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Editorial

Dear readers of the WISE/NIRS Nuclear Monitor,

In this issue of the Monitor:

- Michael Mariotte writes about the inspiring Nuclear-Free, Carbon-Free Contingent at the People's Climate March in New York City;
- We summarise the reasons why nuclear power must be rejected as a 'solution' to climate change;
- We look at the state of the global uranium market − a modest price increase masks deep problems for the industry, not least stagnant demand;
- Niels Henrik Hooge writes about the diminishing prospects for uranium mining in Greenland;
- We summarise recent developments in Finland, where one nuclear power project has effectively been rejected while another has been approved;
- We consider South Africa's stop-start nuclear power program

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. The next issue will be sent to subscribers on October 29.

Regards from the editorial team.

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Monitored this issue:

People's Climate March in New York City

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NM792. 4416 No matter how you look at it, 400,000 turning out for the September 21 People's Climate March in New York is a lot of people. It's not the largest crowd I've ever been in: that was the nearly two million at President Obama's first inauguration. Nor the largest demonstration: that was the million at the 1982 nuclear freeze march in New York City. But it's still a lot of people.

And to put it in a more appropriate perspective, it's as many or more people than participated in some other seminal events that changed history and the trajectory of American politics and lives: the 1963 civil rights March on Washington, the 1969 Woodstock festival, the November 1969 anti-Vietnam war mobilization, the 1979 No Nukes protest in Washington after Three Mile Island.

It is too early to pronounce, or even take a legitimate guess at, the ultimate impact of the People's Climate March on September 21. Perhaps the world's governments will simply ignore the legions in the streets − and in the streets of cities and towns all across the world – and continue to do little or nothing to take the steps necessary to save our planet. That would be a tragedy.

But perhaps September 21, 2014 will be recognized in the history books as the day the tide began to shift, just as the 1963 March on Washington is now considered the day civil rights became a mainstream issue, as the 1969 anti-Vietnam march heralded the beginning of the end of that monstrous war, as the 1979 No Nukes protest helped turn public sentiment against nuclear power and kept the nuclear industry at bay for decades.

New York City, September 21.

The key will be the follow-up. If the march is seen, especially by its participants, as an end in itself, it will become just another day not noted in any history book. But if the People's Climate March ushers in a new era of citizen action on climate − as we hope it does − then yes, it will be likely to qualify as the historic event its backers (including ourselves) promised.

That is just as true for the Nuclear-Free, Carbon-Free Contingent to the march.

Not only was the overall march itself historic in terms of turnout, so was the Nuclear-Free, Carbon-Free Contingent. Largest Climate March ever .... largest Nuclear-Free, Carbon-Free action ever. By the time the rally ended but well before the marching began, the entire city block was wall-to-wall people.

When I arrived at our assembly spot at 7am to set up the stage and sound system, the block of Central Park West between 73rd and 74th looked very big and very empty. That was a lot of space to fill with people. And, by the time the Nuclear-Free, Carbon-Free Contingent's rally kicked off with songs from Raging Grannies at 10am, it still looked very big and largely empty − only a couple hundred people had shown up by then.

On September 21, WISE organised a 'Floating Climate March' against 'False Solutions: Don't Nuke the Climate!' A fleet of eight boats and 135 people 'marched' through the Amsterdam canals, at the end joining a big Climate March. More information and photos: www.wiseinternational.org/node/4172

I'll admit to being a little nervous. NIRS had brought 650 flags and 200 posters to distribute, and other people had brought their own banners and other materials. That would have been a lot of stuff for a couple hundred people to carry. I needn't have worried. As buses arrived, as subways disgorged tens of thousands of passengers, the block began filling. By the time the rally ended at 11:30am, the flags and posters were long gone − we could have used another thousand or two. There was no room left on the block either. There were thousands of us pressed together, ready to march. It was beautiful, it was awesome.

Speakers at the Nuclear-Free, Carbon-Free rally included Dr. Arjun Mahkijani (IEER and author of Carbon-Free, Nuclear-Free); Jessica Azulay (AGREE); Julia Walsh (Frack Action & New Yorkers Against Fracking); Mary Olson and Michael Mariotte (NIRS); Leona Morgan (No Nukes Dine; Japanese activist Yuko Tonohira and NIRS Board Chair Chris Williams. The Nuclear-Free, Carbon-Free Contingent was endorsed by over 130- organizations (listed at www.nirs.org/climatemarch/ncfccendorsers.htm).

