

Ontario's Emissions in 2015



How are our emissions?

Moving in the right direction

Abstract

This chapter describes Ontario's most up-to-date greenhouse gas emissions data and how they are changing within each economic sector.

Ontario's greenhouse gas emissions in 2015 were the lowest since reporting began in 1990. This continues the recent downward trend in emissions that allowed Ontario to meet its 2014 emissions-reduction target of 6% below 1990 levels. However, this past success was largely a result of closing Ontario's coal power plants. 2015 was the first year coal was not used to generate any of Ontario's electricity. Thus, new initiatives are needed if Ontario is to meet its future emissions-reduction targets of 15% in 2020, 37% in 2030 and 80% in 2050.



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1.0 Greenhouse Gas Emissions at Their Lowest

Ontario's greenhouse gas (GHG) emissions are the lowest since reporting began in 1990.¹ Emissions in 2015 were 8.3% below those in 1990, as shown in Figure 1.1. The previous reported low was 7.9% below 1990 levels in 2009 during an economic recession.²

ONTARIO'S GREENHOUSE GAS EMISSIONS ARE THE LOWEST SINCE REPORTING BEGAN

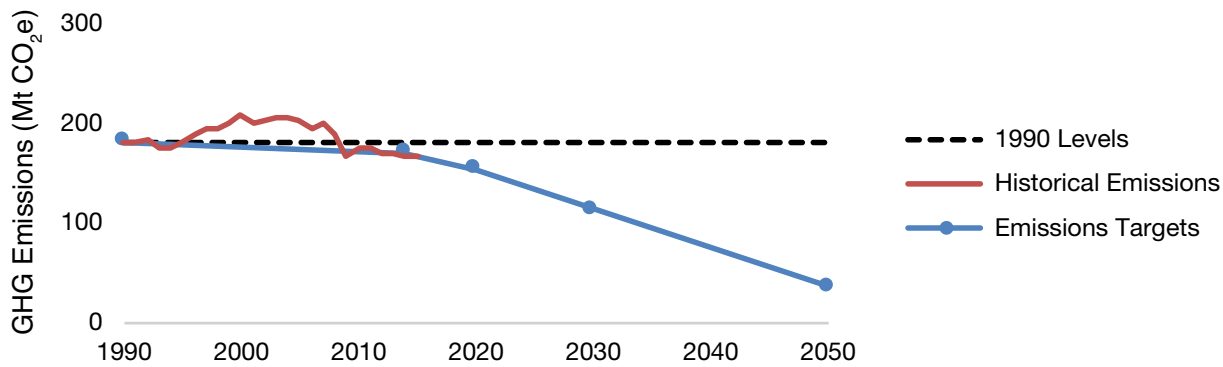


Figure 1.1. Ontario's historical GHG emissions and emissions-reduction targets.

Source: Environment and Climate Change Canada, *National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada* (2017), Part 3, Table A11-12, page 58.

Ontario has three GHG emissions-reduction targets that are based on 1990 levels. The province achieved its first target of a 6% reduction by 2014 (Figure 1.1). This success was largely a result of the phase-out of coal for electricity generation, which was completed in 2014. This allowed the post-recession downward trend that began in 2010 to continue into 2015 – even with the economic and population growth shown in Figure 1.2.

THE PHASE-OUT OF COAL ALLOWED THE POST-RECESSION DOWNWARD TREND THAT BEGAN IN 2010 TO CONTINUE INTO 2015

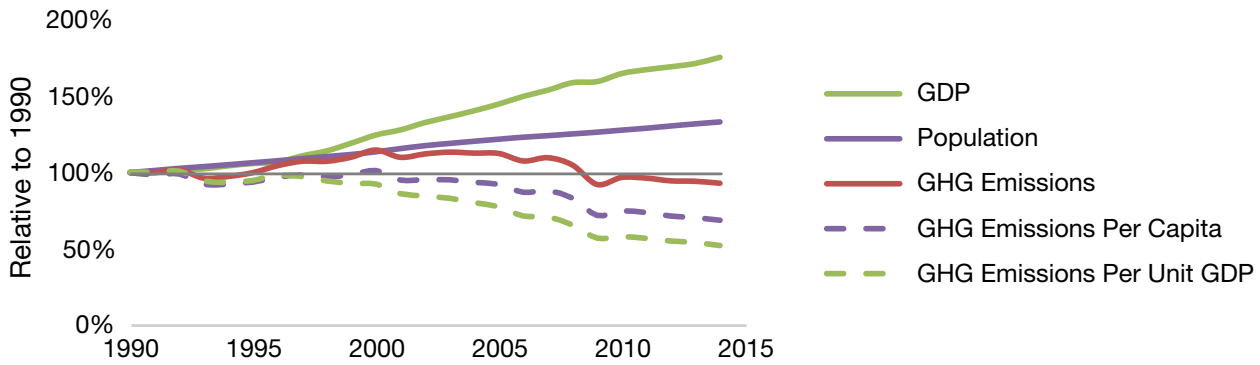


Figure 1.2. Ontario's GHG emissions relative to GDP and population.

Source: Statistics Canada, *Gross domestic product, expenditure-based, provincial and territorial* (2016), CANSIM Table 384-0038; Statistics Canada, *Population by year, by province and territory* (2016), CANSIM Table 051-0001.

Ontario's ability to reduce electricity sector GHG emissions has been nearly exhausted, as shown in Figure 1.3. Non-electricity GHG emissions were 3% higher in 2015 than in 1990. Thus, non-electricity GHG emissions must start to fall in order for Ontario to meet its increasingly stringent future targets of a

15% reduction by 2020, 37% reduction by 2030 and an 80% reduction by 2050. These targets and the initiatives the government has proposed to pursue them can be found in Ontario's *Climate Change Action Plan 2016-2020*.

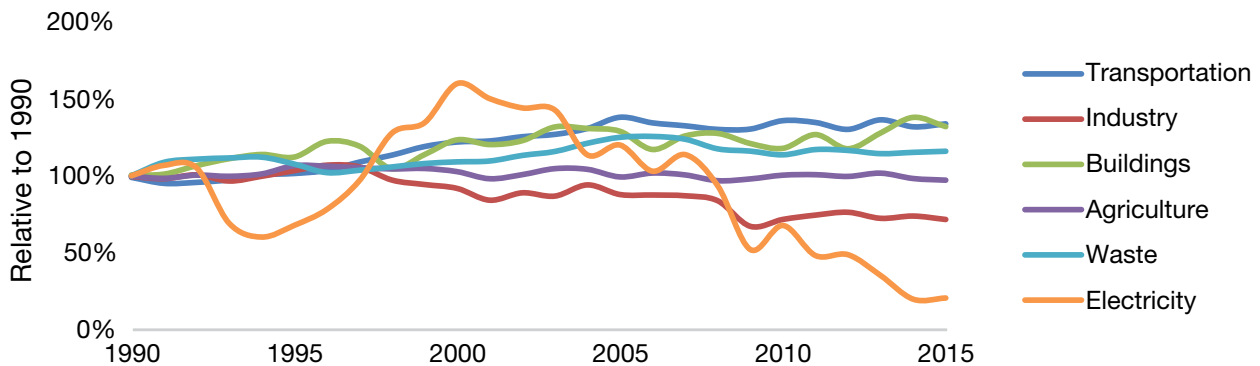


Figure 1.3. Ontario's historical GHG emissions by economic sector relative to 1990 levels.

