An Energized Forecast: Charting your utility's EV Future.

Long-term Planning to meet the EV future

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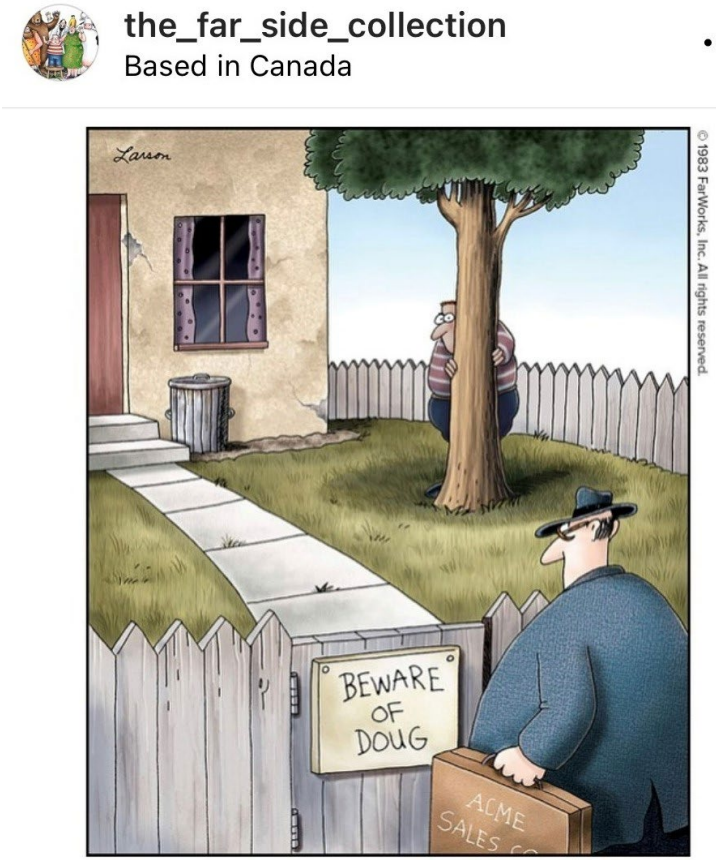
Today's Agenda

- Introduction
- 'EV Recharge' EVSE Program Overview
- Current Status of EVs and EV Charging Infrastructure in Maryland and SMECO
- Details of SMECO EV Recharge Program
- Contractor Options
- Lessons Learned
  - Installation / Maintenance
  - Rates / Peak-use vs off-peak
  - Customer usage (or lack there of…)
- Future endeavors

Introduction

- SMECO:
  - Top 15 Cooperative based on size.
  - 170,000 meters, 803 MW demand, 460+ employees, 7,300+ solar installations
  - Ranked 9th in J.D. Power 2020 Electric Utility Residential Customer Satisfaction Study for Cooperatives
  - State of Maryland dictated utility involvement based on ZEEVIC goals
  - 4 IOU's agreed
  - 1 Coop – 6 – 9 months later and a bit reluctantly.



