

Alberta in Transition?

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“The oil and gas industry is reducing its emissions fast”

“Who cares? You will be irrelevant in 10 years”

A polarized debate



“We have to figure out what are the right bets to take in a world that is completely changing because of society’s concerns around climate change”

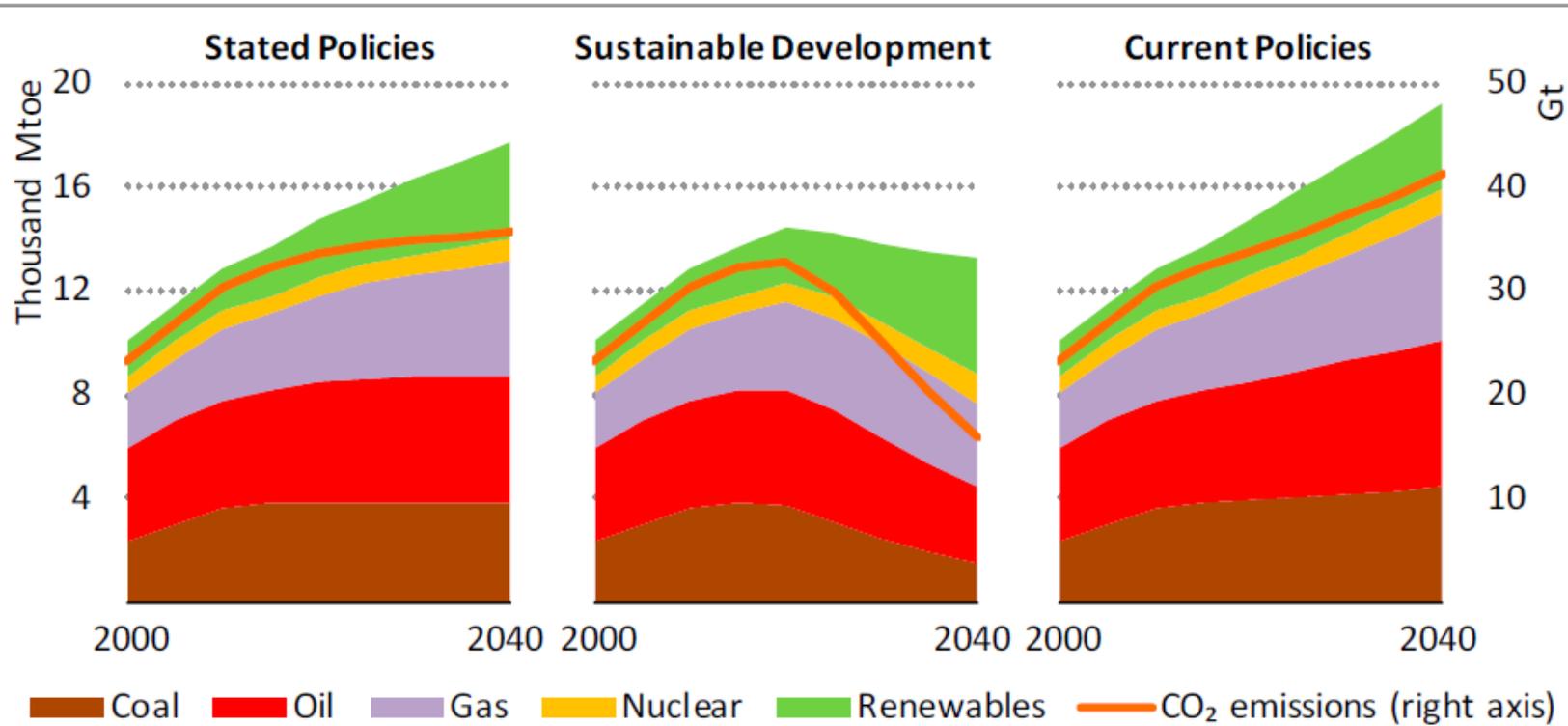
Ben van Beurden, Shell CEO
January 2020

What does the energy future look like?

(Answer: It depends.)

Answer: it depends!

Figure 1.1 ▶ World primary energy demand by fuel and related CO₂ emissions by scenario



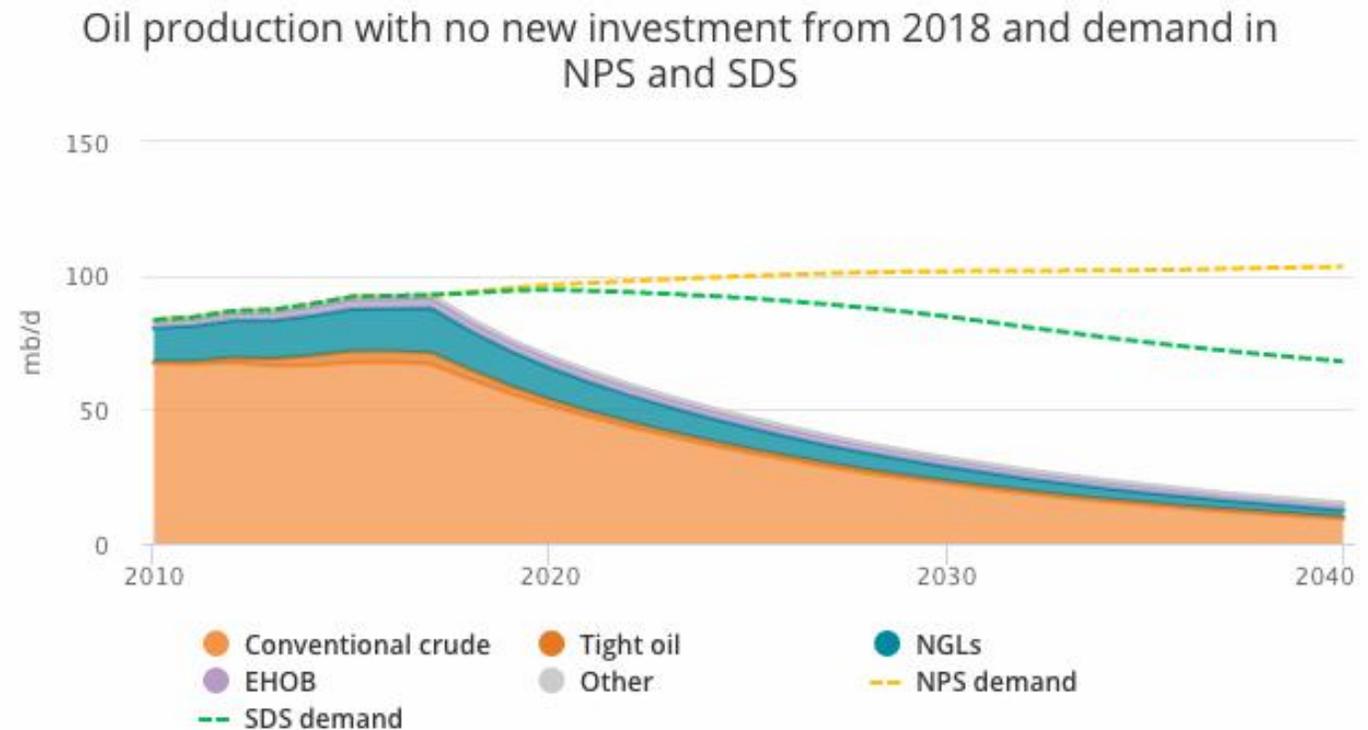
Existing policies and announced targets slow growth in global emissions to 2040, but they are not strong enough to force a peak in an expanding energy system

Demand for oil

The **orange dashed line** (NPS demand) is often touted by those justifying oil production growth by saying oil demand is increasing through 2040.

This is the scenario that is ***inconsistent*** with meeting Paris.

