



Still Minding the Gap: An Assessment of Canada's GHG Aspirations after Paris

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Canada's GHG Aspirations

With the 21st Conference of the Parties behind us,

- New provincial announcements and a new outward facing federal government.
- New federal, provincial and territorial working groups.
- A good time to take stock of our greenhouse gas (GHG) emissions trajectories.

What all the promises may deliver on the way to achieving Canada's 2020 and 2030 GHG aspirations?

What about deep decarbonization aligned with this 1.5dC science target?

Use an integrated CGE model GEEM to forecast long-term economic growth, emissions and carbon policy effectiveness to 2030.

- Variants of the model used by the Governments of BC, AB, SK, ON, NFLD, NS and NB to conduct climate policy options analysis.

The Basis of the Assessment

Two economic and technology models to forecast emissions trajectories to 2030 under alternative oil price scenarios and then layer in:

1. A “no climate **policies case**”, where we simulate no GHG measures and allow the economy and emissions to grow unconstrained. Adopt NEB, 2016 energy price forecasts.
2. A “**current policies**” scenario reflecting carbon policies implemented prior to September 2015, similar to Environment Canada’s 2nd Biennial Report.
3. A “**developing policies**” scenario, reflecting recent firm announcements since September 2015.
4. A “**speculative policies, federal floor**” scenario, including plausible policies that have been publically supported by some jurisdictions, as well as a federal policy floor to smooth misaligned carbon policies between jurisdictions.

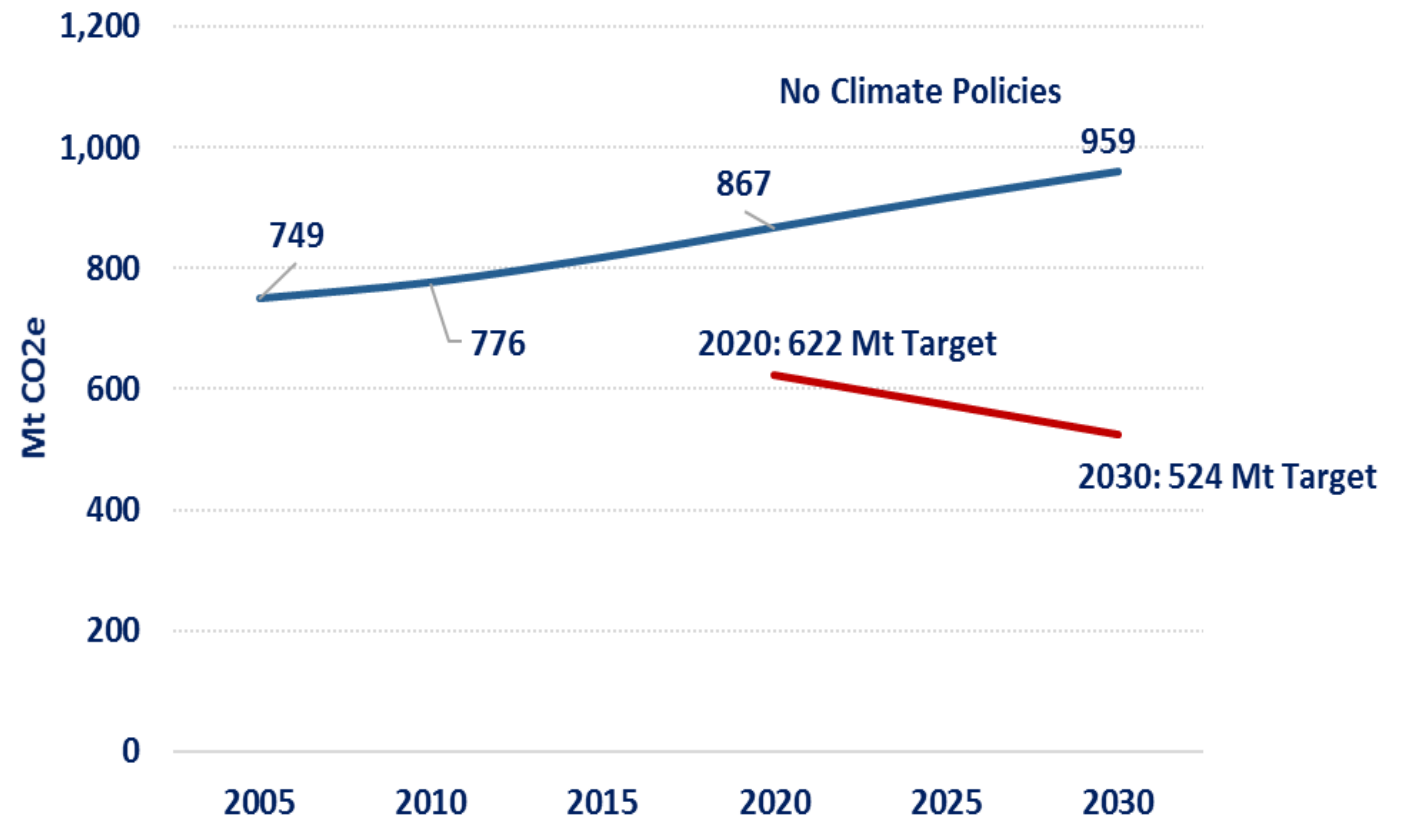
For each of these scenarios, we then assess progress towards Canada’s Nationally Determined Contribution of 30% below 2005 GHGs in 2030. We also assess the 2020 Copenhagen target along the way.

We also look at the impact of \$40 bbl oil.

No Policies Forecast

Absent carbon policies, Canada's emissions would have grown substantially to 2030.

Large possible gaps to 2020 and 2030 targets if no policies were implemented.

