

# NUCLEAR MONITOR

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## Editorial

Dear readers of the WISE/NIRS Nuclear Monitor,

In this issue of the Monitor:

- We update the situation in Japan – debates over the protracted reactor restart process; the economics of different electricity sources; the government's top-down approach to finding a high-level waste repository site, and yet another propaganda report from the IAEA.
- Michael Mariotte writes about the energy transition in the US.
- We summarize the nuclear slow-down in Russia, with plans for new reactors at home and abroad facing problems.
- Academic Mark Diesendorf argues that nuclear power isn't worth the risks.

The Nuclear News section has reports on the global renewables jobs boom, cyberattacks on nuclear facilities, and Germany's nuclear fuel levy.

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

Regards from the editorial team.

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## Japan: Back to a nuclear future?

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

**NM805.4474** The Japanese government's draft policy for electricity supply to 2030, recently endorsed by a panel of 'experts' at the Ministry of Economy, Trade and Industry, envisages nuclear power supplying 20–22% of electricity in 2030, with renewables supplying 22–24%, coal 26% and gas 27%.<sup>1,2</sup> In 2010, nuclear power accounted for 28.6% of electricity generation, while renewables supplied 9.6%, with most of that coming from hydro.

The draft is likely to be adopted as official government policy in the coming months.<sup>3</sup>

Former Democratic Party of Japan parliamentarian Satoshi Shima said Japan has energy politics but no energy policy. Politics is about making arrangements as to who will gain profits, according to Shima, whereas policy is about deciding the best choice from an overall

perspective. "Japan, as it stands now, has nothing more than a sum of stakeholders' lobbyism. Nuclear opponents are no match for pro-nuclear lobbies, which are so influential," Shima said.<sup>4</sup>

Leaving aside the questionable merits of the draft policy, it is doubtful whether nuclear can reach or sustain a 20–22% contribution. Around 34 of Japan's idled 43 reactors would need to be restarted to reach that figure.<sup>5</sup> That is at the upper end of estimates of the number of reactors likely to be restarted. Some anticipate far fewer restarts – for example Sheila Smith, senior fellow for Japan studies at the Council on Foreign Relations, predicts just 10 to 12 restarts.<sup>6</sup>

To maintain a 20–22% contribution, there would need to be numerous extensions beyond planned 40-year

reactor lifetimes, and/or new reactors. An analysis by Bloomberg New Energy Finance (BNEF) concludes that nuclear will probably supply no more than 10% of electricity in 2030, taking into account costs and the regulatory hurdles required for lifetime extensions beyond 40 years.<sup>2</sup>

“Overall, the government’s outlook appears to be an attempt at reconciling competing goals of achieving a lower-emission generation mix while at the same time protecting the politically favoured technologies of coal and nuclear,” BNEF said.<sup>7</sup>

“The Japanese government faces a twofold challenge,” said Jane Nakano, an energy and security expert at the Center for Strategic and International Studies. “How many reactors can they restart, and how many new ones can they build to start replacing those aging power plants?”<sup>6</sup>

Japan’s reactor restart process has been “one step forward, two steps back” according to financial analyst Greg Peel from FN Arena.<sup>8</sup>

Japan had 54 power reactors before Fukushima. Now, the number of ‘operable’ reactors has fallen to 43, with all six reactors at Fukushima Daiichi permanently shut down along with five other reactors at four plants. None of the 43 ‘operable’ reactors are operating.’ Applications to restart 21 reactors have been submitted to the NRA.

Every one of the applications is the subject of a lawsuit by local residents determined to stop reactor restarts.<sup>9</sup>

### Reactor restarts – the Sendai saga

Kyushu Electric Power Company has received the third and final regulatory approval to restart the Sendai 1 and 2 reactors. Kyushu submitted its application to restart the reactors to the Nuclear Regulation Authority (NRA) in July 2013. In September 2014, the NRA gave Kyushu approval to make changes to the nuclear plant. In March 2015, the company’s modifications – such as installing new piping to enhance emergency core cooling systems, and additional emergency generators – were approved. In May 2015, the NRA approved Kyushu’s operational safety plans including emergency response plans. Final inspections are under way, and Kyushu plans restarting Sendai 1 in mid-August and Sendai 2 in late September.<sup>10</sup>

Kyushu has obtained approval from the prefectural government and from Satsuma-Sendai City for the restart of Sendai 1 and 2. Strong opposition in neighboring communities, who were not consulted, was ignored.

In November 2014, Kagoshima Prefectural Council approved a petition for the restart of the Sendai reactors, while rejecting 31 petitions opposing it in some ways (e.g. outright opposition, calling for caution, demanding more research and the inclusion of more local residents as stakeholders).<sup>11</sup>

In April 2015, a local court rejected a legal bid to block the restart by residents concerned about the plant’s vulnerability to nearby volcanoes.<sup>12,13</sup> Residents have appealed the decision. Lawyer Hiroyuki Kawai said the ruling was “full of mistakes of fact.”<sup>14</sup> Lawyers representing residents said in a statement: “With this rejection, the court has abandoned its duty as a fortress of human rights. The cowardly attitude of a judge who

does not stop abuse of human rights by government deserves strong criticism.”<sup>15</sup> More than half of the residents who had sought an injunction dropped their actions after Kyushu threatened to countersue for massive damages caused by any delay.

Kyushu has been required to implement some safety upgrades, but concerns remain. Kyushu has a ‘grace period’ in which to install certain safety features such as filtered ventilation systems, and the company has been given approval to use a temporary off-site command center for emergencies while a permanent one is being built.

Kobe University professor and seismologist Katsuhiko Ishibashi said in April 2015: “Kyushu Electric was allowed to select their own criteria for quakes that could hit the plant and they ignored several as outliers.”<sup>16</sup>

A November 2014 editorial in *Japan Times* said the NRA’s approval of Kyushu’s restart plans contained “serious safety and procedural problems” such as inadequate evacuation plans, the lack of a permanent off-site command centre in the case of an emergency, the exclusion of eight municipalities from the approval process, and numerous other problems. The editorial said “a dangerous precedent has been set and many fundamental questions remain unanswered.”<sup>17</sup>

### Other reactors

Another saga is unfolding with Kansai’s Takahama 3 and 4. Kansai has received most of the necessary NRA approvals to restart the reactors.<sup>18</sup> However in May 2015 the Fukui district court upheld an injunction banning the restart of the two reactors, describing the NRA’s guidelines as “too loose” and “irrational”.<sup>19</sup> Residents argued that Kansai underestimated earthquake risks, failed to meet tougher safety standards and lacked credible evacuation measures.<sup>20</sup>

Apart from Sendai and Takahama, the only other plant to receive preliminary NRA reactor restart approval is Shikoku’s Ikata plant. One of the three reactors has received preliminary approval but the future of the plant’s other two reactors is unclear. Applications to restart the two reactors have not been submitted, and one of them is nearly 40 years old. Residents filed a lawsuit in December 2011 to close the plant, but a ruling has not yet been made.<sup>19</sup>

The assessment of seismic risks is delaying some restart approval processes and will likely result in some reactors being permanently shut down:

- The two reactors at Hokuriku’s Shika plant may be scrapped after an expert panel established by the NRA concluded that the plant likely sits above active faults. Hokuriku has applied to restart one of Shika reactors.<sup>21</sup>
- One of the two reactors at Japan Atomic Power Co.’s Tsuruga plant is likely to be scrapped after the NRA concluded in March 2015 that it sits above an active fault line.<sup>22</sup>
- At least two key geological faults under Tohoku’s Higashidori 1 reactor are believed to be active. NRA commissioner Akira Ishiwatari said in March: “It is very difficult to judge the situation. This is not a matter on which we can have an answer soon.”<sup>22</sup>