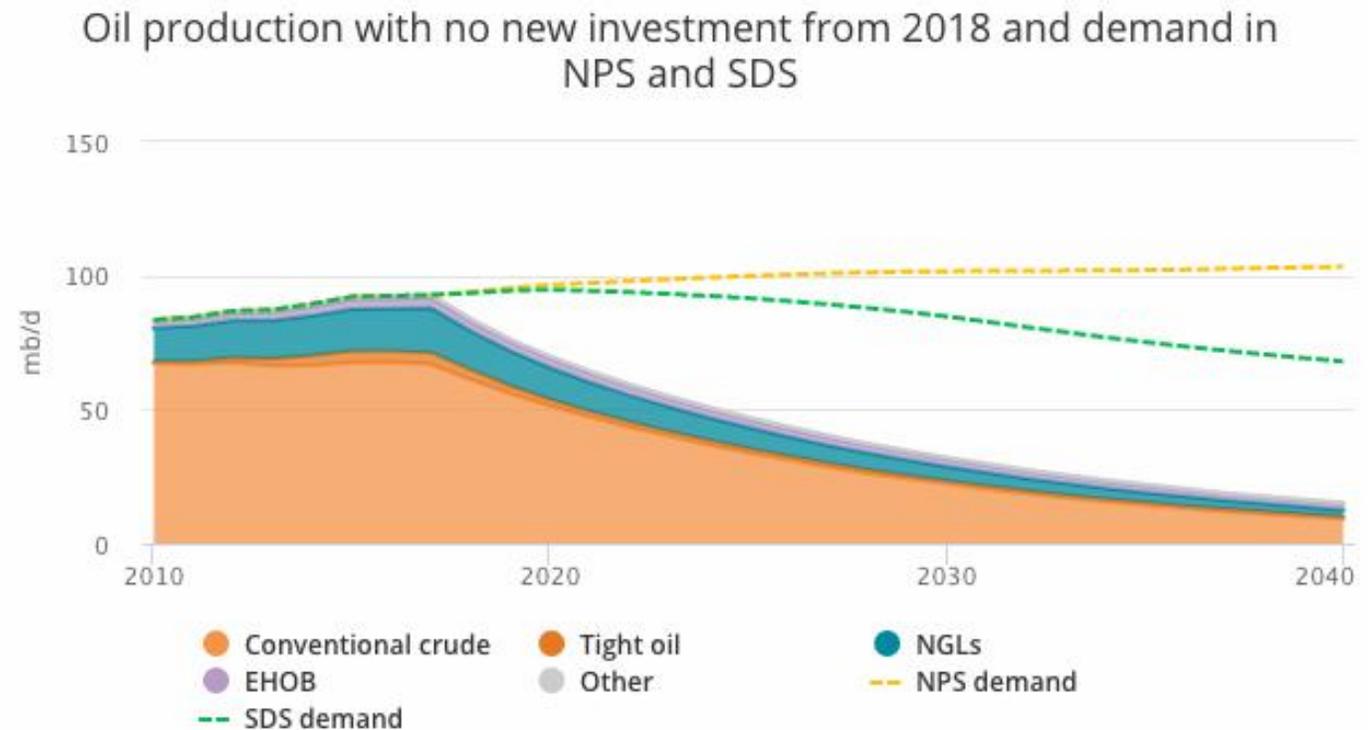
Those referencing this line are knowingly ignoring Paris' goals.



Demand for oil

The **green dashed line** is oil demand under the "sustainable development scenario", one that is consistent with Paris (*although not with a 1.5°C target*).

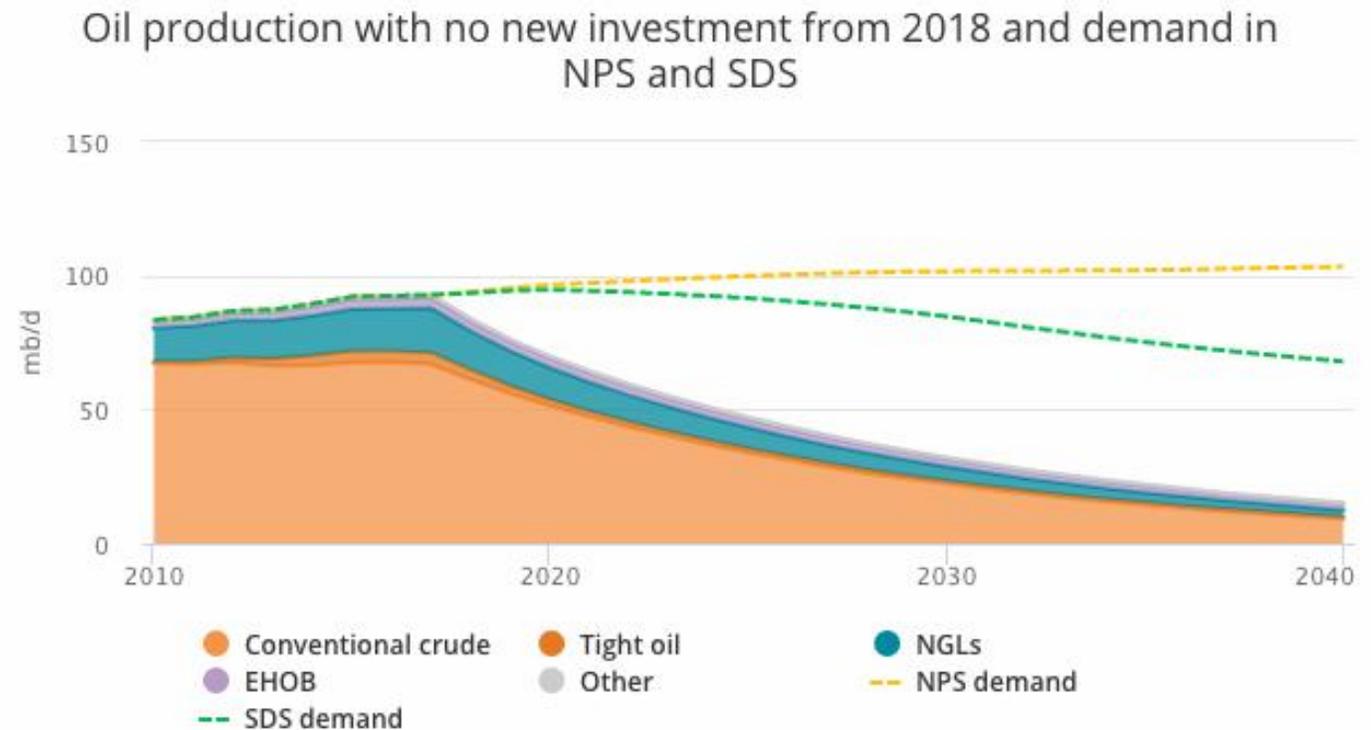
Oil demand begins to decline in the early 2020s in this scenario.



Demand for oil

BUT... note the filled areas below: that's oil production *with no new investment*.

