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Editorial

Dear readers of the WISE/NIRS Nuclear Monitor,

In this issue of the Monitor, our first for 2014:

- We look at the nuclear 'renaissance', which can now be pronounced stone cold dead: if there is any growth over the next 15-20 years, it will fall well short of the significant, sustained growth implied in the term 'renaissance';
- Philip White examines the debate over energy policy in Japan; and
- Tarun Kanti Bose and P.T. George write about indigenous tribes in Jharkhand, India fighting against uranium mines.

The Nuclear News section has reports on the Linear No Threshold theory; 300 groups urging James Hansen and his colleagues to rethink their support for nuclear power; BP's Energy Outlook 2035; transport accidents in the UK and France; the nuclear 'Doomsday Clock'; nuclear winter; and Deutsche Bank's decision to exit the uranium trading business.

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

Regards from the editorial team.

Email: monitor@wiseinternational.org



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The nuclear renaissance is stone cold dead

Author - Nuclear Monitor editor Jim Green

NM776.4379 The figures are in: 2013 was another bad year for the nuclear power industry - its third in a row - and it's time to call shenanigans on the nuclear 'renaissance' that never was.

The most that could be said for the 2013 figures¹ - four reactors connected to grids, four permanently shut down - is that they weren't as bad as the previous year, and the industry can take some comfort from 10 reactor construction starts. In 2012, nuclear power generation fell by 7% from the 2011 figure - its biggest ever one-year fall.² Nuclear generation fell in no less than 17 countries, including all of the top five nuclear-generating countries.³ Nuclear power accounted for 17% of global electrical generation capacity in 1993; it has steadily declined to 10% now³; and it will account for just 4.5-6.2 of electrical generation capacity in 2030 according to the latest International Atomic Energy Agency (IAEA) forecasts.⁴

The IAEA has downwardly revised its projections repeatedly since the Fukushima disaster. Its latest forecast is for growth from 373 gigawatts (GWe) of global nuclear capacity (in September 2013) to 435-722 GWe by 2030; that is, growth of 17-94%. As if to soften the blow of its latest downward revision, the IAEA noted that the latest reduction "is less than in the two previous years."⁴

The IAEA's low estimate (435 GWe) is down 20% from the pre-Fukushima, 2010 low estimate of 546 GWe in 2030. The high estimate (722 GWe) is down 10% from the pre-Fukushima, 2010 high estimate of 803 GWe.³⁶

Historically, the IAEA's high estimates have been fanciful, while its low estimates also tend to be too high (by 13% on average⁵) but provide a reasonable guide nonetheless. So growth of 17% by 2030 - annual growth of 1% - is about as much as the industry can realistically hope for.

	2010	2011	2012	2013
Low estimate 2030 nuclear capacity (GWe)	546	501	456	435
High estimate 2030 nuclear capacity (GWe)	803	746	740	722
Estimate 2030 nuclear share of elec. generation capacity (%)	8.5-10.4	5.2-6.2	4.7-6.2	4.5-6.2
Estimate 2050 nuclear share of elec. generation capacity (%)	5.0-11.9	2.7-6.0	2.3-5.7	2.2-5.6

The IAEA will further reduce its projections when it fully accounts for last year's developments. Perhaps the most striking developments were in the United States, where the industry is finding it increasingly difficult to profitably operate existing reactors - especially aging reactors requiring refurbishments - let alone build new ones. Almost half of the world's reactors have operated for 30 years or more³, so the problem of aging reactors is starting to come into sharp focus.

Peter Bradford, a former member of the US Nuclear Regulatory Commission, noted in July 2013 that applications for 31 new reactors in the US were pending by 2009. "The 31 proposed reactors are down to four actually being built and a few others lingering on in search of a license, which is good for 20 years," Bradford wrote. "Those four are hopelessly uneconomic but proceed because their state legislatures have committed to finish them as long as a dollar remains to be taken from any electric customer's pocket. Operating reactors are being closed as uneconomic for the first time in 15 years."⁶

Last year alone, US utilities closed or announced plans to close five reactors in addition to cancelled plans for new reactors and cancelled plans to increase the power of existing reactors; Forbes recently listed another six nuclear plants that could be next for the chopping block⁷; and academic Mark Cooper has identified 38 US reactors in a similar situation to those that have recently been shut down.⁸ Small comfort for the industry that the number of reactors listed as under construction has risen to five.

The UK has finally made some movement towards replacing its fleet of aging reactors.⁹ The capital cost for two planned large reactors (totalling 3.2 GW) at Hinkley Point in Somerset: a staggering £16 billion (US\$26.4 billion). Utilities can't raise the capital, so the UK government is offering loan guarantees of £10 billion. And the UK government is guaranteeing French utility EDF a staggering £89.50 for every megawatt-hour generated by the Hinkley Point reactors, fully indexed for inflation, for a staggering 35 years.

Economic consulting firm Liberum Capital said "we are flabbergasted that the UK government has committed future generations of consumers to the costs that will flow from this deal" and that Hinkley Point will be "both the most expensive power station in the world and also the plant with the longest construction period."¹⁰

EDF plans to build European Pressurized Reactors (EPRs) at Hinkley Point. Two other EPR projects - in Finland and France - have been disastrous. The estimated capital cost for the EPR in Finland has ballooned from \$4.5 billion to \$12 billion.¹¹ The estimated cost for the EPR in France has ballooned from \$5 billion to \$12.8 billion.¹² Thus we have a rule-of-thumb for estimating the true capital costs of nuclear power: double the initial estimate and add a few billion for good measure.

