

# National Charging Costs

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## **PlugShare Connector locations by zip**

North Dakota South Dakota Wyoming New Hampshi Massachuset Rhode Island New Jersey Delaware Maryland District of Number of Conne.. 1 Baja California 100 200 Chihuahua 298 Baja California Sinaloa Durango

Charging stations



Movico

### **Connector type by Network**





### **Cost information provided? By Network**



# What percentage of connectors have payment information?



#### ■ Missing ■ Free ■ Paid ■ Other



#### **Charging Cost Examples: over 350 unique costs**

- \$4 per session
- \$0.03/min
- \$0.69/kWh
- \$2.95/hour, max \$24
- \$0.29 per kilowatt hour (kWh) \$0.50 minimum. First 5 minutes are free.
- \$0.45/hour, min \$0.45, max \$4.50, time limit 10
- \$3.00/session, time limit 8
- \$9.95 for 30 minutes / Level 3 DC
- \$0.00/hour for first 1 hours, \$1.00/hour afterwards
- \$0.00/hour for first 1 hours, \$1.00/hour for next 1 hours, \$2.00/hour for next 1 hours, \$3.00/hour afterwards
- \$1.00 per hour of time connected. Fees continue until car is disconnected even if charging has ended. \$0.50 minimum. First 60 minutes are free.



Some locations have cost minimums,

some have maximums, and they

charge by time, kWh and sessions

#### **Cost Units**

**DCFC Units** 

L2 Units







### **Converting Currency**

While the charging stations use kWh, time and sessions to charge, we chose to boil everything down to \$/kWh. We assumed a couple conversions and looked at different charge times and battery sizes to see the variability in costs. We kept L2 and DCFC separate for this analysis.

# Charge Level: DCFC (assume 50 kW station)

Case 1: 12 kWh in 15 minutes

Case 2: 24 kWh in 30 minutes

Case 3: 48 kWh in 1 hour

Stations that charge by the session will have vastly different \$/kWh depending on how many kWh were transferred.

Similarly, stations that have a minimum charge will favor longer charge sessions Example:

If it costs \$9.99 to charge for 30 mins, \$9.99 / 30 kWh = \$0.33/kWh

# Charge Level: L2 (assume 6.6 kW station)

Case 1: 6.6 kWh in 1 hour

Case 2: 13.2 kWh in 2 hours

Case 3: ~20 kWh in 3 hours

Example:

If it costs \$2.95/hour to charge, for 3 hours it costs:

(\$2.95 \* 3) / 20 kWh = \$0.44/kWh



# Cost by kWh and time

Charge Level: DCFC (50 kW)

It is interesting to note that while charging by the hour and charging by the minute is the same, stations that post their rates by the minute tend to be more expensive than those that post their rates by the hour. Stations that charge by kWh are on average most expensive.

#### 0.50 0.7 0.45 0.6 0.40 0.35 0.5 0.30 v / Avg. \$/kWh 0.4 **9** 0.25 0.3 0.20 0.2 Units 0.15 hour Units kWh hour min 0.10 0.1 kWh session min 📕 session 0.05 0.0 24 kWh/30 minute 48 kWh/ 1 hou 12 kWh/15 minut 0.00 14 kWh/ 2 hours 6.6 kWh/1 hou 20 kWh/3 hour

While the \$/kWh is relatively constant over the different charge times, the session stations are very different. The session charging stations will be investigated separately and will be removed from the rest of the analysis to not skew the results since there are relatively few charging stations that are charging by session.

Charge Level: Level 2 (6.6 kW)



#### Charging stations: Charging by session (\$), DCFC



Of the data that we have, currently, 3 networks charge by session at their DCFast chargers. Price breakdown is shown.



#### Charging stations: Charging by session (state), DCFC



Of the data that we have, currently, 3 networks charge by session at their DCFast chargers. States where this occurs is shown

![](_page_10_Picture_3.jpeg)

## Charging stations: Charging by session (\$), L2

![](_page_11_Figure_1.jpeg)

Of the data that we have, currently, 2 networks charge by session at their L2 chargers. Price breakdown is shown.

![](_page_11_Picture_3.jpeg)

#### Charging stations: Charging by session (state), L2

![](_page_12_Figure_1.jpeg)

Of the data that we have, currently, 2 networks charge by session at their L2 chargers. States where this occurs is shown

![](_page_12_Picture_3.jpeg)

# **DCFC Price information**

Stations charging by session have been removed from all further analysis.

![](_page_13_Picture_2.jpeg)

### **DCFC: Average cost by state**

![](_page_14_Figure_1.jpeg)

![](_page_14_Picture_2.jpeg)

# DCFC: State average, with each station showing a data point.

![](_page_15_Figure_1.jpeg)

![](_page_15_Picture_2.jpeg)

#### **DCFC: Average cost by network and number of records**

![](_page_16_Figure_1.jpeg)

![](_page_16_Picture_2.jpeg)

#### **DCFC: Network average, each station showing a data** point.

![](_page_17_Figure_1.jpeg)

other. Within a network there is not much price variability.

![](_page_17_Picture_3.jpeg)

# **L2 Price information**

Stations charging by session have been removed from all further analysis.

![](_page_18_Picture_2.jpeg)

#### L2: Average cost by state

![](_page_19_Figure_1.jpeg)

![](_page_19_Picture_2.jpeg)

# L2: State average, with each station showing a data point.

![](_page_20_Figure_1.jpeg)

![](_page_20_Picture_2.jpeg)

#### L2: Average cost by network and number of records

![](_page_21_Figure_1.jpeg)

![](_page_21_Picture_2.jpeg)

# L2: Network average, each station showing a data point.

![](_page_22_Figure_1.jpeg)

![](_page_22_Picture_2.jpeg)

#### Average \$/kWh for residential electricity

![](_page_23_Figure_1.jpeg)

#### prices that are less)

![](_page_23_Picture_3.jpeg)

![](_page_24_Picture_0.jpeg)

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![](_page_24_Picture_2.jpeg)

![](_page_24_Picture_4.jpeg)

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![](_page_25_Picture_11.jpeg)

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