

# NUCLEAR MONITOR

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## MONITORED THIS ISSUE:

## FUKUSHIMA 1 REACTOR: WATER LEVEL LOW

In last Nuclear Monitor the unstable situation of Fukushima Daiichi unit 4 fuel pool was mentioned, this time's bad news is about water level at reactor 1. Former Prime Minister Kan repeated that the nuclear lobby was to blame for the Fukushima disaster, and 70% of Japanese companies support abandoning nuclear power

(750.4238) WISE Amsterdam - An analysis by the Japan Nuclear Energy Safety Organization has shown that the level of water filling the number 1 reactor may be far lower than estimated by plant operator Tepco, officials of JNES said on May 22. JNES estimated that the water in the primary containment vessel is only 40 centimeters deep. TEPCO has estimated the water level to be about 1.9 meters. Not disputed is the fact coolant water injected into the reactor is leaking. JNES thinks that the water injected into the reactor may be leaking from a hole (of about 2 cm in diameter) located in a section connecting the primary container and the suppression pool, leaving the container with water just 40 cm in depth. Tepco spokesperson Matsumoto declined to comment, but said that what is important is that the nuclear fuel, which has melted through the pressure vessel and accumulated at the bottom of the outer primary container, is covered with water and kept cool.

TEPCO hopes to insert an endoscope into the reactor by the end of the year to determine the actual water level. Although JNES officials noted there are "uncertainties" in their analysis, the track record of Tepco is not very good (to put it mildly). Tepco has already inserted an endoscope into the crippled No. 2 reactor and found the water level at a much-lower-than-expected 60 cm deep.

On May 25, a Reuters poll showed that nearly three-quarters of Japanese companies support abandoning nuclear power after last year's Fukushima disaster, although a majority set the condition that alternative energy resources must

be secured. Highlighting public mistrust of Japan's regional monopoly power companies, only 11 percent of those surveyed approved of utilities' efforts to secure power supply and just 12 percent trusted their projections for electricity demand. Forty percent saw efforts by power companies as "insufficient" and 29 percent saw their power demand projections as unreliable. Critics accuse utilities of exaggerating potential power shortages in order to win public support to restart off-line reactors, beginning with two at the Ohi plant. The poll also showed 70 percent of firms are prepared to cooperate on power saving to the same degree as last summer, with 24 percent willing to cooperate to a lesser extent.

Naoto Kan, the former Prime Minister, has admitted that his office was "overwhelmed" during the Fukushima nuclear meltdown last year, and he recommended that Japan scrap all its reactors to avoid a repeat. On May 28, he told a parliamentary committee that the bulk of the blame for the disaster lay with the nuclear lobby, which he said had acted like the nation's out-of-control military during the Second World War, with "a grip on actual political power".

**Sources:** Mainichi, 23 May 2012 / Reuters, 25 May 2012 / Independent (UK), 29 May 2012

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# SHAKE-UP AT U.S. NRC: JACZKO RESIGNING, ANTI-YUCCA GEOLOGIST NOMINATED AS REPLACEMENT

**For many months, four of the five NRC Commissioners, backed loudly by Congressional Republicans, have been waging an unprecedented and nasty campaign to remove NRC Chairman Greg Jaczko from his post. Their public complaints have focused on management style, accusations of bullying of NRC staff, and an unwillingness to keep the four informed on some key issues.**

**(750.4239) NIRS** - The real issue for waging a campaign to remove NRC Chairman Jaczko from his post has been policy. Jaczko was appointed Chair by President Obama in 2009 at the urging of his former employer, Senate Majority Leader Harry Reid, in part because Jaczko was a longtime and effective opponent of the Yucca Mountain radioactive waste dump. Obama had agreed to end the Yucca Mt. project and Jaczko was expected to—and did—end NRC review of the Department of Energy's license application for the project. After all, with DOE no longer pursuing the project nor willing to spend money to defend its application or participate in the process, there wasn't much left to review. But some of the Commissioners felt differently.

That alone wouldn't have been enough, however, to foment this kind of revolt. The last straw for the Commission majority was Fukushima. First, Jaczko kept them out of the NRC's emergency operations center during the height of the crisis. He didn't want critical NRC staffers having to disrupt their 24-hour/day work to answer Commissioner questions. Then Jaczko stood with President Obama and urged Americans within 50 miles of Fukushima to evacuate—even though NRC policy only contemplates evacuations out to 10 miles.

And when an NRC staff task force was set up to examine lessons learned from Fukushima and recommend regulatory changes, Jaczko ran interference for them and kept the other Commissioners from disrupting their process. He then took those recommendations and pressed hard for their speedy implementation against the opposition of the other Commissioners. Finally, Jaczko voted against both new reactor licenses granted by the NRC in 2012 (and voted against relicensing of the Fukushima-clone Pilgrim reactor in Massachusetts end of May).

None of this was welcomed by the nuclear power industry, nor their allies on the Commission and on Capitol Hill. So despite the fact that the NRC ranked in annual surveys as the best place to work in the entire federal government throughout Jaczko's term, Jaczko's management abilities were suddenly brought into question and the bullying (and worse) charges levied against him. Bitter Congressional hearings were held.

Jaczko has his powerful Congressional supporters of course, like Sen. Reid, along with Senate Environment Committee chair Barbara Boxer and Rep. Ed Markey, usually the most outspoken nuclear critic in Congress. But it was becoming obvious that he would be unlikely to be confirmed for another term as Chair when his appointment runs out in June 2013. And, really, who in his right mind would want to subject themselves to five more years of the kind of abuse heaped on him?

So in May, Jaczko announced he would resign, but that his resignation would only become effective upon confirmation of a new chair. Given the slow pace of action and deep polarization in Congress, that might keep him in the job for months and perhaps fully through his term.

But the nuclear industry and Congressional Republicans really want a new term for Commissioner Kristine Svinicki—by voting record the most pro-industry Commissioner of them all. Her term ends next month. Sens. Reid and Boxer had already stated their opposition to that renomination (which Obama unfortunately did make), and it appeared unlikely she would be confirmed.

