

NUCLEAR MONITOR

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Editorial

Dear readers of the WISE/NIRS Nuclear Monitor,
We're returning after a mid-year break and will be publishing fortnightly for the rest of the year. In this issue of the Monitor:

- Vladimir Slivyak writes about the Russian government's attacks on environment group Ecodefense;
- Andriy Martynuk writes about some of the nuclear dimensions of the Ukrainian-Russian conflict;
- Hajime Matsukubo from Japan's Citizens' Nuclear Information Center writes about debates over reactor restarts;
- We summarize key findings from the 2014 World Nuclear Industry Status Report;
- Helen Jaccard, Margaret Flowers and Klee Benally from the *Clean Up The Mines!* campaign write about the threat of abandoned uranium mines in the US.

The Nuclear News section has reports on research linking uranium exposure to skin cancer; the uranium industry's latest problems; GE-Hitachi's decision to puts laser uranium enrichment on the slow-track; further delays with US nuclear power projects; legal action initiated by Greenpeace against the Polish 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.

Regards from the editorial team.

Email: monitor@wiseinternational.org



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Russian government repression against Ecodefense

Author: Vladimir Slivyak – Ecodefense co-founder

NM789.4403 On July 21, leading Russian anti-nuclear group Ecodefense was included in the Russian Ministry of Justice's "foreign agent" roster. Ecodefense, one of the oldest environmental groups in Russia, became the first environmental organisation in Russia to be targeted by the "foreign agent" law for successfully resisting the construction of the Baltic Nuclear Power Plant in the Russian enclave of Kaliningrad.

The Russian government also filed a lawsuit against activists which may result in the fine of up to US\$22,000 (€16,500). The first court hearing is to be held on August 25 in Kaliningrad. Further governmental action may lead to Ecodefense being closed down and even a jail term for its director.

Ecodefense's campaign against the Baltic Nuclear Power Plant started in 2007, when information surfaced

that Russian state nuclear corporation Rosatom was looking to build a nuclear power plant in the enclave of Kaliningrad Region to export energy to Russia's European neighbours. Ecodefense succeeded in convincing a number of European banks to deny financing for the construction. Several major energy companies in Europe also declined to invest in Rosatom's project, and no contracts for future electricity have been signed with potential customers. Europe's financial participation could have given Rosatom the needed market entry to sell nuclear power to European grids – but the plan failed, and construction of the plant ceased in June last year. Kaliningrad Region has plenty of energy of its own, and there is no exporting electricity to customers who do not want to buy it from a plant no-one wants to invest money in. Stopping the Baltic nuclear project was a major success for the environmental movement and Ecodefense owes a great debt of gratitude to its partners in Europe, who helped make it happen.

Russia's 'Foreign Agent' law

In 2012, Russia adopted the notorious law that forces to register as "foreign agents" non-governmental organisations that engage in "political activities" and also receive funding from abroad. Since then, no organisation actually engaged in political activity has come to harm from the new law. Rather, trouble started for those who have always distanced themselves from the political process and focused on protecting the rights of Russian citizens.

Having completed its inspection of Ecodefense in early June, the Ministry of Justice asserted in its summary of inspection that Ecodefense is a "foreign agent" by saying that "the organisation has been conducting political activity, including in the interests of foreign [funding] sources." Now, the justice ministry sees Ecodefense's campaign against the Baltic nuclear plant as political, not environmental activity. This, after Fukushima and Chernobyl – two catastrophes that showed to the world what irreparable environmental harm nuclear power can wreak. The accusation appears all the more absurd if one takes into account that opposition to the Baltic nuclear plant is a sentiment shared by a large majority of Kaliningrad residents.

Ecodefense's position

Given the scarce resources, the day-to-day work that the organisation has been created to do is thus effectively finished; what follows is inspections, more inspections, court hearings, and fines. This naturally forces the organisation to stop its activities and close because a non-profit group like Ecodefense does not earn any money. The Ministry of Justice was well aware of this situation.

And yet, this is not the main problem, and not the main reason why the status of a "foreign agent" is unacceptable to the group. Agreeing to be labeled as a "foreign agent" would mean compromising one's moral standards and misleading the public. Ecodefense has always conducted its activities in accordance with decisions made by its board, a council consisting of Russian citizens, and never in the interests of any foreign citizens, organisations, or governments. As a matter of principle, Ecodefense has never in its history participated in politics – elections or any other actions aimed at gaining access to political power. Never has our organisation even agitated for or endorsed any politician, Russian or foreign.

Being designated as a "foreign agent" would harm the reputation we have worked for many years to build and would create a false impression that environmental work is undertaken in the interest of foreign entities when in fact it is undertaken to defend the ecological rights of Russian citizens.

Therefore, Ecodefense will never agree to the "foreign agent" status. We know that Russian courts almost always side with the state, and we do not entertain high hopes for a just decision when we face these charges in court. But some little hope we do hold out – and we will fight to continue our work in Russia. Russia's environmental situation is too severe to abandon this fight.

Support Ecodefense

You can help Ecodefense in these ways:

- Please donate to help us to cover legal costs (we have two lawsuits proceeding presently). Our contact details are listed below.
- Organisations are asked to sign the letter initiated by Friends of the Earth France and WISE Amsterdam – see the box opposite.
- Organisations or individuals can write your own letter. Please mention two most important points – protesting nuclear power is not a crime; and Ecodefense is not anyone's agent, it is an independent organisation campaigning for an environmentally-sustainable and nuclear-free future.

