JULY 2022

Three Nations ENERGY

ELECTRIC Vehicle NEWS

MYTH 1

EVs Cost Too Much

- Gasoline/diesel vehicles (called ICEs for *internal combustion engine*) have over **200** moving parts. Electric vehicles (EVs) can have as few as **17**.

This mean less maintenance, less replacements, less break-downs and less expense!

- Electricity is generally cheaper than gasoline.
- EVs do not need engine oil changes.
- You only need to replace the battery every 5-8 years in EVs.
- EVs are coming down in price as batteries get less expensive.

So, EVs might be more expensive to buy, but they can be cheaper over 3-4 years of ownership.

Bonus - when it comes time to sell, you'll get more second hand value back than a fossil fuel car.

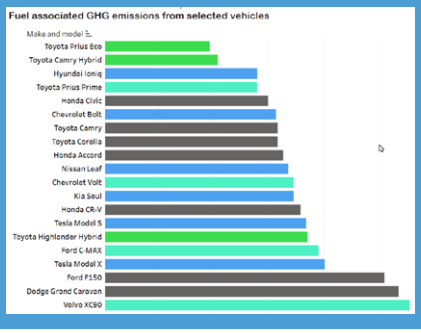
MYTH 2

Electricity Is Just As Bad as Gasoline

- It's true that Alberta's electricity comes from coal and natural gas but some also comes from solar, wind and hydroelectric.
- But, even in Alberta, electric vehicles produce fewer greenhouse gas (GHG) emissions than gas-powered cars overall.

How much CO2 do vehicles emit?

Go to this Canada Energy website to see up-to-date tools that let you pick your province to see what's happening.



https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/market-snapshots/2018/market-snapshot-how-much-co2-do-electric-vehicles-hybrids-gasoline-vehicles-emit.html

Charging an electric vehicle on Alberta's electricity grid can reduce average GHG emissions by 41%.

This will get even better over time as we add more renewable energy production like solar and wind farms.

-Study completed by Simon Fraser University

https://mccac.ca/2021/05/07/myth-busting-evs-in-alberta/

MYTH 3

EVs Don't Have Enough Range

The distance an EV can travel on a charge is being continually increased - 500 km on a single charge is becoming more common. Most people charge at home so this works out well in small towns, the suburbs as well as inner cities.

Charging Speeds

Range has also been helped by increased charging speeds. Charging stations range from level 1, 2 and 3.

- **Level 1 - charge within 8 hours on a normal household 120V outlet.**
- **Level 2 - charge within 4 hours on a 240V outlet, more commonly found at workplaces.**
- **Level 3 - (Rapid Charging) charge in around 30 mins, - just right for a rest break.**

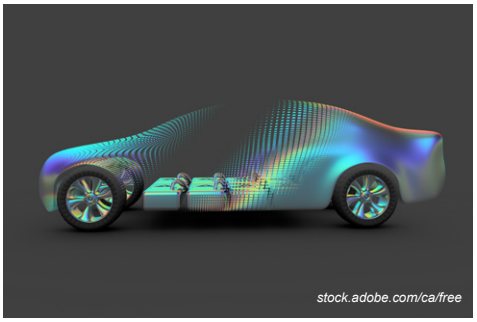
80% of charging typically occurs at home!

MYTH 4

EV Batteries Will Not Last

Electric vehicles use similar batteries as smart phones, but they work under drastically different conditions:

- Phones are charged daily while the average driver will only charge their EV a few times a month.
- EVs can control their energy use with special software so, the batteries are more efficient and last longer.
- EVs have cooling systems that prevent heat buildup and increase the lifespan of batteries.
- EV batteries can now last over 500,000 km of use with a range of over 400 km per charge.
- Many auto makers provide warranties on the battery for at least ***eight years*** or 160,000 km for 70% capacity.



Need a Charge?

There's an App for That!

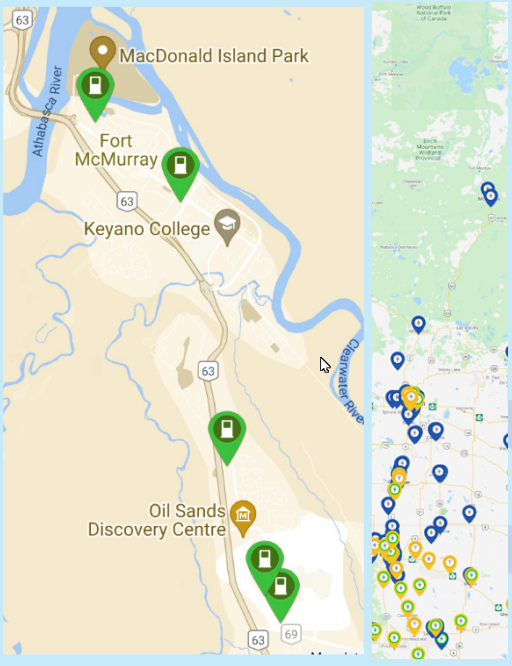
More charging stations are appearing all the time at parks, grocery stores, malls, and service stations. There are websites and smart phone apps that help you find charging stations so you can plan your trips: Some examples include:

ChargeHub.com

https://chargehub.com/en/charging-stations-map.html

PlugShare.com

https://www.plugshare.com/location/60526



MYTH 5

Battery Manufacturing Is Dirty

- EVs currently use mostly lithium ion batteries. The lithium may come from mines but the majority (87%) comes from brine (from the sea).
- EV batteries can be reused for energy storage for solar panels and wind turbines.
- Batteries are recycled for their valuable metals such as lithium, nickel, and cobalt and used in new batteries, limiting waste.

Battery Gold with Recycling!

Li-Cycle is a Canadian company from Ontario that is taking the mounting heap of battery waste and turning 95 per cent of it into "gold" – battery-grade raw materials for new batteries. See this video:

MYTH 6

EVs Aren't Safe

The same risks exist for all drivers, no matter how their vehicle is powered.

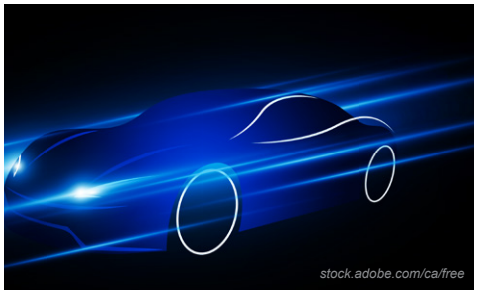
However, the design of the EV makes it a safer option.

- EV batteries are placed with the same care as a fuel tank is.
- Lithium ion batteries do produce poisonous fluoride gases when on fire, but they take much longer to ignite.
- An ICE (internal combustion engine) is more likely to catch fire with all the flammable fuel on board.

MYTH 7

EVs Lag

People sometimes think lagging is just part of using an electric vehicle. NOT SO.



Electric vehicles provide instant usable torque - when you step on the accelerator, you go!
Most electric cars on the market do 0-100 km/hr in less than 8 seconds, so faster than standard ICE vehicles. Some EVs can even do it in under 2 seconds!

MYTH 8

EVs Can't Handle Harsh Alberta Winters

- The coldest extreme weather can reduce an EV's range but there are some advantages too.
- With EVs, you don't have to stand freeaing outside to refuel. Instead, plug in your vehicle at home to charge it overnight.
- EVs do not use a gas engine to start, or any oil that may become too cold or thick to use in cold temperatures. This means they start better in the cold than ICEs.
- EVs heat up quickly using electric resistance heating rather than waste heat from a gasoline engine.

Town of Banff's battery electric vehicle works great in the winter. (https://mccac.ca/2021/05/07/myth-busting-evs-in-alberta/)

- Heating up an electric vehicle in winter consumes more of the battery life. But gas powered vehicles burn more gas to stay warm, too.

Fortunately, electric vehicles can still manage the average Canadian's winter drive without difficulty.

BONUS MYTH 9

Alberta Has No Electric Vehicle Funding Options

True, there are no provincial incentives for Albertans at this time but there are for municipalities. Through the Municipal Climate Change Action Centre's Electric Vehicles for Municipalities Program, cities and towns are replacing gas-powered fleets with electric options. Visit:
https://mccac.ca/programs/electric-vehicles-for-municipalities-program/

Okotoks' Enforcement team is reaching new places with their new electric ATV. (https://mccac.ca/2021/05/07/myth-busting-evs-in-alberta/)

Find Out More

Articles

Electric Vehicles - Natural Resources Canada

Learn about:

- Travelling with an electric vehicle
- Electric vehicles for all lifestyles
- Financial incentives

https://www.nrcan.gc.ca/energy-efficiency/transportation-alternative-fuels/travelling-electric-vehicle/19198

Myth Busting: Electric Vehicles in Alberta

Explore how to reduce maintenance costs, and lower your impact on the environment with an electric car. Learn about myths and misconceptions about electric vehicles in Alberta.

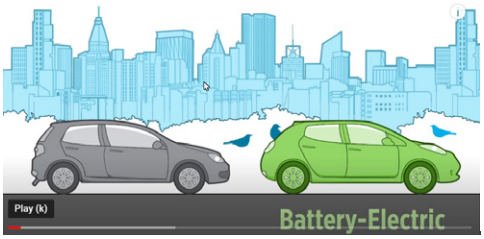
https://mccac.ca/2021/05/07/myth-busting-evs-in-alberta/

Electric Vehicles 101 - Natural Resources Defence Counsel

After ten days behind the wheel and numerous conversations with EV owners, advocates, and manufacturers, we came away from the trip overwhelmed with the countless additional perks and benefits of driving an EV.

https://www.nrdc.org/experts/madhur-boloor/electric-vehicles-101#:~:text=The%20difference%20is%20even%20starker,motor%20typically%20has%20just%202.