While the costs of renewables are falling - and in the case of solar PV, plummeting³⁵ - nuclear power is subject to a 'negative learning curve'.¹³ Economic boffins at Citigroup explain: "The capital cost of nuclear build has actually risen in recent decades in some developed markets, partly due to increased safety expenditure, and due to smaller construction programmes (i.e. lower economies of scale). Moreover the 'fixed cost' nature of nuclear generation in combination with its relatively high price (when back end liabilities are taken into account) also places the technology at a significant disadvantage; utilities are reluctant to enter into a very long term (20+ years of operation, and decades of aftercare provisioning) investment with almost no control over costs post commissioning, with the uncertainty and rates of change currently occurring in the energy mix."¹⁴

The French President has pledged to reduce reliance on nuclear power from 75% to 50% of total electricity generation¹⁵ (though his plan faces significant opposition).¹⁶ Belgium, Germany, and Switzerland plan to phase out their existing nuclear power programs.³

In January 2014, the European Commission forecast that EU nuclear generating capacity of 131 GWe in 2010 will decline to 97 GWe in 2025 before rising to 122 GWe in 2050 - still lower than the 2010 figure. The European Commission forecasts that nuclear's share of EU electricity generation will decline from 27% in 2010 to 21% in 2050, while the share held by renewables will increase from 21% to 51.6%, and fossil fuels' share will decline from 52% to 27%.¹⁷

Academic Richard Tanter noted that 2012 was a "busy year for nuclear corruption".¹⁸ The same could be said for 2013. South Korea is one of four countries that is supposedly driving the nuclear renaissance (along with China, India and Russia). But plans to expand nuclear power to 41% of electricity supply by 2035 have been reduced to a 29% target¹⁹ in the wake of a major scandal involving bribery and faked safety certificates for thousands of reactor parts²⁰, and another scandal involving the cover-up of an accident that sent the temperature of a reactor core soaring. One hundred people have been arrested including a former chief executive of Korea Hydro and Nuclear Power (KHNP), a vice president of Korea Electric Power Corp., and a former deputy minister in charge of energy.

In September, the chief executive of KHNP issued a public apology, saying "our domestic nuclear project is facing the utmost crisis" and noting that public trust has "hit the ground" because of the Fukushima disaster and the corruption.²¹ The proportion of South Koreans who consider nuclear power safe fell from 71% in 2010 to 35% in 2012²², while a 2011 survey found 68% opposition to new reactors in South Korea (and 69% opposition across 24 countries).²³

No reactors are operating in Japan - some will restart in the coming years but plans to add at least 15 reactors to Japan's fleet of 50 reactors are dead and buried. The Fukushima disaster will be with us for decades and the economic costs are being counted in the hundreds of billions of dollars.

Plans for a new nuclear power plant in Taiwan motivated 200,000 people to participate in protests in March 2013²⁴, led to a physical brawl in Parliament in August²⁵, and both major parties are promising an eventual phase-out of nuclear power.²⁶

Russia³³ and China have reduced their projections for nuclear power growth (though significant growth in China, where 28 reactors are under construction, still has the potential to mask patterns of stagnation and slow decline elsewhere). Public opposition forced the cancellation last year of a planned nuclear fuel processing plant in China²⁷ and contributed to the cancellation of a planned power reactor near Kaliningrad in Russia³⁴ - the first time in both countries that public opposition has stopped nuclear projects.

Canada has abandoned plans for new reactors.²⁸ The government of Brazil, the world's fifth most populous country, recently announced that apart from one reactor already under construction, plans for new reactors have been put on hold indefinitely.²⁹ The head of Brazil's energy planning agency, Mauricio Tolmasquim, said: "This is wind power's moment. There's been a revolution in terms of cost."

South Africa - the only country in Africa with power reactors - abandoned plans for new reactors in 2008, revived them, then abandoned them again in December 2013.³⁰

In the Middle East, only Iran has a nuclear power reactor, while Jordan, the United Arab Emirates, Turkey and Saudi Arabia are pursuing nuclear power programs with greater or lesser intent. Meanwhile a swag of countries in the Middle East and North Africa have put nuclear power on the back-burner, including Kuwait, Oman, Qatar, Bahrain, Egypt, Syria, Tunisia, Israel, Morocco, Algeria and Libya.^{3,31}

Any number of other countries have decided since the Fukushima disaster not to engage or re-engage in nuclear programs, including Singapore, Greece, Italy, Peru, Portugal, Thailand, Venezuela, and many others.³

The nuclear renaissance is dead ... stone cold dead. If there is any growth at all, it will fall well short of the significant, sustained growth implied in the term renaissance.