Source: Environment and Climate Change Canada, *National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada* (2017), Part 3, Table A11-12, page 58.

1.1 Which Greenhouse Gases Are Produced?

Carbon dioxide represented 84% of Ontario's reported 2015 GHG emissions, as illustrated in Figure 1.4. Another 9% were from methane, 5% from nitrous

oxide, and 2% from synthetic gases. However, as first discussed in Chapter 3 of our *2016 Greenhouse Gas Progress Report* (which can be found on our website

along with our other past reports cited here), and further examined below, Ontario's official emissions from the *National Inventory Report* underestimate the climate change impact of methane. This means both the contribution from methane and Ontario's total GHG emissions are higher than those reported.

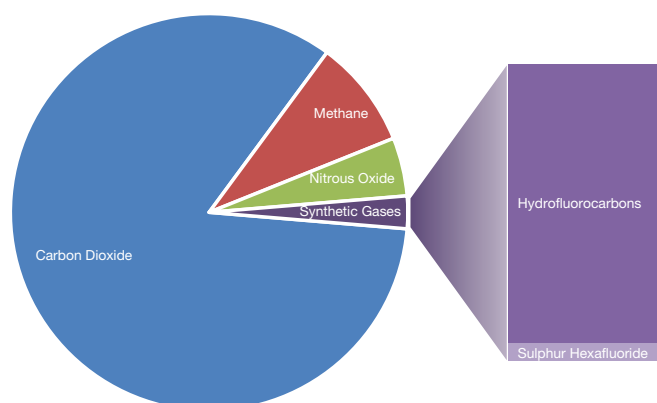


Figure 1.4. Ontario's 2015 GHG emissions by greenhouse gas type. Perfluorocarbons are synthetic gases that are not shown in the figure due to their relatively small quantities.

Source: Environment and Climate Change Canada, *National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada (2017)*, Part 3, Table A11-13, page 59.

Global warming potentials are weighting factors that allow comparisons between the different types of GHG emissions. Each type of GHG emission is weighted by its ability to absorb heat over a period of time, as compared to carbon dioxide. The *National Inventory Report* uses 100-year global warming potentials from the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4) released in 2007. However, the IPCC has since released a Fifth Assessment Report (AR5) in 2014 with updated global warming potentials that are now higher for methane. Additionally, methane is a short-lived climate forcer, which means its global warming potential is even higher when examined over a 20-year time horizon.

The impact on Ontario's GHG emissions of using a higher methane global warming potential is shown in Figure 1.5. All other figures in this chapter are produced using the official GHG emission estimates from the *National Inventory Report*.

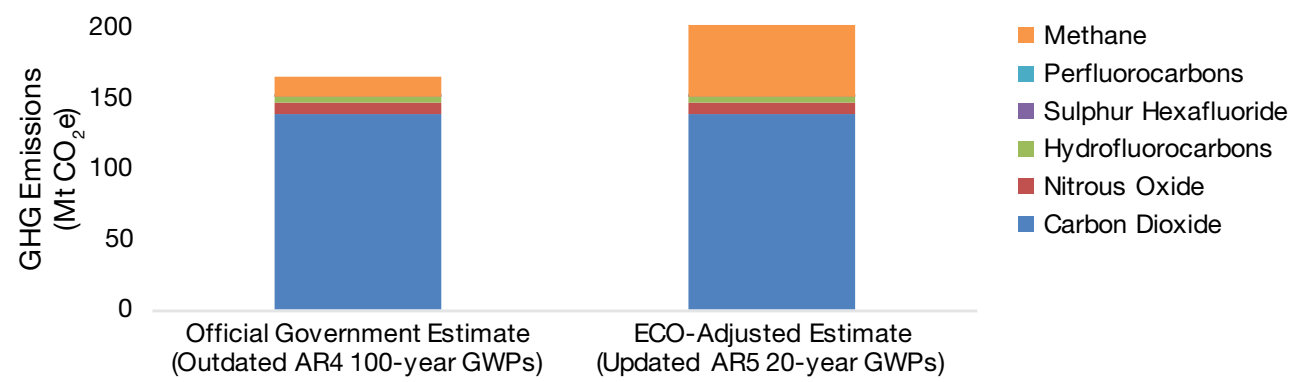


Figure 1.5. Official and revised estimates of Ontario's 2015 GHG emissions showing the impact of using different methane global warming potentials (GWP).

Source: Environment and Climate Change Canada, *National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada (2017)*, Part 3, Table A11-13, page 58.



1.2 IPCC Sectors – How Are Emissions Produced?

The *National Inventory Report* classifies Ontario's sources of GHG emissions into four IPCC sectors: *energy, agriculture, waste, and industrial processes and product use.*

Energy use resulted in 76% of Ontario's official 2015 GHG emissions. This was primarily from the burning of fossil fuels for transportation and heating, but also from venting and leakage. These emissions were primarily in the form of carbon dioxide, with methane and nitrous oxide emissions released in much smaller quantities, as shown in Figure 1.6.

Agricultural practices include animal digestion, manure, soil and fertilizer use. These produced 6% of total emissions, mostly in the form of methane and nitrous oxide.

Waste management produces emissions from decomposition and incineration. These were responsible for 5% of the total emissions and were predominantly methane.

Industrial processes and product use result in emissions from physical and chemical reactions. These emissions were 13% of the total, and mostly carbon dioxide but also include smaller quantities of synthetic gases. Hydrofluorocarbons (e.g., from use as a refrigerant), perfluorocarbons (e.g., from use as a solvent) and sulphur hexafluoride (e.g., from use as an insulating gas) were the synthetic gases emitted.

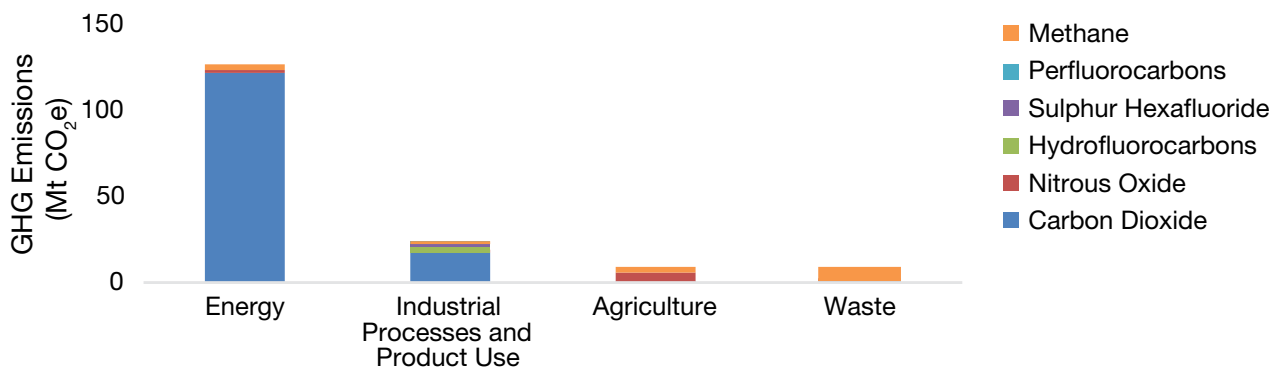


Figure 1.6. Ontario's 2015 GHG emissions by IPCC sector.

