



Electric Vehicles
Do you have a question?
Ask the owners!!
March 21, 2023, 7 PM Webinar

Nith Valley EcoBoosters:

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<https://nvecoboosters.com> (Event recording can be found on the NVEB YouTube channel)

www.facebook.com/Nith-Valley-EcoBoosters

<https://www.instagram.com/nvecoboosters>

Post-Event Resource Sheet

The following panelists have consented for you to contact them directly, should you have a question arising from their presentation:

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Keynote presentation by Neil Lackey

Click on this link to access a copy of Neil's keynote PowerPoint slide presentation: <https://bit.ly/3K2PjKe>

Questions from webinar Q&A session

Click on this link to access a document containing all questions from the Q&A session. In addition to the verbal answers given during the webinar, some additional written responses are included in this document: <https://bit.ly/40caoYq>

Electric Vehicles, do you have a question? - EV Terminology

Types of Vehicles

- **ICE Vehicles** - Powered by an Internal Combustion Engine (ICE) , burns gasoline or diesel.
- **Hybrid Electric (HEV) Vehicles** - Powered by gasoline (ICE) and electricity. A battery is charged by the gasoline engine and "regenerative braking" (see below). When stopped or going slowly, the gasoline engine shuts off and the car runs on battery. A hybrid gets better gas mileage overall and better city mileage than on the highway.
- **Plug-In Hybrid Electric (PHEV)** - Similar to an HEV, but with a larger battery that can be plugged into a charger. PHEVs can use the battery until it is almost depleted, then the gasoline engine kicks in. Electric-only range is usually enough for daily commutes, and around town. Overall gas mileage can be ~2 L/100km due to the electric motor.

Electric Vehicles, do you have a question?

- **Battery Electric (BEV)** - Powered only by electricity which is stored in a large battery. Regenerative braking is used for efficiency. Range currently varies from 150 km to well over 500 km, depending on the make and model.

EV Fuel – the kWh

- EV fuel is electricity measured in Kilowatt Hours (kWh), same as your house hydro bill.
- Kitchener Wilmot Hydro currently charges (effective November 4, 2022):
 - 9.1¢/kWh off-peak
 - 11.9¢/kWh mid-peak
 - 16.8¢/kWh on-peak
 - Included in the above are charges of 1.7¢/kWh for transmission and regulatory fees.
 - Note: All other hydro bill charges are per month, regardless of electricity usage.

Fuel Consumption (“mileage”)

- ICE fuel consumption is measured in Litres/100km (i.e., 8 L/100km).
- BEV fuel consumption is measured in kWh/100km (i.e., 16 kWh/100km).
- HEV and PHEV fuel consumption is a combination of both.
- Natural Resources Canada – fuel consumption tool - <https://fcr-ccc.nrcan-rncan.gc.ca/en>

Electric Vehicle Chargers

- **Level 1** – reg. household plug 110-volt AC +/- 24 hour charge time
- **Level 2** – like dryer or stove plug 220-volt AC +/- 4-9 hour charge time.
- **Level 3** – fast (DC) charging stations +/- 45 minutes charge time.

Many EV owners have a Level 2 charger at their residence, in the garage or outside. They can be permanently wired into your house circuitry or plugged in to a stove-like outlet with a separate circuit on your electric panel and by unplugging, become portable. For cross country travel, this link allows selection of charger map locations by level (2, 3) in Canada.

[Zero-emission vehicle charging stations \(canada.ca\)](#) (level 3)

Regenerative Braking

- Slows the car by using the electric motor as a generator - which also charges the battery.
- Used in HEVs, PHEVs and BEVs.

Further Information?