Utilities are feeling the pain. The 2013 World Nuclear Industry Status Report noted that over the previous five years, 10 out of 15 assessed nuclear utilities were downgraded by credit rating agency Standard and Poor's, four remained stable, while only one was upgraded.³ Dr Ian Fairlie has recently compiled a list of over 40 examples of governments, banks, utilities and energy companies around the world withdrawing from nuclear projects since 2011.³²

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Japan goes back to the future to affirm energy ‘foundation’

Author - Philip White

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NM776.4380 On December 6 the Japanese government released a new draft Basic Energy Plan (BEP) for public comment. This will replace the 2010 BEP, which is still legally current despite the fact that its foundations were blown away by the March 11, 2011, nuclear accident at the Fukushima No. 1 plant.

In September 2012, the then Democratic Party of Japan (DPJ) government issued an “Innovative Strategy for Energy and the Environment,” which set the unprecedented goal of phasing out nuclear power by 2039. But this did not have the same legal status as the BEP, and when the Liberal Democratic Party (LDP) won back power in the December 2012 election, it declared that it would review the DPJ’s strategy from scratch, stating that it did not support a nuclear phase-out.

The recently released draft BEP goes as close as possible to preserving the pre-Fukushima nuclear status quo, but with all nuclear power plants currently closed down and public opinion still strongly in favour of a nuclear phase out, it was unable to set ambitious targets for nuclear energy.

The 2010 BEP aimed for 50% of electricity generation from nuclear power by 2030, with at least 14 new nuclear power plants being constructed in that time, but the recently released draft eschews targets altogether, settling instead for qualitative statements affirming the continuing role of nuclear power. It states that nuclear energy is an “important baseload power source that serves as a foundation” for the stability of Japan’s energy supply.

The word “foundation” was added for emphasis after the draft was initially released, even though one of the drafting committee members pointed out that over-emphasis reduces credibility.

An aspect of the DPJ’s “Innovative Strategy” that attracted criticism from all sides was the nuclear fuel-cycle policy. The strategy purported to maintain the existing policy, which meant reprocessing all spent nuclear fuel to separate plutonium, at the same time as phasing out the proposed means of consuming that plutonium, namely using it as fuel in nuclear reactors (be they standard light-water reactors or fast-breeder reactors). Besides domestic criticism of this contradiction, it was also criticised by officials in the U.S. government who were concerned about the proliferation implications of more plutonium stockpiles.

Economy, Trade and Industry Minister Toshimitsu Motegi jumped on this contradiction during his December 6 press conference announcing the draft BEP. He implied that the new draft resolved this problem because it states that nuclear power plants will continue to operate, but in fact the draft gives no indication of what steps will be taken to ensure that Japan’s plutonium stockpile does not grow.

Japan now has 44 tons of separated plutonium (enough to make over 5,000 nuclear weapons), 34.9 tons stored in Europe and 9.3 tons stored in Japan.

Given the push to restart the Rokkasho Reprocessing Plant, the very limited capacity to consume plutonium even if permission is given to restart some of Japan’s idled nuclear reactors, and the fact that Japan does not yet have a fuel fabrication plant designed to manufacture plutonium-based fuel for light-water reactors, it is inevitable that Japan’s in-country plutonium stockpile will grow if reprocessing resumes.

Even more back to the future than the draft BEP contents was how the BEP was produced. After the Fukushima No. 1 nuclear plant accident, the DPJ government commenced a review of energy and environment policy. After deliberations in a committee that included more or less equal numbers of nuclear critics, proponents and neutral people, in June 2012 three scenarios were announced — based on 0%, 15% and 20–25% of electricity generation from nuclear energy. In July–August, these scenarios were put to a broad national debate, the outcome of which was that a clear majority of the public supported a nuclear phase-out. The national debate played a crucial role in pushing the DPJ government to support a nuclear phase out in its “Innovative Strategy.”

Besides repudiating the DPJ’s goal of phasing out nuclear energy, the LDP government also revamped the policy-drafting committee, drastically reducing the number of nuclear critics. The chairman, Akio Mimura, who had played a problematic role in the DPJ review, was retained. He became even more outspoken in his support of nuclear energy and did not hesitate to make disparaging remarks about the contributions of the two remaining nuclear critics on the committee.

But the clearest evidence of the reversion to the old ways was the manner in which public comments on the draft BEP were called. The draft was produced by the secretariat (provided by the Agency for Natural Resources and Energy) without consultation with committee members.

It was said to be based on the committee's discussions, but there was no indication of how members' views were reflected. When it was presented to the committee on December 6, many of the members said they had not even had time to read it, yet it was released for public comment on the same day.

At the following meeting, held on December 13, a draft slightly amended on the basis of comments at the previous meeting was tabled, but the deadline for public comments was only extended two days to January 6. Chairman Mimura spoke as if the committee would probably not reconvene before a Cabinet decision was made on the BEP sometime in January [see update below].

Presumably some formal response to the public comments will be produced, but it seems that the government does not regard it as necessary for the committee to be given a chance to comment on the public comments. Apparently there are no plans for public hearings to be held.

From a process perspective, this represents a step back about 20 years. The first official example of public participation in Japan's nuclear energy policymaking process occurred in 1994. Before that, there was no public participation and policymaking committees were held in secret. 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.

No doubt this is partly due to the LDP government's determination to totally repudiate the DPJ government's record. A precedent was established with the DPJ's 2012 national debate on energy policy. For the first time the public was allowed to exert influence on energy policy. But for the nuclear industry this was a precedent they did not want repeated ever again.