Source: Environment and Climate Change Canada, *National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada* (2017), Part 3, Table A11-13, page 58.

1.3 Economic Sectors – A More Intuitive Approach

The Government of Canada is required to report GHG emissions in accordance with international guidelines using the IPCC sectors introduced above in Figure 1.6. However, this is not an intuitive approach. Many people may find it easier to understand GHG emissions based on economic sectors. In this approach, one attributes emissions from driving farm tractors to the *agriculture*

sector, as opposed to the *energy* sector. Similarly, emissions from a car's air conditioner are attributed to the *transportation* sector rather than to *industrial processes and product use*. Figure 1.7 illustrates Ontario's GHG emissions organized into these more intuitive economic sectors.

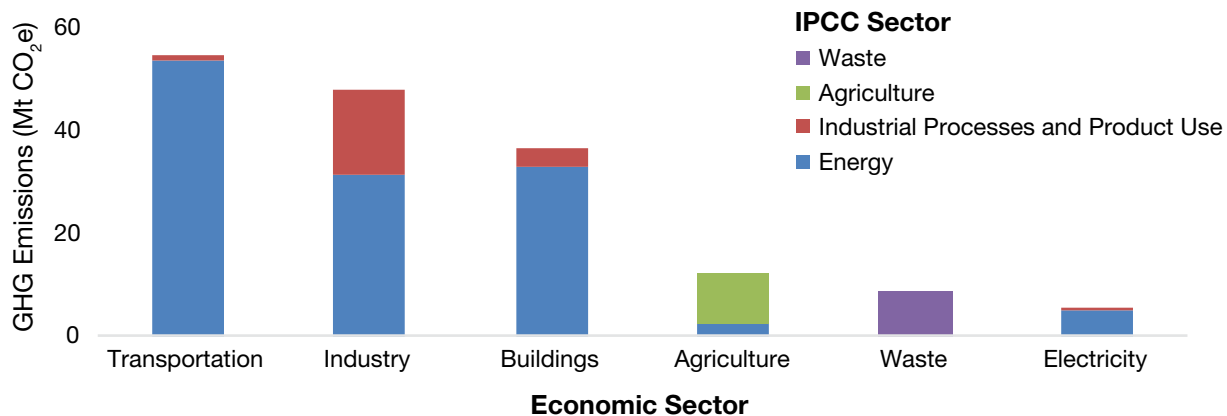


Figure 1.7. Ontario's 2015 GHG emissions by economic sector.³

Source: Environment and Climate Change Canada, *National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada* (2017), supplemental data provided to the ECO.

The transportation sector is the largest contributor to Ontario's GHG emissions (33%), followed by industry (29%), buildings (22%), agriculture (7%), waste (5%) and electricity (3%). The emissions from each of these

sectors and their subsectors are compared with those in previous years in Table 1.1. Each economic sector is analyzed below using insights and historical data from the *National Inventory Report* unless otherwise specified.



Table 1.1. Ontario's 1990, 2014 and 2015 GHG emissions by economic subsector.

GHG Emission Sources	Emissions (Mt CO ₂ e)			Change (%)		Share of Total (%)
	1990	2014	2015	1990-2015	2014-2015	2015
Transportation	41	54	55	+34	+1	33
Passenger Transport	31.0	34.7	35.3			
Cars, Light Trucks and Motorcycles	29.0	32.5	33.1			
Bus, Rail and Domestic Aviation	2.0	2.2	2.2			
Freight Transport	8.6	18.6	18.7			
Heavy-Duty Trucks, Rail	7.2	17.0	17.4			
Domestic Aviation and Marine	1.4	1.6	1.2			
Recreational, Commercial and Residential	1.4	0.9	1.0			
Industry	67	50	48	-28	-3	29
Emissions-Intensive and Trade-Exposed Industries	43.2	30.0	29.1			
Iron and Steel	15.0	13.7	12.1			
Chemicals and Fertilizers	16.2	6.8	7.4			
Cement	4.5	4.4	4.5			
Pulp and Paper	3.2	1.8	1.6			
Mining	1.1	1.4	1.5			
Lime and Gypsum	1.7	1.1	1.0			
Smelting and Refining (Non-Ferrous Metals)	1.5	0.7	1.0			
Oil and Gas	10.3	10.8	10.3			
Petroleum Refining	6.6	8.0	7.5			
Oil and Natural Gas Transmission	3.0	2.1	2.1			
Natural Gas Distribution	0.4	0.5	0.5			
Natural Gas Production and Processing	0.3	0.2	0.2			
Conventional Oil Production	0.1	0.0	0.0			
Other	13.2	9.0	8.9			
Light Manufacturing	9.9	6.1	5.7			
Construction	2.9	2.5	2.7			
Forest Resources	0.4	0.4	0.5			
Buildings	28	39	37	+32	-4	22
Residential	18.2	22.3	21.3			
Service Industry	9.6	16.3	15.5			
Agriculture	13	12	12	-3	+1	7
Animal Production	7.4	6.3	6.3			
Crop Production	3.1	3.6	3.3			
On-Farm Fuel Use	2.1	2.6	2.6			
Waste	7	9	9	+16	+1	5
Solid Waste	6.9	7.9	8.0			
Waste Incineration	0.3	0.3	0.3			
Wastewater	0.2	0.3	0.3			
Electricity	26	5	5	-80	+4	3
TOTAL	181	168	166	-8	-1	100

Based on: Environment and Climate Change Canada, *National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada* (2017), Part 3, Table A12-7, page 82.

1.4 Transportation – Ontario’s Largest Emissions Source

The reported emissions from the transportation sector in 2015 were 34% higher than 1990 levels. This growth was primarily due to freight vehicles, though on-road passenger vehicles continued to dominate the sector’s overall emissions. (Note that the trends shown in Figure 1.8 exclude emissions from international aviation and marine, in accordance with IPCC requirements.)