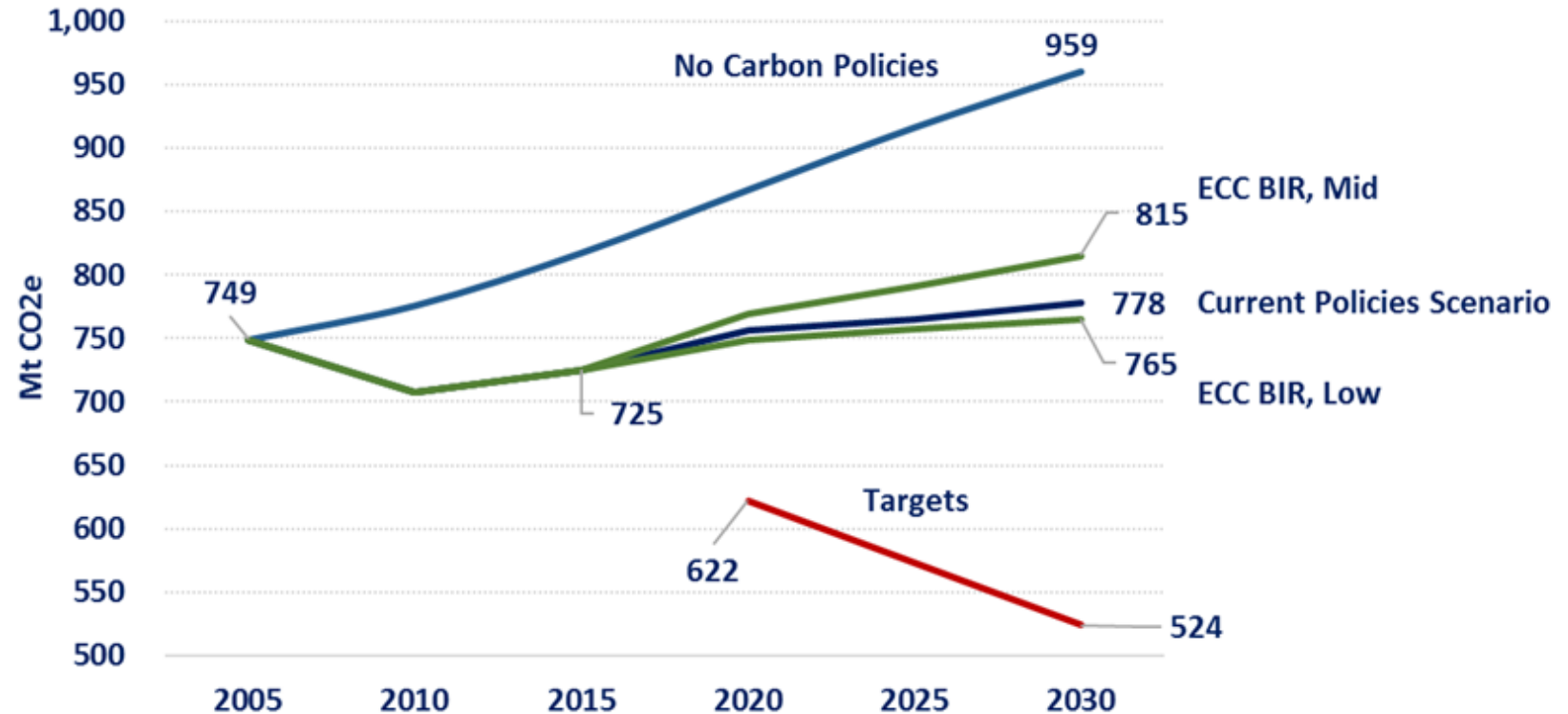


Current GHG Policies

Current and developing policies have a significant impact on Canada's GHG trajectory.

Current Policies:

- BC Ctax,
- AB SGER,
- SK Boundary Dam CCS,
- ON Coal ban,
- QC WCI,
- NS RPS,
- Federal coal generation regs and vehicle standards,
- Waste regs in provinces.



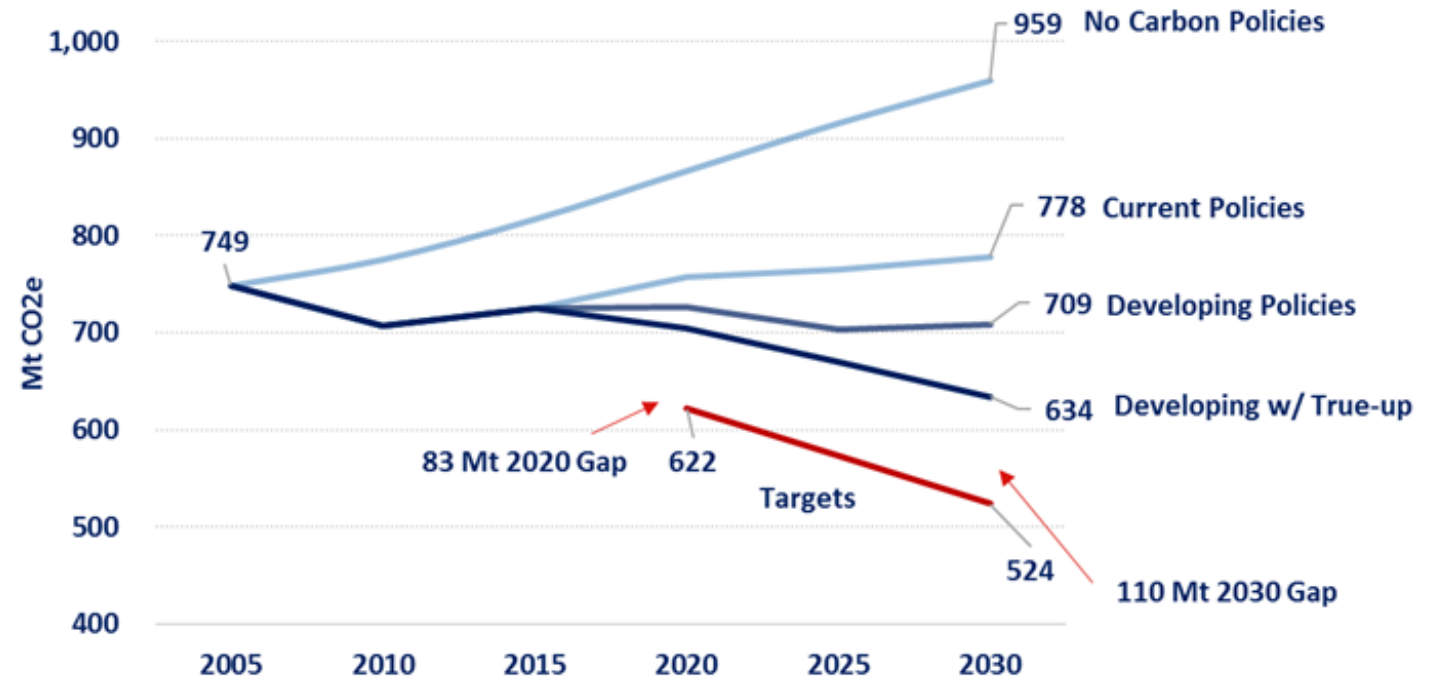
Current and Developing Policies

Current and developing policies have a significant impact on Canada's GHG trajectory.

Developing Policies:

- ON C&T
- AB Climate Leadership
- SK 50% renewable power
- Federal methane regulations for oil and gas (follows US, AB)

QC and ON True-Up: 22 to 25 Mt in 2020; 73 Mt in 2030



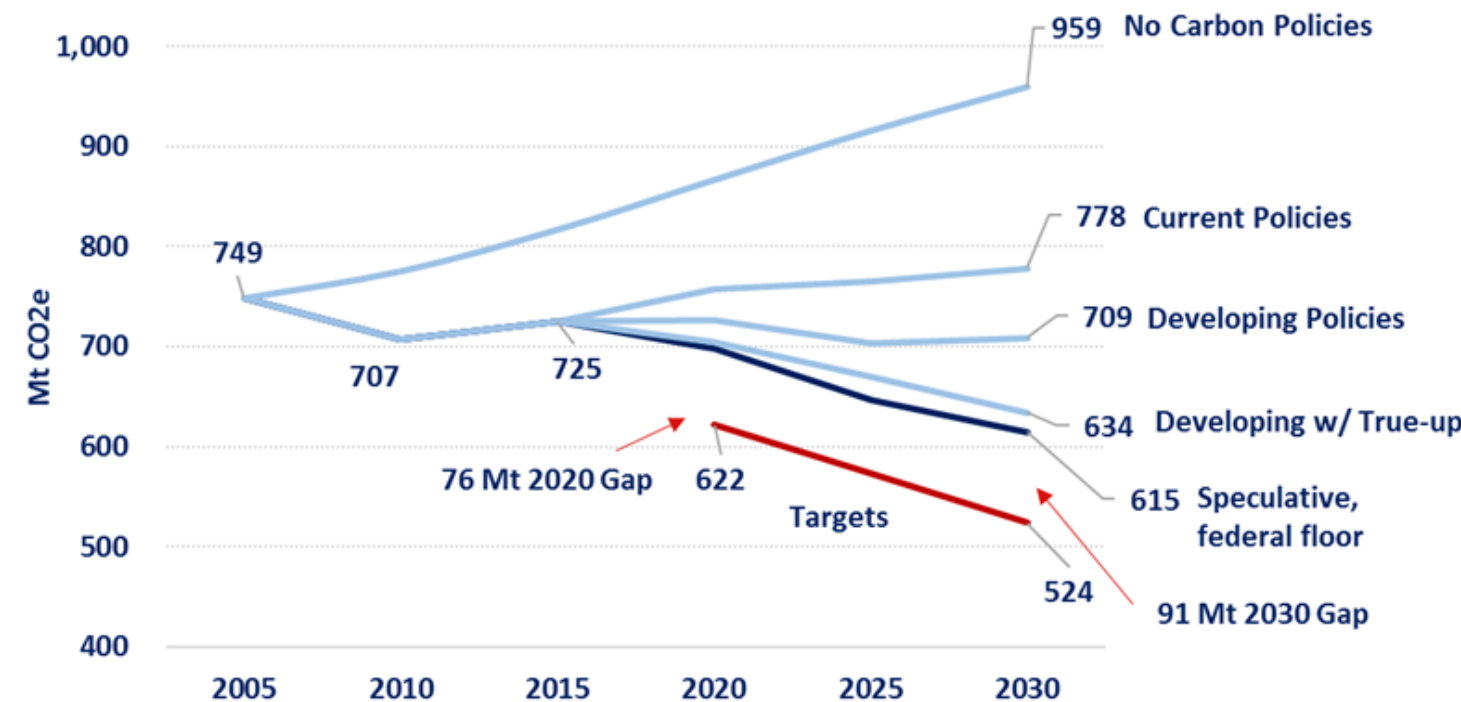
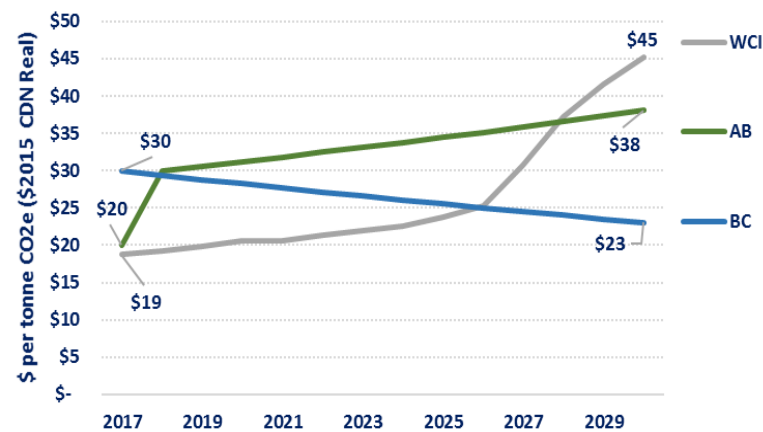
Proposed policies, federal floor