Some LDP politicians support a phase-out of nuclear energy, and popular former LDP Prime Minister Junichiro Koizumi has come out strongly in favour of a nuclear phase out, but the current LDP hierarchy has been working overtime to protect the nuclear industry.

What with rescuing Tokyo Electric Power Co., whose management led to the Fukushima nuclear disaster, Prime Minister Shinzo Abe acting as chief salesman for nuclear exports, and now this gung-ho approach to energy policymaking, it is back to the future turbo-charged.

Update:

The Cabinet decision on the Basic Energy Plan is likely to be delayed for at least a month due to opposition within the LDP; because the LDP's coalition partner New Komeito Party has campaigned for a nuclear-free Japan; and because of concerns that an anti-nuclear candidate might win the February 9 Tokyo governor election.

Former Prime Minister Morihiro Hosokawa is standing for the position of Tokyo governor on a nuclear-free platform, and has been endorsed by former Prime Minister Junichiro Koizumi. Sophia University Professor Koichi Nakano said: "What Hosokawa and Koizumi show is that the anti-nuclear hopes are not held just by left-wing radicals, but also by a good number of middle class including even those who are conservative otherwise."

Ironically, the Japanese government has justified delaying the BEP by saying it is time-consuming to properly consider the 19,000 public submissions on the draft BEP, even though the government is doing all within its powers to ignore and sideline public opinion as Philip White's article demonstrates.

Just as ironical was the statement from industry minister Toshimitsu Motegi that: "We also have to think more about nuclear waste." The government has no intention of letting its nuclear power plans be derailed by the absence of any disposal sites for high-level nuclear waste.

- *Nuclear Monitor*

Paradise Lost – Indigenous tribes in Jharkhand fight against uranium mines

Authors - Tarun Kanti Bose and P.T. George

Writer and editor Tarun Kanti Bose and P.T. George, director of the research institute Intercultural Resources, spent six months studying the effects of uranium mining in Jharkhand. Their report, 'A Paradise Lost: Tribes of Jharkhand Fight against Uranium Mines', is posted at www.scribd.com/doc/198829263/A-Paradise-Lost-The-Impacts-of-New-Uranium-Mines-in-Jharkhand or <http://tinyurl.com/bose-george>

NM776.4381 Sixty-five year old Siyaram Besra was born in the Dhodanga village of India's East Singhbhum District and has been living here all his life. But now he feels that his future is very bleak. A uranium mine and mill are very close to his village and the mining and dumping has reached the edge of his hamlet. The sound of blasting echoes in the mountains and disturbs the serenity and peace that he had experienced all his life.

The uranium mine waste rocks are carelessly dumped on to the paddy fields and grazing grounds, a few metres from his home where he sits all day. He is frail and sick. Doctors say he has tuberculosis and have been giving him medicines for that. He says the medicines have not helped cure his illness. Unable to do any work, he quietly sits on the verandah of his hut and stares blankly.

The Uranium Corporation of India Limited (UCIL) has been mining uranium in the eastern Indian state of Jharkhand. Several new mines are opening - Turamdih, Banduhurang and Mohuldih are the latest additions to the existing mines in Jaduguda, Narwapahar and Bhatin.

Jharkhand is protected by various acts like the Chotanagpur Tenancy Act, Panchayati Raj Extension Act, Forest Rights Act and so on, providing various levels of protection to tribal people, their land, resources and collective rights. However, these provisions have been continuously flouted and twisted to benefit entrenched interests and lobbies. The Indian government and the Jharkhand state government have been trying to override these Acts and grab the tribal land and resources, all in the name of development.

Kumar Chand Mardi, a tribal leader and activist working among the displaced in Jaduguda and Turamdih, recalled: "Tribals have been ruined in the debris of development. Their status has been reduced to slavery and servitude. Their struggles have been intensified, especially after the formation of the state of Jharkhand." Mardi says the uranium mines in the East Singhbhum region have become a big threat to tribal people.

Focusing only on the question of energy actually dilutes the entire debate on nuclear issue. Xavier Dias, a senior functionary of Bindrai Institute of Research Study & Action Mines Monitoring Centre and an anti-nuclear activist pointed out that the whole debate about the nuclear science and the nuclear industry should be taken beyond issues of energy, because there is hardly any discussion on larger issues related to nuclear weapons, nuclear power plants and other

nuclear installations. There is nothing safe in uranium mining, in transporting the ore, in processing it, getting it converted into fissile materials that could be readily used either for the power plant or for the production of nuclear weapons.

The displaced villagers reveal that hundreds of acres of their prime land have been taken away for the Banduhurang, Turamdih and Mohuldih mines. Thakur Soren, a farmer, says that "22 acres of our family agricultural land has been taken away by UCIL for the Mohuldih mine. A good stretch of prime forest land also has been acquired for mining". With no alternative livelihood, he now works as a daily labourer in one of UCIL's uranium mines.

Jhameli Murmu, a villager from Byanbill Panchayat, says: "Around 1050 families in Nandup village in my Panchayat are displaced by uranium mining. When the uranium mining project was approved and the land acquisition began, there was no discussion with the local Gram Panchayat on this issue". She further pointed out, "the state government and the UCIL together, forcibly took away our land and the UCIL gave some compensation to few people amounting to Rs. 50,000 or 60,000 [less than US\$1000] per acre which is far too low at the market rate. A lot of people are yet to receive any compensation".