But with Jaczko's announcement, Reid—who is dedicated to permanently defeating Yucca Mountain--seized on

the opportunity, and apparently convinced President Obama to nominate Allison Macfarlane as the new NRC chair.

Macfarlane is a geologist and a longtime opponent of Yucca Mountain, on strictly scientific grounds. She simply doesn't believe it is a suitable site for radioactive waste and has said so clearly. She also opposes reprocessing of radioactive waste, and believes waste in fuel pools should be moved to dry casks. Most recently she was a member of the Department of Energy's Blue Ribbon Commission on America's Nuclear Future, which adopted some of her positions.

Macfarlane is not anti-nuclear power, however, and it is somewhat unclear how far her expertise extends on nuclear reactor safety issues.

Macfarlane would never be confirmed by the Senate in normal times. Except there is that Svinicki nomination, which was headed for a no vote. So, the Nuclear Energy Institute quickly fell into line and endorsed Macfarlane as a package deal with Svinicki. So did Senator Reid. While some extreme right-wing commentators and industry people have since weighed in urging the Senate to reject Macfarlane, at this point it looks like the deal will hold. One thing is certain at this point: either the NRC will get both of them, or neither of them. Hearings are expected on both nominations early in June, and possibly a Senate floor vote shortly thereafter.

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# NUCLEAR-FREE AUSTRIA STOPS IMPORT OF NUCLEAR ELECTRICITY

Austria's people decided in a national referendum in 1978 against the start-up of the nuclear power plant in Zwentendorf, which resulted in a constitutional law (*Bundesverfassungsgesetz Atomfreies Österreich*, 1998). On the other hand, Austrian utilities recently imported large amounts of "dirty" electricity, in particular from the Czech Republic as well as from Germany – including at least 5 % of nuclear electricity.

**(750.4240) Global 2000** - Electricity in the EU can be traded separately from its guarantee of origin. On the first impression, this system sounds complicated as it makes the process of trading much more complex (issue of certificate, trading of certificate and cancellation of certificate as well as de-labelling the original source of the certificate). On second thoughts the system is simply not working – the general idea of electricity certificates was that by making certificates (guarantees of origin) tradeable separately from the electricity itself, extra revenue would be generated for renewable electricity and hence the investment in renewable energy sources would be supported. As the experiences with renewable electricity certificate systems show not just in the EU, but also in the US, there is no noticeable extra support for "new renewables" through this system, rather customers who are willing to pay a premium buy the renewable parts of the electricity mix, and in particular industry customers buy just anything they can get cheap, including nuclear electricity (as long as it is still heavily subsidized). Electricity certificates are mostly issued for renewable sources, but also for nuclear and fossil generation.

We started off from the position of thinking that electricity certificate systems in general are a stupid and not functioning system, but as there is no major overhaul to the system on the EU-level in sight, we thought it better to reform the system (on a national level) than to carry on lamenting, at the same time closing the worst loophole in the electricity certificate law for the import of nuclear electricity:

## Legal aspects of (nuclear) electricity certificates

The Renewables Directive of the EU (2009/28/EC) defines in Article 15 that electricity certificates can be traded separately from the electricity itself. The Electricity Internal Market Directive (2009/28/EC) regulates in Chapter II, Article 9 consumers' rights for fuel mix disclosure – it is the right of customers

to know what sources of electricity they consume (and hence pay for / support). There is, however, a major snag to this: as electricity can be traded separately from its certificate, electricity bought from an electricity exchange does not as such have a certificate / guarantee of origin with it. (The electricity exchanges account for small amounts of total trade, in the case of the German exchange 17 %, in the case of the Austrian exchange 7 % – most electricity is traded in direct, Over The Counter (OTC)-contracts.)

For electricity bought from the exchanges, the Electricity Internal Market Directive allows suppliers to use *aggregated* figures for the electricity exchange – an average value, an assumption about the average mix rather than precise figures. This of course contradicts the right of customers for full disclosure of fuel sources.

On the national level of the member states, it got worse: The Austrian Electricity law (*Elektrizitätswirtschafts- und Organisationsgesetz 2010*) provided in § 79.3 a major loophole for hiding unwanted amounts of electricity: If suppliers were unable (or unwilling) to purchase certificates for electricity, as is the case of electricity bought from the electricity exchanges without buying accompanying certificates, the suppliers could still sell this electricity and label it according to average *European* values, assumed from data for the previous year / statistics of the European Transmission System Operators (excluding electricity generated from renewable sources, as it was rightly assumed that this would not be sold at the electricity exchanges, but rather for a premium in direct Over The Counter-contracts).

## The situation in Austria

With the advent of electricity market reform, Austrian utilities exported more and more "green" electricity (or green electricity certificates) to countries where consumers were willing to pay a premium for this – and selling electricity generated from fossil, nuclear or unknown sources to the Austrian industry

(that consumes 57 % of electricity).

Most recent data (2010) show that 14,7 % of Austria's total electricity consumption was either bought from the electricity exchanges without any electricity certificate, or its certificate was sold separately (mostly hydro certificates to Germany). There was no legal requirement for suppliers to provide electricity certificates for all electricity, amounts without certificate were simply called "Strom unbekannter Herkunft" (electricity with unknown origin) in § 79.3 of the Electricity law.

This meant that traders could easily hide the fossil and nuclear parts of their fuel mix behind the smokescreen of "Strom unbekannter Herkunft" – they could even buy electricity from known (dirty) sources, sell it at the exchange and buy it back – whereby it lost its certificate.

