Fukushima-daiichi nuclear accident: Implications for the future of nuclear power

ISSUE BRIEF

"If there are risks of accidents that could make half the land mass of our country uninhabitable, we cannot afford to take such risks, even if we are only going to be playing with those risks once a century."

- Prime Minister Naoto Kan, September 7, 2011.

The nuclear industry was in crisis before the events at the Fukushima-daiichi nuclear power plant in March 2011. Huge and escalating costs, ageing reactors and major safety issues meant that the worldwide expansion of nuclear power was in reality industrial myth-making, echoed and magnified by ill informed politicians and multimillion dollar public relations campaigns. After the events of March 11, 2011, the decade long effort to project an image of safe and clean nuclear power has been shattered.[1]

Photo: International Atomic Energy Agency

More than the image of nuclear power has been damaged, the accident had an immediate impact on nuclear power. In addition to the four reactors destroyed at Fukushima, Japan has shut down all but two of its fifty remaining reactors.[2] By May 2012, Japan, the third largest generator of nuclear electricity in the world will have no operating reactors. Desperate efforts by nuclear utilities to restart these shutdown reactors are being challenged by communities and local governments across Japan. It is unclear if, when and how, many of these facilities will begin operation. In reaction to its worst ever industrial accident, the public has embraced renewable energy and energy efficiency, with reports of 70 percent demanding a phase out of nuclear power.[3]

The impact of Fukushima also resonated worldwide. The conservative government in Germany, with the fourth largest economy in the world, immediately closed seven of its oldest nuclear reactors and one other.[4] The conclusion of a Government appointed commission was that ending nuclear power was necessary to avoid the risk of accident, was easily achievable in terms of alternatives, while also meeting carbon reduction targets and could demonstrate **"that a withdrawal from nuclear energy is the chance to create a high-powered economy."**[5] Two months after the start of the accident at Fukushima the German government passed legislation that will shut down its remaining nine reactors by 2022. A 50-year-old commitment to nuclear power was abandoned when parliament unanimously approved an end to nuclear power and an even greater expansion of wind, solar, biomass and energy efficiency.[6] It's noteworthy, that despite the significant reduction of nuclear power, not only have Germany's energy needs been met, but, in February for example, it was exporting as much as 5 gigawatts of electricity to France, including a significant contribution from solar energy.[7]

1 See, http://www.ipsos-na.com/news-polls/pressrelease.aspx?id=5265
2 See, http://www.spiegel.de/international/world/0,1518,bild-322529-818567,00.html
3 See, http://www.asyura2.com/11/genpatu18/msg/183.html as cited in Nuclear Power and Shifts in Japanese Public Opinion, Matthew Penney, Feb. 13th, 2012 http://www.japanfocus.org/events/view/130
4 See, http://www.spiegel.de/international/germany/0,1518,757371,00.html
5 See, http://www.nytimes.com/2011/05/12/business/energy-environment/12energy.html
6 See, http://online.wsj.com/article/SB10001424052702304584004576417432939804792.html, for plan for renewables and rapid nuclear phaseout, http://www.greenpeace.de/fileadmin/gpd/user_upload/themen/energie/DerPlan.pdf
7 See, http://www.jeremyleggett.net/2012/02/german-power-exports-to-france-including-solar-increasing/

Friends of the Earth
1100 15th St NW, Flr 11
Washington, DC 20005
202.783.7400(p)
202.783.0444 (f)

311 California St, Ste. 510
San Francisco, CA 94104
415.544.0790 (p)
415-544-0796 (f)

www.foe.org

CONTACT: Shaun Burnie ~ Nuclear campaigner ~ burnie.shaun@googlemail.com

France, the nation with highest percentage share of nuclear generated electricity,[8] has also been impacted by the Fukushima-daiichi accident. Polls indicating more than 75 percent of the French public opposed to nuclear power have emerged since the accident.[9] Nuclear safety is one of the major issues in the French Presidential Elections, with the possibility that a new government will scale back the French nuclear program and increase investments in renewables and energy efficiency.[10] With its management of nuclear plants weighing it down, the state owned utility, Electricite de France (EDF), has seen its share price drop through 2011[11] and has debts of US$43 billion.[12] Desperate to extend the operating life of 28 of its oldest reactors, it was planning to spend US$21 billion on safety upgrades on these before the Fukushima-daiichi accident.[13] The additional costs, as a result of Fukushima, have already been estimated as a further US$13 billion for the whole fleet of 58 reactors,[14] following assessments made by the nuclear safety regulator.[15] The one reactor under construction in Normandy is three years behind schedule, and 50 percent over budget, with major safety issues still unresolved.[16] AREVA the state owned nuclear company, which is attempting to secure orders worldwide for its reactors and nuclear waste and plutonium management operations, saw its share value collapse and trading suspended during 2011. It has recently posted its trading losses of US$3.1 billion its worst since it was established in 2001.[17] The Fukushima accident's global impact on prospects for nuclear power were cited as reasons for AREVA's disastrous results.[18] The nuclear program of France had major problems before the Fukushima-daiichi accident, since when they have only increased. Yet this is claimed as the model for nuclear power development in the United States and worldwide.[19]

