Coal vs Water

The trade-off and the future of coal for steel-making in a carbon-constrained world

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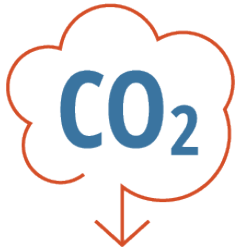
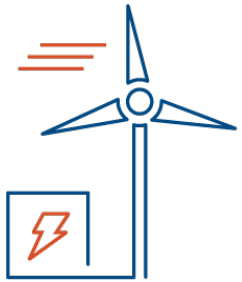
Leading Canada's transition to clean energy

The Pembina Institute is a non-profit think-tank that advances a prosperous clean energy future for Canada through credible policy solutions.



Climate policy

- Climate leadership
- Carbon pricing



Clean electricity

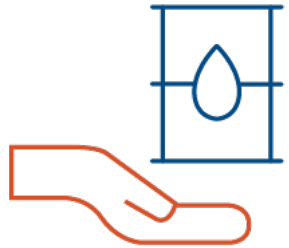
- Coal phase-out
- Renewable energy
- Clean technology
- Indigenous communities
- Electrification

Clean transportation

- Moving goods
- Moving people
- Clean fuel standard

Green buildings

- Energy efficiency
- Net-zero buildings



Oil and gas

- Methane emissions
- Oil & gas regulations
- Oilsands development and tailings
- Inactive and orphaned oil & gas wells
- Impacts of oil & gas development
- Liquefied natural gas

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My take-aways from Cheviot Mine experience

- Global metallurgical coal market is extremely competitive
- Alberta is a high-cost source of metallurgical coal – and therefore among the first to become uneconomic
- Regulators are reluctant to impose environmental protection and reclamation guarantees because this increases cost of mining
- The regulator will regulate a project to death if the ruling government does not support it

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Coal export jobs vs. an intact watershed

- Alberta government supports metallurgical coal mining in Alberta
- Global climate action will push down long-term demand for coal in steel-making
- No alternative use for metallurgical coal
- Temporary jobs and virtually zero royalties
- Risk of early closure
- Risk of reclamation liabilities
- Water is valuable and renewable if managed carefully

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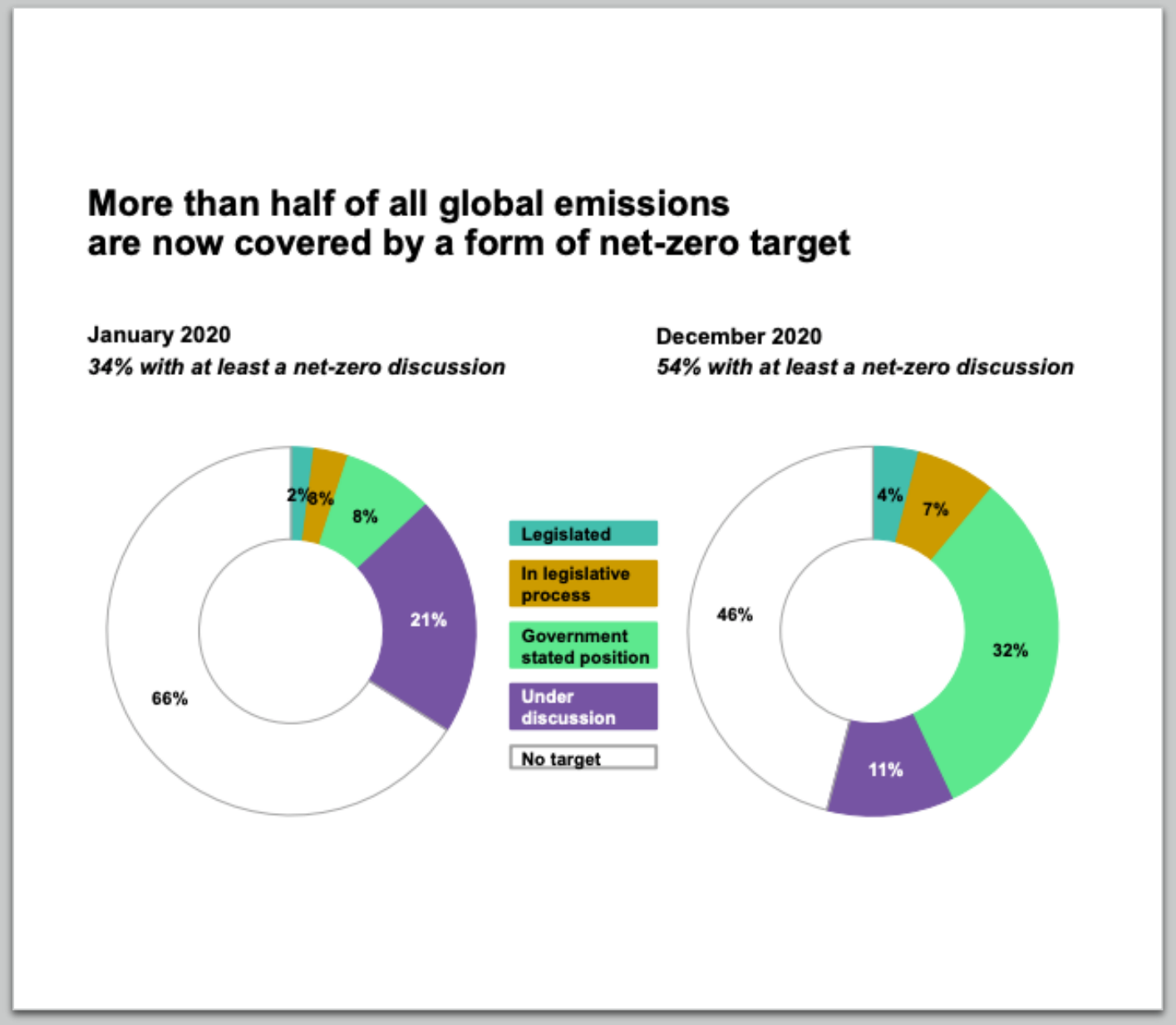
Metallurgical coal mining in a carbon-constrained world

