

The Live Net Zero Commuting Challenge

If we were to ask you where most of our transportation emissions come from, would you say?

- 1. The extraction, production, and transportation of gasoline and diesel fuel.**
- 2. Burning that gasoline and diesel fuel when we drive our vehicles.**

We suspect most people will choose Number 1 – hands-down. In fact, the fuel we burn in our cars, trucks, vans, and motorcycles accounts for approximately 80% of the total lifecycle emissions from extracting it out of the ground to the exhaust puffing out of your tailpipe. This total lifecycle is also known as well-to-wheels emissions.

Powering electric vehicles (EVs) comes with a carbon emissions footprint as well. However, its carbon intensity varies depending on how electricity is generated in your province or territory, whereas the amount of CO₂ emitted burning a litre of gasoline is the same wherever you live, 2.3 kg.

For comparison, we'll use the information in Volvo's Carbon Footprint Report which compares the internal combustion version of their XC40 Crossover vehicle with its EV counterpart, the XC40 Recharge.

XC40 Crossover	XC40 Recharge
Driving for 100 km would produce 16 kg of CO ₂ . At an efficiency of 24 kWh/100 km and charging at the national average carbon intensity of 110 g CO ₂ /kWh.	Driving for 100 km would produce 2.6 kg of CO ₂ , which is 6 times less!

But that's the national average. If you charged the same car in Alberta, where most electricity is generated from natural gas, you'd still be reducing your emissions by 2kg/100km over the gasoline engine (12%), and if you recharged your XC40 Recharge in a hydro-rich province like Manitoba or Quebec that reduction grows to around 95%.

In Canada, personal vehicle transportation accounts for 10% of our national carbon emissions, or about 4.6 tonnes of greenhouse gases (GHGs) per vehicle per year. With a vast landscape, sprawling cities, and sparse rural areas it's not practical for everyone to stop driving altogether, but there are actions everyone can take to start making a positive difference.

Start the Live Net Zero Commuting Challenge

The Challenge: Finding ways to decrease your household emissions connected to commuting.

Examine your usual routes and routines. Determine how your family could drive less. Explore mobility options with fewer, or even zero, emissions. By making smart choices, changing old habits, and investing in new technologies, your household can dramatically reduce your commuting carbon footprint.

We'll help kickstart some ideas to get you moving in the right direction...

Don't drive / Drive less

On average, a reduction in driving a gasoline powered vehicle by a mere 20 kilometers per week decreases carbon emissions by 13 kg. If 1.5 million vehicles remained parked for those kilometers the annual reduction in emissions would be 234,000 tonnes of CO₂. So, how can we drive less and still get to where we need to go?

Choose alternative modes of transportation: Active travel is vital to making substantial reductions in the emissions connected to shorter commutes. What is active travel? For most journey purposes active travel covers short to medium trips – typically 2 km for walking, 5 km for cycling, and 10 km for e-biking. This requires a commitment to changing behaviour

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and leaving the keys by the door when you need to pop out to pick something up. Draw a series of circles on a map radiating out from your home and you'll likely be surprised at what fits into 2, 5, and 10 km. Cargo bikes are a great option for running those short to mid-range errands or dropping a couple young kids off at school.

Embrace micromobility: Whether you purchase your own or use ride-share services if they are available in your area, there are plenty of e-mobility options available that aren't EVs. These include electric bikes, scooters, skateboards, and more. Carbon emissions connected to recharging vary depending on how the electricity is produced, but are a small fraction compared to driving your car the same distance.

Take public transit: How green your public transit system depends on what powers your local buses and trains, but even for a diesel-fuelled bus, the emissions are divided across many people so everyone's personal emissions are lower compared to driving individual vehicles.

Work from home: Remember all those early-pandemic photos of smog-free skies around the world? EVERYONE suddenly stayed home and stopped driving. If it is an option, choose to reduce your number of daily commutes to work and watch your emissions savings add up.

Be more efficient

With a little planning and preparation you can make small changes that still make a difference in your driving footprint.

Plan your trips: Are you able to group your errands to reduce the overall distance travelled to achieve them? Or carpool commutes to work, school, or leisure activities?

Drive smarter: When you do drive, there are many things you can do to increase your vehicle's fuel efficiency and in turn decrease emissions, including: avoid hard braking and acceleration; ensure tires are inflated properly; remove unnecessary cargo weight; remove rooftop racks and bins when not in use, perform regular maintenance; and don't idle.