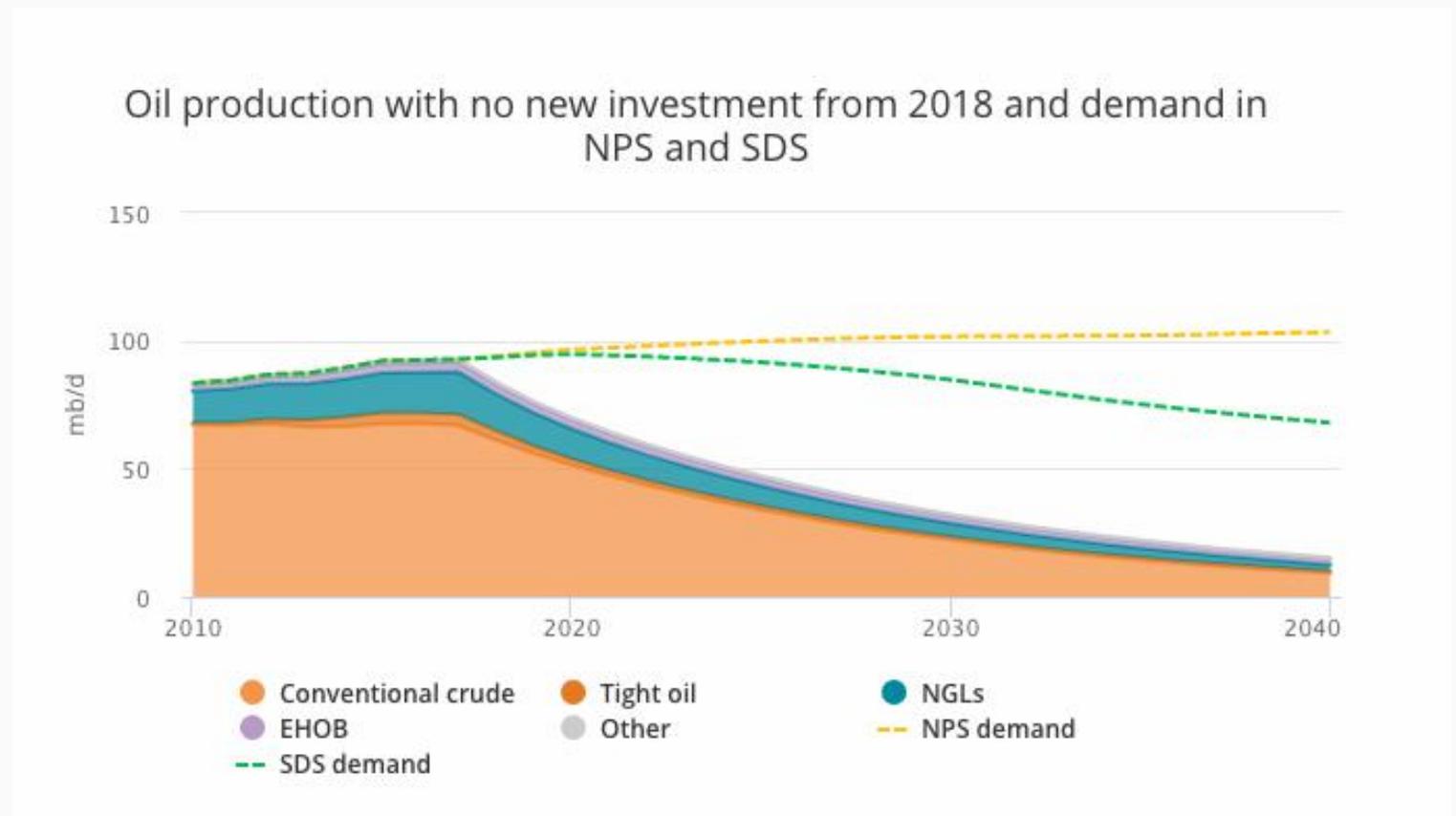
Steep decline rates for much of today's production means supply won't meet even the SDS demand in a very short amount of time.



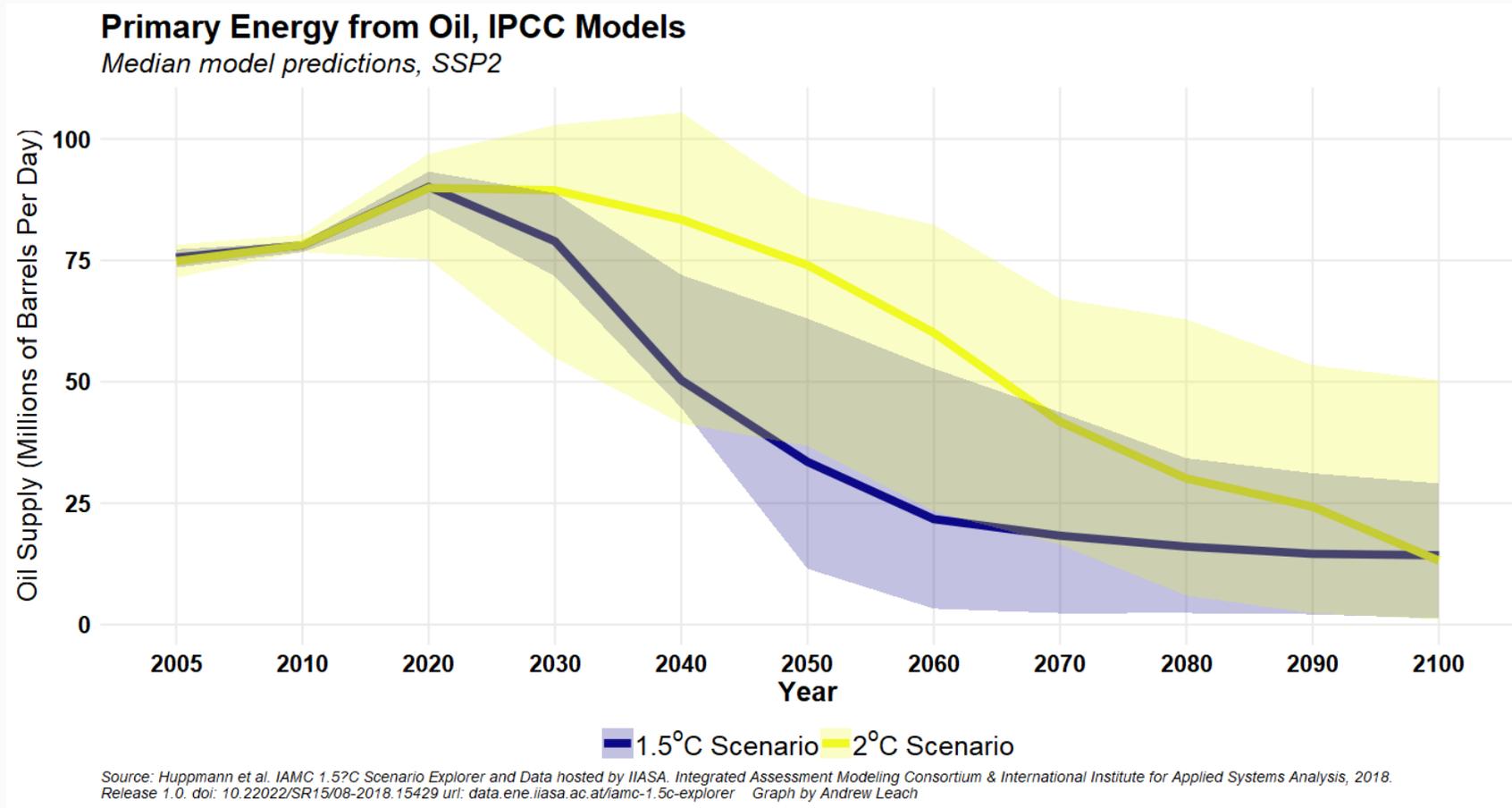
Demand for oil

=> New production is needed to meet Paris-consistent demand (albeit this is the 2°C scenario, not 1.5°C).