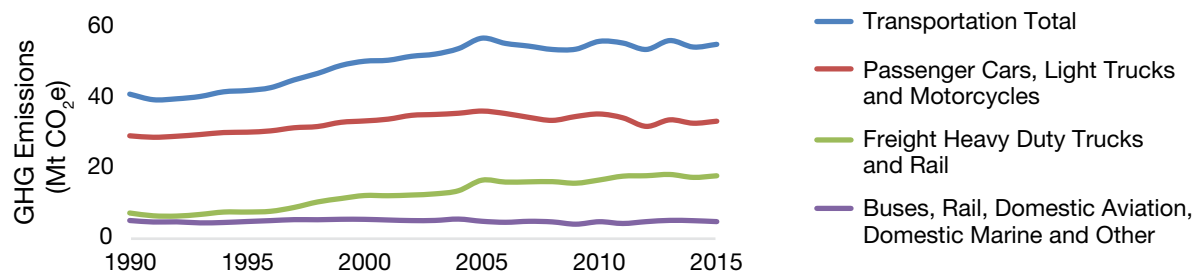


Figure 1.8. Ontario’s GHG emissions from transportation.

Source: Environment and Climate Change Canada, *National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada* (2017), Part 3, Table A12-7, page 82.

There has been rapid growth in both on-road passenger travel and freight activity, as shown in Figure 1.9. Fortunately, the growth in emissions has been moderated by improvements in vehicle fuel efficiency. The improvement has been correlated with increasing fuel prices, as shown in Figure 1.10 for passenger vehicles, while freight vehicles are further examined in Chapter 6. Vehicle fuel efficiency is also regulated by federal policies, but these have been partially undermined by consumer preferences for SUVs and pickup trucks over cars. Additionally, freight truck GHG emissions regulations only began in 2014.

**THERE HAS BEEN RAPID GROWTH
IN BOTH ON-ROAD PASSENGER
TRAVEL AND FREIGHT ACTIVITY**

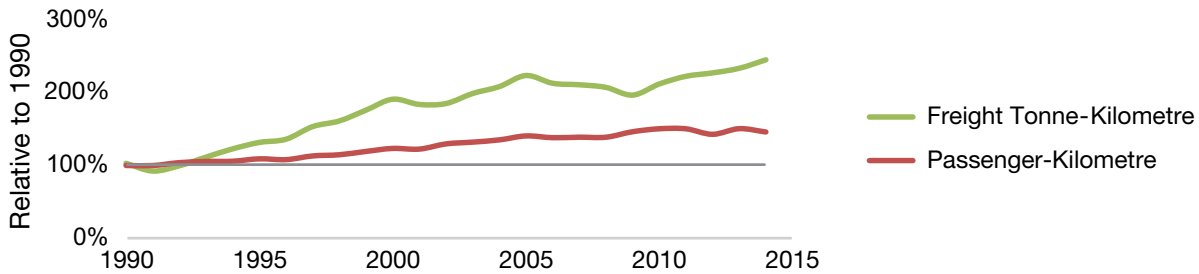


Figure 1.9. Ontario's on-road vehicle activity and energy intensity.

Source: Natural Resources Canada, *Comprehensive Energy Use Database* (2016), Transportation Sector, Ontario, Table 9: Road Transportation Secondary Energy Use and GHG Emissions by Energy Source.

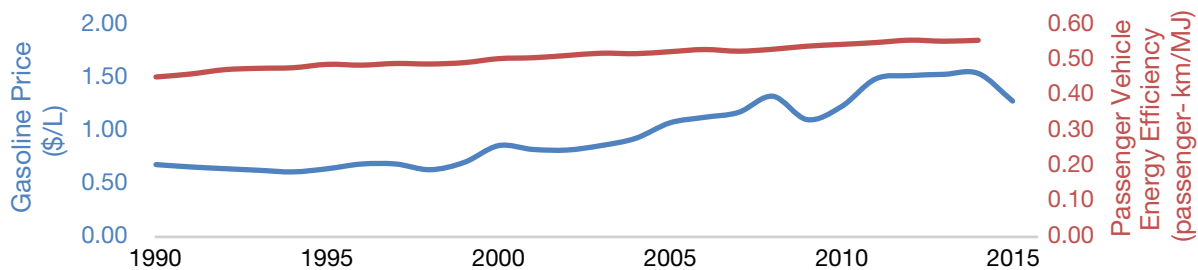


Figure 1.10. Toronto gasoline price and Ontario passenger vehicle energy efficiency.

Source: Statistics Canada, *Average retail prices for gasoline and fuel oil, by urban centre* (2017), CANSIM Table 326-0009; Natural Resources Canada, *Comprehensive Energy Use Database* (2016), Transportation Sector, Ontario, Table 10: Passenger Road Transportation Secondary Energy Use and GHG Emissions by Energy Source.

Nearly all (98%) transportation emissions were from vehicle fuel use (shown above in Figure 1.7). Most of the fuel used is ethanol-blended gasoline, as shown in Figure 1.11. Diesel, aviation fuel, propane and natural gas combustion were also used. (Fuel production emissions are excluded from the transportation sector and instead allocated to industry.) GHG emissions from industrial product use in vehicles, namely air conditioner refrigerant, were in the form of hydrofluorocarbons and relatively minor (2%).

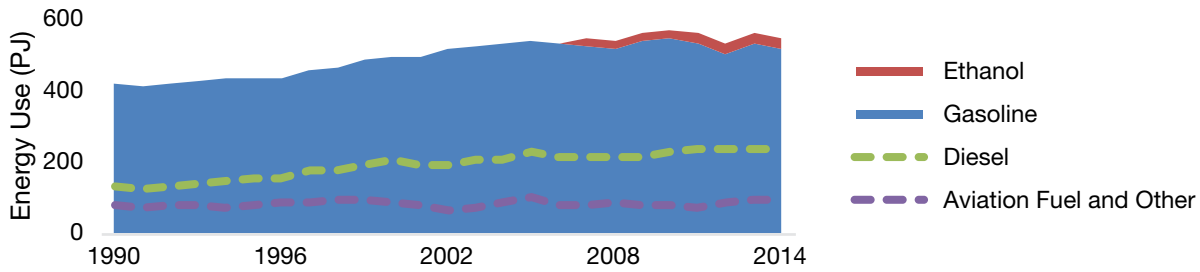


Figure 1.11. Ontario's transportation energy use by energy source.

Source: Natural Resources Canada, *Comprehensive Energy Use Database* (2016), Transportation Sector, Ontario, Table 1: Secondary Energy Use by Energy Source.

1.5 Industry – Transitioning to a Low-Carbon Economy

Ontario's industry sector had 28% lower GHG emissions in 2015 than in 1990. This decrease was due to a reduction in *emissions-intensive and trade-exposed*, as shown in Figure 1.12. Emissions from oil and gas, light manufacturing, construction and forest resources have remained relatively consistent.

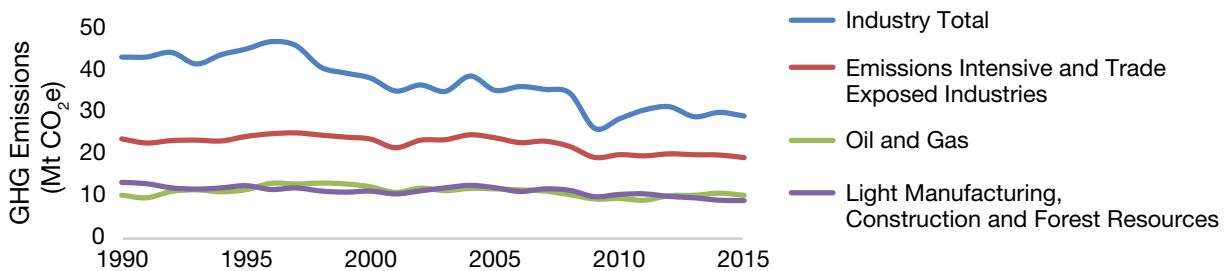


Figure 1.12. Ontario's GHG emissions from industry.