COOP Program Overview

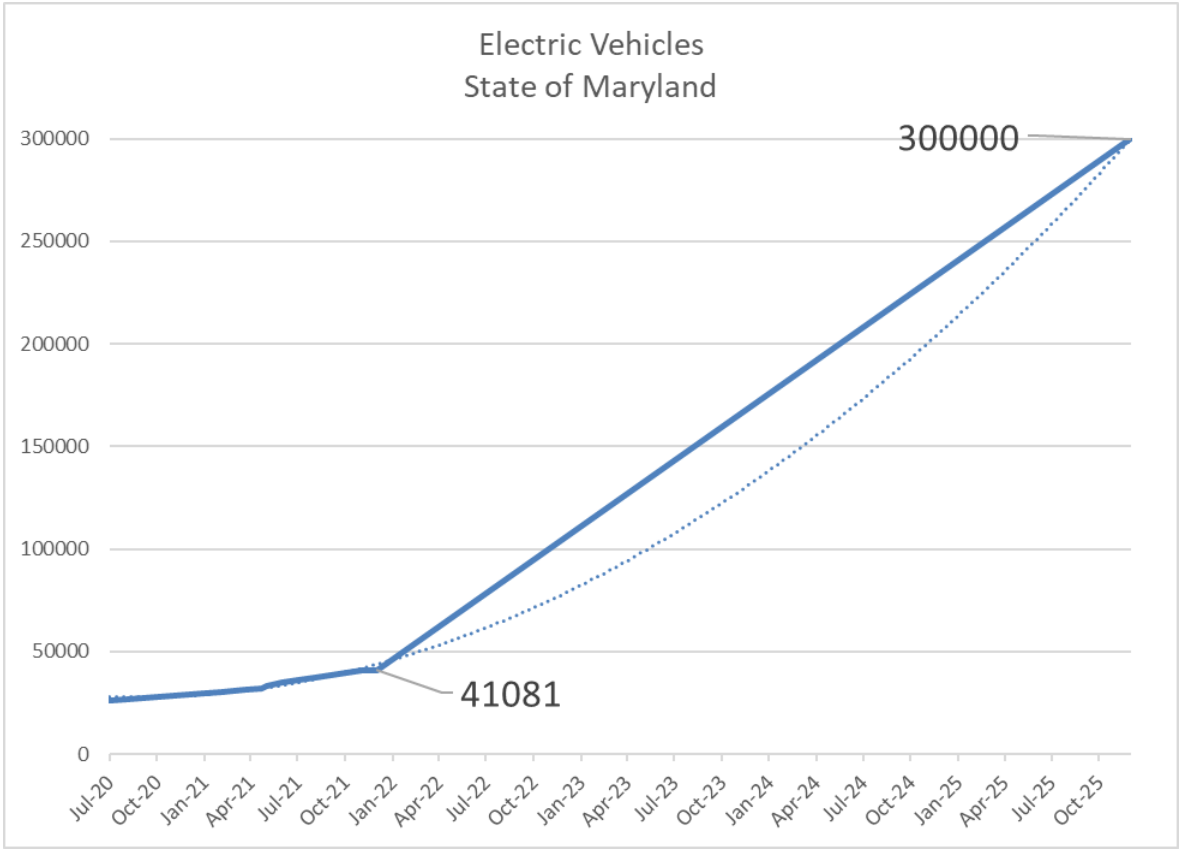
- All utilities will install, own, operate EV charging stations at public sites.
- SMECO put in for 60 based on load served vs IOU load (example: BG&E/PEPCo – 500 each)
- Of the 60 chargers, original projection of 50 Level 2 and 10 Level 3.
- Limitation: All chargers will be installed on “property leased, owned or occupied by a unit of State, county or municipal government for public use” per the Maryland PSC order.
- Users of the EVSE’s will be charged via fees at the charging stations.
- Pay through app on the phone, credit card over the phone, etc.
  - (Since SMECO was late into the game, we went with 18 cents kWH for Level 2, 34 cents kWH for Level 3. Why?? BG&E, PEPCO and PHI all used this rate…..)

Does your utility have EV Goals, EVSE Goals…?

- If not, other entities goals may ultimately make your utility decision for you.
  - State
  - Federal
  - Local
- Get ahead of the game and track what might be inevitable