- 1 ton steel emitted 1.85 tons of CO2 or 8% of global emissions (2018).
- Net-zero countries now include China, EU, Japan and South Korea
- Volkswagen and Toyota goal to eliminate carbon emissions entirely from value chain
- Future demand for metallurgical coal limited due to global climate action

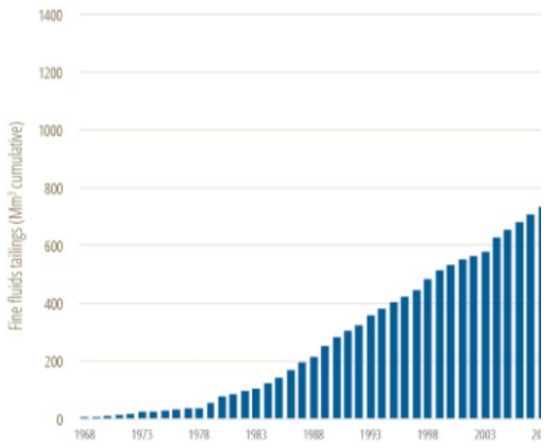


- Alberta has an estimated:
  - 162,500 active wells
  - 97,000 inactive wells
  - 71,000 abandoned wells
- As of April 15, 2020, the OWA had an inventory of 2,983 orphan wells for abandonment and 3,284 sites for reclamation.

Oilsands liabilities

Tailings ponds volume reached **1,271,000,000** cubic metres in 2016

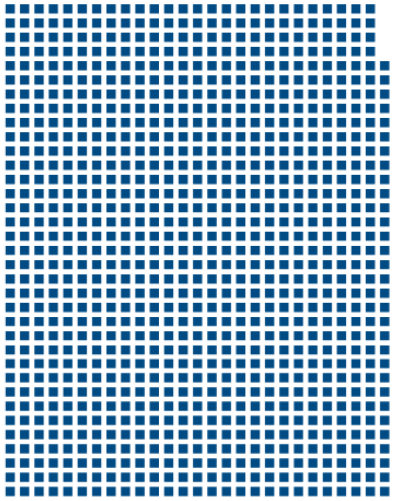
Source: Government of Alberta



PEMBINA institute pembina.org/oil-sands/tailings-ponds

1,271,000,000 m^3 = 44,884,941,403 ft^3

One square represents the area of 100 hectares (ha) of land



Active area of the land mined for oilsands (94,095 ha)

Area of the land mined for oilsands certified as reclaimed and returned to the province (104 ha)

