

Clean Fuel Standard 101

A key policy driver for energy transition: review & status update

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Outline

- I. CFS 101
 - i. Eight ways of looking at a CFS
 - ii. How it works
 - iii. What role for municipalities?
 - iv. LCFS experience elsewhere: CA, BC

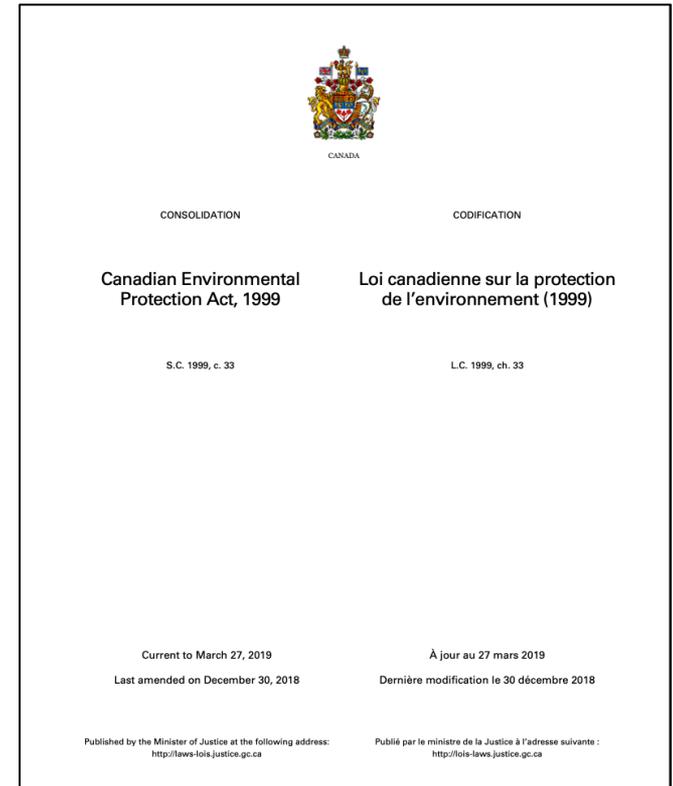
- II. Where are we now?
 - i. Current status: timing, key issues
 - ii. Next steps

- III. Q & A

I. CFS: what's that again?

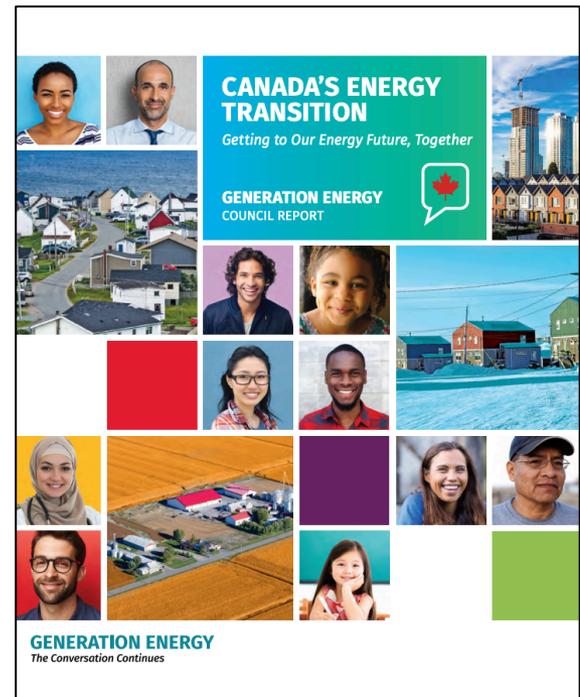
Eight ways of looking at a Clean Fuel Standard

1. A regulation under the *Canadian Environmental Protection Act, 1999*
2. A technology-neutral, market- and performance-based “low-carbon fuel standard” requiring gradual reductions to the ***carbon intensity*** of fuels (liquid, gaseous, solid) supplied for combustion-based consumption in Canada
3. An emissions reduction mandate of 30 Mt CO₂eq by 2030, applicable to “fossil fuel primary suppliers”



Eight ways of looking at a CFS

4. An innovation policy to drive *both* reductions in the lifecycle GHGs of fuels *and* investments in clean fuel / clean tech alternatives: a “cross-subsidy”
5. A paradigm shift in the national regulation of fuel and a policy backbone for decarbonizing transportation across the country
 - ~80% of liquid fuels used for passenger/freight transport
6. The policy anchor for one of the four key energy transition pathways (“*Using more renewable fuels*”) identified through the federal *Generation Energy* consultation led by NRCan (final report July 2018)



Eight ways of looking at a CFS

Canadian greenhouse gas emissions, 1990-2017

Megatonnes carbon dioxide equivalent (Mt CO₂e)

