



Durham's Greenhouse Gas Emissions – For Good Measure

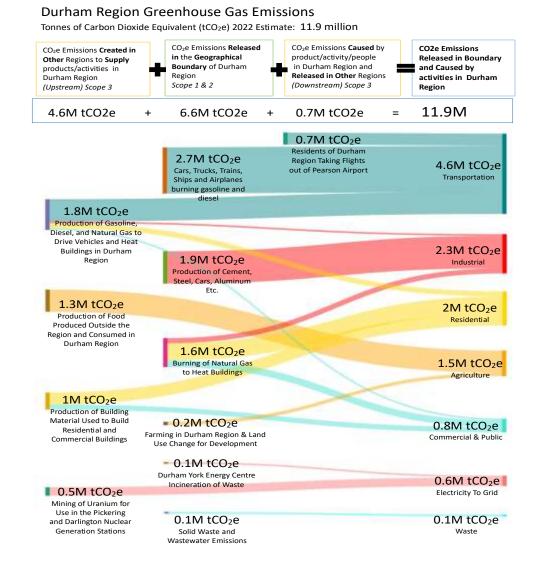
Region of Durham, November 2023

Durham Region Greenhouse Gas (GHG) emissions Scopes 1, 2, & 3, 2022

Scope 1: Emissions occurring in geographical boundaries.

Scope 2: Emissions occurring in geographical boundaries from grid supplied electricity.

Scope 3: Emissions occurring outside geographical boundaries caused by activities in the boundaries.





Durham Region GHG emissions

Production CF Liquid Poets: 1,288,000 Dienel Corenantus: 870 July CHI 4.040,907 Aviation Privated Departing Propher (79),717 Other Flat Combustors 241,052 Forest Fuer: 6,789,655 Centres Argort Combuston Departures 8-754 Fossil Fuels 6.8M tCO₂e Water Transport Outhound Combustion: 6,119
Water Transport Informati Combustion: 7,287 Clubway Asport Continues to Department in Bruindary, 612 Office NG Customer 190,799 Box BEV Evisions 329 BE'V Transmission Loaner, 129 Other Common NO Combuston: 75,256 at Emissions NS LCA Other Common: 21,655 Parameter thomas Material 706,900 Marural Green 9,195,468 Resistances, 1,000,000 Emissions NG LGA Residense: 247.565 Residented Not Water NG: 156,500 E Households Cifner No. 1/2 and -Pleasannial Electricity; 55 695 v Mail Residential Fleet NG: 52:547 -lone Electricity Production LCA: 29:267 -Multi Residential Hot Water NG: 6.382 Multi Residential Other NG: 5.000 Sken Residential Suiting Malerial: 335,770 Conversion Duesting Healing WG: 210.075 Building Material 1M tCO₂e Elementors NO LCA Commercia: A Public: 82 564 in Commercial & Public Other Electricity: (IA/822 -Commerced Buildings Other NO: 60,041 -Enterland Electricity LGA Commercial & Public; 20.006 -Regional Facilities Natural Ges; 10.545 -Regional Facilities Electricity; 3.766 Covaumed Electricity (50,000) Darbagnon NESS: 222-244 Gred Electricity, (923, 47) Number Flori 479,510 Pickering NGS: 257.272 St. Maryo Curnam: 1,405,620 Waste to Everyy Routes intrakery: E310,234 Germa Americani; 125.097 B White Persugns 19,642 -INDREST PERSONNEL OF NO LICA- TO DREW Damest Motors 37,963 -Industry Production of Electrony LCA 21,119 -Instantry Non-Plant 1:925,211 Industry Electrony: 55,005 -Signatum Aluminum: 14,277 -Quarren: 47,791 -Industrial Non Fuel 1.9M tCO₂e Food Certains Sweeteck: 865,034 Land-Use and Perenty: 4,295 Apresistant 1,400,045 Festivated Food Demand: 1,890,760 Food Dament Late: 480.017 Imported Food 1.3M tCO₂e Liverine Pressure: 132 FBF 8 Land Use Everysione: 88.348 n Land Use Change 4,258 Brosk Wast Landtin 28,234 -Fugitive Washinston, 15,831 -et Bissolds Indinenties, 2,246 -Bingle Consulten Plane 808 Waste Management Nov Fuet 165817 . Cities Wands - 95 cips --