## Energy costs

The Ministry of Economy, Trade and Industry (METI) estimates that nuclear power will remain the cheapest alternative for Japan over the next 15 years.<sup>23,24</sup>

METI's estimates of generating costs in 2030 are: "at least" ¥10.1/kWh for nuclear; coal ¥12.9, gas ¥13.4, oil ¥28.9–41.6, onshore wind ¥13.9–21.9, geothermal ¥19.2, hydro ¥11, biomass ¥13.3–29.7, and solar (utility and household) ¥12.7–16.4.<sup>23</sup>

METI's figures have attracted criticism. The nuclear figures are "fooling no one" according to a piece in *Japan Times*.<sup>24</sup> METI excluded costs such as those associated with reactor decommissioning and the final disposal of reactor waste.<sup>23</sup>

METI's estimate of the future costs of dealing with nuclear disasters has been reduced on the grounds that stricter safety standards have halved the probability of large-scale accidents.<sup>25</sup> By that logic the estimated costs ought to be increased on the grounds that Japan's corrupt 'nuclear village' is back in control just a few years after the Fukushima disaster.<sup>26</sup>

In a 2011 assessment, the minimum estimated generation costs in 2030 for renewable energy sources were below that of nuclear power. The latest report gives higher estimates for renewables, in part because it includes government-funded research projects on renewable energy.<sup>25</sup>

The Japanese government is alert to the economic vulnerability of nuclear power and is planning guaranteed

prices for nuclear power even as the rest of the electricity industry is liberalized in the coming years.<sup>27</sup>

The *Asahi Shimbun* newspaper editorialized last August: "Giving preferential treatment to nuclear power, which the government has promised to reduce under its energy policy, would enable big utilities to keep their nuclear plants running and put these operators at an unfair advantage in competition with their rivals."<sup>28</sup>

## Nuclear waste

There is no end in sight to Japan's efforts to establish a repository for high-level nuclear waste. The Nuclear Waste Management Organisation was set up in October 2000 by the private sector to progress plans for disposal. Municipalities were invited to indicate whether they were interested in hosting a repository. Only the town of Toyo in western Japan indicated interest – but the town's application was quickly withdrawn after the local population expressed strong opposition.

Now, the Japanese government intends to use a top-down approach, identifying "scientifically promising locations" first and then discussing options with local governments. The new policy was approved by Cabinet in May 2015.

The revised policy does not specify a timeframe for building a repository. The cost of building a repository is estimated at ¥3,500 billion (US\$28.1b; billion; €24.9b).<sup>29</sup>

The Science Council of Japan has criticized the government for being "irresponsible toward future

generations” by seeking to restart reactors without a decision on a waste disposal site. The council says that finding a site will be difficult “given that public trust in the government, power companies and scientists has been lost” because of the Fukushima disaster.<sup>30</sup>

### IAEA report

The International Atomic Energy Agency (IAEA) has written a detailed report on the causes and consequences of the Fukushima disaster.<sup>31,32</sup>

The report was more than two years in the making, and involved 180 ‘experts’ from 42 countries along with several international bodies. The report is to be released to the IAEA’s General Conference in September. But Greenpeace has obtained the report and published it online.<sup>32</sup> Greenpeace has also released a detailed critique of the IAEA report.<sup>33</sup>

Justin McKeating from Greenpeace notes that the IAEA creates “a narrative that minimizes the health and environmental impacts of Fukushima, while emphasising that lessons are being learned, including in making nuclear safety regulation more effective. In short, the IAEA is moving to protect the nuclear industry instead of the people whose lives have been destroyed by the Fukushima disaster and those who may be affected by future nuclear accidents.”<sup>32</sup>

The IAEA’s primary currency is misleading euphemisms. IAEA Director General Yukiya Amano said the disaster resulted from “certain weaknesses in plant design, in emergency preparedness and response arrangements and in planning for the management of a severe accident.”<sup>31</sup> Likewise, the IAEA report states: “The regulations, guidelines and procedures in place at the time of the accident were not fully in line with international practice in some key areas, most notably in relation to periodic safety reviews, re-evaluation of hazards, severe accident management and safety culture.”

In fact, the problems went well beyond “certain weaknesses” and a slight misalignment with international practice. Japan’s nuclear industry was thoroughly corrupt. Numerous accidents before Fukushima resulted from the industry’s serious, systemic failings – as did the Fukushima disaster itself.<sup>34</sup>

The disaster “exposed certain weaknesses in Japan’s regulatory framework”, according to the IAEA, including divided responsibilities and a lack of clarity.<sup>31</sup> In truth, the problems went well beyond “certain weaknesses”. Japan’s nuclear regulatory bodies were in on the game; they were part of the ‘nuclear village’. Moreover, the problems that led to the Fukushima disaster are re-emerging; the nuclear village is back in control.<sup>26</sup>

Greenpeace notes that the new regulator, the NRA, is failing in its job. This is evident in the NRA’s handling of the application to restart the Sendai reactors. Greenpeace notes: “Despite warnings of weak nuclear regulation, the NRA is not following international practice, including recommendations made by the IAEA. The NRA review of nuclear plants planned for restart, specifically the Sendai nuclear reactors, has accepted the violation of the post-Fukushima regulations, and

thus has approved an inadequate seismic standard essential for the safety of the nuclear plant.”<sup>33</sup>

The IAEA report claims that “no discernible increased incidence of radiation-related health effects are expected among exposed members of the public and their descendants.” That may be true in that it would be difficult to detect Fukushima-related morbidity and mortality in epidemiological studies. Nonetheless, as the Greenpeace report notes, the number of fatal cancers in the Japanese population can be estimated at roughly 4,800 (based on the UN’s collective dose estimate), in addition to non-fatal cancers and non-cancer illnesses.

Ever since the Fukushima disaster, the IAEA has been encouraging the Japanese government to weaken its radiation dose limits for workers and the public – and the government seems happy to oblige. The NRA is to increase the radiation exposure limit for workers in emergency situations from the current 100 millisieverts (mSv) to 250 mSv.<sup>35</sup> For members of the public, the internationally accepted limit of 1 mSv has already been increased to 20 mSv, and members of the ruling Liberal Democratic Party are pushing for the limit to be increased to 50 mSv.<sup>36</sup>

The IAEA’s platitudes about the importance of ‘stakeholder involvement’ are particularly cynical. In Fukushima prefecture, people have been effectively forced return to contaminated land. The lifting of evacuation orders, and the termination of compensation payments one year later, has forced people to return to places such as Tamura (Myakoji) or Kawauchi, where the evacuation order was lifted last year.<sup>33</sup>

The platitudes about ‘stakeholder involvement’ also ignore the fact that the current LDP government has set the clock back 20 years regarding public involvement in the development of energy policy. Dr Philip White, an expert on Japan’s energy policy formation process, notes: “A major step toward greater public participation and disclosure of information occurred after the December 1995 sodium leak and fire at the Monju fast breeder reactor. Although public participation was not conducted in good faith, at least lip service was paid. It seems that the current government has decided that it doesn’t even need to pay lip service.”<sup>37</sup>

Meanwhile, at Fukushima Daiichi, it’s business as usual with a steady stream of radioactive leaks. The latest significant leak, discovered on May 29, involved an estimated 7 to 15 tons of highly radioactive water leaked from a hose that was used to transfer contaminated water from storage tanks to a treatment facility. TEPCO said the water contained 1.1 million becquerels of beta-emitting radioactive materials per liter. The radioactive water made its way to the sea through a ditch, according to TEPCO.<sup>38</sup>