Upgrade your older vehicle: Even if you're not yet in the market for an EV (ahem, you should be), a new, more fuel-efficient vehicle helps reduce your carbon emissions, though not nearly as much. The catch? Any new car comes with a new production footprint. It's not something a lot of people think about, but anything we buy new already has carbon emissions attached to it when we take it home. A new internal combustion engine (ICE) vehicle with better fuel efficiency, improved emissions controls, and features like auto stop-start will reduce your CO₂ footprint when driving, but in addition to the emissions from burning gasoline or diesel to get from A to B, you really should consider the vehicle's production footprint in your long-term household emissions.

Re-Evaluate your ride

Switching to an electric vehicle (EV) eliminates all tailpipe emissions since they don't burn fossil fuels – and don't have a tailpipe – but it's not a short-term silver bullet and can come with a hefty up-front price tag depending on your needs or sense of style. On the flip side, as a long-term investment against an EV's lifecycle it is one of the most significant changes you can make to reduce your commuting carbon footprint.

What are some considerations?

Be a leader: Canada is banning the sale of new combustion engine passenger cars and light trucks by 2035 which is only 13 years away. This target comes with milestones of at least 20% zero emissions sales by 2026 and 60% by 2030. With vehicle manufacturers electrifying their model lines at an increasing pace, there are more and more options available ranging from compact cars to full-size pick-ups to meet your specific needs, and federal and provincial incentive programs help offset the slightly higher price. So, what are you waiting for? Get ahead of the curve and inspire others to make the switch to an electric vehicle.

How your electricity is produced: Hydro-rich provinces like British Columbia, Manitoba, Quebec, and Newfoundland and Labrador have much a lower carbon footprint for electricity production than Alberta which is primarily from natural gas-fired power plants, or Saskatchewan, Nova Scotia, and New Brunswick which are currently still reliant on coal-fired generation. Want to green your charge? See if your current utility provider has green energy plans. Have the ability to install solar panels on your garage to charge your EV? Bonus! Green energy and no electricity charges. To see how your home province stacks up, check out our handy Electricity Carbon Intensity chart, below.

The EV production carbon footprint: The emissions related to driving an EV are dramatically lower than the burning of fossil fuels in an internal combustion engine (ICE) as soon as you switch from fuelling up to charging up, but the carbon emissions attached to a vehicle when it comes off the assembly line are higher for EVs than a comparable gasoline-powered vehicle. This is primarily due to present battery production technology which is advancing all the time.

So it takes a little while to hit the break-even point in an EV's lifecycle when powering with electricity instead of fossil fuels makes up the difference in production emissions. What does that mean on the road? It depends on the specific vehicle, electricity mix in your region, and how much you drive, but on average you hit that break-even point in about 2 years.

Find the right fit: You don't need to spend \$100,000 on an electric sports car with an insane button or pick-up truck that can power your home for days to get into an EV and eliminate your tailpipe emissions. Take a look at your expected use for an EV and find the one that fits your needs, your typical range, and your pocketbook. The price gap is continuing to close between ICE vehicles and EVs and with federal and provincial incentive programs some vehicles are pretty much at par. Another consideration... if it suits your needs, a compact, short-range EV is not only a lot less expensive than a larger, long-range e-SUV, its production footprint is a lot smaller which helps you get to net zero faster.

ICE vs EV vs PHEV: For the majority of Canadians, EV range is not a concern between regular commuting distances, improvements in battery technology, and the ongoing installation of more fast charging stations along our country's highways. A 2019 report found the majority of road trips taken by BC residents are less than 300 km which is well within the range of most newer EVs.

If you are an edge case, regularly driving long distances in areas with limited access to charging stations, or in remote locations with extremely cold winter temperatures, a plug-in electric hybrid (PHEV) could be a way for you to start shrinking your driving footprint until charging infrastructure and battery technology meet your needs. It would allow you to eliminate tailpipe emissions for shorter commutes, and reduce your emissions while driving on the battery then switching to the gas engine for the majority of your long drive. The trade-offs, besides not realizing the total [emissions](#) reduction of a full EV, are that battery ranges on hybrids are shorter because a gas tank takes up potential battery space, and you are maintaining two different powertrains and miss out on the advantage of the low maintenance costs of a fully-electric vehicle with fewer components and no oil changes.

Did you know...