But what matters most, what will determine whether the Nuclear-Free, Carbon-Free Contingent's action was just a great day or something that will matter long term, is how we follow up. That's why we built in a national strategy meeting on Saturday afternoon for everyone who could arrive a day early. Over 60 activists attended and good things are going to come out of it. Better and faster communication among the grassroots, better coordination and strategizing, especially for the upcoming battles in the states against the dirty, aging and uneconomic nuclear reactors of the 20th century that threaten to hold back deployment of clean energy technologies.

It's not automatic, but a clean energy system is inevitable. The question is whether it will be deployed in time. In time to prevent the next meltdown, in time to slash the carbon and methane emissions that are smothering our home planet. That's the job before us now, that's the follow-up we must accomplish for September 21, 2014 to make the history books − as indeed it deserves.

More information and photos:

www.nirs.org/climatemarch/climatemarchhome.htm

http://peoplesclimate.org/nonuclearpower

Ten reasons not to nuke the climate

NM792. 4417

#1 − Too many reactors, not enough carbon reductions:

Major studies (from MIT, Commission on Energy Policy, and the International Atomic Energy Agency, for example) agree that about 1,500−2,000 large new reactors would have to be built worldwide for nuclear power to make any meaningful dent in greenhouse emissions (less than 400 reactors now operate globally). If all of these reactors were used to replace coal plants, carbon emissions would drop by about 20% worldwide. If used entirely as new capacity instead of sustainable technologies like wind power, solar power, energy efficiency, etc., carbon emissions actually would increase.

#2 − Too much money:

New reactors cost some US$7−15 billion (€5.5−11.8b) each. Construction of 1,500 new reactors would cost US$10.5−22.5 trillion (€8.3−17.7t). Use of resources of this magnitude would make it impossible to also implement more effective means of addressing global warming. Energy efficiency improvements, for example, are some seven times more effective at reducing greenhouse gases, per dollar spent, than nuclear power.

#3 − Too much time:

Construction of 1,500 new reactors would mean opening a new reactor about once every two weeks, beginning today, for the next 60 years − an impossible schedule and even then too late to achieve necessary carbon reductions. Since reactors take 6−10 years to build (some U.S. reactors that began operation in the 1990s took more than 20 years), a nuclear climate plan is already years behind schedule and would fall farther behind. Addressing the climate crisis cannot wait for nuclear power.

#4 − New reactor designs: too slow, no demand:

Some otherwise knowledgeable climate scientists advocate using new, supposedly safer, reactor designs as a climate solution. These untested designs, such as the IFR (Integral Fast Reactor), PBMR (Pebble Bed Modular Reactor), thorium reactors and others, including 'small modular reactors', won't help either. The designs − all of which have been around for decades − exist only on paper and it would take decades to bring them to commercial operation. The Generation IV International Forum says it will take "at least two or three decades before the deployment of commercial Gen IV systems" ... which is just what the industry was saying two or three decades ago.

Utilities show little interest in developing radically new reactor types. Their costs would be even higher than current reactor designs − one reason utilities aren't interested. Safety-wise, the designs are unproven and would require extensive and time-consuming testing before licensing. Waiting for such reactors to materialize would forestall much faster and cheaper climate solutions.

#5 − Too much waste:

Operation of 1,500 or more new reactors would create the need for a new Yucca Mountain-sized radioactive waste dump somewhere in the world every 3-4 years. Yucca Mountain was under study for nearly 20 years and was dropped by President Obama as a non-viable waste solution. International efforts to site radioactive waste facilities are similarly behind schedule and face substantial public opposition. For this reason, some countries are attempting to increase reprocessing of nuclear fuel as a waste management tool − a dangerous and failed technology that increases proliferation risks.

#6 − Too little safety:

Odds of a major nuclear disaster are said to be on the order of 1 in 10,000 reactor-years, but experience shows accidents occur even more frequently. Operation of some 1,500 reactors could result in a Fukushima-scale nuclear accident every five years − a price the world is not likely to be willing to pay. Over 250,000 people were displaced because of the Chernobyl disaster; over 150,000 people remain displaced because of the Fukushima disaster. With 1,500+ reactors, there would be millions of nuclear refugees at any point in time. And more reactors means more terrorist targets.

#7 − Too much bomb-making material:

Operation of 1,500 or more new reactors would require a dozen or more new uranium enrichment plants. Over a 50-year lifespan, 1,500 reactors would produce over 20,000 tons of plutonium, enough to build over two million nuclear weapons. The Intergovernmental Panel on Climate Change maps out a scenario whereby nuclear capacity would grow nine-fold to 3,300 gigawatts by 2100 and the accumulated plutonium inventory would rise to 50-100 thousand tonnes − enough to build 5−10 million nuclear weapons.