TEPCO said it did not replace the hose with a more durable one even though it was aware of the potential danger that could result from aging, and had not checked the hose since installing it in October 2013. NRA chair Shunichi Tanaka said TEPCO “should be held deeply responsible” and “lacks a strategic approach in addressing the contaminated water issue.”<sup>38</sup>



## References:

1. 3 May 2015, 'The same old energy mix', [www.japantimes.co.jp/opinion/2015/05/03/editorials/the-same-old-energy-mix/](http://www.japantimes.co.jp/opinion/2015/05/03/editorials/the-same-old-energy-mix/)
2. Chisaki Watanabe, 2 June 2015, 'Japan Government Too Bullish on Nuclear Role by 2030, BNEF Says', <http://about.bnef.com/bnef-news/japan-government-too-bullish-on-nuclear-role-by-2030-bnef-says/>
3. 27 May 2015, 'Nuclear power crucial as renewable energy too costly, ministry says', <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201505270040>
4. Naohito Maeda, 5 April 2015, 'Why not talk more about a nuclear-free future for Japan?', <http://ajw.asahi.com/article/views/column/AJ201504050005>
5. Chisaki Watanabe and Emi Urabe, 28 April 2015, 'Japan Sees Clean Energy Edging Out Nuclear Power in 2030', [www.bloomberg.com/news/articles/2015-04-28/japan-expects-renewable-energy-to-edge-out-nuclear-power-by-2030](http://www.bloomberg.com/news/articles/2015-04-28/japan-expects-renewable-energy-to-edge-out-nuclear-power-by-2030)
6. Keith Johnson, 8 April 2015, 'Japan Bets on Nuclear, and Coal, for Future Power', <https://foreignpolicy.com/2015/04/08/japan-bets-on-nuclear-and-coal-for-future-power/>
7. <http://about.bnef.com/white-papers/japans-likely-2030-energy-mix-gas-solar/>
8. Greg Peel, 26 May 2015, 'Uranium Week: Japan's Ups And Downs', FNArena News, [www.fnarena.com/index2.cfm?type=dsp\\_newsitem&n=5A1656BA-B6B4-86CD-5386A1BEA1F45137](http://www.fnarena.com/index2.cfm?type=dsp_newsitem&n=5A1656BA-B6B4-86CD-5386A1BEA1F45137)
9. 25 April 2015, 'Legal fallout: Court cases frustrate efforts to restart Japan's nuclear plants', [www.economist.com/news/asia/21649557-court-cases-frustrate-efforts-restart-japans-nuclear-plants-legal-fallout](http://www.economist.com/news/asia/21649557-court-cases-frustrate-efforts-restart-japans-nuclear-plants-legal-fallout)
10. WNN, 27 May 2015, 'Sendai reactors cleared for restart', [www.world-nuclear-news.org/RS-Sendai-reactors-cleared-for-restart-2705154.html](http://www.world-nuclear-news.org/RS-Sendai-reactors-cleared-for-restart-2705154.html)
11. Friends of the Earth Japan, 7 Nov 2014, [www.foejapan.org/en/energy/doc/141107.html](http://www.foejapan.org/en/energy/doc/141107.html)
12. Reuters, 27 May 2015, 'Nuclear regulator clears two Sendai reactors for restart', [www.japantimes.co.jp/news/2015/05/27/national/nuclear-regulator-clears-two-sendai-reactors-restart/](http://www.japantimes.co.jp/news/2015/05/27/national/nuclear-regulator-clears-two-sendai-reactors-restart/)
13. Beyond Nuclear, 22 April 2015, 'Local judge denies lawsuit to block Sendai nuke restart as Japanese vow continued resistance to potential atomic volcano', [www.beyondnuclear.org/japan/2015/4/22/local-judge-denies-lawsuit-to-block-sendai-uke-restart-as-j.html](http://www.beyondnuclear.org/japan/2015/4/22/local-judge-denies-lawsuit-to-block-sendai-uke-restart-as-j.html)
14. 23 April 2015, 'Anti-uke activists disheartened over court ruling on reactor restarts in Kagoshima', [http://ajw.asahi.com/article/behind\\_news/social\\_affairs/AJ201504230054](http://ajw.asahi.com/article/behind_news/social_affairs/AJ201504230054)
15. Robin Harding, 22 April 2015, 'Japan moves closer to nuclear restart', [www.ft.com/intl/cms/s/0/486a7f74-e8c1-11e4-87fe-00144feab7de.html](http://www.ft.com/intl/cms/s/0/486a7f74-e8c1-11e4-87fe-00144feab7de.html)
16. Yuriy Humber, 1 May 2015, 'Japan Earthquake Expert Says Nuclear Watchdog Ignoring Risk', [www.bloomberg.com/news/articles/2015-04-30/japan-earthquake-expert-says-nuclear-watchdog-ignoring-risk](http://www.bloomberg.com/news/articles/2015-04-30/japan-earthquake-expert-says-nuclear-watchdog-ignoring-risk)
17. 12 Nov 2014, 'Bad precedent for nuclear restart', [www.japantimes.co.jp/opinion/2014/11/12/editorials/bad-precedent-nuclear-restarts/](http://www.japantimes.co.jp/opinion/2014/11/12/editorials/bad-precedent-nuclear-restarts/)
18. Nuke Info Tokyo No. 165, 31 March 2015, 'Green Light Given for Restarting Takahama Units 3 and 4', [www.cnic.jp/english/?p=3047](http://www.cnic.jp/english/?p=3047)
19. 20 May 2015, 'NRA approves restart for third nuclear plant', [www.japantimes.co.jp/news/2015/05/20/national/japan-approves-third-nuclear-plant-restart/](http://www.japantimes.co.jp/news/2015/05/20/national/japan-approves-third-nuclear-plant-restart/)
20. 15 April 2015, 'Japanese court blocks restart of Kansai Electric's Takahama nuclear reactors on safety grounds', [www.abc.net.au/news/2015-04-14/japanese-court-blocks-restart-of-nuclear-plant-on-safety-grounds/6391804](http://www.abc.net.au/news/2015-04-14/japanese-court-blocks-restart-of-nuclear-plant-on-safety-grounds/6391804)
21. Toshio Kawada, 14 May 2015, 'Panel says faults under Shika nuke plant may be active', [http://ajw.asahi.com/article/behind\\_news/social\\_affairs/AJ201505140050](http://ajw.asahi.com/article/behind_news/social_affairs/AJ201505140050)
22. WNN, 26 March 2015, 'Tsuruga 2 sits on active fault, NRA concludes', [www.world-nuclear-news.org/RS-Tsuruga-2-sits-on-active-fault-NRA-concludes-2603155.html](http://www.world-nuclear-news.org/RS-Tsuruga-2-sits-on-active-fault-NRA-concludes-2603155.html)
23. Osamu Tsukimori, 28 Apr 2015, 'Japan's electricity cost estimates by power source in 2030 – METI', <http://af.reuters.com/article/energyOilNews/idAFL4N0XP05M20150428>
24. Philip Brasor, 23 May 2015, 'Lowball nuclear pitch is fooling no one', [www.japantimes.co.jp/news/2015/05/23/national/media-national/lowball-nuclear-pitch-fooling-one/](http://www.japantimes.co.jp/news/2015/05/23/national/media-national/lowball-nuclear-pitch-fooling-one/)
25. Tomoyoshi Otsu, 28 April 2015, 'Nuclear energy cheapest power source due to reduced disaster risks, ministry says', <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201504280045>
26. 19 March 2015, 'Japan's 'nuclear village' reasserting control', Nuclear Monitor #800, [www.wiseinternational.org/nuclear-monitors](http://www.wiseinternational.org/nuclear-monitors)
27. Reuters, 21 Aug 2014, <http://af.reuters.com/article/commoditiesNews/idAFL4N0QR1G120140821>
28. 23 Aug 2014, Asahi Shimbun, 'Special support for nuclear power operators at odds with market liberalization', Editorial, <http://ajw.asahi.com/article/views/editorial/AJ201408230035>
29. WNA, Japan's Nuclear Fuel Cycle, updated May 2015, [www.world-nuclear.org/info/Country-Profiles/Countries-G-N/Japan--Nuclear-Fuel-Cycle/](http://www.world-nuclear.org/info/Country-Profiles/Countries-G-N/Japan--Nuclear-Fuel-Cycle/)
30. 22 Feb 2015, 'Editorial: Nuclear waste disposal problem', [www.japantimes.co.jp/opinion/2015/02/22/editorials/nuclear-waste-disposal-problem/](http://www.japantimes.co.jp/opinion/2015/02/22/editorials/nuclear-waste-disposal-problem/)
31. IAEA, 14 May 2015, 'IAEA Delivers Major Report on Fukushima Accident to Member States', [www.iaea.org/newscenter/news/iaea-delivers-major-report-fukushima-accident-member-states](http://www.iaea.org/newscenter/news/iaea-delivers-major-report-fukushima-accident-member-states)
32. Justin McKeating, 1 June 2015, 'Greenpeace releases confidential IAEA Fukushima-Daiichi accident report', [www.greenpeace.org/international/en/news/Blogs/nuclear-reaction/IAEA-Fukushima-Daiichi-accident-report/blog/53055/](http://www.greenpeace.org/international/en/news/Blogs/nuclear-reaction/IAEA-Fukushima-Daiichi-accident-report/blog/53055/)
33. Jan Vande Putte, Kendra Ulrich and Shaun Burnie, 28 May 2015, 'The IAEA Fukushima Daiichi Accident Summary Report: A preliminary analysis', [www.greenpeace.org/japan/global/japan/pdf/IAEA%20analysis%20by%20GP%2020150528.pdf](http://www.greenpeace.org/japan/global/japan/pdf/IAEA%20analysis%20by%20GP%2020150528.pdf)
34. Friends of the Earth, Australia, 2012, 'Japan's nuclear scandals and the Fukushima disaster', [www.foe.org.au/anti-nuclear/issues/nfc/power/japan](http://www.foe.org.au/anti-nuclear/issues/nfc/power/japan)
35. WNN, 21 May 2015, 'Japan to raise worker emergency radiation exposure limits', [www.world-nuclear-news.org/RS-Japan-to-raise-worker-emergency-radiation-exposure-limits-2101154.html](http://www.world-nuclear-news.org/RS-Japan-to-raise-worker-emergency-radiation-exposure-limits-2101154.html)
36. 22 May 2015, 'LDP wants to let evacuees move back to areas tainted with 50 millisieverts or less by March 2017', [www.japantimes.co.jp/news/2015/05/22/national/lpd-team-calls-lifting-evacuation-orders-less-radiation-polluted-areas-march-2017/](http://www.japantimes.co.jp/news/2015/05/22/national/lpd-team-calls-lifting-evacuation-orders-less-radiation-polluted-areas-march-2017/)
37. Philip White, 24 Jan 2014, Japan goes back to the future to affirm energy 'foundation', Nuclear Monitor #776, [www.wiseinternational.org/node/4219](http://www.wiseinternational.org/node/4219)
38. 4 June 2015, 'NRA rebukes TEPCO for failure to contain radioactive Fukushima water', <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201506040105>