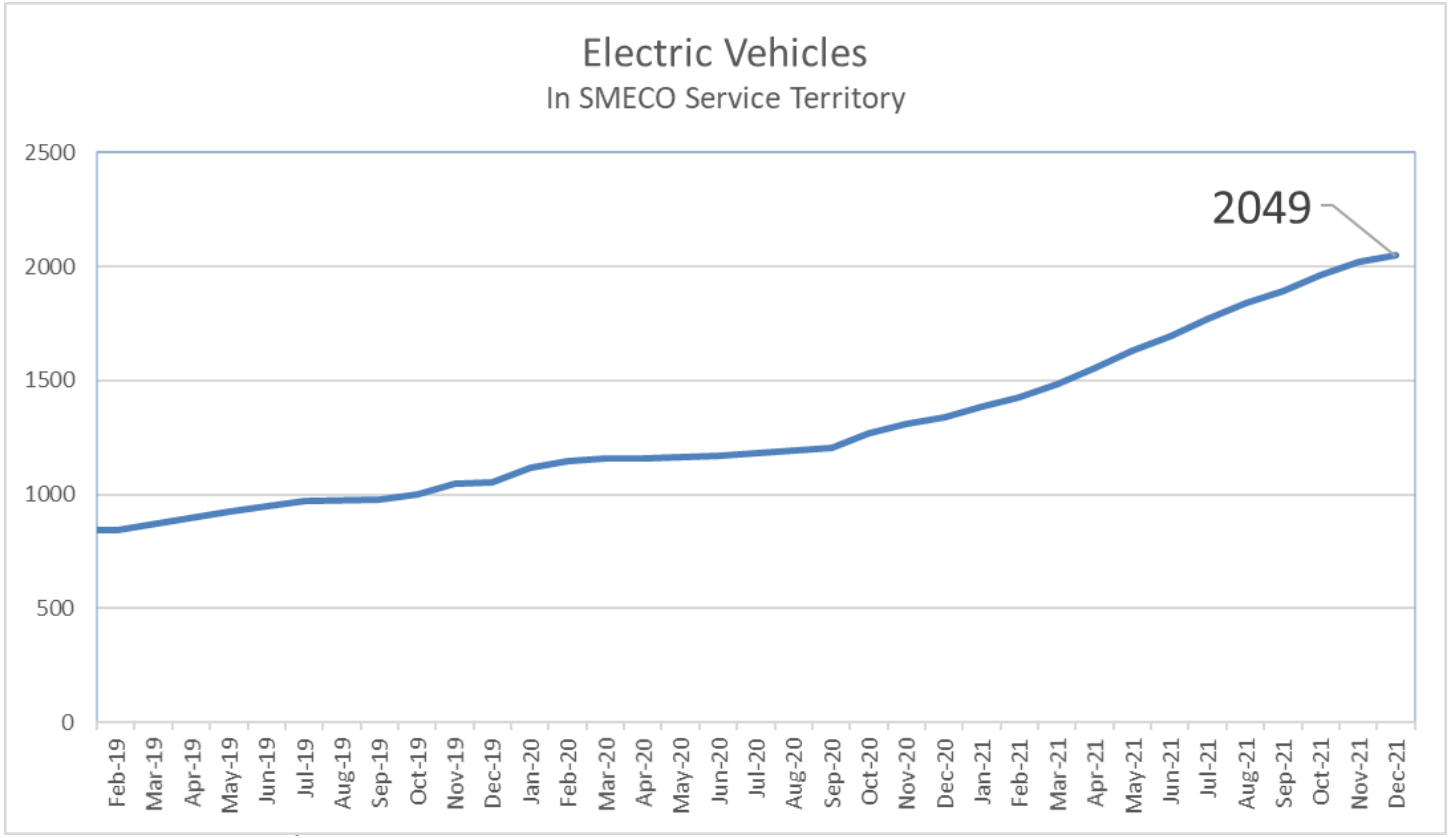
Status of EVs in Maryland

Maryland state goal is 300,000 EVs by end of 2025



- As of January 2022, there are more than 41,081 EVs registered in Maryland.
- Goal is 300,000 by end of 2025.
- To increase transportation electrification in Maryland, additional public charging stations are needed.
- **Using DOE's ratio of 32 cars to 1 charger, Maryland would need 9,375 public facing chargers. Accurate??**

Status of EV's – in Service Territory



- As of January 2022, there are approximately 2,049 electrical vehicle's registered in SMECO's service territory.
- **If Maryland reaches 300,000 EV's, SMECO territory should have around 18,000 EV's and 563 EVSE's. Accurate????**

Every State has goals.

