Phase out coal by 2038: a roadmap for Germany

A report and an opinion by John Hollins [1,]

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Germany is more dependent on coal than most other western economies.

A Kommission appointed by the Government of Germany in 2018 has proposed that Germany should stop using coal for the generation of electricity by 2038, laying out an 80-billion Euro (C$120 billion) roadmap. Under the plan, half of the funds would go to the regions to replace closed plants, while the other half would be spent on preventing electricity prices from rising. (Not only in Ontario, you say?)

Open pit lignite mine in North Rhine Westphalia

According to the *Financial Times*, power plants that run on coal and lignite currently generate about 40% of Germany's electricity.

Following the Kommission's roadmap, several plants using lignite or brown coal, which is more polluting than black coal, would be closed by 2022. Other plants would follow until 2030, when only 17 Gigawatts (GW) of Germany's electricity would be supplied by coal, compared to 45 GW in 2018. The last plant would close no later than 2038.

The Kommission's report says that the loss of generation from coal will be made up by renewables. Germany, however, is connected to the European electrical grid, so it also has the ability to both import and export electricity, which is what it has been doing for many years to balance the intermittent generation of its massive investment in solar and wind. The imports have included coal-fired generation from Poland; those emissions, incidentally, are assigned to Poland the producer, not to Germany the consumer.

According to *Clean Energy Wire*, renewables accounted for 35.2% of Germany's energy production in 2018 and should account for 65% by the end of the 2020s.

Nuclear power will not play any part. The German government announced in 2011, following the tsunami that disabled the nuclear reactor at Fukushima, Japan, that it would abandon nuclear energy by 2022. (Although there is no prospect of a tsunami striking Germany.)

The Kommission states that its roadmap will enable Germany to meet its goal of reducing its carbon dioxide emissions by more than 60% by 2030.

Canada

By way of comparison, the shares of electrical generation in Canada in 2016 were:

Hydro	59%
Nuclear	15%
Coal,	9%
Gas/oil/others, and	10%
Non-hydro renewables	7%

The 9% share of coal in national generation derives from four provinces; the share of coal within those provinces is:

Saskatchewan:	48.9%
Alberta:	48.5%
Nova Scotia:	48.5%
New Brunswick:	14.8%

Commentary

Germany has depended primarily on coal for electricity since the 19th Century. It possesses very little hydro. It is phasing out nuclear. It is in a much more difficult position than Canada to reduce its dependence on coal.

Yet Germany has prepared a credible roadmap to get off coal drawing on its substantial history in science and technology, and its practice of creating powerfully informed kommissions to address public issues that require the assessment of science and technology in order to effectively address broad questions in public policy.

In the same spirit, what could Canada do to get off coal? Canada could search for and find a pathway with a mix of technically feasible options that would actually get the job done, amongst them [2]:

- Existing and unexploited large hydro,
- Grid connections from east to west;
- Wind and solar power,
- Geothermal energy, including ground-source heat pumps,
- Substantial improvements in energy efficiency,
- Nuclear generation,
- Use of modern batteries à la Tesla at the scale of both utilities and domestic and community microgrids.

A roadmap for Canada

What Canada really needs is a roadmap, like Germany. We could identify some obvious places to start, for example, phasing out coal. Ontario has already done that and is consequently well along the path to meet its provincial goal for 2030 [3]. Another obvious path would be for Alberta and Saskatchewan to connect to hydro in BC and Manitoba.

But then we would need to look at the entire system. To inform policy, governments in Canada should use a tool proven in other countries: energy systems analysis to examine options and select a pathway extending well into the future. Once a pathway has been selected, governments in Canada then have a wide range of tools in their policy boxes that could be used to travel to success in reaching their goals.

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[1] Dr. John Hollins is Past Chair of the Canadian Association for the Club of Rome. He is an Honourary Member of the Energy Council of Canada.

[2] The Canadian Association for the Club of Rome will publish in 2019 May a study on the pathways that Canada could follow to meet its goals.

[3] Ontario's decision was made primarily to reduce the health effects of smog from pollutants in the summer; reduction of emissions of carbon dioxide was an incidental, global benefit.