# Checking in on the energy transition in the US

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**NM805.4475** In Germany it's called the Energiewende—the energy transition. It's a deliberate decision to move away from nuclear power and fossil fuels in favor of renewables and energy efficiency. And it's working. Renewables are skyrocketing, nuclear reactors have closed and more shutdowns are on the way, and coal use is declining too<sup>1</sup>, despite the misleading claims of renewable energy haters.

Here in the US, it isn't called anything – if we have an “official” government policy at all it's “all of the above”, which is the same as saying meaningless. But an *ad hoc* energy transition is nonetheless taking place in the U.S.

In April, 100% of all new electric generating capacity in the US was wind and solar –511 MW of wind and 50 MW of solar.<sup>2</sup> For the year so far, renewables account for 84.1% of new capacity, with natural gas supplying the rest. The amount of solar is understated, however, since it doesn't account for rooftop solar and other distributed generation. Nor, of course, do these numbers, compiled by the Energy Information Administration, attempt to quantify the effect of energy efficiency on avoiding the need for new generating capacity. There has been no new capacity from nuclear, coal or oil.

This is an energy transition already underway, quietly, with some government support but without an actual transition policy – indeed, with a policy that is inherently hostile to the transition.

As Ken Bossong of the Sun Day Campaign points out, “Renewable energy capacity is now greater than that of nuclear (9.14%) and oil (3.92%) combined. In fact, the installed capacity of wind power alone has now surpassed that of oil. In addition, total installed operating generating capacity from solar has now reached and surpassed the one-percent threshold – a ten-fold increase since December 2010.”

But it's an energy transition with a long ways to go. Germany is the clear global leader in solar power – despite its relatively low solar potential – with 38,200 MW of solar installed as of the end of 2014. The US ranked fifth then with 18,280 MW of installed capacity, also behind China, Japan and Italy – although the US likely has passed Italy by now. Given solar's low capacity factor, that's only about 4.5 large nuclear reactors worth of power installed in the US.

And it looks worse when you look at solar from a *per capita* basis.<sup>3</sup> The US barely cracks the top 20 of installed solar capacity per person, at 19th in the world, the US

is behind nations like Bulgaria (8th), non-nuclear Austria (13th) and even nuclear-dominated France (15th).

Still, the US is a big country with a lot of generating capacity (China is even bigger, and thus doesn't even make the top 20 on a *per capita* basis). It takes a while to install that amount of any form of generating capacity. And solar is growing faster than any other form. Remember that 10-fold increase in solar capacity in less than five years. With no indications of slowing down, there's good reason to believe that before the end of this decade another ten-fold increase will occur. That would put solar alone above 10% of our electricity generation, and wind will provide even more.

Another ten-fold increase after that would be impossible of course, since it would make solar the only generating source in the US. But this is how the energy transition in the US is occurring: without formal policy, without significant government support. Even though the nuclear and fossil fuel industry hacks continue to carp about subsidies for renewables, the reality is that their industries have been far more heavily subsidized over the years than renewables. If renewables do get the majority of the subsidy crumbs left on the table by the budget-slashers these days, and that's by no means clear, it's simply because it's their due for being ignored so long while untold billions of dollars were heaped on dirty energy technologies.

The US can, must, and all indications are will continue to bring renewables online rapidly. And as that happens, higher-cost and dirtier nuclear and coal plants inevitably will continue to close. The rationale for keeping them open with ratepayer bailouts becomes thinner and thinner even to those expected to be warm to utilities clinging to expensive and outdated dirty power plants. In the last week of May alone, the Illinois legislature deferred action on Exelon's 18-month pursuit of a nuclear bailout<sup>4</sup>, while the Ohio Public Utilities Commission has put off its action on a similar request from First Energy to bail out the Davis-Besse reactor and some coal plants.<sup>5</sup> Whichever way those entities end up deciding on those issues, it's clear that the old arguments aren't working for the utilities. Even skeptics are now having to acknowledge the economic and environmental benefits of clean energy technologies.

