

## The Future of Nuclear Energy in Canada

ANASTASIA MAMAY\*

**LT** Canada; Environmental policy; Nuclear power; Ontario; Privatised industries; Project finance; Radioactive waste

According to the 2008 federal budget which was tabled on February 26 (the Budget), investing in nuclear energy is now part of Canada's ecoACTION plan, designed to ensure "a cleaner and healthier environment". There are a number of stated reasons for increased interest in nuclear energy by the Canadian government, including growing demand for energy worldwide, rising fossil fuel prices and concerns over global warming. Still, the future of nuclear power in Canada is far from settled. Though nuclear energy is an attractive alternative to fossil fuels, several challenges remain in the development of the nuclear sector in Canada.

Canada has traditionally been an important player on the world nuclear market, producing a third of the world's uranium—mainly in Saskatchewan.

Canada also offers financing options for both exploration and production stage mining companies, including those specializing in uranium. As of December 31, 2007 TSX and TSX-V mining financings reached \$19 billion combined, with 1,373 companies listed on these two exchanges.

Further, Canada is a recognised leader in nuclear technology, such as the CANDU reactor. The CANDU technology is used by all nuclear power stations in Canada. It was developed by the Crown-owned Atomic Energy Canada Ltd (AECL) and has been used by Canadian nuclear plants for over 40 years. The Budget contemplates investing \$300 million to support nuclear energy, including the development of a next-generation Advanced CANDU reactor designed by the AECL.

A renewed focus on nuclear energy is part of the Canadian government's overall strategy to tackle emissions and global warming. Nuclear energy

remains a controversial part of Canada's energy agenda, as discussed below. However, a shift in the federal government's position on this matter is apparent when comparing its budgets for 2007 and 2008. Nuclear energy was not part of the federal government's cleaner energy strategy in the 2007 budget.

Interestingly, in 2000 the Liberal Government suggested that its international sales of CANDUs may entitle it to Kyoto credits. The proposal was met with skepticism, not only because the Kyoto Protocol does not recognize credits generated from nuclear activities, but also due to controversies surrounding nuclear as a source of energy, as discussed below. The United Kingdom was one of the states not welcoming Canada's proposal. The UK Government seems to be becoming more supportive of nuclear power, however, as in January of this year it approved construction of new reactors by private firms. This step is seen by many as the UK Government's attempt to not only satisfy the country's growing energy demand, but also to attempt to meet its climate change obligations.

As in other jurisdictions, the building of new nuclear capacity in Canada is a controversial initiative. On the one hand, nuclear energy is recognised by many as a viable alternative to coal and other fossil fuels. One of the reasons for this is that nuclear plants do not contribute to climate change in the same manner as fossil fuels. Among other advantages of nuclear plants are low operational costs and large generation capacity.

Counter-arguments are well known. As emphasised by the Ontario Public Health Association in its report "Beyond Coal: Power, Public Health and the Environment",<sup>1</sup> although:

"... nuclear energy does not contribute to smog or climate change, it presents other health, safety and security issues for workers, the public and the environment."

These risks are present at each stage of the production cycle. The arguments concerning broader environmental implications of nuclear power illustrate the fact that a "climate-friendly" energy solution may not necessarily be an "environmentally-friendly" solution.

One major environmental concern in connection with nuclear power is the problem of storing, transporting and managing toxic nuclear waste. In Canada, strategies on how to deal with nuclear waste are still under study. The Nuclear Waste Management Organization (NWMO) was established in 2002 to recommend a long-term approach for managing used nuclear fuel produced by Canada's electricity generators. Its work led to a set of recommendations entitled "Adaptive Phased Management"<sup>2</sup> that are proposed to:

"... safeguard the public in a way that is sustainable, ethically and socially acceptable, and respectful of the environment now and in the future."

\* Anastasia Mamay is a Russian-qualified lawyer and a foreign legal consultant with the Mining, Energy and Emissions Trading and Climate Change practice groups at McMillan Binch Mendelsohn LLP. The author would like to thank Barbara Hendrickson, a partner at McMillan Binch Mendelsohn LLP for her support on this article.