Write to:

Mr. Alexander Konovalov
Minister of Justice of the Russian Federation
14 Zhitnaya Str. Moscow, Russia
Official municipal post-1, 119991

Contact Ecodefense:
ph +7 903 299 7584
e-mail ecodefense@gmail.com
web (in Russian) www.ecodefense.ru

Solidarity Statement for Ecodefense

Organisations willing to endorse the following statement are asked to contact Friends of the Earth France (lucie.pinson@amisdelaterre.org) or WISE Amsterdam (info@wiseinternational.org) as soon as possible.

On July 21st, the Russian government included one the oldest environmental non-governmental organization Ecodefense on the Ministry of Justice “foreign agent” roster. As national and international organizations from many countries, we strongly condemn this decision that criminalizes environmental defenders and supporters of social and environmental justice.

We strongly condemn this decision of the Russian authorities that was taken while proceedings to determine their status have either not yet concluded or even started and that leaves some these organizations without any recourse to contest this labelling.

We are very concerned about the adoption of the “foreign agent” law in November 2012 and the motivations for this adoption as only this environmental organization – Ecodefense – and several more human rights groups are listed in the “foreign agents” roster right now.

While the Russian authorities should protect human rights and support the organizations that help it to do so by bringing human rights violations in Russia to light, this decision illustrates threaten even more democratic rights and leave Russian citizens under the threat of arbitrary choices.

We also particularly condemn the listing of the environmental association Ecodefense for the campaign against Baltic nuclear plant construction near Kaliningrad. Protesting nuclear power cannot be considered as a crime and discussing risks of nuclear is a democratic right. We have been working with Ecodefense for many years and acknowledged the quality of its work as an organization that works independently from any other political power for the people and the environment in Russia and elsewhere.

We urge you to stop repression and let Ecodefense as other environmental and human rights organizations work free in Russia. We called the Russian authorities to reverse their decision to include Ecodefense on the “foreign agent” roster and repeal the November 2012 “foreign agent” law, which brings under threat civil and democratic rights.

Ukrainian-Russian conflict: atomic details

Author: Andriy Martynyuk

NM789.4404 Realizing the truth of Zbigniew Brzezinski's words that "Russia will stop being an empire without Ukraine", Russia is taking shocking steps. These include the annexation of Crimea, comprehensive support for terrorists in the Donbas region, blocking the gas supply into Ukraine from Russia, and many other openly-hostile steps. But, against the background of gas and other conflicts between Russia and Ukraine, the subject of nuclear relations between these states has remained almost out of focus of the media, politicians and citizens. These nuclear relations have a lot of interesting, little-known details.

In 2013, 56% of gas consumed in Ukraine was purchased in Russia. The topic of gas dependence is widely debated at all levels, and Ukraine's objection to paying the price proposed by Russia was the formal reason for the gas supply cut-off by Russia. At the same time, the majority of Ukrainians do not realize that almost 100% of the nuclear fuel in Ukraine comes from Russia – all except the use of Westinghouse fuel on a trial basis in the South Ukraine Nuclear Power Plant. Ukraine pays nearly US\$600 million (€450m) a year for fresh nuclear fuel and also nearly US\$100 million (€75m) a year to send spent nuclear fuel back to Russia.

Against the background of US\$12 billion (€9m) paid by Ukraine for Russian gas in 2013, these figures look negligible. However, they are gigantic in the context of the budget of the state operator of all 15 Ukrainian

nuclear units of Energoatom, National Nuclear Energy Generating Company of Ukraine. Energoatom posted a loss of more than US\$500 million in 2013. The reason for this is that nuclear power plants have been selling electricity for blatantly populist price throughout the entire history of independent Ukraine. In April 2014, the price was increased to US\$0.025 /kWh. (€0.019) This is not enough even for carrying out priority measures to improve safety standards, and the company is forced to take multibillion-dollar loans to fulfill the requirements of the regulator – the State Inspectorate of Nuclear Regulation – as well as to extend the lifespan of the reactors. And no-one even seriously talks about funds for reactor decommissioning and long-term solutions for spent nuclear fuel and other radioactive wastes.

100% dependence on Russian nuclear fuel has long aroused concerns of the Ukrainian political leadership. The responses are as follows. Firstly, spent fuel storage, which has already been built at the Zaporizhia Nuclear Power Station, and the construction of centralized spent fuel storage for the three remaining nuclear power plants in the Chernobyl zone. The official justification for such actions is the reduction of payments to Russia for the storage of spent fuel, and preserving a valuable resource for future generations. Secondly, the signing of the contract with Westinghouse for the research and industrial exploitation of its fuel at the South Ukraine Nuclear Power Plant.

Ukrainian spent fuel storage in Russia is a concern – but it is a concern that is ignored by the Russian media. A spent nuclear fuel processing plant is to be built by 2020–2025 at Zheleznogorsk in the Krasnoyarsk region of Russia. But there is already an accumulation of spent fuel in the same city, raising objections from local authorities. The fact that Russia is not going to keep Ukrainian spent nuclear fuel forever remains little-known – Russia will only process it and then send back it to Ukraine. Ukraine does not even have facilities for handling spent fuel, and it is often just piled in the open air. That is why the lever of pressure on Ukraine will be the possibility of sending some spent nuclear fuel back from Russia, and Ukraine does not have any solution for it.

The contract with Westinghouse has provoked much greater opposition from Russia. In 2009, the Ukrainian edition of the *Mirror of the Week* posted the secret plan which compels cooperation with Russia's Rosatom. Among other things, Russia openly planned (and used) political pressure and economic blackmail to bar the Ukrainian fuel market from using any fuel of non-Russian origin. All Russian-Ukrainian nuclear cooperation plans – plant construction for fuel production, new nuclear units and credits for them, use of Ukrainian uranium – were developed under the harsh conditions of purchasing exclusively Russian fuel.

