "the leading energy organisation covering all fuels and all technologies" – has released a report promoting nuclear power and downplaying the potential of renewables.[1]

The report, 'Nuclear Power in a Clean Energy System', focuses on the role of nuclear power in 'advanced economies', comprising Australia, Canada, Chile, the 28 members of the European Union, Iceland, Israel, Japan, Korea, Mexico, New Zealand, Norway, Switzerland, Turkey and the United States.

The report notes the looming tidal wave of reactor closures due to the aging of the global reactor fleet – it states that without action, nuclear power in advanced economies could fall by two-thirds by 2040 and the report discusses the implications of this 'Nuclear Fade Case' for costs, emissions and electricity security.

Unfortunately, the report reinforces long-standing concerns about the IEA's pro-nuclear, anti-renewables bias.[2-8]

It recommends government actions that aim to ensure "existing nuclear power plants can operate as long as they are safe, support new nuclear construction and encourage new nuclear technologies to be developed." And it places particular emphasis on the (alleged) importance of keeping aging reactors running for as long as possible.

The report has nothing to say about problems with nuclear waste management (other than to make the dubious claim that several 'small modular reactor' designs have inherent advantages in safety and waste management). It has little to say about reactor safety or the heightened risks of continuing to operate aging plants.[9] It is silent about the weapons proliferation risks associated with civil nuclear programs. There's nothing about uneven and in some cases inadequate regulatory standards other than the throw-away platitude that "where necessary" safety regulations should be updated "to ensure the continued safe operation of nuclear plants."

The report makes any number of implausible claims in support of nuclear power. For example, it states that over the past 50 years, the use of nuclear power has reduced carbon dioxide emissions by over 60 gigatonnes. That statement is meaningless unless the point of reference is noted. Presumably the assumption is that nuclear power has displaced fossil fuels. If so, that needs to be stated, and the assumption also needs to be justified. It might have been a reasonable assumption decades ago; it certainly isn't now.

The report claims that achieving the clean energy transition with less nuclear power is possible but would require an "extraordinary effort". It also asserts that meeting international climate goals requires "massive" investments in efficiency and renewables as well as an 80% increase in global nuclear power production by 2040.

But it ain't necessarily so. The UN's Intergovernmental Panel on Climate Change (IPCC) released a report last year warning that global warming must be limited to 1.5˚C.[10]

In the IPCC's low-carbon scenarios, nuclear power accounts for only a small fraction of electricity supply (even if nuclear output increases) whereas renewables do the heavy lifting. For example, in one 1.5°C scenario, nuclear power more than doubles by 2050 but only accounts for 4.2% of primary energy whereas renewables account for 60.8%.[11] In another 1.5°C scenario, nuclear nearly doubles by 2050 but its contribution to total electricity supply falls to 8.9%, compared to 77.5% for renewables.[12]

The IPCC report states: "Nuclear power increases its share in most 1.5°C pathways by 2050, but in some pathways both the absolute capacity and share of power from nuclear generators declines. There are large differences in nuclear power between models and across pathways … Some 1.5°C pathways no longer see a role for nuclear fission by the end of the century, while others project over 200 EJ / yr of nuclear power in 2100."[13]

The IEA report states that the most important reason for the collapse of investor appetite for new nuclear projects in Europe and the US has been the major cost overruns on EPR reactors in France and Finland, the collapse of the VC Summer AP1000 project in South Carolina and major cost overruns on the two AP1000 reactors still under construction in the US state of Georgia. It states that the current estimated cost of those projects – US$7,000 to US$8,000 per kilowatt – is "roughly four times the cost estimated in 2005". But the latest estimate in Georgia is well over US$10,000 per kilowatt and the current estimate for the Hinkley Point EPR project in the UK is close to US$10,000 per kilowatt.

Given the IEA's inability to get its basic facts right, its conclusions should be treated with skepticism. The report states that "taking nuclear out of the equation results in higher electricity prices for consumers". That might or might not be true if considering the costs of paying for upgrades to extend the lifespan of operating reactors (according to the IEA, the estimated cost of extending the operational life of 1,000 MW of nuclear capacity for at least 10 years ranges from US$500 million to just over $1 billion[14]); it certainly isn't true for new build.

PV Magazine

An article in *PV Magazine* dissected the IEA report:[15]

The IEA study claims if there is no further investment in nuclear power in advanced economies – and a forecast two-thirds decline in nuclear capacity by 2040 occurred as a result – around four billion tons of avoidable CO2 emissions would be produced. That calculation, however, appears based on an assumption gas or coal, rather than renewables, would replace retired nuclear capacity.