Source: Environment and Climate Change Canada, *National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada* (2017), Part 3, Table A12-7, page 82.



A closer examination of *emissions-intensive and trade-exposed industries* in Figure 1.13 shows the emissions reductions occurred primarily in the chemical and fertilizer sector. In particular, a single adipic acid plant with high nitrous oxide emissions, which produced 15% of 1990 industry sector emissions, installed emissions-reduction technology in 1997 and shut down in 2009. Emissions from iron and steel have gradually decreased, primarily with dropping production levels.

A SINGLE ADIPIC ACID PLANT WITH HIGH NITROUS OXIDE EMISSIONS, WHICH PRODUCED 15% OF 1990 INDUSTRY SECTOR EMISSIONS, SHUT DOWN IN 2009

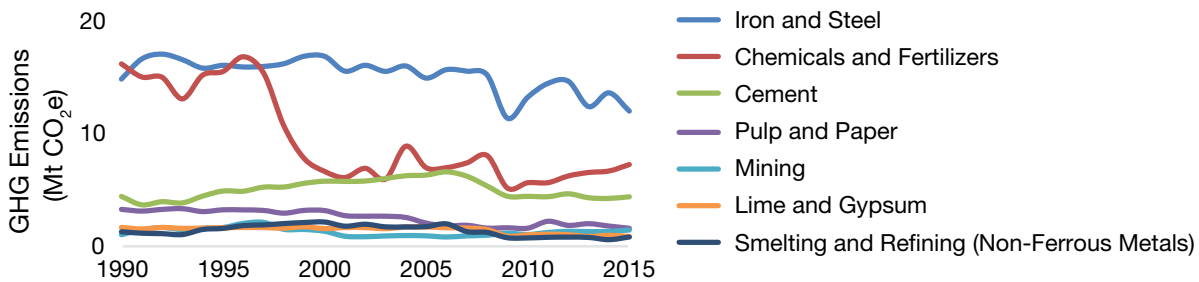


Figure 1.13. Ontario's GHG emissions from emissions-intensive and trade-exposed industries.

Source: Environment and Climate Change Canada, *National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada* (2017), Part 3, Table A12-7, page 82.

Although some emissions reductions have been a result of declining industrial production, Figure 1.14 shows economic activity in some industries are similar or higher than they were in 1997 (when Statistics Canada began to report industry-specific contributions to GDP).

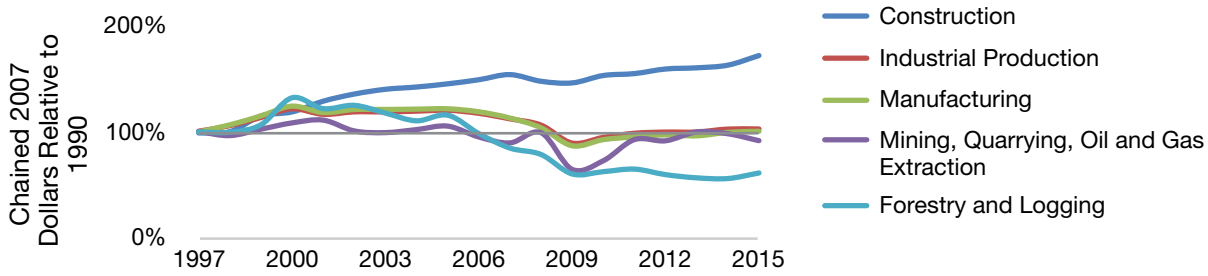


Figure 1.14. Gross domestic product of Ontario’s industrial production, mining, quarrying, oil and gas extraction, construction and manufacturing, and forestry and logging.

Source: Statistics Canada, *Gross domestic product (GDP) at basic prices, by North American Classification System (NAICS), provinces and territories* (2017), CANSIM Table 379-0031.

GHG emissions attributed to the industry sector were mostly (65%) from energy use (shown above in Figure 1.7). These emissions were primarily from combustion, but also include a small quantity of emission leaks from oil and gas infrastructure (leaks, accidents, venting and flaring). Most of the energy was in the form of natural gas used for

heat or, to a much lesser extent, for onsite cogenerated electricity (Figure 1.15). (Emissions from electricity generated by offsite sources are allocated to the electricity sector.) Some industries (e.g., oil and gas, pulp and paper) used their own by-products as fuel. Diesel was used for off-road industry (e.g., construction and forestry) vehicles.

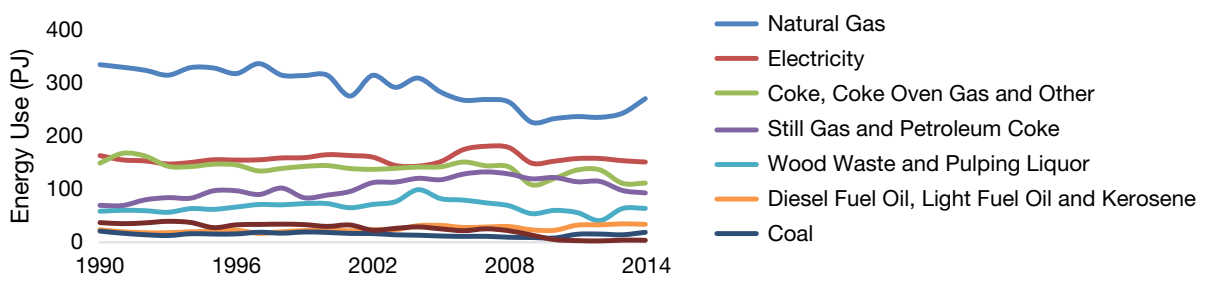


Figure 1.15. Ontario’s industry energy use by energy source.

Source: Natural Resources Canada, *Comprehensive Energy Use Database* (2016), Industry Sector, Ontario, Table 1: Secondary Energy Use by Energy Source.

The remaining (35%) emissions from the industry sector were from *industrial processes and product use*. This included cement production and was mainly in the form of carbon dioxide.



1.6 Buildings – More Space For All

Emissions from Ontario buildings increased by 32% between 1990 and 2015. This was due to growth in both residential and service industry building emissions, as shown in Figure 1.16.