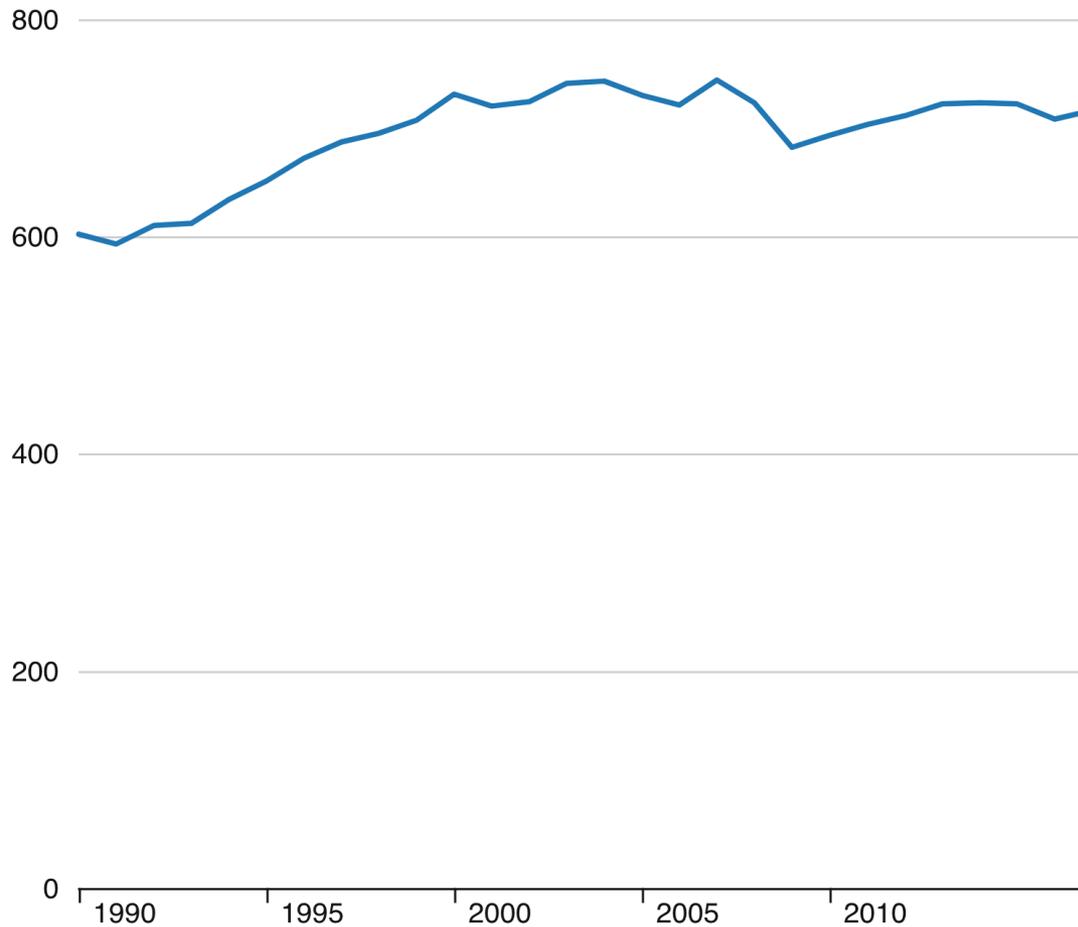
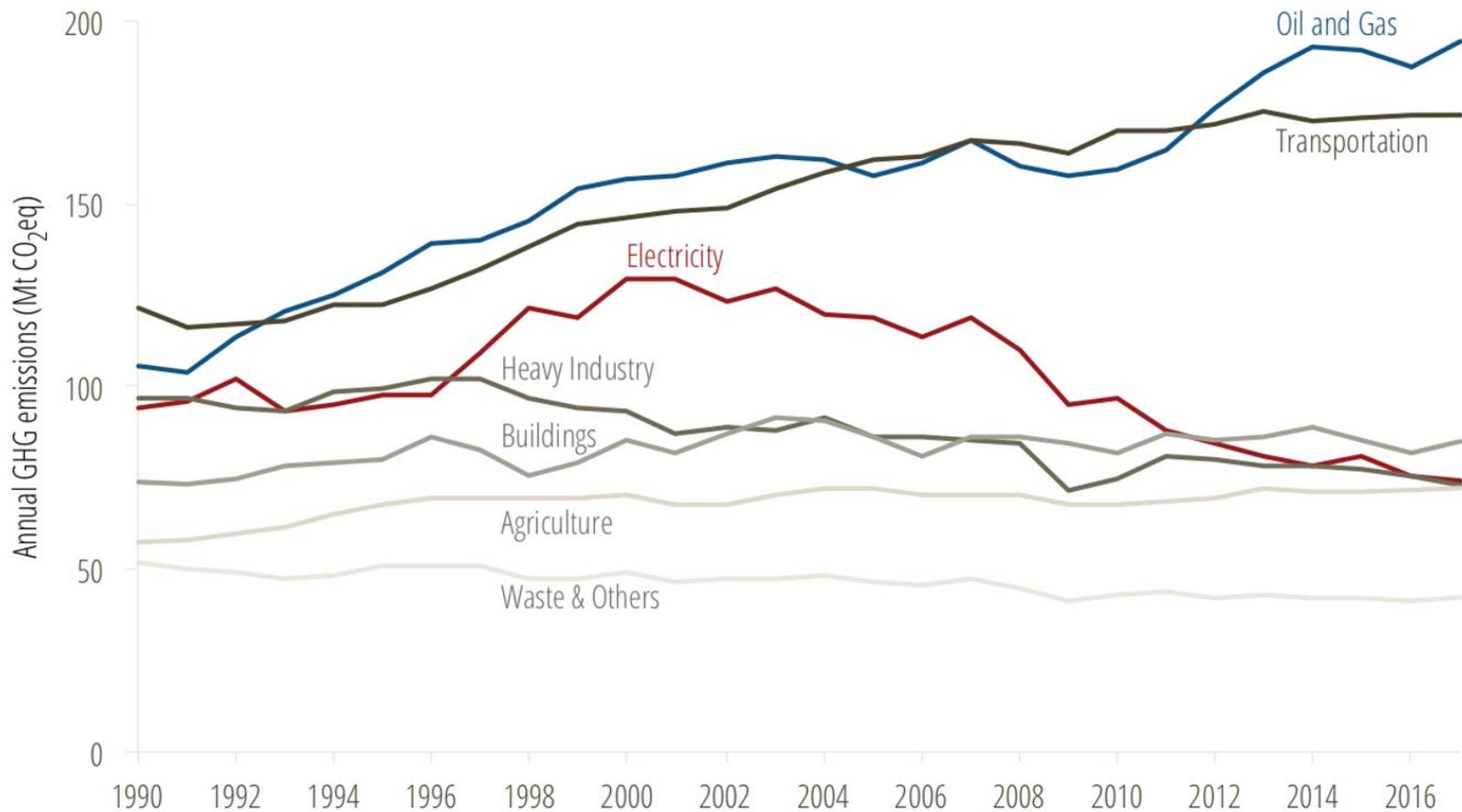