And so the transition continues, largely out of sight to the average American and perhaps even less so to the average politician. But that doesn't make it any less real.

*Michael Mariotte regularly writes at [www.safeenergy.org](http://www.safeenergy.org)*

## References:

1. <http://reneweconomy.com.au/2015/nuclear-isnt-the-only-energy-phase-out-happening-in-germany-24135>
2. [www.renewableenergyworld.com/articles/2015/05/wind-and-solar-account-for-100-percent-of-new-us-generating-capacity-in-april.html](http://www.renewableenergyworld.com/articles/2015/05/wind-and-solar-account-for-100-percent-of-new-us-generating-capacity-in-april.html)
3. <http://breakingenergy.com/2015/05/25/actually-the-us-is-a-dismal-solar-power-adopter/>
4. [www.chicagobusiness.com/article/20150527/NEWS11/150529874/springfield-neither-shaken-nor-stirred-by-exelons-uke-threats](http://www.chicagobusiness.com/article/20150527/NEWS11/150529874/springfield-neither-shaken-nor-stirred-by-exelons-uke-threats)
5. [www.dispatch.com/content/stories/business/2015/05/28/issue-of-coal-plant-income-guarantees-remains-unsettled.html](http://www.dispatch.com/content/stories/business/2015/05/28/issue-of-coal-plant-income-guarantees-remains-unsettled.html)

# Russia's nuclear slow-down

Author: Jim Green – Nuclear Monitor editor

**NM805.4476** Russia is often said to be one of four countries driving the global nuclear renaissance, along with China, India and South Korea. The World Nuclear Association's reactor database paints a rosy picture: 34 'operable' reactors, 9 under construction, 31 'on order or planned', and 18 'proposed'. Nuclear capacity is 25.3 gigawatts, with 57.2 GW in the pipeline.<sup>1</sup>

Those numbers mask a very different reality. If there is any nuclear growth in Russia, it will be slow and modest. The rapid, sustained growth implied in the term 'renaissance' is out of the question. Just four reactors have begun operation since the year 2000, and new reactors will be required just to maintain the status quo given the ageing of the Russian reactor fleet – already 19 reactors have been operating beyond their engineered life spans of 30 years.<sup>2</sup>

On May 26, Russia's ministry of economic development announced significant delays to the completion and start-up of new nuclear power plants.<sup>3</sup> Deputy Russian Economic Development Minister Nikolai Podguzov said: "In agreement with all executive bodies together with Rosatom, our prognosis is there will be a very significant delay in commissioning the reactors. ... These units are simply not needed at the moment thanks to a current energy surplus."<sup>4</sup>

Reactors affected by the latest decision include the two reactors of Leningrad Phase II, the second reactor of Novovoronezh Phase II, and the planned four-reactor Smolensk Phase II project.

While the government cites an energy surplus for the nuclear slow-down, other factors are at work – Russia's economic problems, and Rosatom's inability to fund the many reactors projects it has planned in Russia and overseas. Nils Bøhmer, a nuclear physicist and executive director of the Environmental Rights Center Bellona, said: "I think this is the first signal from the Russian nuclear industry that they will reduce their building of new nuclear reactors, both domestic, but also on the international arena."<sup>4</sup>

A January 2015 report by the Russian Duma's independent Audit Chamber revealed that delayed payments for construction costs at numerous new nuclear plants are leading to cost overruns and delays. Overall, funding constraints have put seven of nine new Russian nuclear power plant builds behind schedule, according to the report.<sup>5</sup>

The Audit Chamber report also questioned the adequacy of reviews of nuclear projects by the Directorate-General for State Environmental Reviews. One problem occurred at Leningrad-2 plant's No. 1 reactor – technical violations in construction resulted in a collapse of the unit's reinforcement cages, which brought down the reactor's outer protective shell in July 2011. The construction of the No 1 and 2 reactors was delayed by a year as a result, with substantial cost overruns.<sup>5</sup>

According to the Russian nuclear regulator Rostekhnadzor, 39 incidents occurred at Russian

nuclear power plants in 2013. The main reasons cited by the regulator were "mismanagement, defects in equipment and design errors."<sup>2</sup>

In January, the international ratings agency Fitch downgraded 13 of the largest Russian companies, including Rosatom subsidiary Atomenergoprom. Government funding for Rosatom's reactor projects is expected to amount to 88 billion roubles (about US\$1.57b; 1.41b) this year but will fall to less than half that amount in subsequent years.<sup>6</sup>

## Exports

Vladimir Sliviyak, co-chair of the Russian ecological group Ecodefense, noted in a recent article:

*"Despite a portfolio of orders estimated at over \$100 billion Rosatom claimed it had at the end of 2014, actual construction work on the company's new reactor projects is effectively only proceeding in China and Belarus (and the Indian Kudankulam-2 was just recently finished, according to the Russian media). Domestically, the state corporation last year promised to launch three new reactors, but only one saw the light of day: a new unit at Rostov NPP, in the south of European Russia. Overall, all Rosatom projects where any work at all is being done are affected by serious delays, which increases costs significantly."*<sup>6</sup>

It is unlikely that Rosatom is capable of building dozens of new reactors across the world. The Russian National Wealth Fund – which is meant to complement and support Russia's pension system – is being plundered to part-fund Rosatom's planned new reactor in Finland.<sup>6</sup>

Former World Nuclear Association executive Steve Kidd noted in October 2014 that it is "highly unlikely that Russia will succeed in carrying out even half of the projects in which it claims to be closely involved".<sup>7</sup>

There are also serious doubts about the ability of a number of the countries interested in buying Russian reactors to finance them – even though Rosatom is offering huge loans to get projects off the ground. Countries reported to be considering purchasing Russian reactors include Iran, Turkey, Vietnam, Bangladesh, Jordan, Hungary, Finland, Egypt, India and South Africa.

## Floating reactors, fast reactors

The cost of building Russia's floating nuclear power plant has increased four-fold to 37 billion roubles (US\$660m; €590m), and it is seven years behind schedule. The plant, which is two years from completion, comprises a barge and two 35-megawatt reactors. There are concerns that it will be a sitting duck for terror attacks, nuclear theft, and unreachable accidents.<sup>8</sup>

Rosatom subsidiary Rosenergoatom has "indefinitely" postponed construction of the BN-1200 sodium-cooled fast neutron reactor, citing the need to improve fuel for the reactor and amid speculation about the cost-effectiveness of the project. The decision to indefinitely postpone the

project might be reviewed in 2020. The reactor had been scheduled to start commercial operation in 2025, depending on experience operating a pilot BN-800 fast-neutron reactor which achieved first criticality in June 2014 but has not yet started commercial operation.<sup>9</sup>

As recently as July 2014, Rosenergoatom's director general said that Russia planned to begin construction of three BN-1200 reactors before 2030.<sup>9</sup> OKBM – the Rosatom subsidiary that designed the BN-1200 reactor – previously anticipated that the first BN-1200 reactor would be commissioned in 2020, followed by eight more by 2030.<sup>10</sup>