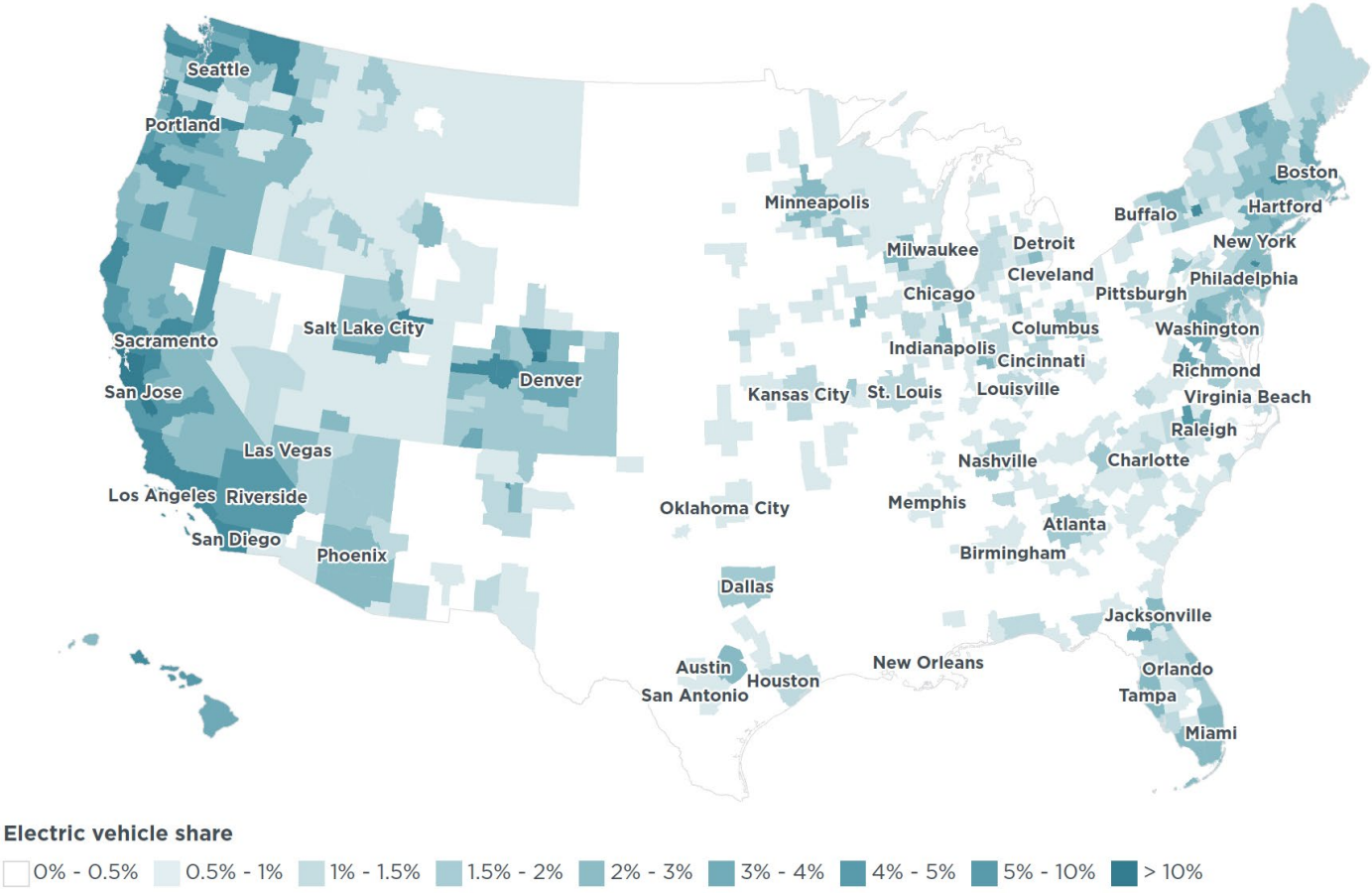
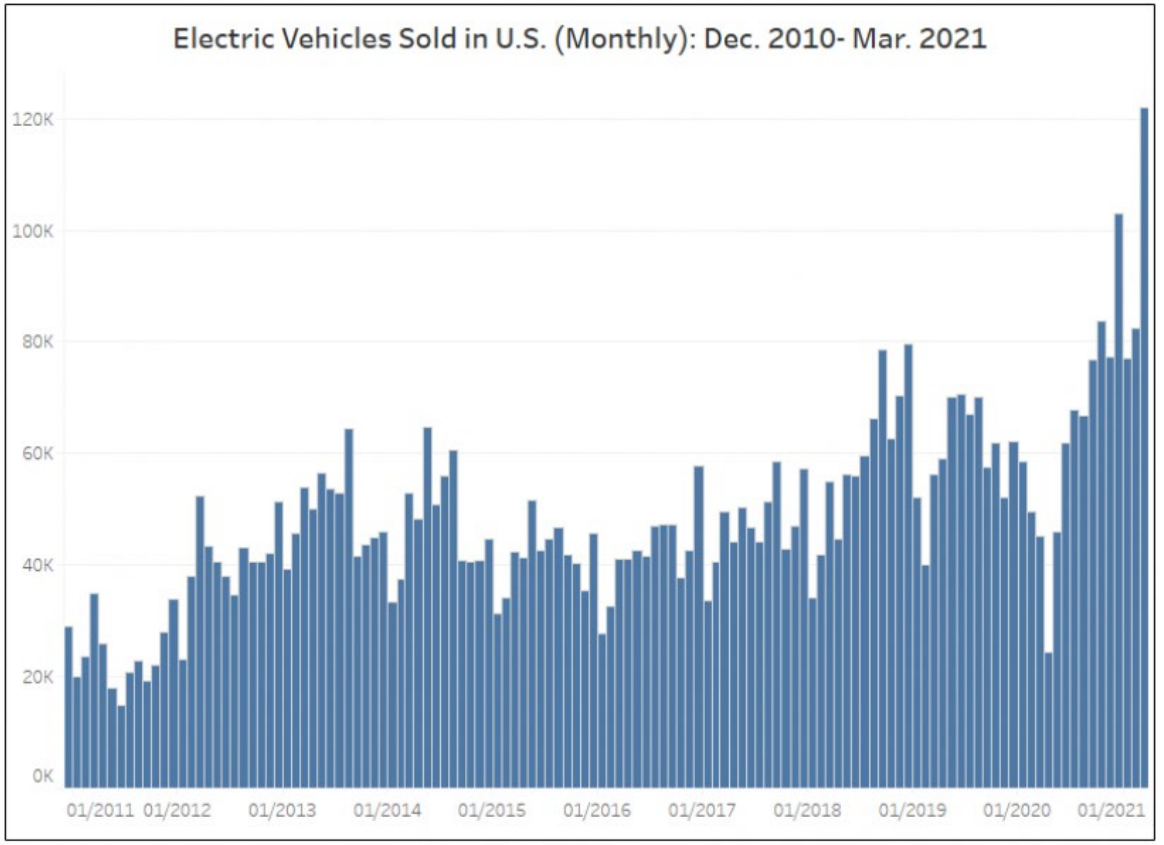
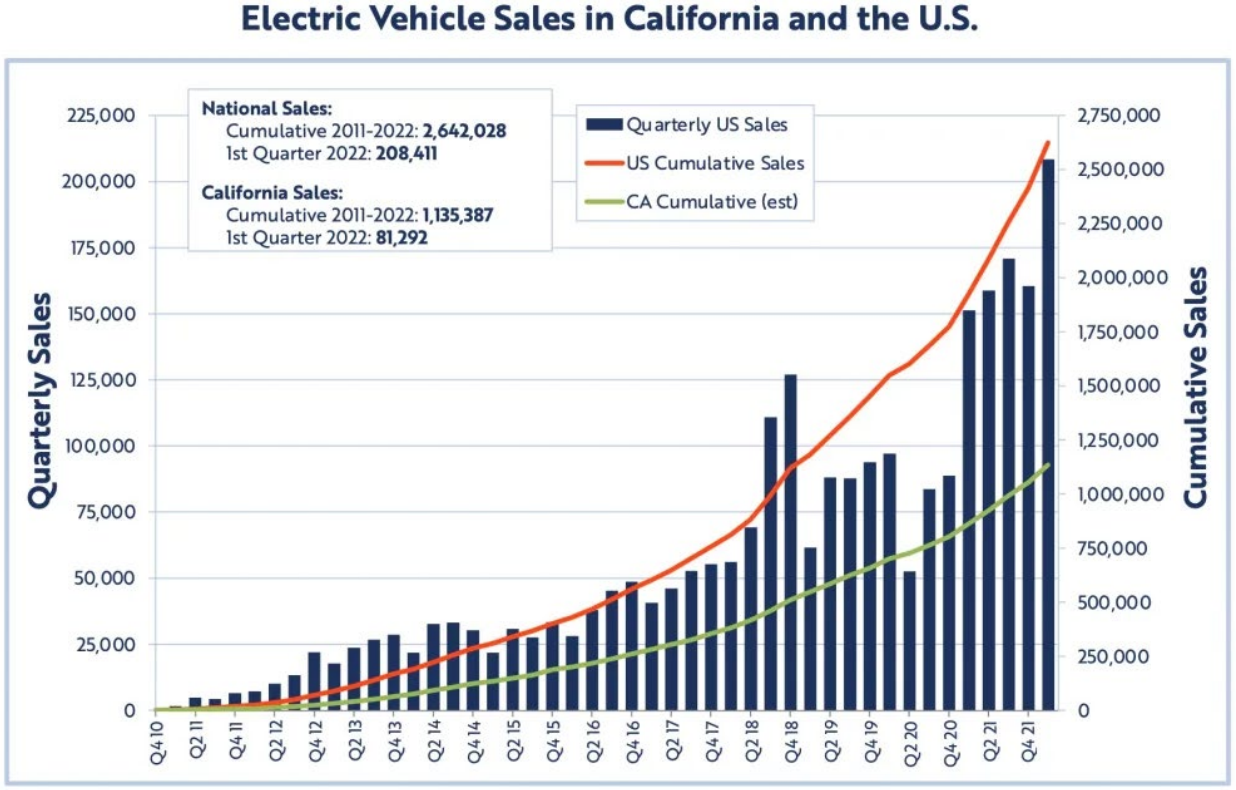