Transportation 4.6M tCO₂e

Country Corporation, 1.487,79

Buildings 2.8M tCO₂e

Industry 2.3M tCO₂e

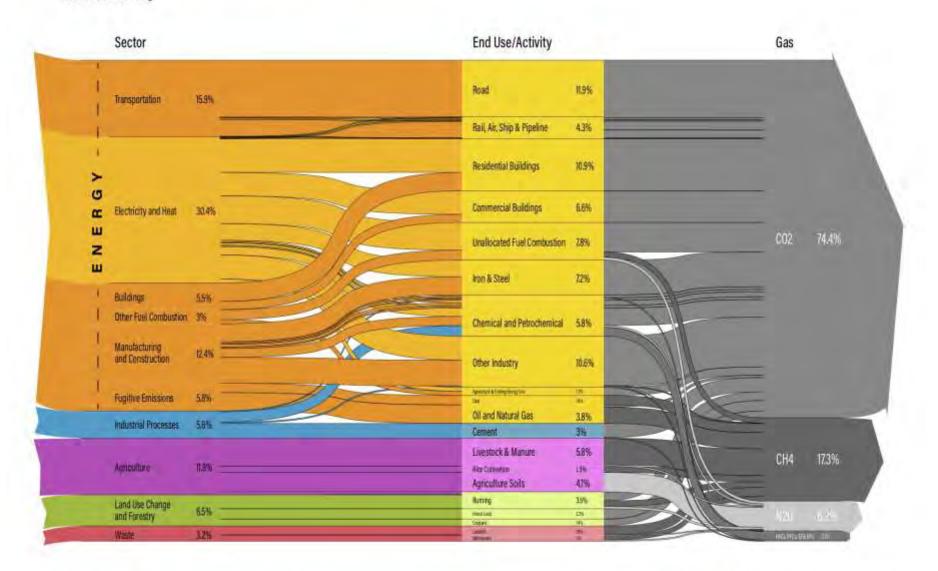
Agriculture 1.5M tCO₂e

Waste 0.1 tCO₂e



World Greenhouse Gas Emissions in 2016

Total: 49.4 MtCO₂



Keeling Curve World's most consistent measure of the greenhouse effect

Nov 14, 2023: 419.1 ppm CO₂









Uxbridge moves to strike climate action committee

Committee approved but no climate emergency declared

By Moya Dillon Uxbridge Times Journal

▲ Thursday, January 16, 2020 💆 2 min to read













UXBRIDGE -- Demonstrators marched through downtown Uxbridge and up Toronto Street to Uxbridge Town Hall to show their support for immediate action to tackle the climate crisis in September. The event's organizers, Uxbridge Climate Action, were successful in a recent request to have a new committee of council formed to focus on lowering emissions. Friday, Sept. 27,2019. - Moya Dillon

Closer to home

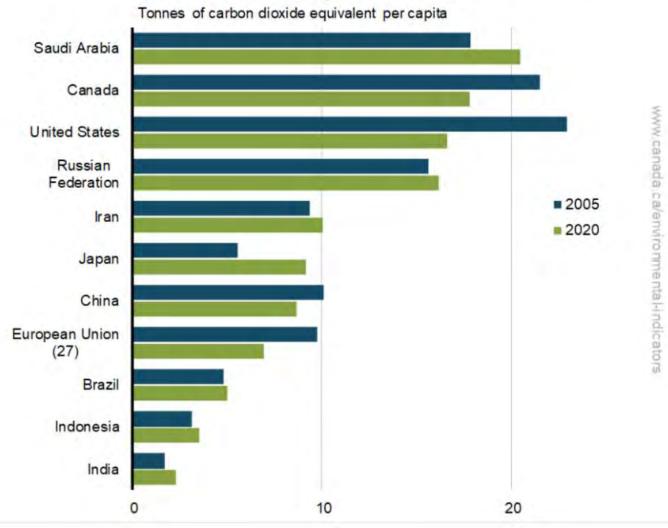
Climate emergencies declared! Net-zero targets legislated!





