ELECTRIC VEHICLE (EV) FACTS

Town of Torbay, 2025

Maintenance - the battery

- All new EVs come with at least an 8-10 year or 160,000 km warranty on the battery. The Town's current vehicle procurement policy for light and medium duty vehicles follow 7-9 and 5-7 year replacement cycles, respectively. Given that the vehicles only drive within the Town's boundaries, they are unlikely to surpass 160,000 km in this time.❼ **therefore, it is very unlikely that the Town would be on the hook for the cost of a battery replacement.**
- Along with this, EV battery replacements are very rare overall. A 2023-24 study of 20,000 EVs showed that of the oldest EVs on the road (which are now 10-15 years old), 13% have had battery replacements. Of EVs that were manufactured after 2016, the figure drops to less than 1% (the average across all EVs from all years is 2.5%). While these newer EVs have not been around long enough for us to know for sure how long they will last, battery and battery management technology has advanced so much since those first models, that we have good reason to expect that replacement rates will continue to be low.

  Source: https://www.recurrentauto.com/research/how-long-do-ev-batteries-last
- Along with this, the cost of batteries (and therefore battery replacement cost) has dramatically decreased – prices reduced by 85% between 2013 and 2024. This downward trend is attributed to advancements in battery technology, economies of scale in production, and a decrease in raw material prices.

  Source: https://about.bnef.com/blog/lithium-ion-battery-pack-prices-see-largest-drop-since-2017-falling-to-115-per-kilowatt-hour-bloombergnef/?utm_source=chatgpt.com
- Takeaway ❼ What you likely heard about EV batteries 10 years ago is not particularly relevant now – things have been changing very quickly.

Maintenance - everything else

- EV owners save an average of 40-50% on maintenance costs compared to internal combustion engine vehicles (gas and diesel vehicles, often called ICEVs for short). EVs have fewer moving parts so there is less that can go wrong, there is no oil to change and

no exhaust system to maintain. Brakes typically last longer in EVs because of the regenerative breaking system.

Sources: https://evbuyersguide.caa.ca/content/costs#savings

https://takechargenl.ca/evs/charging-maintenance/

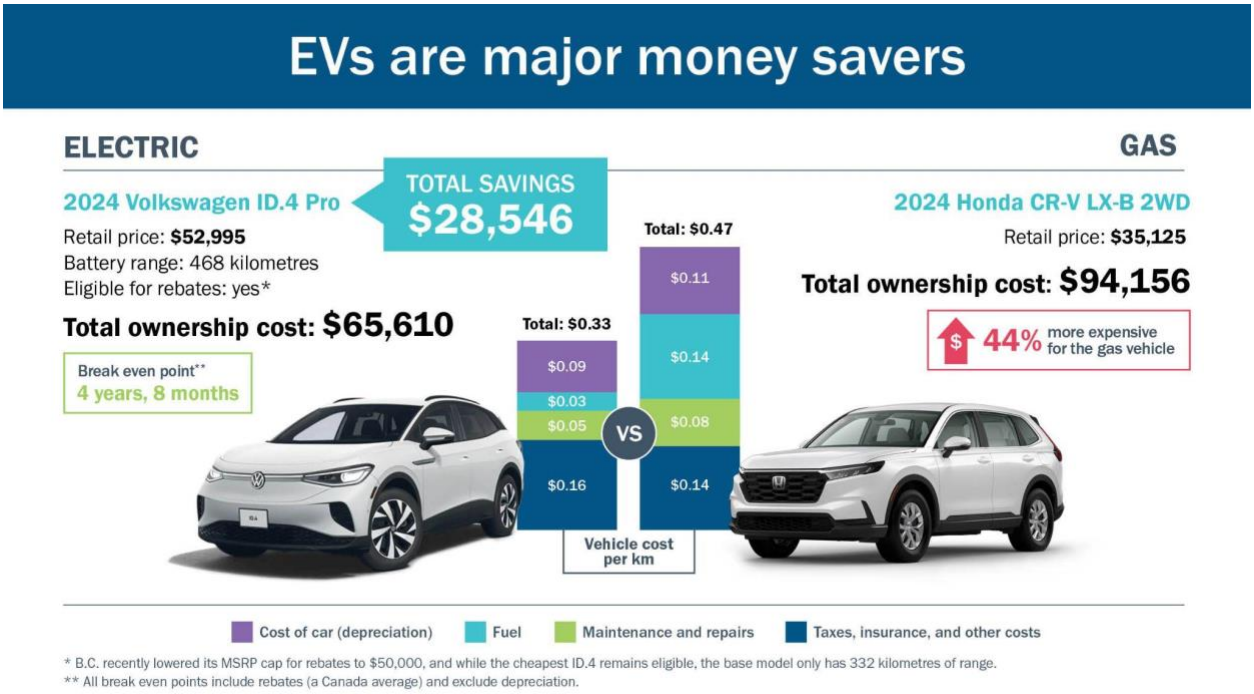
- Many EVs are available from local dealerships which can directly service them (in NL, this includes Ford, Chevrolet, Hyundai, Volkswagen, etc.). Since EVs are still less popular than ICEVs, it can be more difficult to find independent garages that are trained to service them, but this is changing as EV adoption increases. If the Town were to procure any EVs, availability of servicing will be a key factor in the selection process.

