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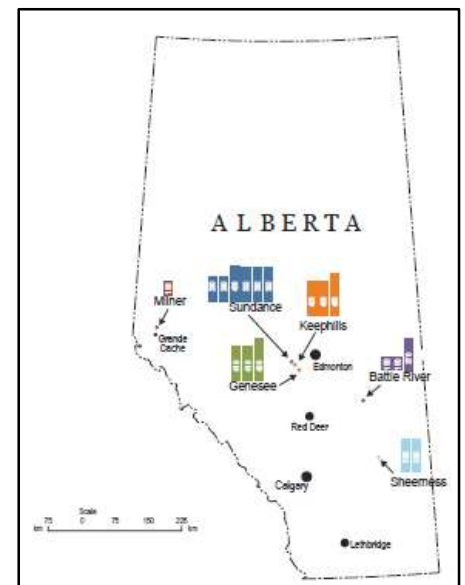
 **Public Interest Alberta**
Advocating for a Better Alberta for All

Backgrounder: Phasing Out Alberta's Coal Plants

Our four organizations have been calling for the phase-out of Alberta's coal-fired power plants for two years now because they are a major source of: air pollutants that harm the health of Albertans; mercury which is persistent and accumulates in the food chain; and greenhouse gases that contribute to climate change.

Reliance on Coal Plants in Alberta

- Alberta burns nearly twice as much coal as all of the other provinces combined.
- In 2014, Alberta generated 68 per cent of its electricity from coal.
- While other jurisdictions have been working to reduce or phase-out their use of coal, Alberta has been increasing its coal-fired generating capacity. Between 2002 and 2012, Alberta increased its coal capacity by 14 per cent.
- Alberta has six coal plants with 18 individual generators. Each one has a generating capacity ranging from 150 MW to 495 MW for a combined capacity of over 6,200 MW. (Pembina, 2013)
- The figure to the right identifies the locations of Alberta's coal-fired power plants in 2015 (Pembina, 2015).