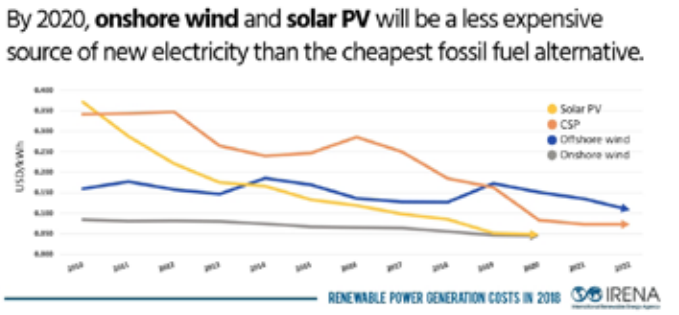
"It is a fallacy to claim nuclear will be replaced by natural gas since solar or wind, plus batteries, is less expensive," said Mark Jacobson, a professor at Stanford University who has worked for more than a decade on modelling a 100% renewable energy world. "California, Florida, Colorado and South Australia, for example, have all selected renewables-plus-storage over gas."

Jacobson said the money the IEA is calling on governments to pump into nuclear would be better spent funding further expansion of renewables. "The IEA is irresponsible for promoting the subsidy of expensive, failing nuclear plants instead of using those subsidies to fund clean renewable energy, particularly wind and solar," the Stanford professor told pv magazine. "These will eliminate more carbon and air pollution than the nuclear they will replace, and at a lower cost."

The controversial IEA study arrived in the same week as the Renewable Power Generation Costs in 2018 report[16] published by the International Renewable Energy Agency (IRENA), which noted the cost reductions achieved by renewables continue to defy expectations.[17] The review found three-quarters of new onshore wind, and four-fifths of new PV projects due to be commissioned next year, will produce power at lower prices than the cheapest new coal options without financial assistance.

"Renewable power is the backbone of any development that aims to be sustainable", stated IRENA director-general Francesco La Camera. "Today's report sends a clear signal to the international community: Renewable energy provides countries with a low-cost climate solution that allows for scaling up action."

Previous reports by Finland's Lappeenranta University of Technology[18] also contradicted the IEA's claim the global energy transition would be more difficult without investment in nuclear power. "LUT University, in collaboration with the Energy Watch Group, published two major reports that clearly document that new nuclear energy capacities are not needed for the energy transition at all," said LUT professor Christian Breyer. "Key reasons are disastrous economics, unresolved radioactive waste problems, vulnerability to terrorist attacks, remaining technical risks, limited nuclear fuels for present reactor designs and proliferation."



Source: International Renewable Energy Agency, 'Renewable Power Generation Costs in 2018'

Breyer noted other technologies vital to the energy transition, such as power-to-X and the electrification of the heating and transport sectors require very low energy costs that cannot be met by nuclear, while the issue of renewable energy intermittency and the lack of flexibility cited by the IEA can all be managed by energy storage and other innovations. Breyer also highlighted the IEA's historic underestimation of renewable energy[19] as a further problem, adding: "The report claims that less nuclear would lead to higher cost in the energy system. Given the much too high cost assumptions for renewables and the too low cost assumptions for nuclear energy in the World Energy Outlook, this may be the case for the IEA scenarios, but it violates results with real cost numbers: the real cost for nuclear energy and the real cost for renewable energy."

Mycle Schneider, lead author of the World Nuclear Industry Reports said, while IEA statements that "additions of new [nuclear] capacity have dwindled to a trickle" and "most nuclear power plants in advanced economies are at risk of closing prematurely" are not far from the findings of his annual assessments, it would take more than the policy changes recommended by the IEA to revive nuclear. "The IEA's assumption that it is only a matter of political will to reverse the trend and obtain 'an 80% increase in global nuclear power production by 2040' is lacking basic evidence for industrial feasibility, and is in fundamental contradiction with the historic performance of the industry over the past three decades," Schneider said.

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Nuclear power exits Australia's energy debate, enters culture wars

Author: Jim Green – Nuclear Monitor editor

With a dwindling number of exceptions, all of the support for nuclear power in Australia comes from the far-right of the political spectrum. They aim to have national legislation banning nuclear power plants repealed … but that seems unlikely.

The pro-nuclear far-right includes a number of politicians and ex-politicians, and some business lobby groups such as the Minerals Council of Australia and the Business Council of Australia.

Few would be surprised that the far-right supports nuclear power (if only because the 'green left' hates it). But in Australia, support for nuclear power is increasingly marginalized to the far-right. Indeed support for nuclear power has become a sign of tribal loyalty. You support nuclear power (and coal) or you're a 'cultural Marxist' (the far-right's description for anyone who isn't far-right). You oppose renewables and climate change action or you're a 'warmist' … and a cultural Marxist.