A national carbon price floor aligned with current policies is just that, a floor.

Proposed: MB C&T, CPrice Atlantic

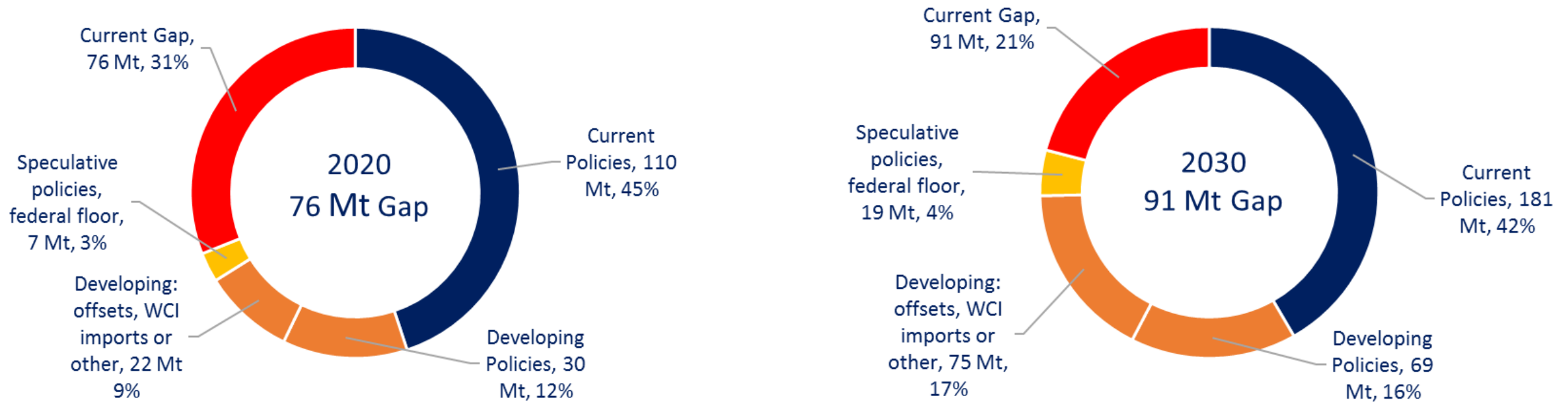
Federal floor: CPrice aligned with WCI

Adds SK, supersedes BC, AB after 2025 in our price forecast



Still Minding the Gap

Still a large gap in 2020 and 2030, high reliance on external WCI imports or compliance grade domestic offsets

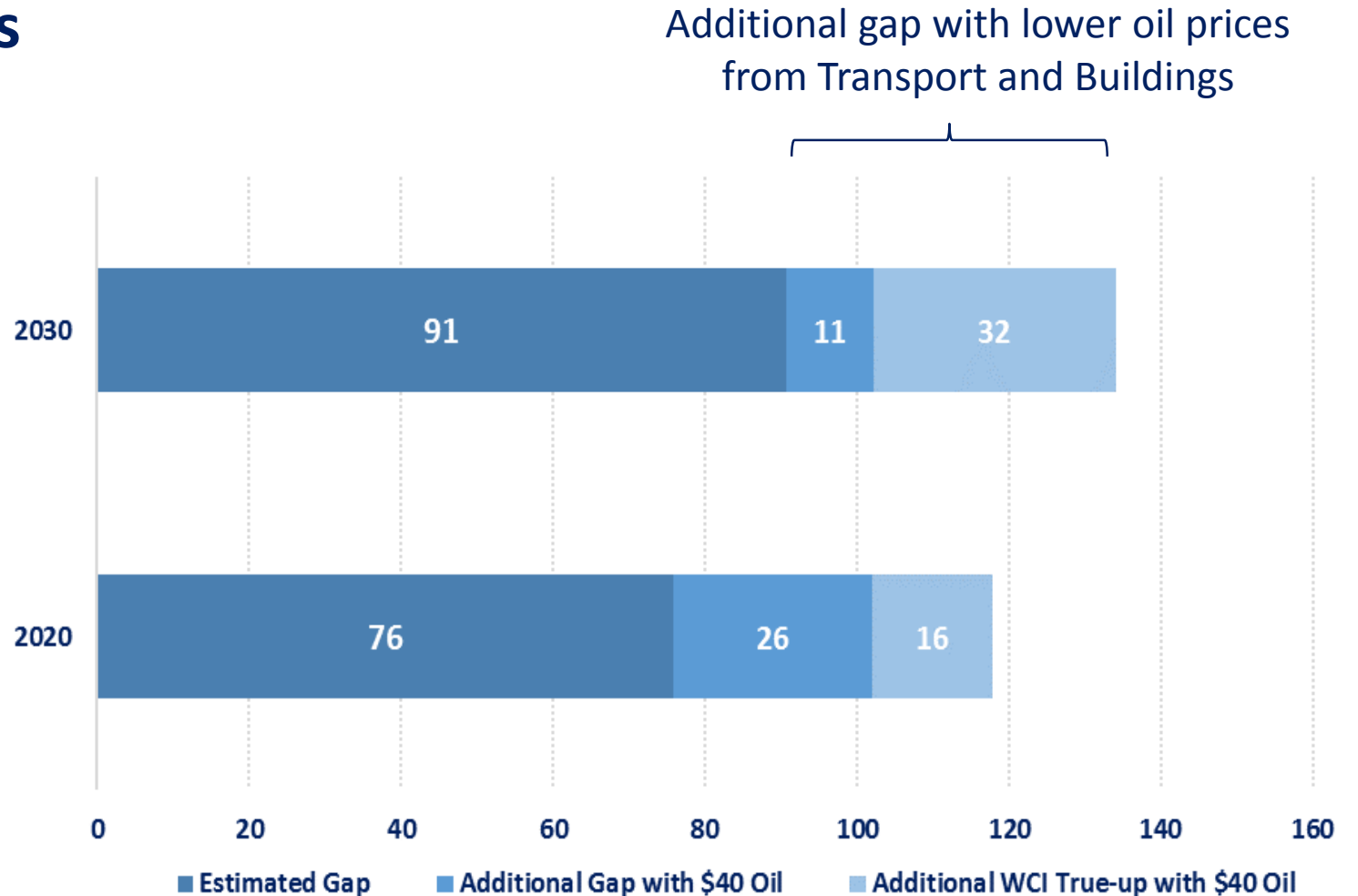


Carbon Policies and Oil Shocks

Nationally policy holes are revealed, with policy not covering transport and buildings.