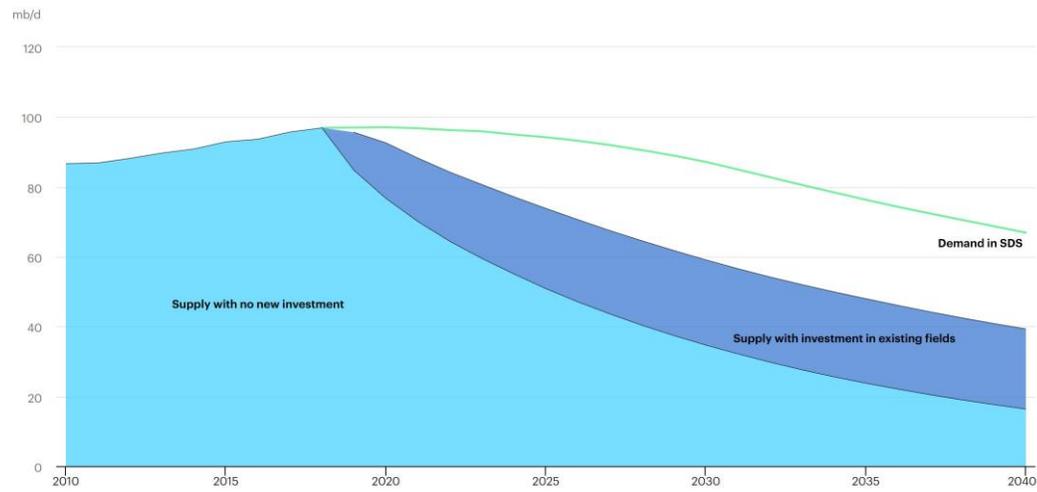
The real debate then is over which barrels should fill that gap between the green dashed line and the declining current production.



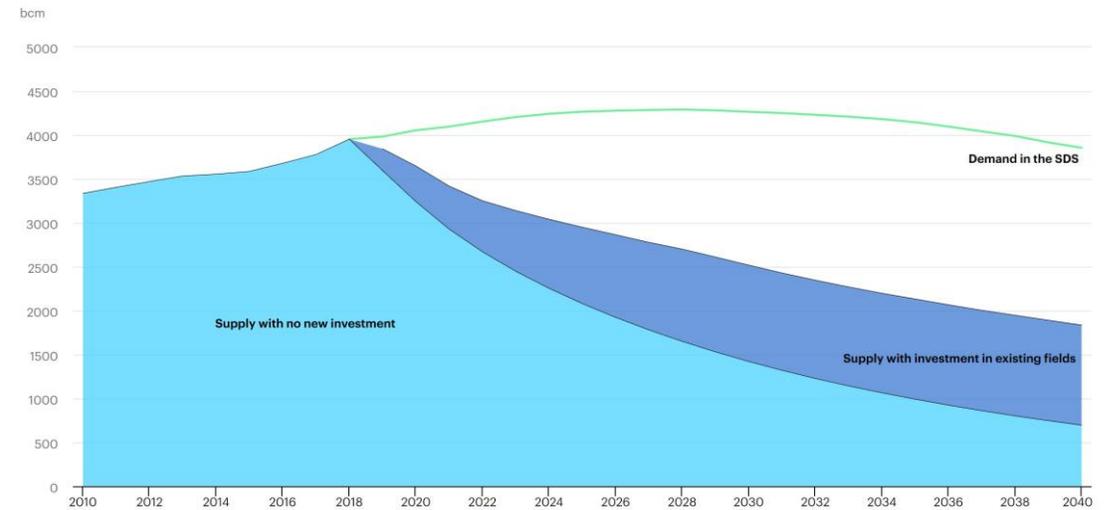
Add in 1.5C, uncertainty, and the future



Oil



Natural Gas



Source: IEA
WEO 2019

Alberta's "Bet": The Question

Are we planning for:

- *the orange line* ("stated policies", growing oil demand, higher emissions)?
- *or the green line* ("sustainable scenario", falling oil demand)?

Alberta's "Bet": The Answer

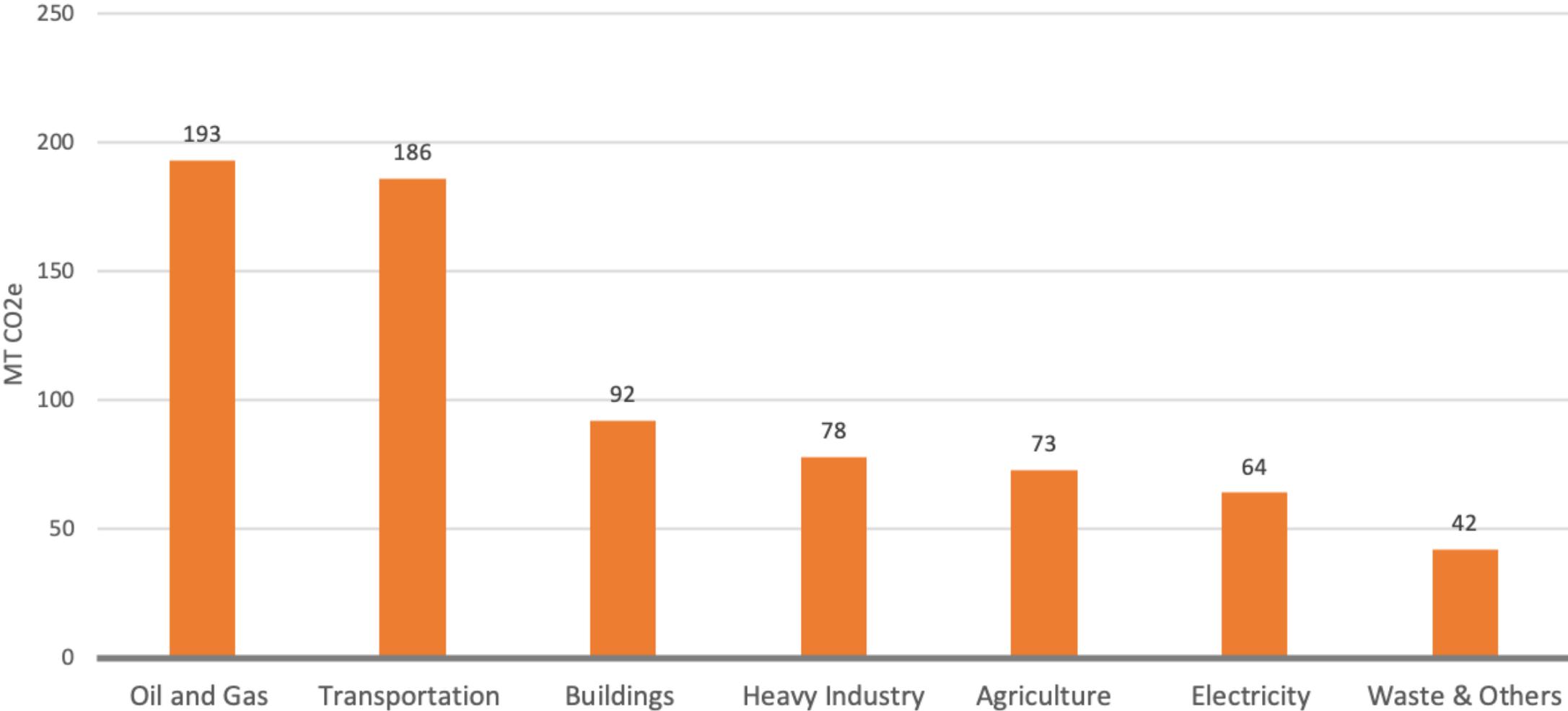
"Although the world's energy mix is changing, [demand for] oil will continue to grow"