## The campaign

GLOBAL 2000 and Greenpeace CEE had been campaigning on this issue / "hidden" nuclear electricity in Austria for years. When the majority state-controlled utility "Verbund" started a massive advertising campaign in 2010 positioning itself as "100 % hydro", GLOBAL 2000 started a campaign outlining that a 100 % subsidiary of Verbund sold almost entirely dirty electricity to the industry. After the Fukushima-events in March 2011, the campaign gained momentum and the Austrian government, eager to demonstrate change, agreed to ban nuclear electricity at a first summit with the two NGOs in June 2011. Quite predictably, some utilities opposed these moves, so the NGOs had to provide detailed legal and financial expertise that a) the proposed legal changes are sound on basis of European and WTO law and b) electricity prices would not skyrocket – the average price increase for labelling all electricity in Austria without nuclear certificates would be in a very modest range from € 0.13–1.95 per average household per year. We were lobbying for a legally binding prohibition to import nuclear electricity or certificates, but this stalled as

the ministry of economics was fiercely opposed to this: The minister argued this would be an infringement to Art 34 TFEU (Treaty of the Functioning of the European Union, Free movement of goods) – we argued: yes it would, but this can be justified by Art 194.2 TFEU – the right of member states of the EU to choose their energy sources, that came into force with the Lisbon treaties. The NGO campaign was backed by Austrian anti-nuclear initiatives, the Austrian Chamber of Labour and the major tabloid in Austria, Kronenzeitung – this helped a lot. When finally even the Catholic Church (in the person of the Klagenfurt bishop) signalled that nuclear electricity imports should be stopped, on April 16th we finally managed to achieve at least a compromise as follows:

### Results

1) Labelling: legally binding obligation for disclosure of all electricity that is consumed in Austria -- this includes households and industry as well as pumped-storage hydro (which consumes large amounts of electricity in Austria). The legal changes to the national electricity law will make it mandatory that the entire electricity supplied is labelled, i. e. that electricity can only be sold *together* with an electricity certificate, and “Strom unbekannter Herkunft” is not applicable any more for fuel

disclosure. These changes to § 79.3 are to be drafted this year and come into force by 2015.

2) Nuclear certificates & electricity: Austrian utilities voluntarily exclude certificates and direct contracts from nuclear generation from their portfolio immediately (it would be economic suicide to market explicitly labelled nuclear electricity in Austria anyway). Österreichs Energie (representing the largest utilities in Austria) also agreed that on a voluntary basis they will already start labelling their entire electricity supply by 1.1.2013 for household consumers and the – much larger amounts – for industry by 1.1.2015.

3) Label: there will be a certification label by the (federal) Issuing Body E-Control, developed together with the NGOs, that guarantees that the utility does not use any nuclear electricity or nuclear electricity certificates.

4) Transit: as electricity labelling is consumer/disclosure-oriented, the proposed changes do not affect the transit of electricity through Austria.

Regarding electricity certificates: The Austrian issuing body only acknowledges four types of electricity certificates, three national certificates under RES-law and one international – the

EECS-GO (European Energy Certificate System-Guarantee of Origin), where the issuing body is nominated by the state and conforms to fairly tight rules (to prevent double counting of certificates). This excludes systems (RECS, TÜV, ...) that are not as strict, are set up by market players or cannot exclude double counting, which of course immediately perverts the entire system.

The above is a compromise, but a reliable disclosure of all electricity sources is a big victory for the campaign. Lots of people were involved in this campaign, on the NGO-side Friends of the Earth Austria/GLOBAL 2000 & Greenpeace CEE as well as the ÖKOBÜRO legal experts.

If – as we hope – this campaign can be copied to other European countries, full disclosure can give consumers more power in choosing the clean electricity sources they want to consume – and avoiding the ones they do not wish to pay for any more, namely nuclear electricity.

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## STOP IMPORT OF NUCLEAR ELECTRICITY FROM RUSSIA

**Russian and Norwegian environmental NGOs oppose increased electricity trade between Russia and western countries, as long as common environmental and safety standards are absent. They urge the Finnish government to stop future import of nuclear electricity from the new Leningrad Nuclear Power Plant-2 (LNPP-2) in Russia. This import will be facilitated by the new power cable between Sosnovy Bor (St. Petersburg region, Russia) and Vyborg (Russia).**

**(750.4241) Green World** - The Russian company JSC Edinaya Energeticheskaya Sistema (Unified Energy System of Russia), in cooperation with the State Corporation on Nuclear Energy (Rosatom), is laying an underwater 1000 MW power cable from the new Leningrad nuclear reactor -2 (LNPP-2, under construction) on the south shore of the Gulf of Finland, to a point south of the city of Vyborg on the north shore. A public hearing of the environmental impact assessment (EIA) of the cable project was held in Sosnovy Bor in December 2011.

The cable will have a capacity of 1000 MW, and is capable of transporting electricity directly from 1 out of 4 units

of VVER-1200 nuclear reactors of the New Leningrad NPP-2. The cable will bypass the limitations in the transmission lines around St Petersburg, and allow a more direct access to the international electricity market via Finland. In the last years Russian-Finnish transfer of electricity has been about 10-11 TWh/year. This is about the equivalent of the electricity production of the 2 oldest Chernobyl type reactors of Leningrad NPP. These reactors have received a license for the prolonged operation after reaching their 30 years design limit. This political decision was adopted without public participation and EIA.

The High Voltage Direct Current power link-project will decrease environmental safety in the Baltic part of Russia by promoting the prolongation of old and unsafe nuclear reactors and the accumulation of nuclear and radioactive waste on the coastline of our common Baltic Sea. It will lead to environmental dumping, due to lower safety and environmental standards in Russia.

The transport of nuclear electricity is not solely a bilateral decision between Russia and Finland. Also other Nordic and EU countries will be influenced, as electricity imported to Finland will reach the common Nordic and EU market.



1. The new cable leads to environmental dumping

- *Electricity import from Russia represents the dumping of cheaper electricity produced with lower environmental and safety standards, on the Nordic market.*

Northwest Russia has excess electric generating capacity because of prolonged operation of the first generation nuclear reactors. The reactors have not only passed their 30 year of designed lifetime, but they are also built with serious safety design deficits that make it impossible to meet European safety standards. For instance, EU told Lithuania to close down Ignalina nuclear power plant for safety reasons, although its reactors were newer and better than the two oldest reactors at Leningrad Nuclear Power Plant.

