

Coal-fired power in British Columbia

Coal-fired power generation is a new threat to the lands, air and communities of British Columbia. While other places such as Ontario have committed to phasing out coal-fired power generation, British Columbia has, for the first time ever, opted for coal-fired power.

In 2002, British Columbia's Energy Plan laid the groundwork for coal to comprise a significant percentage of new supply, and in July 2006, this became a reality when BC Hydro awarded contracts to proposed coal plants in Tumbler Ridge and Princeton. If these projects proceed, they will release greenhouse gas emissions, sulphur dioxide, nitrogen oxides, particulate matter and mercury, not to mention the land and water impacts that will be associated with coal mining.

What are the impacts?

Coal-fired generation has by far the greatest impact on local air quality because of nitrogen oxides, sulphur dioxide, particulate matter and other air contaminants. All these emissions have demonstrably impacted human health and air quality. In Ontario, the government has estimated that air pollution from coal-fired power plants is responsible for the premature deaths of 668 people per year in the province. Coal is also the only power generation option that emits significant levels of mercury, a further concern to human and wildlife health.¹

In addition to air quality impacts, coal-fired power will produce the greatest levels of per-megawatt-hour of greenhouse gas emissions of any of the potential generation options available in British Columbia right now. If these two projects go ahead, the greenhouse gas emissions from British Columbia's electricity sector will more than double. Currently, providing electricity to 1,000 British Columbia homes (primarily through hydro and some natural gas) produces 326 tonnes of greenhouse gas emissions. Alberta, whose electricity

supply comes predominantly from coal, emits 8,794 tonnes of greenhouse gases per 1,000 homes because of its reliance on coal-fired generation.²

What are the technology options?

There is considerable talk about "clean coal" and how improved technology has the potential to dramatically reduce air pollution. This is true to some extent using technologies available today, but the best available options still result in greater emissions than a typical natural gas plant. To put this in context, neither the Duke Point Vancouver Island Generating Project on Vancouver Island nor the Sumas 2 Power Plant

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▲ Coal-fired power will result in increased local air pollution. Sundance Coal Power Plant, Wabamun Lake, Alberta.

PHOTO: DAVID DODGE, THE PEMBINA INSTITUTE

1 BC Hydro's Resource Options Report, 2006

2 Natural Resources Canada's Comprehensive Energy Use Database, 2004

near Abbotsford proceeded, in part, because of their potential air quality impacts.

The three main ways to convert coal to electricity are:

1 Pulverized Coal Combustion (PCC), which works by grinding the coal into a fine powder that is burned to create steam to turn a turbine.

2 Fluidized Bed Combustion (FBC), which is similar to PCC, except that the powder is suspended or “fluidized” in hot air and typically mixed with powdered limestone.

3 Integrated Gasification Combined Cycle (IGCC), which first converts the coal into a synthetic gas (gasification) that is then burned like natural gas to create electricity.

In general, costs will go up and emissions will go down, as one moves toward IGCC. For example, using gasification technologies results in 73% less nitrogen oxides emissions than pulverized coal because many of the pollutants in coal can be removed prior to combustion.³ However, the British Columbia proposals will use the less efficient and more polluting fluidized bed combustion. At some point, existing coal plants in Canada using pulverized and fluidized coal technology will need to be retrofitted to minimize air quality emissions. It does not make sense to build more plants using this already outdated technology.

In terms of greenhouse gas emissions, there are no coal plants using technologies to significantly reduce greenhouse gas emissions. In the future, a company could use technology to capture most carbon dioxide emissions (the most abundant greenhouse gas). If utilized, these technologies could significantly reduce greenhouse gas emissions, but they would increase the cost of the coal production by approximately 50%.⁴



▲ Coal truck at Genesee Power Plant, Alberta.

PHOTO: DAVID DODGE, THE PEMBINA INSTITUTE

Is the promise of clean coal real?

If coal fired power is to be considered for British Columbia, a number of questions should be answered first:

1 Have opportunities for energy efficiency, conservation and renewables been exhausted?

BC Hydro estimates that wind projects throughout British Columbia could generate up to 13,000 GWh per year, enough power to supply 1.3 million homes – or the number of homes in Greater Vancouver and Vancouver Island. Similarly, BC Hydro estimates that efficiency and conservation measures have the potential to reduce demand by 6,000 GWh per year, which is three times the energy to be supplied by the coal plants.

2 Will the proposal use an IGCC process?

Of the three options for conventional coal production, this is the least problematic from an air quality perspective and presents a stronger possibility of capturing greenhouse gas emissions in the future.

3 Will the proposals help reduce British Columbia's emissions of greenhouse gases, or, at a minimum, is there a plan to fully offset these emissions?

Currently, an estimated 10% of new coal plants proposed for U.S. markets are expected to be IGCC plants, though none of those

being built is intending to capture carbon emissions.⁵

Investment in outdated coal technology also hampers the development of clean, low-impact, renewable and competitive technologies in the future. One of Premier Gordon Campbell's five great goals is for British Columbia to “lead the world in sustainable environmental management, with the best air and water quality... bar none.” Coal-fired generation, as it is currently proposed in British Columbia, makes this goal impossible.

3 Natural Resource Canada's Clean Coal Technology Roadmap, 2005

4 Natural Resource Canada's Clean Coal Technology Roadmap, 2005

5 USDOE's Tracking New Coal-Fired Power Plants: Coal's Resurgence in Electric Power Generation, 2006