– Canadian Association of Petroleum Producers 2019

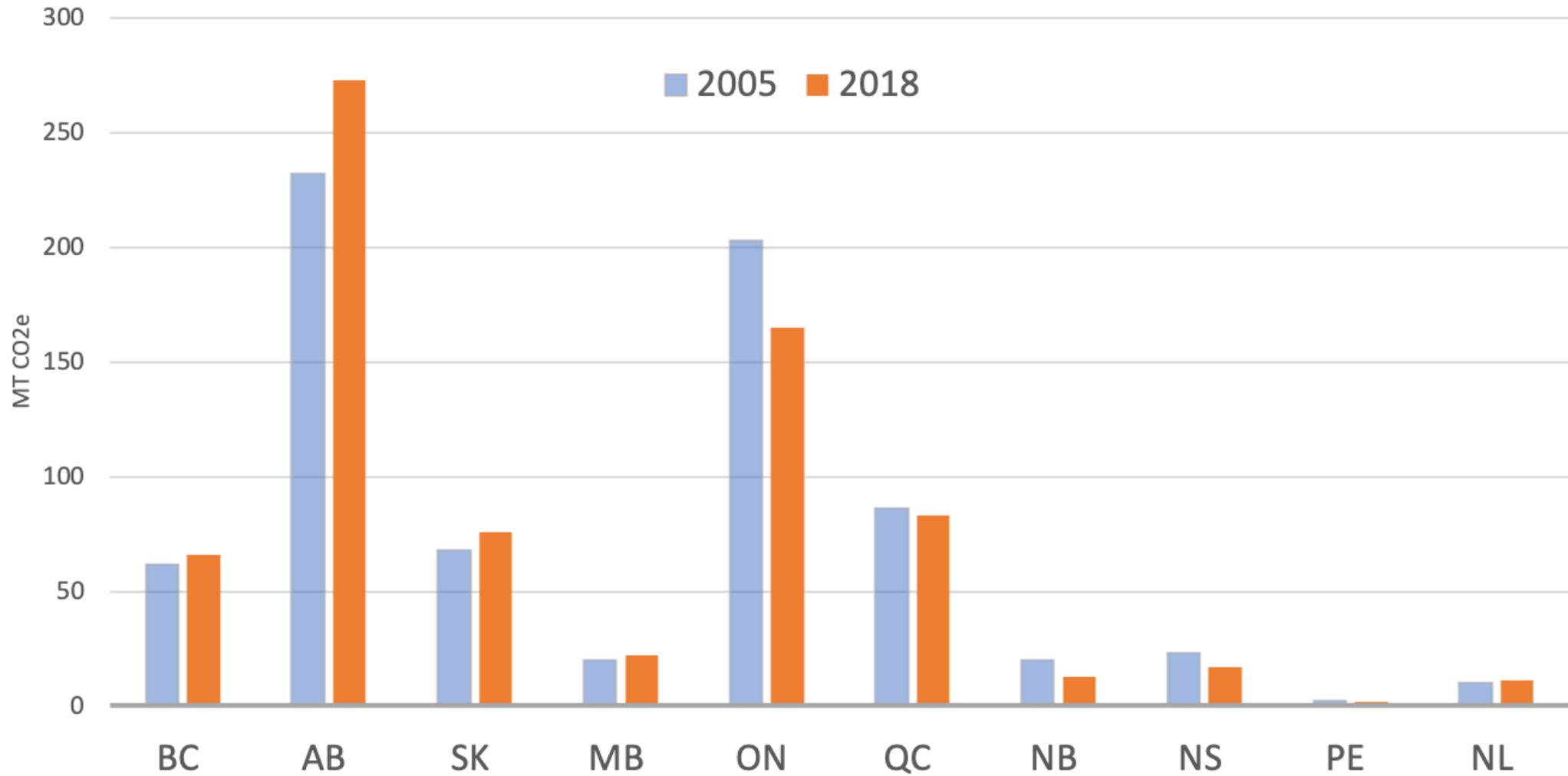
- Relies entirely on the stated policies scenario (or "NPS" in the prior charts)
- Consistent with a world of approx. +3° to 4°C global average temperature

Alberta's GHGs in context

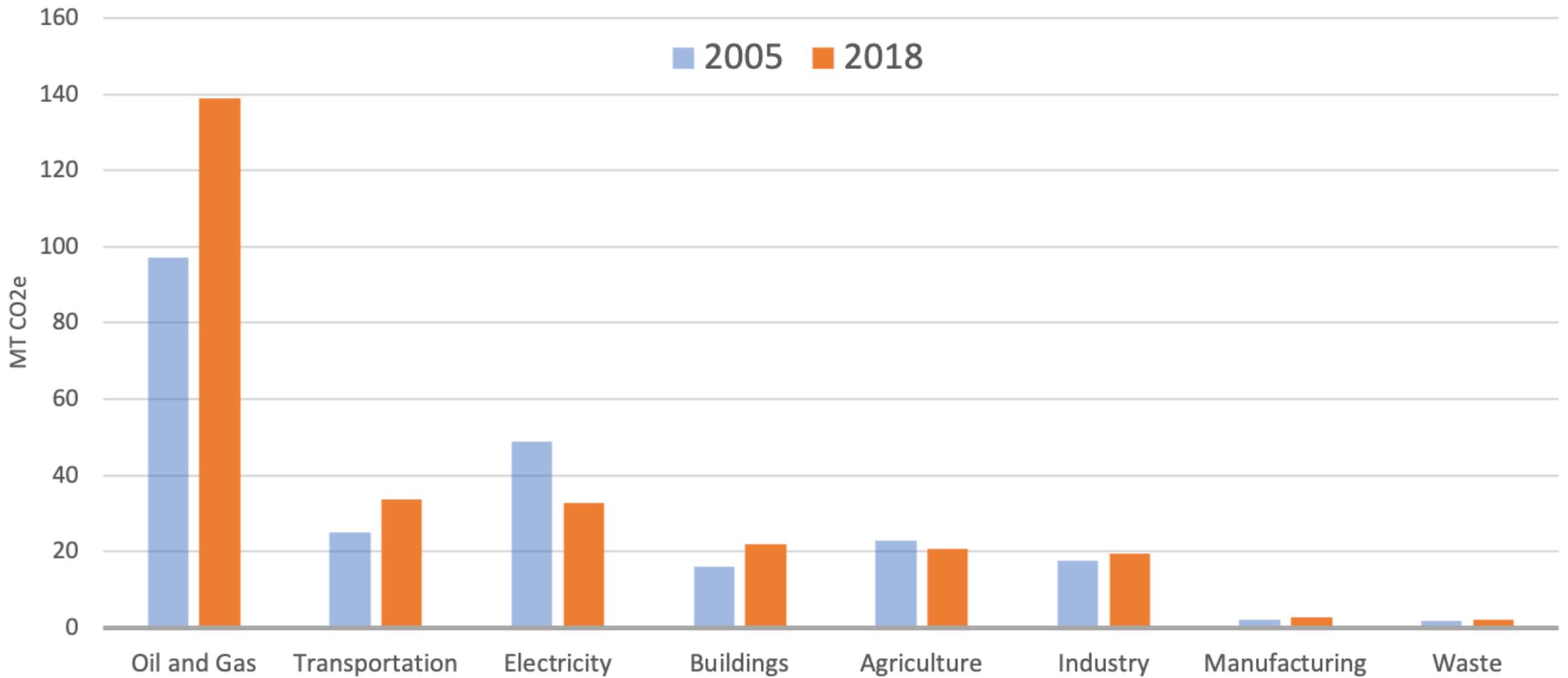
Canada's GHG Emissions (2018)