Figure 3. Electric vehicle shares of new 2020 vehicle registrations by metropolitan area.

Total US Sales



Is it all about California?



Note: According to California Air Resources Board data, California sales fluctuate between 40-50% of national sales.
Data source: California Energy Commission (2022). Retrieved April 22, 2022 from energy.ca.gov/zevstats.

Q1 2022 data update.

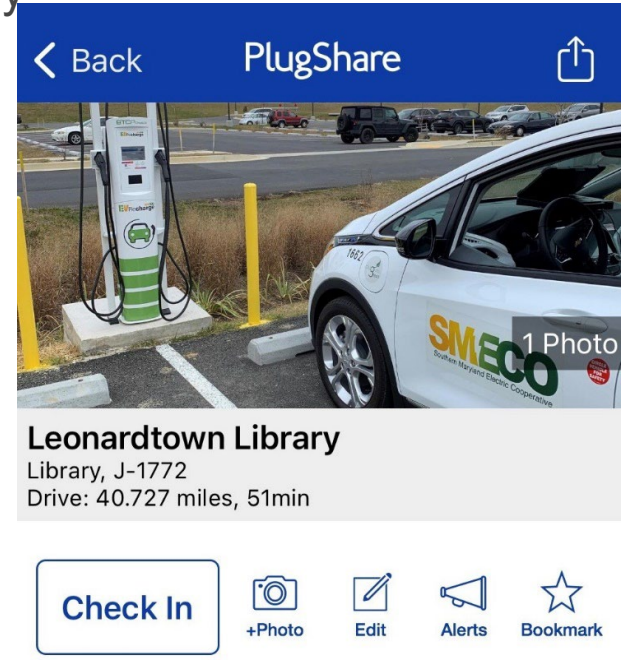
NO! It's not.

- It's about the impact on your utility.