- *A common market should have common standards.*

EU's position in the energy dialogue with Russia has been that a common EU and Russia electricity market should have common environmental standards. Therefore EU has shown reluctance to import Russian electricity before environmental and safety conditions are improved. As members of EU, Finland should not act in a way that contradicts this position.

- *Environmental dumping is bad both for the environment and for competition.*

The prolonged operation of Russia's first generation nuclear power reactors will decrease the level of environmental safety in the whole Baltic Region populated by more than 90 million people. In

addition to harming the environment by decreasing the level of environmental safety, different standards in the same market is unfair competition.

2. The new cable helps prolongation of old and unsafe nuclear reactors

- *Electricity import provides money for the Russian nuclear industry.*

Russia's nuclear operator RosEnergAtom is one of the companies that will receive increased income from the electricity export. Earning money from electricity export, the operator of the old reactors will be more likely to continue operation. Even though there is surplus capacity of electricity generation in North West Russia, old nuclear reactors that have reached the end of their planned lifetime have received permission for prolongation of operations. This is done without public debate or necessary environmental impact assessments (EIA).

- *Electricity import from Russia results in prolongation of old reactors.*

Thus the proposed cable will decrease the level of environmental safety in the whole Baltic Region populated by more than 90 million people.

- *Electricity import makes the work for decommissioning even more difficult.*

Environmental NGOs in Russia work for decommissioning of old reactors, but face a tough challenge in today's Russia, where organisational freedom is limited. The court system is also not working in our favour. Electricity import from Russia will counteract their efforts.

- *The Russian courts have denied the right of NGOs to stop unlawful lifetime extension*

Russian NGOs have attempted to use the legal system to stop the unlawful lifetime extension of the old reactors at the Leningrad nuclear power plant, but the effort has not been successful. The courts have so far blocked any discussion of this problem with Russian NPP operators and regulators of nuclear safety.

- *Setting conditions for electricity import is a way to help decommissioning.*

The Nordic countries, EBRD (The European Bank of Reconstruction and Development) and others have given financial and technical support for safety measures at the old reactors, on the condition that they close at the end of their designed lifetime. Nevertheless, RosEnergAtom has chosen to prolong their operation. By unconditionally buying the power from RosEnergAtom, the Nordic countries undermine their own possibilities for actual influence on Russian authorities on this issue.

NGO's involved in this campaign are Green World, Sosnovy Bor, Kola Environmental Center, Murmansk, Zapriodu, Chelyabinsk and Norges Naturvernforbund / FOE Norway, Oslo.

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## U.K.: NO NUCLEAR SUBSIDIES MEANS WHAT THE GOVERNMENT CHOOSES IT TO MEAN

The UK Government has finally published its Draft Energy Bill which includes proposals for so-called Electricity Market Reform as promised in the Queen's Speech on 9th May. Energy Minister, Ed Davey insists the proposals will provide a market structure to help keep the lights on, but without any subsidy for new nuclear reactors.<sup>(\*1)</sup> Almost everyone else agrees this Bill is about exactly that - setting up a complicated series of support mechanisms behind the veil of market reform - in order to subsidise nuclear.

(750.4242) **Pete Roche** - The right of center *Telegraph* newspaper describes the proposals as "the biggest shake-up of the industry since privatization", intended to secure £110bn of investment in power generation.<sup>(\*2)</sup> The Bill is supposed to keep expected increases in energy bills down, reduce carbon emissions and secure electricity

supplies. But Bridget Woodman, of the energy policy group at the University of Exeter, said: "Rarely can an energy measure have attracted such universal condemnation. The key players - renewable generators, most energy companies, consumer groups and commentators - all recognize that [it] won't deliver a sustainable energy future ...

*The government is in a hole and needs to stop digging before it's too late to put the UK on a path to a sustainable energy future.*"<sup>(\*3)</sup>

Keith MacLean, head of policy at one of the UK's Big Six utilities, Scottish and Southern Energy, says it's a complex system "designed to mask what is

effectively a subsidy for new nuclear power, which could derail investment in renewables". Another of the Big Six RWE, which together with EON recently pulled out of plans to build new reactors at Oldbury in Gloucestershire and Wylfa on Anglesey, says the Energy Bill could add billions of pounds in unnecessary costs for the industry. (\*2)

Energy Secretary Ed Davey was pressed on BBC Radio 4 on whether the changes amounted to a subsidy for new nuclear. But rather than admitting, as almost every commentator says, that new reactors are too expensive to be built without some form of subsidy he continued to cling to the illusion that "There is going to be no public subsidy for new nuclear". (\*4) (The predicted cost of building two new EPR reactors at Hinkley Point in Somerset has increased from £9 billion to £14 billion). (\*5)

Davey says the idea of the "Contract for Difference" or Feed-in Tariff proposed in the Energy Bill is that by giving investors more certainty, the cost of borrowing will come down. "What we want is a market structure that makes sure we keep the lights on."

The interviewer was having none of it. He said the Coalition Agreement and the European Commission prohibit subsidies to new reactors and so you are trying to get around that by calling it something else, and offering long-term contracts to would-be nuclear-builders.

Davey calls the proposals in the Energy Bill the most affordable way to get low carbon energy in a secure way. Yet many in the industry have poured scorn on the idea that the proposed reforms offer the cheapest route to securing investment. (\*2)

Davey is trying to make his reforms sound like a simple tweaking of the free market - despite the fact that they will virtually dispense with the free market and replace it with fixed long-term contracts. He says "there will be no blank cheque for nuclear. Unless nuclear can be price competitive - as the industry says it can be - these nuclear projects won't proceed". (\*4)