GHG Emissions by Province



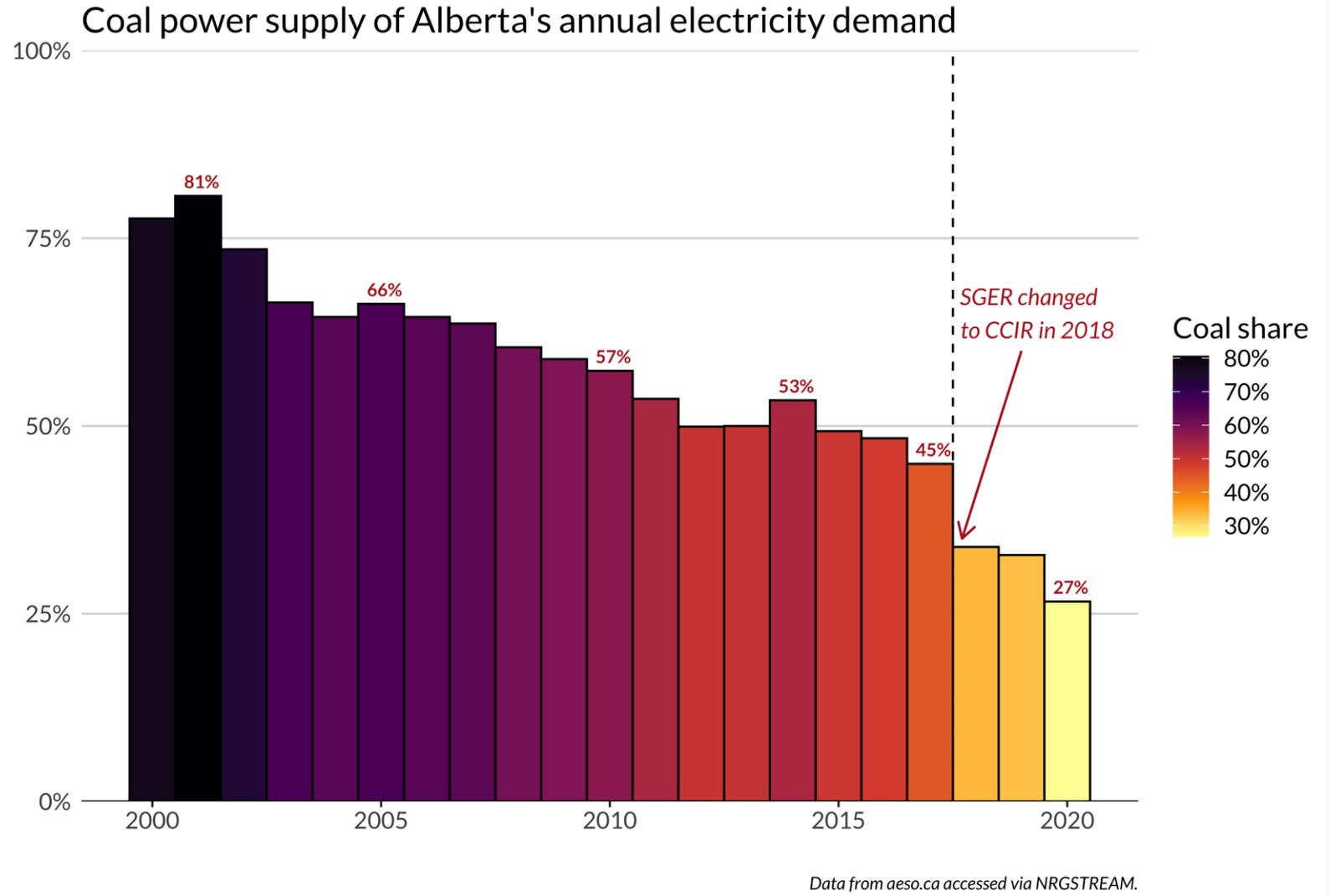
GHG Emissions in Alberta



The Good, the Bad, and the Ugly

The Good

Alberta's new large emitter carbon pricing system has resulted in a drop in the share of coal power



Climate policies affecting electricity in Alberta



Coal phase-out (2030)



Change to large emitter carbon pricing (SGER -> CCIR)



Renewable Electricity Program

More Good

Wind and solar proceeding despite lack of government contracts

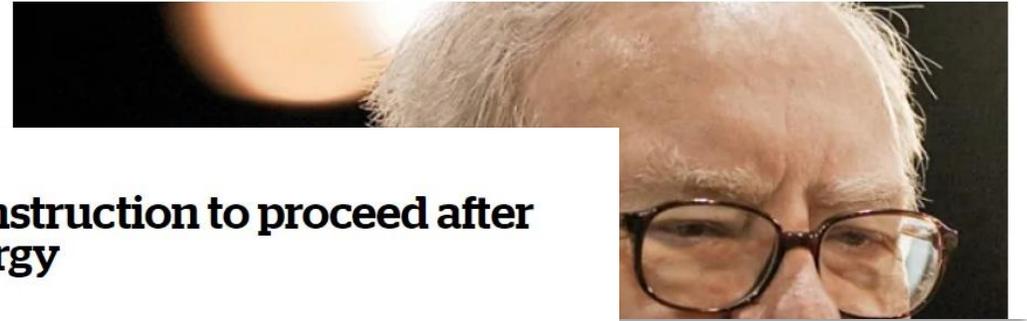
Calgary · New

Warren Buffett-linked company to build \$200M wind power farm in Alberta



Rattlesnake Ridge Wind project to produce enough energy for 79,000 homes

The Canadian Press · Posted: Oct 15, 2019 10:50 AM MT | Last Updated: 22 minutes ago



Calgary

Alberta solar farm construction to proceed after deal to supply TC Energy



Perimeter Solar Inc. says TC Energy has agreed to purchase 75 megawatts of electricity

The Canadian Press · Posted: Sep 30, 2019 4:25 PM MT | Last Updated: September 30



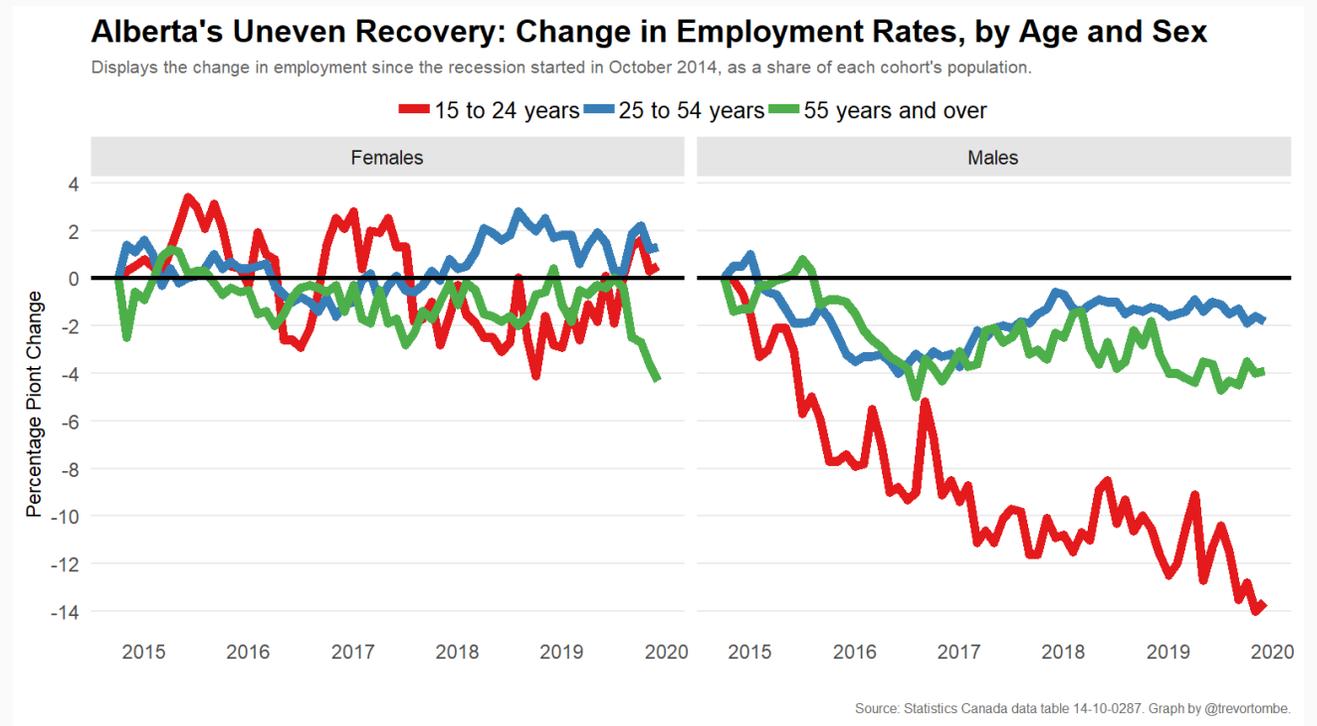
Canada's largest solar farm gets approval for southern Alberta

The solar farm to be built in Vulcan County will have 1.5 million solar panels and will provide enough electricity to power 100,000 homes.

