ELECTRIC VEHICLE MYTHS AND REAL-WORLD OWNERSHIP EXPERIENCE

Our EV experience started in 2015 with leasing a BMW i3 and we have been 100% EV since March 2020.

BMW i3 charging at Carlton College in Northfield, MN

Our EV experience started in 2015 with leasing a BMW i3 and we have been 100% EV since March 2020.

2017 Chevy Bolt

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Tesla Model 3 pick-up day (May 2018)

Our EV experience started in 2015 with leasing a BMW i3 and we have been 100% EV since March 2020.

2020 Chevy Bolt and 2020 Tesla Model Y (100% electric garage)

Our EV experience started in 2015 with leasing a BMW i3 and we have been 100% EV since March 2020.

Tesla Model Y towing Safari Condo Alto and charging at Supercharger

There are some new terms to learn when talking about the future of personal transportation.

Term	Definition
BEV	Battery Electric Vehicle
DCFC	DC Fast Charger
EV	Electric Vehicle
EVSE	Electric Vehicle Service Equipment (for L1 & L2 AC charging)
ICE(V)	Internal Combustion Engine (Vehicle)
PHEV	Plug-in Hybrid Electric Vehicle

MYTH: EVs are more expensive to own and operate than equivalent ICEVs.

5 Year Cost of Ownership

(2019 numbers)

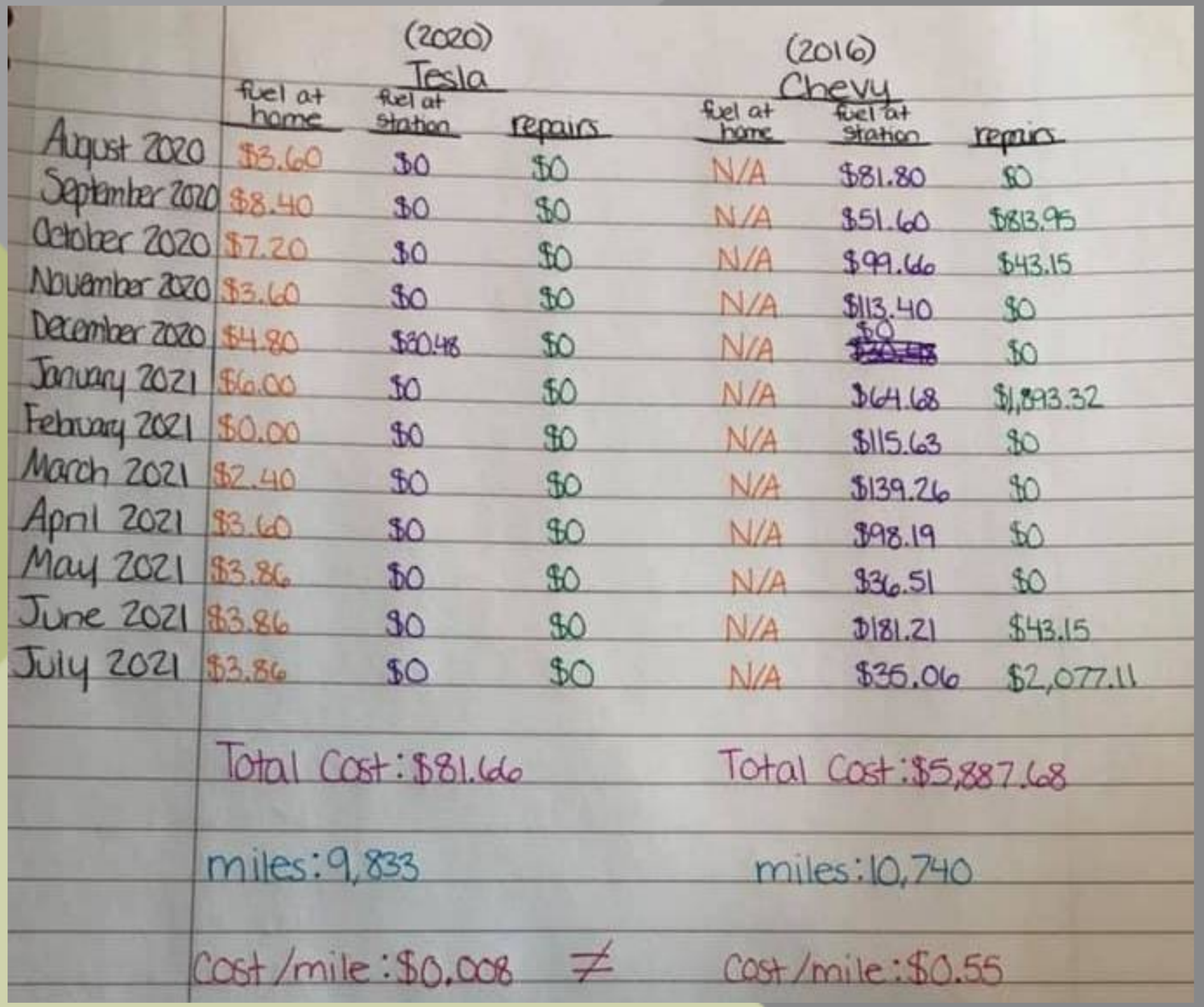
	Tesla Model 3	Toyota Camry LE	Audi A5
Purchase Price	$38,900	$24,600	$44,200
Financing	$2,765	$486	$3,180
Tax, Title and License	$3,025	$2,050	$5,405
Insurance	$5,640	$6,060	$8,080
Fuel/Electricity	$2,250	$8,140	$9,910
Maintenance/Repairs	$1,200	$4,000	$8,000
Total	$53,780	$45,336	$78,775
Resale Value	($18,988)	($8,905)	($18,564)
Total	$34,792	$36,431	$60,211
Cost Per Mile	$0.46	$0.49	$0.80

Source: Loup: Tesla Model 3 Cost of Ownership Slightly Cheaper Than a Camry

One happy Tesla Model Y owner's energy and maintenance costs after one year

"Last Friday marked one year of owning my Model Y. I still kept my gas vehicle and drove them both pretty equally last year because I wanted to see what the ROI would look like for the Tesla in terms of cost savings on fuel and maintenance. Pretty crazy to see side by side!"

— a MN Tesla Club member



	(2020) Tesla			(2016) Chevy		
	fuel at home	fuel at station	repairs	fuel at home	fuel at station	repairs
August 2020	$3.60	$0	$0	N/A	$81.80	$0
September 2020	$8.40	$0	$0	N/A	$51.60	$813.95
October 2020	$7.20	$0	$0	N/A	$99.66	$43.15
November 2020	$3.60	$0	$0	N/A	$113.40	$0
December 2020	$4.80	$30.48	$0	N/A	~~$20.48~~ $0	$0
January 2021	$6.00	$0	$0	N/A	$64.68	$1,893.32
February 2021	$0.00	$0	$0	N/A	$115.63	$0
March 2021	$2.40	$0	$0	N/A	$139.26	$0
April 2021	$3.60	$0	$0	N/A	$98.19	$0
May 2021	$3.86	$0	$0	N/A	$36.51	$0
June 2021	$3.86	$0	$0	N/A	$181.21	$43.15
July 2021	$3.86	$0	$0	N/A	$35.06	$2,077.11
	Total Cost: $81.66			Total Cost: $5,887.68		
	miles: 9,833			miles: 10,740		
	Cost/mile: $0.008		≠	Cost/mile: $0.55		

MYTH: It will take decades for the the industry to convert over to producing primarily electric vehicles.

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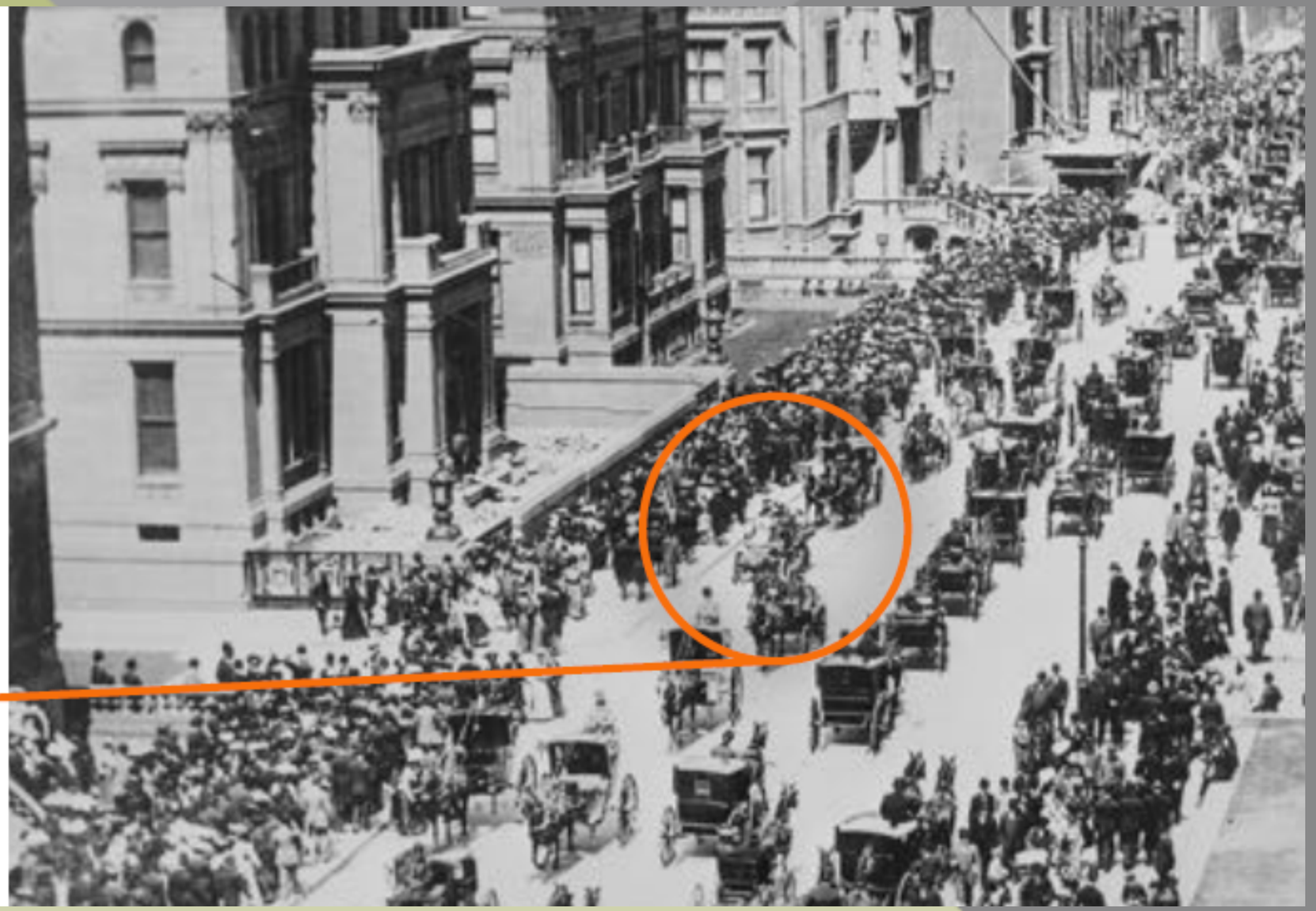
5th AVE NYC