Unsurprisingly, support for nuclear power in Australia has ebbed in the aftermath of the Fukushima disaster, catastrophic costs overruns on reactor projects in western countries, and the falling costs of renewables.

Dr Ziggy Switkowski used to be nuclear power's head cheerleader in Australia and he led the federal government's review of nuclear power in 2006.[1] But he said last year that "the window for gigawatt-scale nuclear has closed"[2], and that nuclear power is no longer cheaper than renewables with the costs continuing to diverge rapidly in favour of renewables.[3]

Peter Farley, a fellow of the Australian Institution of Engineers, wrote: "As for nuclear the 2,200 MW Plant Vogtle [in the US] is costing US$25 billion plus financing costs, insurance and long term waste storage. ... For the full cost of US$30 billion, we could build 7,000 MW of wind, 7,000 MW of tracking solar, 10,000 MW of rooftop solar, 5,000MW of pumped hydro and 5,000 MW of batteries. ... That is why nuclear is irrelevant in Australia. It has nothing to do with greenies, it's just about cost and reliability."[4]

In January, Australia's Climate Council – comprising our leading climate scientists and other policy experts – issued a policy statement concluding that nuclear power plants "are not appropriate for Australia – and probably never will be".[5] The Climate Council's statement continued: "Nuclear power stations are highly controversial, can't be built under existing law in any Australian state or territory, are a more expensive source of power than renewable energy, and present significant challenges in terms of the storage and transport of nuclear waste, and use of water".

The 2006 Switkowski report estimated the cost of electricity from new reactors at A$40–65 per megawatt-hour (MWh).[1] That's roughly one-quarter of current estimates. Lazard's November 2018 report on levelized costs of electricity (LCOE) gives these figures[6]:

- New nuclear: US$112–189 / MWh (A$161–271 / MWh)
- Wind: US$29–56 / MWh (A$42–80 / MWh)
- Utility-scale solar: US$36–46 / MWh (A$52–66 / MWh)
- Natural-gas combined-cycle: US$41–74 / MWh (A$59–106 / MWh)

In 2009, Switkowski said that the construction cost of a 1,000 MW power reactor Australia would be A$4–6 billion.[7] Again, that's about one-quarter of all the real-world experience over the past decade in western Europe (and Scandinavia) and north America:

- The cost estimate for the Vogtle project in US state of Georgia (2 x AP1000 reactors) has doubled to US$27–30+ billion (A$38.8–43.2+ billion).[8] In 2006, Westinghouse said it could build an AP1000 reactor for as little as US$1.4 billion (A$2 billion)[9] – that's 10 times lower than the current estimate for Vogtle.
- The V.C. Summer project in South Carolina (2 x AP1000 reactors) was abandoned after expenditure of at least US$9 billion (A$12.9 billion).[10] The project was initially estimated to cost US$9.8 billion (A$14.1 billion); when it was abandoned, the estimate was around US$25 billion (A$36 billion).[11]
- The estimated combined cost of the two EPR reactors at Hinkley Point in the UK, including finance costs, is £26.7 billion (A$48.7 billion) (the EU's 2014 estimate of £24.5 billion[12] plus a £2.2 billion increase announced in July 2017[13]). A decade ago, the estimated construction cost for one EPR reactor in the UK was almost seven times lower at £2 billion (A$3.65 billion).[14]
- The Wylfa (Wales) project was abandoned by Hitachi after the estimated cost of the twin-reactor project had risen from ¥2 trillion (A$26.4 billion) to ¥3 trillion (A$39.7 billion).[15]
- France: The EPR reactor under construction at Flamanville is seven years behind schedule and the estimated cost of €10.9 billion (A$17.7 billion) is more than three times the original estimate of €3.3 billion (A$5.4 billion).[16]
- Finland: One EPR reactor under construction, 10 years behind schedule (and counting), the estimated cost of €8.5 billion (A$13.8 billion) is nearly three times the original €3 billion price tag.[17] The €8.5 billion figure was Areva's estimate in 2012[18]; true costs have likely increased for the long-delayed project.

Nuclear exits energy debate, enters culture wars

The far-right won't let facts get in the way of their promotion of nuclear power. New South Wales Deputy Premier John Barilaro claims that nuclear power would probably be the cheapest power source for the average Australian household[19] and is "guaranteed" to lower power bills.[20] Far-right ex-politicians Jim Molan[21] and Clive Palmer[22] claim nuclear power is "cheap". The claim by the Institute of Public Affairs that 10 power reactors could be built for A$60 billion[23] is out by A$80–180 billion based on recent experience in western Europe and north America.