EV Charger Basics

(high level overview)

- **Level 1** -
  - 120 volt - typical household outlet
  - Slowest charge available: 18 hours or more to fully charge an EV battery
- **Level 2** –
  - 240 volt - typical household clothes dryer or electric stove/range
  - Typically 30 AMP circuit
  - Most EV owners install a Level 2 charger at their home.
  - Medium speed charging: 4 – 8 hours to fully charge an EV battery
  - Commercial 25 kVA Trans



EV Charger Basics
(high level overview)

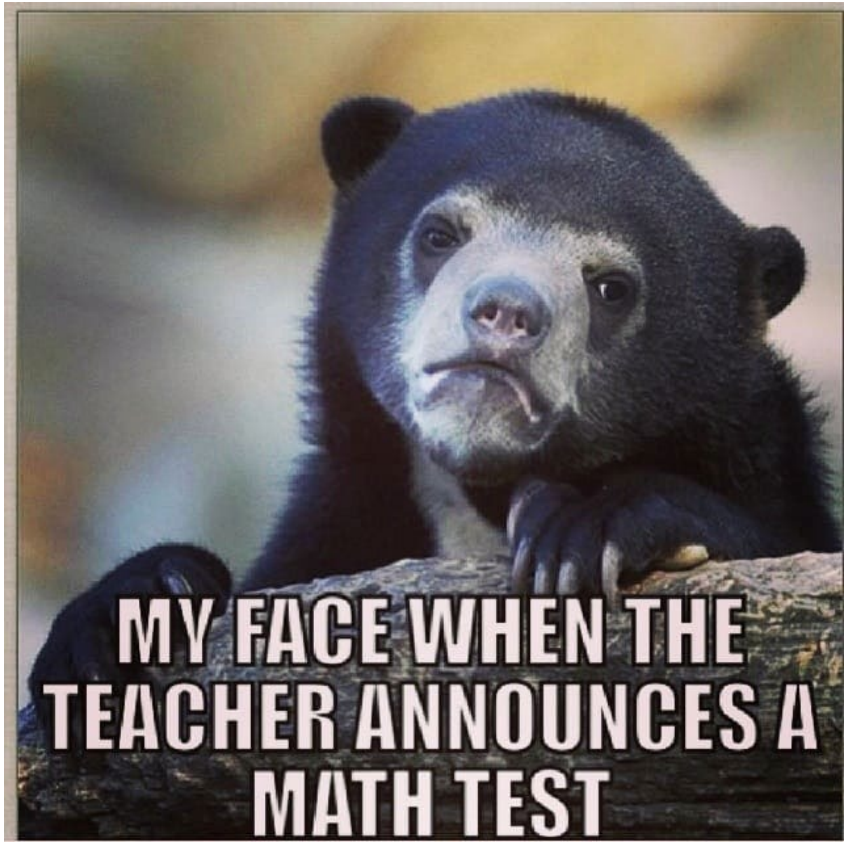
- **Level 3 -**
  - Direct Current Fast Charging (DCFC)
  - Typically, 277/480 volt three-phase units
  - Fast charging: several minutes to an hour
  - Commercial 150 KVA transformer and higher

EV Charger Basics

(Continued)

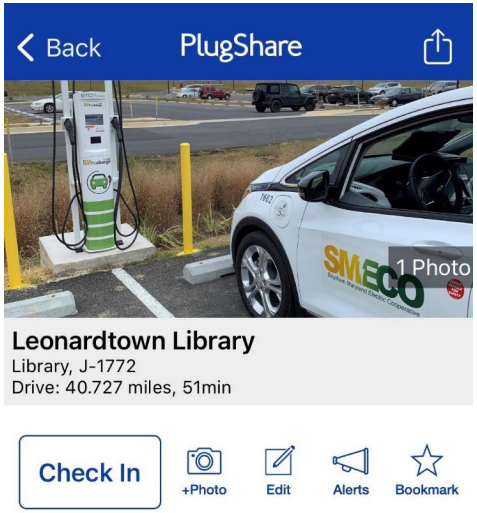
- **EV Miles vs Gasoline Miles** -
  - 100 Mile in an EV = ~28 kWH
- **EV Charging** –
  - 80-85% of all charging occurs at home.
    - Cheaper
    - More convenient
  - ~10% of all charging occurs at work
- **Charging Speed** -
  - Much depends on the vehicle's battery
  - Batteries have limits to the amount of flow it can accept
  - Batteries – as they get closer to 'full', then tend to slow down.

MATH ALERT!!!!



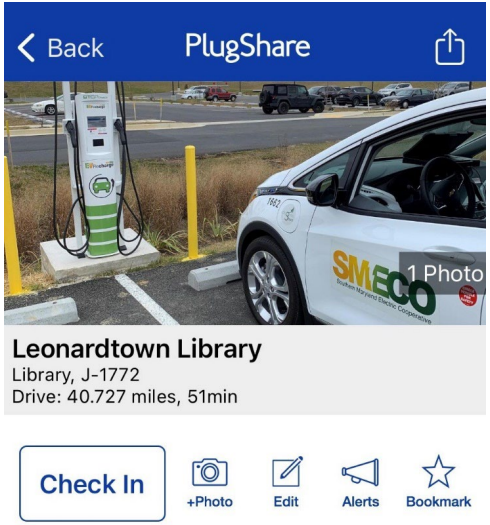
Back to the Basics – 100 miles

- **Level 1** - Math example 1
  - 120 volt AC x 15 Amp = 1.8 kW demand
  - 28 kWH / 1.8 = 15 ½ hours for 100 Miles
- **Level 2** – Math example 2
  - –240 volt AC x 30 amp = 7.2 kW demand
  - 28 kWH / 7.2 kW = 3 Hours 54 minutes for 100 Miles
  - Clothes dryer / Electric Stove running for 4 hours