- Nith Valley EcoBoosters webinar on February 18, 2021, provides a tutorial. Being over a year old, much has changed, including gasoline prices. But the basic information is still applicable. Select “Let’s Talk EVs” link from [NVEB videos](#)
- Other informative sites: www.PlugnDrive.ca insideevs.com plugshare.com (location of public chargers) <https://cleanenergycanada.org/report/the-true-cost/> [Waterloo Region EV Assoc.](#)
- **What you need to know for your next hybrid or electric vehicle purchase Jan 2023** <https://theconversation.com/what-you-need-to-know-for-your-next-hybrid-or-electric-vehicle-purchase-196336>
- Transport Canada also offers information for interested persons <https://tc.canada.ca/en/road-transportation/innovative-technologies>
- Re large EVs, in the following “[A comparison of the lifecycle greenhouse gas emissions of European heavy-duty vehicles and fuels,](#)” the authors examine not only CO₂ emissions from vehicle tailpipes, but also the GHG emissions arising from the manufacture of the vehicles and their components, vehicle maintenance, fuel production and electricity production.

Electric Vehicles, do you have a question?

Electric Vehicles, do you have a question? – Typical Concerns

Cost of Vehicle (Total Cost of Ownership)?

- BEV's purchase price often more than an equivalent ICE vehicle, but fuel cost is 90% less.
- Consider "Total Cost of Ownership", i.e. total cost after 100,000 km. For example:
 - For ICE vehicle: 8 litres/100km @ \$2.00/litre = \$16/100km = \$16,000/100,000 km
 - For EV: 13.4kWh/100km @ \$.099/kWh= \$1.34/100km = \$1,340/100,000 km (assumes mostly overnight charging at your residence).
- Difference - \$14,260 less fuel cost for an EV if driven 100,000 km.
- Maintenance of EVs is less than 50% of ICE vehicles as EVs have about 10% of the parts.
- Result - In 3-5 years, most EVs total cost of ownership is less than for an ICE vehicle.
- EV purchase prices should come down as supply chain issues get resolved.
- Does buying an electric vehicle make financial sense? <https://www.ctvnews.ca/business/does-buying-an-electric-vehicle-make-financial-sense-1.6283858>
- How much does it cost to go 100 KM in and EV?
<https://www.edmunds.com/fuel-economy/the-true-cost-of-powering-an-electric-car.html>

Are EVs really Environmentally Friendly?

- Most of Ontario's electricity is not from fossil fuels.
- Mining for lithium, cobalt, etc. has an impact, but not as much as drilling and fracking for oil, mining oil sands, transportation and refining, disposal of used engine oil, filters, antifreeze, exhaust systems, etc.
- Feb 19, 2023 Three EV myths debunked: why electric vehicles really are cleaner than gas-burning cars <https://www.therecord.com/ts/news/canada/2023/02/19/three-ev-myths-debunked-why-electric-vehicles-really-are-cleaner-than-gas-burning-cars.html>

Charging Time (refueling time)?

- 95% of charging done at home at night, so time to charge is often irrelevant.
- Level 3 high-speed public charging stations – can add 200 km range in 15 to 45 minutes, depending on charging station max rate and the EVs charging speed (EV controls rate).

Home Charger – How and What Cost?

- Home (Level 2) chargers use 240V AC, same as your electric stove and clothes dryer.
- Most people do not need to upgrade their home electric panel as they mostly charge the car at night – when they are not using their stove or clothes dryer.
- Home chargers typically cost between \$1000 and \$1500, including electrical work.
- Next generation of EVs and home chargers will be 2-way, meaning your EV battery could function as backup power for your house in the event of a power outage, or a source of low cost overnight power during high-cost power daytime house usage.

Will the hydro grid be able to handle all the electric vehicles?

- Yes. Most home charging is done at night when there is a surplus of grid capacity, as most businesses are not active. Also, electric utilities are ready to handle increased demand.

Vehicle Range?

- Most new EVs have a ranges of 400 to 550 km.
- Many high-speed chargers are available across Canada, particularly on major routes.
- Outside low temperature can affect range by 20-30% due to cabin heating. Also, road conditions (snow, slush) and winter tires affect the range all vehicles. Towing a trailer will also affect range.

