DEQ MONTANA ENERGY OFFICE

Memorandum

DATE: March 9, 2022
TO: Transportation Interim Committee
FROM: Dan Lloyd, Energy Bureau Chief
SUBJECT: Electric Vehicle Questions

Question 1: What is the cost to charge an electric vehicle (EV) at public charging stations in Montana?

All of the direct current fast charging (DCFC) charging stations in Montana are privately owned. Station owners generally set the price to charge a vehicle to cover their costs (upfront capital investments along with operations and maintenance, including electricity), while ultimately allowing them to earn a profit. Though funds managed by the state of Montana—including Volkswagen Environmental Trust and federal funds—may be used to offset costs associated with EV infrastructure development, state funds are not used to support the costs associated with the "fuel" for EVs or the initial capital investment. In other words, the costs of EV charging are set by the owners of the charging equipment, and EV owners pay that price. As outlined below, an EV with a smaller battery, could cost between $5 and $10 to fully charge at a public station in Montana while a larger vehicle with fully depleted capacity, might cost between $15 and $40 to fully charge.

Table 1: Cost to Charge at DCFC Stations in MT

Company	Location(s)	Capacity	Cost to charge	Approximate cost per mile	Notes
Tesla	Glendive, Miles City, Billings, Big Timber, Bozeman, Big Sky, Butte, Missoula, Superior, Helena, Great Falls, West Yellowstone, Lima	150-250 kW at each station depending on location	About $25 for 250 miles of range.	$0.10/mile	Only Tesla vehicles can charge at Tesla Super Charger stations.
Electrify America	Butte (Rocker), Missoula, Dell	150kW-350kW	$0.12-$0.32/minute ($7.20-19.20 per hour)	$0.13-0.34/mile	Lower cost per minute for drivers who pay $10/month for a pass.
Enel X	Taco Bells in Wye, Polson	50kW	$15/hour (0.25/minute)	$0.34/mile	
EV Connect	Audi Dealership, Bozeman	50kW	Unknown	Unknown	

Question 2: What are the costs of the individual charging units?

The cost for the charging station itself can vary widely based on factors including type of charging hardware, required electric upgrades, and any associated infrastructure upgrades. As a rule, the unit costs of Level 2 stations are significantly lower than the unit costs of direct-current fast charger (DCFC) stations. There is a wide range of installation costs associated with DCFC stations, due primarily to electric utility upgrades necessary to accommodate higher capacity chargers. Using Volkswagen Settlement Funding DEQ, has funded 14 DCFC stations and 13 Level 2 stations. The table below compares the average upfront costs of Level 2 and Level 3 electric vehicle charging stations. It should be noted that these costs can vary widely and per unit savings can be realized when multiple charging units are installed in a single location.

Table 2: Average Charging Station Unit, Installation, and Utility Upgrade Costs

Charging Unit Type	Dual-plug unit hardware cost (average)	Per unit installation cost (average)	Utility upgrade costs	Total cost (average)
Level 2	$400-$6,500 [1]	$5,500[2]	Included in installation cost (if any)	~ $9,000
Level 3 (50 kW)	$28,000[3]	$46,000[4]	$8,300[5]	~ $82,000
Level 3 (150 kW)	$75,000-100,000[6]	$48,000[7]	$100,000[8]	~ $235,000

Question 3: Who Pays for Electric Vehicle Charging Stations?

In many states, a portion of the equipment, operation and maintenance costs can be covered by grants or incentives. The remaining costs are typically covered by private charging station companies, or commercial businesses that host charging stations on their property. Businesses can recover upfront costs and additional electricity costs by charging electric vehicle drivers who use the stations.

For example, a charging company could apply to DEQ for a Volkswagen-funded grant to install a Level 2 charging station at a restaurant in Polson. If the charging station costs $10,000 the grant would fund $8,000 and the charging company would be responsible for the remaining $2,000. The charging company would have an agreement with the restaurant to install and operate the station

[1] Nelder, Chris and Rogers, Emily. Reducing EV Charging Infrastructure Costs, Rocky Mountain Institute, 2019. https://rmi.org/insight/reducing-ev-charging-infrastructure-costs (17)

[2] *Ibid, (37)*

[3] Nicolas, Michael. *Estimating electric vehicle charging infrastructure costs across major U.S. metropolitan areas, ICCT, 2019.* https://theicct.org/publication/estimating-electric-vehicle-charging-infrastructure-costs-across-major-u-s-metropolitan-areas/ (2)

[4] *Ibid, 3*

[5] Average utility upgrade costs at 9 locations that have received Volkswagen Settlement funding from DEQ

[6] Nelder, Rogers. Reducing EV Charging Infrastructure Costs (17)

[7] Nicolas, Michael. Estimating electric vehicle charging infrastructure costs across major U.S. metropolitan areas (4)

[8] Based on quotes provided to DEQ for 150kW fast-charging stations

on their property. If someone is driving from Kalispell to Missoula and needs to charge their vehicle while they are grabbing a bite to eat, they would stop at the charging station, swipe their credit card and be charged a per-minute or per-hour fee (determined by the charging station owner). These fees would help cover the owner's $2,000 cost of the charging station, additional electricity costs, and ongoing maintenance.

Question 4: How many stations can Montana fund with IIJA (Federal Infrastructure) funding?

The Infrastructure Investment and Jobs Act (IIJA) established the National Electric Vehicle Infrastructure Program (NEVI), which allocates funding to each state through a formula, to deploy electric vehicle charging stations along interstate and highway corridors.

Montana will receive about $42.9 million over five years from the program with a Federal cost share of 80 percent. Private and/or state funds can be used to provide the remaining cost-share. DEQ is collaborating with the Montana Department of Transportation to develop and administer the program to ensure that private entities provide the 20 percent cost share, similar to what DEQ has required for projects funded with Volkswagen Settlement dollars. Based on federal guidance, to be eligible for NEVI funding, proposed charging station locations must be capable of charging four EVs at 150 kW fast-charging plugs.

In addition to upfront costs, there are also ongoing operation and maintenance costs associated with charging stations that are eligible for NEVI funding. These costs include networking and data collection that are assessed annually. Average operation and maintenance costs are $6,800/year per location.

Assuming the average total cost per 150 kW station from the table above, the requirement that there be four stations per location, an anticipated 20 percent cost share from a private partner, an 80 percent federal cost share, and $6,800/site per year in O&M costs, **Montana could fund approximately 40 locations with the infrastructure funding over the next five years depending on actual charging station unit, installation, and utility upgrade costs.** It should be noted that these costs are a rough estimate made at this time and it is likely that actual costs will vary per site location and throughout the five years of the program.

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