So far, Russian nuclear lobbyists have confined themselves to high-flown statements.

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The work did not even come down to public safety and economic comparisons of fuel from Rosatom's TVEL fuel company and Westinghouse. The whole rhetoric boils down to charges about the impossibility of using the fuel of other producers in WWER Soviet units, and conversely, the need to diversify fuel supply. Obviously, Rosatom realizes the uncertainty of its own position in the international arena, and does not dare to take any steps in the style of Gazprom such as sharply increasing in the cost of nuclear fuel, limiting fuel supply or refusal to accept spent nuclear fuel from Ukraine. But our current experience shows that such a scenario is quite possible, and it will be implemented if the political leadership of Russia considers it reasonable.

Trying to develop nuclear energy, Ukraine as a state does not act in its own interests. Research by the International Energy Agency suggests that investments in energy efficiency in Ukraine are several times more profitable than the construction of any new generating capacity. Instead, we plan to build new reactors and a plant for uranium fuel production, and we opened a new uranium mine. Since the implementation of such plans is impossible without Russia's participation, it would lead to an increase in our energy dependence. We should immediately start a wide discussion about the real cost of nuclear power and its necessity, as well as introducing an economically-justified tariff on nuclear electricity.

Japan's nuclear power restart debates

Author: Hajime Matsukubo – Citizens' Nuclear Information Center (Japan)

Web: www.cnic.jp, www.cnic.jp/english

Email: matsukubo@cnic.jp

NM789.4405 After the 2011 Fukushima Daiichi nuclear disaster, the importance of separating nuclear regulation and promotion was highlighted. Therefore the Nuclear Regulation Authority (NRA) was established in September 2012 to regulate nuclear activities. In July 2013, the NRA developed new regulatory requirements that included enhancement of nuclear safety such as severe accident countermeasures. And NRA will conduct compatibility evaluations of all nuclear power plants in Japan. Without NRA authorization, nuclear plants cannot restart operation.

Current status of review

In Japan, there are 48 nuclear power reactors. Kansai Electric Power Co.'s Ohi reactors #3 and #4 commenced periodical inspection from September 2013, so all nuclear power plants in Japan are offline now.

As described in the table below, some nuclear plant operators have applied for compatibility evaluation of new regulatory requirements. Further applications will be submitted upon satisfactory completion of compatibility evaluation.

Nuclear Power Plant	Commercial Operation Began (Reactor Years)	Submission date for compatibility evaluation (Y/M/D)	
Hokkaido Electric Power Co.	TOMARI 1 (PWR)	1989 (25)	
	TOMARI 2 (PWR)	1991 (23)	
	TOMARI 3 (PWR)	2009 (5)	
Kansai Electric Power Co.	OHI 3 (PWR)	1991 (23)	
	OHI 4 (PWR)	1993 (21)	
Kansai Electric Power Co.	TAKAHAMA 3 (PWR)	1985 (29)	
	TAKAHAMA 4 (PWR)	1985 (29)	
Shikoku Electric Power Co.	IKATA 3 (PWR)	1994 (20)	2013/7/8
Kyushu Electric Power Co.	SENDAI 1 (PWR)	1984 (30)	2013/7/8
	SENDAI 2 (PWR)	1985 (29)	
Kyushu Electric Power Co.	GENKAI 3 (PWR)	1994 (20)	2013/7/12
	GENKAI 4 (PWR)	1997 (17)	
Tokyo Electric Power Co.	KASHIWAZAKI-KARIWA 6 (ABWR)	1996 (18)	
	KASHIWAZAKI-KARIWA 7 (ABWR)	1997 (17)	2013/9/27
Chugoku Electric Power Co.	SHIMANE 2 (BWR)	1989 (25)	2013/12/25
Tohoku Electric Power Co.	ONAGAWA 2 (BWR)	1995 (19)	2013/12/27
Chubu Electric Power Co.	HAMAOKA 4 (BWR)	1993 (21)	2014/2/14
Japan Atomic Power Co.	TOKAI-DAINI (BWR)	1978 (36)	2014/5/20
TOHOKU Electric Power Co.	HIGASHIDORI 1 (BWR)	2005 (9)	2014/6/10
HOKURIKU Electric Power Co.	SHIKA 2 (ABWR)	2006 (8)	2014/8/12

NRA is prioritizing Pressurized Water Reactors (PWR) because it thinks these reactors are safer than Boiling Water Reactors (BWR). Among the PWR reactors, Kyushu Electric Power Co.'s Sendai reactors #1 and #2 went to the top of the queue of the compatibility evaluation process. NRA released a report on 16 July 2014 stating that Sendai reactors #1 and #2 meet new regulatory requirements. NRA has also opened a report for public comment from the scientific and technical point of view until August 15.

NRA chairman Shunichi Tanaka said at a press conference after the release of a report of NRA's evaluation, "assessment does not guarantee safety at the Sendai nuclear power station, it shows only that the plant matches the new regulatory standards". He also said: "restarting the plant depends solely on a consensus of local residents, municipalities, and other parties concerned". Meanwhile, Prime Minister Shinzo Abe said in response to questions in the Diet in February 2014 that the government will restart nuclear plants whose safety is confirmed by nuclear regulators.

Future situation

NRA's report about the Sendai plant will be given formal approval after the public comment process unless basic defects are found. Even if plant owner Kyushu gets approval, it will need to pass four gateways – NRA's Approval of Construction Plan, NRA's Approval of Operational Safety Program, NRA's Pre-service Inspection, and local governments' approval of restart.

