



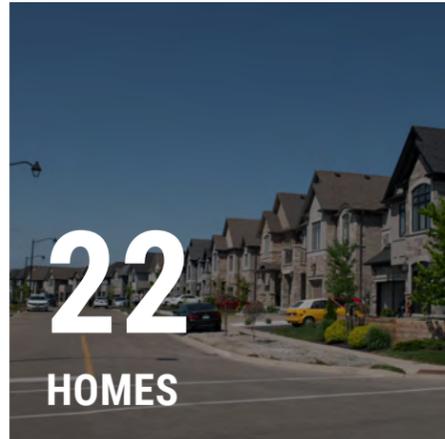
OUR PROGRESS, OUR PATH 2020

A photograph of a city street scene. In the foreground, there are several buses, including one with "Goldfinger" branding and another with "iXpress" branding. In the background, there are modern buildings and a street lamp with three globe lights. The sky is blue with some clouds. The bottom of the image is partially obscured by a dark grey text box.

COMMUNITY GREENHOUSE
GAS RE-INVENTORY REPORT

April 2023

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WHO WE ARE

CLIMATE ACTION WR

ClimateActionWR is a collaboration between local organizations, community members, and all eight municipalities in Waterloo Region. We focus on climate change mitigation in Waterloo Region by coordinating the activities of our community's climate action plans, measuring and monitoring progress on emissions reductions, and by engaging the community on climate action initiatives.

Together, our community is working to achieve Waterloo Region's long-term goal of an 80% greenhouse gas emission reduction (based on 2010 levels) by 2050 (80by50). In 2018, all 8 area municipal and Region Councils approved the 80% by 2050 target. In 2021 all municipalities in Waterloo Region increased our interim target to 50% by 2030 and adopted TransformWR, a new transformational climate action plan to drive beyond incremental change towards significant emissions reductions.





Though we have maintained some of our emissions reductions since 2010, we have continued to see upward pressure on our carbon footprint

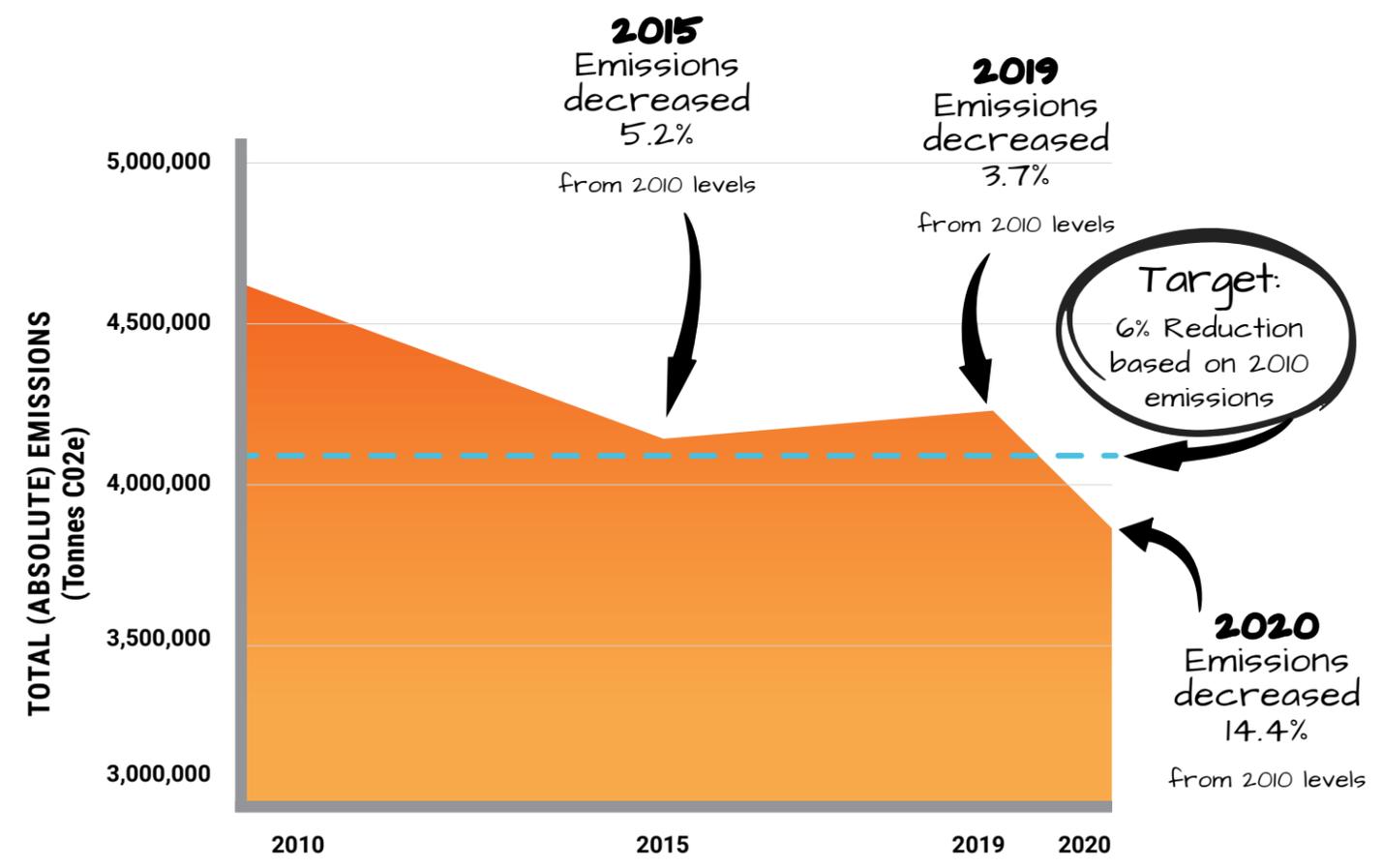
FROM 2010 TO 2020 CHANGES IN OUR COMMUNITY CARBON FOOTPRINT

When creating the first community Climate Action Plan, we completed a community-wide greenhouse gas (GHG) emissions inventory and forecast for Waterloo Region for the year 2010. It identified our carbon footprint: the amount of GHGs the community of Waterloo Region emits. In 2017 we completed [“Our Progress, Our Path”](#) to compare our 2015 data with the 2010 footprint and measure our progress towards our 6% reduction target for the period 2010-2015. In this inventory we reported a 5.2% emissions reduction. The significant reduction in this period is largely attributed to the phasing out of coal in Ontario.

What is CO2e?
Carbon dioxide equivalent (CO2e) is a term used to describe different greenhouse gases in a common unit. Greenhouse gasses, like methane (CH4) and nitrous oxide (N2O), each have different impacts on climate change. For example, 1 tonne of CH4 has the same impact on climate change as 25 tonnes of CO2, so it is expressed as 25 tonnes of CO2e. For the data in this report, CO2 is used as the base unit.

Now we have completed our 2020 inventory and measured the progress we made through this plan between 2016-2020.

Please Note: As a result of the impacts of the COVID-19 pandemic on our community, emissions data in 2020 does not accurately reflect progress since 2015. To account for this, we have also conducted an inventory of 2019. Throughout this report we will present data from both 2019 and 2020 to more accurately understand our community's progress.



What the Numbers Tell Us

BASED ON 2019 EMISSIONS IT IS UNLIKELY THAT WE WOULD HAVE ACHIEVED OUR 6% REDUCTION TARGET IN 2020 WITHOUT THE DRASTIC EFFECTS OF THE COVID-19 PANDEMIC.

Our progress between 2010 and 2020 underscores the necessity of transformational systems shifts and the actions outlined in the TransformWR strategy.



REACHING BEYOND OUR COMMUNITY

There are many actions we can take to dramatically reduce emissions while increasing the resilience of our own community. However, we cannot do it alone. Reducing emissions at this scale requires simultaneous system shifts through supportive policy at both the Federal and Provincial levels of government. Without the coordinated action between all levels of government we are constrained in reducing our community's emissions and anticipate this as a continued challenge ahead.

A significant challenge for reaching our targets is the emissions factor of the energy grid provincially. The Ontario energy grid is forecasted to continue to become more carbon intensive over the next decade if a significant transition to renewable energy is not pursued. This underscores the importance of both coordinated advocacy across municipalities and community organizations to upper levels of government, and increased generation of renewable energy locally.