Former US Vice President Al Gore has neatly summed up the problem: "For eight years in the White House, every weapons-proliferation problem we dealt with was connected to a civilian reactor program. And if we ever got to the point where we wanted to use nuclear reactors to back out a lot of coal ... then we'd have to put them in so many places we'd run that proliferation risk right off the reasonability scale."

Running the proliferation risk off the reasonability scale brings us back to climate change − a connection explained by Alan Robock in *The Bulletin of the Atomic Scientists:* "By our calculations, a regional nuclear war ... using less than 0.3% of the current global arsenal would produce climate change unprecedented in recorded human history and global ozone depletion equal in size to the current hole in the ozone, only spread out globally."

#8 − Nukes are not carbon-free:

While atomic reactors themselves are not major emitters of greenhouse gases, the nuclear fuel chain produces significant greenhouse emissions. Besides reactor operation, the chain includes uranium mining, milling, processing, enrichment, fuel fabrication, and long-term radioactive waste storage, all of which are essential components of nuclear power. At each of these steps, transport, construction and operation of nuclear facilities results in greenhouse gas emissions.

Academic Benjamin Sovacool states: "To provide just a rough estimate of how much equivalent carbon dioxide nuclear plants emit over the course of their lifecycle, a 1,000 MW reactor operating at a 90 percent capacity factor will emit the equivalent of 1,427 tons of carbon dioxide every day, or 522,323 metric tons of carbon dioxide every year. Nuclear facilities were responsible for emitting the equivalent of some 183 million metric tons of carbon dioxide in 2005."

Life-cycle greenhouse emissions from nuclear power will increase as relatively high-grade uranium ores are mined out. In 2009, mining consultancy firm CRU Group calculated that the average grade of uranium projects at the feasibility study stage around the world was 35% lower than the grades of operating mines, and that exploration projects had average grades 60% below existing operations.

#9 − Not suited for warming climates:

Unlike solar power, nuclear power does not work well in warming climates. Reactors require vast quantities of water to keep their cores and steam condensers cool; changes in water levels, and even water temperatures, can greatly affect reactor operations. Reactors in the U.S. and elsewhere have been forced to close during heat waves, when they're needed the most. Ever-stronger storms, like Hurricane Sandy, also threaten to inundate both coastal and inland reactors. More frequent and more powerful tornados, ice storms and related loss-of-power accidents, and other indicators of climate change also imperil reactors. The Fukushima accident was caused primarily by loss-of-power, not damage from the earthquake/tsunami. Rising sea levels threaten coastal reactors with flooding even without mega-storms.

#10 − A nuclear-free, carbon-free energy system is safer, cleaner, cheaper and faster at reducing carbon emissions:

Just a few years ago, solar and wind power weren't competitive with either nuclear power or fossil fuels. Now, both are usually cheaper than the polluting power choices. Increasingly, it is both feasible and economical for homeowners to install their own solar power plants on their rooftops. Smart grids, distributed generation and other 21st century technologies enable the large-scale use of renewables despite their intermittent nature. And advances in battery and other electricity storage technologies mean that both rooftop solar and larger-scale renewable power plants increasingly and affordably provide power 24/7. Numerous studies show conclusively that a nuclear-free, carbon-free energy system is both attainable and affordable before mid-century.

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Uranium's dead cat bounce as miners play chicken

Author: *Jim Green − Nuclear Monitor editor*

NM792. 4418 After languishing below US$30 / lb U3O8 through the middle of the year (a nine-year low), the uranium spot price has steadily increased to reach US$36.50 on September 22. Is this the beginning of a sustained upturn, or a dead cat bounce?

The upturn is believed to be driven partly by speculation that sanctions against Russia over its conduct in Ukraine could squeeze supplies − Russia produces only 5% of the world's uranium but is a major provider of enrichment services to many Western utilities. Another factor was a labour dispute at Cameco's McArthur River mine in Saskatchewan, Canada.[1]

In other words, the price increase has been driven by supply-side concerns and speculation instead of increased demand or even speculation regarding increased demand. UBS commodities analyst Daniel Morgan said in early September: "There's been a few supply-side issues which has been enough for a very modest price rise. What the market really needs is a demand-side driver to get the price going and in my view we don't have one at the moment."[2]

Macquarie Group's Stefan Ljubisavljevic predicts a uranium supply surplus for the next five years unless some unprofitable mines close.[1] Raymond James analyst David Sadowski said in May that many utilities around the world "are sitting on near-record piles" of uranium.[11] For example China has stockpiled about eight years' supply (at its current rate of consumption) while it may take Japanese utilities a decade or more before they exhaust existing stockpiles.[12]