AB Climate Leadership Plan and Federal methane rules dampen oil growth in high oil price scenario.

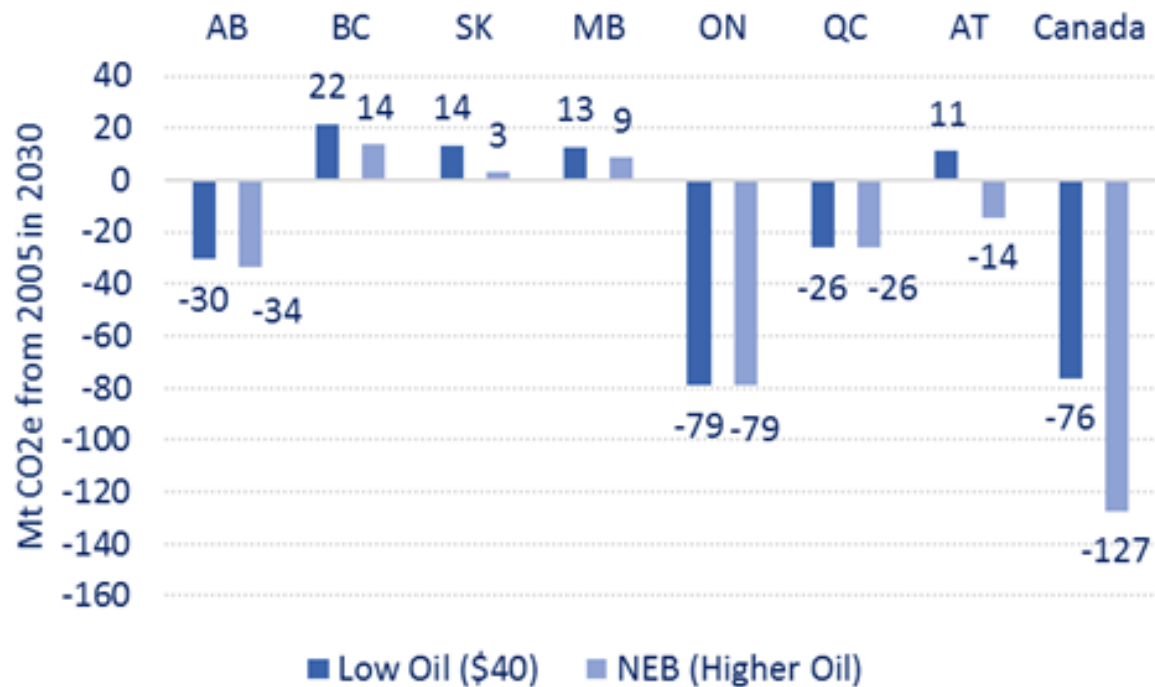
- With the oil prices we have modelled, any contraction in upstream oil and gas production is **more than** offset by an expansion in energy end-use emissions and *vice-versa*.
- Targets more sensitive to down side oil price, not necessarily upside as traditionally thought.



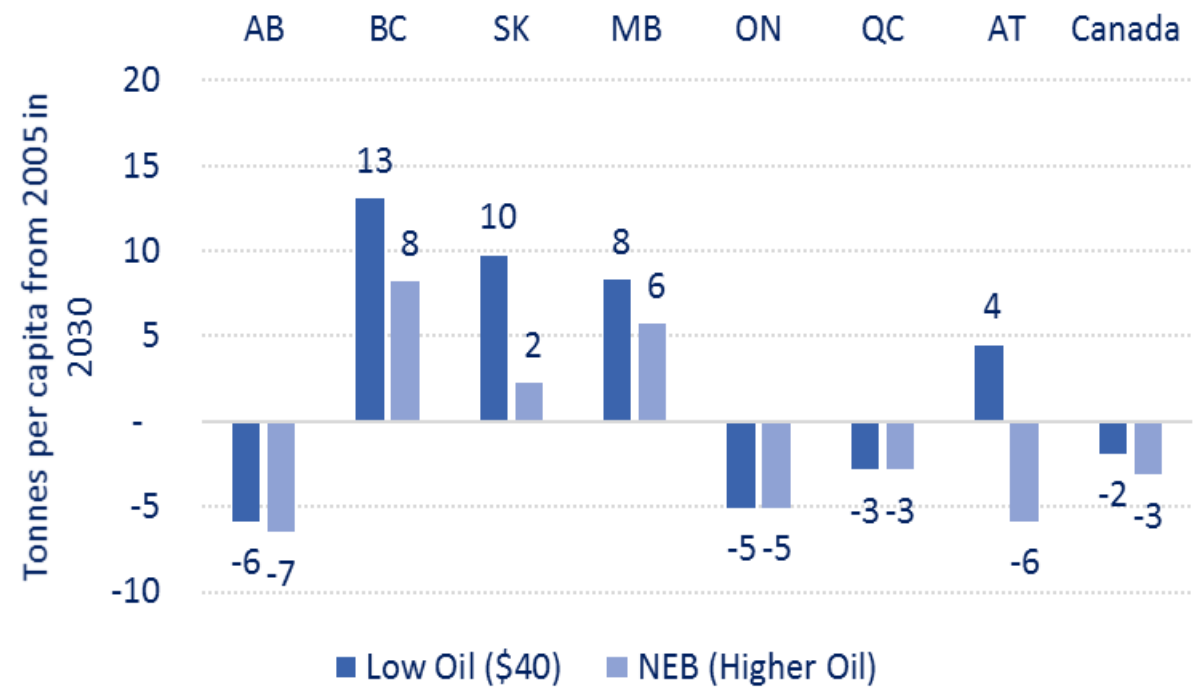
Carbon Policies and Oil Shocks (current and developing policies)