1900

Where is the car?



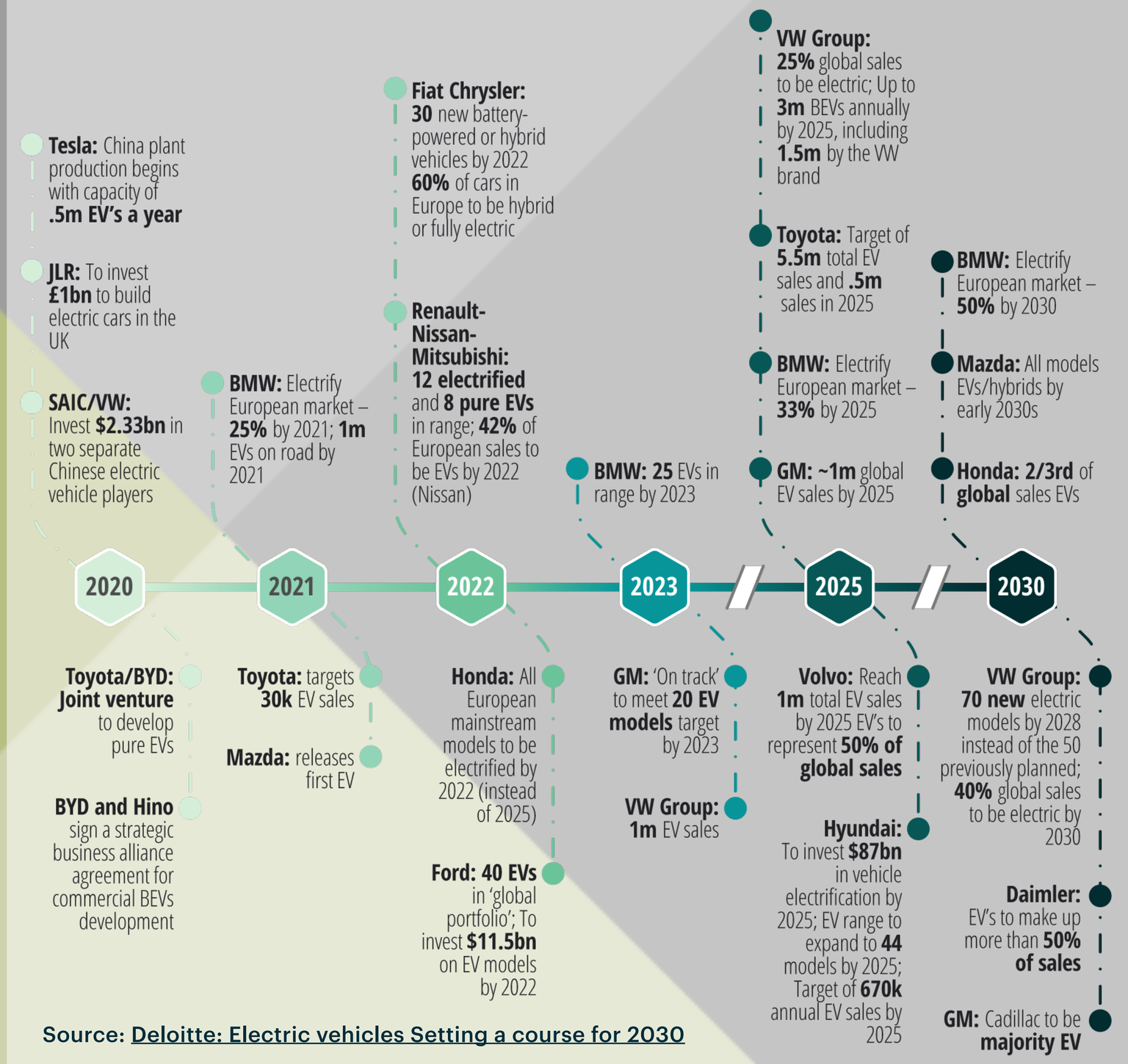
MYTH: It will take decades for the the industry to convert over to producing primarily electric vehicles.

5th AVE NYC

1913

Where is the horse?

MYTH: It will take decades for manufacturers to convert over to producing EVs (from ICEVs).
Reality: The 2020s are last ICE decade.



Source: Deloitte: Electric vehicles Setting a course for 2030

There are a number of EVs available for purchase in Minnestota.

Plug-in vehicles available in Midwest (January 2019)

Midwest EVOLVE

Manufacturer										Range			Charging speed (miles/hr)			Performance				
Name	Model	Photo	Seating	PEV Type	FWD/ RWD/ AWD	Base MSRP	Federal tax credit	Price after federal tax credit	Battery size (kWh)	Electric Range (miles)	Total Range (miles)	Level 2 Charging Rate (kW)	Level 1 120v	Level 2 240v	DCFC 400+v	MPGe/MPG	Top Spd (mph)	0-60 mph (sec)	Towing capacity (lbs)	NHTSA Crash Rating
Audi	A3 E-Tron		5	PHEV	FWD	$38,900	$4,168	**$34,732**	9	17	430	3.3	3	8	N/A	86/39	130	7.6	0	NR
BMW	i3		4	BEV	RWD	$44,450	$7,500	**$36,950**	42	153	153 (200)	7.4	4	27	166	124 (39)	93	6.9-7.2	0.0	4 star
BMW	i8		4	PHEV	AWD	$147,500	$3,793	**$143,707**	7.2	15	330	3.3	3	7	N/A	76/28	155	4.2	0	NR
BMW	X5 xDrive40e		5	PHEV	AWD	$62,100	$4,700	**$57,400**	9	14	540	3.3	2	5	N/A	56/24	130	6.5	0	NR
BMW	330e		5	PHEV	RWD	$45,600	$4,000	**$41,600**	7.6	14	350	3.7	3	8	N/A	72/31	130	5.9	0	NR
BMW	530e		5	PHEV	RWD/ AWD	$,400	$4,200	**$49,200**	9.2	16	370	3.5	3	7	N/A	72/29	146	6	0	NR
BMW	740e		5	PHEV	RWD/ AWD	$,700	$4,200	**$86,5 **	.2	14	340	7	2	7	N/	64/ 7	130	5.1	0	NR
Chevrolet	Bolt EV		5	BEV	FWD	$37,495	$7,500	**$29,995**	60	238	238	7.2	4	25	159	119	98	6.5	0	5 star
Chevrolet	Volt		4.5	PHEV	FWD	$33,170	$7,500	**$25,670**	18.4	53	420	3.3	4	10	N/A	106/42	98	8.4	0	5 star
Chrysler	Pacifica Hybrid (PHEV)		7	PHEV	FWD	$42,000	$7,500	**$34,500**	16	33	570	6.6	3	16	N/A	84/32	107	7.8	0	NR
Ford	Fusion Energi		5	PHEV	FWD	$31,120	$4,007	**$27,113**	7.6	21	610	3.3	3	10	N/A	97/42	85	8.5	0	5 star
Honda	Clarity PHEV		5	PHEV	FWD	$33,400	$7,500	**$25,900**	17	48	340	6.6	4	22	N/A	110/42	110	8.8	0	NA
Jaguar	I-PACE		5	BEV	AWD	$69,500	$7,500	**$62,000**	90	234	234	7	4	18	180	76	124	4.5	0	NR
Kia	Niro PHEV		5	PHEV	FWD	$27,900	$4,543	**$23,357**	8.9	26	560	3.3	4	10	N/A	105/46	107	9	0	NA
Mini	Cooper S E ALL4		5	PHEV	FWD	$36,900	$4,001	**$32,899**	7.6	12	270	3.3	4	8	N/A	65/27	NA	6.8	0	NR

Click for full list

Many new EV models have been introduced or are in the pipeline for 2022 release. 2022 is the year of the electric pickup!