On August 5, Kyushu announced that the submission of the Construction Plan to NRA will be delayed until the end of September. NRA's review process will take some

months, so it will be difficult for Kyushu to restart Sendai reactors #1 and #2 this year.

Kansai Electric Power Co.'s Takahama reactors #3 and #4 were thought to be in second place, but it turned out that some months of construction work are required to bolster tsunami defences. So there is no chance of Takahama reactors restarting this year.

Thirteen reactors face important problems such as active earthquake faults or ageing problems and it will be difficult to restart them – TEPCO's Fukushima Daini reactors #1–4, Japan Atomic Power Co.'s Tokai Daini nuclear power station and Tsuruga reactors #1 and #2, Kansai Electric Power Co.'s Mihama reactors #1–3, Chugoku Electric Power Co.'s Shimane reactor #1, Shikoku Electric Power Co.'s Ikata reactor #1, and Kyushu Electric Power Co.'s Genkai reactor #1.

Kansai Electric Power Co.'s Ohi reactors #3 and #4 also have a significant hurdle to overcome – the Fukui district court ruled against restarting these plants on May 21.

Debate on reactor restarts

As mentioned, NRA has assessed just whether the plant matches the new regulatory standards or not, and it will not guarantee safety of nuclear power plant. But the government said the NRA will evaluate safety. So each body sidesteps their responsibility.

How will the government ensure local residents' radiation protection in the case of severe accident? After the Fukushima disaster, NRA widened the emergency preparedness area from an 8–10 km radius to a 30 km radius around the nuclear power plant. But the NRA will not evaluate evacuation plans. Local governments

have to take primary responsibility for evacuation plans. These evacuation plans do not address Japanese social reality or the complexities of disasters such as tsunamis, earthquakes and nuclear disasters.

New regulatory requirements are based on the Fukushima Daiichi disaster, but there are still a lot of ambiguities about the disaster. New regulatory requirements do not reflect the latest findings about the disaster.

Citizens' attitudes

A local newspaper, *Minami Nippon Shimbun*, held an opinion poll in April about the restart of the Sendai Nuclear Power Station in Kagoshima Prefecture, and found that 59.5% of voters "disagree" or "rather disagree" with reactor restarts, whereas 36.8% of voters "agree" or "rather agree". A nationwide poll by the *Asahi Shimbun* newspaper in July found that 59% of voters "disagree" with reactor restarts, whereas only 23% "agree". These numbers have been consistent since the Fukushima disaster.

Satsuma-Sendai City, the local municipality of Sendai Nuclear Power Station, agrees with its restart but at the adjacent Ichiki-Kushikino City (population: 29,926), more than half of the residents signed a petition against restarting the Sendai reactors. The council of Aira city, located within the 30 km radius of the Sendai Nuclear Power Station, adopted a report against restarting Sendai reactors and calling for them to be decommissioned.

Concluding remarks

It is expected that the NRA will give the approval that Sendai meets new safety standards. But as Chairman Tanaka said, it does not give a guarantee of safety. Evacuation plans, and the safety which is not ensured by the new regulatory standard, are the main battlefields of Sendai Nuclear Power Station. As part of this battle, large meetings will be held at Kagoshima Prefecture on August 31 and September 28.

World Nuclear Industry Status Report 2014

NM789.4406 The World Nuclear Industry Status Report (WNISR) 2014 was released in late July. Here we summarise key findings from the report.

WNISR notes that government, industry and international institutions consider the entire Japanese reactor fleet of 48 units to be operational even though none are generating electricity and some never will again (the Japanese reactor restart program is certain to be partial and protracted). WNISR proposes a new category called Long-Term Outage (LTO) for reactors producing no power in the previous calendar year or in the first half of the current calendar year. Only two Japanese units (Ohi-3 and -4) generated power in 2013 and WNISR classifies 42 reactors in Japan as being in Long Term Outage (LTO). Besides the Japanese reactors, one Indian and one South Korean reactor meet the LTO criteria.

Taking into account reactors in LTO, as of 1 July 2014:

- The number of operational reactors in the world drops by 39 (9%) from 427 in July 2013 to 388 in July 2014 – 50 fewer than at the peak in 2002.
- Total installed capacity peaked in 2010 at 367 GW before declining to the current level of 332.5 GW.

For comparison, as of 1 August the World Nuclear Association lists 435 'operable' reactors with a capacity of 375 GW.

Other figures are gloomy for the nuclear industry whether or not the LTO categorisation is used:

- Annual nuclear electricity generation reached a maximum of 2,660 TWh in 2006 and dropped to 2,359 TWh in 2013 (-11.4%)
- Nuclear power's share of global commercial primary energy production declined from the 2012 low of 4.5%, a level last seen in 1984, to a new low of 4.4%.

- Nuclear's share of global electricity generation fell to 10.8% in 2013, the lowest since the 1980s and well down from the peak of 17.6% in 1996.
- Only one country, the Czech Republic, reached its record nuclear contribution to the national electricity mix in 2013 (and the Czech Republic cancelled plans for two new reactors at the Temelin plant in April 2014).
- The average age of the world's operating nuclear reactors continues to increase and by mid-2014 stood at 28.5 years. More than 170 reactors, 44% of the total, have been operating for 30 years or more; of those, 39 have operated for over 40 years.

Reactor status and nuclear programs:

- In 2013, four reactors started up (three in China, one in India), while one was shut down (in the U.S.). In the first half of 2014, two started up (one each in China and Argentina) and none were closed.
- Delays have occurred in the development of nuclear programs for most of the more advanced potential newcomer countries, including Bangladesh, Jordan, Lithuania, Poland, Saudi Arabia, Turkey, and Vietnam.