AMANDA STEPHENSON, CALGARY HERALD Updated: August 28, 2019

The Bad

Unemployment rates continue to rise, especially among young men
(*pre-Covid data*)



The Bad

"They don't want to work in oil and gas – either because of the environmental implications of it or they just don't really see a future in that field – and feel like if they live in Calgary, that's kind of a written-in-stone future for them. So they felt the need to move away."

– CBC News, 3 February 2020

Calgary population growth (or loss) by age group over past decade

Change in population from 2009 to 2019. Click or tap on the tabs below to switch between absolute (population) and relative (percentage) terms.

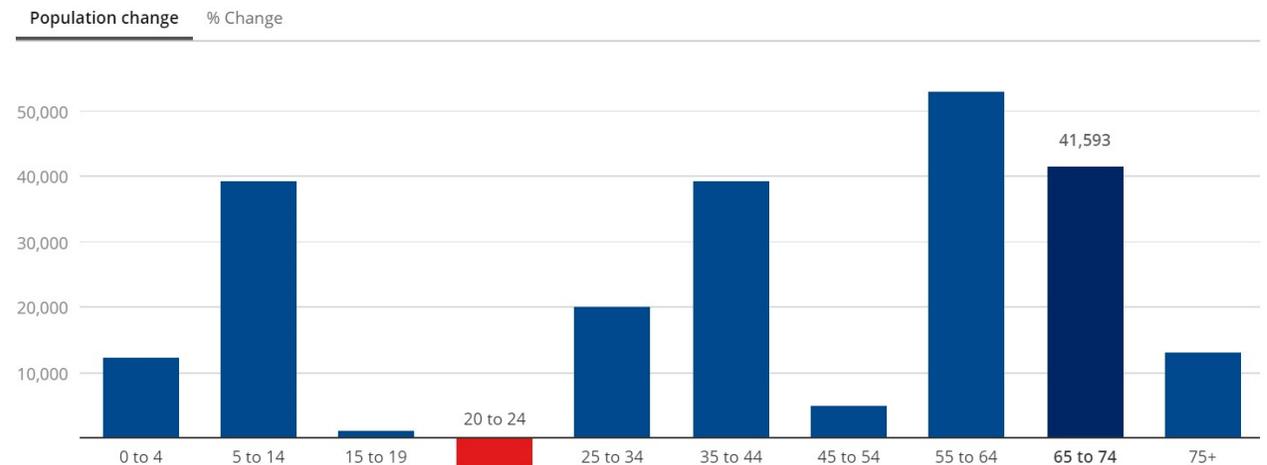


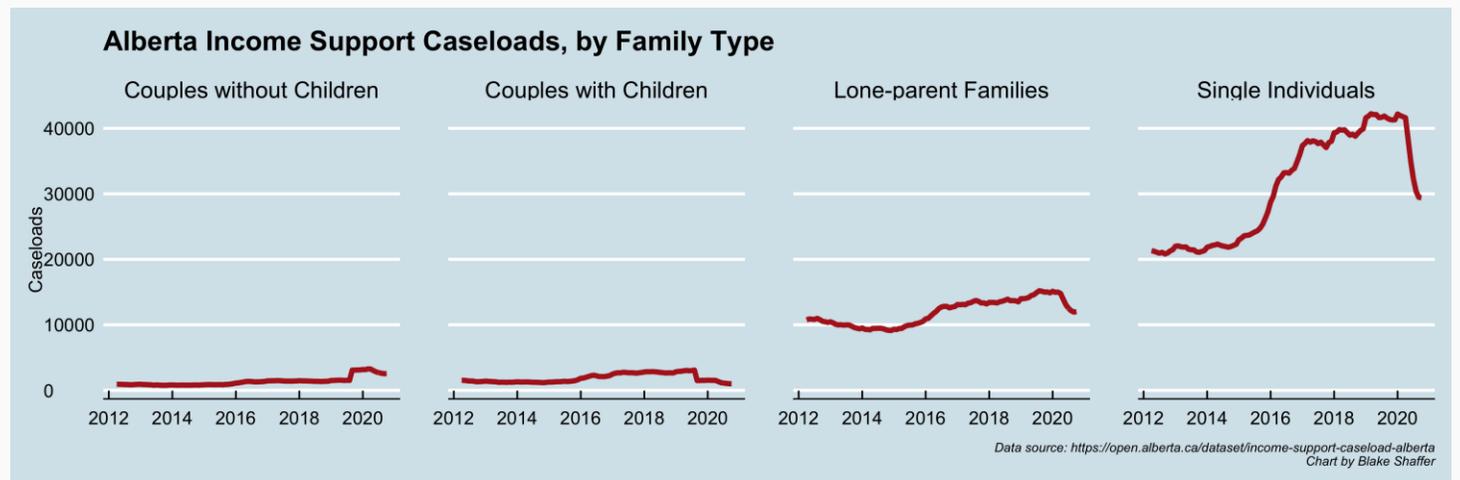
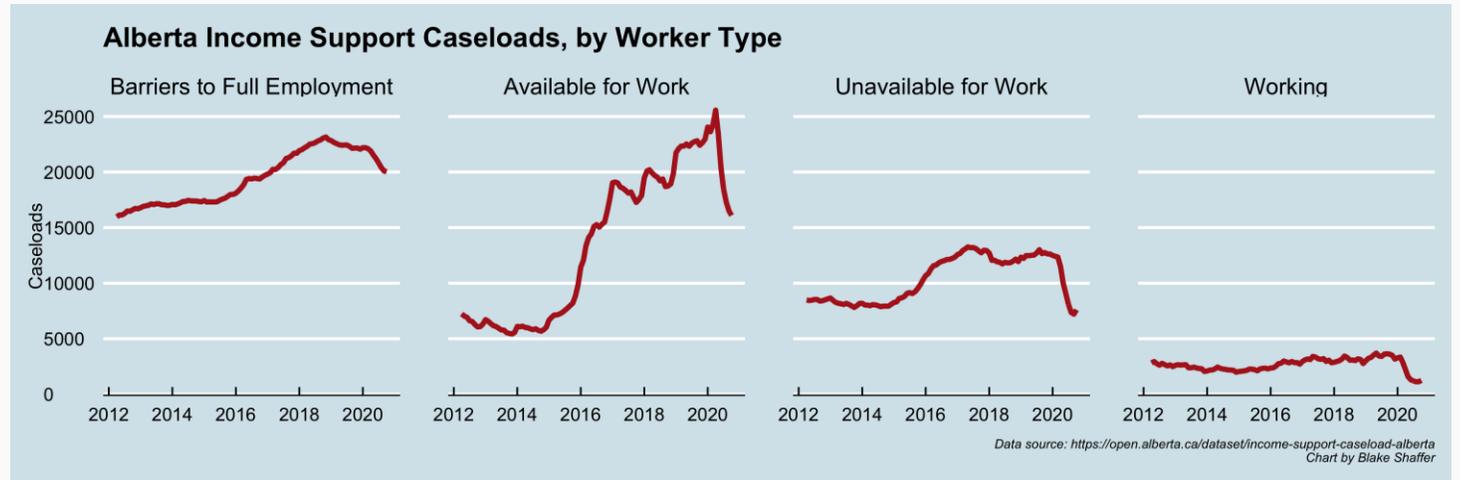
Chart: Robson Fletcher / CBC • Source: Calgary Civic Census



More Bad

Income support caseloads on the rise.

(2020 drop likely due to CERB crowding out provincial supports)



The Ugly

A wide, flat beach at low tide, showing intricate sand patterns and ripples. The sky is blue with scattered clouds. The beach extends to the horizon under a clear sky.