In actual fact the Draft Energy Bill doesn't tell us much more than we already knew. It looks to be largely in line with the expectations established in last year's electricity market reform (EMR)

proposals. There is confirmation of the four-pronged regime based around contracts for difference (CfDs), a new capacity mechanism to support back-up power plants, a carbon floor price to provide stability for investors, and an emissions performance standard to ban coal-fired power plants. But we didn't get any of the answers needed to calculate the viability of future renewable energy schemes, particularly offshore wind farms, or nuclear reactors. We will have to wait for the crucial numbers that will determine which "low carbon" projects proceed. The simple fact is that new investment in nuclear and offshore wind will not really begin to flow until the government confirms the "strike price" at which CfDs will be offered for different technologies. If the market price for electricity falls below this guaranteed "strike price" the nuclear or renewable energy operator would be paid the difference. (\*6)

#### **Start of earthwork preparation of Hinkley site put back.**

Meanwhile, mid-May, EDF decided to delay the start of massive earthworks needed to prepare the ground for a new nuclear power station at Hinkley Point, dealing a further blow to the government's energy plans. Reports of rising reactor costs and the election of François Hollande as French president, with promises to cut back on nuclear power, have dented confidence. Work to move millions of cubic meters of soil and rock at the Hinkley site was due to begin in August, according to West Somerset council's planning department. But EDF staff has been told the work will now start in 2013.

**Guardian, 14 May 2012**

But all the signs are that Davey is being disingenuous, and that the Government is determined to make sure new reactors are built whatever the cost. His Liberal Democrat Party, which is a junior member of the Coalition Government is still, in theory, opposed to new reactor construction, and only agreed to allow the Government to pursue a pro-nuclear policy on the basis that there would be no public subsidies. Only a couple of weeks ago the Party's Deputy Leader, Simon Hughes MP, told the House of Commons that the policy of not subsidizing new reactors meant "it will not happen because it has always needed to be subsidized".

But not everyone in the Department of Energy and Climate Change seems to agree with Davey's idea that new reactors will only be built if they are cheap enough. A spokesperson told The Guardian that "New nuclear is where the future lies for long-term energy security.

*This is why it is so important we begin the transition on market reform today."*

Davey has confirmed talks have begun between his Department, EDF Energy and Centrica- the companies planning to make a final investment decision before the end of 2012 on whether to build two EPR reactors at Hinkley Point C. The talks will provide with EDF and Centrica with some firmer guarantees in order to make sure plans for Hinkley Point C go ahead. (\*7) With RWE and EON having recently dropped their UK nuclear plans, EDF has the Government over a barrel, and will no doubt be telling the Energy Department what strike price they want before they agree to go-ahead - in effect writing their own subsidy cheque from the electricity consumer. The strike price rates will not be finalised until 2013 - and not available to generators until 2014 - but under the terms of the draft Energy Bill, the government can issue a likely strike price in advance of formalising the rate and introducing CfD in 2014.

Confirming this nuclear enthusiasm, Conservative Junior Energy Minister Charles Hendry says the Government has done everything possible to ensure that EDF and Centrica go ahead and build another two EPRs at Sizewell in Suffolk. "We have worked closely with EDF and we are confident the outcome will be positive." (\*8)

The Green Party's only UK MP sums up the view of environmentalists in Britain when she says:

*"the Electricity Market Reform proposals expose a clear bias towards nuclear and gas. We know that subsidising new nuclear would fly in face of the Coalition's promise not to use taxpayer's money for nuclear, yet no matter how much Ministers deny it, EMR will gift EDF and other potential nuclear operators with billions of pounds in subsidies over the lifetime of a power station."*

Rather like Humpty Dumpty when it comes to nuclear subsidies the word means just what the Government chooses it to mean - neither more nor less. As Friends of the Earth point out: the Energy Bill is a desperate attempt to prop up the dying nuclear industry and a way of letting in dirty gas by the back door, even though soaring gas prices have led to rocketing bills. More gas and new nukes will only add to bill payers' pain.

**Sources:** \*1- DECC, 2 May 2012: [http://www.decc.gov.uk/en/content/cms/news/wms\\_energybill/wms\\_energybill.aspx](http://www.decc.gov.uk/en/content/cms/news/wms_energybill/wms_energybill.aspx)  
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 \*8- East Anglian Daily Times, 23 May 2012: [http://www.eadt.co.uk/news/size-well\\_new\\_power\\_station\\_set\\_to\\_get\\_go\\_ahead\\_1\\_1385859](http://www.eadt.co.uk/news/size-well_new_power_station_set_to_get_go_ahead_1_1385859)  
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# RISK OF MAJOR NUCLEAR ACCIDENTS UNDERESTIMATED

**Major reactor accidents of nuclear power plants are rare, yet the consequences are catastrophic. But what is meant by “rare”? The results of a new study indicate that previously the occurrence of INES 7 major accidents and the risks of radioactive contamination have been underestimated. Scientists at the Max Planck Institute for Chemistry in Mainz (Germany) have calculated that such events may occur once every 10 to 20 years (based on the current number of reactors) - some 200 times more often than estimated in the past.**

**(750.4243) Jos Lelieveld et.al** - Nuclear accidents associated with the melting of the reactor core are caused by the failure of the cooling systems, and can have major environmental and societal consequences. In total about 20 core melt events have occurred in military and commercial reactors worldwide since the early 1950s (Burns et al., 2012). An accident risk assessment of nuclear power plants by the US Nuclear Regulatory Commission in 1975 estimated the probability of a core melt at 1 in 20 000 per year for a single reactor unit. A follow-up report in 1990 adjusted this number and indicated that the core damage frequency is not a value that can be calculated with certainty, though an appendix presented the following likelihood of a catastrophic accident (NRC: Severe Accident Risks – An Assessment for Five U.S. Nuclear Power Plants, NUREG 1150, 1990):  
 a. Probability of core melt 1 in 10 000 per year;  
 b. Probability of containment failure 1 in 100;  
 c. Probability of unfavourable wind direction 1 in 10;  
 d. Probability of meteorological inversion 1 in 10;  
 e. Probability of evacuation failure 1 in 10.