Constructions starts and delays:

- 14 countries are currently building nuclear plants. Over the past year, Belarus has been added to the list and Taiwan removed. Of the 14 countries, only Belarus and the United Arab Emirates are building power reactors for the first time.
- In 2013, construction began on 10 reactors – including four reactors at two sites in the US, a first in 35 years. In the first half of 2014, construction began on a second reactor in Belarus and work started on a small 25 MW pilot reactor in Argentina.

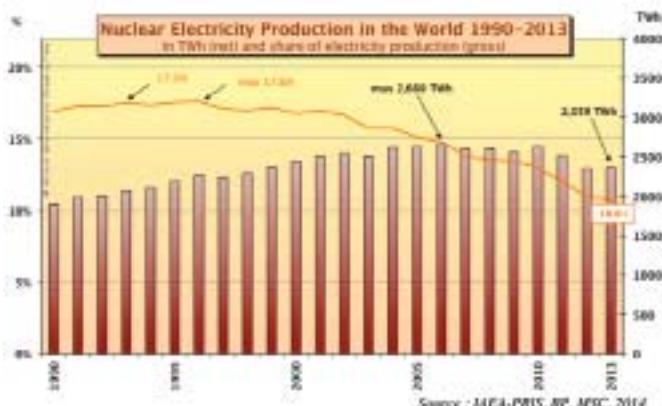
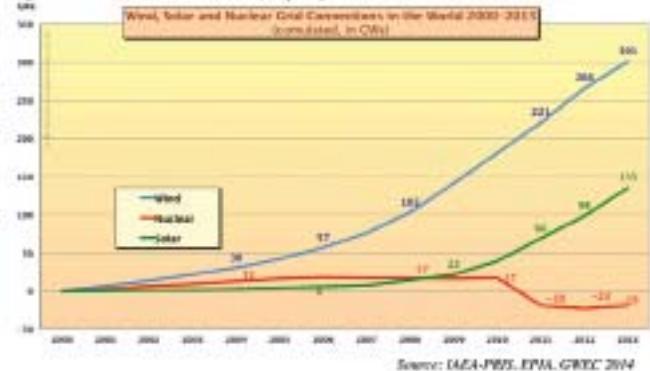


Figure 17: Wind, Solar and Nuclear, Capacity Increases in the World 2000-2013



- As of July 2014, 67 reactors were under construction (one more than in July 2013). Two-thirds (43) of the reactors are located in three countries: China, India and Russia. Of the 67 reactors, at least 49 have encountered construction delays, most of them significant (several months to several years). Eight reactors have been listed as “under construction” for more than 20 years.
- The average construction time of the last 37 reactors that started up in nine countries since 2004 was 10 years with a large range from 3.8 to 36.3 years.
- Several projects have been cancelled and new programs indefinitely delayed, including in the Czech Republic and in Vietnam.

Renewables vs. nuclear:

- In 2013 alone, 32 GW of wind and 37 GW of solar were added to the world power grids.

- By the end of 2013, China had 91 GW of wind power and 18 GW of solar capacity installed, solar exceeding operating nuclear capacity for the first time. China added four times more solar than nuclear capacity in the past year.
- Spain generated more power from wind than from any other source, outpacing nuclear for the first time – it is also the first time that wind has become the largest electricity generating source over an entire year in any country. Spain has thus joined the list of nuclear countries that produce more electricity from new renewables (excluding large hydro) than from nuclear power that includes Brazil, China, Germany, India and Japan.

The World Nuclear Industry Status Report 2014 is posted at www.worldnuclearreport.org

The toxic threat of abandoned uranium mines in the United States

Authors: Helen Jaccard, Dr. Margaret Flowers and Klee Benally – Clean Up The Mines!

Email: cleanupthemines@gmail.com

Web: www.cleanupthemines.org

NM789.4407 The nuclear industry is a many-headed toxic beast – nuclear power and nuclear weapons are just the most visible ones. Mining, milling, processing, reprocessing, manufacturing, and transporting nuclear materials are some other heads of the beast that are less visible. All are desecrating Mother Earth and killing her peoples. It's time to deal with the initial stage of this problem. We can begin by cleaning up the abandoned uranium mines and placing a National Environmental Security Moratorium on all uranium extraction.

Irresponsible corporations and negligent government agencies have abandoned more than 10,000 toxic uranium mines throughout the US. These hazardous mines poison our air, land and water and harm public health. Currently no laws require cleanup of these dangerous sites. A new campaign, *Clean Up The*

Mines!, aims for remediation of these mines through federal legislation and action, and public education.

Abandoned Uranium Mines (AUMs)

The Environmental Protection Agency and US Geological Survey document over 10,000 abandoned uranium mines in the US, most in 15 western states on public, private, and tribal lands. Over 4,200 of these mines produced uranium that was sold to the US Atomic Energy Commission for use in nuclear weapons from the 1940s through the 1970s. Starting in the 1960s, much of the mining was done to provide fuel for nuclear power plants.

There are several AUMs in and near the Grand Canyon, 169 of them within 40 miles of Mt. Rushmore, and eight right on the edge of Grand Teton / Yellowstone National

The *CleanUpTheMines!* team at the Riley Pass mine, South Dakota.



Parks. One in seven (10 million) people in the western US lives within 50 miles of an AUM.

The Mining Act of 1872 governs hard rock mining (including uranium mining) on federal lands. Since enactment 142 years ago, the law has never been substantially modified. It was passed to encourage settlement and development of the western US, and current government interpretation specifies that the highest and best use of federal land is mining.