For over a decade the nuclear industry has claimed that a new program of worldwide expansion was underway – the so-called nuclear renaissance. Much of this growth was predicated on the expansion of nuclear power in China. Indeed, 27 reactors are currently under construction – though much of this was temporarily put on hold following the Fukushima accident. What the nuclear industry does not talk about is that in 2010 installed wind generating capacity in China was four times larger than nuclear.[20] In the same year China invested US$50 billion in renewable energy compared with US$10 billion in nuclear.[21] The reality is that in 2010 nuclear power generated only 5 percent of global energy and 13 percent its electricity,[22] and has declined as a share of global capacity and the overall share of energy generation. That decline has only accelerated since the Fukushima accident. In 2010, for the first time installed renewable generating capacity was larger than installed nuclear capacity.[23] Even the International Atomic Energy Agency (IAEA) a body dedicated to the promotion and expansion of nuclear power was predicting that by 2030 its share of global electricity would not rise above 9 percent.[24] That was before the Fukushima meltdown.

The true scale of the environmental and human health consequences of the Fukushima accident will only be revealed in the years and decades ahead. Already clear however is that the prospects for nuclear power, not good before Fukushima, have become much worse.

---

8 See, Nuclear generates 75% of France's electricity, http://www.world-nuclear.org/info/inf40.html
9 See, http://www.nuclearpowerdaily.com/reports/French_Greens_seek_nuke_power_phase-out_999.html
10 See, http://www.france24.com/en/20111205-security-breach-nuclear-debate-greenpeace-sarkozy-hollande-fukushima
11 See, http://english.capital.gr/News.asp?id=1331805
12 See, http://www.bloomberg.com/news/2012-02-16/edf-says-2011-net-income-rose-as-french-nuclear-output-climbed.html
13 See, http://www.bgcpartners.com/news-centre/in-the-media/97675379.html
14 See, http://online.wsj.com/article/SB10001424052970203550304577138392366526910.html
15 See, http://www.french-nuclear-safety.fr/index.php/English-version/News-releases/2012/ASN-Report-on-the-Complementary-Safety-Assessments-CSA
16 See, World Nuclear Industry Status Report 2010–2011 Nuclear Power in a Post-Fukushima World 25 Years After the Chernobyl Accident, Mycle Schneider, Antony Froggatt, and Steve Thomas, Worldwatch Institute, Washington, D.C., U.S.A. with the support of the Greens-EFA in the European Parliament, April 2011, http://www.worldwatch.org/system/files/WorldNuclearIndustryStatusReport2011_%20FINAL.pdf
17 See, http://www.modernpowersystems.com/story.asp?sectioncode=131&storyCode=2061386 and http://www.neimagazine.com/story.asp?storyCode=2061388 and http://areva.com/news/liblocal/docs/FICHIERS%20PDF%20CP/2012/20120302%20-%20AREVA%20RA%202011_UK%20FINAL.pdf
18 See, http://www.google.com/hostednews/afp/article/ALeqM5iOV39cTcXFRDaJaGyWZ108fOHw7Q?docId=CNG.4f45fdff3292f10f96f9f9caed149d3e.261
19 See, http://www.reuters.com/article/2009/09/14/idUS131353+14-Sep-2009+PRN20090914
20 See, Mycle Schneider: Nuclear Power in a Post-Fukushima World, June 2011, http://www.ps.boell.org/downloads/MycleSchneiderAmman-June2011.pdf
21 Ibid.
22 Ibid.
23 See, Pew charitable trusts, "Who's winning the clean energy race – Edition 2010", Philadelphia, 2011 - as cited in the, http://www.worldwatch.org/system/files/WorldNuclearIndustryStatusReport2011_%20FINAL.pdfopcit,
24 Opcit, IAEA, 2009, Barnaby/Burnie, 2010.

CONTACT: Shaun Burnie ~ Nuclear campaigner ~ burnie.shaun@googlemail.com

Shifting Japan's energy direction

> ***"The government, operator, and the academic world were all too steeped in a safety myth. Everybody must share the pain of responsibility,"***
>
> -Prime Minister Noda, March 2rd 2012.[25]

Confronted with the meltdown of three nuclear reactors and an uncontrolled situation at a fourth, in one year Japan has shut down more than twice the number of nuclear power plants that worldwide have begun operation in the last 10 years.[26] The 50 reactors that will all be closed by the summer of 2012 represent perhaps US$500 billion dollars of assets. The 10 nuclear companies that own these power plants are haemorrhaging billions in lost electricity sales. For a society built on the generation and consumption of electricity, 29 percent of which was produced by nuclear power,[27] and with the aim of significant carbon emissions by 2020, such a situation appears to be unsustainable. At some point the nuclear power plants will surely be turned back on. But not necessarily,[28] and the events of March 11 could prove the catalyst for a revolutionary shift in Japan's industrial and energy infrastructure, as great as its modernization during the 1950s and 1960s.

