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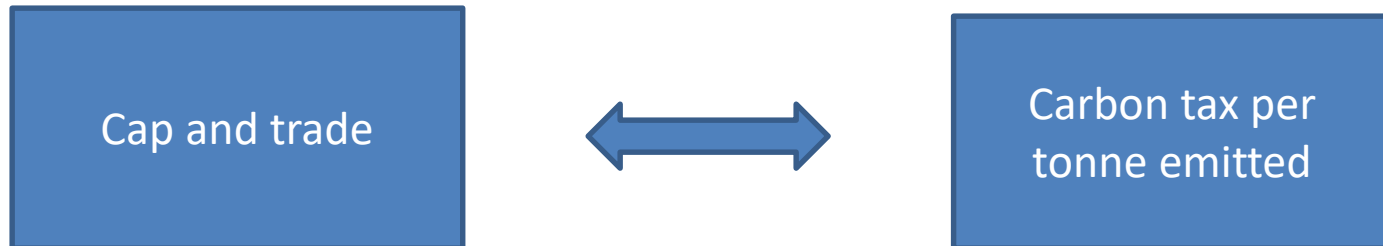
Research paper – carbon policy and
biomass in Canada
November 2016

Basics of carbon policy



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- Carbon emission is causing GHG, and needs to be reduced.
- Reduction needs to be achieved through economic levers.
- Policy refined to two essential approaches, limit emission by regulation(with penalties) or just tax emissions and recycle revenues to alternative uses
- Both seek to amend behavior through economic self interest



Is all carbon the same?
No...