Carbon Intensive

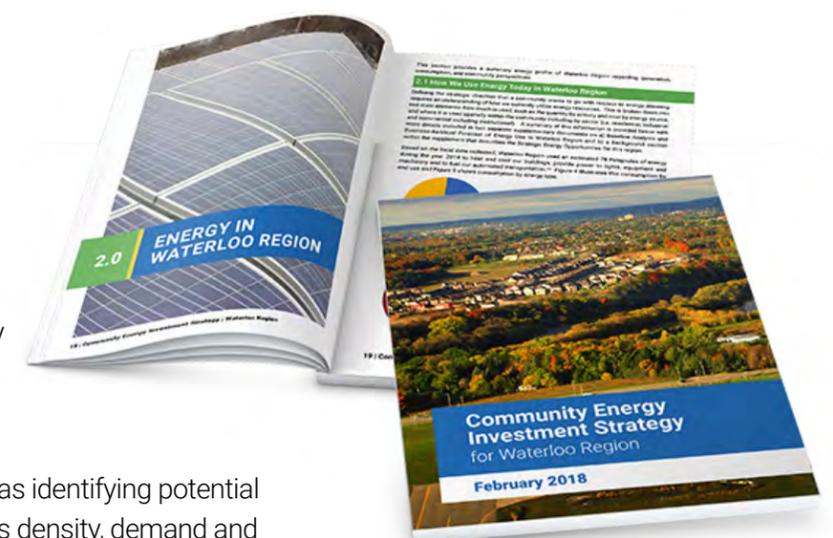
Refers to how much carbon dioxide is emitted per kilowatt hour of electricity.

For more details on our energy profile go to [page 10](#)

COMPLETION OF THE COMMUNITY ENERGY INVESTMENT STRATEGY BY THE REGION OF WATERLOO

In 2018 the development of a [Community Energy Investment Strategy \(CEIS\)](#) was completed by the Region of Waterloo. This strategy identifies opportunities to cost-effectively and reliably meet local energy needs, enhance economic prosperity, and promote sustainable development. The strategy was developed and approved by local councils and was published in February 2018. WR Community Energy (WRCE) was established in 2019 to implement this strategy.

WR Community Energy's first initiative in 2020 was identifying potential district energy sites in Waterloo Region. Due to its density, demand and capacity for renewable energy, downtown Kitchener was selected for a pre-feasibility study. The results of the study showed how a district energy system could reduce GHG emissions by 5,000 tonnes a year with a financial payback of 6%. For more information on the WRCE study [click here](#).



ANALYSIS OF RESULTS

In 2015 we neared our 6% emissions reduction target from the 2010 baseline year. As our community has continued to grow, we have maintained some of the progress, but have seen an increase in emissions by 110,006 tonnes CO₂e in 2019 from 2015. As you can see with the 2020 data, our community emissions did decrease overall from 2015 by 373,043 tonnes CO₂e. However 2020 was not an accurate indicator of our progress due to the impacts of the COVID-19 pandemic on changes to our community's consumption and travel patterns, industry shifts, and new ways of working. We are encouraged to see a decrease in per capita emissions, which highlights the importance of targeting initiatives that contribute to significant reductions despite population growth.

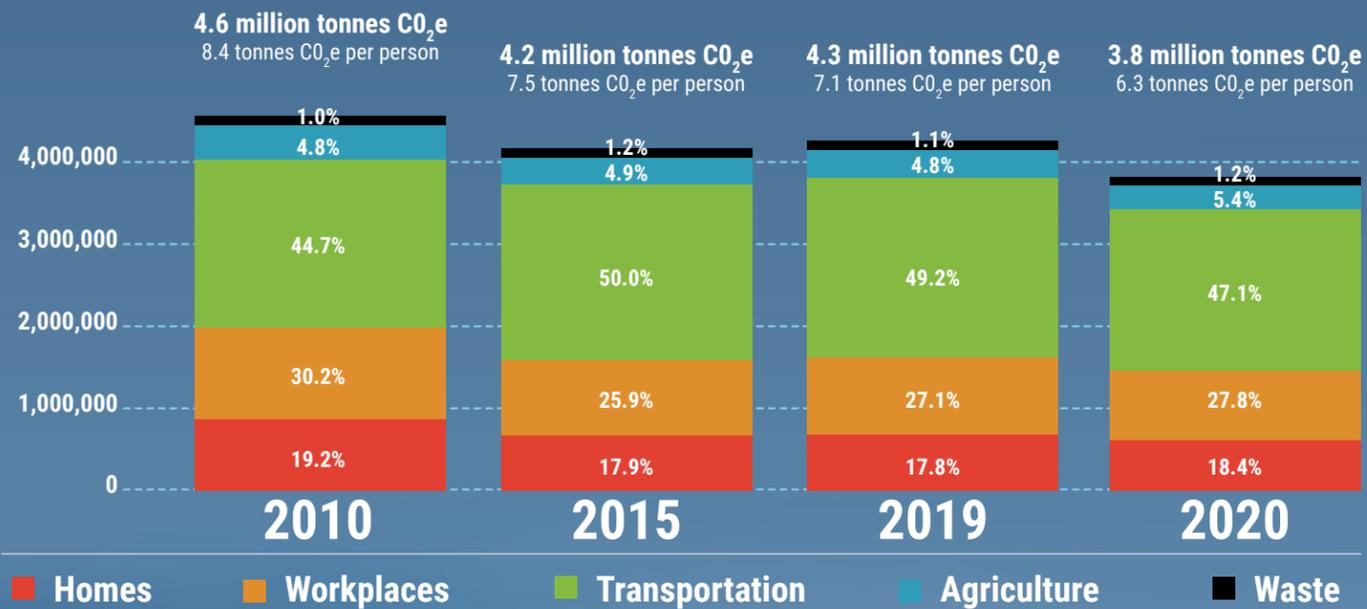
Two Types of Emissions

Per Capita Emissions

A calculation of the total of our community emissions divided by the total population as an indicator of emissions in relation to growth of our community.

Absolute Emissions

Our targets are based on absolute emissions, or the total GHG emissions at a given time (CO₂e)



COVID-19 & ITS EFFECTS ON THE CLIMATE CRISIS

Due to the COVID-19 pandemic, 2020 was not an average year and therefore not an accurate representation of our progress. We experienced a significant decrease of absolute emissions by 14.4% and per capita emissions of 6.3% as compared to the baseline. While this is positive for the atmosphere, it is not expected to be a sustained reduction of emissions. Our path forward to reaching our climate targets is one that is not only low carbon, but also equitable, prosperous and resilient. The COVID-19 crisis exploited existing inequities in our community and significant impacts to prosperity and wellbeing. So while we need to be achieving even more significant reductions, we must be prioritizing initiatives that build a stronger and more equitable community.

During this time we learned that in the face of existential crisis we can make rapid and transformational changes. We can use this as an opportunity to learn from the continued impacts of the pandemic on our community and how we respond to the existential crisis of climate change. At the time of writing this report we have yet to see if and how we have maintained emissions reductions in the years since. For example, many workplaces have shifted from full time to hybrid or remote working models.



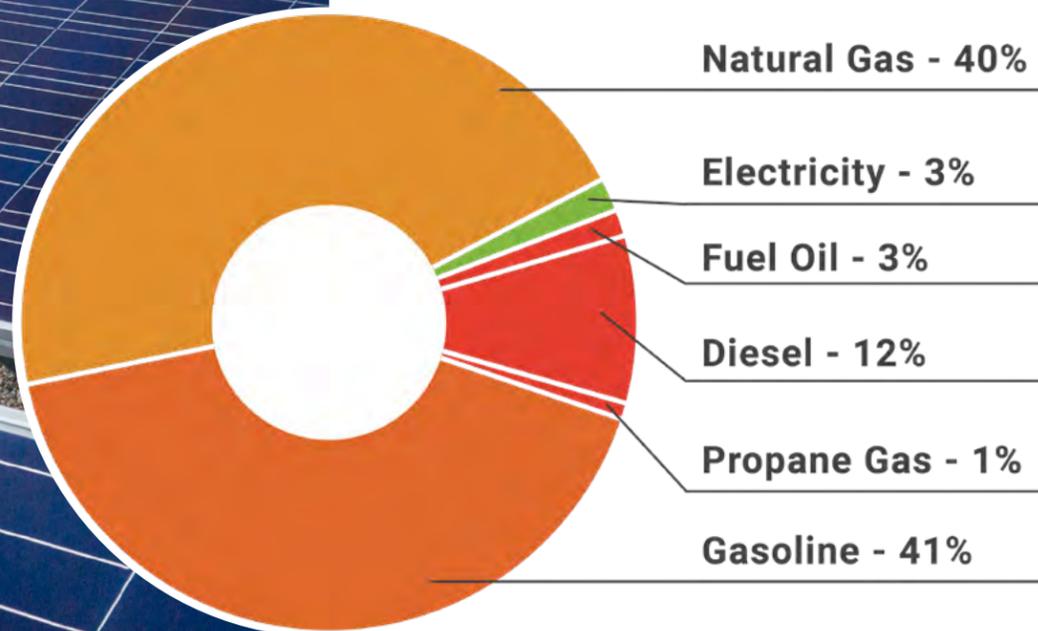
OUR ENERGY BREAKDOWN

Emissions Factor

The rate of emission per unit of activity (Intergovernmental Panel on Climate Change). For example the rate of CO₂e per kWh of electricity.