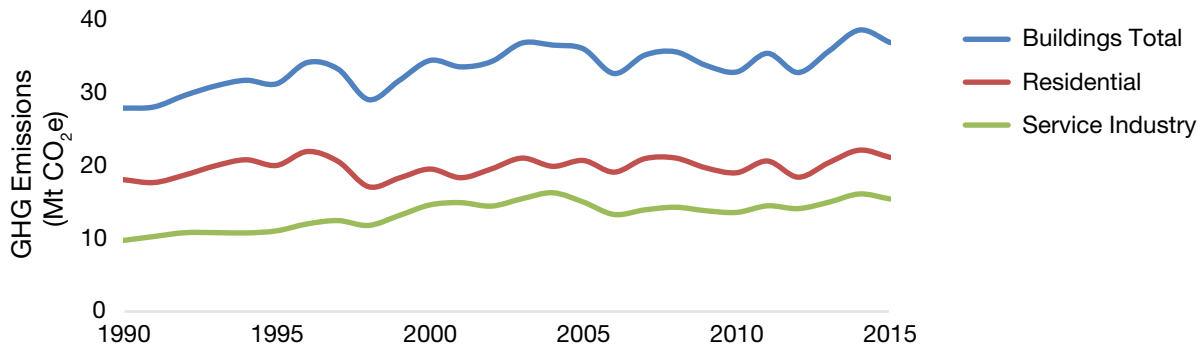


Figure 1.16. Ontario's GHG emissions from buildings.

Source: Environment and Climate Change Canada, *National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada* (2017), Part 3, Table A12-7, page 82.

Building sector emissions increased from growth in both population and floor space per person. Fortunately, the increase in residential (but not service industry) building emissions has been slowed by energy efficiency improvements. These improvements are shown as a reduction in energy intensity (energy use divided by floor space) in Figure 1.17. There are also year-to-year energy intensity fluctuations in response to the weather (as indicated by heating degree days).

BUILDING SECTOR EMISSIONS INCREASED FROM GROWTH IN BOTH POPULATION AND FLOOR SPACE PER PERSON

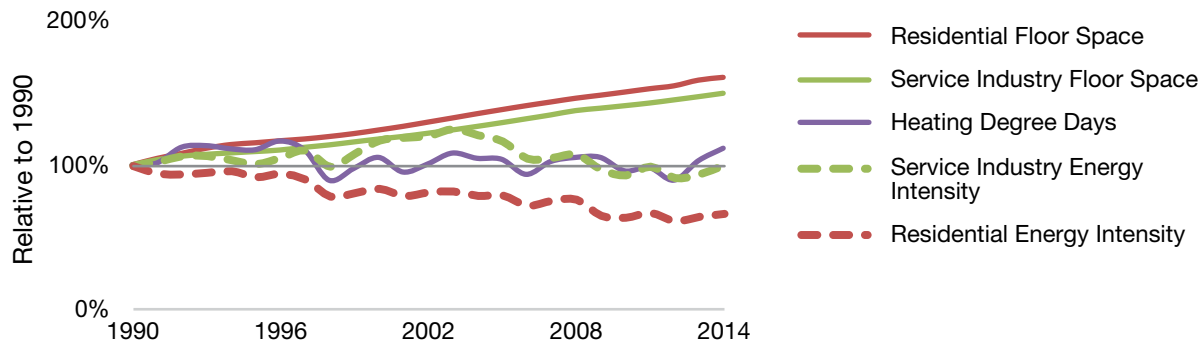


Figure 1.17. Ontario's residential building floor space and energy intensity relative to 1990.

Source: Natural Resources Canada, *Comprehensive Energy Use Database* (2016), Commercial/Institutional Sector, Ontario, Table 2: Secondary Energy Use and GHG Emissions by End-Use.

Source: Natural Resources Canada, *Comprehensive Energy Use Database* (2016), Residential Sector, Ontario, Table 2: Secondary Energy Use and GHG Emissions by End-Use.

The vast majority (90%) of GHG emissions from the buildings sector were from energy use (shown above in Figure 1.7). These were mainly associated with natural gas (Figure 1.18) used for space heating (Figure 1.19). Other uses included water heating, cooking and on-site

cogenerated electricity production. (Emissions from electricity generated by off-site sources are allocated to the electricity sector.) Non-energy use emissions included hydrofluorocarbons from refrigerants used for air conditioning and refrigeration.

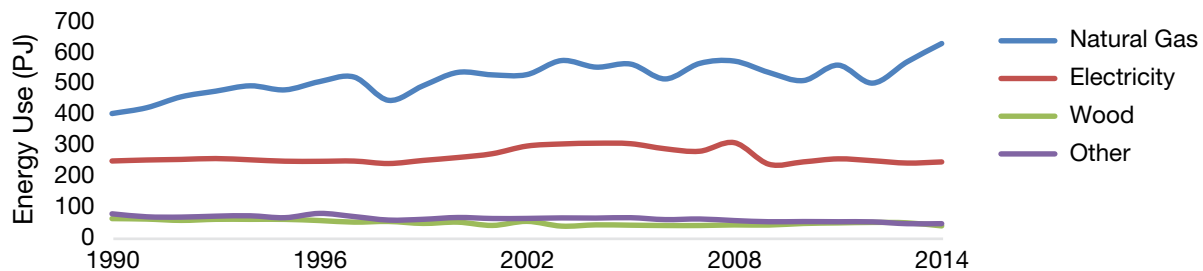


Figure 1.18. Ontario's building energy use by energy source.

Source: Natural Resources Canada, *Comprehensive Energy Use Database* (2016), Residential Sector, Ontario, Table 1: Secondary Energy Use by Energy Source; Natural Resources Canada, *Comprehensive Energy Use Database* (2016), Commercial/Institutional Sector, Ontario, Table 1: Secondary Energy Use by Energy Source.

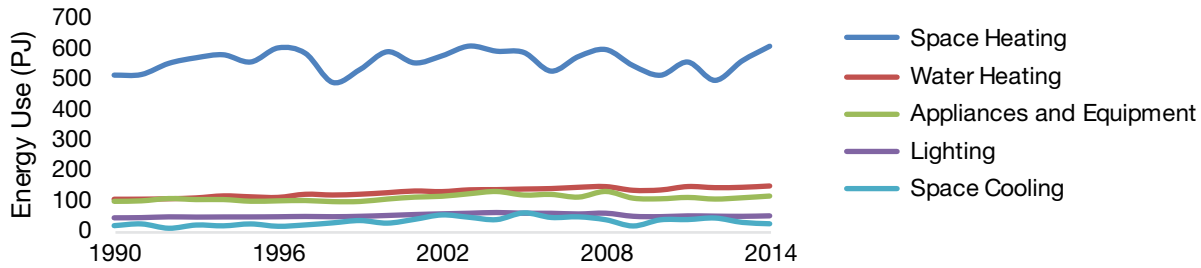


Figure 1.19. Ontario's building energy use by end use.

Source: Natural Resources Canada, *Comprehensive Energy Use Database* (2016), Residential Sector, Ontario, Table 2: Secondary Energy Use by End-Use; Natural Resources Canada, *Comprehensive Energy Use Database* (2016), Commercial/Institutional Sector, Ontario, Table 2: Secondary Energy Use by End-Use.