The long term price, where most uranium business is conducted, was still languishing at US$44 / lb in late August, a six-year low.[3]

A number of mines have been put into care-and-maintenance over the past year, including Paladin Energy's Kayelekera mine in Malawi, and the Honeymoon mine in South Australia, owned by a Rosatom subsidiary. Many other planned mining projects have been cancelled or deferred or scaled down, and some uranium mining companies are being downgraded. Recent examples include:

- Rio Tinto announced in June that it would cut 265 of the 1,168 jobs at its Rossing mine in Namibia. In 2012, 276 workers at Rossing were fired. Production is to be reduced to just under 2,000 tonnes in 2014, down from 2,409 tonnes in 2013. Rossing Uranium Ltd. Managing Director Werner Duvenhage said: "We have to keep company operating to avoid care and maintenance or complete closure. We are significantly downgrading production targets."[4]
- Areva and the Nigerien government have agreed to delay the start of production at the Imouraren mine. Niger and Areva will create a committee to decide on a timetable for its start-up according to market conditions. Areva CEO Luc Oursel said: "In the current context, neither Areva nor Niger are interested in dumping uranium on the market that would not find a buyer."[5]
- Credit ratings agency Standard & Poor's has put French nuclear power group Areva on "creditwatch negative" and will soon decide whether to downgrade its credit ratings.[6]
- Moody's Investors Service said on September 3 that KazAtomProm, Kazakhstan's state-controlled mining company, might lose its investment-grade credit rating as a result of "weak pricing" and other issues.[7]

Miners playing chicken

Despite the closures and cancelled projects, many uranium mines continue to operate − and to operate at a loss. Macquarie Group estimates that around half the industry could be unprofitable at current prices.[1] Thus global production increased by 7.6% from 2010−2012 and it probably increased in 2013 as well.[8]

Ongoing operation of loss-making mines is regarded as the least-worst option, preferable to putting mines into care-and-maintenance or permanently closing them. Benjamin Sinclair explains: "For one, starting and stopping mines can be expensive, especially with unionized labour. So it may be easier to ride out the downturn, especially if politics are involved. Furthermore, if the long-term outlook for uranium demand is promising, there may be incentive to keep production going. And finally, no one wants to shut down a mine only to see competitors benefit from a price increase – so the industry turns into a game of chicken."[9]

David Sadowski gives these reasons: "The three main reasons for continued global growth of uranium mine production are the persistence of long-term fixed-price sales contracts, the intransigence of government producers who believe that security of supply is more important than mine economics, and byproduct uranium production."[10]

Olympic Dam uranium mine, South Australia, 2012.

OECD/IAEA Red Book

The latest edition of the 'Red Book' − 'Uranium 2014: Resources, Production and Demand' − has been released by the OECD Nuclear Energy Agency and the International Atomic Energy Agency.[8]

According to the Red Book, the world's identified uranium resources increased by more than 7% since 2011, but the majority of the increases have been in categories with higher production costs. Overall resources (reasonably assured and inferred) as of January 2013 are estimated at 5.90 million tonnes of uranium (tU) recoverable at costs of up to $130/kgU.

In the highest cost category (<US$260/kgU or <US$100/lb U3O8), total identified resources increased 7.6% to 7.63 million tU. There has been a significant reduction of 36% in the <USD 80/kgU (or <US$30/lb U3O8) cost category, due to increased mining costs. The lowest cost category (<US$40/kgU or <US$15/lb U3O8) changed little since the 2012 Red Book.

At the 2012 level of uranium requirements, identified resources are sufficient for over 120 years of supply for the global nuclear power fleet.

Global production in 2012 was 58,816 tU and the Red Book projected a small increase to 59,500 tU in 2013.

In-situ leaching accounted for 45% of world production in 2012 and the Red Book estimates 47.5% in 2013. The remaining 55% was produced by underground mining (26%), open-pit mining (20%), co-product and by-product recovery from copper and gold operations (6%), heap leaching (2%), and other methods (1%).

From 2011 to 2013, uranium was produced in 21 different countries, with Kazakhstan, Canada and Australia the largest producers, accounting for 63% of world production. New countries may join existing producers, including Botswana, Tanzania and Zambia.

"Uranium miners have been hit harder by the Fukushima Daiichi accident than any other segment of the nuclear fuel cycle," the Red Book states, and Fukushima "has eroded public confidence in nuclear power in some countries and prospects for growth in nuclear generating capacity are in turn being reduced and subject to even greater uncertainty than usual."