Our use of natural gas has increased 19% from 2010 to 2019. Gasoline has also gone up significantly from the baseline. We have seen a positive reduction in fuel oil use, with a decrease of 15.5 % since 2010. These energy sources have a high emissions factor compared to electricity and contribute to the increase in emissions since 2015. Though we will need a combination of many energy sources to continue to meet our energy demands, we must as a community focus on reducing our GHG emissions from energy sources to see significant progress towards our climate targets.

Percentage of emissions created by fuel type



More details on our energy composition can be found on [page 12](#).

THREE APPROACHES TO REDUCING GHG'S

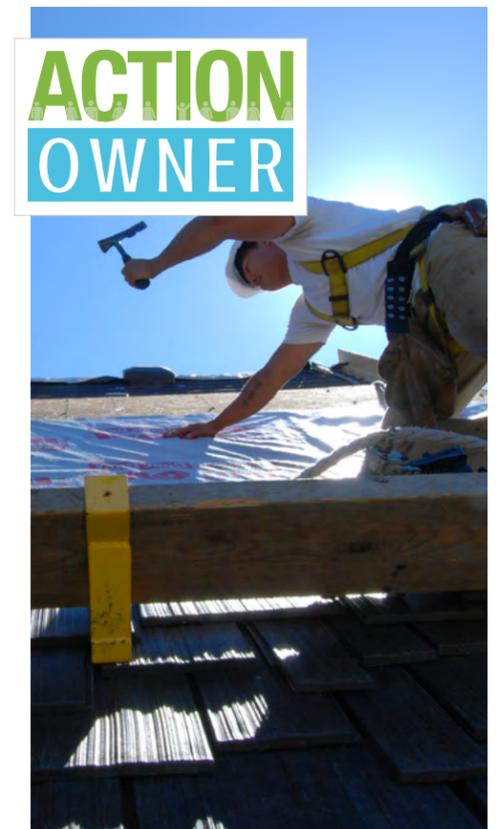
- 1 ENERGY CONSERVATION**
 Use less energy and use it more efficiently
 Find ways to reduce energy consumption in all parts of the region including, reducing energy use by taking public transit or active transport. Additionally, by better insulating buildings, adjusting the heat settings at work and in your home, and installing energy efficient machinery or appliances.
- 2 FUEL SWITCHING**
 Use clean energy
 Electrification is an important part of our energy transition. In 2019, 94% of Ontario's electricity was generated using GHG emission free sources.
- 3 ENERGY GENERATION**
 Make local clean energy
 Renewable energy produced locally can provide many benefits for our community, including being reliable and affordable, improving our infrastructure, increasing local job opportunities and keeping more energy dollars in our community.

PROGRESS TOWARDS LOCAL INNOVATIVE FINANCING FOR ENERGY RETROFITS

In 2020, WR Community Energy partnered with local environmental charity, Reep Green Solutions, and the Region of Waterloo, to support a preliminary study on local innovative financing for energy retrofits. The goal was to develop local financing tools that support homeowners with the upfront costs of deep retrofits and renewable energy installations.

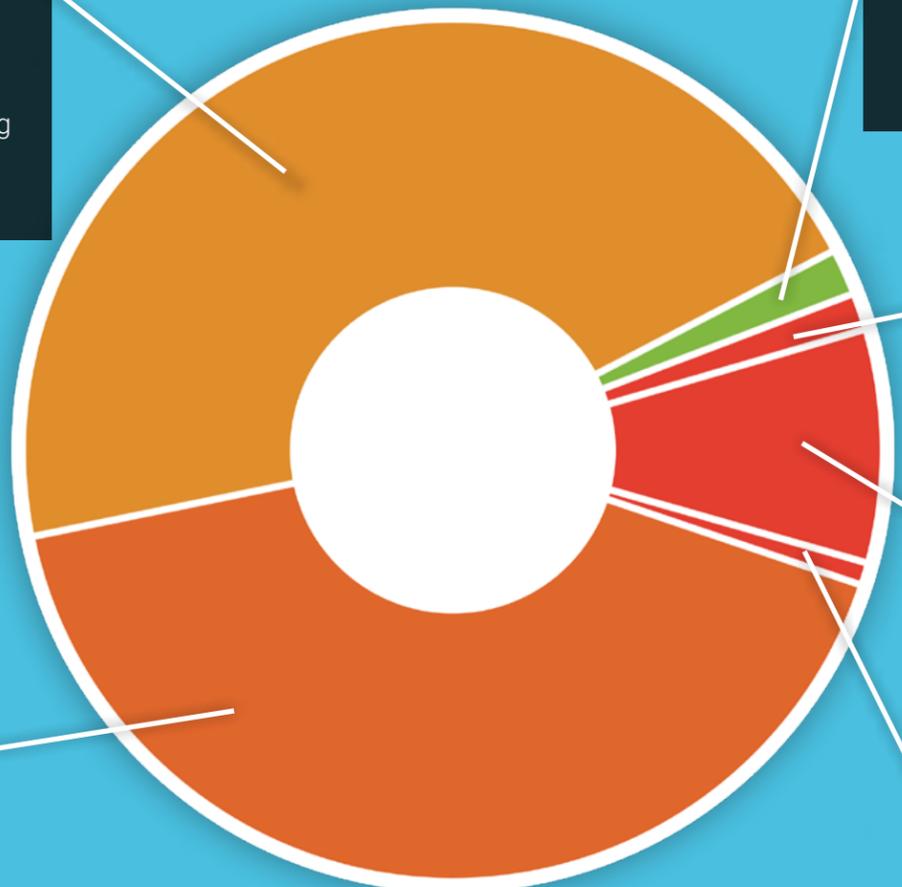
The newly developed collaboration – led by Reep – secured funding from the Federation of Canadian

Municipalities to design an energy efficiency financing program for Waterloo Region that would support homeowners in upgrading their homes to reduce carbon. Results of this work will provide a thorough understanding of the financing options and appropriateness for homeowners in Waterloo Region. An additional report by Reep Green Solutions, titled "Considerations of Equity in an Efficiency Financing Program", outlines how to build equity into a financing program.



SOURCES OF ENERGY IN OUR LIVES

Percentage of emissions created by fuel type



Natural Gas - 40%

Natural gas is a fossil fuel energy source that is a naturally occurring mixture of gasses, primarily consisting of methane gas.

Used for:

- Commercial, industrial and residential space heating and cooling
- Commercial, industrial and residential water heating
- Cooking both commercially and in some homes

Electricity - 3%

Electricity in Ontario is primarily generated by nuclear and hydroelectric power. As a result, it has the lowest emissions factor compared to other forms of energy. Other renewable energy sources, such as solar and wind also produce electricity in our province.

Used for:

- Powering machines and production equipment
- Running office equipment (computers)
- Indoor cooking, lighting, cleaning, and entertainment
- External lighting, alarm systems, and traffic lights
- Space heating

Fuel Oil - 3%

Fuel oil is the result of the distillation of petroleum. It can take the form of heavy fuel oil, furnace oil, gas oil, heating oils and diesel fuel.

Used for:

- Some commercial and residential heating and cooling
- Operating machines
- Material of everyday products & building materials (plastics, electronics, equipment)

Diesel (a type of fuel oil) - 12%

Diesel is a type of fuel oil and form of petroleum.

Used for:

- Powering heavy duty industrial and agricultural equipment
- Fuelling a portion of our cars and trucks

Propane Gas - 1%

Propane gas is another form of liquid petroleum gas and fossil fuel energy source.

Used for:

- Agricultural and industrial equipment
- Residential use (patio heaters, pool heaters, and as BBQ fuel)
- Generators

▲ Did you Know...

Buildings burn more gas during years with longer or colder winters. The larger or less insulated the building the more gas will be used. Having less efficient furnaces will also lead to increased gas use.

Gasoline - 41%

Gasoline is another fossil fuel derived petroleum liquid.