CHART TOOL » SOURCE: ECCC, NIR 2019: PART 3, ANNEX 10, TABLE A10-2 / COMPILED BY PEMBINA INSTITUTE

Eight ways of looking at a CFS

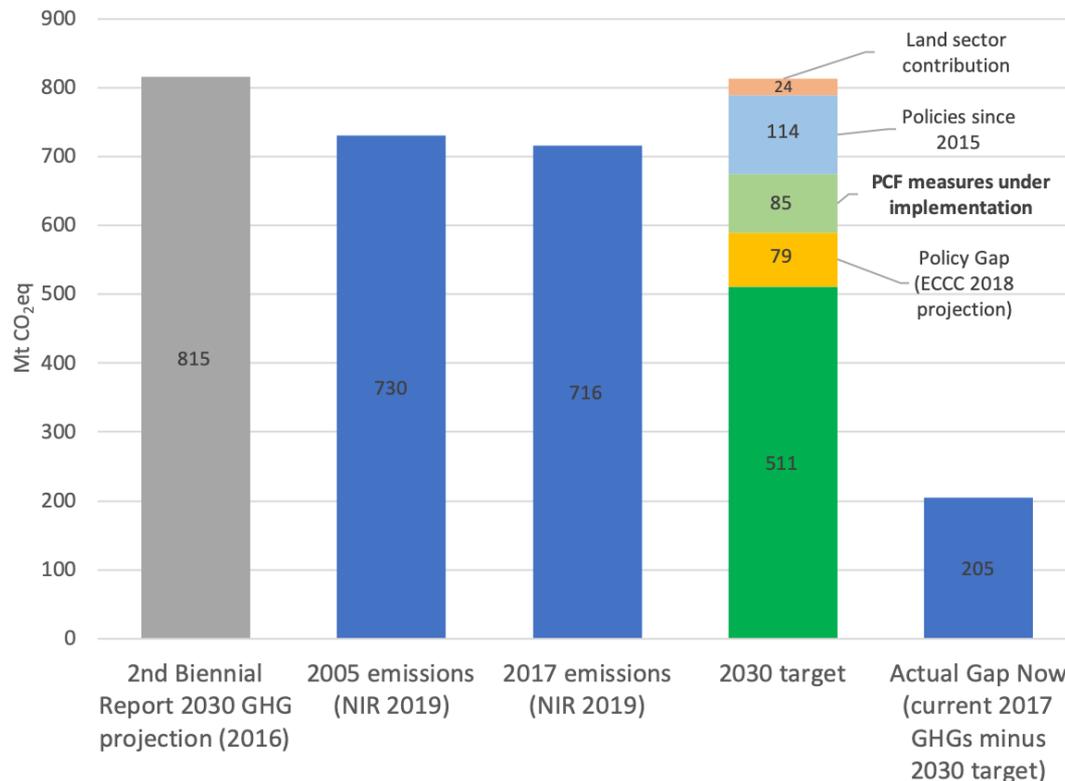


Eight ways of looking at a CFS

7. The single largest mitigation contribution* under the Pan-Canadian Framework on Clean Growth and Climate Change, the federal-provincial-territorial plan for climate change and economic development.
 - 15% of reductions needed to fill actual gap
 - 35% of reductions anticipated under PCF

