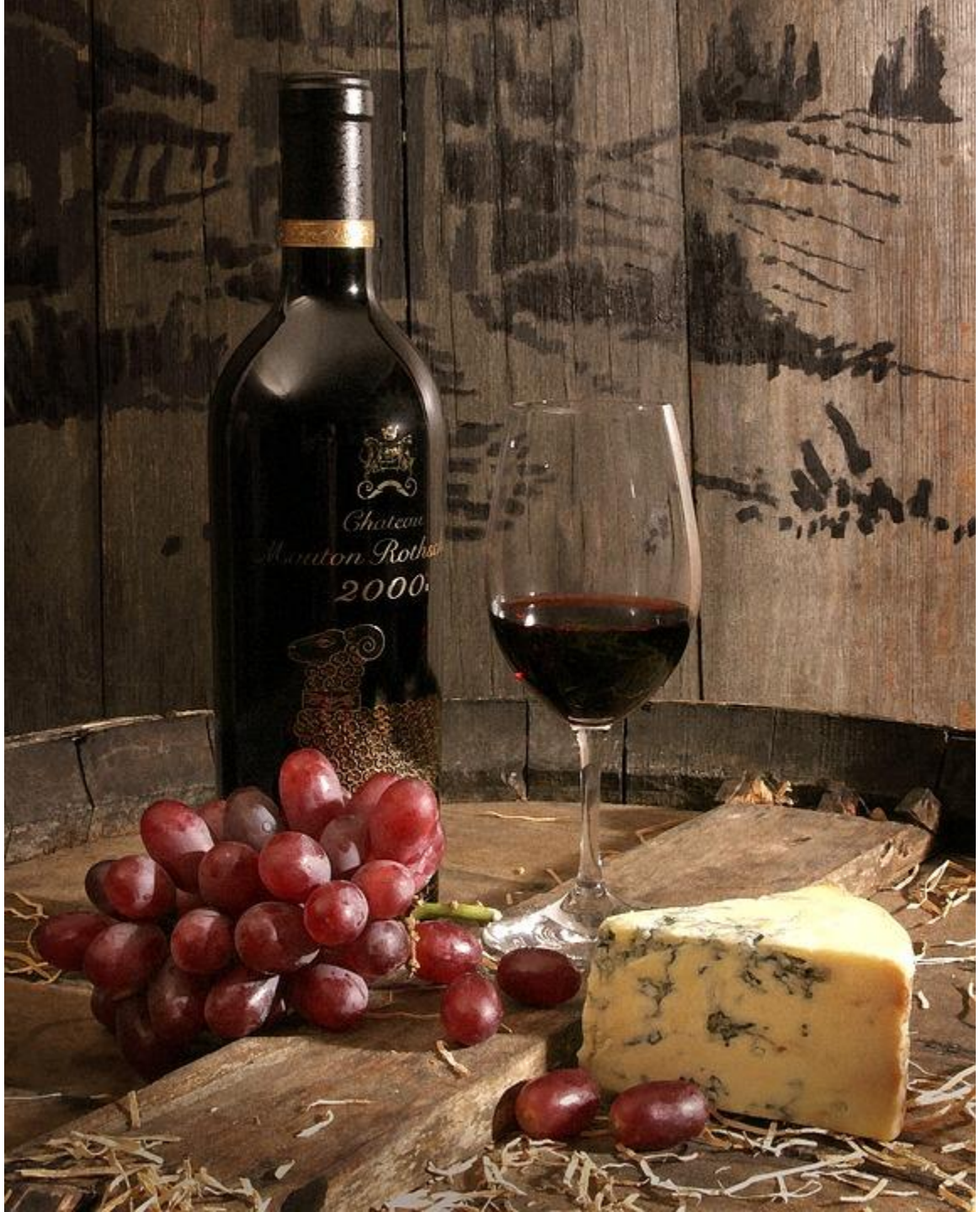
FINE WINE



PATHWAYS:
THE C8 REPORT

Can Canada & Canadians Conquer the Climate Change Challenge?

