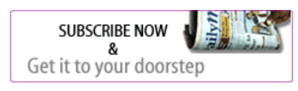

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MAKINGS OF A NUCLEAR NIGHTMARE

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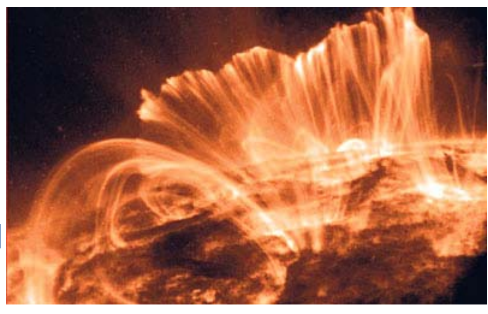

The nuclear industry has been described as “the largest managerial disaster in history.”

The driving force of the ‘nuclear renaissance’ is a claim that nuclear power, once up and running, is a carbon-free energy source. The assertion is that a functioning nuclear reactor creates no greenhouse gases and thus contributes nothing to global warming or chaotic weather. That part is almost true, but the claim ignores the total environmental impact of nuclear energy, which includes a long and complicated chain of events known in the industry as the ‘nuclear cycle’. The cycle begins with finding, mining, milling and enriching uranium, then spans through plant construction and power generation to the reprocessing and eventual storage of nuclear waste, all of which creates tons of CO2.

By Mark Dowie

In 1990 the inland Inuit of Nunavut, a vast autonomous native region of northern Canada, voted almost unanimously to prohibit the prospecting and mining of uranium on their lands. They knew well the hazards of uranium from the experience of the Dine and other neighbouring tribes devastated by previous mining ventures on their homelands. Uranium at the time was about US$7 a pound on the world market. Referendum aside, the calculus of mining, milling and shipping uranium ore almost anywhere in the world at that price was not much better than break- even. So the prospectors in Nunavut packed up and went home. But some things have happened to change their plans. The planet continued to heat up, carbon dioxide became recognised as a global toxin, and burning fossil fuels to make energy offered more evidence of human folly

Before long the sagging, moribund but allegedly CO2 industry of nuclear power was being reconsidered. A “nuclear renaissance” was predicted that would expand the global nuclear production from the current 438 power plants operating in thirty-one countries to over 1,000 by 2025. China and India have each announced plans to build scores of nuclear power plants, the tired old Washington nuclear lobby has been rejuvenated, and there is talk of a “hydrogen bonus” — using new nuclear capacity to produce hydrogen: fuel for a new clean and green economy.

Current world production of uranium is inadequate to the task. In 2004 global production was 46,500 tons of uranium oxide, whereas world consumption was 79,000 tons. The difference was made up with secondary sources: stockpiles, decommissioned weapons and recycled waste. But these are shrinking, so demand is growing for fresh sources of radioactive fuel. When US energy policy went nuclear, about the same time as some large mines flooded in Canada and Australia, hedge fund speculators dived into the market and uranium shot up to US$138 a pound, settling back eventually to about half that price, but still almost ten times the US$7 low. Within weeks of the price jump there were thousands of uranium claims staked around the world, hundreds of them in Nunavut.

One by one, newly formed prospecting companies helicoptered supplies into barren Arctic field-camps across the region, each staffed with geologists, engineers, pilots, cooks and as many Inuit helpers as possible. One camp opened in 2004; six more the following year. There were eight by 2006, and when I arrived in April 2008 there were twenty-eight uranium prospectors drilling the tundra of Nunavut. Huge milling companies from around the world, with names such as Uranor, Areva and Titan, had opened community liaison offices around the territory, all of them promising partnerships and royalties to impoverished Inuit villagers — and jobs. But the unemployment rate in some Nunavut communities is close to 70%.