*apart from higher levels of carbon pricing

PCF progress

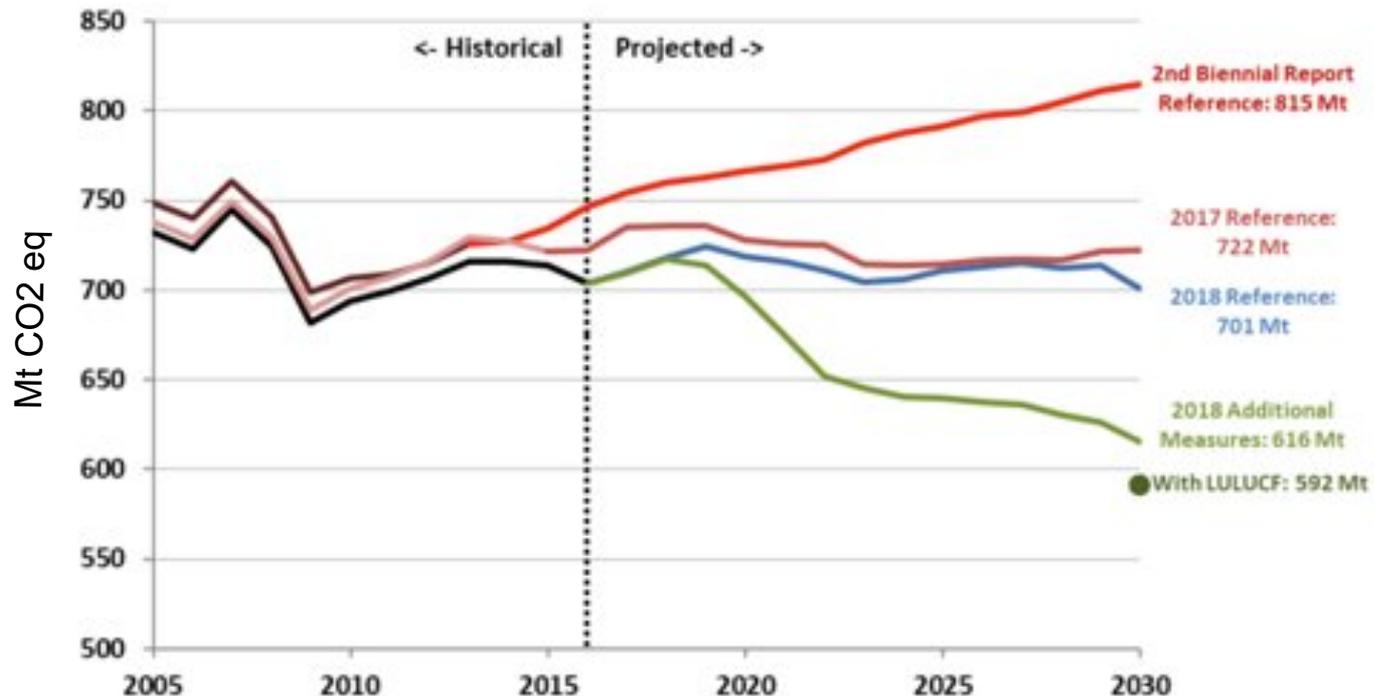


Eight ways of looking at a CFS

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PCF progress: scenarios of Cdn GHGs to, and projected reductions in, 2030



How it works

By 2030, reduce lifecycle emissions by 30 Mt CO₂eq for all fuels



Liquid



Gaseous



Solid

Graphics: Clean Energy Canada (2017), [What a Clean Fuel Standard Can Do for Canada](#); Navius Research (2014), [The Renewable and Low Carbon Fuel Requirement Regulation](#); Shutterstock, icon-library.net

How it works



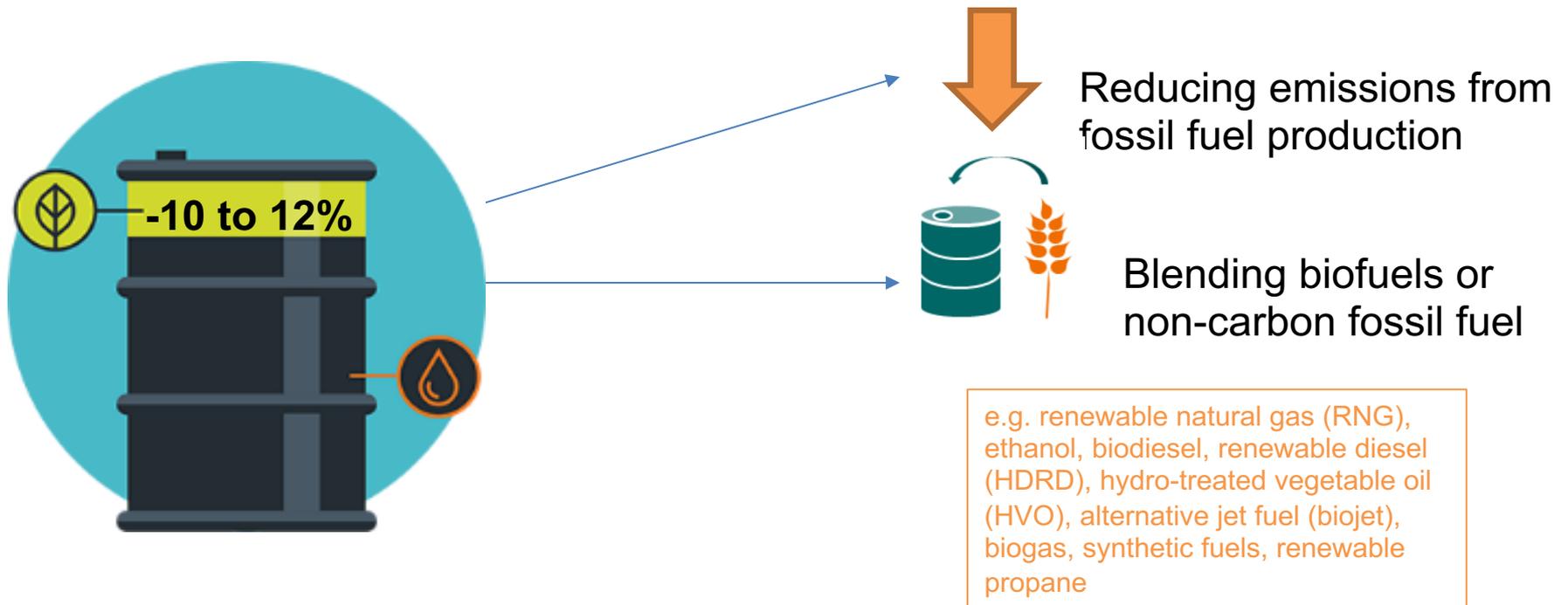
e.g. industrial process/facility energy efficiency (e.g. methane capture or LDAR, but can't be required by existing regulations)