Canada's GHG emissions. Ranking Per Capita

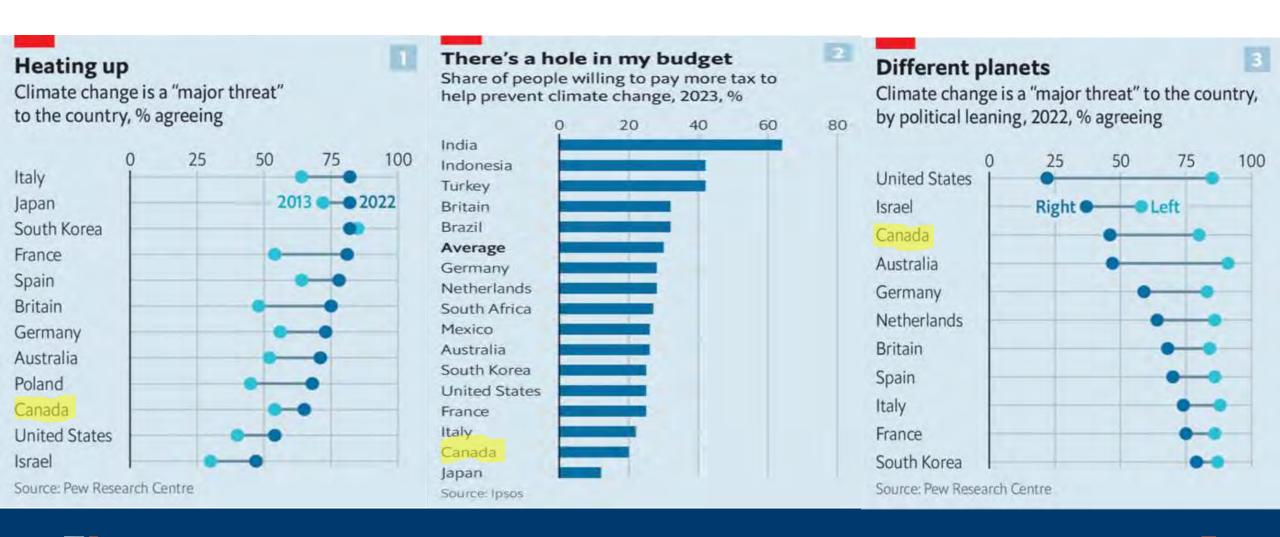
Greenhouse gas emissions per capita for Canada the top 10 emitting countries and regions, 2005 and 2020





The Power of Politics

The Economist, 12 October 2023





Canada's climate challenge

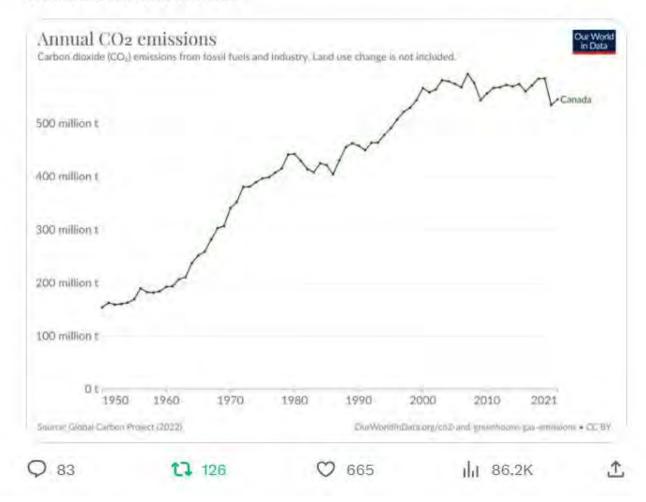
- * global laggard on reductions
- * emissions and trends vary by province (and community/household)
 - * lots of money and politics involved
 - * some behavioral changes needed



Hannah Ritchie @_Hannah Ritchie · Oct 4

Some high-income countries are making progress on reducing emissions.

Canada is not one of them.