Seventy-five percent of the AUMs are on federal and tribal land. There is no royalty paid for mining on federal lands and no environmental protection or cleanup requirements. Many of the companies who owned the land or operated the mines no longer exist, others have illegally spun off these toxic 'assets' into now-bankrupt companies. The result? The people must pay the billions or trillions of dollars to restore most of these sites.

There is also no federal set of best practices or standards for cleanup. As a result, most of the EPA-directed cleanup efforts are nothing more than toxic landscaping.

AUM hazards and contamination pathways

Physical hazards of AUMs come from unmarked, unprotected mine entrances, cliffs, falling rocks, and collapsing buildings and equipment. Wind picks up radioactive dust from rock piles and blows it for miles – people breathe fine particles into their lungs, resulting in much higher levels of lung cancer near AUMs. People carry the radioactive dust, dirt, and mud around on their clothes and shoes, spreading the contamination to their homes and families.

One of the decay elements of uranium is radon gas. It seeps up through the ground in many areas around mine sites where people and animals breathe it in. Exposure to radon gas is the second leading cause of lung cancer in the US.

Water picks up radiation in a variety of ways – rain washes radioactive dust from the air and rocks and carries it into streams and rivers. Surface and

underground water dissolve uranium from rock and dust. This is particularly true of uranium that has been exposed to oxygen, which changes it from U^{IV} to U^{VI} , which is more soluble in water. (This is the principle used in 'In Situ Leaching', similar to fracking techniques, the method most commonly used now.) The result is polluted rivers, lakes, and aquifers, with no safe available drinking water for thousands of communities.

Pools and lakes of contaminated water contribute to bringing radioactivity into the food chain. Cattle and wild animals can drink this toxic water, concentrating radiation in their organs which is called bio-accumulation. Plants in areas surrounding AUMs take up the radioactive waste as well. Whether grown for crops or eaten by animals, the radiation continues to bio-accumulate and spread.

On the Spokane Indian Reservation in Eastern Washington State, there are two lakes collecting water from AUMs that are so acidic that if you dip a spoon in, it will melt. Uranium often occurs with other toxic heavy metals, and over time, as contaminated water flows out of the AUM and into a lake, evaporation and replenishment by more contaminated water gives an extreme concentration of toxic and radioactive heavy metals.

The EPA has estimated that mining has polluted 40% of the headwaters of western watersheds.

Public health emergency

People living near AUMs face increased rates of cancer, diabetes, kidney disease, hypertension, thyroid disease, autoimmune diseases such as arthritis and lupus, and birth defects. Because so many of these mines are on or near indigenous lands, the genocide of the Indian peoples continues. In many indigenous communities no safe drinking water is available. The EPA has closed 22 wells on the Navajo Nation due to unsafe levels of radioactivity.

Site visits and investigation in South Dakota

A *CleanUpTheMines!* team visited Mt. Rushmore as part of our Earth Day launch of the campaign. The Geiger

counter measurement at the national monument's main viewing area was 30 microrems per hour, higher than normal because of the 169 AUMs within 50 miles of the monument. Millions of tourists unknowingly face exposure to this toxic threat by breathing radioactive dust and radon gas.

In Riley Pass, one of the largest AUMs in South Dakota, the deadly effect of the mine was apparent. As the group approached the bluff, the tree line ended abruptly at the edge of the mine. Although Riley Pass is designated as a Superfund site, signs of water runoff from the AUM were visible, no barriers or fences prevented people or animals from accessing parts of this hazardous site. This is a site where toxic landscaping was done, leaving very high levels of radioactivity to poison the water and soil of the area.

At the small community of Ludlow, the group measured radioactivity with a Geiger counter at an elementary school playground that was 44 microrems/hour. This is the equivalent of more than 150 Counts Per Minute (CPM), over the 100 CPM threshold, which means it cannot be attributed to background radiation and is not safe. A private abandoned, open-pit uranium mine about 200 meters from the school emits 1170 microrems per hour, more than four times as much as being emitted from the Fukushima nuclear power plant in Japan. This is only one abandoned, open-pit uranium mine in the middle of the US.

Charmaine White Face, a scientist and coordinator of Defenders of the Black Hills, facilitated the campaign launch event. "For the American public to be exposed to radioactive pollution and not be warned by federal and state governments is unconscionable," stated White Face. "Shame on the American federal and state governments for allowing their citizens to be placed in such danger for more than 50 years and not stopping the source of the danger. It is a national travesty." She noted that according to her doctor, thyroid cancer rates are 10 times higher than the national average in western South Dakota. Margaret Flowers, MD, said, "The mines are a silent health threat. Millions of people are at risk of breathing or ingesting radioactive particles that travel through the air and water and settle in soil where they enter our food system."

In every community we visited, we heard that people are dying of cancer and have other serious diseases caused by the radioactive contamination. They are very concerned over the lack of information about AUMs and lack of action to remediate them. Babies are born with severe, multiple birth defects. When we visited Red Shirt Village in southeast South Dakota, we heard from Dennis Yellow Thunder, Natural Resources Technician for the Oglala Sioux Tribe Natural Resources Regulatory Resources Agency. His family, including his daughter, used the water for drinking and bathing. His granddaughter was born with multiple birth defects. "If we don't defend our sacred water it will be the end of us all," he said, "We must support this campaign to clean up the mines. We need to protect this land, our water and the sacred Black Hills. We need to do it from our heart."

The water serving this area is heavily contaminated with 'technologically enhanced' uranium (from mining and milling waste rather than how it occurs naturally in the ground) and even more with thorium, the first element

in decay of uranium. "Without water, nothing can exist", said Charmaine White Face.