A Report of the Canadian Association for the Club of Rome - CACOR

UNITS ARE MEGATONNES = 1 million kilograms				
SECTOR: ACTION REQUIRED	**2005**	**2019**	**2030**	**2050**
129_BUSINESS AS USUAL SCENARIO	705.3	699.6	676.6	718.0
130_ELECTRIFIED RESIDENTIAL	705.3	699.5	657.8	674.8
131_ELECTRIFIED COMMERCIAL	705.3	699.5	626.4	639.6
132_ELECTRIFIED INDUSTRIAL NON FUEL	705.3	699.5	619.8	605.1
133_ELECTRIFIED TRANSPORTATION	705.3	698.0	550.4	476.1
134_CLEAN GRID	705.3	701.3	510.0	430.9
TARGET 2030 {Minus from 2005}			493.7	
135_PHASE OUT OILSANDS 2050	705.3	701.3	467.8	334.1
136_PHASE OUT NG PRODUCTION 2050	705.3	701.3	467.8	269.2
137_REDUCED IMMIGRATION 1	705.3	694.8	454.9	255.2
138_REDUCED IMMIGRATION 2	705.3	691.5	448.4	248.1
TARGET 2050 {minus 80% from 2005}				141.06

ICELAND’S Carbon Capture Machine

ICELAND'S Carbon Capture Machine

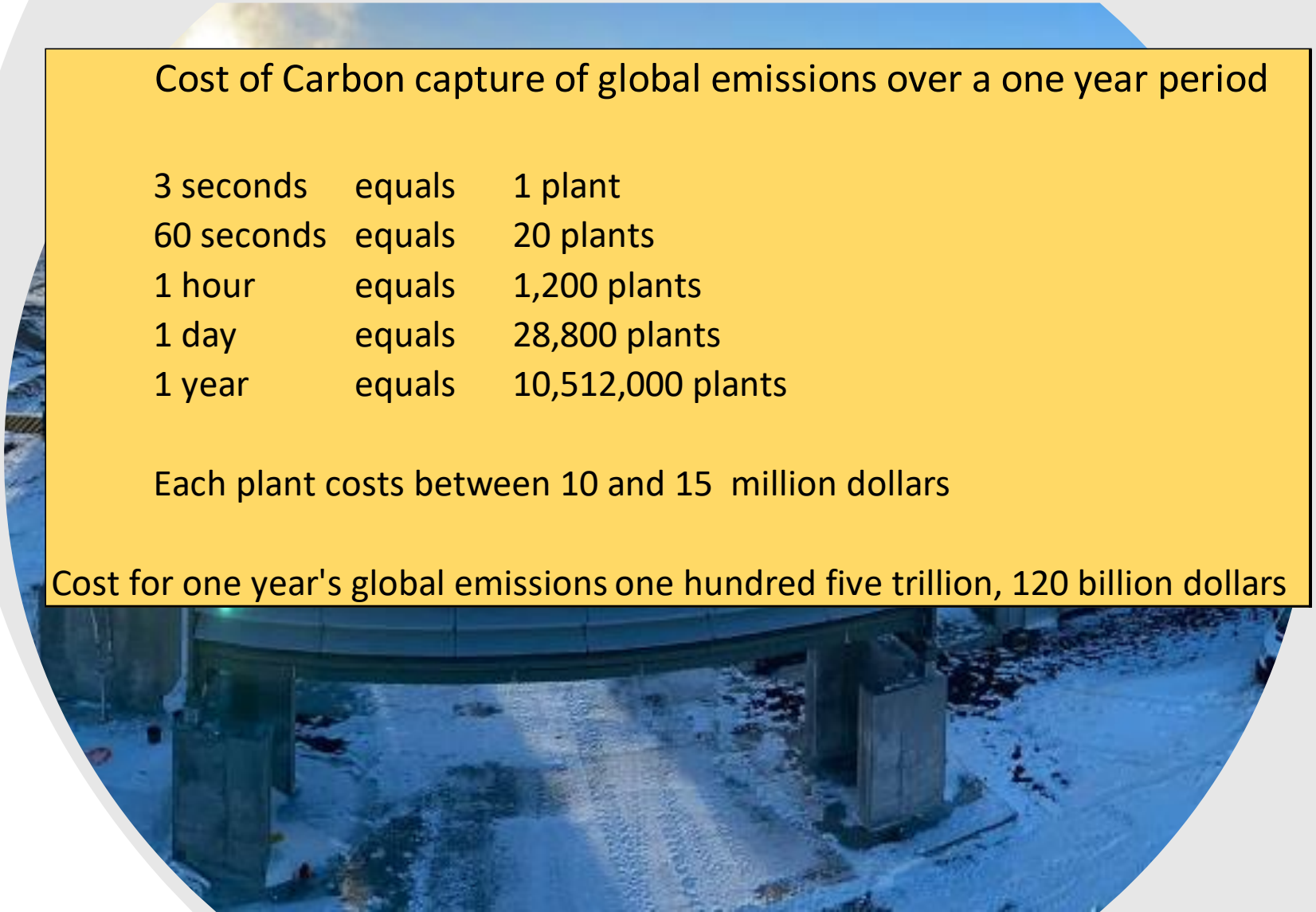
WILL CAPTURE 800 CAR'S EMISSIONS That's 500 Tons!