Back to the Basics – 100 miles

- **Level 3** - Math Example 3
  - AC transformed to DC
  - HEAT losses. Fans or coolant system required
  - Typically 100 Amps or more
  - 28 kWH / 50 kW = 34 minutes for 100 Miles
  - 28 kWH / 150 kW = 11 to 12 minutes

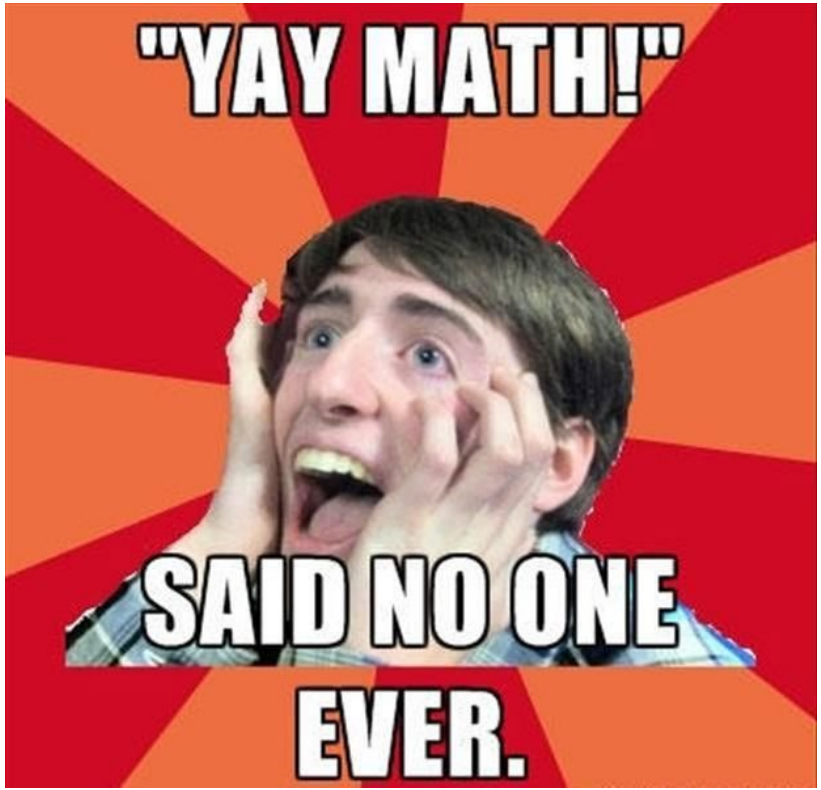


Full Tank?

What's the 'fill up' speed of a full tank of gas…..?

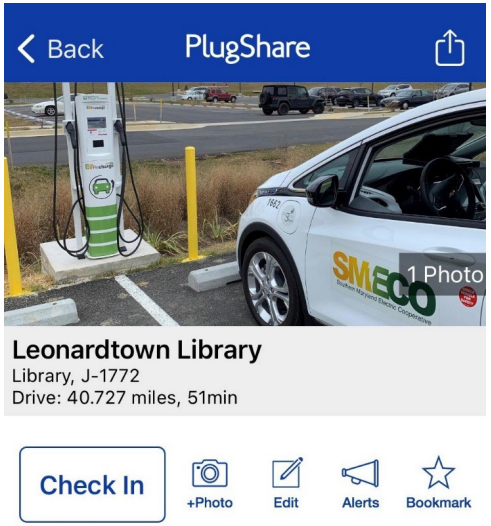
My Volkswagon Golf TSI = 13 gallons at 30 mpg = **390 miles**
MATH – 390 miles = 3.9 x 100 miles

6 Minutes…..



Full Tank?

- **Level 1** - Math!
  - 120 volt AC x 15 Amp = 1.8 kW demand
  - 28 kWH / 1.8 = 15 ½ hours for 100 Miles
  - 3.9 x 15 ½ hours = 60+ Hours!
- **Level 2** – Math!
  - 240 volt AC x 30 amp = 7.2 kW demand
  - 28 kWH / 7.2 kW = 3 Hours 54 minutes for 100 Miles
  - 3.9 x 3 H 54 Min = 15 Hours, 10 min!