Mustang Mach-E (Now)

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Volkswagen ID.4 (Now)

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Chevrolet Bolt EUV (Now)

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Rivian R1T and R1S (September 2021)

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Hyundai Ioniq 5 (2022)

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Ford F-150 Lightning (2022)

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Tesla Cybertruck (2022)

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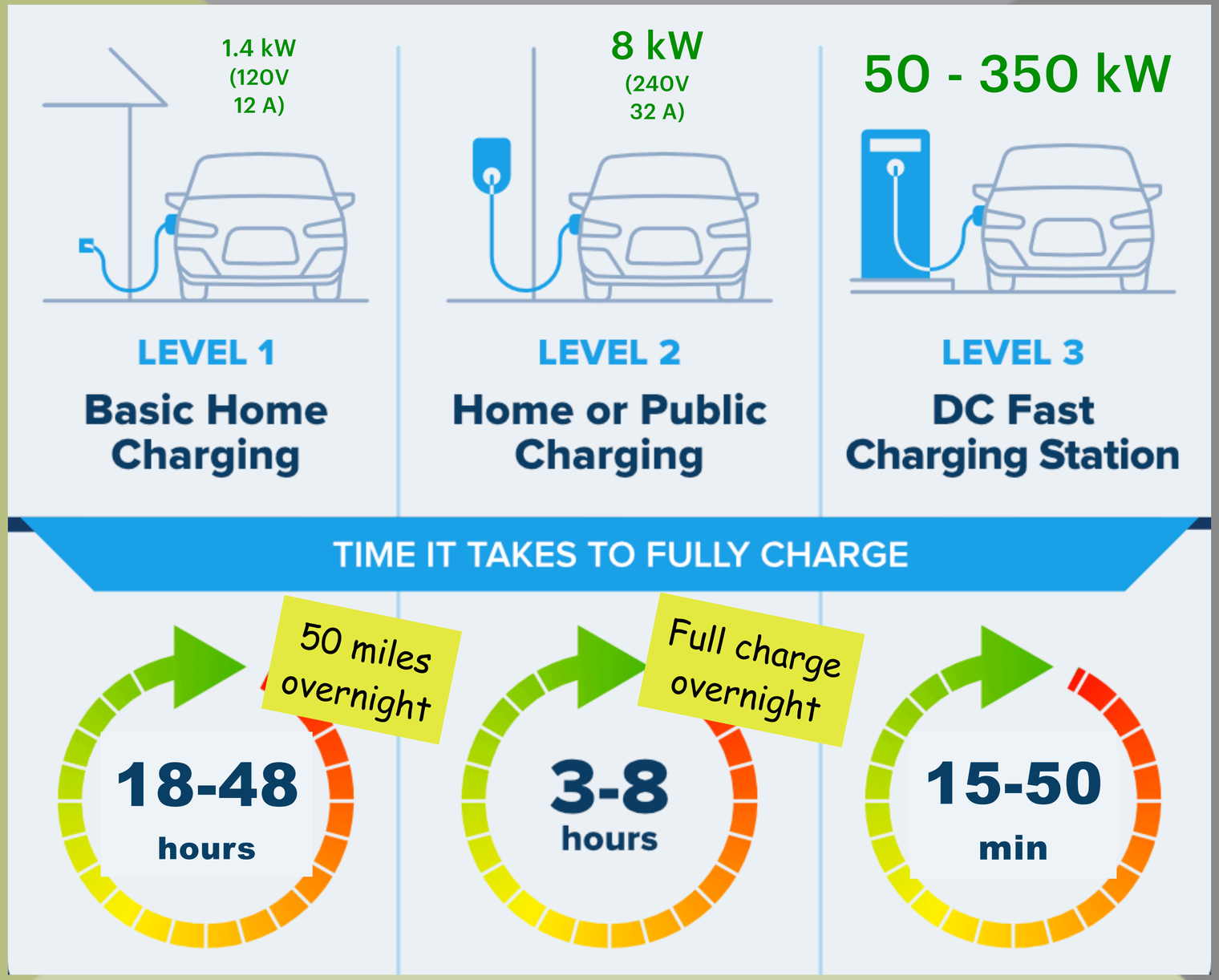
- Since 2015, we’ve driven about 75,000 all-electric miles in all weather across 5 different electric vehicles from 3 different manufacturers.
- We have taken 5 out-of-state road trips, including below 0 temps and towing a trailer.

There are three levels of Electric Vehicle charging.



There are several types of Electric Vehicle charging equipment.

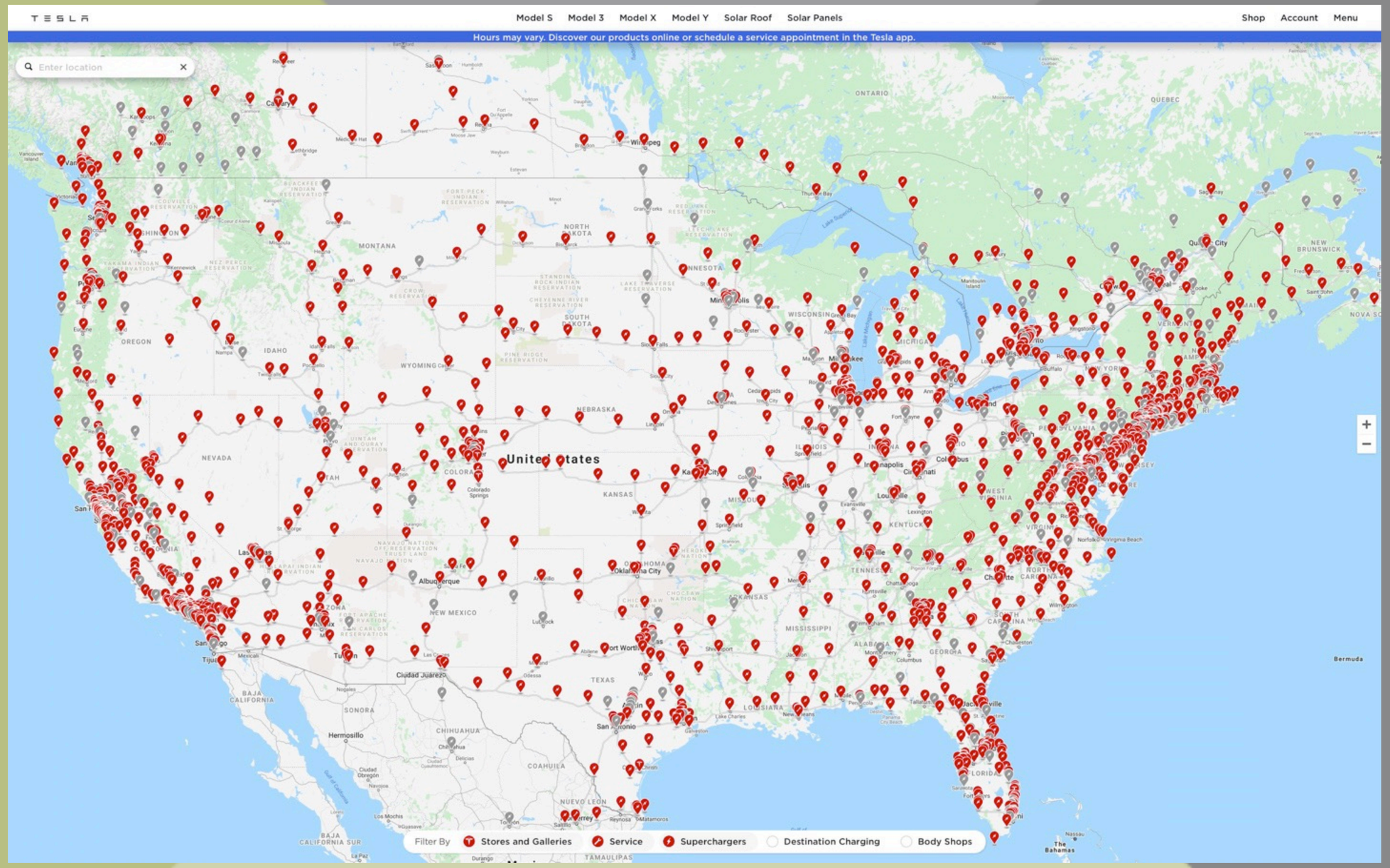
Portable L1-L2 EVSE
(home charger)