Reducing emissions from fossil fuel production (upstream)

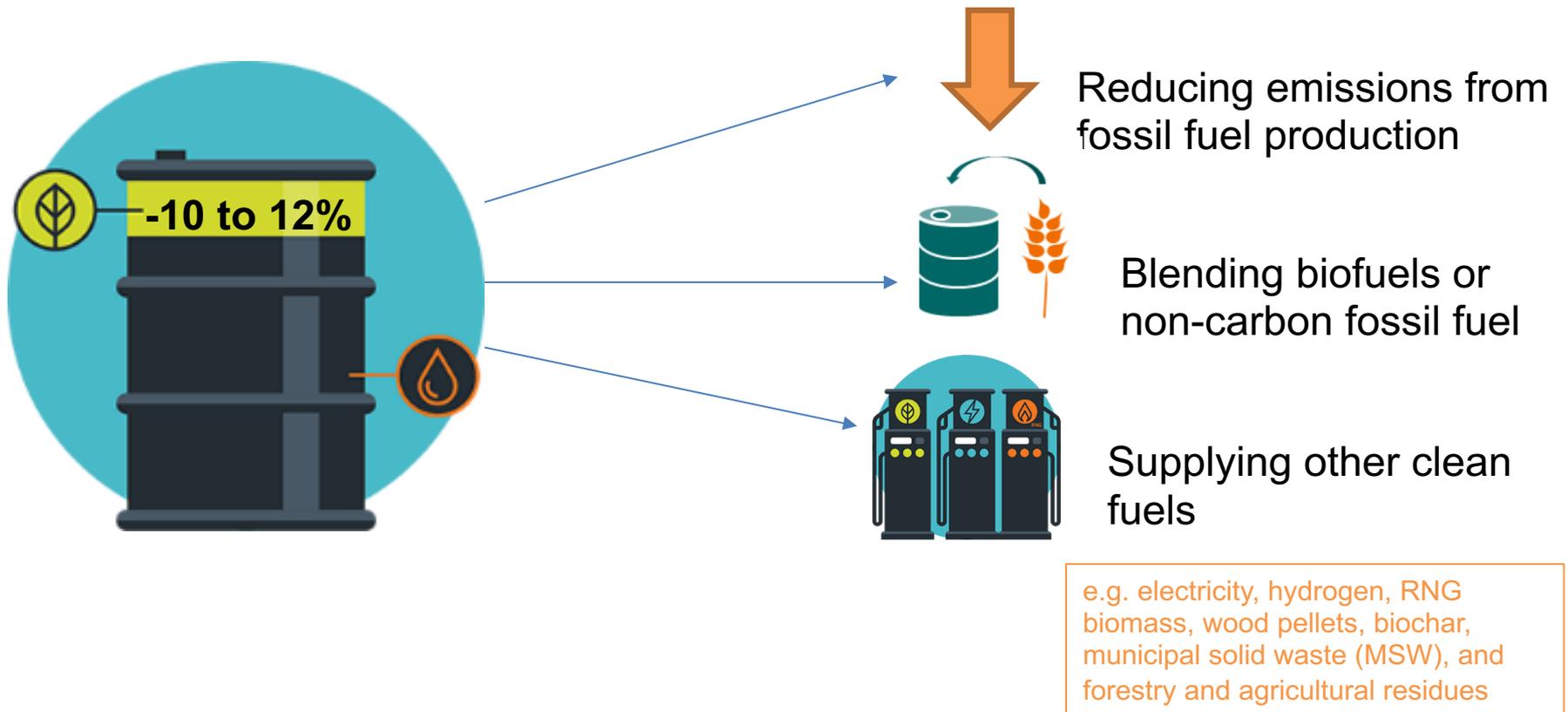
Graphics: Clean Energy Canada (2017), [What a Clean Fuel Standard Can Do for Canada](#); Navius Research (2014), [The Renewable and Low Carbon Fuel Requirement Regulation](#)