Strong Goals

Weak Plans





Recognized the world over



Fossil fuels

'Insanity': petrostates planning huge expansion of fossil fuels, says UN report



A large majority of countries profiled to the report into mode not been principle, and see not onto the Cachal Matthew Photos and the Chicago Statement on international forces of more also planning to non-seasonable and perspective, and see a present of the common profiled in an international or Chicago Statement of the Cachal Statement of the common profiled in an international or Chicago Statement of the Cachal Statement of the Cach

Country	Status of national net-zero commitment; net-zero target year	Signatory of Global Methans	Signatory of Glasgow Statement	Planned change in annual fossil fuel production for 2030 relative to 2021 (E3)		
		Pledge		Coal	.00	Das
Australia 9 Liny 2050		1		0.2	0.	07
Brazil	NOC objective 2050	4		No data	5.2	1.0*
Gornalda	W Saw 2050	~	~	No data	30	06
China.	NDC objective 2060			53	- D	26
Colombia	2050	1		17	01	0
Germany	91 Jany 2045	~	1	05	in in	7
India	NDC ebjective 2070			10.7	Asidan -	1946 states
Indonesia	in strategy document 2090	~		2.5	02	111
Kazakhstan	in strategy focureant 2080			02	0.4	01"
Kawait	Political pledge 2050 (ni & gas sector) 2060 (rest of accounty)	~		No. production	2.1	A Iri
Mexico	No commitment	1		No mata	1.4	0.6
Nigeria	10 Law 2080	4		No duti-	(3)	284
Norway	No commitment	1		No data	0.5	03
Qutar	No operatment			No. production	No data	119
Russian Federation	In strategy document 2060			52	2.0	3.2
Saudi Arabia	Political pledau 2080	~		No printection	5.5	1.37
South Africa	in drahagy document 2050			Nedda	No data	No.dasa
SIAE	NDC objective 2050	~		No production	180	84
UK	10 law 2050	4	1	Nedata	W 0.7	08
us	to policy document. 2050	1	-	▼ 51	5.2	25

Firming the connection in a "time extracts excelly" by 1000 at to \$100 Decay for set \$6.000 persons reaction tagger.



Flammar Housey for John Cartesin year for which date is assistan-

Femaleg gas that all revenerable consumer by producing, and/or flagor.

Source: tetSox 2 locks (2003) and non-applican (set Chapter I)

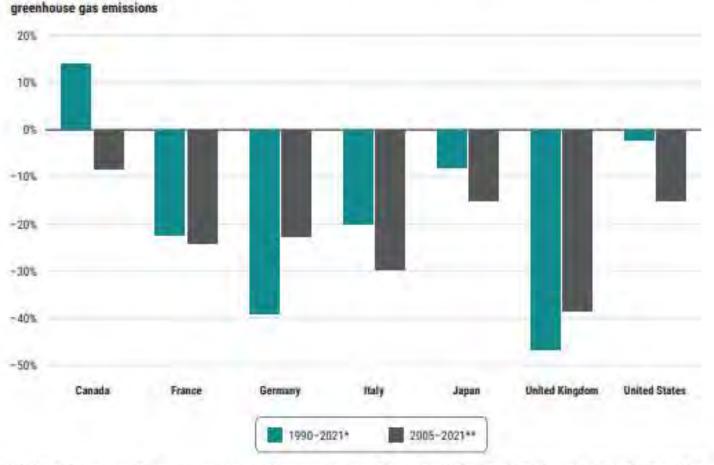
Canada's increasingly lonely challenge

Blessed by people (most educated) and geography (temperate climate, resources)

But oil and gas not uniformly distributed, much locked up in sand.

With plentiful energy and hydro-power, per-person most wasteful nation on earth (solid waste, GHG, energy-use).

Exhibit 6.3-Performance of Group of Seven countries in reducing greenhouse gas emissions



^{*1990} is the baseline year for reporting emissions and assessing progress for Canada and other industrialized countries under the United Nations Framework Convention on Climate Change.

Percentage change in

Source: National Inventory Report 1990-2021: Greenhouse Gas Sources and Sinks in Canada, Environment and Climate Change Canada, 2023



^{**2005} is the baseline year picked by Canada for its 2030 target under the Paris Agreement.