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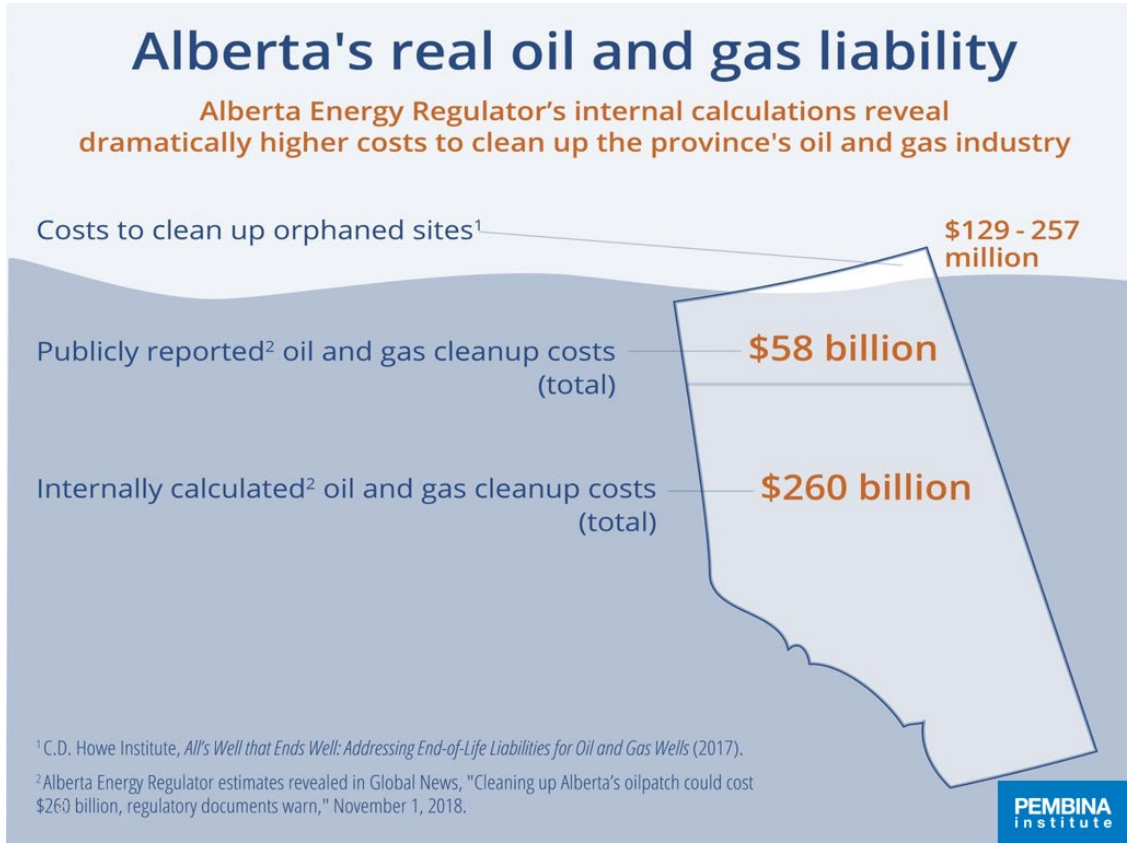
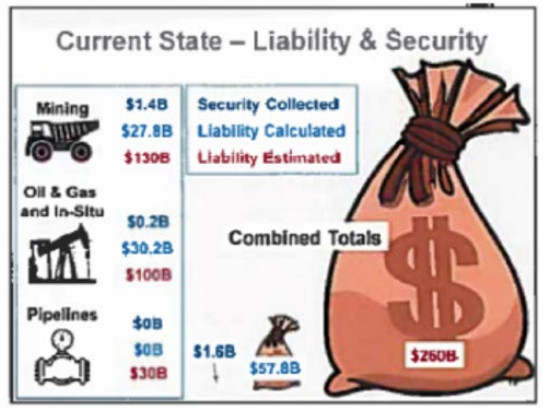
Cost liabilities



A total of **$260 billion** in Alberta oil and gas liabilities?



Graphic from AER presentation showing breakdown of internal liabilities estimates. (Click on image for full presentation).

See: De Souza, M., Jarvis, C., McIntosh, M., and Bruser, D. (2018, November 1). "Cleaning up Alberta's oilpatch could cost $260 billion, internal documents warn." *Global News*.

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Water-short Alberta

- Water over-allocated in many parts of Alberta
- Renewable and likely to decline
- It will increase in value over time
- Intact watersheds and wilderness areas along the eastern slopes are valued by people - diversification

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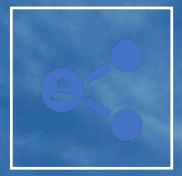

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