In Buffalo, 20 miles from Ludlow, 12 people (out of about 600 living nearby) now have brain tumors. Experts from Mayo Clinic said the only way people get these are from breathing uranium. Copper sulfate is being fed to cattle so that their fur will be brown or black instead of gray from the radiation. Sheep can't live there because their immune systems won't tolerate the radiation. Most ranchers can't afford to move from this toxic area.

Sandra Cuny Buffington, a rancher who resides in Red Shirt community, maintains a herd of cattle in the Bad Lands. She lived at the river until it wasn't possible any more because of contamination. She spoke of high rates of cancer in the area: "We know we are contaminated but where are we going to go? I don't know of any other life than the one that I have lived. As crazy as it sounds, you learn how to live with it."

Abandoned Uranium Mine Cleanup Act

Clean Up the Mines! was established by Defenders of Black Hills and Popular Resistance to pass The Uranium Exploration, Mining Accountability and Moratorium Act (Abandoned Uranium Mine Cleanup Act) of 2014. The Act will:

- maintain a complete inventory of all existing abandoned uranium mining and exploratory sites;
- direct the Environmental Protection Agency to create a new Abandoned Uranium Mines Department, to develop an Action Plan for site-specific reclamation of abandoned uranium mines and exploratory sites;
- place a National Environmental Security moratorium on any processing or approval of new permits for uranium exploration, mining, and in-situ leach operations until the Action Plan is completed;
- institute a program of public education on the dangers of abandoned uranium mines; and
- mandate accountability, enforcement, and public oversight to ensure cleanup of abandoned uranium mines.

From July 21–23, the *Clean Up the Mines!* team visited congressional offices and supporting organizations in Washington, DC. Rep. Grijalva (Democrat, AZ) is supporting the initiative and other members of congress have pledged their support.

You can learn more about the campaign and what you can do to help *Clean Up The Mines!* at www.cleanupthemines.org. Please contact your senators and representatives and encourage them to support the Abandoned Uranium Mine Cleanup Act and to contact Rep. Grijalva's office.

Public education

If you can host an event to educate people about abandoned uranium mines, please contact us at cleanupthemines@gmail.com.

Some of our short videos are available on our youtube channel – here's a web shortcut: tinyurl.com/cleanupthemines

NUCLEAR NEWS

Uranium exposure linked to skin cancer

Northern Arizona University researchers have linked uranium exposure to skin cancer. Biochemistry professor Diane Stearns said her team found that once uranium was present in the skin, exposure to sunlight could be chemically toxic and lead to cancerous lesions. It's a bigger threat for people with Xeroderma Pigmentosum, or XP, a disease that causes extreme sensitivity to sunlight.

"XP is a genetic disease where there are deficiencies in different steps of DNA repair and it makes a person more susceptible to skin cancer," Prof. Stearns said. "There is a sub-population of Navajo who have XP." Many Navajo people have been exposed to uranium from the reservation's abandoned mines.

www.fronterasdesk.org/content/9744/uranium-exposure-linked-skin-cancer

GE-Hitachi puts laser uranium enrichment on the slow-track

GE-Hitachi Global Laser Enrichment LLC (GLE) has announced it will cease funding laser uranium enrichment development projects at Lucas Heights in Sydney, Australia, and put the main project facility near Oak Ridge in Tennessee in "cold storage". Activities at Oak Ridge and Lucas Heights will be consolidated into the Wilmington, North Carolina Test Loop facility. In September 2012, the US Nuclear Regulatory Commission issued a license to GLE to build and operate a laser uranium enrichment plant in North Carolina.

Silex Systems developed the technology and licences it to GLE, a consortium of GE (51%), Hitachi (25%) and Cameco (24%). Silex said the announcement was "unexpected" and GLE had already invested "hundreds of millions of dollars" in the project. Silex said it has been advised that GLE continues to negotiate with the US Department of Energy on the opportunity for enrichment of depleted tails inventories in Paducah, Kentucky.

Silex CEO Michael Goldsworthy said: "The global nuclear industry is still suffering the impacts of the Fukushima event and the shutdown of the entire Japanese nuclear power plant fleet in 2011. Demand for uranium has been slower to recover than expected and enrichment services are in significant oversupply." General Electric's CEO Jeffrey Immelt has been downbeat about the nuclear industry in general, saying in 2012: "It's just hard to justify nuclear, really hard. ... So I think some combination of gas, and either wind or solar ... that's where we see most countries around the world going."

Laser enrichment has long raised proliferation concerns. *The Bulletin of the Atomic Scientists* noted in January 2014 that laser enrichment "promises to provide a route to uranium enrichment that is less expensive and harder-to-constrain than the centrifuge enrichment pursued by Iran and North Korea." A 1999 US State Department assessment conceded that a laser enrichment facility "might be easier to build without detection and could be a more efficient producer of high enriched uranium for a nuclear weapons program."

<http://reneweconomy.com.au/2014/silex-tumbles-after-solar-nuclear-switch-hits-market-roadblock-51041>

<http://asxcomnewspdfs.fairfaxmedia.com.au/2014/07/24/01535857-314409088.pdf>

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

US nuclear power projects delayed

Further delays have been announced for two power reactors under construction in South Carolina. The first of SCANA Corp.'s two new reactors was supposed to start operation in April 2016. The target date was pushed back to early 2017 and SCANA Corp. now says the date could be late 2018 or the first half of 2019 for the first reactor, and one year later for the second reactor.