To bring new resource to the market, "producers will have to overcome a number of significant and at times unpredictable issues ... including geopolitical factors, technical challenges and risks at some facilities, the potential development of ever more stringent regulatory requirements and the heightened expectations of governments hosting uranium mining. Sufficiently robust uranium market prices will be needed to support these activities, especially in light of the rising costs of production."

The Red Book projects that world nuclear generating capacity will increase by 7−82% by 2035; similar to the IAEA's most recent projections of 8% and 88% for the year 2030. The lower end of projections such as these tend to be reasonably accurate, in which case growth will be negligible − under 1% annual growth. Moreover, growth will become more difficult to sustain as the world's fleet of mostly middle-aged reactors becomes a fleet of mostly decrepit reactors.

Secondary supply

Mine production met 78% of global uranium demand in 2009 and 2010, and 85% in 2011, with the shortfall met by secondary sources.[13] The Red Book states that production in 2012 amounted to about 95% of world reactor requirements (61,980 tU), with the remainder supplied by secondary sources including excess government and commercial inventories, blending down highly enriched uranium from the dismantling of nuclear warheads, re-enrichment of depleted uranium tails, and spent fuel reprocessing.

With secondary sources playing a diminishing role, the prospects for secondary supply constraints raising demand for mine production and thus raising the uranium price are also diminishing. And in any case secondary supply is "robust" according to David Sadowski.[10]

Uranium industry boosters promised significant price increases following the end of the US−Russia 'Megatons to Megawatts' program in December 2013. That didn't happen. The Red Book states: "Although information on secondary sources is incomplete, the availability of these sources will at least temporarily decline somewhat after 2013 when the agreement between the United States and the Russian Federation to blend down HEU to LEU suitable for nuclear fuel comes to an end. Limited available information indicates that there remains a significant amount of previously mined uranium (including material held by the military), some of which could feasibly be brought to the market in the coming years."

According to David Sadowski: "The end of the Megatons to Megawatts high-enriched uranium (HEU) deal was long anticipated to usher in a new period of higher uranium prices. But the same plants that were used to down-blend those warheads can now be used for underfeeding and tails re-enrichment. In this way, the Russian HEU-derived source of supply that provided about 24 million pounds to the market did not disappear completely; the supply level was just cut roughly in half. Meanwhile, uranium mines, in aggregate, have increased their output − even though prices are now well below average production costs."[10]

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The prospect of uranium mining in Greenland might be over

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NM792. 4419 After dominating much of the political debate and causing dissent and conflict in Greenland for more than two years, the uranium issue has probably been taken off the agenda. Last year, Greenland's uranium ban was lifted mainly to make one project possible, the enormous uranium / rare earths mine at Kuannersuit / Kvanefjeld in southern Greenland. Realistically, it is the only project on the table in the near and mid-term. The newly elected government's plan was to issue a mining permit next year and to have the mine up and running by 2017. But it now appears that the environmental impact assessment will not be completed before 2−3 years from now.

After a turbulent first year, the social democratic Siumut-led government's original four-seat majority in Parliament has shrunk to one. And in August, due to continued internal disputes within the government, a unified opposition called for an early election. The opposition party Inuit Ataqatigiit – a green, leftist party − which in all likelihood will be at the centre of a new government, has repeatedly stated that it intends to have a referendum on the uranium ban and that it expects it to be reinstated.

One of the reasons for the incumbent government's lack of popularity is that it has become clear that its biggest election campaign promise cannot be fulfilled. To the government, mining and particularly uranium mining has long been synonymous with self-sufficiency and quick economic independence from Denmark. But lately a series of scientific studies have disproved that uranium mining or even the entire minerals sector can support Greenland's economy by itself.

The biggest blow to the government's minerals strategy came in January this year, when a study was published by Copenhagen University and University of Greenland, Ilisimatusarfik.[1] The study, which was widely exposed in the media, concluded that 24 concurrent large-scale mining projects would be required to zero out the financial support from Denmark. To achieve this goal within a reasonable timeframe, a new large-scale project would have to be developed and launched every other year and an unrealistically large number of mineral deposits would be required. However, such a resource-based economy is not economically sustainable, the study concluded: when, after some years, the mining industry begins to decline, the country would be left with the same budgetary challenges as before, but with fewer resources. The study estimated that in a best-case scenario, the extraction of hard minerals could begin to meaningfully contribute to Greenland's economy within 5−10 years.

