

## THE CANADIAN NUCLEAR LESSON

### Why the Kyoto Protocol should not subsidize the dying international nuclear industry

*Canada's support for nuclear power in the Kyoto Protocol is hardly surprising. The Canadian nuclear industry desperately needs additional subsidies because of grave problems with its domestic and export programs.*

*Yet Canada's disastrous experience demonstrates that nuclear power is not sustainable, and not the solution to climate change. Allowing credits for nuclear power would encourage nuclear weapons proliferation and nuclear waste, and discourage the real energy solutions to climate change: renewable technology and efficiency programs.*

*Nuclear power must be made ineligible for the Kyoto Protocol at the Bonn climate negotiations in July 2001.*

#### Introduction

At the COP6 climate negotiations in November 2000, an overwhelming majority of Parties to the Climate Convention agreed that the sale of nuclear power plants from industrialized countries to developing countries should not be allowed to generate carbon credits under the Clean Development Mechanism (CDM). This was the intent of a compromise proposed by COP6 President Jan Pronk at the end of the conference that read “*Annex I Parties [developed countries] will declare that they will refrain from using*

*nuclear facilities for generating certified emission reductions [CERs] under the CDM.”*<sup>1</sup>.

Even Canada apparently accepted this in the final hours of the COP6 meeting in Den Haag. While the language was not the explicit exclusion many wanted and did not include Joint Implementation<sup>2</sup>, it would have prevented Annex I Parties like Canada using the Kyoto Protocol to subsidize its reactor sales in developing countries. It was thus a serious blow to the nuclear industry and its supporters.

However, the collapse of the climate conference in Den Haag in November 2000, meant that the position on nuclear power was not formally adopted, and a decision will not be made until COP6.5 at Bonn, July 16-27 2001. Some countries who grudgingly accepted the nuclear language are now seeking have it deleted or neutered. Canada is at the forefront of this pro-nuclear minority, and has proposed changing the nuclear language to read,

*“Annex I Parties will not use nuclear facilities for generating certified emissions reductions under the CDM unless the highest safety standards have been satisfied, both in the host and investing country”*.<sup>3</sup>

<sup>1</sup> The revised April 9, 2001 version reads: “Annex I Parties to refrain from using nuclear facilities for generating CERs”  
[www.unfccc.org/sessions/cop6\\_2/unfccc\\_np.pdf](http://www.unfccc.org/sessions/cop6_2/unfccc_np.pdf)

<sup>2</sup> The April 9, 2001 proposal by Pronk now also includes the following statement under Joint Implementation: “Annex I Parties to refrain from using nuclear facilities for generating ERUs [Emission Reduction Units]”.

<sup>3</sup> *Views from Parties: Note by the secretariat*, UNFCCC, March 7, 2001, p. 39.  
[www.unfccc.int/resource/docs/cop6secpart/misc01.pdf](http://www.unfccc.int/resource/docs/cop6secpart/misc01.pdf)

Since Canada and its potential nuclear clients would themselves determine safety standards, this proposal is meaningless. Canada is also seeking to have nuclear power made eligible for Joint Implementation (JI) projects, and has expressed interest in Hungary and Romania. JI refers to projects between developed countries and Eastern European countries (referred to as “Economies in Transition”). These proposals must be rejected by Parties to the Kyoto Protocol.

Canada's position is cynically self-interested -- a desperate attempt to save its state-supported nuclear industry, which has experienced severe problems at home and in the export market. In Canada, eight of the country's 22 reactors have been shut down for extended periods due to performance and safety problems. Because of high cost and poor performance, no Canadian utility has ordered a reactor since 1974. Likewise, exports of Canadian CANDU reactors have collapsed, with only two reactors sold since 1992, and there are no sales prospects for the foreseeable future.

This crisis in the Canadian nuclear industry is the driving force behind Canada's push to allow carbon credits for nuclear power in the CDM and JI. After wasting billions of Canadian tax dollars on its CANDU nuclear program, Canada now wants to use the Kyoto Protocol as a new subsidy.

### **Canada's Nuclear Industry -- Fifty Years of Failure**

History shows that there have been no real benefits from nuclear power in Canada. This is a compelling argument for excluding nuclear power from the Kyoto Protocol.

**Economics:** There are currently 22 reactors operating in Canada, with eight of these in long-term shutdown. Nuclear power generated only 12% of Canada's electricity in 1998, and this has come at a very high cost. The total subsidies (1952-2000) for Canada's state-owned nuclear company, Atomic Energy of Canada Limited (AECL) were \$16.6 billion (\$Cdn 2000)<sup>4</sup>. This does not count hidden subsidies such as federal nuclear liability protection, tax breaks, and provincial debt guarantees for nuclear utilities.

At the time of its dissolution in 1999, Ontario Hydro left a massive debt of \$38 billion -- most of it from nuclear power. In order to allow Ontario Hydro's successor companies to remain viable in a competitive market, they were relieved of \$22 billion of this nuclear debt (known as “stranded debt”). Ontario Power Generation (Ontario Hydro's successor on the generating side) is owner of 20 of Canada's 22 power reactors. It has estimated its decommissioning and radioactive waste liability at about \$20 billion (Cdn) - a figure that will undoubtedly rise in coming decades.