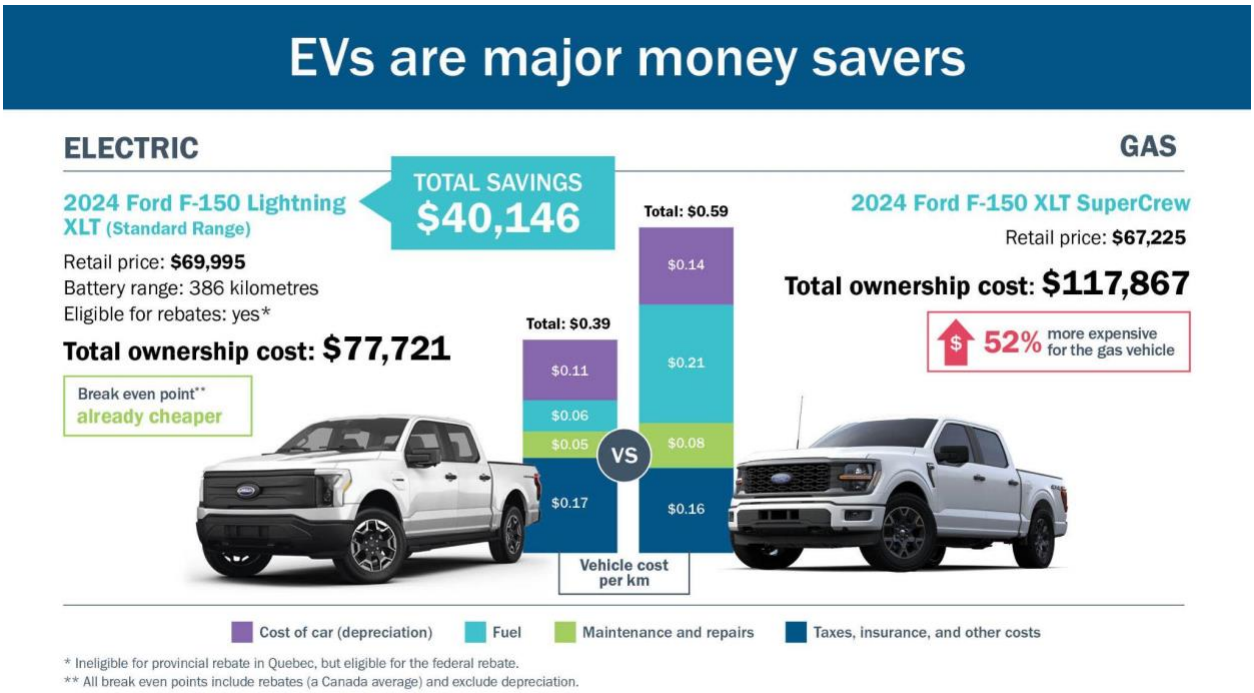
Life Cycle Cost

- At present, EVs typically have a higher upfront cost than an ICEV of the same type. Whether this higher upfront cost pays off in the end is dependent on a number of factors which vary throughout the world - the cost of electricity vs. fuel, how much you drive, maintenance and insurance costs, and whether there are any Government financial incentives involved. In Canada, the consensus is that an investment in an EV will usually pay off in less than 5 years.

  Source: https://evbuyersguide.caa.ca/content/costs#savings

- Clean Energy Canada completed lifecycle cost analyses for several EV models and their ICEV equivalent and found that most result in significant savings over the long term. Two examples, one SUV and one truck, are shown below - these EVs are 44% and 52% cheaper over 8 years, respectively.





https://cleanenergycanada.org/report/the-true-cost/

https://cleanenergycanada.org/countering-common-myths-about-electric-vehicles/

Fire Risk

- It's hard to say for sure what the risk of fire is for any given vehicle, but the latest estimates based on global data between 2010 and 2020 indicate that EV batteries have about a 0.0012% chance of catching fire. Compare this to the around 0.1% chance that any gas/diesel vehicle has of catching fire – that's 83 times more likely. Why does it feel like we hear about EV fires more often? Because the media does not report all the ICEV fires.