These findings have been confirmed by other reports. For example an analysis by Greenland's Economic Council, published in September, concluded that a natural resource wealth fund modelled on the Norwegian oil fund, scaled down to Greenland's smaller economy, would have to be 5−7 times greater than the amount Norwegians have amassed from the sale of their North Sea oil in order to offset the Danish transfer payments.

Failure of a long lobby campaign

This is all bad news for the lobbyists who have campaigned to introduce uranium mining in Greenland. Once again, it has been demonstrated that the idea was never really accepted by the general public – it was always a project forced through by a small but powerful alliance of industrialists, politicians and civil servants who were willing to set aside all consideration for democracy, civil liberties and good governance.

The lobby campaign started in 2007, when the Australian company Greenland Minerals and Energy Ltd. (GMEL), which is licensed to explore for rare earths at Kuannersuit, announced that it also intended to extract uranium. It has been known for more than half a century that Kuannersuit contains substantial amounts of uranium and thorium. But whereas uranium until this point in time was considered the main deposit, it was now mentioned as an insignificant but inevitable by-product of the rare earths that GMEL wants to extract.

The campaign's second step was when a delegation of politicians and government officials made a study tour to Canada in 2010 to investigate the Canadian uranium mining industry. And it peaked in September last year, when the Greenlandic parliament, Inatsisartut, repealed the country's 25 year old uranium ban with a one-vote majority. The repeal was preceded by two government reports that exonerated uranium mining from any suspicion of negative environmental impacts and concluded that it is possible to safely extract uranium if the minimum nuclear proliferation standards set by the International Atomic Energy Agency are met.

Lowering procedural environmental standards

In June, a new strategy was devised to circumvent the public's growing resentment of the prospect of uranium mining: the government tabled amendments to the Mineral Resources Act to remove the right of public access to documents that constitute the basis for decisions on issuance of mining permits, before they are given, and to repeal access to justice. If adopted, the pillars which according to the Aarhus Convention are essential to good environmental governance will no longer exist in Greenland.

At the same time, a week-long workshop was held in Greenland's capital Nuuk to lay down the groundwork for future legislation on extraction, production and

exportation of uranium. The workshop, which was organised by DIIS, the Danish Institute for International Studies, a government-funded think tank with close ties to the Danish Foreign Ministry, was closed to the public and the identity of the participants kept secret. However, it later emerged that three representatives of GMEL attended – but no stakeholders from civil society. By any standard, it is unheard of that a mining company actively participates in secret preparations for legislative proceedings with such far-reaching consequences as the uranium legislation in Greenland.[2]

Not entirely a bad experience

Considering that all these efforts now seem to have been in vain, a brief review might be appropriate. First and foremost, it is striking how consistently the incumbent Greenlandic government has broken its promises of openness, transparency, neutral information and public participation in developing the minerals sector. To say the least, the political process has been flawed.

No less disappointing has been the role of the Danish government: Through some of its institutions – mainly The Geological Survey of Denmark and Greenland and DIIS, but also others − it actively promoted uranium mining with no regard to its negative health and environmental impacts.

However, the experience has not been all bad: when it mattered the most, Greenland's civil society stepped up and countered the efforts to force through uranium mining at all costs. Last year, an NGO coalition, reflecting a broad spectrum of Greenland's NGO community, was formed as a direct response to the government's attempts to cover up the negative aspects of the various large-scale mining projects in the making. And for the first time ever, Greenlandic and Danish NGOs started a close collaboration to initially keep the uranium ban in effect and when it was lifted, to prevent the Kuannersuit mining project from ever happening.[3]

As a consequence of the failed attempt to introduce uranium mining in Greenland, the NGO community has started to blossom and environmental considerations seems to play a bigger role in shaping public opinion. Luckily, that may be the only lasting result to come out of this pro-uranium lobby campaign.

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Finland's Cabinet rejects one nuclear power project, approves another

Author: *Jim Green − Nuclear Monitor editor*

NM792. 4420 Finland's Cabinet has rejected an application from utility Teollisuuden Voima (TVO) to extend a permit for a new nuclear reactor in the west of the country, finance minister Jan Vapaavuori said on September 25. TVO had requested a five-year extension to the Olkiluoto 4 reactor project. TVO has until 1 July 2015 to submit a construction plan for Olkiluoto 4 to the government, but is unlikely to meet the deadline.[1]

TVO received preliminary approval to proceed with the project in 2010, but had to submit a revised application to the government because of changes in the ownership of TVO and because of changes to the design of the planned reactor.[2]

The Olkiluoto 4 license extension was voted down by the National Coalition Party and two minority partners while the Social Democratic Party split with around half of its ministers voting in favour.