Used for:

- Primary fuel for movement of goods and people
- Combustion engine vehicles and trucks

Only 13% of all of the money (approximately \$4 billion annually) we spend on our energy sources stays in Waterloo Region. With more local sources of energy, such as renewables, ground source heat pumps, and district energy we could keep significant amounts of our energy dollars in our local economy. (2014 Statistic From [Community Energy Investment Strategy for Waterloo Region](#))

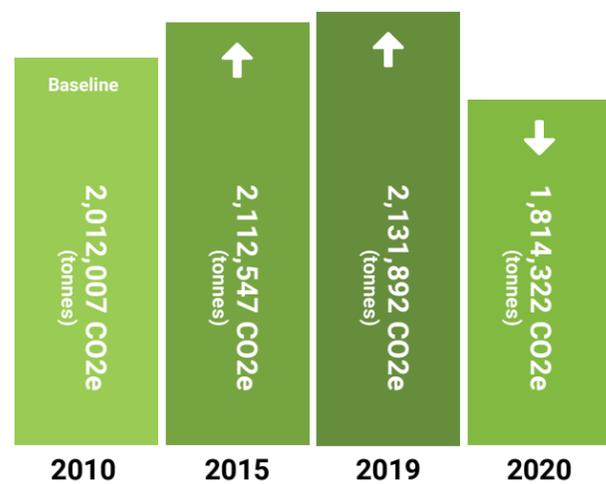


FOCUS AREA

TRANSPORTATION

The transportation sector still is the **largest emitting sector** of Waterloo Region's overall community GHG emissions at **47- 49%**. It remains a significant challenge to address in meeting our climate targets. We continue to see an increase in the number of passenger vehicles on the road and a return to larger sized, less efficient vehicles being purchased.

From 2019 to 2020 we see a significant decrease in emissions by **15%** from travel behaviour change as a result of the COVID-19 pandemic.



TOTAL TRANSPORTATION SECTOR EMISSIONS



BY THE NUMBERS

↓ **1,814,322**

CO2e (tonnes)

Total in emissions in 2020 from the Transportation Sector (down from 2,131,892 in 2019)

↓ **15%**

Estimated decrease in transportation GHG emissions in 2020 compared to 2019 due to travel behaviour changes as a result of the COVID-19 pandemic during this period.

↑ **32%**

Increase in the total number of registered vehicles in the Region in 2019 from 2010.

↑ **62%**

Increase in the number of passenger light trucks.

Resulting in a 32% increase in CO2e emissions.

↑ **11%**

Increase in the number of passenger cars.

Offset by increased fuel efficiency and reduced travel per vehicle



Did you Know...
 The uptake in electric vehicles (EVs) included over 2,700 EVs on the road by 2020 which greatly surpassed our goal of 1000 targeted in our first climate action plan.

A concerning trend that emerged was an approximately 62% increase in the number of passenger light trucks from 2010 to 2019, compared to an approximately 11% increase in passenger cars. This substantial increase in passenger light trucks suggests a trend that our community is back to consumption behaviours of purchasing bigger and less efficient vehicles for personal passenger use. The decrease in passenger car emissions is likely due to improvements in fuel economy. Electric vehicle (EV) uptake is still an important reduction effort as there are significantly less emissions than a combustion engine.

The transportation sector as a whole experienced a 6% increase in emissions (tonnes) in 2019 compared to the 2010 baseline. Due to the restrictions of the COVID-19 pandemic that significantly reduced non-essential travel in the region in 2020, the Transportation sector decreased by 9.8% in 2020. Without the halt of travel in 2020, we would not have reached our goals based on the trajectory from 2019 data.

The important takeaway for our community is that we need to be spending our efforts on making transformational changes to the ways we move goods and people. Planning smarter communities, prioritizing transit and active transportation infrastructure in combination with increase zero emissions vehicles can help us achieve this transformation.

The TransformWR strategy outlines actions we can implement going forward under Call to Action 1 "Transform The Ways We Move" to further accelerate emission reductions.

LED STREET LIGHT RETROFITS

Since the first climate action plan all Region of Waterloo municipalities converted their streetlights to energy efficient LED fixtures. Approximately 50,000 streetlights have been converted region-wide with millions in annual electrical cost and maintenance savings going forward and 80-85% reduction in GHG emissions.

Please see appendix A for details on all the municipalities' recorded efforts on these actions.



REGION OF WATERLOO'S TRANSPORTATION MASTER PLAN

The Region of Waterloo's Transportation Master Plan (TMP) was completed in 2018 and included policy improvements and updated plans for active transportation and high-order transit improvements. Additionally,

an education campaign was launched to the general public and Regional staff to raise awareness of the key recommendations. The recommendations of the TMP are being used to guide designs and policy updates since the council approval of the TMP in June 2018.

Since adoption of the TMP, many of the action items have been completed including a number of active transportation upgrades (e.g. bike lanes, multi-use pathways, sidewalks, etc.) and transit planning initiatives (e.g. ION Stage 2 planning; Cambridge GO Study).



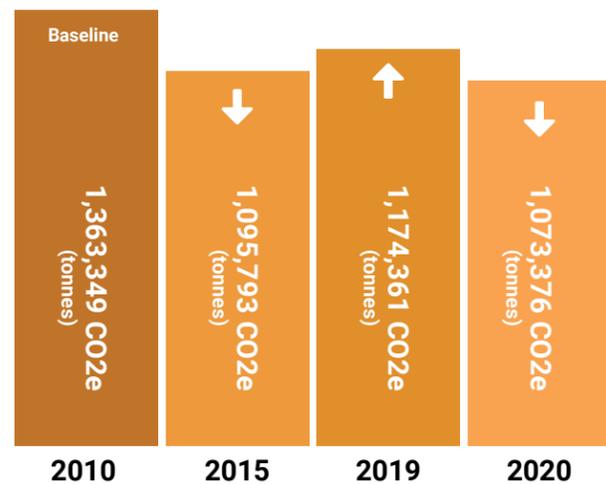


FOCUS AREA

WORKPLACES

The workplaces sector focused on emissions of industrial, commercial and institutional industries. This remains to be our **second largest source of emissions** in our community at **27%**.

From 2019 to 2020 we see a **decrease of 8%** in this sector. The COVID-19 pandemic required many employees across the region to work from home, resulting in reduced building occupancy and energy demands. Additionally, in the 2015 GHG inventory we found the impacts of the removal of coal-fired power plants from Ontario's electricity generation mix significantly aided the reduction of building emissions and remains a significant contributing factor for the reductions in 2020.



TOTAL WORKPLACES SECTOR EMISSIONS



BY THE NUMBERS

2010-2020

↓ **21.3%**

In 2020, the Workplaces sector decreased workplace/ICI related emissions by 21.27% in 2020 compared to 2010.

2019-2020

↓ **8%**

Estimated decrease in overall total Workplaces fuel use CO2e emissions in the year 2020 compared to 2019

2010-2019

↓ **13.9%**

Estimated decrease in overall total Workplaces fuel use CO2e emissions in the year 2019 compared to 2010





Did you know...

All 48 Waterloo Catholic District School Board (WCDSB) schools became EcoSchools by 2019, teaching all students environmental literacy. In 2020 both the WCDSB and Waterloo Region District School Board set a 20% emissions reduction target by 2029.

Behaviour changes during the COVID-19 pandemic resulted in a decrease of emissions from the ICI sector. Many people were required to work from home and eliminate or reduce non-essential trips to their workplace. This significant behavioural shift would have impacted the energy consumption of many workplace buildings as there would have been substantially less occupancy during this time, reducing the energy demands of the buildings.

TransformWR calls on us to prioritize energy efficiency, conservation, and fuel switching while making transformative changes to the way we construct and operate our commercial buildings. We have many opportunities moving forward as to how we build and operate our spaces by taking advantage of deep retrofits of our ICI buildings including the shift to net zero buildings. This will require the commitment and collaboration of

our community, organizations, ICI sector leaders and municipal leaders to push towards the transformational changes as outlined in the actions in the TransformWR strategy.

Beyond Our Community

The impact of closing coal fired electricity generation plants and maintaining a clean electricity grid, allows for the continued reduction of emissions despite increasing electrical consumption.

The TransformWR strategy outlines actions we can implement going forward under Call to Action 2 "Transform The Ways We Build and Operate Our Spaces" to further accelerate emission reductions.

PROGRESS ON MUNICIPAL CORPORATE EMISSIONS

Our municipalities have made substantial progress in their individual Corporate GHG reductions. Some examples include the City of Kitchener's Corporate GHG Reduction Initiatives, where in 2019 council approved the Corporate Climate Action plan of an 8% absolute GHG reduction by 2026 from 2016 levels. The corporate greenhouse gas baseline emissions is 10,397 tCO₂e (2016). In 2020, the corporate emissions reduced 20% from the 2016 level.