Holes in policy coverage in some jurisdictions are revealed by oil price shocks

Tonnes change from 2005 in 2030



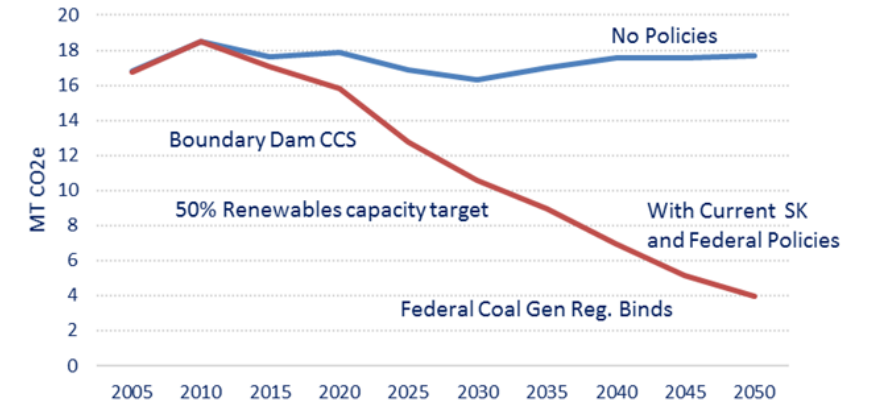
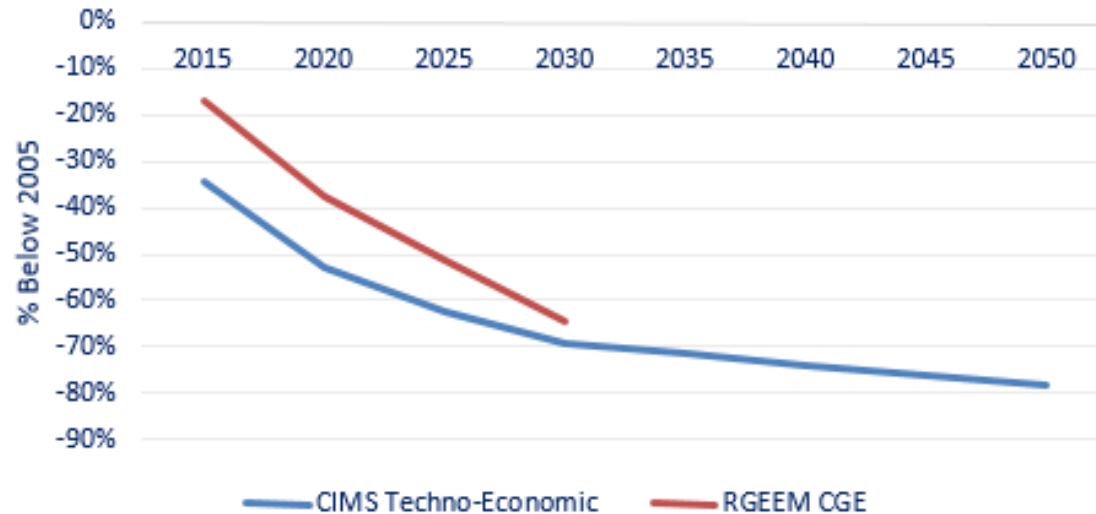
Tonnes per capita change from 2005 in 2030



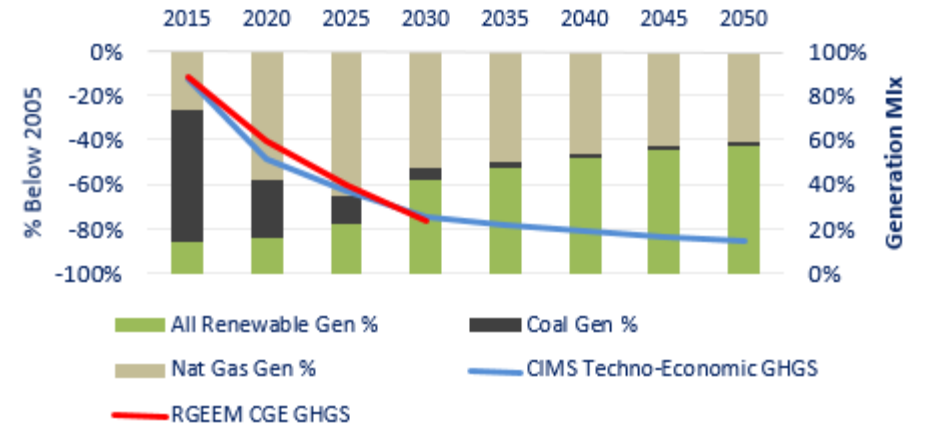
Electricity on 2dC Pathway of -80% from today?

Governments are making promises backed by policy, and not just expounding deep decarbonization targets divorced from action.

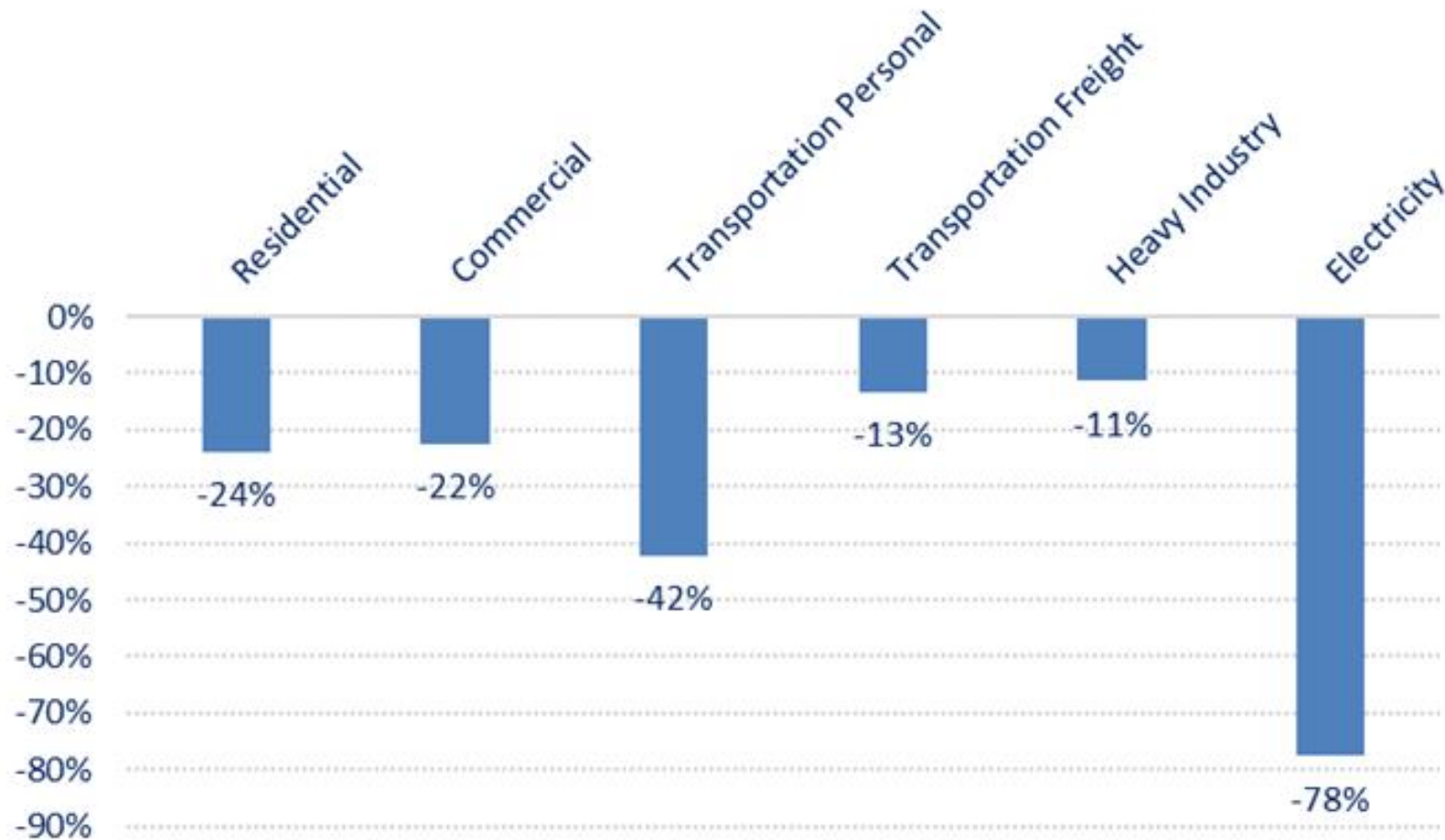
Canada's ELEC GHGs under Current and Developing Policies