  Source: https://www.evfiresafe.com/ev-fire-faqs
- What is a valid concern about EV fires – in the rare instances when they occur - is that they must be treated differently than ICEV fires due to the chemistry and behaviour of the batteries. Extinguishers don't work in the same way so more water is required, the fire can remain active for longer and may reignite after settling down, and more toxic gases are released so more robust protection for responders is required. While further advancements in battery technology may address some of these challenges going forward, the solution at this time is to properly train first responders. The NL Association of Fire Services hosted training earlier this year to teach fire how to manage such incidents.

  Source: https://www.evfiresafe.com/risks-ev-fires

Lifecycle GHG Emissions

- Greenhouse Gas (GHG) emissions (often referred to as carbon emissions) are causing climate change. When it comes to vehicles, we usually think about the emissions from the use stage (driving it), but there are also emissions associated with extracting, processing, and assembling the materials to make it (the production stage) and the emissions that occur when we recycle or landfill the materials when the car is retired (disposal stage). A lifecycle GHG assessment (sometimes called a carbon footprint) considers all of the sources of emissions that a vehicle creates from production to the end of its life. Doing a lifecycle GHG assessment is a complex scientific process and there are many variables involved.
- A 2022 study analyzed 790 different vehicle models and concluded that battery electric vehicles have lower overall lifecycle GHG emissions compared to conventional ICEV vehicles, despite having higher GHG emissions associated with the production stage

(due to their lithium-ion batteries). If renewable energy is used to charge the EV, the lifecycle emissions of EVs are up to 89% lower than an ICEV → **this is the case here in NL where our electricity is primarily from hydro power**

Source: https://www.researchgate.net/publication/358276768_Total_CO_2_-Equivalent_Life-Cycle_Emissions_from_Commercially_Available_Passenger_Cars

- A 2023 literature review analyzed the results of 122 different publications and found that the lifecycle emissions for a gas vehicle are 97% higher than that of an electric vehicle, and 70% higher for a diesel vehicle.

  Source: https://www.researchgate.net/publication/376133057_Life_cycle_assessment_of_electric_vehicles_a_systematic_review_of_literature

Other Environmental Impacts

- GHG emissions are one type of environmental impact, but there are several other metrics that lifecycle assessments often look at related to ecosystem and human health.
- The 2023 study noted above found that EVs result in better air quality than ICEVs (no fuel means no exhaust), but extraction of the metals used to make lithium-ion batteries currently has more negative environmental and social impacts than the production of ICEVs. Proper recycling and reuse of the batteries at the end of their life can reduce these impacts. Significant research and development is underway around the world to make recycling processes more efficient and to develop new types of batteries that use less (or none) of these rare metals.

Cold Climate Performance

- Globally, EV adoption is highest in Norway, Denmark, and Sweden where the share of new car sales that were fully electric was 89.3%, 50.4% and 34.4%, respectively, in 2024 (in Canada, we hit 14.3% in 2024). What do these places have in common? They are northern – further north than the majority of Canada and similarly cold.

  Source: https://www.reuters.com/business/autos-transportation/norway-nearly-all-new-cars-sold-2024-were-fully-electric-2025-01-02/

  https://electricautonomy.ca/data-trackers/2025-02-28/s-p-q4-2024-canada-zev-adoption/

- Cold weather does indeed impact EV battery range, but it impacts the range of ICEVs too – we just don't notice as much. Similarly, wind, a hilly landscape, additional passengers or cargo, how fast you drive, and how often you stop and start all impact the efficiency of a vehicle and therefore how far it can go on a full tank or charge. On the other hand, warm weather and a smooth drive can make your EV or ICEV go further than usual with the same amount of energy.
- Studies have found significant variation between different EV models when it comes to range loss in the cold, but 20-25% was the average. **For the Town of Torbay, fleet vehicles typically do not travel more than 100 km in one day. With rated ranges of around 400 km, currently available EVs should perform as required even if range is significantly impacted by cold or other factors.**

  Source: https://ekoenergetyka.com/blog/does-cold-weather-affect-the-performance-of-your-electric-vehicle-ev/

General Resources:

- https://cleanenergycanada.org/countering-common-myths-about-electric-vehicles/
- https://evbuyersguide.caa.ca/content/vehicles?utm_
- https://takechargenl.ca/evs/
- https://www.driveelectricnl.ca/