Japanese energy policy for nearly five decades prioritized nuclear power above all other sources. The result of this was hundreds of billions of taxes invested in nuclear power plant subsidies. Nuclear facilities such as the Rokkasho-mura plutonium reprocessing plant were built at a staggering cost of US$20 billion,[29] not to forget the US$11 billion Monju Fast Breeder reactor.[30] Neither of these were necessary for Japan's energy supply, and they don't work anyway. But they are indicative of the power and influence of the central planning bureaucrats in the Ministries of Economy and Science, and their partners in the large corporations and electrical utilities. Central planning from Tokyo, with cash distributed to the nuclear power plant hosting Prefectures through the closed electrical grid, meant no space for competition let alone the deployment of large scale renewables and little possibility of changes in direction.

The Japanese people devastated by the scale of the earthquake and tsunami have now turned against nuclear power as never before. The deep sadness of the human tragedy of hundreds of thousands of people displaced by the nuclear accident and widespread contamination has become an anger at the those who promised them that nuclear power was safe. The enormous costs of the accident are slowly being realized. As a recent analysis concluded, the bill over the next ten years ranges from US$74 to US$261 billion.[31] But this does not include compensation to fisheries and farming communities which could add at least another US$52 billion. The total cost has been estimated as high as US$650 billion – a figure comparable to the cost of the U.S. banking meltdown in 2008.[32] The fifty billion dollar nuclear assets that in the space of few hours became worthless liabilities at Fukushima-daiichi on March 11, 2011 are only a fraction of the true cost the people of Japan will have to pay in the decades to come.

The enormous scale of the challenge to shift direction on energy in Japan is difficult to comprehend. Technically it can be done, and the Japanese people overwhelmingly support it. There have been no power shortages during the winter of 2011-2012 when most of Japan's reactors have been closed.[33] There are credible plans for dramatically scaling up renewable energy and energy efficiency with no restart of any nuclear reactors. Such an approach, if implemented would

---

25 See, http://www.nytimes.com/2012/03/04/world/asia/japans-premier-says-government-shares-blame-for-fukushima-disaster.html
26 Opcit, http://www.worldwatch.org/system/files/WorldNuclearIndustryStatusReport2011_%20FINAL.pdf
27 See, World Nuclear Association, http://www.world-nuclear.org/info/inf79.html
28 See, Japan Nuclear Stress Tests Fail to Assuage Public Fears, Wall St Journal, March 3rd 2012, http://online.wsj.com/article/SB10001424052970203986604577257631414823596.html
29 See, http://cnic.jp/english/publications/pdffiles/ThinkingTheUnthinkable.pdf
30 See, Restarting Monju - Like Playing Russian Roulette, CNIC Tokyo, 2009, http://cnic.jp/english/newsletter/nit134/nit134articles/monju.html and No funding for Monju reactor test run, December 14th 2011, Kyodo, http://www.japantimes.co.jp/text/nn20111214a8.html
31 See, The Fight for Compensation: Tales from the Disaster Zone, Dr David McNeill, in Lessons from Fukushima, Greenpeace International, February 28th 2012, http://www.greenpeace.org/international/Global/international/publications/nuclear /2012/Fukushima/Lessons-from-Fukushima.pdf, citing - Kobori T (2011). Fukushima crisis estimated to cost from 5.7 trillion yen to 20 trillion yen. The Asahi Shimbun, 1st June 2011 - http://ajw.asahi.com/article/0311disaster/ quake_tsunami/ AJ201106010334, and Japan Center for Economic Research. (JCER), The 38th Middle-Term Forecast, 2nd December 2011, p.3. http://www.jcer.or.jp/eng/pdf/m38_abstract.pdf.
32 Ibid.
33 See, Nuclear-free society can be achieved much earlier, Asahi Shimbun Editorial, February 27th 2012, http://ajw.asahi.com/article/views/editorial/AJ201203030025

still allow Japan to reduce carbon emissions by 25 percent by 2020 (compared to those in 1990).[34] One consequence would be that even larger reductions in carbon emissions and the further deployment of renewables in the years to 2050 will become more achievable due to the scale of the changes made in the next few years.

The very powerful forces in Japan who over decades have worked to prevent any change in energy policy,[35] are still determined to stop the necessary change. It means the outcome of the battle now underway today in Japan is uncertain. But Japan really has no choice but to change. The Fukushima-daiichi accident is truly a horrific accident, but it is not worst-case. When last March the Atomic Energy Commission presented Japanese Prime Minister Naoto Kan with a possible scenario that would have required the evacuation of 30 million people living in greater Tokyo, he realized that a technology which could destroy the nation must have no future.[36]

Updated March 8, 2012

34 See, scenarios calculated by the German Aerospace Center (DLR) with support from the Institute for Sustainable Energy Policies (ISEP) for The advanced energy revolution for Japan, European Renewable Energy Council/Greenpeace www.greenpeace.org/japan/Global/japan/pdf/er_report.pdf; also see http://www.isep.or.jp/e/Eng_index.html

35 See, Dogs and Demons – the fall of modern Japan, Alex Kerr, 2001 and the Enigma of Japanese Power, Karel van Wolferen, 1989.

36 See, http://www.japantimes.co.jp/text/nn20120219a2.html