1 Kim Perrotta, *Beyond Coal: Power, Public Health and the Environment*, (Ontario Public Health Association: November 2002); see <http://www.opha.on.ca/resources/coal.pdf> [Accessed March 31, 2008].

2 See <http://www.nwmo.ca/default.aspx?DN=1612,1554,1>, *Documents* [Accessed March 31, 2008].

The Adaptive Phased Management involves:

“... centralized containment and isolation of used nuclear fuel in a deep repository with the option of an interim shallow- underground storage facility at the site.”

It also provides for perpetual monitoring and long-term management of the nuclear waste.

On June 14, 2007, the federal government approved Adaptive Phased Management in principle. The NWMO has been charged with implementing the recommendations. As part of this process, the NWMO will be organising multi-party dialogues in the nuclear provinces of Ontario, New Brunswick, Quebec and Saskatchewan. The first set of dialogues is expected to take place early in 2008.

In addition to environmental issues, there are economic objections to building new nuclear capacity in Canada. Among these are the very high capital costs in constructing nuclear plants, frequent project delays and cost overruns.

For Ontario, which generates the majority of Canada's nuclear power, the use of this form of power has been primarily driven by increasing concerns over shortages in energy supply and, some predict, a coming electricity supply crisis in the province.

Nuclear power is expected to play an important role in Ontario's electricity production for the foreseeable future: according to the provincial government, at least through 2025. With nuclear power as a key component of the province's energy strategy, the government needs to upgrade its aging nuclear power plants and procure better and safer technologies. In October 2005, the Ontario Power Authority entered into a \$4.25 billion agreement with Bruce Power, Ontario's only private nuclear power plant operator, to restart Units 1 and 2 (and refurbish Unit 3 and Unit 4) of the "Bruce A" generating station. In August 2007, the refurbishment agreement was expanded to include work to extend Bruce A's Unit 4 operational life to 2036, with added capital investment of \$1 billion. It is expected that the refurbishment will add an additional capacity of 750MW.

The Ontario Government is faced with the complicated task of addressing various concerns associated with building new nuclear capacity (discussed above), on the one hand, and securing coal-free electricity supplies in the province, on the other. Ontario continues

to evaluate nuclear technologies for new Ontario reactors. The AECL has worked hard to convince Ontario to purchase Canadian CANDUs. The AECL has acknowledged that it is important to secure a contract for CANDUs with Ontario in order for it to compete with France's Areva SA. While the Ontario Government appears to favour the Canadian technology, it has also stated that "the best technology at the best price" will ultimately be used.

In the past, the AECL was itself subject to controversy, including internal management issues and a difficult relationship with its regulator, the Canadian Nuclear Safety Commission (CNSC). In December 2007, the AECL was ordered by the CNSC to shut down its reactor at Chalk River over safety concerns. The shutdown caused major disruptions with domestic and international supplies of medical isotopes supplied by Canada worldwide. The Parliament of Canada overrode the regulator and expedited the restarting of the reactor. The President of the CNSC was dismissed by the government shortly thereafter.

These recent events concerning AECL management, and its regulator, could interfere with the federal government's plans to privatise or sell a substantial interest in the AECL. Often named as potential buyers of AECL are General Electric Co and France's Areva. It has been suggested that the most likely model for the future of the AECL would be a public-private partnership, under which the government would retain an interest.

A step to improve the commercial attractiveness of the AECL was taken on February 22, when the interim President of the AECL, Michael Binder, reinstated the practice of "pre-licensing" for new reactors. This step will expedite the reactor approval process.

Canada's nuclear landscape is changing. The Budget and other recent developments discussed above appear to signal greater enthusiasm (or at least acceptance) of nuclear power generation at the federal level, and in Ontario. This is likely connected, to a large degree, to the government's desire to find means to reduce greenhouse gas emissions while maintaining a consistent energy supply. While expanded nuclear power capability may not be the preferred solution for all, it may be the most powerful and practical measure to secure cleaner energy until alternative sources are discovered or gain recognition.