Many of the displaced tribal people, due to sheer frustration and lack of employment opportunities, have turned to brewing local alcohol, selling datun (neem stick used as toothbrush) or doing odd jobs to meet their daily needs. The situation is very grave for the displaced and the landless. There is a very high rate of unemployment, poverty, hunger and malnutrition among them.

According to Xavier Dias, the miners working in UCIL's Turamdih mines and mills, Banduhurang open cast mines and Mohuldih underground mines are at great risk, because of their continuous exposure to high concentrations of radon gas. Radon-222 is a decay product of uranium and a highly carcinogenic alpha emitter. When inhaled it gets deposited in the air passage of lungs, irradiating cells which may later become malignant. Uranium miners are also exposed to radium-226, another uranium daughter, which is an alpha and gamma emitter with a half life of 1,600 years.

Many people working in the UCIL mines of Jaduguda, Bhatin, and Narwapahar - though it is kept as a secret - have died of lung cancer. "What happened to those workers in the older mines would also happen to miners working in the new mines

of Banduhurang, Turamdih and Mohuldih. A deadly fate is eagerly awaiting them all,” said Xavier Dias.

The uranium tailings pond in Talsa village is very close to Bada Talsa village where hundreds of tribal people live. The construction of the pond began in 2005 and was completed in 2010. The nuclear waste slurry from the Turamdih Uranium Mill is dumped into this tailings pond.

Sahebram Murmu, who lives on the edge of the tailings pond, is of the opinion that since only one side of the tailings pond is fenced off and all the other sides are kept open, it creates lots of problems for the villagers. Wild animals and even domestic animals often get trapped in the poisonous sludge and die. Often, the villagers’ cattle also stray into the pond, get trapped in the poisonous sludge and die.

The villagers and the experts point out that the Talsa Uranium Tailings pond is not constructed in line with international standards. Leakages and bund bursts have occurred several times in the tailings pond resulting in radioactive waste overflow into paddy fields and low-lying areas.

Murmu further pointed out that during the construction of the tailings pond, UCIL cut down thousands of trees which adversely affected their local environment. Now the remaining trees around the tailings pond are also dying, due to the high acidity level in the pond. In June 2008, due to heavy rain at Talsa village, the outlet of the tailings pond was unplugged by UCIL as the pond was on the verge of collapse. Because of the high contamination and radiation, fish in the downstream Subarnarekha River perished overnight. Several hundred snakes, rats and other rodents also died. Paddy fields turned yellowish and dried up.

The radioactive debris from the uranium mines in Jharkhand has heavily polluted the underground water and the Subarnarekha River flowing through the states of Jharkhand,

West Bengal and Odisha, a fact that UCIL has been rejecting all the while. Water from this river is used for agriculture and for drinking by the people living in all these states.

Arjun Samad, president of the Turamdih Vistapit Samiti, says: “The issue of radiation from the uranium mines is being ignored or overlooked by the people here. The Adivasis living here are disturbed over issues of livelihood, farming, employment etc. Whenever our organisation raises these issues and protest, the police harass the villagers and book them under several false cases. Custodial violence at the police station is also a big issue.” Arjun further recalled that recently, several boys belonging to the Turamdih Vistapit Samiti were tortured and abused by the police, because they raised their voice against UCIL. The police derogatorily call the Adivasis (tribals) ‘jungle’ and uncivilised.

The Jharkhand state government, under the Mahatma Gandhi National Rural Employment Guarantee Act scheme, is constructing around 80,000 water wells to help address the shortage of drinking water. The granite stones used for the construction of some of the wells are obtained from the uranium mine waste. It is a matter of serious concern that needs to be probed.

Shutting down the dirty business of uranium mining in the whole country is a big political issue. We should wait for the day when the masses of this country and the government are able to collectively see the wisdom, that the uranium mining is a very risky business that can adversely affect people’s health and the environment. Only then, these dangerous mines could be closed down and alternative sources of energy could be developed which are more eco-friendly and sustainable. Until then, the hapless victims of uranium mines in Jharkhand, especially the Adivasis whose land and resources are being looted, will continue to suffer.

India's renewable energy prospects

When the world thinks of countries that could go 100%, the immediate thoughts go to islands with solar and storage, hydro and geothermal rich countries such as Iceland, or even wind and wave-rich countries like Scotland. One of the last economies imagined going fully renewable would be India, the rising economic giant that is still yet to connect several hundred million people to its mostly coal-fired grid, and is expected to have the highest growth of electricity consumption.

But according to environmental group WWF, India could reach a goal of 100% renewables by 2050. The study examines the possibility of a near 100% Renewable Energy Scenario for India by the middle of the century against a reference scenario in which the economy is likely to be dependent primarily on fossil fuels – coal, oil and gas. WWF says that to get there India must make some large-scale changes to get on the right track as soon as possible. According to the report, aggressive energy efficiency improvements alone can bring in savings of up to 59% (by both the supply and demand sides) by mid-century.