Electric Vehicles, do you have a question?

Battery Replacement and Recycling?

Typical battery warrantee – 160,000 km or 8 years, likely longer than you'll own the car. Most last a lot longer.

- Batteries should NOT go to landfill. They are very profitable to recycle or repurpose.
- Battery Life article <https://www.lifewire.com/how-long-will-ev-battery-last-5201587>
- *At the moment, there is no agreed European or international standard on vehicle life-cycle assessment.* See Link below for more details.
<https://chargedevs.com/newswire/ricardo-to-define-a-harmonized-european-life-cycle-assessment-standard-for-evs-and-batteries>

Acceleration and Handling?

- Instant response as no need for multiple gears. Try one!
- Low centre-of-gravity as battery typically under the cabin floor.

Government incentives for purchasing an EV?

- Currently the Government of Ontario provides no rebates for purchasers of EVs. Quebec and BC do provide rebates to encourage purchasing of EVs as part of their climate action plans.
- The Federal Government of Canada has been providing rebates depending on the type of vehicle you are purchasing. Check out their list monthly to see what rebates may be offered for the EV you are considering
<https://tc.canada.ca/en/road-transportation/innovative-technologies/zero-emission-vehicles/light-duty-zero-emission-vehicles/eligible-vehicles>

Upcoming event for Women

Emerge Guelph is having a webinar on EVs for women on April 4 from 7:00 p.m. to 8:30. Here is a link for further info and registration - <https://www.eventbrite.ca/e/womens-ev-night-tickets-592745657217>

Links from the slides shown during the event:

A Brief EV Update

1. A plethora of choices are coming available as supply chain issues are resolved.
2. New features you'll find only in electric vehicles. (e.g. V2G)
3. Tractor Trailers, School and Transit Buses, Delivery Vans, Pick-up trucks, SUVs, Sedans, Short Haul Planes, Motorcycles, Bicycles, etc.
4. Passenger vehicles that are available (updates regularly) as of February 2023 in Canada:
 - o [Light-duty zero-emission vehicles \(canada.ca\)](https://www.canada.ca/en/transportation/innovative-technologies/zero-emission-vehicles/light-duty-zero-emission-vehicles/eligible-vehicles)

[Light-duty zero-emission vehicles \(canada.ca\)](https://www.canada.ca/en/transportation/innovative-technologies/zero-emission-vehicles/light-duty-zero-emission-vehicles/eligible-vehicles)

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Car Fire Research (Jan 18, 2022)

CAR FIRES BY VEHICLE TYPE

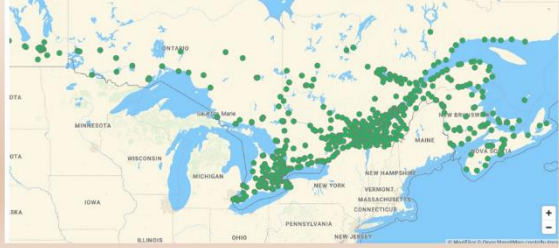
Rank and Fuel Type	Fires (per 100k Sales)	Total Fires
1 Hybrid	3,474.5	16,051
2 Gas	1,529.9	199,533
3 Electric	25.1	52

Study: Hybrids, ICE Cars Far More Likely Than EVs To Catch Fire (insideevs.com)

[Study: Hybrids, ICE Cars Far More Likely Than EVs To Catch Fire \(insideevs.com\)](https://www.insideevs.com/news/hybrids-ice-cars-far-more-likely-than-evs-to-catch-fire)

Electric Vehicles, do you have a question?

Out of province travel: Where, in Canada are there chargers for Battery Electric Vehicles (BEVs)?
[Zero-emission vehicle charging stations \(canada.ca\) \(level 3\)](#)



[Zero-emission vehicle charging stations \(canada.ca\)](#)
(scroll down the webpage for map)

Thank you for your interest in this NVEB webinar. Together we can inform ourselves and others to act and make the world a better, healthier home for all.