#### References:

1. [www.world-nuclear.org/info/Facts-and-Figures/World-Nuclear-Power-Reactors-and-Uranium-Requirements/](http://www.world-nuclear.org/info/Facts-and-Figures/World-Nuclear-Power-Reactors-and-Uranium-Requirements/)
2. Vladimir Sliviyak, December 2014, 'Russian Nuclear Industry Overview', <http://earthlife.org.za/2014/12/pay-more-with-nuclear-report-4/>
3. WNN, 27 May 2015, 'Russian ministry agrees to postponement of new reactors', [www.world-nuclear-news.org/NN-Russian-ministry-agrees-to-postponement-of-new-reactors-27051501.html](http://www.world-nuclear-news.org/NN-Russian-ministry-agrees-to-postponement-of-new-reactors-27051501.html)
4. Charles Digges, 8 June 2015, 'Is Russia postponing reactor builds over power surpluses or financial deficits?', <http://bellona.org/news/nuclear-issues/2015-06-russia-postponing-reactor-builds-power-surpluses-financial-deficits>
5. Charles Digges, 27 Jan 2015, 'Russian Audit Chamber cites ballooning budgets in domestic nuke projects', <http://bellona.org/news/nuclear-issues/nuclear-russia/2015-01-russian-audit-chamber-cites-ballooning-budgets-domestic-uke-projects>
6. Vladimir Sliviyak, 18 May 2015, 'Survival of the fittest? World's major nuclear builders are in for a long stretch in the red', <http://bellona.org/news/uncategorized/2015-05-survival-fittest-worlds-major-nuclear-builders-long-stretch-red>
7. Steve Kidd, 6 Oct 2014, "The world nuclear industry – is it in terminal decline?", [www.neimagazine.com/opinion/opinionthe-world-nuclear-industry-is-it-in-terminal-decline-4394815/](http://www.neimagazine.com/opinion/opinionthe-world-nuclear-industry-is-it-in-terminal-decline-4394815/)
8. Charles Digges, 25 May 2015, 'New documents show cost of Russian floating nuclear power plant skyrockets', <http://bellona.org/news/nuclear-issues/2015-05-new-documents-show-cost-russian-nuclear-issues-power-plant-skyrockets>
9. World Nuclear News, 16 April 2015, 'Russia postpones BN-1200 in order to improve fuel design', [www.world-nuclear-news.org/NN-Russia-postpones-BN-1200-in-order-to-improve-fuel-design-16041502.html](http://www.world-nuclear-news.org/NN-Russia-postpones-BN-1200-in-order-to-improve-fuel-design-16041502.html)
10. [www.world-nuclear.org/info/Country-Profiles/Countries-O-S/Russia--Nuclear-Power/](http://www.world-nuclear.org/info/Country-Profiles/Countries-O-S/Russia--Nuclear-Power/)
11. Alexander Nikitin, 5 May 2015, 'In a perpetual search for perpetuum mobile', <http://bellona.org/news/uncategorized/2015-05-perpetual-search-perpetuum-mobile>

#### More information:

- Greenpeace, October 2014, 'Rosatom Risks: Exposing the Troubled History of Russia's State Nuclear Corporation', [www.greenpeace.org/hungary/PageFiles/636986/rosatom\\_risks.pdf](http://www.greenpeace.org/hungary/PageFiles/636986/rosatom_risks.pdf)
- Vladimir Sliviyak, December 2014, 'Russian Nuclear Industry Overview', <http://earthlife.org.za/2014/12/pay-more-with-nuclear-report-4/>

## Accidents, waste and weapons: nuclear power isn't worth the risks

**Author:** *Mark Diesendorf – Associate Professor and Deputy Director, Institute of Environmental Studies, University of New South Wales, Australia.*

**NM805.4477** The case for expanding nuclear energy is based on myths about its status, greenhouse gas emissions, proliferation, accidents, wastes and economics. Let's take each in turn.

### Status

Nuclear is not, and has never been, a major energy force. Global annual nuclear energy generation peaked in 2006. Meanwhile its percentage contribution to global electricity generation has declined from its historic peak in 1993 of 17% to about 10% today. The only countries with significant growth are China, India, Russia and South Korea. In the rest of the world, retirements of ageing reactors are likely to outweigh new builds.<sup>1</sup>

### Greenhouse emissions

Nuclear advocates are fond of claiming that nuclear energy has negligible greenhouse gas emissions and hence must play an important role in mitigating climate change. However, the greenhouse case for new nuclear power stations is flawed.

Rosenergoatom spokesperson Andrey Timonov the BN-800 reactor "must answer questions about the economic viability of potential fast reactors because at the moment 'fast' technology essentially loses this indicator [when compared with] commercial VVER units."<sup>9</sup>

Another fast-neutron reactor project – the BREST-OD-300 – is stretching Rosatom's funds. Bellona's Alexander Nikitin said that Rosatom's "Breakthrough" program to develop the BREST-OD-300 reactor was only breaking Rosatom's piggy-bank.<sup>4,11</sup>

In a study published in 2008,<sup>2</sup> nuclear physicist and nuclear energy supporter Manfred Lenzen compared life-cycle emissions from several types of power station. For nuclear energy based on mining high-grade uranium ore, he found average emissions of 60 grams of CO<sub>2</sub> per kilowatt hour of electricity generation, compared with 10–20 g per kWh for wind and 500–600 g per kWh for gas. Now comes the part that most nuclear proponents try to ignore.

The world has, at most, a few decades of high-grade uranium ore reserves left. As ore grades inevitably decline, more diesel fuel is needed to mine and mill the uranium, and so the resulting CO<sub>2</sub> emissions rise. Lenzen calculated the life-cycle emissions of a nuclear power station running on low-grade uranium ore to be 131 g per kWh.

This is unacceptable in terms of climate science, especially given that Lenzen's assumptions favoured nuclear energy. Mining in remote locations will be one of the last industries to transition to low-carbon fuels, so new nuclear reactors will inevitably become significant greenhouse gas emitters over their lifetimes.<sup>3</sup>



## The next generation of reactors

Some generation IV reactors<sup>4</sup> are potentially lower in life-cycle greenhouse gas emissions, but these are not yet commercially available.

All are likely to be even more expensive than conventional reactors. The fast breeder reactor is even more complex, dangerous, expensive and conducive to weapons proliferation than conventional nuclear reactors. Despite several decades of expensive pilot and demonstration plants, fast breeders have not been successfully commercialised, and may never be.

Advocates try to justify the integral fast reactor and the thorium reactor on the fallacious grounds that they cannot be used to produce nuclear weapons explosives. However, if not operated according to the rules, the integral fast reactor can actually make it easier to extract weapons-grade plutonium and hence make bombs.<sup>4</sup> To be useful as a nuclear fuel, thorium must first be converted to uranium-233, which can be fissioned either in a nuclear reactor or an atomic bomb, as the United States has demonstrated.

## Weapons proliferation

Nuclear proponents dismiss the danger that civil nuclear energy will drive the development of nuclear weapons, by saying that the nuclear industry is now under strong international oversight. This ignores the harsh reality that India, Pakistan, North Korea and South Africa have all used civil nuclear energy to help build their nuclear weapons. Furthermore, Australia, Argentina, Brazil, Iran, Libya, South Korea and Taiwan all used civil nuclear energy to cloak their commencement of nuclear weapons programs, although fortunately all except Iran have now discontinued them.<sup>7</sup>

Thus nuclear energy contributes to the number of countries with nuclear weapons, or the capacity to build them, and hence increases the probability of nuclear war.

## Accidents

Analyses of the damage done by major nuclear accidents, such as Chernobyl in 1986 and Fukushima in 2011, should properly consider not just the short-term deaths from acute radiation syndrome, but also the cancers that appear over the ensuing decades, and which represent the major contribution to death and disabilities from these incidents.