Videos



Electric Cars & Global Warming Emissions - Union of Concerned Scientists

(US content but still relevant.)

Everyone knows electric cars are cleaner than gasoline vehicles—but just how much cleaner? This video explores the global warming emissions of EVs on a lifecycle basis, from the manufacturing of their batteries to their ultimate disposal or reuse.

https://www.youtube.com/watch?v=K9m9WDxmSN8#action=share

Are Electric Cars REALLY Better than Gas Cars? - Electric Futures

Electric cars are capable of accelerating more quickly than ICE cars, because they generate instantly available torque, and deliver it to the wheels more efficiently.

https://www.youtube.com/watch?v=xRM1YAvVqMg

Podcast

Demystifying Electric Vehicles -AskNRCan

Car lover and NRCan program officer Yves Madore talks about common misconceptions about electric vehicles, from charging stations to battery life to charge time.

https://www.nrcan.gc.ca/simply-science/demystifying-electric-vehicles-asknrcan/20489

Designed as freely distributed educational materials for 3NE by:

Greenplanet ENERGY ANALYTICS

Three Nations ENERGY

Name: _____ Class:_____

Electric Cars - What Do YOU Think? (___/30 pts)

On the LEFT of each statement, write if you THINK it is True or False.
*** * * Then wait for instructions. * * ***

TRUE or FALSE (Before)	Statement	TRUE or FALSE (After - 11 pts)
	1. Electric vehicles are more expensive to own than traditional internal combustion engine (gas) vehicles.	
	2. Maintenance costs more for electric vehicles.	
	3. Using electricity is just as bad for the environment as using gas, especially in Alberta. (We use coal and diesel to make electricity.)	
	4. Electric vehicles do not have a far enough range to make them practical.	
	5. Electric vehicle batteries will wear out too fast and need to be replaced often.	
	6. Manufacturing batteries is just as environmentally clean as other car parts.	
	7. Electric vehicle batteries are even safer than gasoline tanks in regular cars.	
	8. Electric cars accelerate faster than internal combustion engine (ICE) cars.	
	9. Electric cars cannot run during cold northern Alberta winters.	
	10. There is no easy way to find out where electric car charging stations are located.	
	11. The only electric vehicles are cars and pickup trucks.	

In the chart above, show how to change the statements to make all of them True. (8 pts)

Share Your Opinion (6 pts)

Did any of the Myth Busters Surprise you? _____

If so, which one? _____

Would you recommend buying and electric vehicle to anyone? Explain your answer.

_____

_____

_____

Use Your Imagination (5 pts)

Come up with a name and logo/symbol for your own electric vehicle. Draw it here.

TEACHER RESOURCE: EVs - Busting the Myths

Teacher Instructions

Have copies of the Student Activity and *Busting the Myths* Fact Sheet ready for the students. (Do NOT hand them out just yet.)

In this activity, students are asked their opinion regarding electric vehicles.

Explain that these responses are not meant to "test" them - right or wrong doesn't matter. This is meant to explore their current beliefs about these topics.

Hand out the student activity and ask the students to go through the list of statements and indicate if they believe them to be true or false in the **left**-hand column.

After they initially fill in their responses, provide students with the "Busting the Myths" fact sheet.

As they read through this (alone or in groups), they can put new True/False answers in the **right**-hand column.

Optional: Share the related videos shown on the fact sheet with the students after they have had a chance to read it.

Conclude with a class discussion:

- What facts surprised them?
- Are there any myths they don't understand?
- Are there any they disagree with?
- How could electric vehicles change their community?

Answers

1. F
2. F
3. F
4. F
5. F
6. T
7. T
8. T
9. F
10. F
11. F

Curriculum Connections

Science 10

Unit B overview:

- Modern and efficient energy devices

Unit B concepts:

- Forms of energy, energy transformation, renewable and non-renewable energy
- Efficient use of energy and the environmental impacts of the inefficient use of energy
- Explain the need for efficient energy conversions to protect our environment and to make judicious use of natural resources (e.g., advancement in energy efficiency; Aboriginal perspectives on taking care of natural resources)

Science 20

Unit B: Changes in Motion

Specific Outcomes for Science, Technology and Society

- Explain that the goal of technology is to provide solutions to practical problems

Biology 20

Unit A: Energy and Matter Exchange in the biosphere

- General outcome 2: explain the cycling of matter through the biosphere
- Constant flow of energy and cycling of matter in the biosphere leading to balanced/ steady state
- Students will become familiar with the maintenance of this balance and explore how various human activities have affected the balance