ICELAND’S Carbon Capture Machine

The world's biggest carbon-removal plant just opened. In a year, it'll negate just 3 seconds' worth of global emissions.

ICELAND'S Carbon Capture Machine

The world's biggest carbon-removal plant just opened. In a year, it'll negate just 3 seconds' worth of global emissions.



Cost of Carbon capture of global emissions over a one year period

3 seconds	equals	1 plant
60 seconds	equals	20 plants
1 hour	equals	1,200 plants
1 day	equals	28,800 plants
1 year	equals	10,512,000 plants

Each plant costs between 10 and 15 million dollars

Cost for one year's global emissions one hundred five trillion, 120 billion dollars

What Germany Can Teach the US About Quitting Coal

While the Trump administration has tried to revive the dying coal industry, the German government set an exit date and made a plan to help coal communities survive.

By Dan Gearino

October 15, 2020

OPINION

Angela Merkel kept the EU from blowing up but left Germany vulnerable on the energy and industrial fronts

ERIC REGULY › EUROPEAN BUREAU CHIEF
ROME
PUBLISHED 2 DAYS AGO

But no German industry faces greater difficulties than the energy sector – another dismal legacy of Ms. Merkel.

She handed Germany's fleet of nuclear plants a death sentence after Japan's Fukushima nuclear disaster in 2011.

At the same time, coal-fired plants were to be phased out because they were incompatible with the net-zero goals. That meant renewable energy – wind and solar – would have to come on strong to fill the gap.

The plan failed. Germany and the rest of Europe now find themselves in a genuine energy crisis, as prices for natural gas and electricity set records virtually every day.

Gas supplies are short, and the North Sea, where much of Europe's offshore wind power is generated, has been unusually windless this year.

On a normal day, Germany gets 30 per cent of its electricity from wind; recently it has been about 10 per cent.

Germany is ramping up its coal plants to make up for the shortfall, and the country's fossil-fuel emissions are soaring.

In the first half of the year alone, emissions from electricity generation were up 28 per cent, and the second half may see an even steeper rise.

That's a bad look to take to the COP26 climate summit in Glasgow in November.

Targets have been set simply in terms of policy prescriptions, in the absence of understanding of physically coherent pathways from current high-emitting activities to those that would be low or non-emitting.

