Transitioning to a Low-Carbon Economy

The Role of the Coal Industry in Canada and the World

Standing Senate Committee on Energy, the Environment and Natural Resources
October 20, 2016
About the Coal Association of Canada

• Vision:
  • Canadians understand role and value of coal in Canada

• Mission:
  • Support Association members in development, growth and advancement of a safe, socially responsible and economically sustainable Canadian coal industry
Coal Around the World

• Global Reserves
  • 968 billion total tonnes at the end of 2013
  • Canada is ranked 15th with 6.6 billion tonnes

• Coal is produced in more than 50 countries and consumed in over 70
Canadian Coal Production

62 Mt in 2015 (<1% of global production)

Meanwhile, global production increases every year... Currently around 8,000 Mt annually.

Total production value of $3.1 billion in 2015

5th most valuable commodity mined in Canada

Sources: Natural Resources Canada; Statistics Canada.
Why Do We Need Coal?

Power Generation (thermal coal) & Steel Making (metallurgical coal)

Image courtesy of http://www.capitalpower.com/

Image courtesy of http://thetelegram.com/
Coal Consumption

China, USA and India accounted for 70% of global coal usage in 2014, according to International Energy Agency’s Coal Information 2015.

Meanwhile...
Canada consumed less than 0.5%

Future Outlook...
• Coal is not going away anytime soon
• Coal remains 2\textsuperscript{nd} largest global energy source until 2030, and 3\textsuperscript{rd} largest until 2040, according to IEA’s Outlook 2016
Electricity in Canada and the Provinces

Very diversified energy portfolio in Canada – hydro, biomass, wind, solar, natural gas, nuclear, coal

Moving toward renewables/natural gas, but coal-fired generation currently plays important role:

**Alberta** – 51% (see right)
Saskatchewan – 44%
Nova Scotia – 56%
New Brunswick – 13%

Nearly 10% of all Canadian electricity is coal-powered

*Geography of province has major impact on power generation*
Keeping the Lights On

• Coal currently provides 41% of the world’s electricity

• 17% of people did not have access to electricity in 2013 – that’s 1.2 billion people

• Coal can provide affordable, reliable and accessible power for these people


<table>
<thead>
<tr>
<th>Region</th>
<th>Population without electricity</th>
<th>Electrification rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing countries</td>
<td>1,200</td>
<td>78%</td>
</tr>
<tr>
<td>Africa</td>
<td>635</td>
<td>43%</td>
</tr>
<tr>
<td>North Africa</td>
<td>1</td>
<td>99%</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>634</td>
<td>32%</td>
</tr>
<tr>
<td>Developing Asia</td>
<td>526</td>
<td>86%</td>
</tr>
<tr>
<td>China</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>India</td>
<td>237</td>
<td>81%</td>
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<tr>
<td>Latin America</td>
<td>22</td>
<td>95%</td>
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<tr>
<td>Middle East</td>
<td>17</td>
<td>92%</td>
</tr>
<tr>
<td>Transition economies &amp; OECD</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>WORLD</td>
<td>1,201</td>
<td>83%</td>
</tr>
</tbody>
</table>
GHG production around the world

Data Source: Environment and Climate Change, Government of Canada, 2012
So how do we do our part?

By investing in technologies that we can use to reduce our emissions at home, and helping to implement them around the world.
Clean Coal Technology – Part of the Solution

- Companies looking for higher efficiencies and lower emissions
- Technology is being developed and improved every day
  - Examples: Carbon Capture and Storage; Supercritical; Ultra-Supercritical; Advanced Ultra-Supercritical; OxyFuel Combustion etc.

Keephills 3 (supercritical boiler technology)

Coal Plant in Germany near Rhenish lignite region
Carbon Capture and Storage

• Crucial to meet global climate targets
• Part of Three Amigos Agreement in June, 2016, and discussed at COP21 in Paris
• The # of large-scale CCS projects around the world has doubled in last decade – now 22

• Shining example: SaskPower’s Boundary Dam CCS
  • Made in Canada solution; Capable of reducing GHG emissions by up to 1 million tonnes/yr; Enhanced oil recovery; sell other by-products like SO2
  • Endorsed by Federal Gov’t
    • “We’re obviously looking at our climate change plan and what we can do to reduce emissions,” McKenna said... “Certainly, carbon capture and storage (is) part of that...” - Regina LeaderPost, May 25, 2016
    • Hon. Jim Carr on CCS “Those who say. ‘It’s good, but not good enough, so stop doing it?’ No. What you do is, you try to make it better.” – Estevan Mercury, July 13, 2016

http://saskpowerccs.com/ccs-projects/boundary-dam-carbon-capture-project/
Metallurgical Coal

- Coal isn’t only used for electricity generation - Metallurgical coal, or coking coal, is used in steel making
- Our way of life depends on it – cars, office buildings, appliance, homes, wind turbines, boats and millions of other daily items – all require steel, which requires metallurgical coal
- Canada is the world’s 3rd largest exporter of metallurgical coal
- World prices have been depressed but we have seen a major spike this year
  - $75/tonne November 2015
  - $218/tonne October, 2016
What about Mining?

- Coal mining is a temporary use of the land
- Reclamation plans made years before mine is operational – very strict conditions
- New recreation areas, fishing lakes, agricultural areas created
- In 2014, mineral sector emitted 7.7% less GHG than in 2005 – a significant improvement
Government Policies - What Do They Mean for Coal?

- Provincial Example:
  - Alberta Climate Leadership Plan - emissions from coal-fired electricity generation will be phased out by 2030.
  - Under Federal regulations, 6 of 18 CFG units should be able to run past 2030, in one case up to 2061.
  - Will need to replace 39% of Alberta’s installed generation capacity - that’s over 6200 MW
  - Who is investing right now?

Communities are Impacted

- When plants shut down, so do the coal mines
- Often one of major employers in the community
- Approx 7,000-10,000 direct and indirect jobs in Alberta alone
Government Policies - What Do They Mean for Coal?

- What will new Federal regulations to cut carbon emissions look like? – Will have to wait until later this fall
- How will they work with existing/proposed provincial policies?
- Could the carbon price be used to invest in CCUS?
- We do know that carbon pricing will make it extremely uneconomical to continue to use coal for power generation in Canada
  - This could be expensive for not only consumers, but owners as well.
What’s happening around the world? Why do we need coal?

• People are moving into cities - # of urban dwellers to double to 7.3 billion by 2050, 96% of which will be in developing countries
  • Will need electricity and infrastructure – both thermal and metallurgical coal
• Reports vary, but a report in 2015 states that 2,400 new coal plants planned around the world
  • Many will use new technologies to reduce emissions
Our Position

• Coal will have a place in the global energy mix for decades to come

• Canada, with its history of innovation in natural resource development, should continue to invest in clean coal technology that can be used locally and around the world
  • This can be how we make a difference globally

• Coal provides affordable and reliable baseload power – this has given industry a competitive advantage. Why take that away?

• We can find the right balance between protecting our environment and our economy – it need not be one or the other

• Let’s work towards reducing emissions, increasing efficiencies and keeping this abundant resource in our energy mix

• Energy transitions can not be rushed – careful analysis and planning is required
References

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• http://www.forbes.com/sites/danielrunde/2015/02/24/urbanization-development-opportunity/#57e907016277
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