How it works



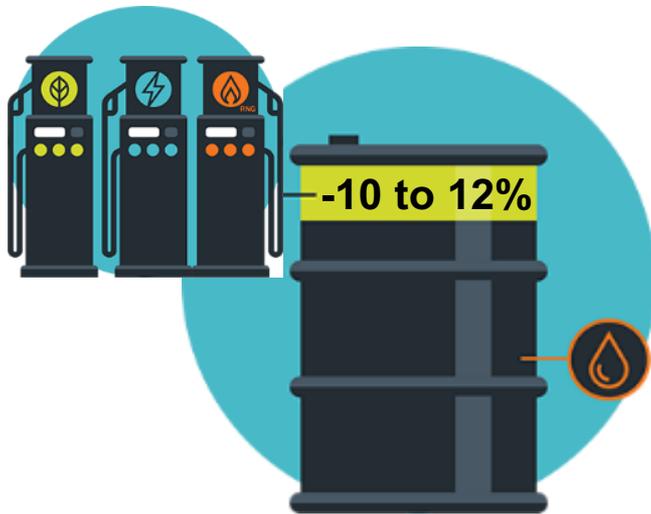
Graphics: Clean Energy Canada (2017), [What a Clean Fuel Standard Can Do for Canada](#); Navius Research (2014), [The Renewable and Low Carbon Fuel Requirement Regulation](#)

How it works



Graphics: Clean Energy Canada (2017), [What a Clean Fuel Standard Can Do for Canada](#); Navius Research (2014), [The Renewable and Low Carbon Fuel Requirement Regulation](#)

How it affects municipalities



- Support local GHG reductions and renewable energy targets
- Support EV or other low carbon transportation goals + policies
- Increase availability and supply of low carbon fuels
- Provides incentive for cost effective fuel switching to electric and low carbon fuels
- Potential new revenue to support (via credit generation) fleet electrification

Graphics: Clean Energy Canada (2017), [What a Clean Fuel Standard Can Do for Canada](#);
Navius Research (2014), [The Renewable and Low Carbon Fuel Requirement Regulation](#)
Data: SFU START [EV Report Card](#)

Example of CFS impact

MD + HD

BEV Fuel Cost Saving Opportunities



EV: 0.56 kWh/mi. Diesel: 22 mpg

Airport Shuttle



EV: 1.04 kWh/mi. Diesel: 10 mpg

Package Delivery



EV: 2.1 kWh/mi. Diesel: 3.5 mpg

Local Drayage

vs Diesel

15%

35%

50%

with LCFS

45%

75%*

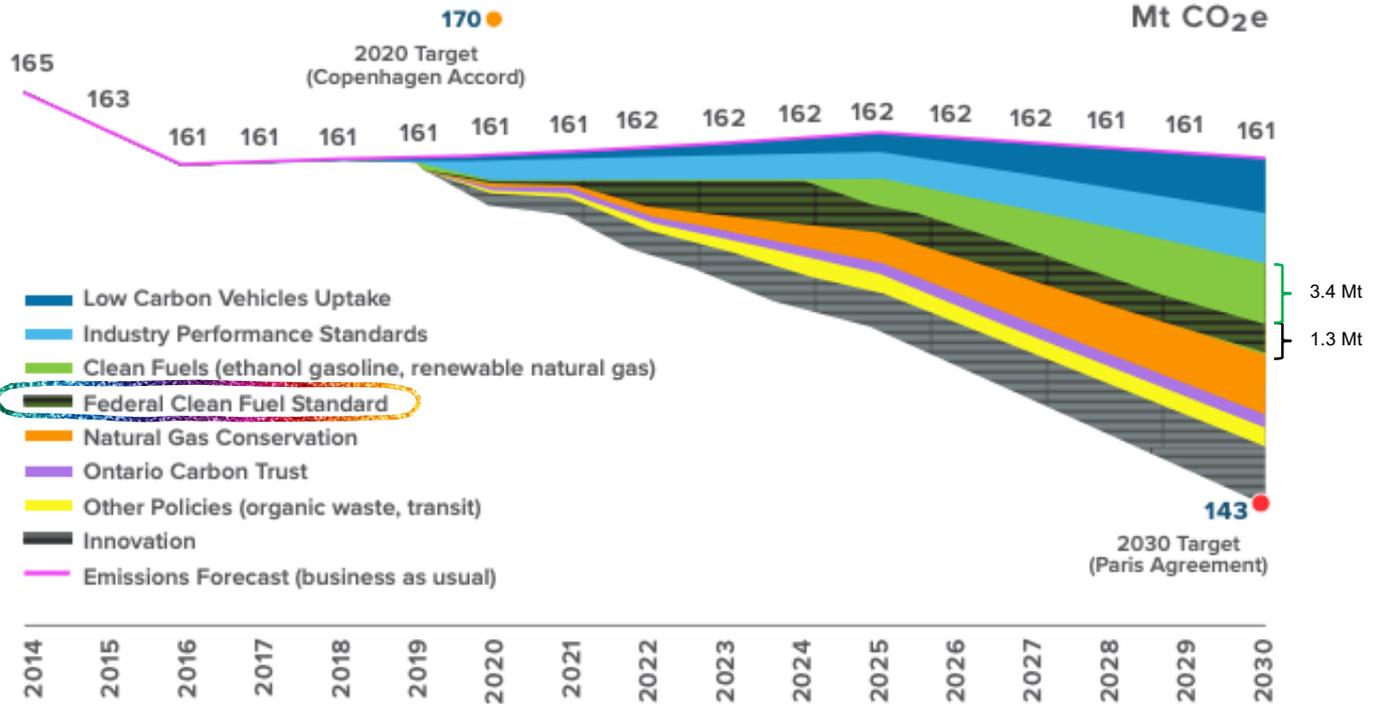
80%*

Data from [CARB Paper](#). Assuming \$3.00/gal., \$0.17/kWh plus a 15% charging loss, LCFS Credits at \$100
*Under proposed amendments