AB ELEC GHGs and Generation Mix under Climate Leadership Policy

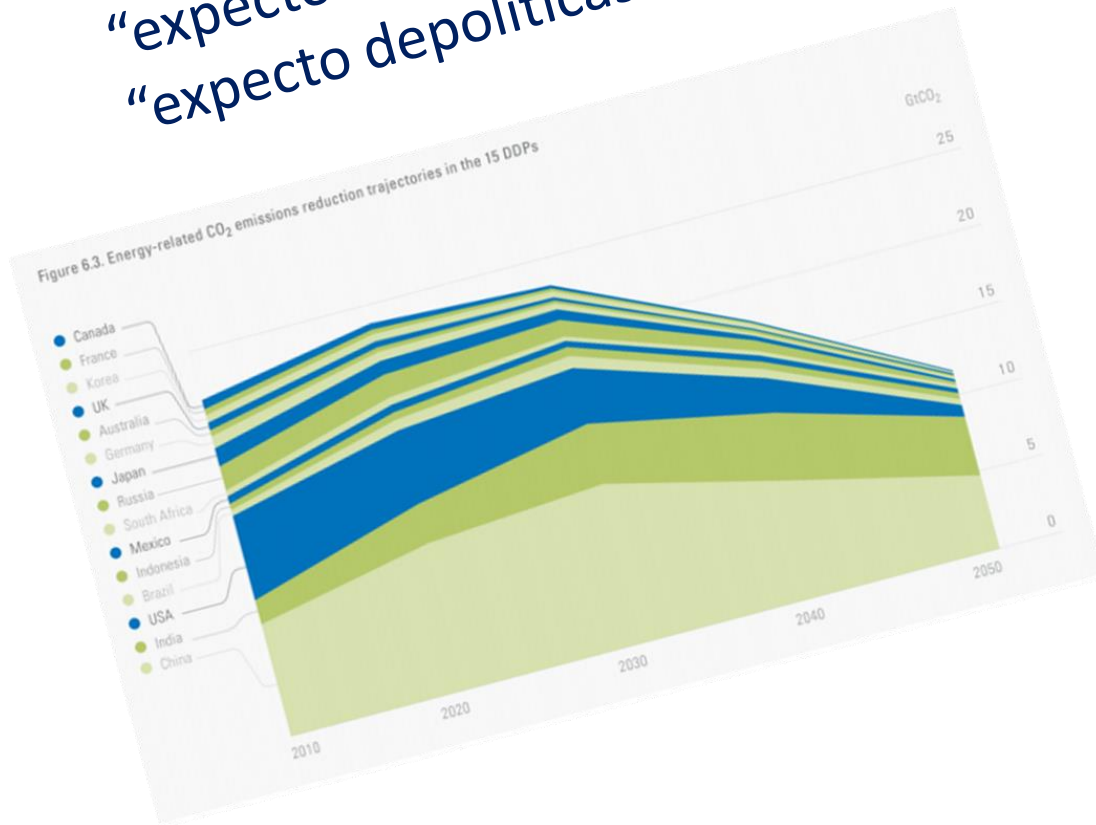


Change in GHGS from Today to 2050 with Current and Developing Policies: Sectors



DDP Warning

Harry Potter scenarios at work:
Wave magic wand and chant
“expecto decarbonis” and then
“expecto depoliticas”



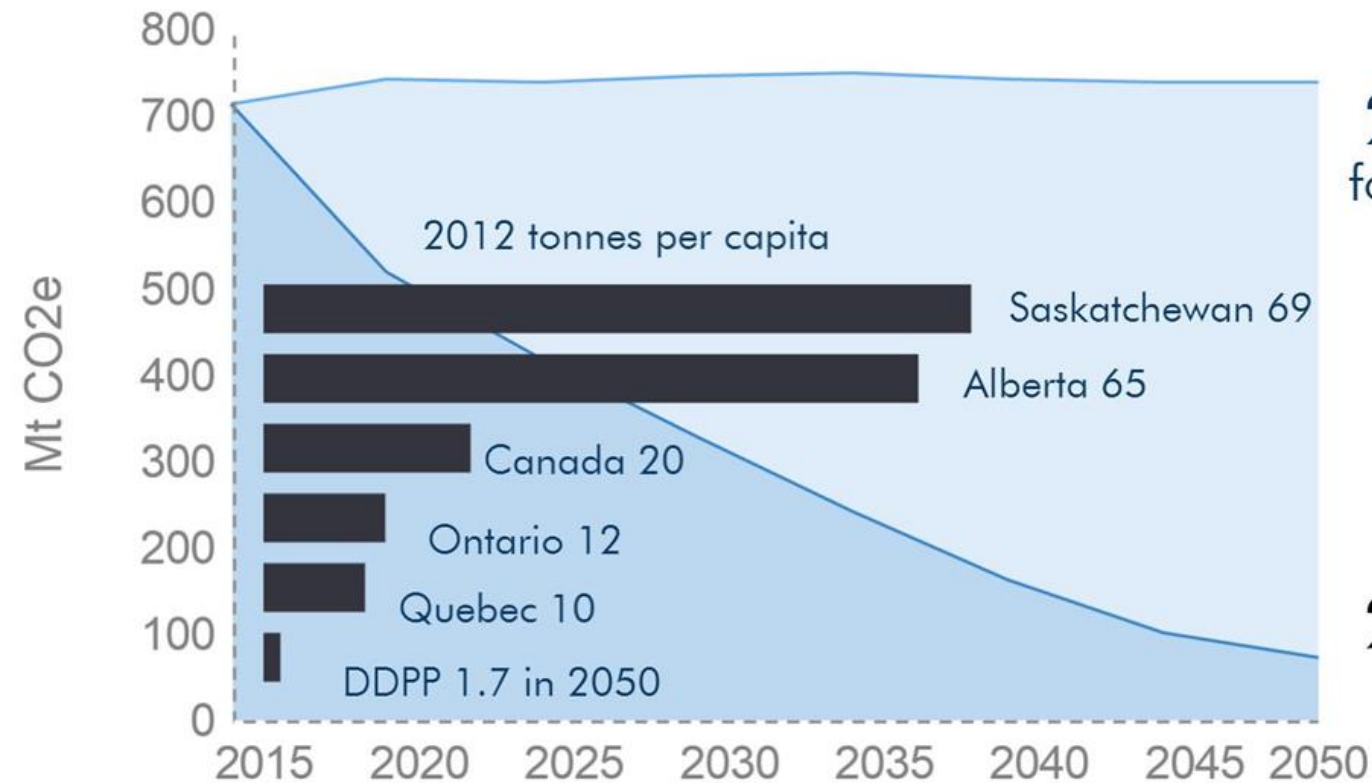
Deep Decarbonization Pathways Project

UN Sustainable Development Solutions Network

- 15 countries explore national deep decarbonization pathways,
- 70% global GHGs, 85% global economy, 90% Canada's trade
- With global prosperity, limit global temperatures to 2dC,
- 1.67 tonnes per capita by 2050 (global Co2 Budget to 2dC /population)

Canada's 2050 2dC Budget 🌍

Decarbonization pathway
to achieve global per
capita GHGs of 1.7 by
2050 across all countries