Public L1-L2 EVSE

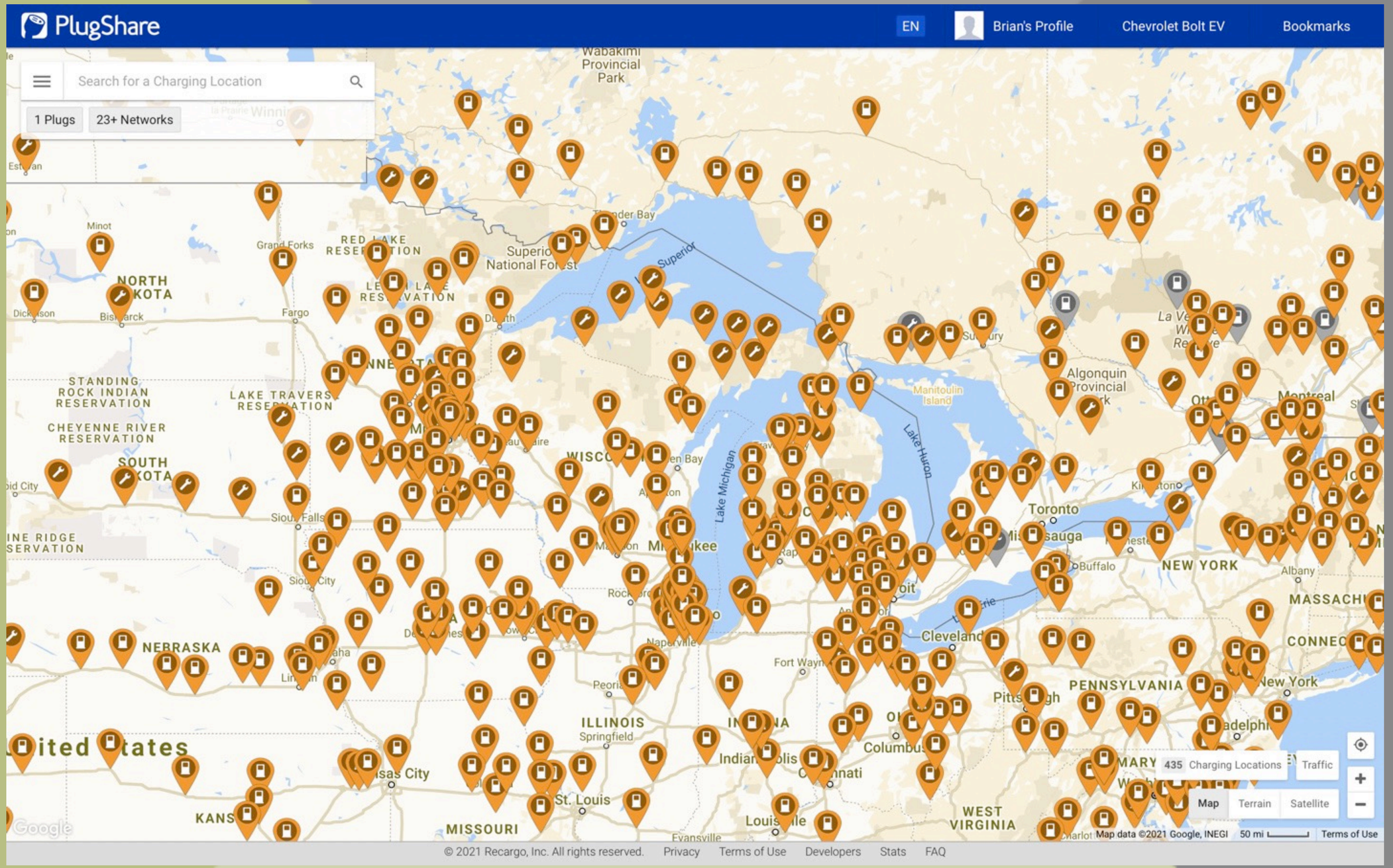
Public DC Fast Charger
(Electrify America)

CONNECTORS	LEVEL	ASIAN MAKES	US / EU MAKES	TESLA
Wall outlets (Nema 515, Nema 520)	1	With adapter	With adapter	With adapter
Port J1772	2	✓	✓	With adapter
Nema 1450 (RV plug)		With adapter	With adapter	With adapter
Tesla HPWC		✗	✗	✓
CHAdeMO	3	✓	✗	With adapter
SAE Combo CCS		✗	✓	✗
Tesla supercharger		✗	✗	✓

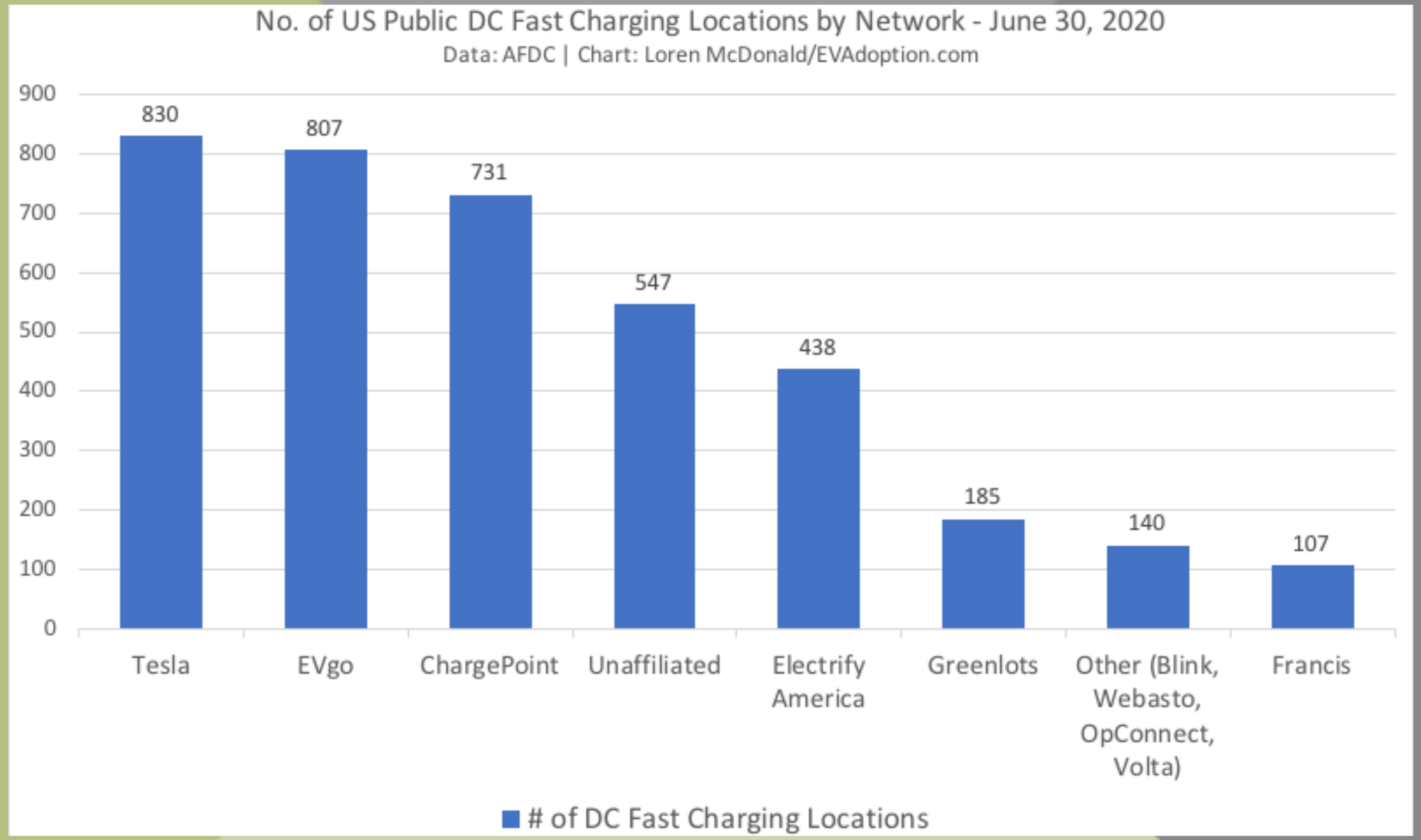
The Tesla charging network provides convenient travel to any location via the in-car navigation and automatic billing for energy.



Third party networks also cover the US and are expanding rapidly.



DC fast charging infrastructure is already robust and is in a high-growth mode. Tesla has fewer locations, but more connections / location.



US Public DC Fast Charging (DCFC) Locations

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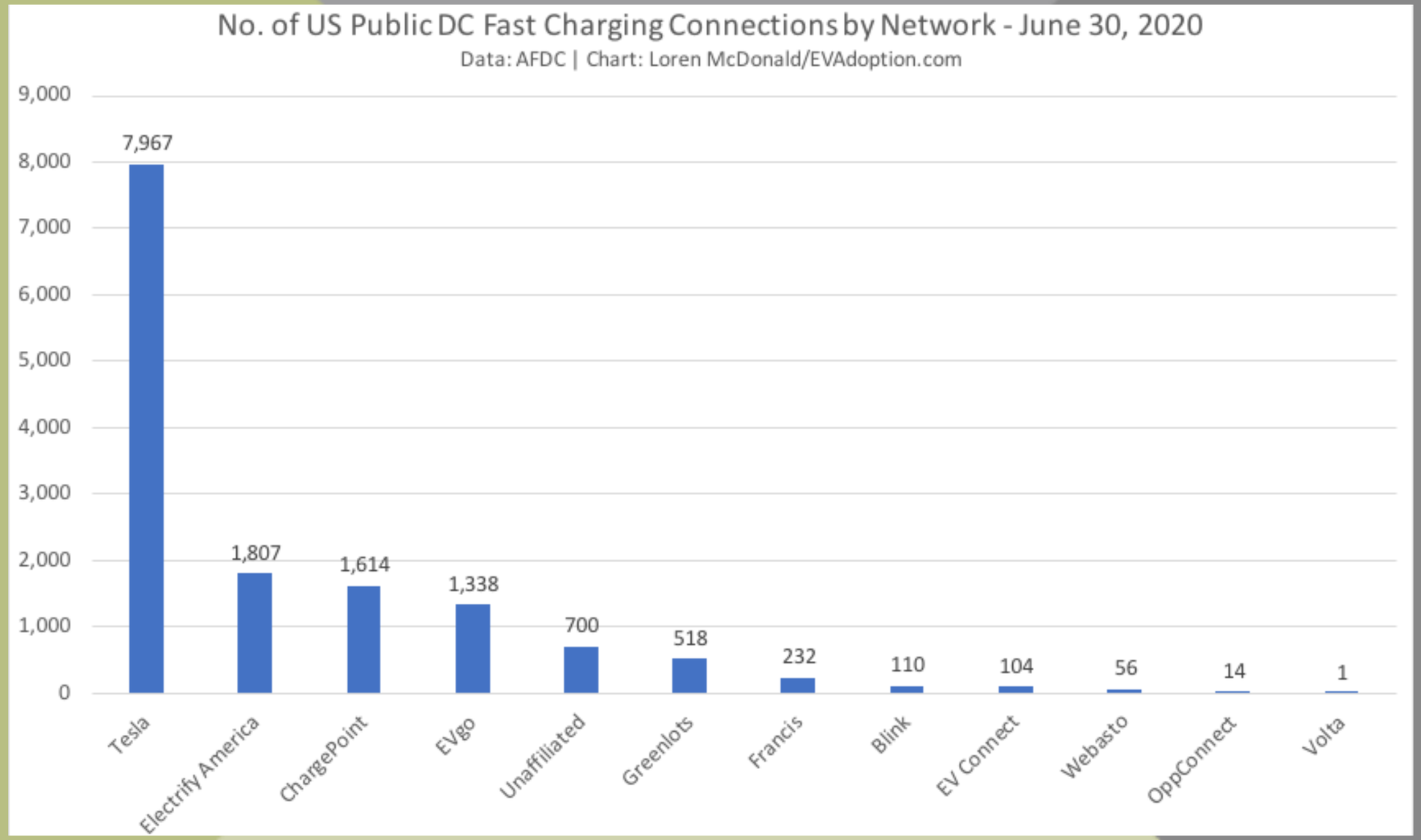