Delays with Olkiluoto 4 project are connected to the lengthy delays associated with the Olkiluoto 3 EPR project. Olkiluoto 3, built by an Areva-Siemens consortium and set to be the country's fifth reactor, is nine years behind schedule and €5.5 billion (US$7.0b) over-budget.

Vapaavuori said: "Owing to uncertainties with the Olkiluoto-3 project it is not possible to reliably evaluate if TVO would be able to proceed with the project all the way through the investment and submission of the construction licence even under a new deadline."[2]

While rejecting the licence extension application from TVO, Finland's Cabinet has accepted changes to the application for a new nuclear power plant at Pyhäjoki in North Ostrobothnia. The application for a 1,200 MW reactor was submitted by Finnish-Russian consortium Fennovoima.[3,4]

Government's ministers voted 10 to seven in favour of the project and the Green League said it would as a result resign from the ruling coalition, which has six months left in the office before a general election in April. The departure of the Green League's 10 MPs will leave the governing coalition with a slim majority of 102 MPs against the opposition's 98.[3,4]

One of the Green League's three stipulations for joining the coalition government had been that no new nuclear power permits would be granted during its four-year legislative term.[5] In 2002, the Green League left the government when the government approved the Olkiluoto 3 reactor.[6]

Cabinet's approval is conditional on Fennovoima boosting Finnish ownership to at least 60%. Currently, Finnish owners have committed to a stake of 52%, while Russia's Rosatom has a stake of 34%. It is not certain that Fennovoima will be able to attract sufficient Finnish investors; many potential investors have pulled out of the project in recent years. Those problems (among others) led Fennovoima to replace its CEO and the head of its Finnish owner (Voimaosakeyhtiö SF) in early September.[7,8]

The upcoming election, and disagreements within the Social Democratic Party over the proposed reactor, could derail Fennovoima's plans.

Fennovoima received preliminary approval to proceed with the project in 2010, but had to submit a revised application to the government because of changes in the ownership of Fennovoima and because the consortium now favours a different design – a Russian 1,200 megawatt AES-2006 pressurised water reactor.[9]

One point of controversy concerns collaboration with Russian state-owned Rosatom at a time when governments are imposing sanctions on Russia. Green League chair and former environment minister Ville Niinistö said: "There is a sense of Finlandisation here. We are giving the Russians the very leverage they are looking for with the west and the EU. This puts us into a very vulnerable position ... Bluntly speaking, it is totally bewildering that the rest of the government thinks this is OK."[10]

Olli Rehn, a senior member of Finland's opposition Centre party and former EU economics commissioner, warned on September 28 that the Fennovoima plan was "economically uncertain and politically crippled" and that "Finland has a history of large industrial policy mistakes that have become politically and economically costly".[11]

Photo from http://olkiluotoblockade2012.wordpress.com

Rehn said the project is inconsistent with calls from the European Parliament to consider freezing nuclear co-operation with Russia, for a reduction of energy reliance on Russia, and a cancellation of any newly-planned energy projects with Russia.

"In line with this, the Finnish government would do wisely to revisit the political and economic sense of the Rosatom deal," Rehn said. "It is also a question of excessive energy dependence. There are other ways to ensure reasonably priced basic energy for the Finnish industry. And we should not crowd out substantial investment in renewable energy sources."

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South Africa's stop-start nuclear power program

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NM792. 4421 South Africa and Russia signed an 'Intergovernmental Agreement on Strategic Partnership and Cooperation in Nuclear Energy and Industry' on September 22. The South African government envisages construction of eight Russian VVER reactors with a total capacity of 9.6 GW.[1,2] Currently, two Areva-supplied reactors at Koeberg generate about 5.3% of the country's electricity.[3]

The agreement also provides for collaboration in other areas, including construction of a research reactor; assistance in the development of nuclear power infrastructure; and training at Russian universities and elsewhere.[1] Rosatom's Director General Mr. Sergey Kirienko said: "Rosatom seeks to create in South Africa a full-scale nuclear cluster of a world leader's level – from the front-end of nuclear fuel cycle up to engineering and power equipment manufacturing. In future this will allow to implement joint nuclear power projects in Africa and third countries."[2]

Zizamele Mbambo, Deputy Director General for Nuclear Energy in South Africa's Department of Energy, said: "We underscore the nuclear programme that is broader and it includes nuclear fuel cycle facilities, nuclear component manufacturing facilities, skills development infrastructure, regulatory infrastructure and of course the nuclear power plants, amongst others," says Mbambo.[4]