Without such understanding:

- **it is not possible to know what progress is being made along the way.**
- **Milestones cannot be set and used to assess the effectiveness of policies and programs in a timely manner.**
  - **By the time it becomes clear that a target will be missed, it is too late to adjust policies and programs to recover.**

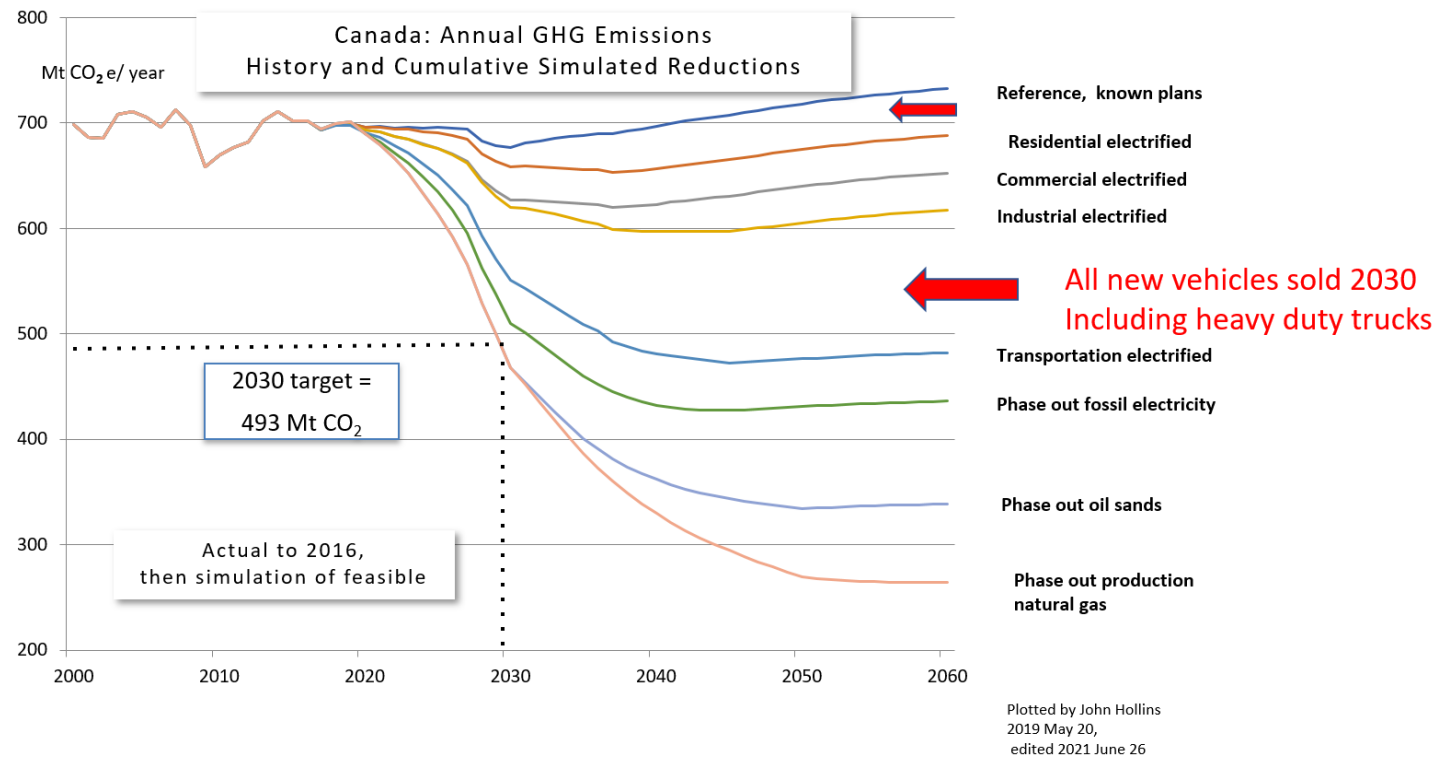
CACOR's Pathways Study

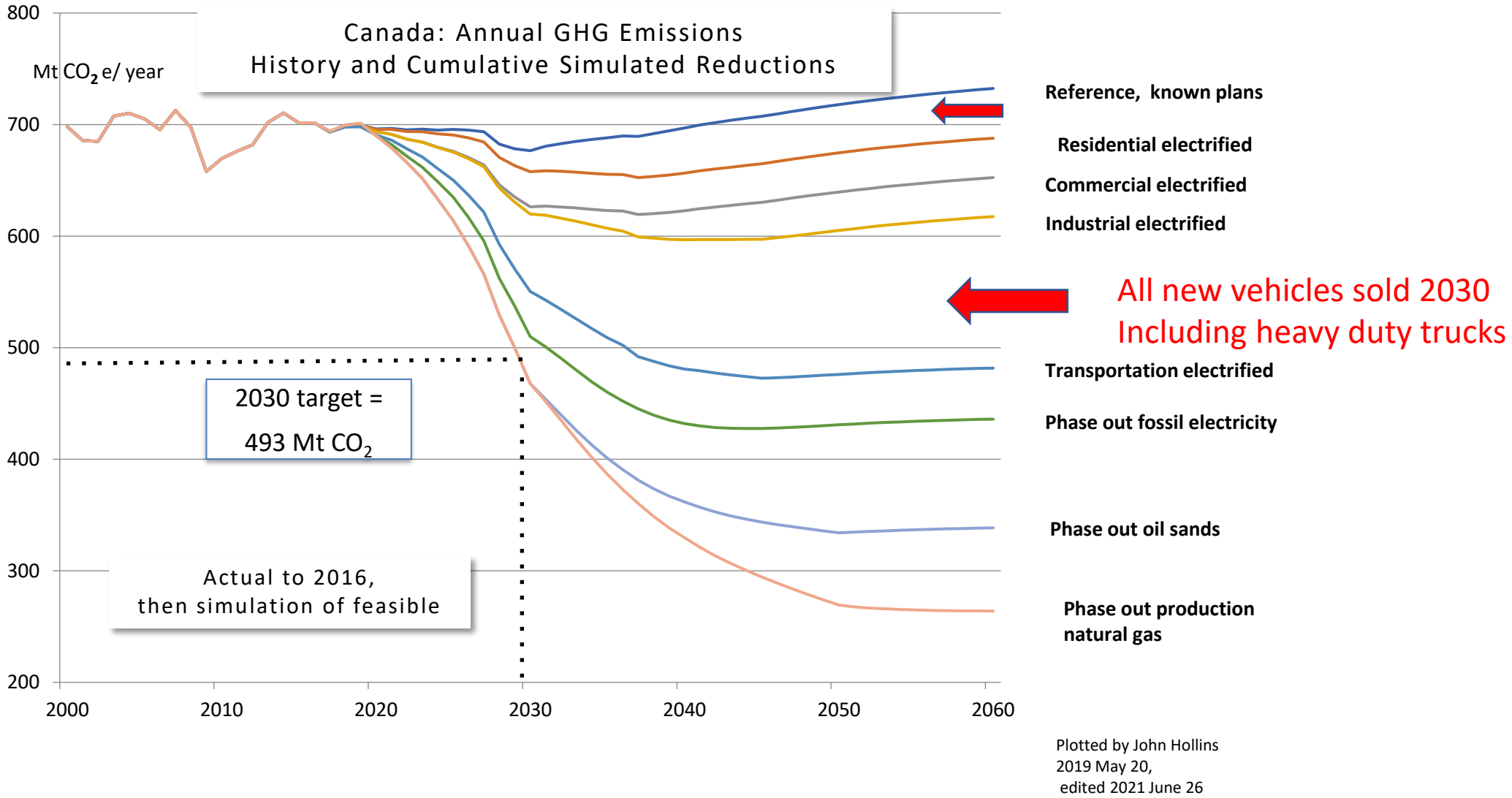
Canada's greenhouse gases

How to set targets and then hit them

Use a technologically coherent simulation model

FINDINGS


Canada: Annual GHG Emissions
History and Cumulative Simulated Reductions
Mt CO_2e/ year
800
700
600
500
400
300
200
2000
2010
2020
2030
2040
2050
2060
2030 target =
493 Mt CO_2
Actual to 2016,
then simulation of feasible
Reference, known plans
Residential electrified
Commercial electrified
Industrial electrified
All new vehicles sold 2030
Including heavy duty trucks
Transportation electrified
Phase out fossil electricity
Phase out oil sands
Phase out production
natural gas
Plotted by John Hollins
2019 May 20,
edited 2021 June 26



Plotted by John Hollins
2019 May 20,
edited 2021 June 26

Observations and Conclusions

1. Canadian policy has repeatedly failed to meet emission targets for GHGs and is on track to continue to do so.

Observations and Conclusions

2. Canadian policy is based on the illusion that targets for reductions in GHG emissions set for dates decades into the future can be met primarily by incentivizing citizens and businesses to take the actions needed and that such actions can be financed by private investors and commercial lenders.

Observations and Conclusions

3. A new approach is needed, one that engages all stakeholders in committing to biophysically and technologically coherent pathways with detailed, regular milestones against which progress can be monitored and policies adapted as need be.