The City of Cambridge GHG Reduction / Energy Management Plan (2009-2019) outlined how the City would reduce emissions by 6% by 2019 from a 2009 baseline.

The City recorded a 17% reduction of emissions and was acknowledged by FCM as having achieved Milestone 5 of the FCM Partners for Climate Protection Program. [The 2020 GHG Reduction/ Energy Management Plan](#) proposes to reduce emissions by 50% below 2010 baseline levels by 2030 and 80% by 2050.

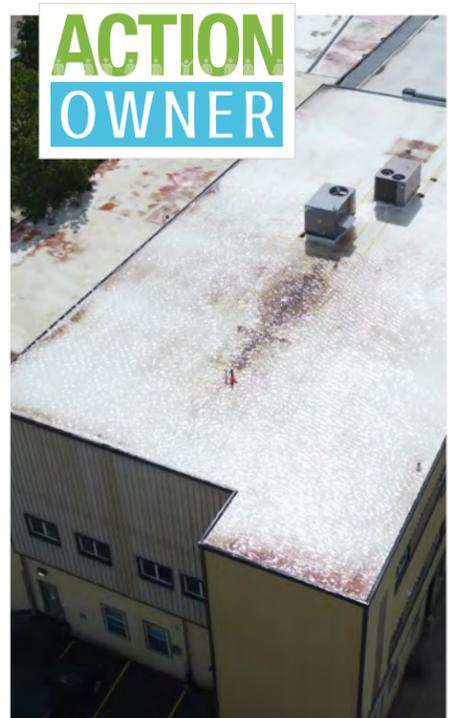
The City of Waterloo's Corporate GHG Reduction Initiatives included the council approval in 2020 of the proposed terms of reference for the Corporate Climate Action Plan (CorCAP). The CorCAP outlines a 50% reduction target by 2030 and looks at a holistic approach including physical measures, education, behavioral changes and policy changes.



AFFORDABLE SMART BLUE ROOFS PROJECT

Enviro-Stewards is a local environmental consultant that installed the region's first Affordable Smart Blue Roof on their head office in Elmira. A blue roof is a type of green infrastructure that is built on the top of flat-roofed buildings. These buildings are common in the industrial, commercial and institutional sector. A smart blue roof collects storm water through a pond system that temporarily

stores and gradually releases the water, offering a way to conserve water and prevent water related damage. This new installation helps to keep the building cool during warm weather, reducing the need for air conditioning. The water can also be treated and stored in a tank for reuse in the toilets. The project highlights a holistic approach to cost-effective and practical solutions to environmental challenges.



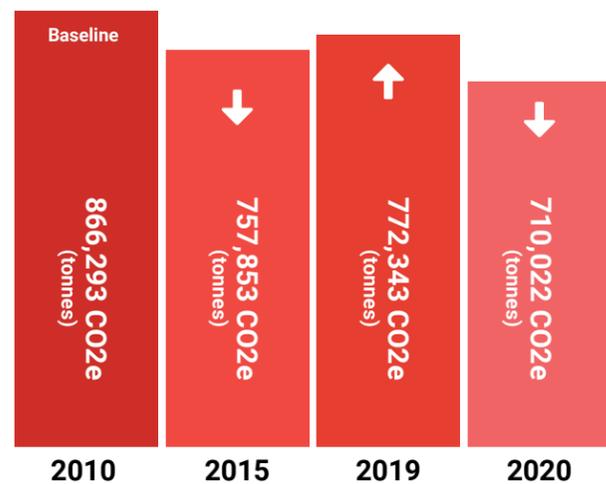


FOCUS AREA

HOMES

Our homes make up the **third largest sector** for emissions in our community at **17-18%** of total emissions.

Waterloo Region has continued to grow with a total of **12% population increase since 2010**. This includes the addition of 15,300 homes between 2015-2020, and an overall addition of **28,100 new households** since 2010. Since 2010 we have seen a 10.9% reduction of emissions in this sector and more significantly an 18.1% reduction in 2020. Data shows a **7.4% increase in residential electricity consumption** in 2020 from 2019, likely from increased demand as more people spent time at home during the pandemic.



TOTAL RESIDENTIAL SECTOR EMISSIONS



BY THE NUMBERS

↓ **10.9%**

reduction in residential sector related emissions between 2010-2019

↑ **12%**

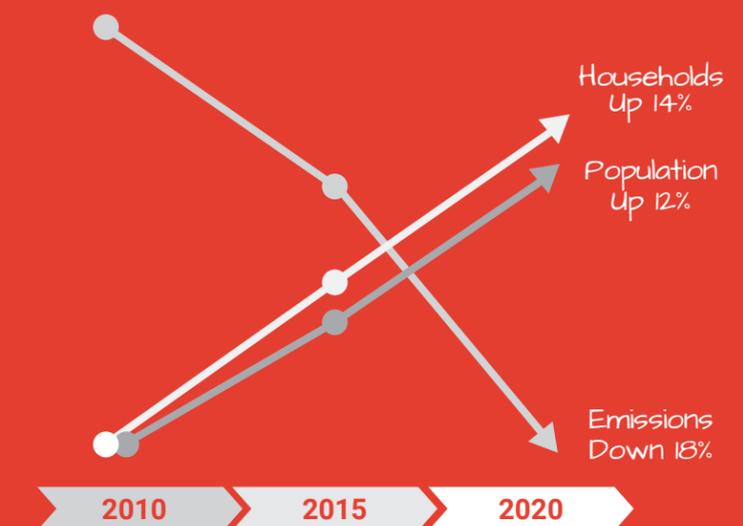
approximate population increase since 2010. We saw an approximate 6.4% increase in population in 2020 from the last inventory in 2015

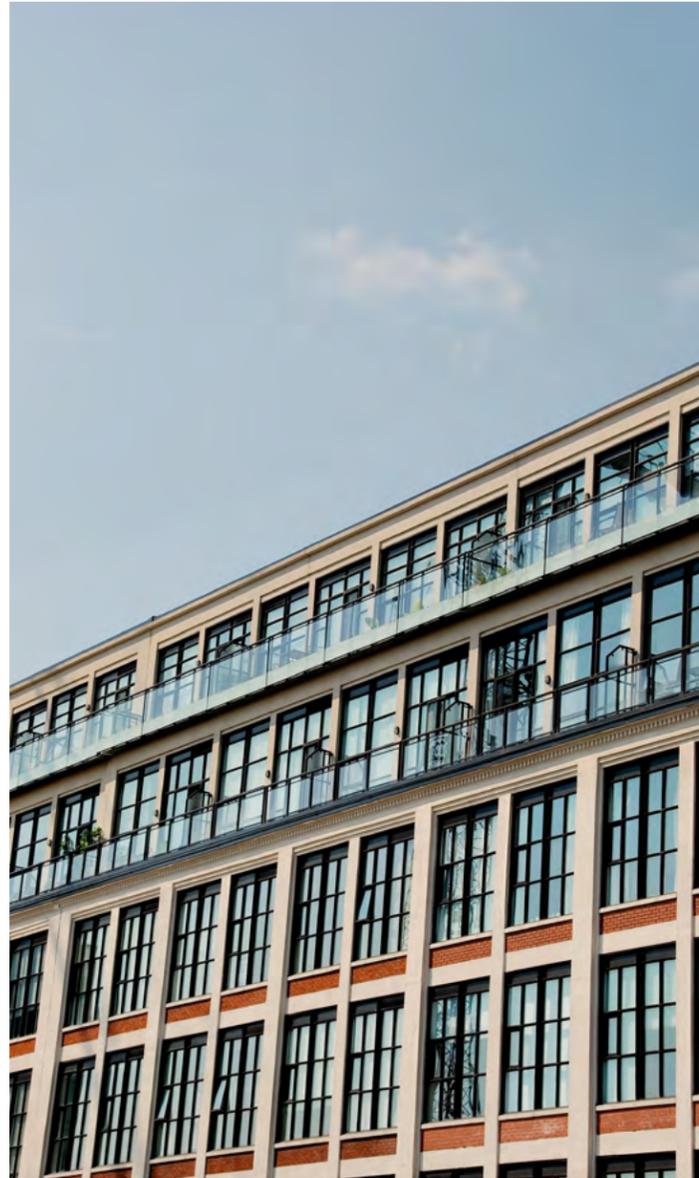
↑ **222,300**

number of households in 2020 up from 219,090 in 2019 and an increase of 14% since 2010

More people and households, less emissions

From 2010 to 2020 our region grew by 12% in population and added 14% more households. Meanwhile residential emissions decreased by 18%. This highlights the importance of energy efficiency as our community continues to grow.