*Renew Economy, 17 Jan 2014,
<http://reneweconomy.com.au/2014/even-india-could-reach-nearly-100-renewables-by-2051-2051>*

WWF India, 'The Energy Report - India 100% Renewable Energy by 2050', www.wwfindia.org/news_facts/?10261

Harsh criticism for India's nuclear safety regime

India's nuclear safety regime is "fraught with grave risks", a parliamentary committee has reported, saying the country's nuclear regulator was weak, under-resourced and "slow in adopting international benchmarks and good practices in the areas of nuclear and radiation operation".

The bipartisan Public Accounts Committee tabled a scathing 81-page report in India's parliament, critical of the decades-long delay in establishing an independent regulator for the nuclear-armed country. The parliamentary committee said India's Atomic Energy Regulatory Board was not an independent statutory body but rather a subordinate agency of the government.

"The failure to have an autonomous and independent regulator is clearly fraught with grave risks, as brought out poignantly in the report of the Fukushima Nuclear Accident Independent Investigation Commission," the report said. "Although AERB maintains liaison with international nuclear organisations, it has been slow in adopting international benchmarks and good practices in the areas of nuclear and radiation operation."

The regulator cannot set or enforce rules for radiation and nuclear safety in India, the committee found. In many cases there are no rules. Despite an order from the government in 1983, the AERB has still not developed an overarching nuclear and radiation safety policy for India. "The absence of such a policy at macro level can hamper micro-level planning of radiation safety in the country," the report said. As a result, India was not prepared for a nuclear emergency, the report found.

"Off-site emergency exercises carried out highlighted inadequate emergency preparedness even for situations where the radiological effects of an emergency origination from nuclear power plants are likely to extend beyond the site and affect the people around."

The maximum fine the AERB can impose for violations of law is 500 rupees - "abysmally low", according to the committee.

This is not the first time the safety of India's nuclear industry has been questioned. The committee's comments echo those of the government auditor-general, who last year found that 60% of regulatory inspections for operating nuclear power plants in India were either delayed - with some up to 153 days late - or not undertaken at all. For power plants under construction, the number of regulatory inspections delayed or not undertaken was 66%. Smaller radiation facilities operate across the country with no licences and no oversight at all.

Abridged from: Ben Doherty, 20 Dec 2013, 'Harsh criticism for India's nuclear safety regime', www.smh.com.au/world/harsh-criticism-for-indias-nuclear-safety-regime-20131220-hv6lz.html

See also:

*Ben Doherty, 15 Oct 2012,
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www.theage.com.au/opinion/political-news/india-questions-its-own-nuclear-industry-20121014-2710a.html*

*M.V. Ramana, 16 Oct 2012,
'India's nuclear power failures warn against uranium exports',
<http://theconversation.edu.au/indias-nuclear-power-failures-warn-against-uranium-exports-10131>*

*M.P. Ram Mohan, 23 Aug 2011,
'How safe is India's nuclear energy programme?',
www.livemint.com/2011/08/22202845/How-safe-is-India8217s-nucl.html?h=B*

*Abhishek Gaba, 20 May 2011,
'Overhaul over India's Civil Nuclear Developments',
<http://thegaba.blogspot.com.au/2011/04/indias-civil-nuke-developments-must.html>*

Nuclear News

Linear No Threshold - an idea which should be retired?

Dr Ian Fairlie writes ¹:

Last year I wrote a post ² expressing regret that ill-informed journalists and others often wrote nonsense articles about radiation risks. Sadly, it's happened again. Stewart Brand, founder of the Whole Earth Catalogue, has recently stated that the Linear No Threshold theory of radiation's effects should be retired because it "... is based on no knowledge whatever." ³ In fact, much powerful evidence backs the LNT. Some of this is discussed at www.ianfairlie.org/news/the-linear-no-threshold-theory-of-radiation-risks.

Brand also states: "Below 100 millisieverts per year, however, no increased cancer incidence has been detected ..." Well again he's plain wrong. At least ten studies show effects below 100 mSv: they are listed at www.ianfairlie.org/news/a-100-msv-threshold-for-radiation-effects.

Mr Brand is an American so he should be aware of the US government's premier body on radiation risks – the US National Academy of Sciences's BEIR committee. Its 2005 report, BEIR VII, strongly supported LNT with a great deal of scientific evidence. ⁴ (BEIR stands for Biological Effects of Ionizing Radiation). It gave a very clear account of why LNT should be used down to very low doses: Mr Brand would be able to understand it.

The problem for Mr Brand and others like him is that radiation's cancer and genetic risks are anonymous and remote in time so can be difficult to grasp. Here's a good way to understand them. If 100,000 US adults were each exposed to one mSv of radiation, 10 to 15 would die of radiation-induced cancer several years, even decades later. Such exposures act like a reverse lottery: each exposed person would get a reverse ticket and some unlucky people would later die.

For example, after the Chernobyl nuclear disaster in 1986, tens of millions of Europeans were exposed to low levels of radioactive fallout. They received reverse lottery tickets and many will ultimately die from cancers from the fallout's radiation. The same occurred to Japanese people after Fukushima.