Global Mitigation path is extremely steep

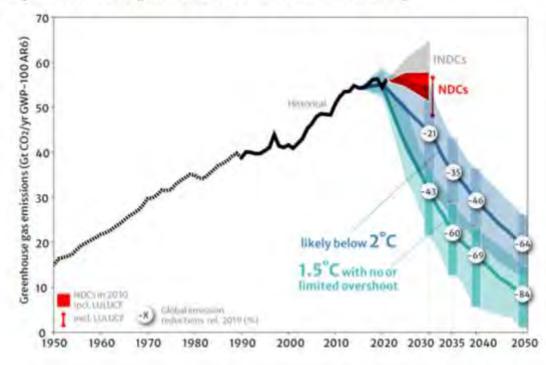
Two possible paths – (i) World gives up (warming >3 degrees)

(ii) Ratchet up our ambitions.

There is a benefit in being an 'early adopter'. Canada is likely not able to 'go it alone'.

Any net-zero pledge requires much greater ambition. More excuses and delays are coming.

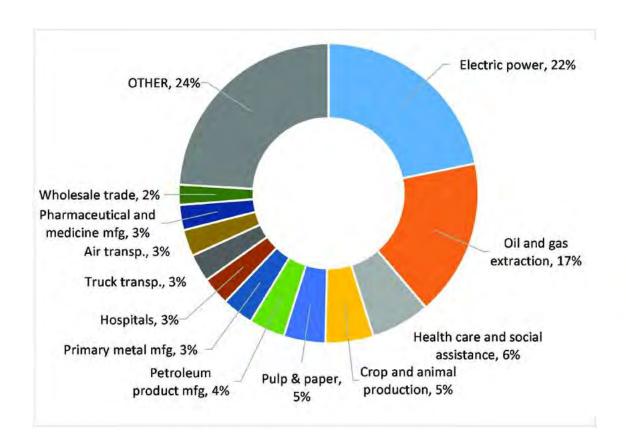
Historical emissions from 1950, projected emissions in 2030 based on nationally determined contributions, and emission reductions required by the Sixth Assessment Report of the Intergovernmental Panel on Climate Change

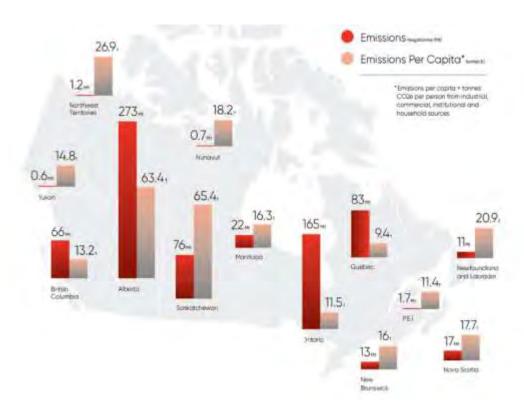


	Reductions from 2019 emission levels (%)						
		2030	2035	2040	2050		
Limit warming to 1.5°C (>50%) with no or	GHG	43 [34-60]	60 [49-77]	69 [58-90]	84 [73-98]		
limited overshoot	CO2	48 [36-69]	65 [50-96]	80 [61-109]	99 [79-119]		
the leavest and the factor of the same	GHG	21 [1-42]	35 [22-55]	46 [34-63]	64 [53-77]		
Limit warming to 2°C (>67%)	CO ₁	22 [1-44]	37 [21-59]	51 [36-70]	73 [55-90]		



Canada's GHG emissions (they call us Bigfoot)

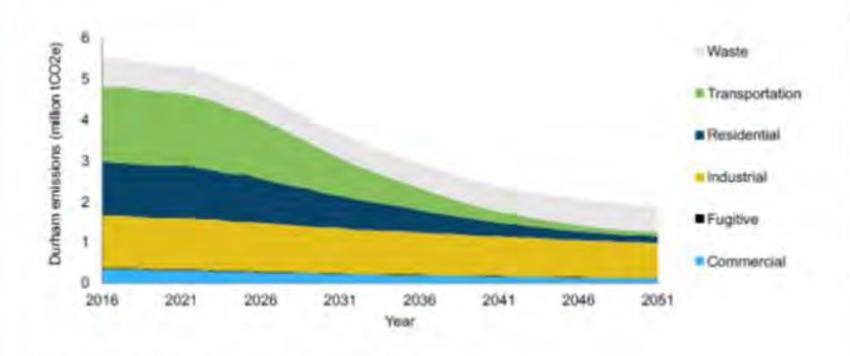








Durham's Community Energy Plan - Low Carbon Pathway



The most cost effective emissions reductions are found in the transportation sector, followed by the residential sector