A sister project at Plant Vogtle in Georgia has also been delayed. Toshiba-Westinghouse AP1000 reactors are under construction at both sites. The first of the Vogtle reactors was supposed to start operating in April 2016, with the second starting a year later. Delays have already pushed those dates to late 2017 and late 2018. The Vogtle project is well over US\$1 billion (€0.75b) over budget and has a large outstanding lawsuit of nearly another US\$1 billion between Southern Company and Westinghouse.

www.dailymail.co.uk/wires/ap/article-2726618/Delays-SC-nuclear-plant-pressure-industry.html
<http://www.cleanenergy.org/delays-and-cost-increases-plague-new-vogtle-nuclear-reactors/>

Greenpeace goes to court on Polish nuclear power program

On August 8, Greenpeace Poland submitted a complaint to the Regional Administrative court in Warsaw concerning the Polish Nuclear Energy Programme (PNEP) that was adopted on 28 January 2014 by the Council of Ministers. Greenpeace Poland alleges that the PNEP was adopted and approved by the Council of Ministers in breach of national and international law.

The most important issues missing in the Strategic Environmental Assessment include:

- No proper and full comparison was made with alternative energy policies, especially policies based on energy efficiency and renewable energy development.
- The PNEP does not take severe accidents into account, because it claims without evidence that no accident could lead to large emissions of radioactive substances.
- The PNEP does not investigate sufficiently how spent nuclear fuel and (other) high-level radioactive waste is to be treated and managed.

By not taking these vital points properly into account, Greenpeace alleges that the government acted in breach with article 6(8) of the Aarhus Convention, article 11(1) of the Kiev Protocol to the Espoo Convention, article 8 of the EU SEA Directive 2001/42/EC and article 42 and 55(1) of the Polish Act on providing information on the environment.

Greenpeace is asking the court to declare the government approval invalid and to order a new Strategic Environmental Assessment with a full public consultation before considering a new policy.

Poland has no power reactors operating or under construction but six are planned according to the World Nuclear Association. On January 28, Poland's Council of Ministers adopted a strategic document describing measures to be taken to introduce nuclear energy. It notes that in the case of Poland, it will be necessary to build almost the entire infrastructure required for the development and operation of a nuclear power program. The location and reactor technology for the first nuclear power plant will be selected by the end of 2016 according to the government's plan. By the end of 2018, all required approvals for the plant's construction should be obtained. The first reactor is set to start up by the end of 2024, with the second reactor starting up by the end of 2030. Completion of a second nuclear power plant is scheduled for 2035.

The full Greenpeace complaint (in Polish) is posted at:
http://greenpeace.org/poland/PageFiles/271319/GreenpeacePL_skarga_na_program_jadrowy.pdf

Greenpeace's Polish energy [r]evolution scenario (in Polish):
www.greenpeace.org/poland/pl/co-robimy/Klimat-i-energia/Rewolucja-energetyczna/

Australia's uranium industry in a hole

Developments in South Australia highlight the uranium industry's ongoing problems. The opening of the state's latest uranium mine – the Beverley Four Mile in-situ leach mine – would normally be accompanied by considerable fanfare. *The Advertiser* – a Murdoch tabloid, and the only mass circulation newspaper in the state – might be expected to parrot industry lies about jobs and export revenue.

But as *The Advertiser* said: "South Australia's newest mine will lose money and won't create any jobs." Part of the problem is that the uranium price is well below the cost of production. And General Atomics has put the nearby Beverley mine into care-and-maintenance and shifted the workforce to Beverley Four Mile – so no jobs have been created. Alliance Resources Ltd. which holds a 25% stake in Beverley Four Mile, is seeking to sell out of the project.

The Honeymoon uranium mining, also in the north-east of South Australia, was equally underwhelming. Just months after first production in 2011, project partner Mitsui announced its decision to withdraw as it "could not foresee sufficient economic return from the project". And last year the mine owner – a subsidiary of Russia's Rosatom – put the mine into care-and-maintenance because it was running at a loss.

Another Murdoch newspaper, *The Australian*, says it may be years before uranium regains its "sexy sector".

In Western Australia, United Uranium, which holds several uranium exploration licences, has decided to get out of uranium exploration and instead focus on property development. The company said its strategic review "underlined a consistent theme, that junior resource companies and in particular uranium focussed companies, are currently 'unloved' by the investment community".

Also in Western Australia, Areva Resources Australia, a subsidiary of the French nuclear giant, has formally withdrawn from the North Canning exploration project because it was not viable. It is believed Areva spent up to A\$5 million (€3.5m, US\$4.66m) on the project. Aboriginal Traditional Owners in the region were opposed to the project and refused to negotiate with Areva.

In June, RBC Capital Markets Analysts cut its 2014 spot price forecast to US\$31.50 a pound, down from US\$45. The 2015 target was cut to US\$40 (from US\$60), and targets for 2016–2018 fell to just US\$40-US\$45 from US\$75-US\$80. RBC believes the uranium market is going to be in surplus until 2021. "Active annual supply exceeds demand by a significant margin, and on top of that, significant excess inventories have been and continue to be accumulated post the Fukushima disaster, particularly in Japan," RBC said, adding that it believes only four Japanese reactors will restart this year, and just 28 (out of 50) will be online by 2018.

WISE/NIRS Nuclear Monitor

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

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

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

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

Subscriptions:

US and Canada based readers should contact NIRS for details on how to receive the Nuclear Monitor (nirsnet@nirs.org).

All others receive the Nuclear Monitor through WISE.

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Contact us via:

WISE International

PO Box 59636, 1040 LC Amsterdam, The Netherlands

Web: www.wiseinternational.org

Email: info@wiseinternational.org

Phone: +31 20 6126368

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