Oil price evolves to \$80 barrel

GHGs stabilize at 736 Mt

Per Capita GHGs 15 tonnes

Canada's 2dC budget 75 Mt

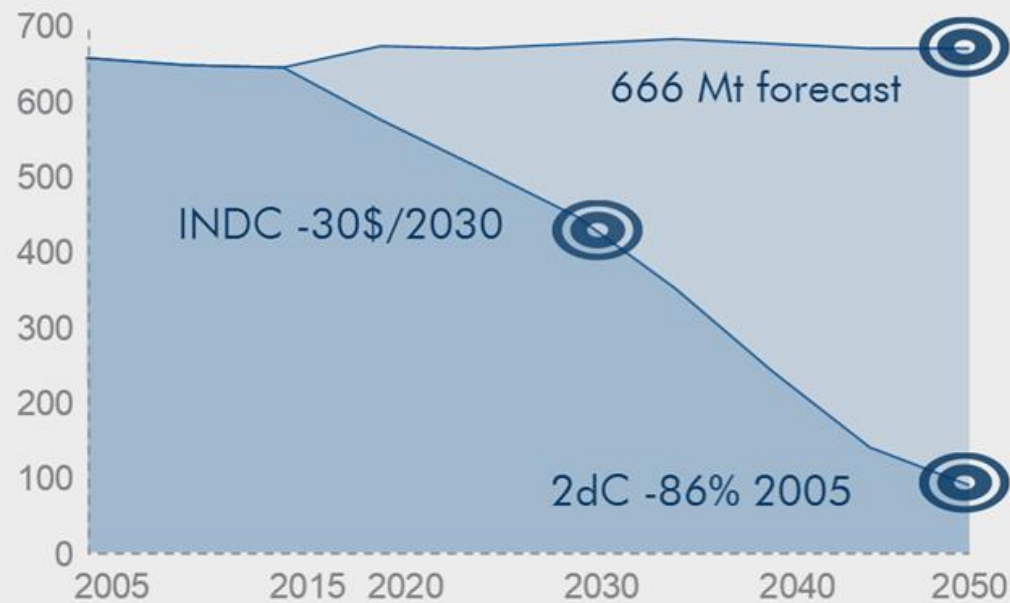
GHGs -88% below 2050

Per Capita GHGs 1.7 tonnes

Canada's INDC -30/2030

Consistent with a 2dC
Pathway 

A DDPP Canada Pathway to 2dC

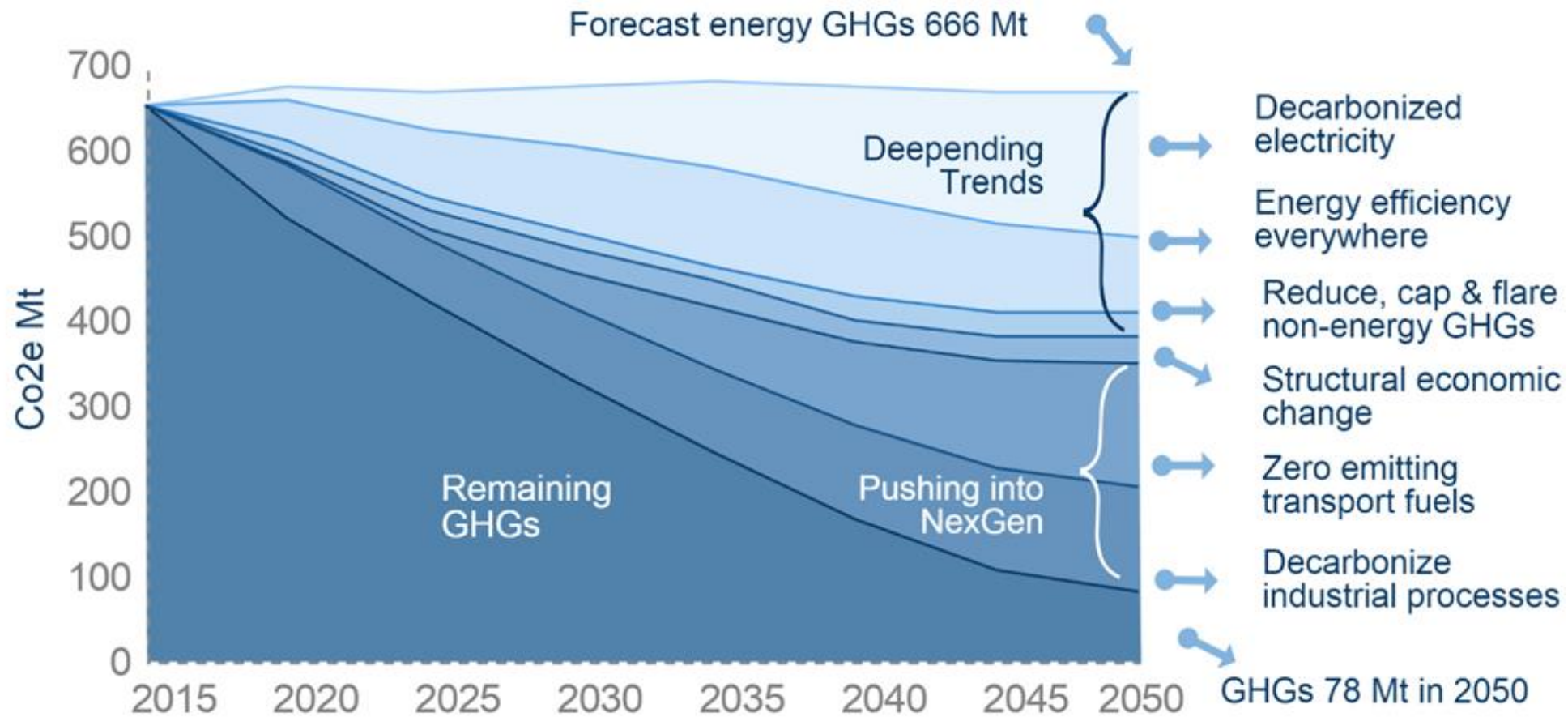


Forecast is 15.6 tonnes
per capita in 2050

Global DDPP 2dC
target is 1.7 tpc in 2050

Excludes LULUCF accounting and net land use emissions

Decarbonization Drivers | Canadian Decarbonization Pathways



Deep decarbonization opportunities

Deepening Current Trends



Household energy efficiency trends are deepening, reinforce these trends



Align commercial building and vehicle energy efficiency with households



Double down decarbonized electrification in all end-uses

Next Gen Technology Gap

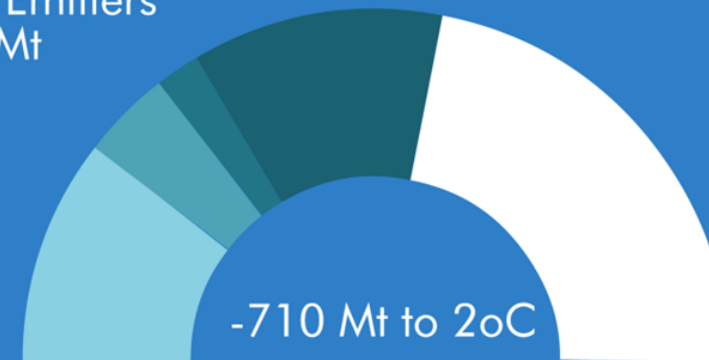
Heavy reliance on carbon capture and storage (CCS)