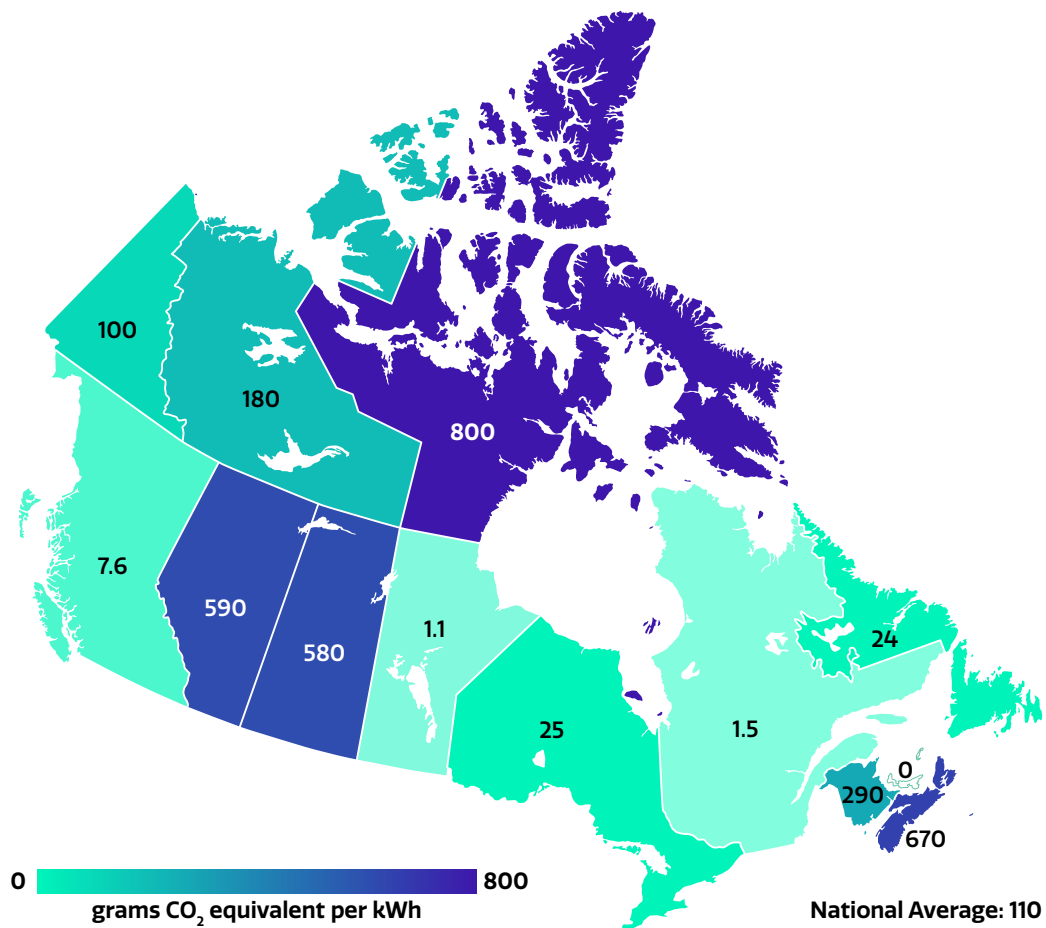
- If you use Shell's [mobile payment app](#), they offset the end-use carbon emissions for your fuel purchase.
- Researchers from Dartmouth found that commutes involving more physical activity, such as walking or bicycling, correlated with less stress and better performance at work. – [Bloomberg](#)
- According to [Natural Resources Canada](#), using a block heater in colder months can increase your fuel efficiency by 10% overall and up to 25% for shorter trips.

Supporting tools

Electricity carbon intensity, 2020 (grams CO₂ equivalent per kWh):

National Average: 110; British Columbia: 7.6; Alberta: 590; Saskatchewan: 580; Manitoba: 1.1; Ontario: 25; Quebec: 1.5; Newfoundland and Labrador: 24; New Brunswick: 290; Nova Scotia: 670; Prince Edward Island: 0 (zero); Yukon: 100; Northwest Territories: 180; Nunavut: 800.

Source: [Canada Energy Regulator](#)



Carbon Footprint Comparison: EV Charging vs Fossil Fuel Combustion

Sorry to ask you to do a bit of math, but use the above chart and following formula to compare the emissions to charge an EV where you live to burning fuel to power the average Canadian internal-combustion vehicle which is around 20,000 g CO₂/100km (20 kg):

$$(\text{Electricity Carbon Intensity}) \times (\text{kWh}/100 \text{ km Rating of the EV}) = (_ _ \text{ g}) \text{ CO}_2 \text{ e}/ 100 \text{ km}$$

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