An increase in residential electricity consumption from 2019 to 2020 could be in part influenced by the change of lifestyle behaviours resulting from the COVID-19 pandemic. With several historically highly occupied commercial, ICI and workplace buildings forced to close or reduce occupancy during the COVID-19 Pandemic, many people were spending more time at home. This additional time spent inside our homes resulted in increased energy consumption during the day.

In 2020 there was a 9.5% decrease in residential natural gas consumption from 2019. This likely resulted from 9% fewer heating degree days in 2020 compared to 2019. So although the reduction is promising, it is important to remember that this does not necessarily indicate a trend based on the variability of heating degree days that fluctuate year to year.

Ultimately the largest source of emissions from homes still comes from natural gas use as it makes up about 88% of the emissions from homes in 2020 compared to 80% in 2010. This poses a significant opportunity for fuel switching from natural gas to electricity by conducting retrofits such as switching to a heat pump for heating and cooling.

Beyond Our Community

Similarly to the Workplaces/ICI focus area the impact of the coal fired electricity generation closure of coal plants would have continued to impact the reduction of electricity derived emissions despite the increase in consumption. Changes to Ontario's energy conservation management programs and lack of incentives could have had an impact on the energy consumption at home between 2015 and 2020 in regards to conservation measures.

The TransformWR strategy outlines actions we can implement going forward under Call to Action 2 "Transform The Ways We Build and Operate Our Spaces" to further accelerate emission reductions.

HOME ENERGY INCENTIVES & ENERGUIDE EVALUATIONS

Home energy efficiency is one of the most important changes we can make to tackle our own carbon emissions and address climate change in our community, as homes account for 18% of greenhouse gas emissions in Waterloo Region. EnerGuide Home Energy Evaluations help homeowners make their homes more energy efficient. In 2016, the

Home Reno Rebate from Union Gas, in partnership with the Government of Ontario and Save on Energy, led to a surge in interest in the program. All homeowners could be eligible for up to \$5,000 in renovation rebates. After the funding ended in 2018, Enbridge and Union Gas merged and offered incentives for their customers under the program name Enbridge's Home Efficiency Rebate.

At the end of 2020, The Government of Canada announced the [Greener Homes Grant](#) for all homeowners with a 2021 launch date.



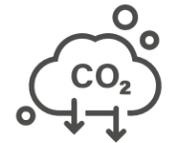
PROGRAM HIGHLIGHTS

based on NRCan data for Waterloo Region between 2017-2020



10,366 homes

completed energy efficiency upgrades



58,533 tonnes

of greenhouse gas emissions reductions

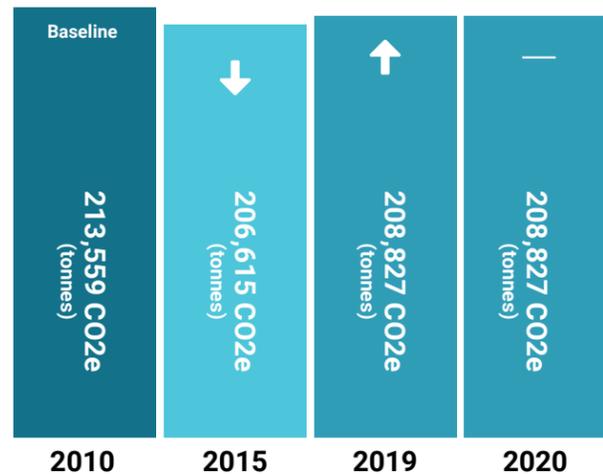


FOCUS AREA

AGRICULTURE

Agriculture sector emissions have remained around **4.8%** of our community's emissions. In 2019-2020, we saw a **2.2% reduction** in agriculture sector related emissions from the 2010 baseline year. This is a slight increase from 2015 by 1.1%.

Emissions data for this inventory comes from reported heads of livestock and manure management in Waterloo Region. Manure to bio-energy remains an opportunity to reduce emissions in this sector.



TOTAL AGRICULTURE SECTOR EMISSIONS

BY THE NUMBERS

↓ **2.2%**

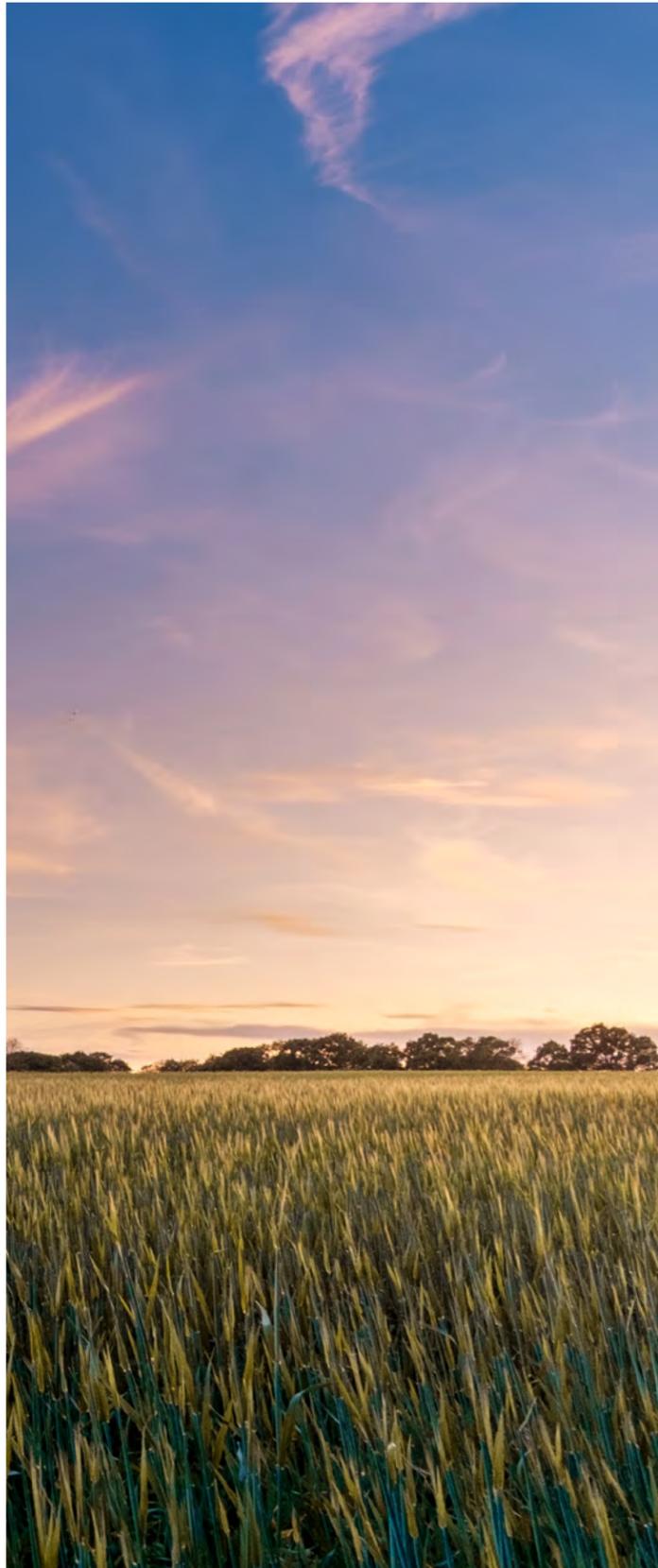
reduction in agricultural sector related emissions between 2010-2019



A 2.2% reduction in agriculture sector related emissions is not surprising as our agricultural production regionally has decreased as land use has changed in the last decade.

As our population continues to grow we need to prioritize making a thriving local food system that focuses on local farming, production and processing that meets our community's needs but also is sustainable. We continue to understand from our lessons learned in our last progress report, implementing livestock manure management and/or exploring opportunities to use waste as a bioenergy resource are methods of reducing GHGs from the agricultural sector that would contribute to our reduction targets without diminishing our precious farmland.

The TransformWR strategy outlines actions we can implement going forward under Call to Action 3 "Transform The Ways We Produce, Consume, and Waste" to further accelerate emission reductions.



COMMUNITY SUPPORTED AGRICULTURE (CSA) DEMAND INCREASED DURING PANDEMIC



In 2020 CSA's saw a surge in demand for memberships. Community Supported Agriculture is a farm business that sells a share (or membership) for the 18-20 week growing season in advance. The purchaser receives weekly or bi-weekly produce boxes of the planted crops as they mature throughout the season from the farm.

Many CSA farms sold out or exceeded the number of memberships that they had anticipated for the 2020 growing season. Much of the increase in demand can be attributed to COVID-19 and increasing instability and food shortages.