Aside from the combined intentions of countries like China, Russia, India, Finland and Italy to build hundreds of nuclear power plants over the next two decades, the driving force of the ‘nuclear renaissance’ is a claim that nuclear power, once up and running, is a carbon-free energy source. The assertion is that a functioning nuclear reactor creates no greenhouse gases and thus contributes nothing to global warming or chaotic weather. That part is almost true, but the claim ignores the total environmental impact of nuclear energy, which includes a long and complicated chain of events known in the industry as the ‘nuclear cycle’. The cycle begins with finding, mining, milling and enriching uranium, then spans through plant construction and power generation to the reprocessing and eventual storage of nuclear waste, all of which creates tons of CO2 . At every stage of the cycle greenhouse gases are released into the atmosphere from burning diesel, manufacturing steel and cement and, in the circumpolar regions of the plan et, by disturbance of the tundra which releases huge amounts of methane, a particularly potent greenhouse gas.

Even the claim that a functioning nuclear power facility is CO2 free is challenged by the fact that an operating plant requires an external power source to run itself, and that electricity is almost certain to come from a fossil-fuelled plant. So the frequently repeated notion that nuclear power is a carbon-free energy source is simply untrue. The estimated contribution of atmospheric carbon from the entire nuclear cycle ranges from 5% to 30% of an equal power output from fossil- fuel generation, depending on who you ask and what they’re comparing nuclear with.

Of course the nuclear industry, in its quest to appear pure and carbon-free, contests all such analysis, repeating an industry mantra that the nuclear cycle’s carbon output is “about the same as solar”. The truth almost surely lies some where in between those numbers and depends on how much fossil-fuelled power is used in milling, transportation, refining, construction, reprocessing and storage, and the carbon content of the fuel that is powering

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comparative systems. Either way, it all begins with mining, which, together with milling of uranium (which almost always takes place near a mine) is a substantial CO2 creator.

Every uranium mine has a different carbon footprint, depending on location, ore grade and distribution, depth of veins, and distance from mine to railhead. I asked as many mining experts as I could find in Nunavut what the local carbon output of the large Kiggavik-Sissons deposit might be. No-one was willing to hazard real numbers, but the extraction plan is revealing.

Uranium ore will be mined from an open pit by huge diesel-powered machines and trucks, transported by rail to Churchill, Manitoba, then barged almost 1,000 kilometres to a yet-to- be-constructed port on Baker Lake. From there it will be transported up a seventy-five-mile all-weather road that is also yet to be built. Fuel for the machinery and the mill will be haulled into the site along the same road by diesel-fuelled tanker trucks. All electricity at the mining camp will be provided by diesel-powered generators. The ore will be milled and refined right at the mine site in a facility powered by diesel, and the resultant uranium oxide, known as yellowcake, will be haulled to the Baker Lake port and tug-barged 1,000 kilometres back to the railhead at Churchill. In the winter months, when Hudson Bay is frozen, yellowcake packed in fifty-gallon drums will be flown from a yet-to-be- paved airstrip to Toronto, then trucked to Port Hope, Ontario, where most Canadian uranium is refined and shipped to reactors around the world — never, according to national policy, to weapons facilities.

Incidentally, if perchance one of those barges should overturn in a storm and a ton or so of yellowcake be released into open water, the western shores of Hudson Bay would experience a major degradation to their eco systems that would last for thousands of years. And an inland radionuclide spill could permanently poison the drinking water of caribou and Inuit alike, as it has near so many former uranium mines around the world, over 70% of them on indigenous lands.

A major challenge facing a resurgent nuclear industry is the astronomical and escalating capital cost of nuclear power and the clear negative return on investment. Wall Street investment bankers long ago backed away from underwriting nuclear energy and still won't touch it, nor will venture capitalists anywhere in the world. The US hasn't begun construction on a nuclear power plant for three decades. But a new generation of smaller, faster and allegedly much safer reactors are moving to wards the drawing boards — eleven in nine US states. And there are currently thirty-one more licence applications be fore the United States Nuclear Regulatory Commission.

Former presidential candidate John McCain says the US should emulate France, where almost 80% of the energy is nuclear, and calls for forty-five new nuclear reactors to be built in the US by 2030, with a long-term goal of 100. And although defeated in the recent presidential election, he stubbornly refuses to support any energy bills lacking sufficient subsidies to meet those goals. Barack Obama is not quite so sanguine about nuclear power, but his home town is ringed by eleven generating reactors, and he accepted generous campaign donations from Exelon, a leading nuclear construction firm, also headquartered in Chicago. Obama refuses to "eliminate nuclear power from the table".

