

Weather Whys
April 11, 2010
Nuclear Far from Green

Mild winters, early springs and extended autumns probably seem like great news for most Canadians. Polls about climate change suggest most Canadians see these trends as part of a larger picture – a package with warmer seasons but more weather extremes.

If only we - individuals, corporations and nations – could decide on ways to limit greenhouse gases and stabilize a climate system while it is still possible. How much time is there to do this? According to some qualified people, this is 10 years or less.

Chances are good that you will talk with someone in the coming months who will present nuclear power as a solution to climate change.

You are probably not sitting next to scientist James Lovelock, author of books about Gaia, but this famous environmentalist rates a mention. He says “We have no time to experiment with visionary energy sources. Civilisation is in imminent danger and has to use nuclear—the one safe, available, energy source—now or suffer the pain soon to be inflicted by our outraged planet.”

He continues, "Billions of us will die and the few breeding pairs of people that survive will be in the Arctic where the climate remains tolerable". Average global temperature increases of 5 to 8°C will leave much of the world uninhabitable and unsuitable for farming.

It is true that nuclear reactors do not emit carbon dioxide and leaks of toxins into the atmosphere and water are rare events. However, the nuclear fuel cycle is complex. Each stage; mining, smelting of ore, refining, fabrication of fuel rods and other components are fossil-fuel intensive. In Canada, mining takes place in Saskatchewan; most other processes take place in a series of places in southern Ontario and eastern Canada. Transportation of materials between all these steps requires carbon-emitting vehicles. Retubing, other major maintenance and final decommissioning (disposal) of reactors and fuel waste disposal are, or will be, also major contributors of greenhouse gases.

A nuclear renaissance?

A few countries, mainly Russia, China and India are presently building reactors. The stated goals of reduced use of coal and energy self-sufficiency seem plausible. These countries also have nuclear-weapons which have been closely linked to their reactor use and internal instability and friction with neighbouring countries, but I digress.

The United States has announced plans for new reactors but debate about liability of tax papers for cost overruns and nuclear accidents has stalled construction. The government of Ontario asked for bids but balked at the price tag - \$13 billion per reactor. Four nuclear reactors have been proposed for northern Alberta, Bruce Power, the proponent, has been accused of “low-balling” estimates.

No new reactors have been started in North America in 30 years. Claims of new efficiency and reduced greenhouse gas continue to prompt interest. It is a similar story in Europe. This is where we find what was a beacon of the nuclear renaissance for “western” countries.

Olkiluoto, Finland

In 2000, the Finnish parliament approved with a slim majority construction of a reactor on an island in the Finnish west coast. The modular design was supposed to be safer than previous reactors and would be faster and cheaper to build. It would provide electricity for domestic needs and export and help Finland meet its greenhouse gas targets under the Kyoto climate treaty.

Construction began in 2004 with commissioning set for May 2009. Events have not gone as planned.

After five years of construction the reactor's 3 billion Euro price tag has climbed to nearly 5 billion Euro (about \$7.7 billion Canadian). The project is now estimated to be completed in later 2012 or 2013.

Thousands of defects and deficiencies (New York Times, May 28, 2009) have slowed progress. These include too porous concrete base for the reactor building and brittle steel prone to corrosion according to Nuclear Safety Authority of Finland. French and British nuclear agencies also express concerns.

Helsingin Sanomat (June 16, 2009), a Finnish financial publication, offers some insights into the vast resources used in the course of the project:

- 250,000 cubic metres of concrete equals ten Helsinki Parliament Buildings
- 52,000 tonnes of steel equals more than 480 kilometres of railway tracks.

The troubled project reveals much, including a climate change time reality. Approval to completion of the Olkiluoto has already taken 10 years. Use of concrete and steel has introduced a spike of carbon dioxide, not a reduction.

The cost over-runs and time delays are reminiscent of Darlington, Ontario's last experiment with the tail end of an earlier nuclear renaissance. This project was nearly \$30 billion (current dollars) over budget and five years late.

Dr. Gordon Edwards, a long-time critic of nuclear energy, has recently returned from Finland. He will be speaking at a public presentation organised by Environment North. He and photographer Robert Del Tredici will present "Ontario's Nuclear Legacy" and will include a discussion of nuclear waste – the Northwest is a potential location. The presentation includes a photo display "Illuminating the Nuclear Enterprise". The talk takes place on April 16 at 7:30 p.m. at Lakehead University (see www.environmentnorth.ca for details).

If you have comments, suggestions or questions please contact me at weatherw@tbaytel.net