How it affects municipalities (eight ways #8)

- CFS is also an explicit part of Premier Ford, Min. Phillips & Min. Yurek’s “Made-in-Ontario” Environment Plan (released Nov. 2018)

Path to Meeting Ontario’s 2030 Emission Reduction Target



The CFS has potential if it uses proven design principles that level the playing field

California LCFS:

- Adopted 2009
- 2011-2017: share of alternative fuel in Californian transportation energy rose 6.1% to 8.5% (Witcover 2018)
- 38.3 Mt CO₂eq GHG reductions through Q1 2018 – exceeded requirements by 9.3 Mt (credit bank)
- late 2018: program extended to 2030; stringency doubled to 20% carbon intensity reduction vs. 2010

British Columbia LCFS:

- 2010-2017: 7.73 Mt avoided GHGs
- like CA, targets decarbonization of transportation sector (transport fuel lifecycle)
- Requirement for 10% CI reduction by 2020 vs. 2010 baseline
- 2019 Clean BC plan indicates provincial intent to extend program & increase stringency to 20% CI reduction by 2030

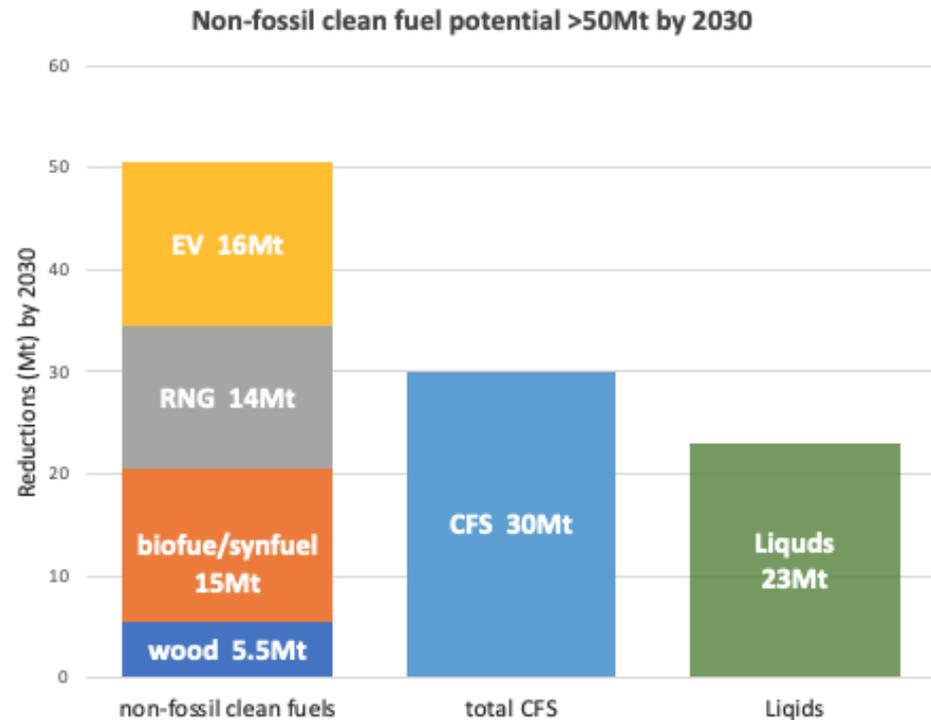
II. Where are we now?

Assessment of the Proposed CFS Design

- CFS as proposed will fail to deliver a clear, distinct market signal for the supply and production of non-fossil clean fuels
- Clear emphasis on crediting of cleaner fossil fuels vs. low-carbon non-fossil clean fuels will reduce the cost-effectiveness of these latter
- Non-fossil fuels are likely to see minimal uptake (beyond new provincial actions)
- For next decade, current proposal would occupy federal regulatory space re. transport/climate & privilege status quo reliance on fossil fuels over opportunity for orderly, structural energy transition
- 30Mt of incremental reductions will not be realized, and the development of a much-needed non-fossil clean fuel market will be delayed
- A robust, stringent CFS has immense potential if it adheres to proven design principles that level the playing field

Non-fossil clean fuels can go beyond 30 Mt and deliver 50Mt across Liquids, Solid, Gaseous ...