A full suite of nuclear fuel cycle facilities and a nuclear export industry for South Africa? Not so fast. The September 22 agreement is not a binding contract for reactors let alone the full suite of nuclear fuel cycle facilities, and it has been greeted with some scepticism in South Africa. The independent IOL newspaper said the agreement was "accompanied by much wheeling out of mirrors and blowing of smoke" and warns that a massive nuclear program "could see the country saddled with a R1 trillion white elephant and the financial headache to go with it".[5]

IOL notes that the agreement violates numerous provisions of the South African government's the Integrated Resource Plan[6] (IRP), updated in late 2013, which puts numerous conditions on any future decision to build new reactors. IOL notes that the nuclear push contradicts IRP specifications regarding economic growth (which has significantly undershot expectations), and the costs of alternative energy sources (the costs of renewables have continued to drop and the government's renewable energy procurement program has been "hugely successful").[5]

According to a 'decision tree' outlined in the IRP, a decision on nuclear power could be deferred until 2018 if progress is made on the planned Grand Inga hydroelectric project. In August, South Africa ratified a treaty with the Democratic Republic of Congo to co-operate on the Grand Inga project. The IRP specifies other conditions that should be met before a decision is taken regarding nuclear power − conditions that are unlikely to be met: net electricity generation of at least 265 terawatt hours in 2014; "no expectation of large-scale gas development"; and nuclear capital costs no greater than US$6,500/kW (€5,100/kW). If those conditions are not met, the IRP states, "then the procurement should be abandoned as the additional cost would suggest an alternative technology instead".[5,6]

The IRP notes that a "persistent and unresolved uncertainty surrounds nuclear capital costs" and further states: "The revised demand projections suggest no new nuclear base-load capacity is required until after 2025 [and for lower demand not until at earliest 2035] and that there are alternative options ... before prematurely committing to a technology that may be redundant."[6,7]

Tom Harris, a research analyst with Frost & Sullivan Africa, notes that in all of the most realistic scenarios outlined in the IRP, "the nuclear option is either discounted completely, suggested to be delayed, or allocated far less than the 9 600 MW of capacity now suggested by our energy minister".[4]

Jumping the gun

While Rosatom is congratulating itself on a 50 billion dollar deal, a South African government source told Reuters that "they jumped the gun": "These kinds of inter-governmental agreements are standard with nuclear vendor countries. We foresee that similar agreements will be signed with other nuclear vendor countries, France, China, Korea, the U.S. and Japan." Xolisa Mabhongo from the South African state agency Nuclear Energy Corporation said there would be a bidding process before any contracts are signed and that other inter-governmental agreements are envisaged.[8]

Neutron Bytes blogger Dan Yurman wrote on September 28: "Where the wheels start to come off in South Africa is that the Treasury Dept told an energy committee in Parliament this week it had no clue about the deal or how the country would pay for it. For its part, the Energy ministry told Parliament it was still working on a [US]$27 billion energy package which, at $6500/Kw, would deliver four reactors. Finally, the ANC, Zuma's home party and source of his political base, told the newspaper it had no idea there was an impending nuclear deal until Rosatom announced it."[9]

A 2013 report commissioned by South Africa's National Planning Commission and produced by University of Cape Town's Energy Research Centre found that "nuclear investments are not necessary [at least in the next 15 to 25 years] nor are they cost effective

based on the latest cost data. Gas options should be explored more intensively and hydro projects from the region should be fast-tracked. Many of the low emission alternatives to nuclear capacity [imported hydro, wind and natural gas] can be installed at lower cost with shorter lead times, in smaller increments, reducing the risk of overbuild." It further stated that the government's plans for nuclear power risk resulting in "surplus, stranded and expensive generation capacity".[7]

The South African *Business Times* newspaper raises concerns about secrecy and impropriety: "There are worrying signs that the South African Nuclear Energy Corporation (Necsa) itself has behaved with impropriety. Earlier this year, it emerged that it had spent R76 000 on a table at an ANC election fundraiser ahead of the general election. Necsa CEO Phumzile Tshelane commented: "Necsa does a cost-benefit analysis and says: 'Can we see the benefit of talking to ministers of trade and industry and energy ... by paying for the table?' So far the nuclear acquisition process has been anything but transparent. There has already been extensive contact − all behind closed doors − between government and potential bidders."[7]

Concerns have been raised about whether secretive negotiations and deals comply with South African law, such as section 217(1) of South Africa's constitution which states that: "When an organ of state in the national, provincial or local sphere of government, or any other institution identified in national legislation, contracts for goods or services, it must do so in accordance with a system which is fair, equitable, transparent, competitive and cost-effective."[10]

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