### References:

1. [www.worldnuclearreport.org](http://www.worldnuclearreport.org)
2. [www.isa.org.usyd.edu.au/publications/documents/ISA\\_Nuclear\\_Report.pdf](http://www.isa.org.usyd.edu.au/publications/documents/ISA_Nuclear_Report.pdf)
3. <http://theconversation.com/sure-lets-debate-nuclear-power-just-dont-call-it-low-emission-21566>
4. [www.beyondnuclear.org/storage/documents/BN\\_Final\\_FullFactsheet\\_IFR\\_Jan2013.pdf](http://www.beyondnuclear.org/storage/documents/BN_Final_FullFactsheet_IFR_Jan2013.pdf)
5. [www.beyondnuclear.org/storage/fact-sheets/Thorium%20and%20Nuclear%20Weapons.pdf](http://www.beyondnuclear.org/storage/fact-sheets/Thorium%20and%20Nuclear%20Weapons.pdf)
6. [www.energyscience.org.au/FS09%20Proliferation.pdf](http://www.energyscience.org.au/FS09%20Proliferation.pdf)
7. [www.researchgate.net/profile/Peter\\_Boyle/publication/7151231\\_Estimates\\_of\\_the\\_cancer\\_burden\\_in\\_Europe\\_from\\_radioactive\\_fallout\\_from\\_the\\_Chernobyl\\_accident/links/540060d20cf24c81027de71b.pdf](http://www.researchgate.net/profile/Peter_Boyle/publication/7151231_Estimates_of_the_cancer_burden_in_Europe_from_radioactive_fallout_from_the_Chernobyl_accident/links/540060d20cf24c81027de71b.pdf)
8. [www.foejapan.org/energy/evt/pdf/121214.pdf](http://www.foejapan.org/energy/evt/pdf/121214.pdf)
9. <http://ennews.com/groundwater-radiation-levels-surge-fukushima-after-another-major-leak-750-tons-water-relatively-high-levels-radioactivity-video>
10. [www.theguardian.com/cities/2015/may/15/what-most-radioactive-city-chernobyl-fukushima](http://www.theguardian.com/cities/2015/may/15/what-most-radioactive-city-chernobyl-fukushima)
11. <http://reneweconomy.com.au/2015/why-nuclear-industry-needs-to-be-paid-500mwh-67193>
12. [www.ucsusa.org/nuclear\\_power/nuclear-power-and-our-energy-choices/nuclear-power-costs/nuclear-power-subsidies-report.html](http://www.ucsusa.org/nuclear_power/nuclear-power-and-our-energy-choices/nuclear-power-costs/nuclear-power-subsidies-report.html)
13. [www.nytimes.com/2014/11/11/science/earth/denmark-aims-for-100-percent-renewable-energy.html?\\_r=0](http://www.nytimes.com/2014/11/11/science/earth/denmark-aims-for-100-percent-renewable-energy.html?_r=0)
14. [www.germany.info/Vertretung/usa/en/06\\_\\_Foreign\\_\\_Policy\\_\\_State/02\\_\\_Foreign\\_\\_Policy/05\\_\\_KeyPoints/ClimateEnergy\\_\\_Key.html](http://www.germany.info/Vertretung/usa/en/06__Foreign__Policy__State/02__Foreign__Policy/05__KeyPoints/ClimateEnergy__Key.html)
15. <http://reneweconomy.com.au/2014/100-renewable-electricity-will-achieved-german-state-soon-91074>
16. <http://theconversation.com/renewable-energy-is-ready-to-supply-all-of-australias-electricity-29200>

Reprinted from *The Conversation*,

<https://theconversation.com/accidents-waste-and-weapons-nuclear-power-isnt-worth-the-risks-41522>

Estimates of future Chernobyl deaths by reputable impartial authors range from 16,000 by the International Centre for Research on Cancer<sup>8</sup>, to 93,000 by an international group of medical researchers.<sup>9</sup>

Four years after Fukushima, the plant is still leaking radiation<sup>10</sup>, while a reported 120,000 people remain displaced<sup>11</sup> and Japanese taxpayers face a bill that could run to hundreds of billions of dollars.

## Economics

Proponents often cherry-pick highly optimistic projections of the future cost of nuclear energy. However, past and present experience suggests that such projections have little basis in reality. Apart from the Generation IV reactors, which are not commercially available and hence cannot be costed credibly, all of the much-touted current (Generation III+) power reactors under construction (none is operating) are behind schedule and over budget.

In Finland, Olkiluoto-3 is nearly a decade behind schedule and nearly three times its budgeted cost; in France, Flamanville-3 is five years behind schedule and double budgeted cost; in Georgia, USA, Vogtle is three years behind schedule and about US\$700 million over budget. Britain's proposed Hinkley Point C will receive a guaranteed inflation-linked price for electricity over 35 years, starting at about US\$180 per megawatt hour – double the typical wholesale price of electricity in the UK. It will also receive a loan guarantee of about US\$20 billion and insurance backed by the British taxpayer.<sup>12</sup> It's doubtful whether any nuclear power station has ever been built without huge subsidies.<sup>13</sup>

## Nuclear waste vs renewable energy

High-level nuclear wastes will have to be safeguarded for 100,000 years or more, far exceeding the lifetime of any human institution.

Meanwhile, Denmark is moving to 100% renewable electricity by 2035<sup>14</sup>, and Germany to at least 80% by 2050.<sup>15</sup> Two German states are already at 100% net renewable energy.<sup>16</sup>

The variability of wind and solar power can be managed with mixes of different renewable energy technologies, at geographically dispersed locations to smooth out the supply.<sup>17</sup> Why would we need to bother with nuclear?

# NUCLEAR NEWS

## Global renewables jobs boom to 7.7 million

According to a report by the International Renewable Energy Agency (IRENA), the global renewable energy industry employed 7.7 million people, directly or indirectly, in 2014 – an 18% increase on the 6.5 million jobs reported in 2013. Large hydro directly employed another 1.5 million in 2014. IRENA expects the number to more than double, to around 16 million jobs, by 2030.

“Renewable energy continues to assert itself as a major global employer, generating strong economic and social benefits worldwide,” said IRENA Director-General Adnan Amin. “This increase is being driven, in part, by declining renewable energy technology costs, which creates more jobs in installation, operations and maintenance.”

According to the IRENA report, solar PV was the largest renewable energy employer in 2014, with 2.5 million jobs worldwide, followed by liquid biofuels (1.8 million), wind (1 million), biomass (822,000), solar heating/cooling (764,000), biogas (381,000), small hydro (209,000), and geothermal (154,000).

China was the world’s largest renewable energy employer in 2014, with 3.4 million jobs.

*IRENA, 19 May 2015, ‘Renewable Energy and Jobs: Annual Review 2015’,*

*Summary: [www.irena.org/News/Description.aspx?NType=A&mnu=cat&PriMenuID=16&CatID=84&News\\_ID=407](http://www.irena.org/News/Description.aspx?NType=A&mnu=cat&PriMenuID=16&CatID=84&News_ID=407)*

*Full report:*

*[www.irena.org/DocumentDownloads/Publications/IRENA\\_RE\\_Jobs\\_Annual\\_Review\\_2015.pdf](http://www.irena.org/DocumentDownloads/Publications/IRENA_RE_Jobs_Annual_Review_2015.pdf)*

## Record solar growth

A record amount of solar power was added to the world’s grids in 2014, pushing total capacity to 100 times the level it was in the year 2000.<sup>1,2</sup> Around 40 gigawatts was installed last year, raising total installed capacity to 178 GW. China (10.6 GW), Japan (9.7 GW) and the US (6.5 GW) were the leaders.

The growth is detailed in SolarPower Europe’s *Global Market Outlook*. Michael Schmela, executive adviser to SolarPower Europe, noted that in 2014 renewables produced more power than nuclear in Europe for the first time in decades. The gap between renewables and nuclear in Europe is certain to grow.