US Public DCFC Connections by Network

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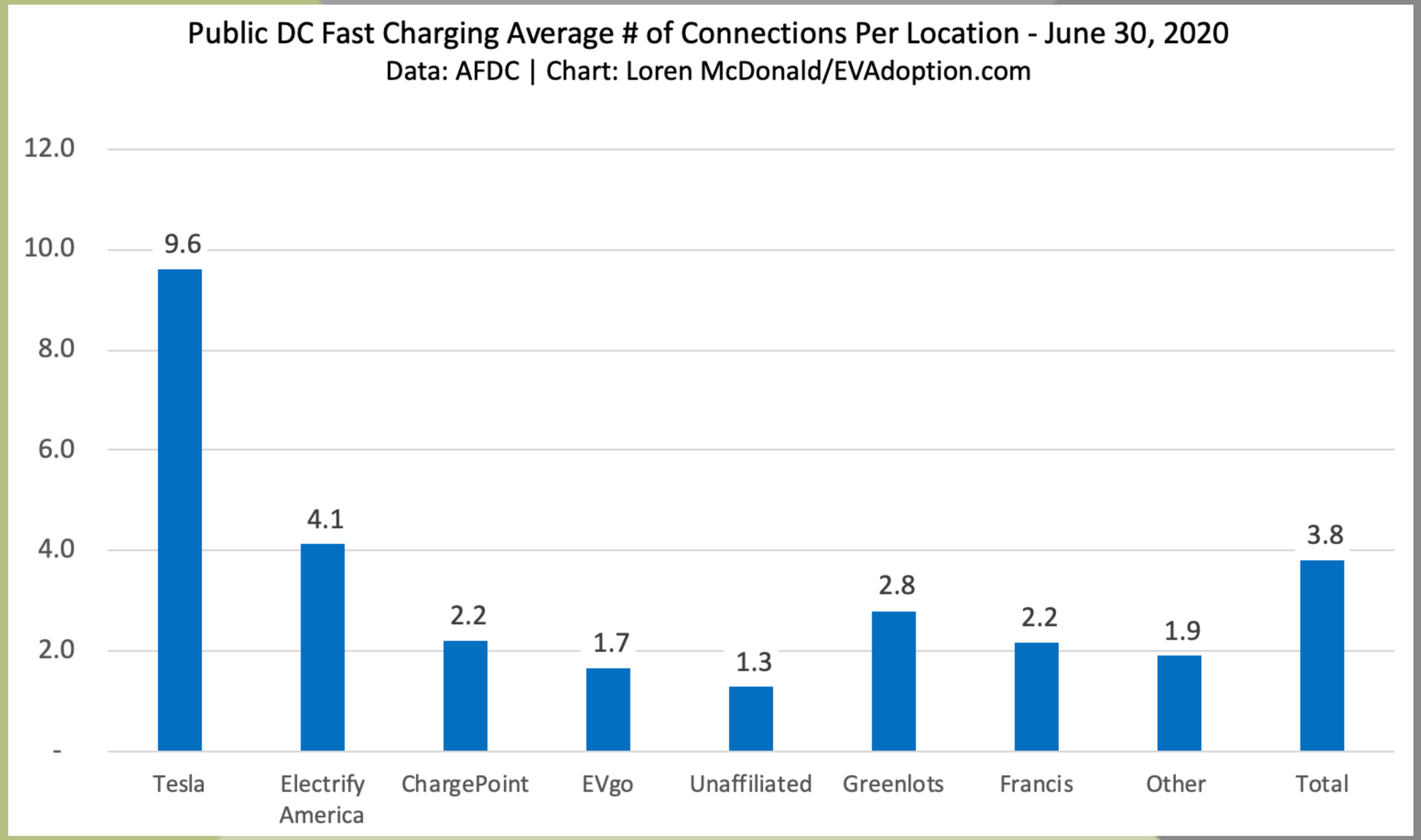
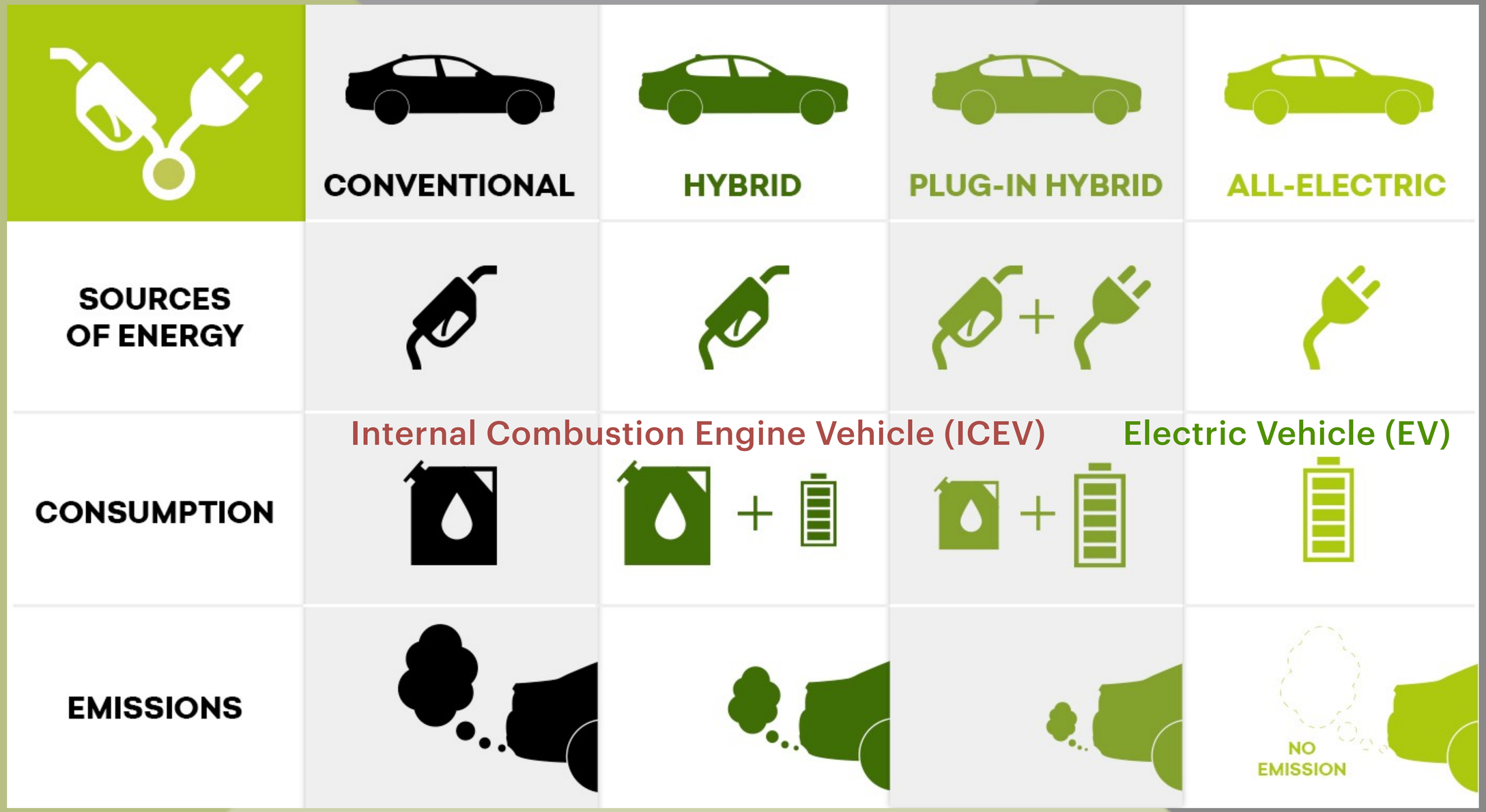


The source of energy for a vehicle is key to understanding it’s environmental impact. For example, hybrids are 100% fossil fuel powered.