1. www.ianfairlie.org/news/lnt-an-idea-which-should-be-retired-no-it-should-be-retained/
2. www.ianfairlie.org/news/recent-evidence-on-the-risks-of-very-low-level-radiation/
3. www.theguardian.com/science/2014/jan/12/what-scientific-idea-is-ready-for-retirement-edge-org
4. www.nap.edu/catalog/11340.html

BP Energy Outlook 2035

BP released the fourth edition of its Energy Outlook 2035 publication on January 15. BP predicts that world energy consumption will grow by 41% between 2012 and 2035, with 95% of that growth in demand coming from emerging economies. Global carbon dioxide emissions are projected to rise by 29% to 2035, or 1.1% annually. ^{1,2,3}

Oil, natural gas and coal are each expected to make up around 27% of the total energy mix by 2035 with the remaining 18% coming from nuclear, hydro and renewables.

Renewable energy will see the fastest growth - 6.4% per year. The share of renewables (including biofuels but excluding hydropower) in primary demand will grow from 2% today to about 7% in 2035, BP predicts. In OECD countries renewables will make "big inroads". The share of renewables in global electricity production is expected to rise from 5% today to 14% by 2035 (greater than nuclear). In the EU, the share of renewables in electricity production is expected to increase from 13% in 2012 to 32% in 2035.

The annual growth in hydro is expected to be 1.8% to 2035, with nearly half of the growth coming from China, India and Brazil. Hydro's share of the energy mix is expected to remain flat at about 7%, equal to (other) renewables.

Nuclear is expected to grow at around 1.9% a year, with its share in total energy supply remaining flat at around 5-6%. China, India and Russia will account for 96% of the global growth in nuclear power. In the OECD, nuclear generation is projected to decline by 0.2% annually as ageing plants are gradually retired. Global growth is expected to be driven by non-OECD countries (with an annual growth rate of 5.9%).

Meanwhile, investment house Deutsche Bank has dramatically lifted its forecasts for the global solar industry, predicting that 46 gigawatts (GW) of solar PV will be installed around the world in 2014, and 56 GW in 2015. ⁴ Credit Suisse estimates that in the US, about 85% of power growth to 2025 will be met by the installation of over 100 GW of renewable energy capacity. By 2025, Credit Suisse projects that renewables will account for about 12% of US electricity generation. ⁵ Spain's grid operator Red Electrica De Espana has revealed that the country's main energy source is now wind with a 21.1% share in 2012, just exceeding nuclear's 21% share. ⁶

1. www.bp.com/en/global/corporate/about-bp/energy-economics/energy-outlook/energy-outlook.html
2. www.energypost.eu/bp-optimistic-worlds-energy-future/
3. www.world-nuclear-news.org/EE-BP-sees-modest-growth-in-nuclear-energy-1701144.html
4. <http://reneweconomy.com.au/2014/deutsche-bank-predicts-second-solar-gold-rush-40084>
5. <http://cleantechnica.com/2014/01/01/credit-suisse-projects-85-us-energy-growth-coming-renewables-2025/>
6. www.edie.net/news/6/Wind-prevails-as-Spain-s-main-energy-source-/

Transport accidents in UK and France

A driver was lucky to escape with his life on January 14 when he abandoned his stricken car at a level crossing at Silverdale – moments before it was dragged down a railway track by a train. The train is used to take spent nuclear fuel to Sellafield but, as it was returning to the Oldbury nuclear power station, was empty.^{1,2}

Nuclear transport trains routinely leave the Sellafield site on a number of days each week, returning empty spent fuel flasks to nuclear power stations around the UK where they are subsequently refilled and returned to Sellafield for the spent nuclear fuel to be reprocessed.

Marianne Birkby, the founder of Radiation Free Lakeland, said: “Radioactive waste should not be shunted around on trains through our towns and villages.” Director of Friends of the Earth Scotland, Dr Richard Dixon, said: “I think people are right to be concerned. There are a couple of things to be worried about – one is the fact that a train full of nuclear waste is a good terrorist target. The other thing is the possibility of accidents. These trains are well constructed and rigorously tested, but nothing is infallible.”

The January 14 accident came just three months after a rail accident outside Barrow docks involving three nuclear transport wagons. With each wagon carrying an empty high level waste flask being returned from Japan, two of the wagons derailed causing a partial blockage of the main railway line serving Barrow and the cancellation of some main line services for several days. Whilst a Network Rail investigation has yet to be published, an in-house investigation by Direct Rail Services concluded that the derailment occurred as a result of an error by train crew.

Meanwhile, a debate is unfolding over plans to train 26 tonnes of “exotic fuel”, which includes plutonium and highly-enriched uranium, from Dounreay in Scotland through densely populated areas to Sellafield in Cumbria.³

In France, a rail freight wagon carrying nuclear waste derailed at a depot in Drancy, 3 kms from Paris, on December 23. There was no spillage of nuclear waste, according to Drancy mayor Jean-Christophe Lagarde. About 4,000 freight wagons carrying radioactive or chemical waste pass through the station each year, Lagarde said, calling the incident “intolerable”. France’s ‘Europe Ecologie Les Verts’ (EELV) Green party called for an end to the transportation of radioactive waste through urban areas and busy stations following the incident.⁴

1. www.lancasterguardian.co.uk/news/nuclear-waste-train-in-50mph-smash-1-6376671

2. www.corecumbria.co.uk/newsapp/pressreleases/pressmain.asp?StrNewsID=331

3. www.thecourier.co.uk/news/scotland/environmentalists-warn-of-nuclear-train-dangers-1.177798

4. www.independent.ie/world-news/europe/freight-train-carrying-nuclear-waste-derails-near-paris-29862491.html

Nuclear ‘Doomsday Clock’ remains at five minutes to midnight

The *Bulletin of the Atomic Scientists* has opted to leave its “Doomsday Clock” fixed at five minutes to midnight for the third year in a row.