The latest edition of BP’s *Energy Outlook* predicts that, globally, non-hydro renewables will overtake nuclear power generation in the early 2020s.<sup>3</sup>

China could get 85% of its electricity and 60% of total energy from renewables by 2050, according to government agencies. A rapid rollout of wind, solar and bioenergy is technologically and economically feasible, a report led by the China National Renewable Energy Centre claims. In a “high renewable” scenario, the country’s coal use would peak in 2020 and its greenhouse gas emissions by 2025.<sup>4</sup>

1. Solar Power Europe, 2015, ‘Global Market Outlook for Solar Power: 2015–2019’, [www.solarpowereurope.org/fileadmin/user\\_upload/documents/Publications/Global\\_Market\\_Outlook\\_2015\\_-2019\\_lr\\_v23.pdf](http://www.solarpowereurope.org/fileadmin/user_upload/documents/Publications/Global_Market_Outlook_2015_-2019_lr_v23.pdf)
2. Arthur Neslen, 10 June 2015, ‘Record boost in new solar power continues massive industry growth’, [www.theguardian.com/environment/2015/jun/09/record-boost-in-new-solar-power-continues-massive-industry-growth](http://www.theguardian.com/environment/2015/jun/09/record-boost-in-new-solar-power-continues-massive-industry-growth)
3. BP, Feb 2015, ‘Energy Outlook 2035’, [www.bp.com/energyoutlook](http://www.bp.com/energyoutlook)
4. Megan Darby, 22 April 2015, ‘China’s electricity could go 85% renewable by 2050 – study’, [www.rtcc.org/2015/04/22/chinas-electricity-could-go-85-renewable-by-2050-study/](http://www.rtcc.org/2015/04/22/chinas-electricity-could-go-85-renewable-by-2050-study/)

## IAEA warns of cyberattacks on nuclear facilities

International Atomic Energy Agency (IAEA) Director-General Yukiya Amano called for stronger efforts to protect the world’s nuclear facilities from cyberattacks. Amano was speaking in front of more than 650 experts from 92 IAEA member states at the inaugural International Conference on Computer Security in a Nuclear World on June 1.

Nuclear facilities around the world are facing daily cyberattacks on their systems, according to the IAEA. “Last year alone,” Amano said, “there were cases of random malware-based attacks at nuclear power plants and of such facilities being specifically targeted.”

The threat of cybercrime and cyberattacks has been steadily growing over recent years and particularly in developing countries where criminals can exploit legal loopholes and weak security measures, according to recent findings by the UN Office on Drugs and Crime.

[www.un.org/apps/news/story.asp?NewsID=51018](http://www.un.org/apps/news/story.asp?NewsID=51018)

[www.scmagazine.com/international-conference-on-computer-security-hosted-for-first-time/article/418241/](http://www.scmagazine.com/international-conference-on-computer-security-hosted-for-first-time/article/418241/)

[www.iaea.org/newscenter/statements/remarks-international-conference-computer-security-nuclear-world-vienna-june-1-2015](http://www.iaea.org/newscenter/statements/remarks-international-conference-computer-security-nuclear-world-vienna-june-1-2015)

## Former US gov't employee charged for trying to steal nuclear secrets

The US Justice Department has charged a former government employee for allegedly trying to steal nuclear secrets through email attacks and then selling them to China. Charles Eccleston allegedly attempted the ‘spear-phishing’ attack in January 2015, targeting dozens of email accounts, which he believed would unleash a virus to collect sensitive information about nuclear weapons.

Eccleston, a former employee at the US Department of Energy and the Nuclear Regulatory Commission, has lived in the Philippines since 2011 after being fired in 2010. He was detained on March 27 and deported to the US.

He was caught in a sting by the FBI after he approached a foreign embassy about providing classified US information.

*Lisa Lambert, 9 May 2015, ‘Former US government employee tried to steal nuclear weapons secrets’, [www.theage.com.au/world/former-us-government-employee-tried-to-steal-nuclear-weapons-secrets-20150508-ggxrc.html](http://www.theage.com.au/world/former-us-government-employee-tried-to-steal-nuclear-weapons-secrets-20150508-ggxrc.html)*

## Australia: uranium miner not prosecuted over spill

The Northern Territory state government is taking too long to punish those responsible for a radioactive spill on Aboriginal land in Kakadu National Park, traditional owners say.

The Department of Mines and Energy has investigated the 2013 spill of up to 1.5 million litres of acidic slurry from a collapsing leach tank at the Ranger uranium mine, operated by Energy Resources of Australia (ERA), which is majority owned by Rio Tinto.

But the department is yet to share its report with stakeholders. The Gundjeihmi Aboriginal Corporation, which acts for the Mirarr traditional owners, says the delay is “completely unacceptable”, especially given ERA was able to restart operations at Ranger a year ago.

“Members of the investigative taskforce as well as the general public are still waiting for the regulator to release its report, let alone prosecute the mining company,” corporation CEO Justin O’Brien said.

Mirarr traditional owners want the government to impose a fine, or declare an operational breach for the spill.

[www.sbs.com.au/news/article/2015/06/05/nt-govt-must-end-delay-ranger-action](http://www.sbs.com.au/news/article/2015/06/05/nt-govt-must-end-delay-ranger-action)

## Beautiful nuclear power

Britain’s new energy secretary Amber Rudd says new nuclear power plants should be aesthetically pleasing in an effort to reduce objections from local communities.

“We’re hoping to build new nuclear plants in the UK over the next few years and I think it is a reasonable ambition to make sure that these big projects have aesthetic appeal as well to help win the public over,” Rudd said. “These big infrastructure projects ... are an integral part of our lives and I think we should make them more attractive to the public.”

[www.dailymail.co.uk/news/article-3113386/Nuclear-power-stations-designed-beautiful-public-says-energy-secretary.html](http://www.dailymail.co.uk/news/article-3113386/Nuclear-power-stations-designed-beautiful-public-says-energy-secretary.html)

[www.independent.co.uk/news/uk/politics/beautiful-nuclear-power-stations-can-win-over-sceptics-says-energy-secretary-amber-rudd-10301365.html](http://www.independent.co.uk/news/uk/politics/beautiful-nuclear-power-stations-can-win-over-sceptics-says-energy-secretary-amber-rudd-10301365.html)

## German nuclear fuel levy is legal

Germany’s tax on nuclear fuel conforms to European Union laws, the European Court of Justice (ECJ) ruled on June 4. Since January 2011, each gram of nuclear fuel loaded into a German reactor has carried a levy, expected to raise about €2.3 billion (US\$2.6 billion) annually.

That levy was imposed as a consequence of an amendment to the 2002 Atomic Energy Act that allowed longer operating lives for German reactors. The tax was retained after Germany adopted a nuclear phase-out policy in the aftermath of the Fukushima disaster.

Kernkraftwerke Lippe-Ems GmbH – a joint venture between RWE and EOn that operates the Emsland nuclear power plant – took legal action over the fuel levy. The European Court of Justice has ruled that the levy is compatible with EU law. The court rejected a claim that nuclear fuel must be exempt from taxation under the European directive on taxation of energy products and electricity; it ruled that the levy does not constitute state aid; and it ruled that the Euratom Treaty does not preclude the levy.

Meanwhile, Germany’s Federal Constitutional Court is considering the legality of the nuclear fuel levy; a decision is expected by the end of this year.

WNN, 5 June 2015, [www.world-nuclear-news.org/NP-German-nuclear-fuel-duty-is-legal-says-European-court-0506155.html](http://www.world-nuclear-news.org/NP-German-nuclear-fuel-duty-is-legal-says-European-court-0506155.html)

# WISE/NIRS Nuclear Monitor

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

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

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

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

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