The far-right repeatedly claim that 'small modular reactors' (SMRs) will come to the nuclear industry's rescue. But real-world experience with SMRs under construction suggests they will be hideously expensive.[24] According to cost estimates in a December 2018 paper by the CSIRO and the Australian Energy Market Operator, the cost of power from SMRs would need to more than halve to be competitive with wind and solar PV even with some storage costs included (two hours of battery storage or six hours of pumped hydro storage).[25]

Former Prime Minister Tony Abbott's rationale for supporting nuclear power – and repealing legislation banning nuclear power plants – is to "create a contest" with the unions, GetUp, the Greens and the Labor Party.[26] Likewise, he said last year that promoting nuclear power "would generate another fight with Labor and the green left."[27]

Abbott – and some others on the far-right – would undoubtedly oppose nuclear power if Labor and the 'green left' supported it and they would be pointing to the A$14–24+ billion price-tags for new reactors in western countries.

Abbott seems to have forgotten the experience in John Howard's last term as Prime Minister. Howard became a nuclear power enthusiast in 2005 and the issue was alive in the 2007 election contest. Howard's nuclear promotion did nothing to divide the opposition Labor Party. On the contrary, it divided the governing Liberal/National Coalition, with at least 22 Coalition candidates publicly distancing themselves from the government's policy during the election campaign. The promotion of nuclear power was seen to be a liability and it was ditched immediately after the election.

Lunatics in charge of the asylum

Those of us opposed to nuclear power can take some comfort in its increasing marginalisation to the far-right. But there are far-right-wingers highly placed in the federal government and a number of state governments. Right-wing National Party MPs are lobbying for a Senate inquiry and for a repeal of the Howard-era legislation banning nuclear power.

It has the sense of a political set-piece: the far-right wins control of the numbers on a Senate inquiry and the government agrees with its pro-nuclear findings and repeals the Howard-era legal ban which prohibits the construction of nuclear power reactors in Australia.

Melbourne, Australia.

But would Prime Minister Scott Morrison agree to repeal the ban given that there is no prospect of nuclear power being a viable option for Australia in the foreseeable future? Surely that would be an own goal, providing ammunition to political opponents and opening up divisions within the Coalition. If Morrison agreed to repeal the ban – and he says the government has no plans to do so – it would presumably only be because he felt constrained to do so by far-right Coalition MPs and by non-government far-right Senators such as Pauline Hanson. (He is also dealing with the push for government funding for a new coal-fired power plant.)

Ecomodernists

Of course, support for nuclear power in Australia isn't exclusively limited to the far-right, although it is heading that way. A tiny number of self-styled 'pro-nuclear environmentalists' or 'ecomodernists' continue to bang the drum. Ben Heard, for example, continues to voice his support for nuclear power – his advocacy lubricated by secret corporate donations[28] and amplified by the right-wing media and by invitations to any number of uranium- and nuclear-industry talk-fests.

Heard continues undeterred by the 2015/16 South Australian Nuclear Fuel Cycle Royal Commission's clear acknowledgement that nuclear power is not economically viable in Australia or by its complete rejection of his 'next generation' nuclear fantasies.[29]

But what impact could Heard's nuclear advocacy possibly have in the current context, with fossil fuel interests fighting to protest their patch and to curb the growth of renewables, and with nuclear power being so exorbitantly expensive that isn't part of any serious debate about Australia's energy options? Surely the only effect of nuclear advocacy in the current context is to muddy the debate about transitioning from fossil fuels to renewables and thus to sure up incumbent fossil fuel interests.

Australian economist Prof. John Quiggin discussed these issues last year:[30]

"The problem is that nuclear fans like Ben Heard are, in effect, advocates for coal. Their line of argument runs as follows:

(1) A power source with the characteristics of coal-fired electricity (always on) is essential if we are to decarbonise the electricity supply

(2) Renewables can't meet this need

(3) Nuclear power can

"Hence, we must find a way to support nuclear. The problem is that, on any realistic analysis, there's no chance of getting a nuclear plant going in Australia before about 2040. So, the nuclear fans end up supporting the Abbott crew saying that we will have to rely on coal until then. And to make this case, it is necessary to ignore or denounce the many options for an all-renewable electricity supply, including concentrated solar power, large-scale battery storage and vehicle-to-grid options. As a result, would-be green advocates of nuclear power end up reinforcing the arguments of the coal lobby. … In practice, support for nuclear power in Australia is support for coal. Tony Abbott understands this. It's a pity that Ben Heard and others don't."

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