Community shared agriculture is a business model that supports reduced emissions from the transportation of food from outside the region and supports local farmers who adopt this business model. Risk of crop failure is shared with the consumer but in return the opportunity to have direct access to fresh locally grown produce is gained.

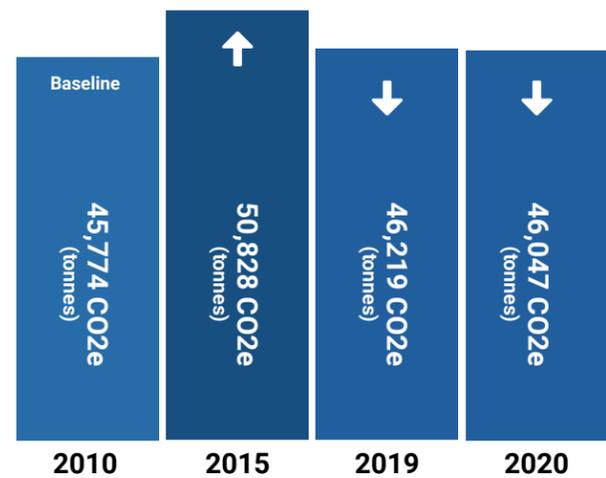


FOCUS AREA

WASTE

Emissions from landfill waste remain at **1-1.2%** of our community emissions. Emissions are captured in the form of **methane** at the landfill, which is a potent GHG that has **over 25 times the global warming potential** as carbon dioxide (CO₂). Methane emissions are a product of previously landfilled organics, and cannot be reduced. Keeping new organic material out of the landfill will stop emissions from increasing.

Since our community will continue to grow and increase waste demands, the amount of waste related emissions are not projected to significantly decrease from the 2010 baseline.



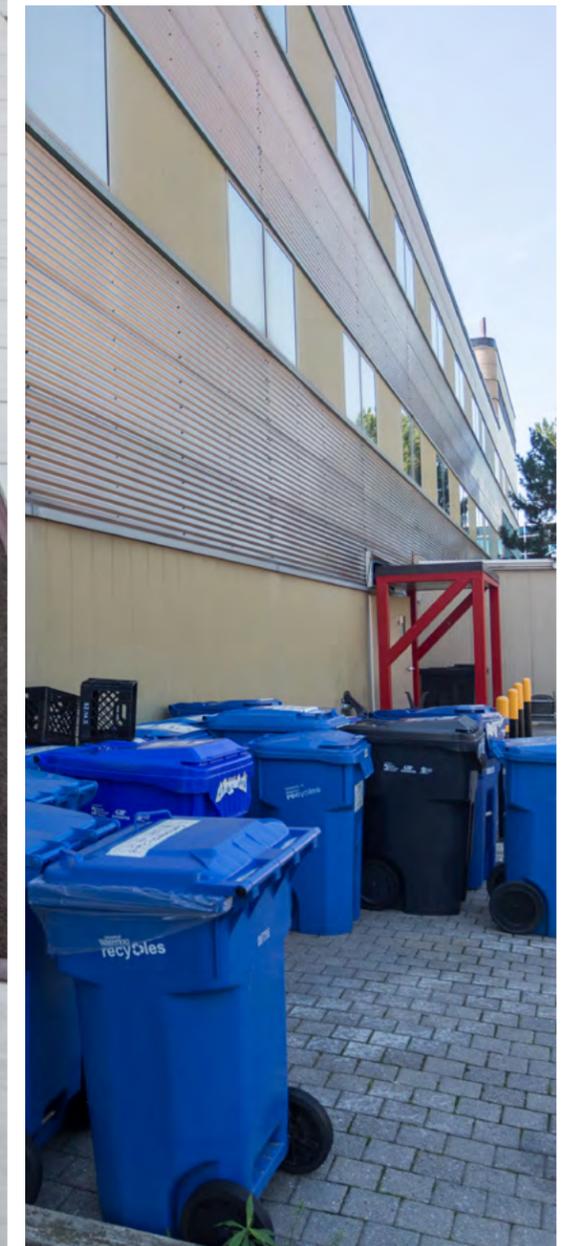
TOTAL WASTE SECTOR EMISSIONS



BY THE NUMBERS

↑ **0.6%**

increase in waste sector related emissions between 2010-2020



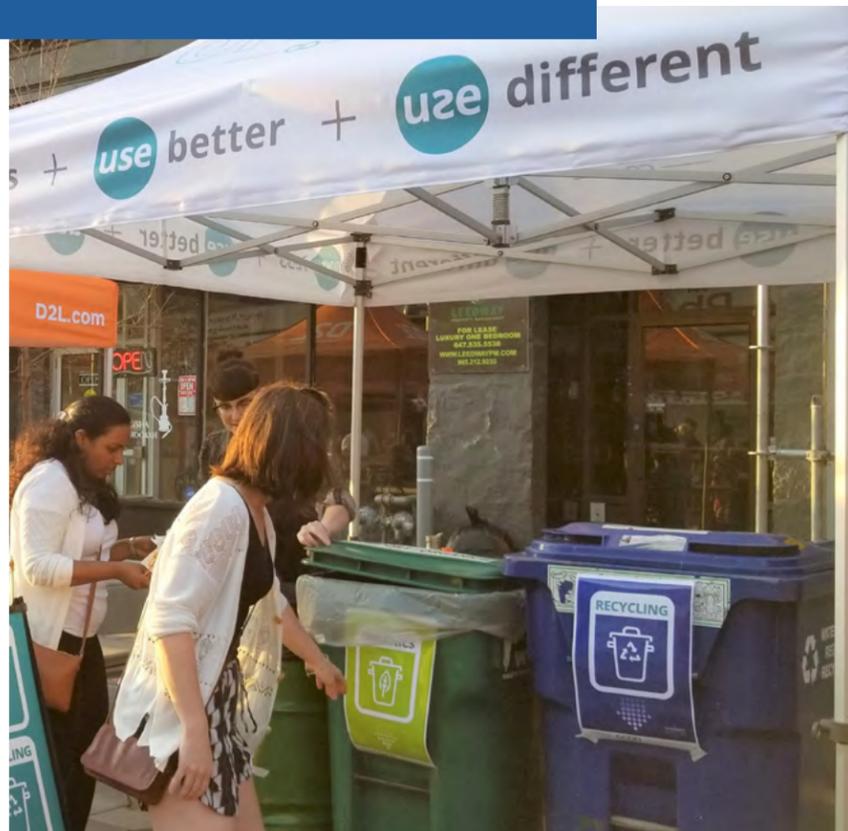
Emissions from waste are captured in the form of methane, which is a potent GHG that has over 25 times the global warming potential as carbon dioxide (CO₂). Methane is produced from waste when organic materials decompose in an environment without oxygen, such as in a landfill. When the same organic materials decompose in an oxygenated environment, such as a backyard composter or the municipal organics digester, methane gas is not produced. This is why it is so important that we compost properly and have the right infrastructure to do so.

Our inventory data only accounts for the emissions from local public landfills, and only includes waste that is directly from our Regional residential waste collection. This means that commercial or private waste collection is not represented in this data. Since our community will continue to grow and increase waste demands, the amount of waste related emissions will not significantly decrease from the 2010 baseline. Therefore we should be maintaining the same level of methane emissions as we had in 2010 as per our targets from our community's first climate action plan in 2013. We need to focus on making sure that organic material does not make it to our landfills, but instead is properly composted. We can maintain this by properly optimizing the use of the existing waste management infrastructure in the region, expanding diversion programs, wasting less, using less and utilizing opportunities for more energy capture.



Did you Know...

Between 4,000-6,000 houses in Waterloo Region are provided electricity each year by gas captured from the Waterloo landfill gas utilization system?



DOWNTOWN KITCHENER WASTE DIVERSION PILOT

The Downtown Kitchener BIA piloted a waste diversion program with restaurants in 2019 with support from Sustainable Waterloo Region. It was the first of its kind in Ontario and perhaps Canada! This pilot involved the Working Center's Job cafe collecting organic waste generated by these businesses and Sustainable Waterloo Region providing the ongoing training and waste audits. This also created job opportunities for at-risk populations. The organic waste was then transferred by RTC Bins to Bio-En Power Inc.'s processing plant in Elmira and converted into electricity through anaerobic digestion.

Participants in the BIA's pilot project included Square, Starbucks, THEMUSEUM, Terminal, Smile io, La Cucina, McCabe's, Pure JBK, Bobby O'Brien's, Matter of Taste, Legacy Greens, Mark's Caribbean Kitchen, Living Fresh, Full Circle Foods, Grand Trunk Saloon/ Grand Surf Lounge, and Café Pyrus. The project was later put on hiatus due to the COVID-19 pandemic.