**Underestimation**  
 The product of these possibilities is 1 in 1 billion per year for a single reactor (this assumes that factors (a)–(e) are independent, which is not the case, so that the actual risk of a catastrophic

accident should be higher than this). Given this, with a total of about 440 active civilian reactors worldwide, and an estimated mean remaining lifetime of 20–25 yr (together ~10 000 reactor years), then the probability of such a major accident occurring in this period would be roughly 1 in 100 000. In light of the uncertainties, the simplicity of this calculation is appealing. However, based on the evidence over the past decades one may conclude that the combined probabilities (a) and (b) have been underestimated.

To evaluate the global risks, empirical evidence can be used to estimate the factors (a) and (b) from above. In the past decades, four INES level 7 catastrophic nuclear meltdowns have occurred, one in Chernobyl and three in Fukushima. Note again that INES 6 and lower level accidents with partial core melts such as Three Mile Island (USA), Mayak (a plutonium production and reprocessing plant in Siberia) and Selafield (UK) are not considered. The total number of operational reactor years since the first civilian nuclear power station in Obninsk (1954) until 2011 has been about 14 500 according to the IAEA in 2011. This suggests that the probability of a major reactor accident, i.e., the combined probability of the factors (a) and (b), is much higher than estimated in 1990.

Simply taking the four reactor meltdowns over the 14 500 reactor years would indicate a probability of 1 in

3625 per reactor per year, 275 times larger than the 1990 estimate. However, since 2011 is at a junction in time with impacts of a catastrophic meltdown still unfolding, this direct estimate is high-biased, and it is rounded off to 1 in 5000 per reactor per year for use in the model simulations. This is actually only a factor of two higher than the estimated core melt probability noted above, factor (a), although originally this factor also represented partial core melts, which have occurred more frequently. Based on the past evidence, this principally assumes that if a major accident occurs, the probability of containment before substantial radioactivity release is very small. The researchers thus argue that including the factors (b)–(e) can distort the risk perception. The rounded estimate implies that with 440 civilian reactors worldwide a major accident can be expected to occur about once every few decades, depending on whether counting Fukushima as a triple or a single event.

Furthermore, by using a state-of-the-art global atmospheric model they can directly compute the anticipated dispersion of radionuclides, avoiding the need to guess the factors (c) and (d). In doing so, they find that the vast majority of the radioactivity is transported outside an area of 50 km radius, which can undermine evacuation measures, especially if concentrated deposition occurs at much greater distances from the accident, as was the case for Chernobyl in May 1986. Furthermore, even if



an evacuation is successful in terms of saving human lives, large areas around the reactors are made uninhabitable for decades afterwards. Therefore, they argue that such events are catastrophic irrespective of evacuation failure or success, and exclude the factor (e).

#### Exposure

In the report, the cumulative, global risk of exposure to radioactivity due to atmospheric dispersion of gases and particles following severe nuclear accidents (the most severe ones, INES 7), are assessed using particulate Cesium-137 and gaseous Iodine-131 as proxies for the fallout..

Using a global model of the atmosphere here the scientists compute that on average, in the event of a major reactor accident of any nuclear power plant worldwide, more than 90% of emitted 137Cs would be transported beyond 50 km and about 50% beyond 1000 km distance before being deposited. This

corroborates that such accidents have large-scale and transboundary impacts. Although the emission strengths and atmospheric removal processes of 137Cs and 131I are quite different, the radioactive contamination patterns over land and the human exposure due to deposition are computed to be similar. Citizens in the densely populated southwestern part of Germany run the worldwide highest risk of radioactive contamination, associated with the numerous nuclear power plants situated near the borders between France, Belgium and Germany, and the dominant westerly wind direction.

In Western Europe, where the density of reactors is particularly high, the contamination by more than 40 kilobecquerels per square meter is expected to occur once in about every 50 years. According to the IAEA, an area with more than 40 kilobecquerels of radioactivity per square meter is defined as contaminated. But of course, an objective

measure for dangerous radioactive contamination is debatable

If a single nuclear meltdown were to occur in Western Europe, around 28 million people on average would be affected by contamination of more than 40 kilobecquerels per square meter. This figure is even higher in southern Asia, due to the dense populations. A major nuclear accident there would affect around 34 million people, while in the eastern USA and in East Asia this would be 14 to 21 million people.

The report '*Global risk of radioactive fallout after major nuclear reactor accidents*', by J. Lelieveld, D. Kunkel, and M. G. Lawrence is available at: <http://www.atmos-chem-phys.net/12/4245/2012/acp-12-4245-2012.pdf>

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## AREVA IN AFRICA; THE HIDDEN FACE OF FRENCH NUCLEAR POWER

**The reality of French nuclear colonialism on the African continent is described in depth by Raphael Granvaud's book *Areva en Afrique*, published in French earlier in 2012. Granvaud details the conditions under which France and Areva procure uranium at the lowest price, at the cost of political interference and environmental, health and social disaster for local people. It dispels the myth of French energy independence through nuclear power, since the uranium fueling civil and military nuclear power comes in large part from Africa.**

**(750.4244) Juliette Poirson** - In recent weeks, Areva's practices in Africa were in the headlines several times, and Areva worries about this growing criticism. On April 25, 2012, employees working at Imouraren uranium mine in Niger (which could become the biggest in Africa when it should open in 2014), went on strike to protest against their working conditions. The information was published not only in local media, but also international media, which is quite new! On May 11, a French Court for social affairs condemned Areva for an "*inexcusable mistake*" in regard to the death from lung cancer of a French former employee who worked seven years for Cominak, one of the two subsidiaries of Areva in Arlit, Niger. This victory gives hope for African victims of uranium. These two affairs are only a visible part of how Cogema, since 2001 called Areva, worked and is still working in Africa. The reality is described in depth by Raphael Granvaud's book *Areva en Afrique*, published in French in

2012 by Editor Agone. He reveals that since the 1950's Areva mines African ore at the lowest cost and with no care for the environment, the workers and the communities.

#### 'Françafrique'

The great development of French civilian and military nuclear power have been possible thanks to the exploitation of the soil of French African colonies (as in Madagascar from 1954) and then of African independent countries (in particular in Gabon and Niger). Even before the closure of the last uranium mine on French soil in 2001, the fuel for French nuclear plants was largely imported. So, the "French energy independence" was always only a myth spread by the French state.