Once touted as an energy source "too cheap to meter", nuclear power became, according to The Economist, "too costly to matter". In 1985, Forbes, America's most conservative business magazine, described the nuclear industry as "the largest managerial disaster in history". That's not the sort of publicity any industry needs in financial centres like London or New York where investors are trying to make, not lose money. Without finance capital, the entire global nuclear industry has become reliant on government support: in some countries, such as France and China, for the entire nuclear programme; in less socialist countries, such as the US, in the form of generous subsidies, loan guarantees and tax incentives to for-profit companies including Westinghouse, Bechtel, Exelon, Entergy and The Shaw Group, along with direct government investment in research and development, insurance and fuel processing.

The American nuclear industry, which now supplies about 20% of US electrical energy, has already received over US$145 billion in direct and in direct subsidies. That number will look small if the US government commits itself to a full nuclear renaissance, as the cost of nuclear construction, in constant dollars, is now three times what it was in 2001 when The Economist declared it too costly to matter. And that's a conservative estimate. An Are- va-designed Evolutionary Power Reactor (the current rage) sells for US$3—4 billion, twice the price of a coal plant producing the same kilowatts. But throw in construction costs, delays, over-runs and interest, and we're looking at something closer to US$8—9 billion per plant.

Whatever the cost of an individual plant, a nuclear revival simply cannot happen, anywhere in the world, with out massive government support. The nuclear industry does not deny the subsidies, or claim that it could survive without them. Its argument is that al most everything worthwhile in a complex economy, including wind and solar power, and now banking and finance, need to be subsidised somehow.

Before I left the barren, windswept reaches of the far north, I visited Sheila Watt-Cloutier, former President of the Inuit Circumpolar Conference, a multinational council representing the 150,000 Inuit living in Alaska, Canada, Russia and Greenland. She was a nominee for the Nobel Prize in 2007. Her modest Iqaluit home is perched on the shoreline of Frobisher Bay, which was still frozen solid in May. As we chatted about Inuit culture and circumpolar politics. I watched Inaluit hunters and fishermen heading down the sparkling sunlit Frobisher ice field in dog sleds and snowmobiles. One was driven by her son-in-law, Qajaac Ellsworth, who was taking her only grandson on his first hunt, a vital rite of passage in any native community. Watt-Cloutier beamed with pride, but she was apprehensive about the future of Inuit culture, as technology and industry offer their alluring enticements. She is opposed to neither, but is concerned about the speed of their approach, as her people experience the jarring transition, shared by so many Indigenous people around the world, from a traditional land- based hunting culture to a modern wage-based economy.

She is reluctant at first to speak out against uranium, even though the Inuit Circumpolar Conference still advocates a "nuclear-free Arctic". Later in the after noon she relents and agrees to discuss, ever so cautiously, what is clearly a sensitive topic in Nunavut. "Mining", she believes, "is the easy way out. And we're moving too quickly to embrace it. It could run counter to everything we are trying to do to recover our culture. We need to step back and ask ourselves what kind of society we are trying to create here. Will we lose awareness of how sacred the land is, and our connection to it? Do we abandon or rebuild institutions we have relied on for generations? Or are we just going to allow ourselves to become dependent on new industries, substances and systems?" She pauses for a moment to watch the hunters head down Frobisher Bay, and then turns back for one last question: "Do we want to lose the wise culture we have relied on for generations?"

The answers to these questions are of vital consequence, not just to the Inuit but to the whole world. Even if the expansion of the US and European nuclear industries is delayed by economic troubles at home, that won't likely stop China, India and other developing nations from expanding their nuclear programmes. No matter what form it takes, one thing seems clear: if the nuclear renaissance is going to happen, uranium mining is going to expand, and indigenous people like the Inuit of Nunavut will bear a considerable pro portion of its ill effects.

-Courtesy "Resurgence" magazine

(Mark Dowie is an investigative historian living in Point Reyes Station, California.)

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