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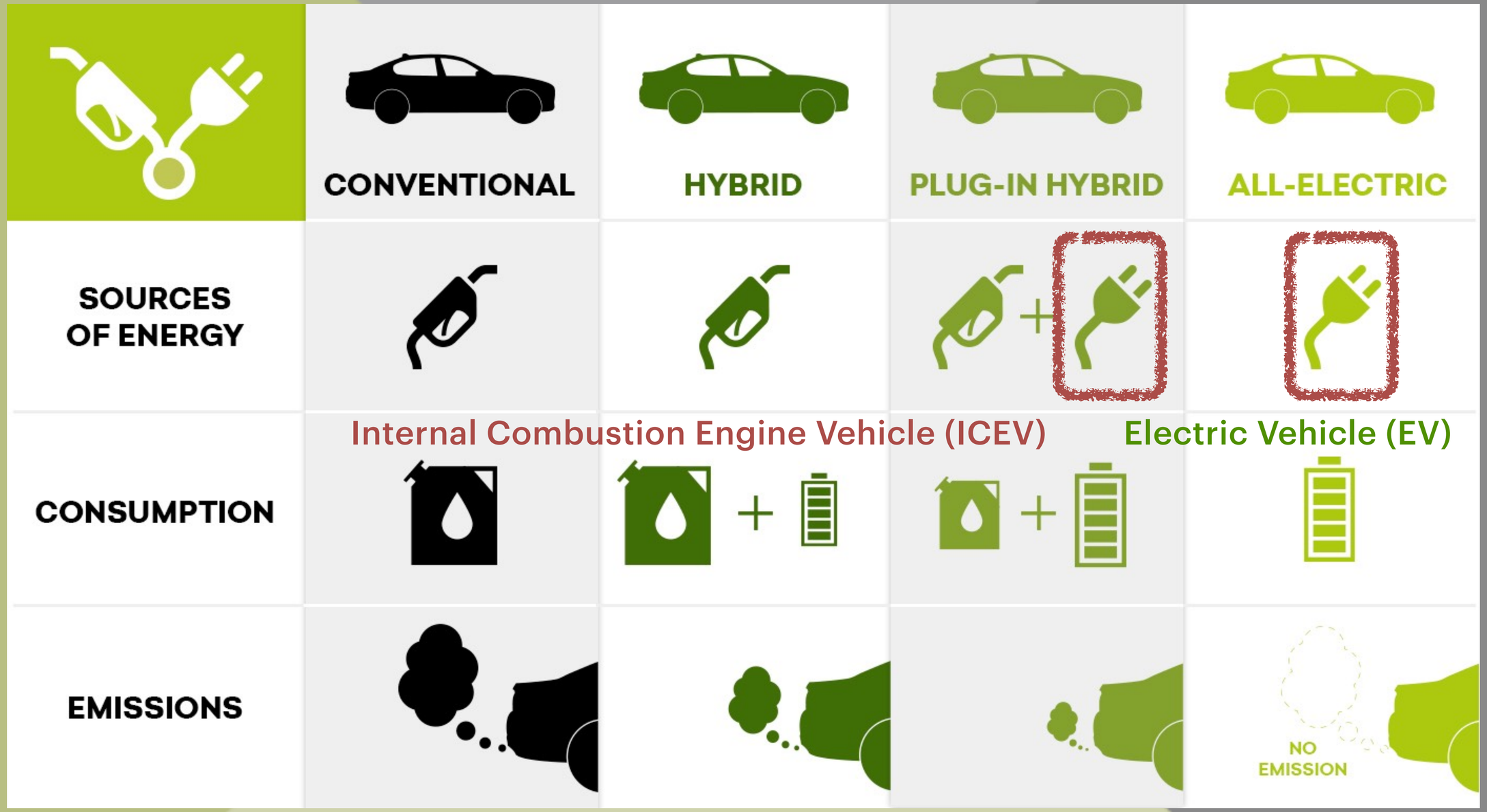
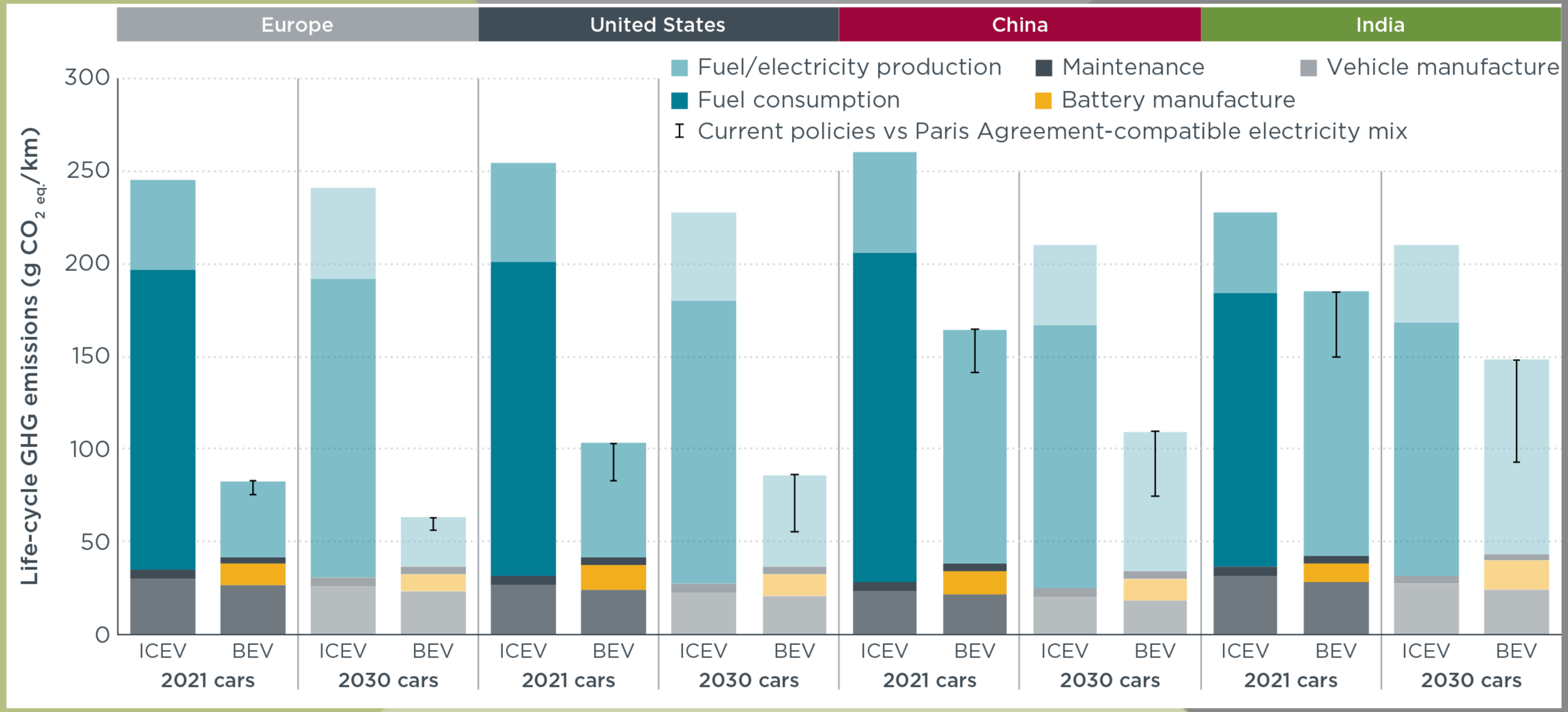
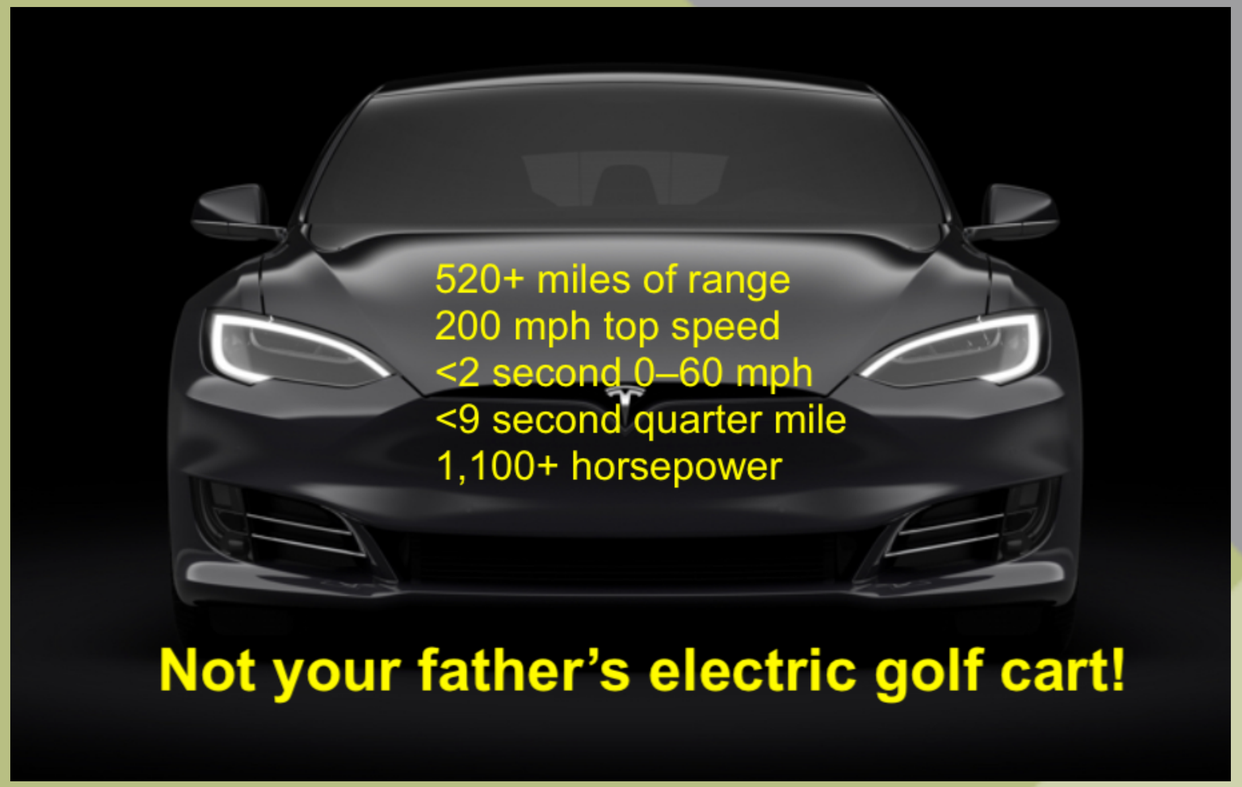