Canada's CANDU reactor export program has also fared poorly. Only 11 reactors have been sold since the early 1960s. In 1995, AECL announced that it would sell “ten reactors in ten years”. Since that time only two reactors have been sold to China, and attempts to sell more reactors to Turkey, South Korea, and China have failed. The company admits that it has no sales prospects in the foreseeable future.

---

<sup>4</sup> “Financial Meltdown: Federal Nuclear Subsidies to AECL” November 2000  
<http://www.cnp.ca/issues/nuclear-subsidies-2000.pdf>

**Safety:** An unsafe technology is not sustainable. Here are a few of the devastating accidents that have plagued Canadian CANDU reactors:

- In 1983, a pressure tube in Pickering Reactor #2 ruptured, dumping coolant into the reactor building. This accident resulted in the retubing of all four reactors at the Pickering "A" Nuclear Station, at a cost of about \$1 billion (Cdn) -- more than the original cost of the station.
- In August 1992, a tube-break in Pickering Reactor #1 dumped 2,000 litres of heavy water contaminated with 2,300 trillion becquerels of radioactive tritium into Lake Ontario. It was the largest tritium release in CANDU history, shutting down a nearby drinking water plant, and raising tritium levels in Toronto drinking water. Tritium causes cancer and birth defects.
- In December 1994, Pickering reactor #2 had a major Loss of Coolant Accident (LOCA) spilling 185 tonnes of heavy water. The Emergency Core Cooling System (ECCS) was used for the first time ever at a CANDU reactor to prevent a meltdown.
- In May 1995, a valve failure caused a 25 tonne leak of radioactive heavy water at Bruce Reactor #5. This accident involved the same equipment which caused the December 1994 LOCA at Pickering reactor #2.
- In February 1996, 500 tonnes of water spilled from the Pickering #6 reactor. Primary and backup heat sinks were lost in the reactor core. A 30 kg. valve component blew two metres into the air, narrowly missing a worker, and service water shot up to the reactor building dome.

- In April 1996, Pickering reactor #4 had a heavy water leak that released 50 trillion becquerels of tritium into Lake Ontario. The level of tritium in local drinking water reached 100 times background level.

**Radioactive waste:** Canadian reactors produced about 35,000 tonnes of high level radioactive waste (spent fuel) by the end of 2000. Despite a ten year study, and the expenditure of \$700 million for research, a national environmental assessment in 1998 failed to support the nuclear industry's proposal for deep-rock storage of radioactive waste. The waste will be hazardous for hundreds of thousands of years.

**Proliferation:** Canadian reactors exports have led to nuclear weapons proliferation. By giving the CIRUS reactor to India in 1956, Canada allowed India to manufacture the plutonium for its first nuclear bomb, exploded in 1974. The Canadian government ignored indications that Turkey might use CANDU technology for nuclear weapons, and continued trying to sell two reactors (unsuccessfully as it turned out).

India and Pakistan conducted nuclear weapons tests in 1998. They refuse to sign the Nuclear Non-Proliferation Treaty or the Comprehensive Test Ban Treaty. They operate unsafeguarded nuclear facilities, have active nuclear weapons programs, and are subject to international restrictions on nuclear trade (to which Canada is a party). Despite these facts, Canada has continued to allow nuclear technical exchanges with India and Pakistan, and has spearheaded a campaign with them to allow carbon credits for nuclear power under the CDM, thus making the Kyoto Protocol a driver for nuclear weapons proliferation.

### **Undermining domestic action**

The inclusion of nuclear power in the Kyoto mechanisms would undermine domestic action on reduction of greenhouse gases. Canada committed to a 6% reduction from its 1990 emission level for the period 2008-2012. The Canadian nuclear industry estimates that nuclear exports could account for 37% of the expected gap of 280 MT CO<sub>2</sub> in 2020. This would turn the Kyoto Protocol into a nuclear subsidy, not a means of reducing emissions in industrialised countries.

### **Conclusion**

The Canadian experience helps us to understand why the Kyoto Protocol should not be used to prop up the failing international nuclear industry. Nuclear power is prohibitively expensive and unreliable, as well as having serious environmental and safety problems. Allowing carbon credits for nuclear power would subvert the intent of the Protocol to promote the truly sustainable energy technologies which can provide the real solutions to climate change.

The Flexibility Mechanisms should be restricted to cheaper, cleaner, and safer alternatives, such as efficiency programs and renewable energy technologies. They should not be used to subsidize the failing nuclear industry of Canada, or any other country.

**Nuclear power must be made ineligible for the Clean Development Mechanism and Joint Implementation at the Bonn climate negotiations in July 2001.**

*Dave Martin, Sierra Club of Canada  
Ben Pearson, Greenpeace International  
June 2001*

#### **For further information:**

Dave Martin,  
Nuclear Campaign  
Sierra Club of Canada  
Ph. + 1 905 852 0571  
nuaware@web.ca

Ben Pearson  
Nuclear Campaign  
Greenpeace International  
mobile: 62 811 80 6599  
ben.pearson@dialb.greenpeace.org  
(attending COP6.5)