“It’s only when the tide goes out that we see who’s been swimming naked.”

- Warren Buffett

The Ugly

- Property tax defaults
- Growing orphan well inventory

ECONOMY

Tax debt owed from oil and gas companies to Alberta towns has more than doubled

BY BOB WEBER - THE CANADIAN PRESS

Posted January 20, 2020 11:28 am

Business - CBC Investigates

Alberta's looming multibillion-dollar orphan wells problem prompts auditor general probe



There are 3,406 deserted oil and gas wells in the province, with growing concern about more joining the list

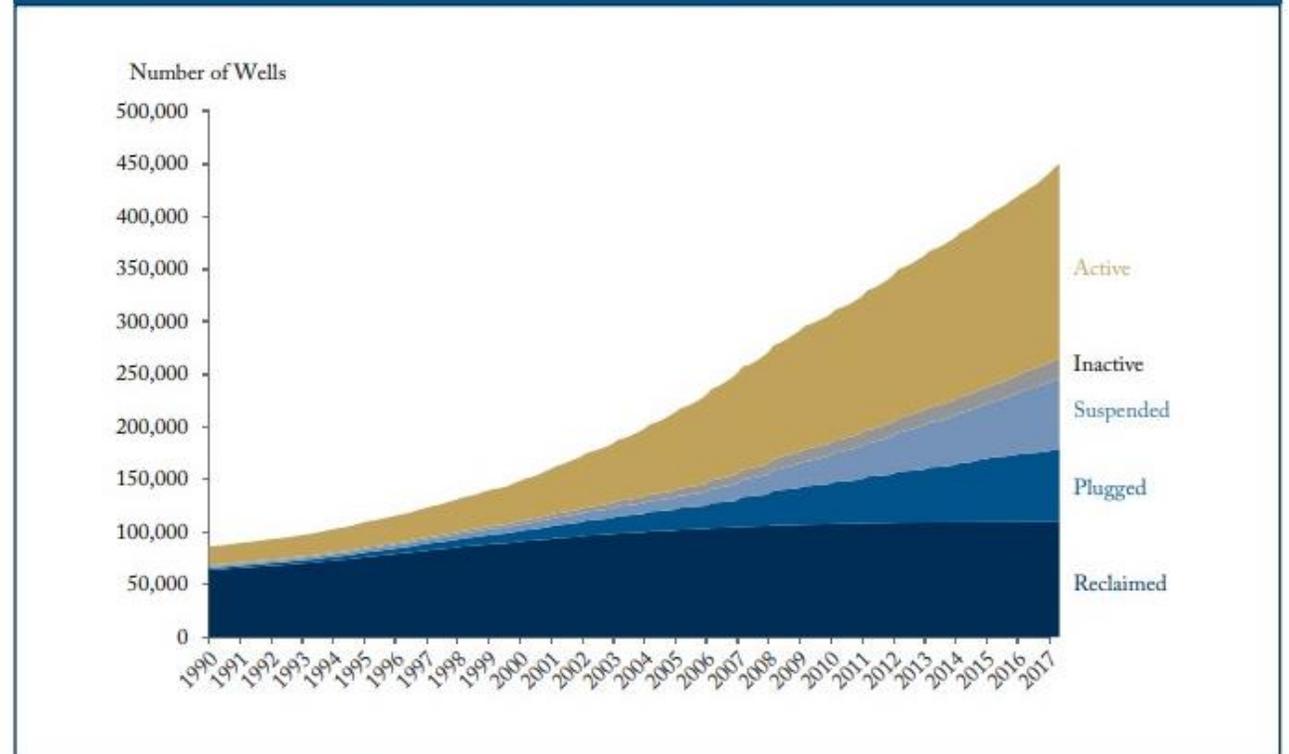


Inayat Singh - CBC News - Posted: Jan 23, 2020 4:00 AM ET | Last Updated: January 23

Uglier...

- Over **150,000** inactive, suspended and plugged (but not yet reclaimed) oil and gas wells
- Cost to remediate ~ \$50,000 to 400,000 each

Figure 2: Wells by Status in Alberta (January 1990 to May 2017)



Source: Authors' calculations using AER data.

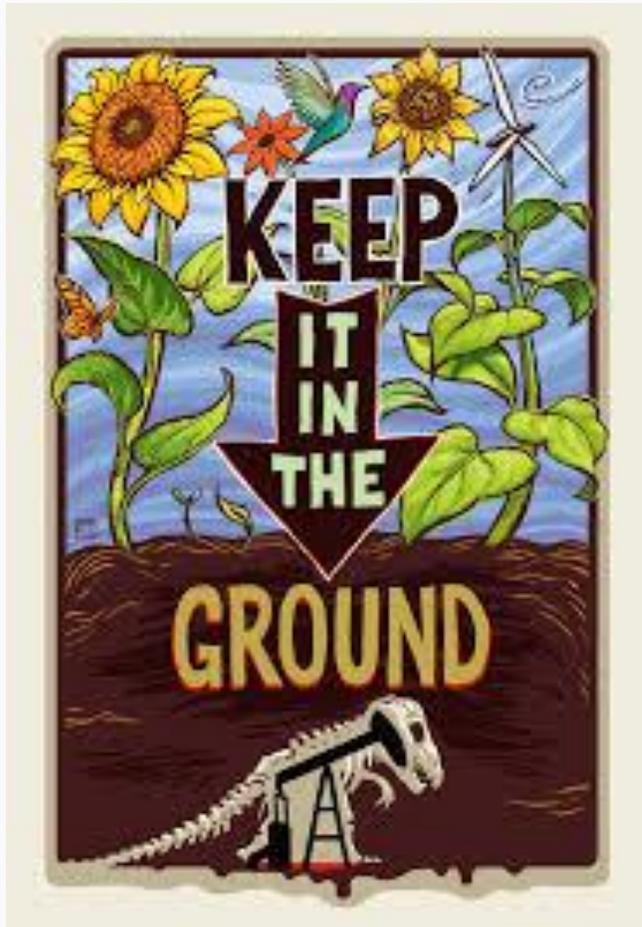
Even uglier...

- Over 1.3 trillion litres of tailings from oil sands mining
- (Official) estimated clean up cost of \$31 billion
- Current security held of \$1 billion



So where do we go from here?

Can we get past the polarized debate?



Where do we go from here?

Step 1: Get a handle on looming end-of-life liabilities

- Consider security requirements for new wells
- Stricter requirements for license transfers
- Fed \$ for clean-up program

Step 2: Improve emission intensity of existing O&G

- Even in a 2°C world, *some* new O&G supply will be needed
- Suppliers of choice will be **low cost** and **low carbon**

Step 3: Position for the *future!*

Positioning for the future

“Mission-based” innovation (vs diffusion-based innovation)

- Oil sands are their own lesson (AOSTRA and original government involvement in oil sands development)
- Government support for outcomes (not technologies)
- Build on areas of strength (core competencies)

Positioning for the future

Rare earth potential?

- Will battery material be increasingly scarce? Increasingly valuable?
- Potential for lithium and other rare earth metals in Alberta
- Finding value in the tailings

OPINION

Alberta has a rare rare-earth opportunity on its hands – if it chooses to seize it

SARA HASTINGS-SIMON

CONTRIBUTED TO THE GLOBE AND MAIL

PUBLISHED JANUARY 22, 2020

TRENDING

1 Alberta mulls deep cuts to

Positioning for the future

A hydrogen future?

- Oil sands potentially large source of hydrogen
- Lower cost than electrolysis
- Hydrogen applications:
 - Inject into NG stream to reduce emission intensity
 - Direct use (e.g. in transportation)
 - Electricity generation
 - Storable
- Requires forward-thinking: new building codes for pipelines *today*

Ready for questions!

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