MYTH: Electrically powered vehicles pollute just as much as, or more than, ICE vehicles (the long tailpipe concept).



Source: https://theicct.org/publications/global-LCA-passenger-cars-jul2021

Electric Vehicles provide a better ownership experience!



Certified Service	7,500 miles	15,000 miles	22,500 miles	30,000 miles	37,500 miles	45,000 miles	52,500 miles	60,000 miles	67,500 miles	75,000 miles	82,500 miles	90,000 miles	97,500 miles	105,000 miles	112,500 miles	120,000 miles	127,500 miles	135,000 miles	142,500 miles	150,000 miles
Rotate tires, if recommended for the vehicle, and perform Required Services.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Replace passenger compartment air filter (or 2 years, whichever comes first).			✓			✓			✓			✓			✓			✓		
Drain and fill vehicle coolant circuits.																				✓

Utilities are providing incentive programs to install home charging.

Xcel Energy

Electric Vehicle Charging Programs

Over 80% of EV charging happens at home. Find the charging program and electric pricing plan that's best for you.

EV Accelerate At Home – Pay As You Go

With **EV Accelerate At Home** you can save on charging with a Level 2 charger, and we'll do all the work to set you up. You select a level 2 charger from one of our two pre-qualified options, we'll install it and maintain it; you charge for less when fueling overnight.

Time of Day – Separate Meter

The Time of Day – Separate Meter plan is for drivers who can charge their vehicles at night and on weekends but use energy for other activities during the day. Investment in a separate electric meter and service is required, but pricing for energy is about half the amount of the regular residential rate for overnight and weekend use while your home stays on the regular residential plan.

CONNEXUS ENERGY

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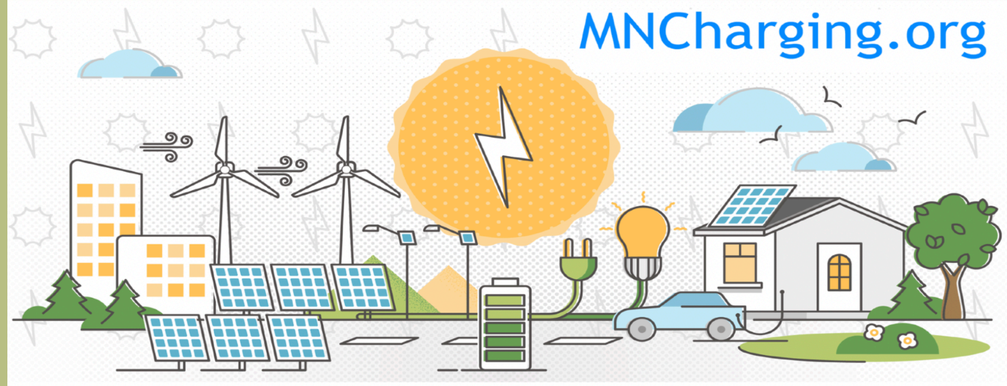
BENEFITS | EV FACTS | SAVINGS CALCULATOR | CO2 REDUCTION | EV MODELS | PHEV MODELS | RATES & OFFERS | CHARGER FINDER

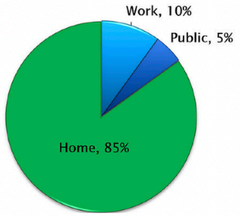
Electric Vehicle Offers & Information

Time-Of-Day Program

Our EV Time-of-Day (TOD) Program offers an affordable rate to members who purchase an electric vehicle to meet

MNCharging.org





You can charge your EV while you sleep!

85% of charging happens at home so focus first on figuring out your home charging setup. After that you can take a look at the public charging to support your road trips and travel needs.

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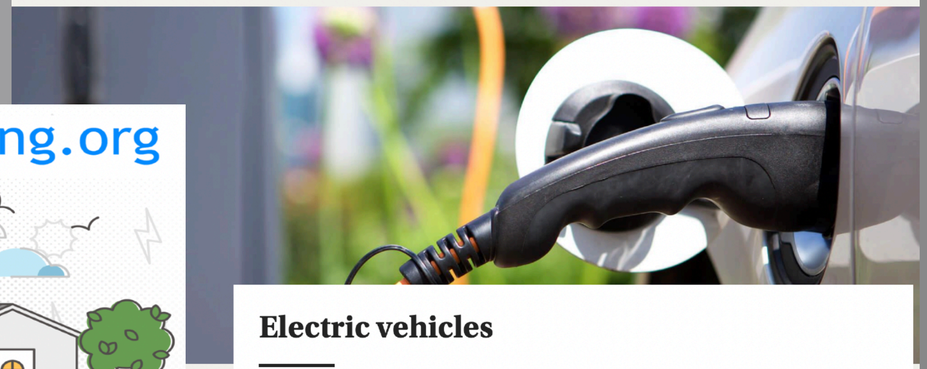


Electric vehicles

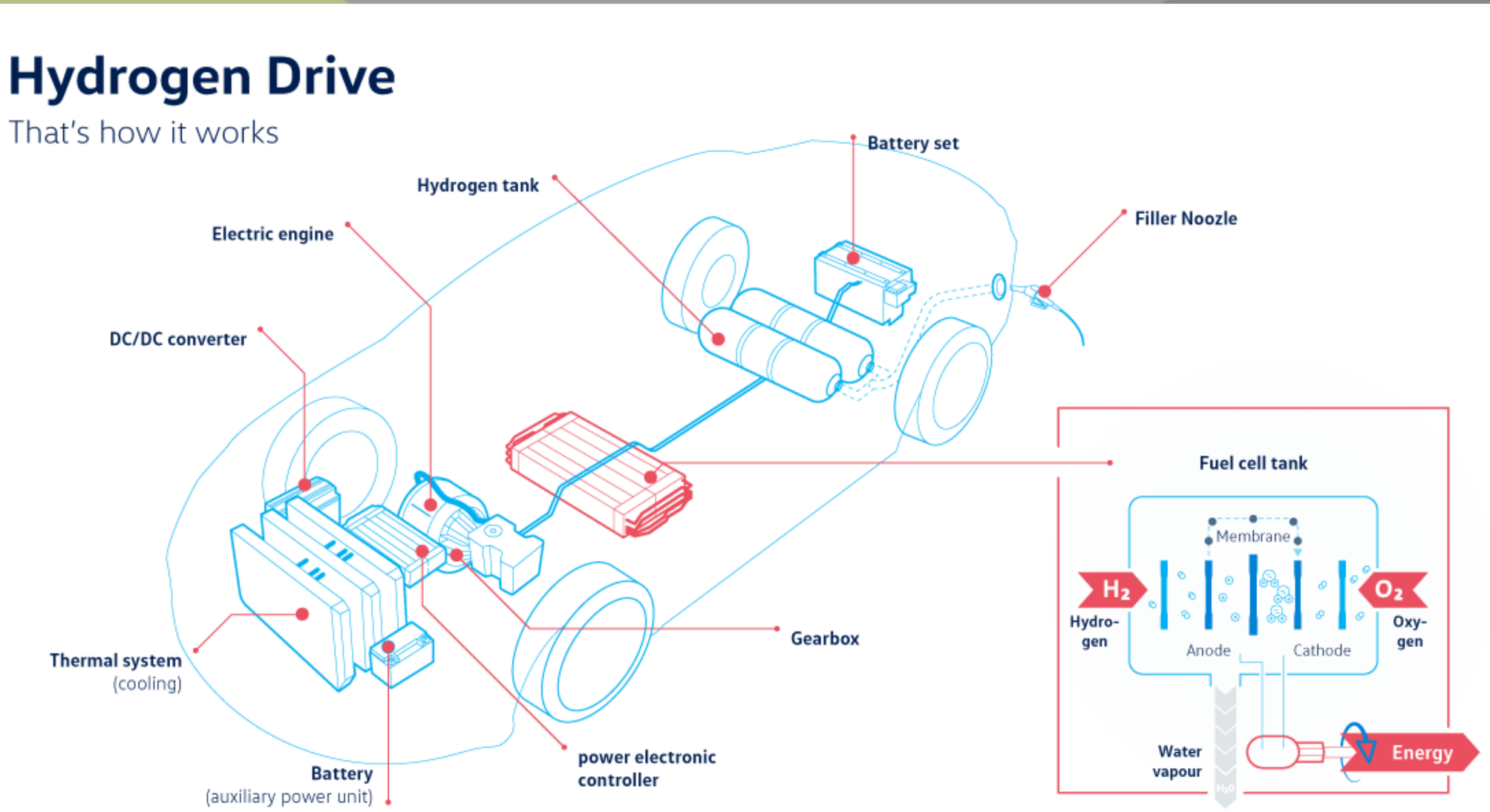
Menu

ELECTRIC VEHICLES

Electric vehicles are fast becoming a reality in homes across the country. Stearns Electric is ready to provide you with the information to help you understand the advances in electric vehicle technology! Before you consider an electric vehicle it is important to understand the market. This resource helps answer common questions Co-op members have about electric vehicles:

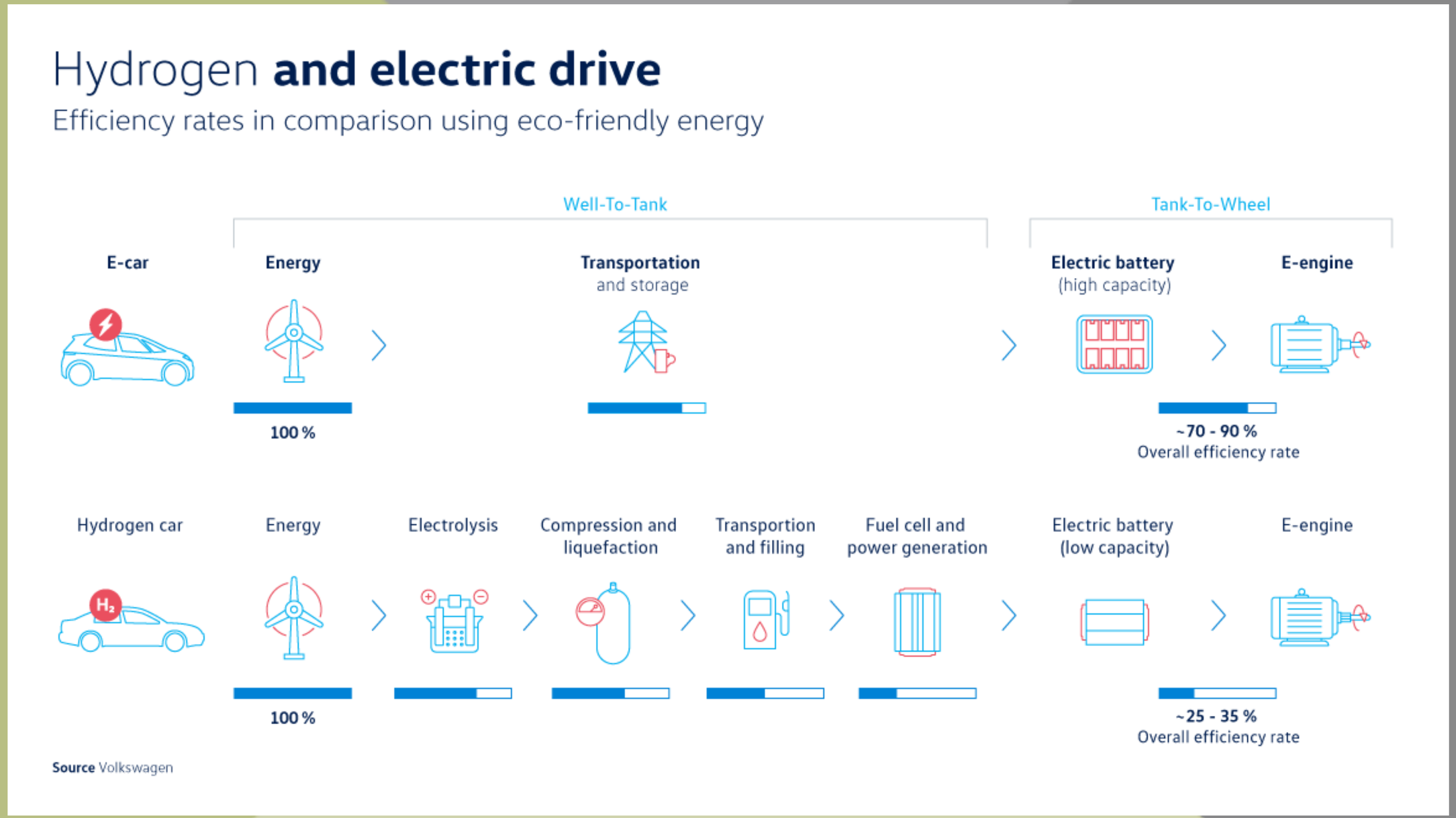
A U.S. Consumer's Guide To Electric Vehicles – EPRI

What about hydrogen fuel cell vehicles (FCVs)?

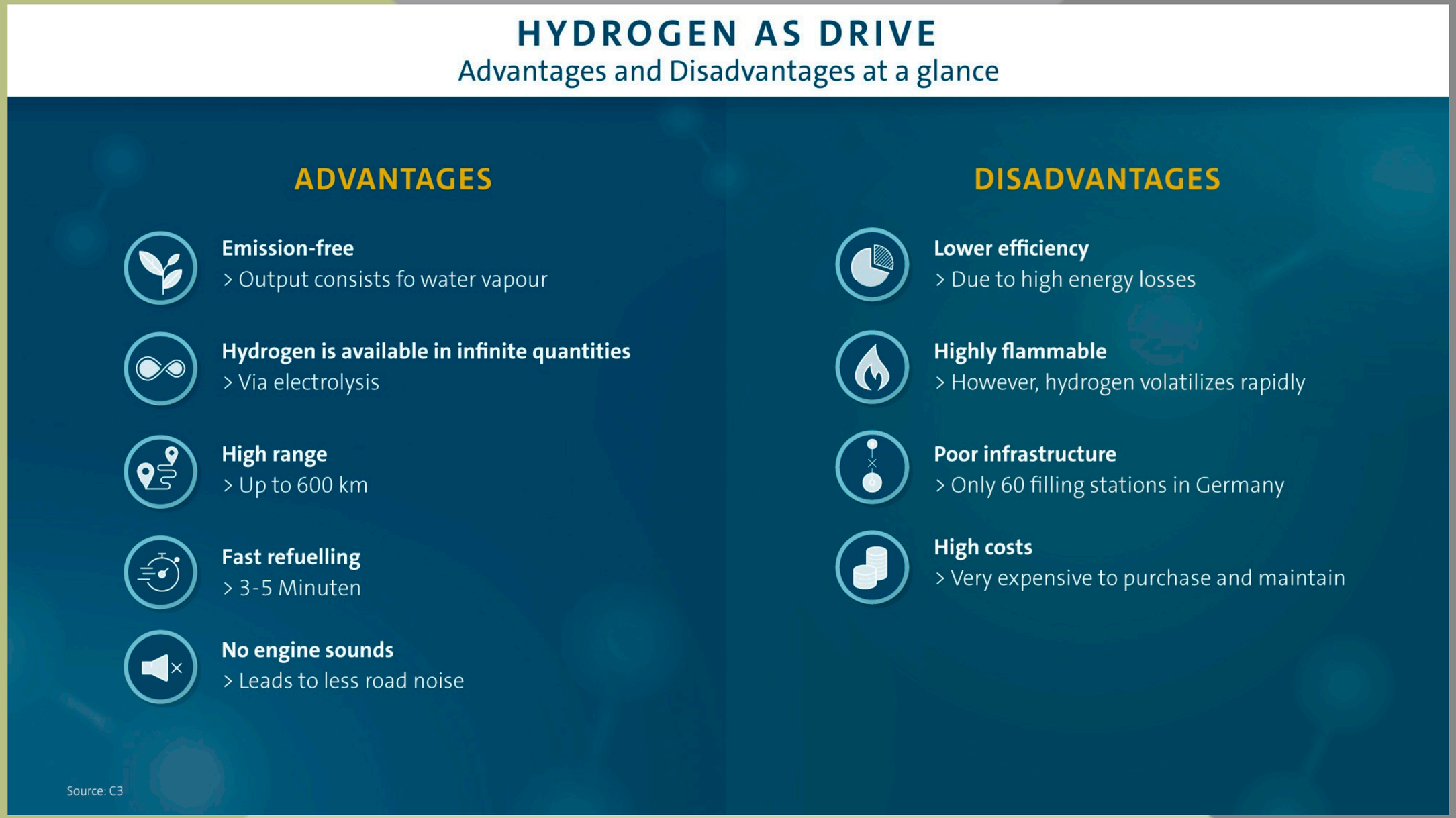


Source: Battery of Fuel Cell, that is the question

FCVs are just as inefficient as ICEVs (and Hydrogen still mainly comes from fossil fuel sources).



While FCVs do have some advantages, they don’t compete with BEVs (and never will, given the physics involved).



Resources

- Loup: Tesla Model 3 Cost of Ownership Slightly Cheaper Than a Camry
- Deloitte: Electric vehicles Setting a course for 2030
- Shift2Electric: Available EV Model Lists
- Electric Cars vs Gas Cars Cost in Each State
- EVadoption: EVGo and GM Partner to Add 2,700 New Fast Chargers Over the Next Five Years
- ICCT: A global comparison of the life-cycle greenhouse gas emissions of combustion engine and electric passenger cars

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ADDITIONAL MATERIAL