1.7 Agriculture – Holding Steady

Ontario's agriculture sector emissions have remained largely unchanged since 1990. Increasing emissions from crop production and on-farm fuel use have offset a decrease in animal production emissions, as shown in Figure 1.20. Declining cattle populations, as shown

in Figure 1.21, have reduced emissions from animal digestion (methane) and manure management (mostly nitrous oxide). Increasing crop production resulted in additional emissions from nitrogen fertilizer use (with associated nitrous oxide).

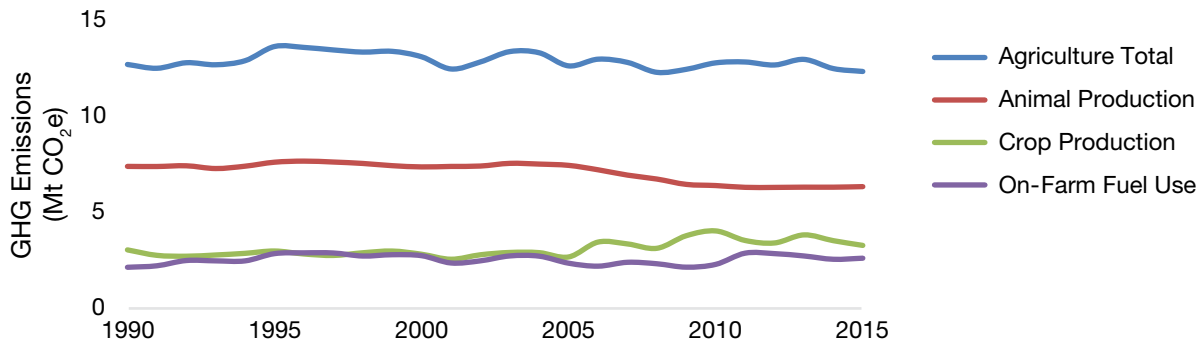


Figure 1.20. Ontario's GHG emissions from agriculture.

Source: Environment and Climate Change Canada, *National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada* (2017), Part 3, Table A12-7, page 82.

Increased crop production has also contributed to higher on-farm energy use. Although cropland area has remained relatively consistent, Figure 1.21 shows a rapid increase in the area used for higher-value greenhouse vegetable production. Greenhouses, unlike field crops, require heating and typically use natural gas.⁴

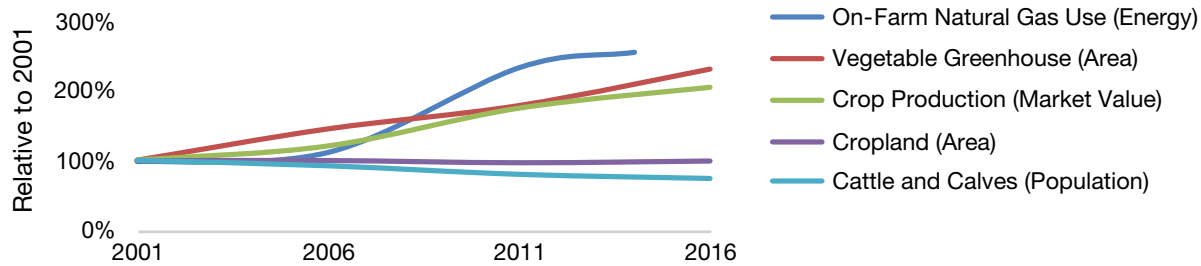


Figure 1.21. Ontario's agricultural sector statistics.

Source: Ministry of Agriculture, Food and Rural Affairs, *Statistical Summary of Ontario Agriculture* (2017); Natural Resources Canada, *Comprehensive Energy Use Database* (2016), Agricultural Sector, Ontario, Table 7: Secondary Energy Use and GHG Emissions by End-Use and Energy Source.

Sources of on-farm fuel use other than natural gas have remained relatively consistent, as shown in Figure 1.22. These include gasoline and diesel use in on-farm vehicles. (All emissions from electricity use are allocated to the electricity sector, which has low emissions in Ontario.)

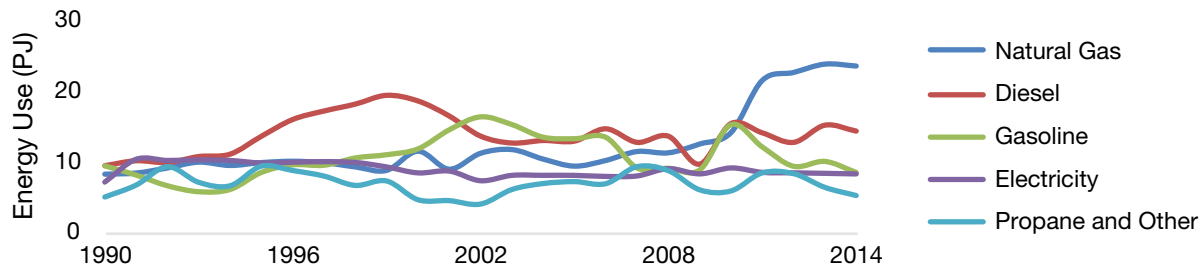


Figure 1.22. Ontario's agricultural sector energy use by energy source.

Source: Natural Resources Canada, *Comprehensive Energy Use Database* (2016), Agricultural Sector, Ontario, Table 7: Secondary Energy Use and GHG Emissions by End-Use and Energy Source.



1.8 Waste – A Big Question Mark

Ontario's waste sector emissions in 2015 were 16% higher than in 1990. This was due to an increase in estimated solid waste emissions (mostly methane) and, to a lesser extent, wastewater emissions (mostly nitrous oxide), as shown in Figure 1.23. Waste incineration

emissions (mostly carbon dioxide) have remained relatively consistent. (Waste sector emissions exclude those from refuse trucks, which are allocated to the transportation sector.)

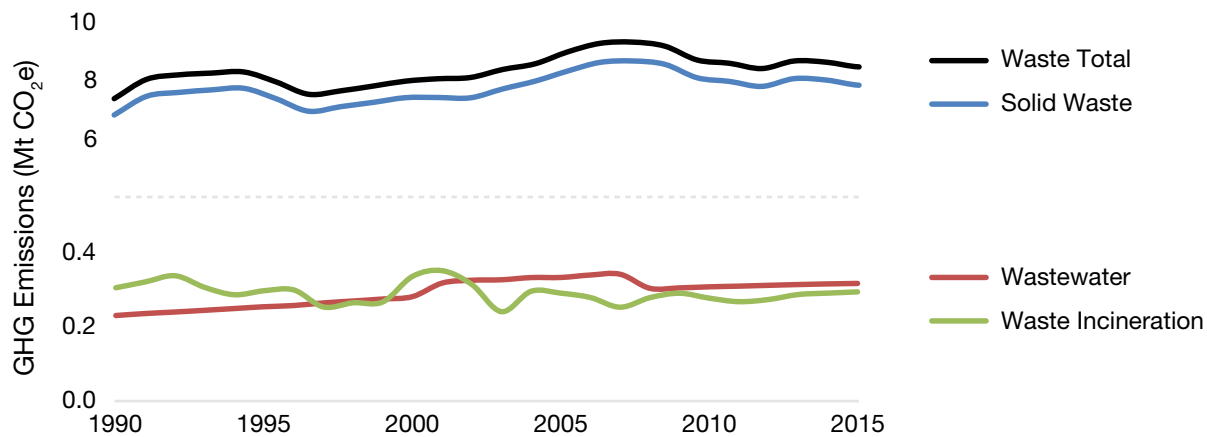


Figure 1.23. Ontario's GHG emissions from waste. Note the y-axis split to show wastewater and waste incineration trends.