The Bulletin recognised “limited strides” made last year in moving away from nuclear annihilation – some limited progress with the Iran situation, significant progress in seven countries to reduce stockpiles of weapons-usable material, and improved nuclear security measures in some countries (though “much nuclear material remains unsecured”).

“Overall, however, in 2013 the international community dealt with the continuing, potentially civilization-ending threat of nuclear weapons in a business-as-usual manner.”

The Bulletin criticised Russia and the US for maintaining their “outsized nuclear arsenals” and noted with concern that China, India and Pakistan all seem to be adding to their own nuclear weapons stockpiles.

The Bulletin expressed concern about the spread of nuclear power and “unlearned lessons” such as the need for independent, open regulation, without which “the world is likely to see more catastrophic accidents.”

The Bulletin goes on to say: “Beyond plant safety and security lies a more general danger: Civilian nuclear power can contribute to new nuclear weapons programs, as illustrated by the complexity of ongoing discussions with Iran. Also, the continued development of laser-based fuel enrichment is not encouraging from the proliferation perspective. This technology promises to provide a route to uranium enrichment that is less expensive and harder-to-constrain than the centrifuge enrichment pursued by Iran and North Korea.”

The Bulletin urges the United Nations to: demand that US and Russian leaders return to the nuclear disarmament negotiating table; support international discussions about the humanitarian effects of nuclear weapons (most of the nuclear weapons states boycotted the Oslo conference in March 2013); exercise political leadership on climate change (by supporting “energy technologies – including wind, solar, and geothermal power generation and vigorous energy efficiency measures”); and create new rules and institutions to manage emerging technology.

<http://thebulletin.org/five-minutes-too-close>

www.nti.org/gsn/article/doomsday-clock-remains-five-minutes-midnight/

Nuclear war, nuclear famine

In April 2012, Physicians for Social Responsibility released the report 'Nuclear Famine: A Billion People at Risk', which examined the climatic and agricultural consequences of a limited, regional nuclear war. The report looked specifically at the declines in US maize and Chinese rice production that would result from the predicted climate disruption and concluded that even a limited nuclear conflict would cause extensive famine, mainly in the developing world, and put more than one billion people at risk of starvation.

Since then, new research by Lili Xia and Alan Robock has shown that the climate change caused by a limited nuclear war would affect Chinese maize production as severely as rice production and it would affect wheat production much more severely than rice output. Their new findings suggest that the original report may have seriously underestimated the consequences of a limited nuclear war.

In addition to the one billion people in the developing world who would face possible starvation, 1.3 billion people in China could confront severe food insecurity. The prospect of a decade of widespread hunger and intense social and economic instability in the world's largest country has immense implications for the entire global community, as does the possibility that the huge declines in Chinese wheat production will be matched by similar declines in other wheat producing countries.

The updated version of the 'Nuclear Famine' report attempts to address these new concerns and better define the full extent of the worldwide catastrophe that would result from even a limited, regional nuclear war.

Dr Ira Helfand, Nov 2013, 'Nuclear Famine: Two Billion People At Risk?', International Physicians for the Prevention of Nuclear War / Physicians for Social Responsibility, www.psr.org/assets/pdfs/two-billion-at-risk.pdf

See also: www.nucleardarkness.org

Environmentalists urge Hansen to rethink nuclear

Over 300 U.S. and international environmental and clean energy groups say in a joint letter released on January 8 that, while they respect the climate change work of Dr James Hansen and three of his academic colleagues, they take exception to the notion that nuclear power is the solution to global warming.

The statement was organised by US organizations Civil Society Institute and the Nuclear Information and Resource Service, in response to a November 2013 statement by James Hansen, Ken Caldeira, Kerry Emanuel, and Tom Wigley.

Caldeira said on Fox News in early January that "Fukushima shows us that the current generation and our current way of operating nuclear power plants is dangerous" but added that "just because something is error-prone today doesn't mean we can't make it better."

Joint NGO statement:

www.nirs.org/climate/background/hansenletter1614.pdf

Caldeira interview: www.youtube.com/watch?v=in9qugXsc7U

Deutsche Bank talks with buyers for its uranium business

Deutsche Bank AG is holding preliminary talks with potential buyers of its uranium trading business, according to news reports in December. The bank's uranium desk is one of the biggest third-party traders in the market, holding uranium stockpiles worth about US\$200 million and with numerous long-term deals with nuclear power plants. The bank expects to start a formal sales process early this year. Goldman Sachs, the other major bank active in uranium trading, is also selling its nuclear fuel arm. Trading firms like Deutsche and Goldman buy and hold uranium stockpiles in warehouses specially licensed to hold the fuel. Uranium prices languish at their lowest since 2005.

www.foxbusiness.com/industries/2013/12/19/report-deutsche-bank-talks-with-buyers-for-its-uranium-business/

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

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