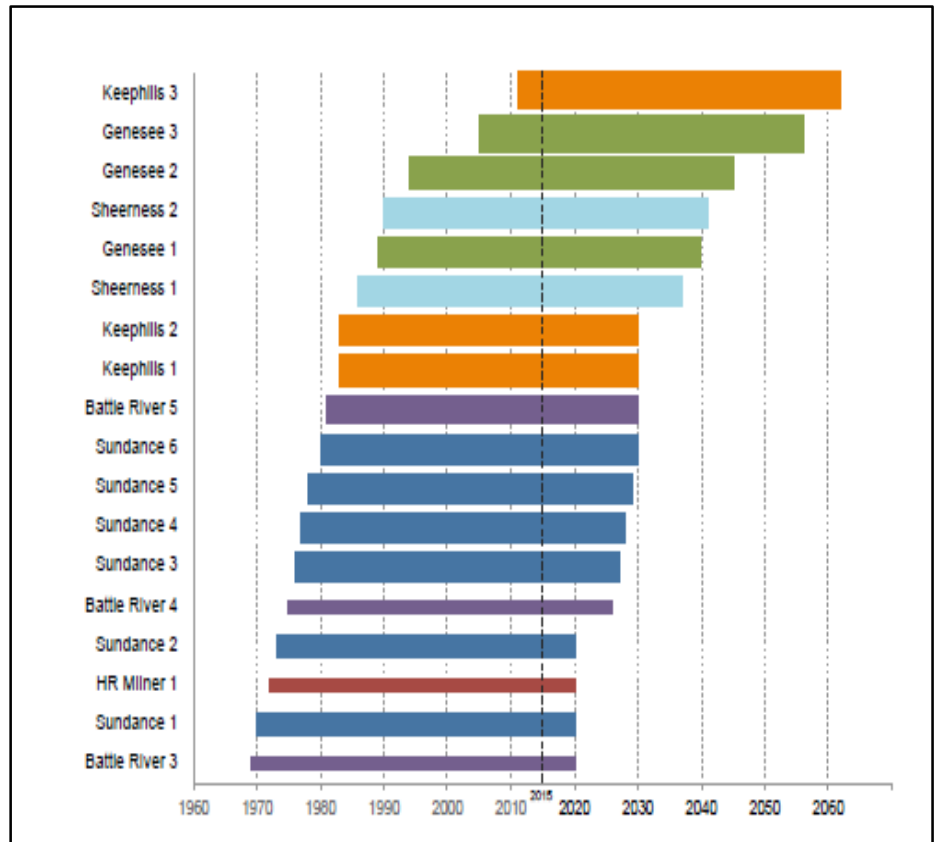


Emissions from Alberta's Coal Plants

- In 2011, Alberta's six coal plants emitted:
 - 33 per cent of the sulphur dioxide (SO₂) released in the province or 114,511 tonnes;
 - 10 per cent of the nitrogen oxides (NO_x) or 71,507 tonnes;
 - 6 per cent of the fine particulate matter (PM_{2.5}) or 1,782 tonnes;
 - 44 per cent of the mercury released from man-made sources; and
 - About 18% of the total greenhouse gases (GHG) emitted in the province or 43 megatonnes (**MT**); almost as much as all of the oil sands operations in Alberta combined (Pembina, 2013).

Alberta's Fleet of Coal Plants

- 12 of the 18 generators are located approximately 70 km west of Edmonton and upwind of Edmonton nine months a year.
- The 18 generators range widely in age from 4 to 46 years. They also vary greatly in efficiency, pollution control measures, emission rates and closing dates.
- The oldest unit, Battle River 3, built in 1969, is scheduled to close with 3 others in 2019.
- The newest unit, Keephills 3, built in 2011, is scheduled to close in 2061.
- Keephills 3 — the most efficient plant — still releases about 858 tonne of GHG per gigawatt-hour (GWh). This is twice the federal limit for plants built after 2015.
- Recently established federal GHG regulations allow most existing coal plants to continue to operate without any carbon reductions until they reach their 50th year of operation.
- Units can operate without meeting the provincial limits for SO_x and NO_x until the end of their “design life” or 40 years after start-up, whichever is longer — and, even then, emission credits can be used to meet limits.
- Alberta is expected to increase its coal plant capacity until 2020 as the fleet has been moving back into full capacity since late 2013.
- As indicated by the figure above, coal plants in Alberta could be affecting health and the environment for many years to come. (Pembina, 2013; Pembina 2015)



Coal Plant Phase-outs - Other Jurisdictions

Other jurisdictions around the world have taken steps to phase-out coal plants. For example:

- **Ontario:** phased out its coal plants in 2014 (10 year phase out)
- **United Kingdom:** has a multi-partisan proposal to phase out coal plants in 10-15 years
- **Denmark:** plans to phase out its coal plants by 2025
- **Los Angeles:** plans to phase out its reliance on coal by 2025

Energy Efficiency Targets – Other Jurisdictions

Other jurisdictions in North America have set ambitious energy efficiency targets to reduce their electricity demand. For example:

- **Alaska:** plans to reduce energy demand by 15% from 2010 levels by 2020
- **Arizona:** plans to reduce energy demand by 22% from 2010 levels by 2019
- **Maryland:** plans to reduce energy demand by 15% from 2007 levels by 2015
- **Massachusetts:** plans to reduce energy demand by 2.6% per year from 2015
- **New Jersey:** 20% reduction by 2020 from predicted 2020 usage
- **Texas:** plans to meet 30% of all load growth with energy efficiency

Renewable Energy Targets – Other Jurisdictions

Other jurisdictions have established aggressive renewable energy targets. For example:

- **Germany:** was generating 32.5% of its electricity with renewable in 2014 and projects that 45% will be generated with renewables by 2030
- **California:** was generating 26% of its electricity with renewables in 2014 and are projecting that 33% of their electricity will be generated with renewables by 2020)
- **Nova Scotia:** was generating 22% of their electricity with renewables in 2014 and are project that 40% of their electricity will be generated with renewables by 2020)

Polling Results for Alberta

When Oraclepoll Research conducted a survey of 750 Albertans by telephone in February 2014, it found that:

- Between 61% and 76% of the people surveyed understood that coal plants are associated with air pollution, adverse health impacts for senior citizens and children, and asthma attacks among children;
- 76% indicated that the government should encourage businesses to generate electricity from renewable clean sources such as wind, water and solar power; and
- 67% indicated that they would be willing to pay "a little more" on their utility bill for electricity generated from renewable clean sources such as wind and solar power and not from coal. (Oraclepoll Research, 2014)