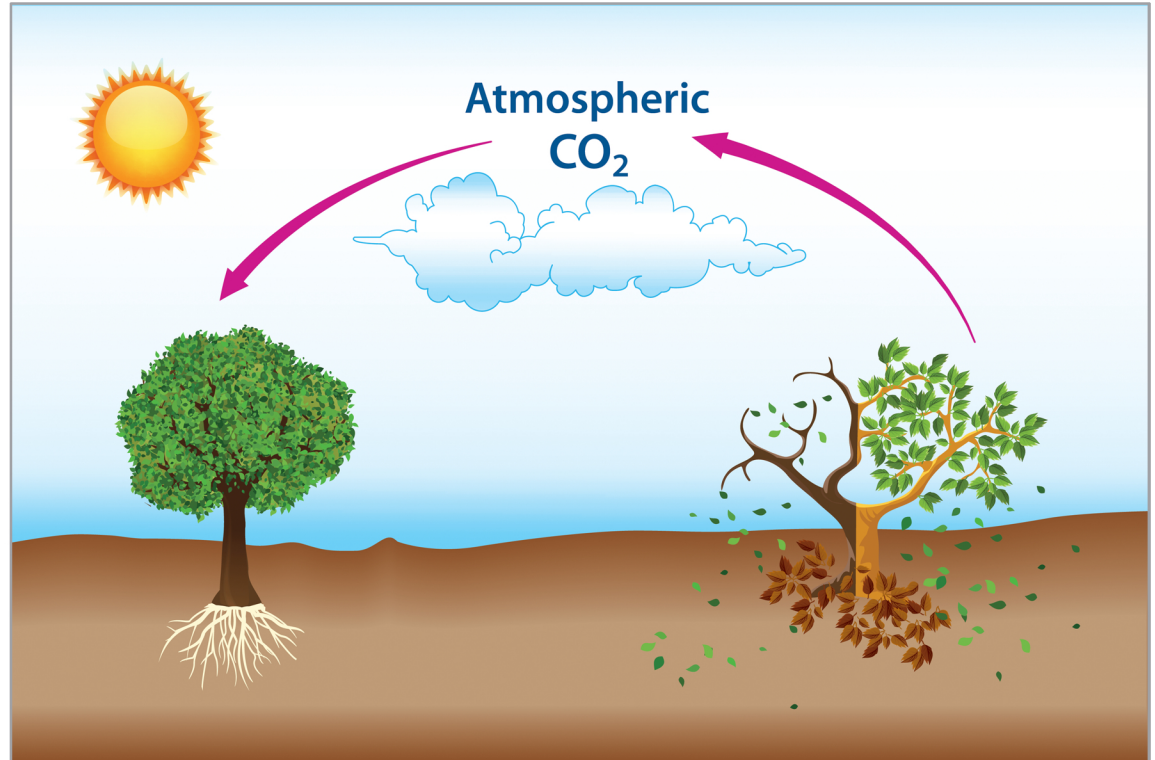
Geological Carbon



Geological Carbon -
Adds to Total CO₂
never intended to be released

vs

Biological Carbon



Biological Carbon -
cycles naturally, and thus
does not add to Total CO₂

Calculating emissions

How do we get to a tonne of CO₂



United States EPA peer reviewed emissions tables*

	Carbon source	Quantity	Metric tonnes of CO₂
	Gasoline	1000 litres	31.16
	Natural gas	1000 Mcf	54.72
	Coal	Metric tonne	187.78
	Diesel	1000 litres	35.51
	Coniferous tree (urban)	1000 medium trees	(10.52)

Carbon Policy – intended to change behaviour

Tax on a tonne of CO₂



Commonly called a 'carbon tax' - calculated as \$x/tonne emitted.
Raises the price of the commodity, encouraging substitutive behavior

Country	Current tax rate /tonne CO ₂
Denmark	USD \$18
India (tonne of coal)	USD \$1.07
Australia	AUD \$23 (repealed 2014)
France	€ 22
Ireland	€ 22
Sweden	€101
Norway	USD \$51

Funds go into general revenues.
Some set aside for funding 'green' activities, most are not.



Provinces get to pick 'em*

National Policy announced October 3, 2016

- Provinces and territories will have flexibility
 - a direct price on carbon pollution or
 - adopt a cap-and-trade system.
- Pricing will be based on GHG emissions, applied to a common set of sources.
- The price on carbon pollution
 - start at a minimum of \$10 per tonne in 2018
 - rise by \$10 a year to reach \$50 per tonne in 2022.
- Provinces choosing a cap-and-trade system
 - Must reduce greenhouse gas emission permits to businesses to meet Canada wide objectives by 2030.
- The Government of Canada will provide a pricing system for provinces and territories that do not adopt one of the two systems by 2018.
- Revenues from carbon pricing will remain with provinces and territories of origin.
 - To use revenues from this system as they see fit.
- Does not distinguish formally between geologic or biologic carbon

Ontario Carbon Policy

Biomass Treatment in Carbon taxation



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Some policy clarity.

- Derived from October, 2016 Carbon Policy
 - Ontario carbon policy paper (Sec 9) expressly ***provides for microgrids using biomass***, as a strategy for provincial carbon reductions; thus taxing biomass emissions as carbon emitters would be self defeating.
 - Further, CO₂ stored in trees is emitted naturally, whether burned or rotting.
 - carbon in trees will be emitted, at one point and recycled naturally, if sustainably harvested.
 - Taxing carbon emissions on burning fibre, but not taxing landowners on emissions from fallen trees, (particularly when it displaces geologic carbon such as diesel use), is paradoxical policy.
 - Would result in inconsistent taxation on identical activity, namely emissions from biomass use when burned or when used in forestry lot.
 - Forest sustainability policy fully contained in Ontario's Crown Forests Act, S 26, and managed through licences/permits and operator undertakings in contained permits.

Policy statements to date provide helpful direction.

Place for biomass

Renewable, green and carbon neutral



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- When harvested sustainably:
 - Biomass displaces GHG from diesel and natural gas, and thus keeps that GHG in the 'ground' as intended.
 - Avoids flying diesel fuel to communities up in planes with special bladders, incurring jet fuel GHG.
 - Insources jobs to local communities, instead of outsourcing those jobs to oil sands and refineries and pipeline operators
 - Biomass carbon recycles naturally, whether burned for fuel, or falls and rots. Never adds to total GHG, as underground geologic carbon sources do such as coal, oil and natural gas.
 - Sustainable forestry in boreal forest now managed under tripartite Boreal Forest Management Agreement,
 - Forestry harvesting takes 0.3% of the forest per annum, while insects take 4.0% per annum and forest fires take .4% per annum.
 - Sustainable forestry requires replanting, avoiding watercourses with proper setbacks, maintaining wind rows for moose and woodland caribou migration. Etc.,
 - 100 years of experience with practices now in place.,
 - Some tree species actually require forest fires as heat opens up their cones to reseed.



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