PROGRAM HIGHLIGHTS



83.83 tonnes
diverted waste from landfill



19 tonnes CO₂e
diverted emissions from landfills



36.59 homes
powered by diverted waste and converting to energy using an anaerobic digester



THE ROAD AHEAD

Since 2015 we have continued to see an upward trajectory on our community's carbon emissions. In 2019 we maintained some of the emissions reductions from the 2010 baseline year with a 3.7% decrease. 2020 was not an average year, as we saw a decrease of emissions 14.4% below baseline levels. We are encouraged to see that from 2010 to 2020 there has been a steady decrease in per capita carbon emissions, but still have much to do in decreasing our total emissions as a community. Based on the outcomes from 2019 emissions it is unlikely that we would have made our 6% reduction target in 2020 without the unprecedented and drastic effects of the COVID-19 pandemic.

Throughout the pandemic we have come together as a community and made transformational changes in the face of an existential crisis. We can learn from this experience as we move forward and accelerate the decarbonization of our community in the face of the climate crisis as well.

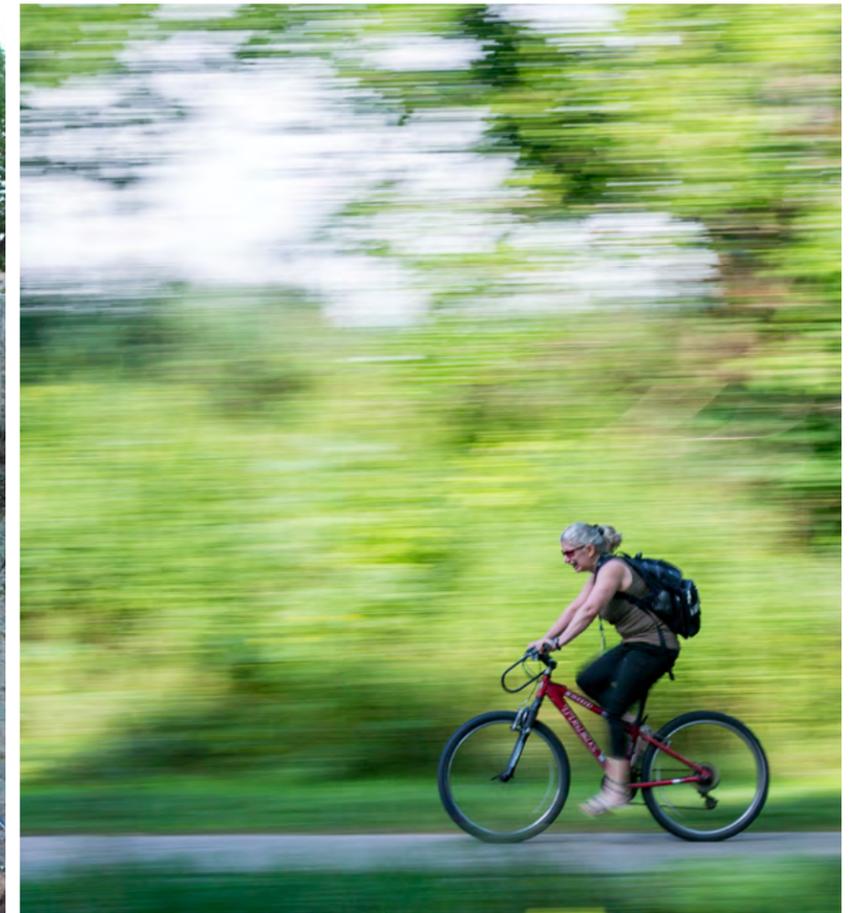
A few key takeaways from this re-inventory:

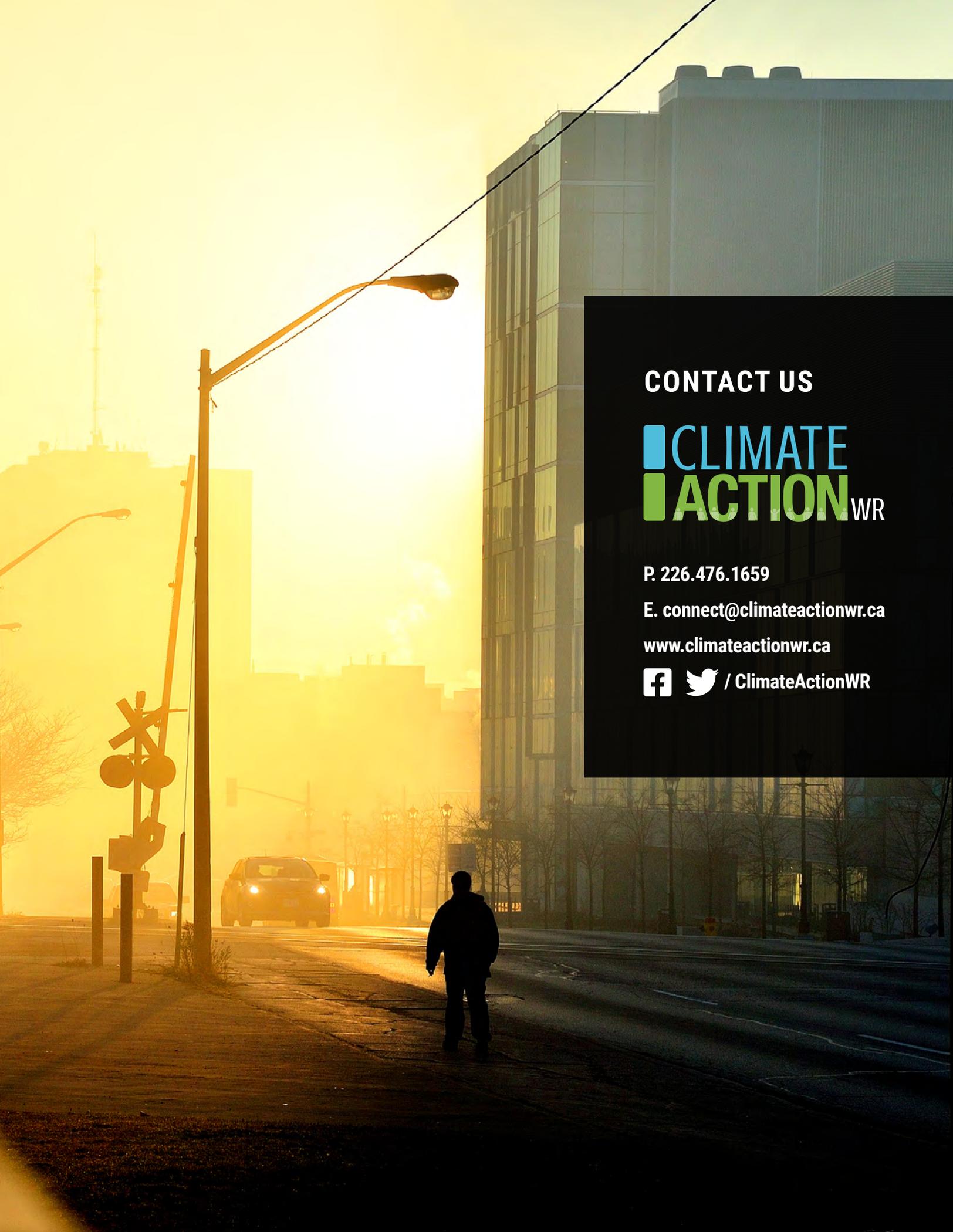
- ➔ Since 2010 **transportation emissions remain the largest contributor of emissions** and continue to increase despite increased fuel efficiency. Changing the ways we move goods and people is imperative to reducing our community's GHG emissions.
- ➔ **Fuel switching is likely our biggest opportunity for transformational change** and impacts across all sectors. We can achieve significant reductions despite population growth by reducing energy consumption, switching to lower carbon energy sources and generating electricity locally.
- ➔ There have been **many promising initiatives** that we are only beginning to see the GHG reduction benefits of. We are encouraged by all the stories throughout this report and many more that we were not able to capture.

As a community we have adopted ambitious targets of 50% emissions reductions by 2030; and 80% by 2050.

Our progress between 2010 and 2020 underscores the necessity of transformational changes over incremental ones.

With this report, we are closing the chapter on our first community climate action plan. Our focus now shifts as a community to the actions outlined in the TransformWR strategy. In the next GHG re-inventory, we will be measuring progress to the 2030 target of a 50% emissions reduction below 2010 levels. We can meet these targets if we prioritize significant climate action efforts across all sectors. Every municipality, business, organization and individual in our community has a role to play in our success.





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