The author shows that for more than 40 years, Cogema's African subsidiaries were able to exploit uranium at low prices thanks to Françafrique and the support of dictatorial regimes sympa-

thetic to French interests. 'Françafrique' is a system of domination developed by France over its former colonies in Africa in order to keep control of raw materials and strengthen its geostrategic and economic position. For instance, in 1974, when Nigerien President Diouri attempted to demand higher uranium prices, he was ousted by a military coup, perpetrated under the watchful eyes of French authorities. Today the collusion between politics and interests of the French nuclear industry keeps going on. In 2009, French President Sarkozy supported Nigerien President Tandja, who sought to extend his term unconstitutionally, in exchange for which he obtained for Areva the contract of Imouraren mine. Similarly, he negotiated in trouble circumstances a memo between the Democratic Republic of Congo and Areva, enabling the company to explore the whole subsoil of Congo, representing an area the size of Europe.



### **The environmental, health and social scandal**

The book points out that African people did not get any positive impact of uranium mining, and that conversely, they were sentenced to all its negative consequences. The disaster in terms of health, social and ecological aspects is immense.

In the case of Arlit, Niger, the uranium exploitation since 1967 resulted in agro-pastoral land-grabbing around the two mine sites, destruction of fauna and flora, air contamination by dust and radioactive gases, radioactive contamination of water or short-term irreversible exhaustion of the two aquifers - one is already dried up to 2/3 and the other will be irreversibly dried up within 40 years.

In the case of Gabon, the uranium mines closed in 1999 but the terrible consequences still continue despite a huge *redevelopment* program largely paid by the European Development Fund and not by Areva itself! Some areas are heavily polluted, as well as the river flowing nearby.

Areva's stranglehold on local health facilities enabled a conspiracy of silence on occupational diseases. In forty years of operation in Arlit, Niger, Areva has not recognized any occupational disease!

### **Mobilization of civil society**

In short, African debt of Areva is huge, but this doesn't arouse much interest among authorities nor international institutions. Until now, mostly civil society organizations do care. The book recalls how local organizations first revealed the scandal of uranium mining in Africa, despite Areva's ostracism.

As a consequence, Areva had to make some concessions, notably regarding the security of the workers, but generally refuses to take responsibility and continues to green wash its activities. 'Health observatories' were set up in Gabon in 2010 and in Niger in 2011. They are supposed to enable individual compensation for the (ex)-workers, who can prove that their illness is related to their work in the mines. After an initial phase of observation, NGOs that are part of these bodies are now denouncing the lack of independence of the Observatories. In the case of OSRA

("health observatory of the Agadez region", Niger), they criticize the fact that Areva offers allowance for attendance, seen as a mean to buy their silence.

There is still a lot to do in terms of information, legal and policy work, in order to improve the lives of local people, reduce environmental risks, obtain a fair distribution of income lead to uranium, as well as to avoid new mines. Hard work is being led by Earthlife in Namibia; Brainforest in Gabon; the CED in Cameroon and in Central African Republic; ROTAB, Gren, Arlit's coordination of civil society, Arlit's civil society synergy in Niger; and many others.

More information on Areva in Africa (in English): <http://survie.org/publications/4-pages/article/nouvelle-traduction-4-pages-areva>

**Source and contact:** Juliette Poirson, Danyel Dubreuil, members of the French NGO 'Survie', which campaigns for the abolition of neo-colonial ties between France and its former colonies. Email : [juliettepoirson\[at\]hotmail.com](mailto:juliettepoirson[at]hotmail.com) Web: <http://survie.org>

## IN BRIEF

**Israel: first permit for uranium exploration.** Israel's Energy and Water Ministry on April 3 granted Gulliver Energy the first ever uranium exploration permit. The Israeli oil and gas exploration company is headed by former Mossad intelligence agency director Meir Dagan. In a statement dated April 3, Gulliver said the permit is for a year and covers 1,200 acres in Israel's northern Negev Desert region near the town of Arad. The area to be explored extends to the Dead Sea. Gulliver requested the permit after radioactive material was discovered at shallow depths of less than 100 meters during oil exploration testing last year. A feasibility study conducted in the past year concluded there was a high probability of finding uranium there. Initial tests were conducted to a shallow depth but further tests at various depths are planned in order to assess the prospects for finding uranium. Arad Mayor Tali Peloskov said the town will not allow any mining in the area. He has requested a meeting with Deputy Health Minister Yakov Litzman on the matter in order to assess the health risk of mining in the area. Local residents who are opposed to mining operations have also set up a lobby to oppose efforts to mine for uranium as well as phosphates near the town. The land involved is near large phosphate reserves. Israel conducted a national uranium survey in the late 1980s, and the region near Arad was found to have potential for uranium. In the past Israel attempted to extract uranium from phosphates. The Weizmann Institute of Science, a multidisciplinary research institute in Rehovot, Israel, developed a technique that was costly and the project was dropped. Neither the company nor the ministry has said whether the uranium would be used in Israel or exported.

**NuclearFuel, 16 April 2012**

**Myanmar: no longer pursuing nuclear program.** Myanmar President Thein Sein said on May 14, the country had given up its plan to develop nuclear programs in cooperation with Russia in the mid-2000s. Sein told visiting Korean President Lee Myung-bak that Russia offered to build two 10 megawatt nuclear reactors for civilian, not military, use. But the country's military junta did not push the project due to its inability to manage it, he was quoted as saying by Lee's security aide Kim Tae-hyo. In 2007, Russia's atomic energy agency and Myanmar signed a deal to build nuclear research reactor. Reports said the reactors would use low enriched uranium consisting of less than 20 percent uranium-235. The plans to buy a nuclear reactor from Russia have been in the pipeline for years, and were met with suspicion. (See for instance Nuclear Monitor 657, 21 June 2007: Myanmar: a new Iran in the making?)