2nd generation biofuels transportation, 162 Mt

Industrial Emitters CCS, 25 Mt

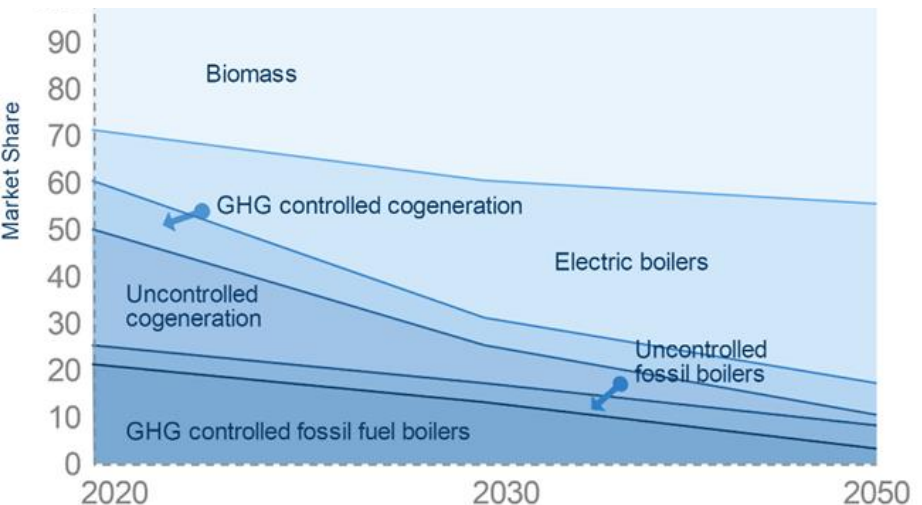
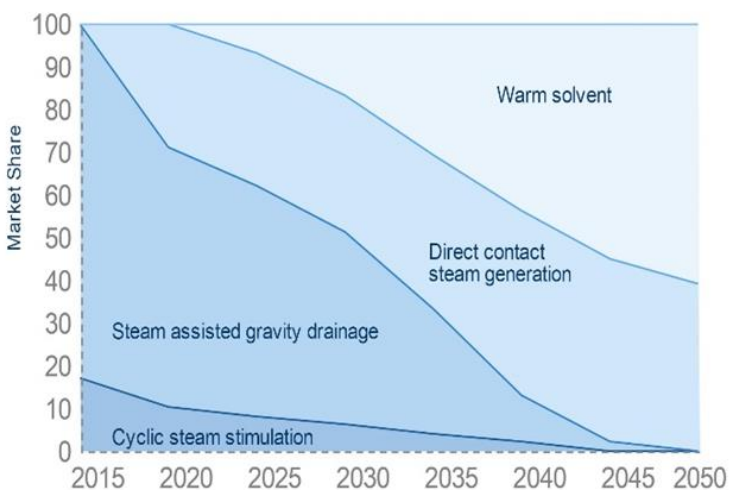
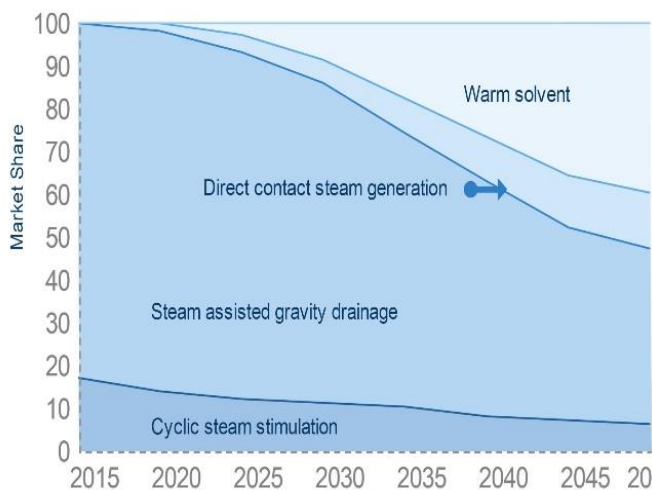
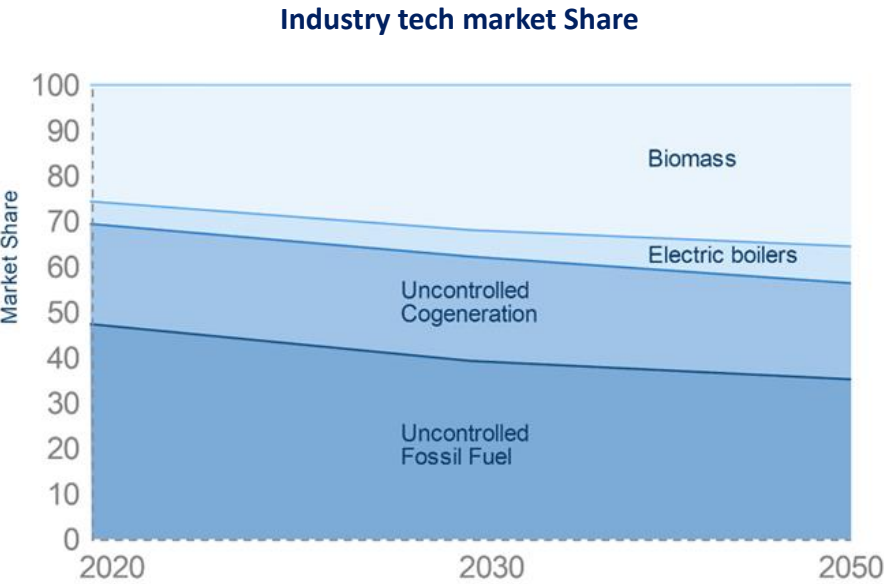
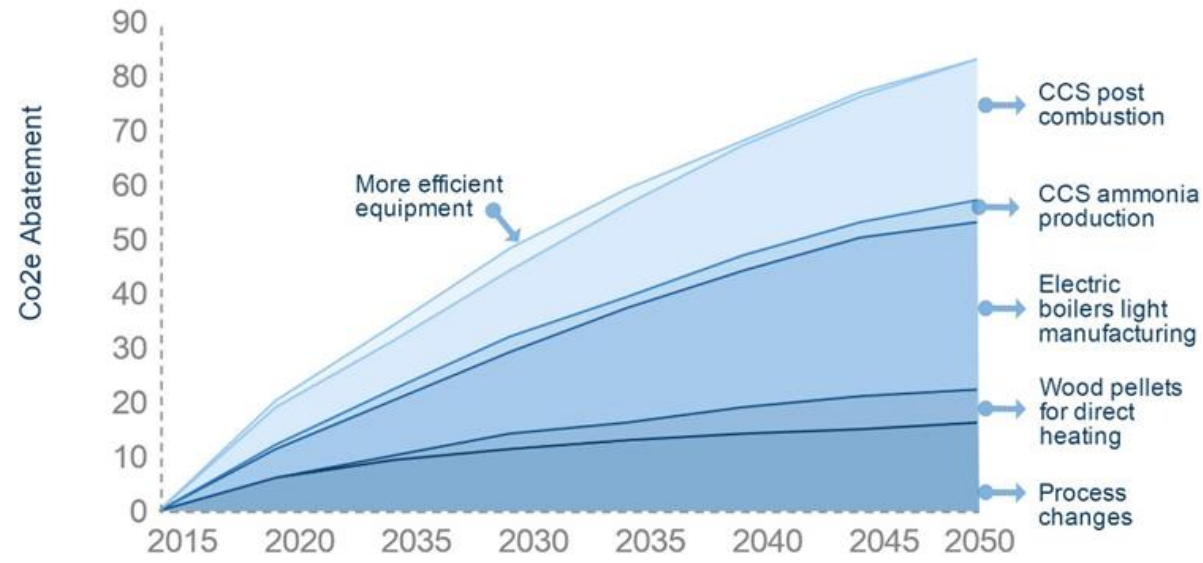
Electricity CCS, 68 Mt

Oil and Gas CCS, 146 Mt



Deepening current trends, 309 Mt

NextGen Technology Gap | Industry



Elements of a Decarbonization Path Forward

1. All emitting sectors of the Canadian economy need to be covered by GHG policy
2. Vehicle and building energy and GHG intensity regulations must get consistently tighter
3. All regions need a basic level of carbon pricing that rises predictably from current levels of \$15 to over \$30 per tonne
4. All regions need to continue current trends towards “decarbonized electrification”
5. Significantly more innovation support is needed to drive down the future costs of emission reductions

Post-Vancouver Declaration

The Vancouver Declaration initiated process is likely not going to satisfy those who want immediate action more aligned with a deeper emission trajectory.

Can we expect more given the independent jurisdictional climate policy paths of the last 10 years?

From a policy development perspective, however, we can be more optimistic.

1. Canada for the most part has stopped arguing over if we should price carbon, or how we should price carbon
2. Instead is focused on filling the jurisdictional policy holes that remain.
3. With those holes plugged, the federation can then move on, looking for ways to increase policy ambition while positioning Canada for long-term, cost-effective decarbonization.