Source: Environment and Climate Change Canada, *National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada* (2017), Part 3, Table A12-7, page 82.

Waste sector emission estimates are highly uncertain and may be up to 40% higher or lower than reported. For example, large landfills (over 1.5 million cubic metres) are required to capture landfill gas emissions. The methane component can be used to generate electricity or flared to produce carbon dioxide and lower the global warming potential of the emissions. However, the effectiveness of these capture systems has been questioned, which also contributes to the uncertainty. Fortunately, Ontario has been gradually diverting more solid waste away from disposal, as shown in Figure 1.24.

WASTE SECTOR EMISSION ESTIMATES ARE HIGHLY UNCERTAIN



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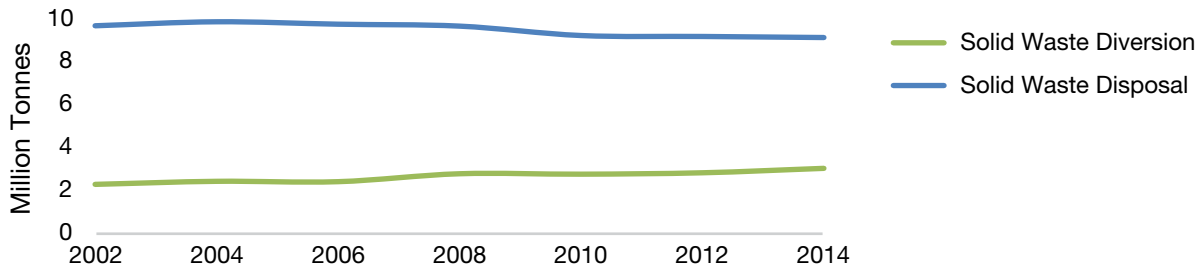


Figure 1.24. Ontario's GHG solid waste disposal and diversion.

Source: Statistics Canada, *Disposal of waste, by source, Canada, provinces and territories* (2016), CANSIM Table 153-0041; Statistics Canada, *Materials diverted, by type, Canada, provinces and territories* (2017), CANSIM Table 153-0043.

1.9 Electricity – Finally Coal Free

Ontario's electricity sector has seen a dramatic 80% decrease in GHG emissions from 1990 levels, as shown in Figure 1.25. As discussed above, this drop occurred because 2015 was the first complete year that coal was no longer used to generate electricity.

2015 WAS THE FIRST COMPLETE YEAR THAT COAL WAS NO LONGER USED TO GENERATE ELECTRICITY

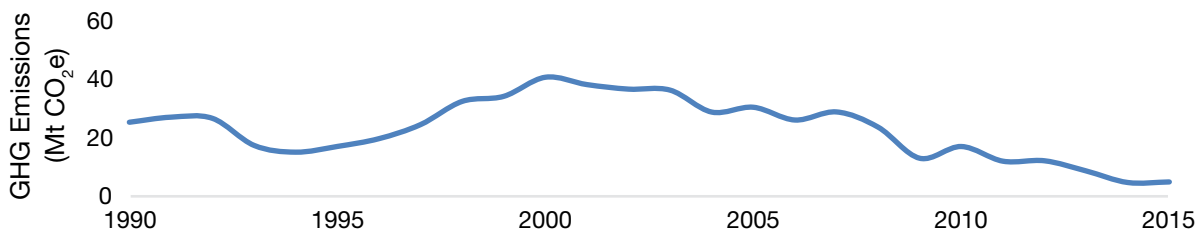


Figure 1.25. Ontario's GHG emissions from electricity.

Source: Environment and Climate Change Canada, *National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada* (2017), Part 3, Table A12-7, page 82.



Some other sources of electricity have stepped up to replace coal, as shown in Figure 1.26. Although the use of natural gas has increased, it is less GHG-intensive than coal and largely limited to supplying peak loads.⁵ The vast majority of Ontario's grid electricity is generated from sources that do not (directly) release GHG emissions – especially nuclear. Additional electricity was produced locally or behind-the-meter from sources including solar, diesel and biomass.

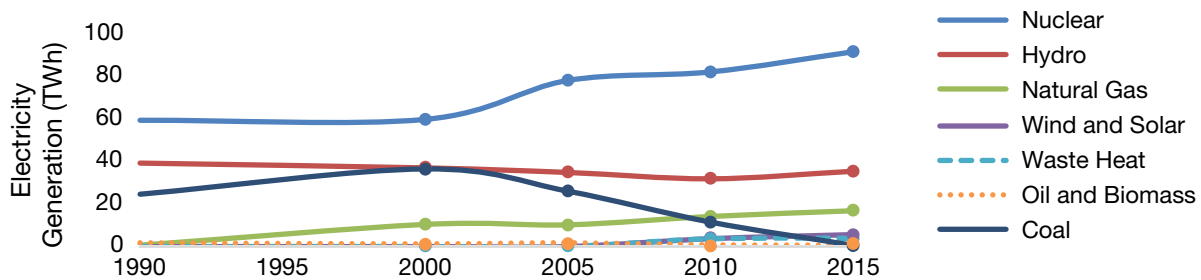


Figure 1.26. Ontario's GHG emissions from different sources of electricity. Note: inconsistent x-axis used due to lack of 1995 data from source.

Source: Environment and Climate Change Canada, *National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada* (2017), Part 3, Table A13-7, page 99.

See our 2017 Energy Conservation report *Every Joule Counts* for further discussion of Ontario's electricity sector.



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Endnotes

1. Environment and Climate Change Canada, *National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada* (Ottawa: Pollutant Inventories and Reporting Division, 2017).
2. Note that the methodologies used to produce the National Inventory Report are continuously refined. This includes those used to calculate historical values. Comparisons to historical data presented here are based on the current methodology and some values will not match those presented in our previous reports.
3. Environment and Climate Change Canada does not have an industry sector in its economic sector breakdown. The “Industry” category was created by the Ontario Ministry of the Environment and Climate Change and is a combination of three ECCC economic sectors: oil and gas; emissions-intensive and trade-exposed; and light manufacturing, construction and forest resources. The ECO has adopted this categorization.
4. “Use of Biomass for Heating Greenhouses in Ontario,” online: Ministry of Agriculture, Food and Rural Affairs <<http://www.omafra.gov.on.ca/english/crops/facts/08-015w.htm>>.
5. “Canadian Energy Dynamics: Review of 2014 - Energy Market Assessment,” online: National Energy Board <<https://www.neb-one.gc.ca/nrg/ntgrtd/mrkt/dnmc/2014/index-eng.html>>