**Asia News Network (The Korea Herald), 15 May 2012**

**Brazil shelve plans to build new nuclear plants.** Brazil announced on May 9, it has abandoned plans to build new nuclear power stations in the coming years in the wake of last year's Fukushima disaster in Japan. The previous government led by

former president Luiz Inacio Lula da Silva had planned to construct between four and eight new nuclear plants through 2030. But the energy ministry's executive secretary, Marcio Zimmermann, was quoted as telling a forum May 8, that there was no need for new nuclear facilities for the next 10 years. "The last plan, which runs through 2020, does not envisage any (new) nuclear power station because there is no need for it. Demand is met with hydro-electrical power and complementary energy sources such as wind, thermal and natural gas."

Brazil has two PWR in operation. The Angra I was the first Brazilian nuclear reactor, which has been hampered by problems with corrosion in the steam generators due to a metal alloy used by westinghouse, which forced the recent replacement of both steam generators.

The Angra II reactor was completed after more than 20 years of construction, as costs soared from initial estimates of 500USD/kW in 1975 to over 4000USD/kw.

The total cost of Angra III, whose completion has been delayed for years, will be around 10 billion Brazilian reais (US\$5.9 billion, 4.7bn euro).

**AFP, 9 May 2012 / www.enformable.com, 9 May 2012**

**Used parts sold for new in South Korea.** On May 11, a South Korean businessman has been jailed for three years for supplying potentially defective parts to the country's oldest atomic power plant Gori, near Busan. The man, identified only as Hwang, was sentenced for selling recycled turbine valve parts. He cleaned and painted used parts stolen from the plant's dump by an employee. He then sold them back to the plant, on three occasions since 2008, disguising them as new products. Hwang pocketed some three billion won (US\$2.6 million) through the fraud, according to the court. The plant employee who stole the scrapped parts was sentenced to three years in prison in April.

There have been previous scandals over potentially defective parts in nuclear power plants. In April the nuclear safety watchdog launched an investigation at Gori and another plant, after they were found to be using components developed by a local company but based on illegally obtained French technology. The Gori-1 Reactor at the plant was also at the centre of a scare in February when it briefly lost power and the emergency generator failed to kick in. Several officials and engineers have been punished for covering up the incident.

**AFP, 16 May 2012**

**Nigeria proposes two reactor sites.** In the category 'uhh, sorry?' the following: Nigeria's Kogi and Akwa Ibom states are being put forward as proposed areas for nuclear reactors, pending approval of the federal executive council, the Nigeria Atomic Energy Commission (NAEC) has said. Chairman of the commission, Dr Erepamo Osaisai, said it would submit the two locations for the siting of nuclear power reactors in the country soon to the Presidency. Dr Osaisai made the disclosure in a lecture to the fellows of the Nigerian Academy of Engineering in Sheda, Abuja. He said the preliminary sites' survey and evaluation project investigated a number of technical, environmental, security, social and economic issues. The two locations are within Geregu and Ajaokuta local governments in Kogi State and Itu Local Government in Akwa Ibom.

Nigeria is planning to generate 1000 MW of electricity through nuclear energy by 2020 and gradually increase it to 4000 MW by 2030. Osaisai expects that NAEC will apply for the licensing of the approved sites by the end of 2013. He said a draft law for the implementation of the national nuclear power program has been developed and has been subjected to detailed scrutiny by all major stakeholders with technical input of the International Atomic Energy Agency (IAEA), according to the news report.

**The Nigerian Voice, 28 May 2012 / Nuclear Energy Insider, Policy & Commission Brief 24 – 30 May 2012**

**Tanzania: uranium mining threat to World Heritage site.** The Unesco World Heritage Committee (UWHC) will break the deadlock in June when it will decide whether or not to allow mining of uranium in Selous Game Reserve, one of the largest remaining wilderness areas in Africa, harboring the largest elephant population on the continent. The Mkuju River Uranium Project is planned by Russian ARMZ, a subsidiary of Rosatom and Canada-based UraniumOne. A decision on whether to change the boundary of the World Heritage site Selous Game Reserve and thus 'pave the way' for uranium mining - or not, will be made by the World Heritage Committee at its June 2012 session in St. Peterburg, Russia.

According to deputy minister for Natural Resources and Tourism, Mr Lazaro Nyalandu, any move by the committee to halt uranium extraction would be a big blow to Tanzania which has been insisting that its extraction is critical to funding the country's development programs and driving its economy. Some international as well as local environmentalists and politicians, including a handful of MPs, have strongly opposed the mining plans. They have maintained that the mining project would have a devastating impact on the economic and social fronts, and would deal a major blow to the ecology of the region. However, Tanzania went ahead and applied to the Unesco World Heritage Committee for permission to mine uranium at the 5-million hectare game reserve in the south of Tanzania.

**The Citizen (Tanzania), 18 May 2012**

**Quote of the month:**

"Anyone who claims to understand energy policy is either mad or subsidized. Last week I wrote that politics is seldom rational. It is more often based on intuition and tribal prejudice. This week we have a thundering example: the government's new policy on nuclear energy."

**Simon Jenkins in the Guardian, 22 May 2012**

## WISE/NIRS NUCLEAR MONITOR

The Nuclear Information & Resource Service was founded in 1978 and is based in Washington, US. The World Information Service on Energy was set up in the same year and houses in Amsterdam, Netherlands. NIRS and WISE Amsterdam joined forces in 2000, creating a worldwide network of information and resource centers for citizens and environmental organizations concerned about nuclear power, radioactive waste, radiation, and sustainable energy issues.

The WISE/NIRS Nuclear Monitor publishes international information in English 20 times a year. A Spanish translation of this newsletter is available on the WISE Amsterdam website ([www.antenna.nl/wise/esp](http://www.antenna.nl/wise/esp)). A Russian version is published by WISE Russia and a Ukrainian version is published by WISE Ukraine. The WISE/NIRS Nuclear Monitor can be obtained both on paper and in an email version (pdf format). Old issues are (after two months) available through the WISE Amsterdam homepage: [www.antenna.nl/wise](http://www.antenna.nl/wise).

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