Figure 20. Annual GHG emissions by sector, LCP (2016-2051)



Durham Community GHG Emissions Profile



Durham Community Energy Plan

Excellent place to start





Excellent list of prioritized, costed mitigation activities (Scope 1 and 2)

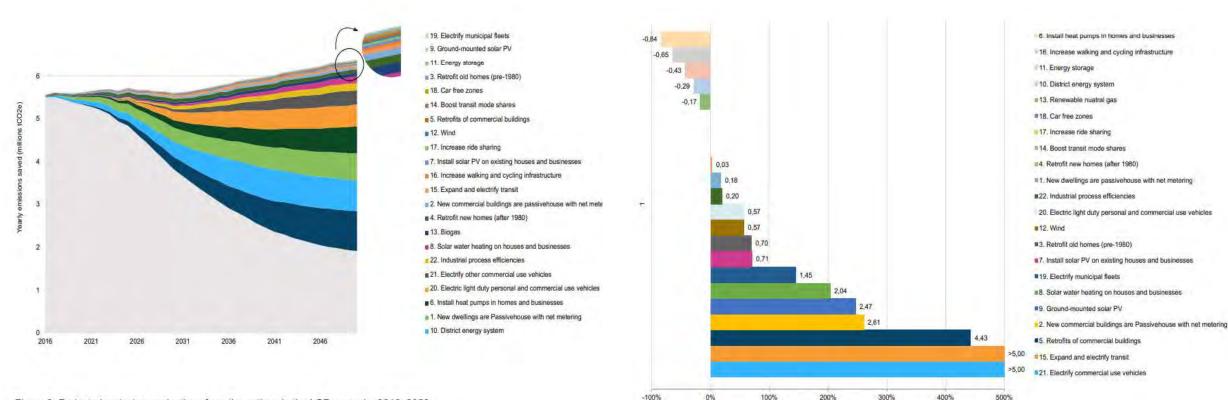


Figure 2. Projected emissions reductions from the actions in the LCP scenario, 2016–2050

Figure 4. Ratio of the present value of savings over the present value of the expenditures for the actions evaluated in the LCP scenario