Replacement Strategy Proposed for Alberta

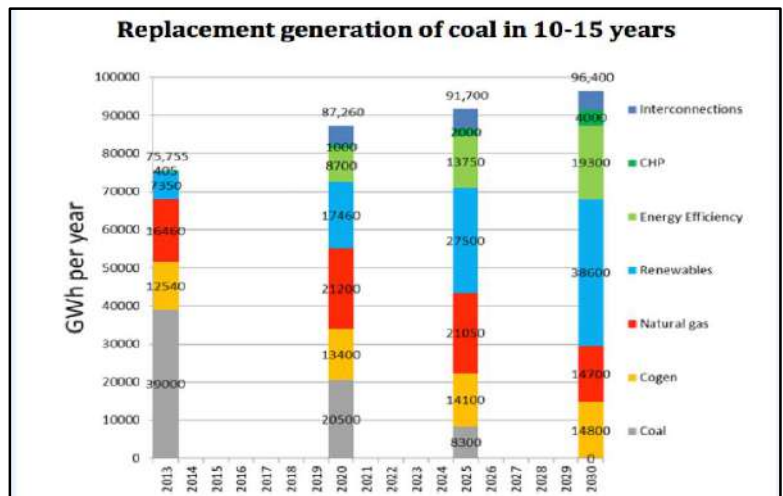
Our four organizations are proposing that Alberta phase-out its coal plants by 2030 by investing in energy efficiency, co-generation and renewable energies. We are strongly discouraging increased reliance on natural gas because of the high volume of GHG emissions associated its production (Howarth, 2014). We believe that the following targets could be achieved:

- Phase-out coal plants by 2030;
- Increase energy efficiency to decrease electricity demand by 10% by 2020, 15% by 2025, & 20% by 2030;
- Increase renewable energy so it provides 20% of the province's electricity by 2020, 30% by 2025, & 40% by 2030;
- Ensure that all new natural gas generation (post Shepard) is co-generation, combined heat and power, or combined with battery storage for residential, industrial or commercial uses;
- Prohibit new stand-alone natural gas generators and phase-out stand-alone natural gas plants starting in 2029 (30 year lifespan);
- Increase industrial co-generation by 1% per year;
- Assuming growth in demand at 2% until 2020 then 1% to 2030 (AESO, in contrast, forecasts 2% growth per year ad infinitum); and

- Meet any power demands above forecasted growth with renewables or combined heat and power.

With this Coal Plant Phase-out Plan:

- Reliance on coal would decrease from 50% in 2013 to 0% in 2030 (grey);
- Reliance on stand-alone natural gas plants would decrease from 21% in 2013 to 15% in 2030 (red);
- Natural gas co-generation would decrease from 16.5% in 2013 to 15% in 2030 (orange);
- CHP would increase from 0% in 2013 to 4% in 2030 (emerald green);
- Interconnections would increase from 0% in 2010 to 6% in 2030 (royal blue);
- Renewables would increase from 10% in 2013 to 40% in 2030 (light blue bar); and
- Energy efficiency would decrease electricity demand by 10% in 2020 to 20% in 2030 (light green).



Mechanisms to Achieve Phase-out & Replacement: Options

1. Legislated closure of units:

- Four units close this year (currently market oversupplied) then one a year until 2026
- Newest units close 2028/2030
- Average life span of 37.3 years (Ontario average at closure was 38.7 years)
- Excluding Keephills 3 & Genessee 3, average life span of 39.3 years

2. Cap lifespan of units at 40 years similar to federal law (legal precedent)

- Allows Coal to continue until 2051

3. Legislate payment of externalities (pollution)

- Pay for SOx/NOx/Hg emissions
- Carbon tax or Cap and Trade; would likely price coal out of the market
- less of a guaranteed timeline

4. Hard Cap on emissions and Ratchet Down

- Annual emissions currently 43 MT
- Ratchet these down each year until zero is reached
- industry figures out how to meet targets
- smaller victory for Alberta as not as easily understood by others

References:

- Howarth, 2014. "A bridge to nowhere: methane emissions and the greenhouse gas footprint of natural gas", Energy Science & Engineering. April 2014.
- Pembina Institute, Canadian Association of Physicians for the Environment, Asthma Society of Canada and The Lung Association Alberta and NWT (Pembina). 2013. A Costly Diagnosis: Subsidizing coal power with Albertans' health.
- Oraclepoll Research. 2014. Coal in Alberta: Survey Report. Prepared for CAPE. February 20

For more information, see [CAPE Website](#) or [Alberta Coal Phase-out Website](#)