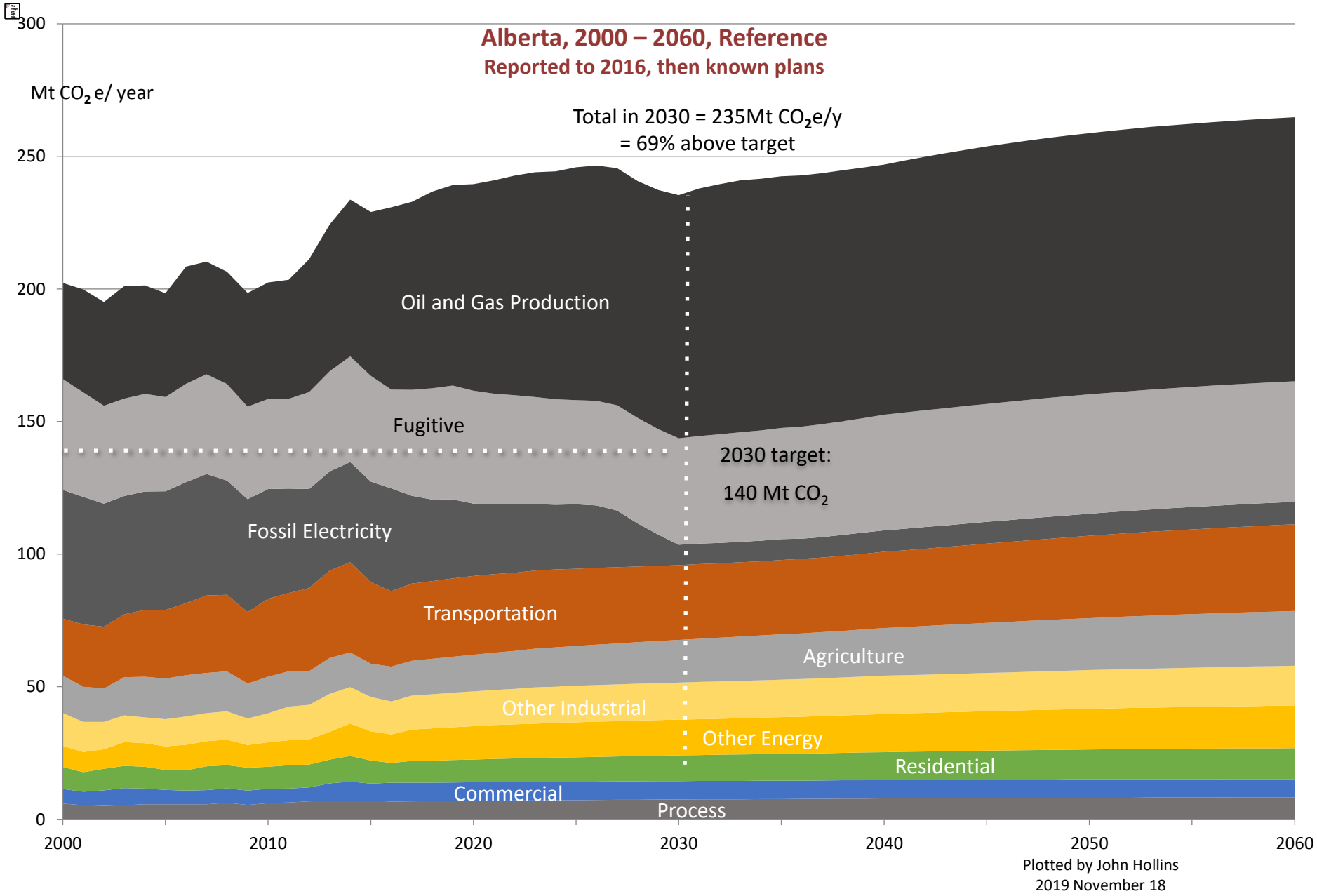
Observations and Conclusions

4. Canada will never be able to meet its commitments as long as it continues to produce huge quantities of oil and gas. It simply does not add up.

Observations and Conclusions

5. To support a new approach, there is a need for an arms-length-from-government agency mandated to collect data and develop exploratory simulation models and make them freely accessible to all stakeholders.

Why do we say Canada will not reach targets


Alberta, 2000 – 2060, Reference
Reported to 2016, then known plans
Mt CO_2 e/ year
Total in 2030 = 235Mt CO_2e/y
= 69% above target
300
250
200
150
100
50
0
Oil and Gas Production
Fugitive
Fossil Electricity
2030 target:
140 Mt CO_2
Transportation
Agriculture
Other Industrial
Other Energy
Residential
Commercial
Process
2000
2010
2020
2030
2040
2050
2060
Plotted by John Hollins
2019 November 18

Targets have been set simply in terms of policy prescriptions, in the absence of understanding of **physically coherent pathways from current high-emitting** activities to those that would be low or non-emitting.

Without such understanding:

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A Few Thoughts About Where Next

- It is about changing paths of social and economic development.
- It involves the entire economy, the extraction and processing of primary resources,
  manufacturing, commerce, trade, and the behaviour of consumers.
- The emissions of the national economy are embedded in stocks of plant and equipment,
  buildings and consumer goods in which substantial investments have been made.

A Few Thoughts About Where Next

- Unless the infrastructure crosses provincial boundaries (Federal) we will need every **province** and municipality planning the vast changes
- Federal government can provide incentives, grants, remove tax subsides, impose carbon prices and appropriate national regulations
- We need to connect with many people and organizations to get the message out
- We need a team of CACOR people to link with multiple organizations to get our report read and to ask people to incessantly bug their MPs, MLAs and Municipal Governments
- We need a team prepared to meet with MPs, civil servants and to organize it

A Few Thoughts About Where Next

- Former Senator Murray commends groups of people on Sept 30, the new national day to honour reconciliation with indigenous people to read portions of the TRC report together and discuss recommendations- that would also be a good start for all of us -
- Read the Pathways Report in detail – Gather some friends, begin your own education process within your networks
- Join any opportunities CACOR announces for focused government advocacy work
- Imagine if someone of us could convince CARP that our CACOR work and reports is important reading and offers opportunities for engagement among their 1000s of members to do something for their grandchildren .

A Few Thoughts About Where Next

- **Back to Madam Chair**
- **Thank you.**