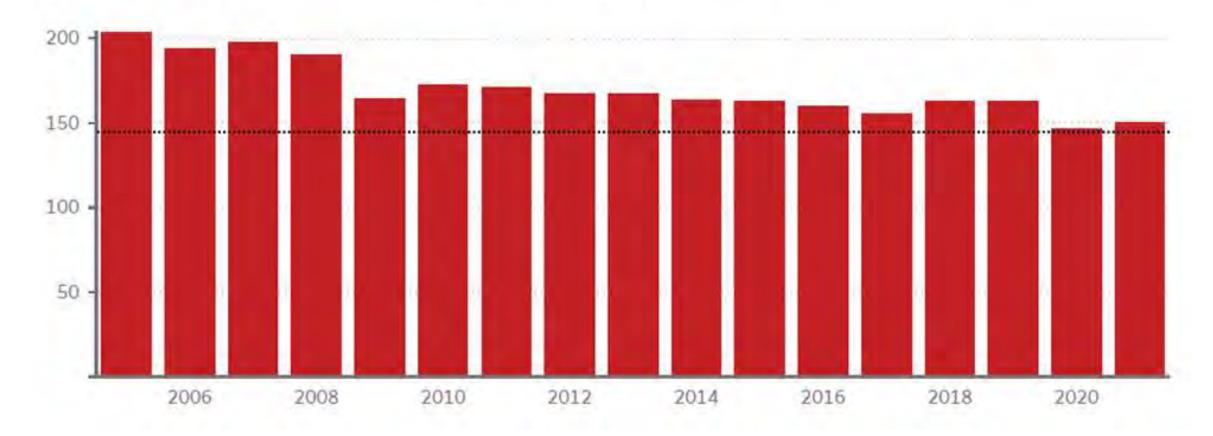
Return on investment

November, 2018 Durham Community Energy Plan



Ontario's annual greenhouse gas emissions

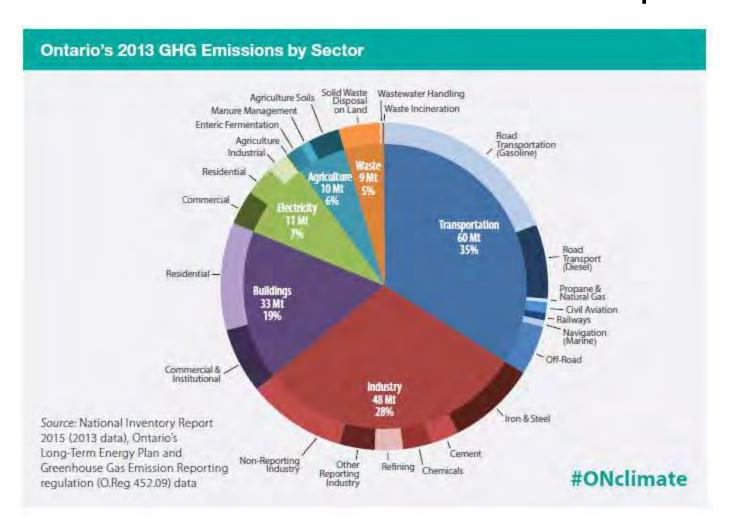
New figures show emissions in 2021 were 150.6 MT only slightly higher than the previous year. The Ford government's target for 2030 is 144 MT, represented by the dotted line.







Ontario's GHG focus needs to be transportation



Source: Ontario's Climate Change Strategy



Net zero targets under increasing scrutiny

"We urgently need every business, investor, city, state and region to walk the talk on their net zero promises. We cannot afford slow movers, fake movers or any form of greenwashing."

António Guterres, UN Secretary General





Globe and Mail, editorial

20 October 2023

Regarding the Supreme Court's ruling on Impact Assessment Act

... It's easy to predict more legal clashes ahead but federalism works best when it is co-operative. Ottawa and the provinces should "exercise their respective powers over the environment harmoniously." It sounds overly optimistic. Tangled messes do not portend harmony. .. Ottawa has to be a little less bossy, and the provinces need to step up their climate ambitions. Canada needs less fighting and more doing.



Mitigation priorities (community-wide)

- (i) shift to a low-carbon integrated mobility.
- (ii) redesign neighborhoods to reduce single occupant vehicle use and high heating and cooling demands for buildings.
- (iii) phase out natural gas for space heating, e.g., use heat pumps, smart thermostats.
- (iv) modify buildings (new construction and renovations) to use material with less embodied emissions.
- (v) reduce (or effectively offset) air transportation and cruises.
- (vi) shift to diets with less meat and reduce food waste.
- (vii) shift agriculture practices to enhance carbon sequestration in soil and reduce emissions from livestock and manure management.
- (viii) waste management, including reduced plastics.
- (ix) minimize leaking methane in wastewater treatment, landfills, and gas transmission.
- (x) shift to a more circular economy with emphasis on waste management (minimization).



Region of Durham – Progress Toward Climate Change Commitments

- Annual report (starting November 2023, Region and Local Area Municipalities)
- Credible measure of net-zero progress, linked with partners' progress
- Comprehensive GHG emissions inventory ("world class")
- All sectors (total community and per person emissions)
- Structured to fit with provincial, national, global inventories and targets, while also providing sufficient detail to capture household/neighborhood actions
- Move toward real-time monitoring as well, e.g., CityWatch

Current likelihood of meeting net-zero by 2050? Less than 50/50





Region of Durham – Progress Toward Net Zero Target

- Rational economist (true price of fossil fuels and energy, air quality, future jobs, Article 6 'border carbon adjustment')
- Affordability (cost/benefits of the energy transition, timing)
- How much should the Region lead? E.g., ask the federal government to maintain a price on (all) carbon, set a sunset date for new gas connections
- Transition together, e.g., link net-zero goals of ON Tech, OPG, GM