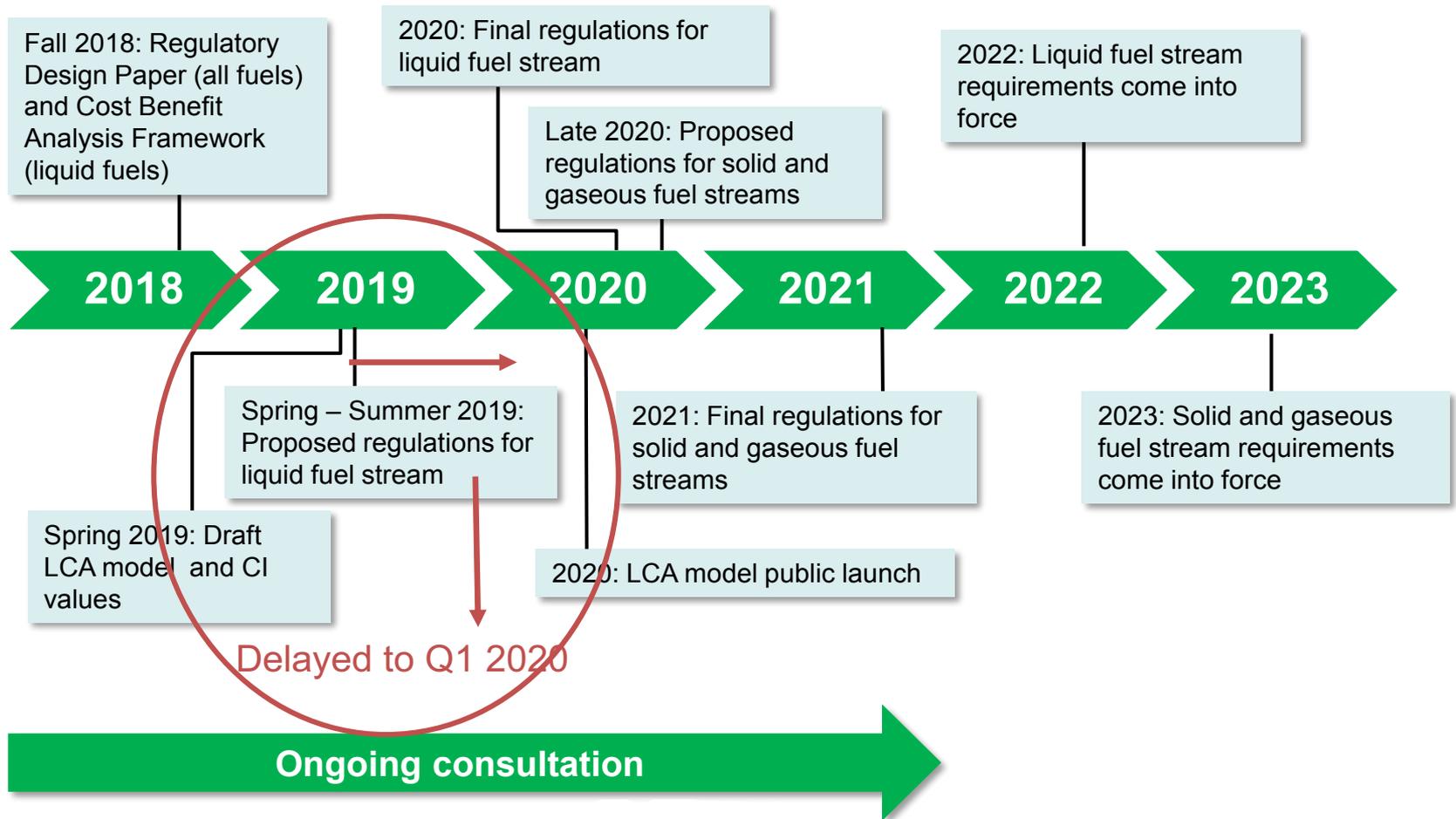
Non-fossil clean suppliers have modelled >50Mt of supply by 2030



Source: ABFC, CBA, CGA, EMC, WPAC

III. Next steps

Where are we now?



Questions?

Appendix

CFS Compliance

(as described in the Proposed Regulatory Design of June 2019)

3 main compliance strategies / credit-generating activities

1. **“actions that reduce the carbon intensity of fossil fuel throughout its lifecycle”**
 - i.e., industrial process/facility energy efficiency (e.g. methane capture or LDAR, but can't be required by existing/in-force regulations)
2. **“supplying low-carbon fuels”**
 - will allow producers and importers of renewable or other low-carbon fuels to generate credits based on annual amount of energy (MJ) these products supply to the Cdn market
 - Including: renewable natural gas (RNG), ethanol, biodiesel, renewable diesel (HDRD), hydro-treated vegetable oil (HVO), alternative jet fuel (biojet), hydrogen, biogas, synthetic fuels, renewable propane, biomass, wood pellets, biochar, municipal solid waste (MSW), and forestry and agricultural residues
3. **“specified end-use fuel switching”**
 - occurs when an end-user of fuel changes or retrofits their combustion devices (e.g. an engine) to be powered by another fuel or energy source.
 - liquid fuel stream: end-use fuel switching from a higher carbon intensity fossil fuel used for transportation (i.e., gasoline, diesel) to specified lower-carbon fuels will be eligible for credit generation: natural gas, propane, and non-carbon energy carriers such as electricity or hydrogen

Why the clean fuel standard matters for e-mobility

- The CFS is intended to reduce GHGs by 30 Mt by 2030 (vs. 2016 baseline) over implementation and enforcement 2022-2030
≈ 15% of reductions needed to achieve current federal climate target
- Electrification of transportation will be a significant compliance action in the liquid fuel stream and could supply half of all compliance credits (LDVs, buses, medium/HDVs)
- Has **the potential to be a substantial revenue opportunity** (>\$230 million in credit value) and **support incremental and accelerated electrification**, but low total increase in electricity demand (1,500 GWhr)