

## The Life of a Nuclear Power Plant

**S**askatchewan is growing. New home construction and industrial expansion means the province needs more power. Couple this with the planned decommissioning of current power facilities and it is easy to see that without action Saskatchewan will face a power supply shortfall.

### The Cost of Nuclear Power

The government of Saskatchewan is already warning of annual electrical rate increases because of needed capital expenditures, increased generating costs and more stringent environmental standards. In fact, the province's current climate change plan will cause rates to increase by over 20% alone once it is implemented.

Constructing a new nuclear power plant is expensive and these capital costs occur over several years. As such, there are always risks of capital cost overruns and delays. This is true of any project of this scale, including new coal plants and hydro dams. However, recent international experience indicates that the major vendors of nuclear power plants have significantly improved budget and scheduled performance.

Given this situation, the cost of nuclear power is becoming increasingly competitive with other forms of electricity generation. Furthermore, when the environmental and social costs of fossil fuel power generation are considered, nuclear is extremely attractive.

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Due to the long timelines and high costs associated with building a nuclear power plant, the provincial government may have a role. To date, the cumulative risks of building a new nuclear power plant have been too large for the private sector to bear alone and governments have played some role in the facilitation of the project.

Thus far, the government of Saskatchewan has not indicated, what, if any, public dollars will be invested in a nuclear power plant should the province decide to move forward. Currently, the most important role of government is to



*An exterior view of the Bruce B generating station.*

provide strong and effective regulation for the nuclear power industry and to provide policy stability that will allow efficient licensing, construction and operation.

Once a nuclear power plant is operational it is not subsidized by the government. In Ontario, Bruce Power leases the facility at Kincardine from Ontario Power Generation (a provincial crown corporation), sells some of its power to the province at agreed upon rates. Should Bruce Power proceed with expansion in Saskatchewan they are likely to use this model as guidance.

## Deciding to Build a Nuclear Power Plant

The regulatory process for licensing a new power plant, starting from the initial site application to commercial operation, requires that the applicant receive three separate licenses: one to prepare the site, the second to construct the plant and the third to operate the plant.

The Canadian Nuclear Safety Commission (CNSC) has estimated that the duration of licensing activities from receipt of an application for *License to Prepare Site to License to Operate* is approximately nine years.

Before a nuclear power plant can be constructed an Environmental Assessment must also be conducted. An Environmental Assessment evaluates the impact the proposed project will have on the surrounding environment and ensures development is sustainable.

Furthermore, in the case of a nuclear power plant for the generation of electricity, the normal provincial approvals required for any major project will also be required.

## Decommissioning a Nuclear Power Plant

At the end of a nuclear plant's useful life it is decommissioned and over a period of time the site will be returned to "Greenfield" conditions.

According to International Atomic Energy Agency, the design life of a nuclear power plant is typically 30–40 years. However, with advances in technology, it is quite feasible that many plants will be able to operate in excess of their design lives provided that all safety requirements are met.

Information on the decommissioning process must be provided to CNSC during each of the licensing stages and financial guarantees for funding the plants decommissioning must also be provided. Another license from CNSC is needed to perform this decommissioning work.

In Ontario, Ontario Power Generation (a provincial crown corporation) is responsible for the decommissioning and nuclear waste management associated with all nuclear power plants. OPG contributes annually to a fund which will be used to pay for station decommissioning and long-term management of nuclear waste.



Should Saskatchewan decide to build a nuclear power plant, regulatory and/or legislative changes will have to be made to ensure the province can play a proactive and significant role in determining how the plant will be addressed and monitored in the long term.

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