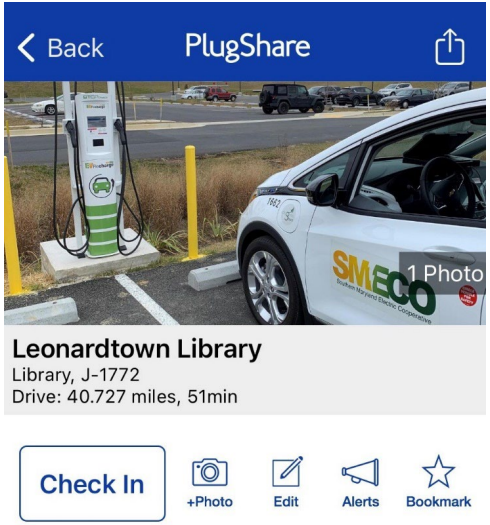
Full Tank?

- **Level 3** - MATH!
  - Typically 100 Amps or more

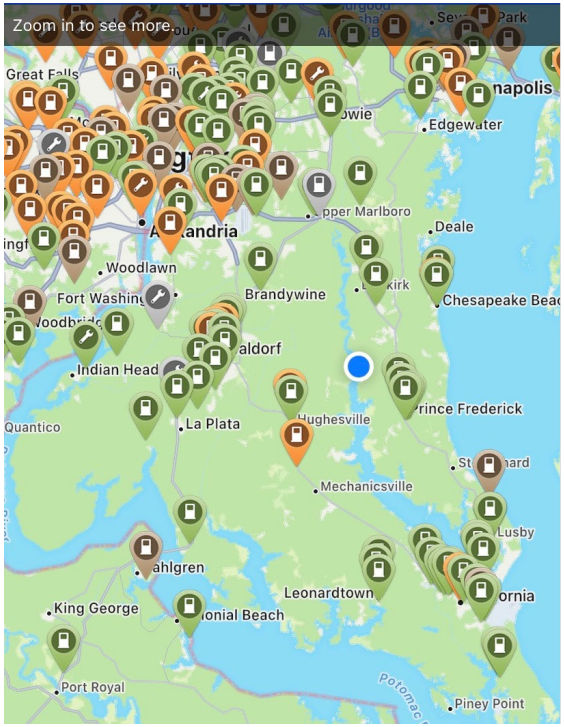
  For 50 kW DCFC
  - 28 kWH / 50 kW = 34 minutes for 100 Miles
  - 34 min x 3.9 = 2 hours, 13 minutes

  For 150 kW DCFC:
  - 28 kWH / 150 kW = 11 – 12 minutes for 100 miles
  - 11.5 min x 3.9 = 43 + minutes

  - **NEED FASTER DCFC charging!!! But what vehicles can accept it…..most can't…**



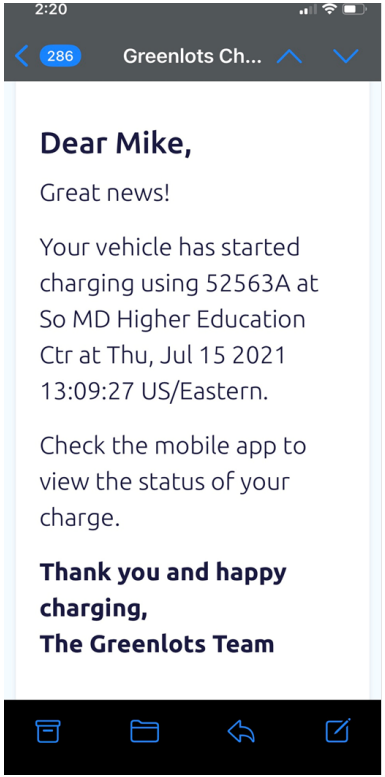
Current Status of EV Charging Infrastructure



Plug Share – every EVSE in the world……Southern Maryland & Michigan

Shell Recharge Role at SMECO

Shell handled all communications, billing, etc…..at a price.
8% of all transactions
$3000 - $3200 – for 5 years of Comms.



the Greenlots Network.

Your vehicle has stopped charging at 52552A, Laurel Springs Park, Connector 2,7.2kW Max

Transaction Details:

Session ID: 5679936 2021-04-14 09:53:02 - 2021-04-14 10:03:39 Currency: USD

Totals:

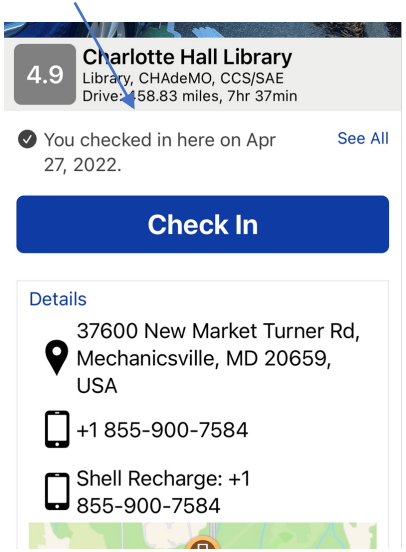
Sale $0.22

Current Status of EV Charging Infrastructure

Plug Share – every EVSE in the world… Ireland & Iceland

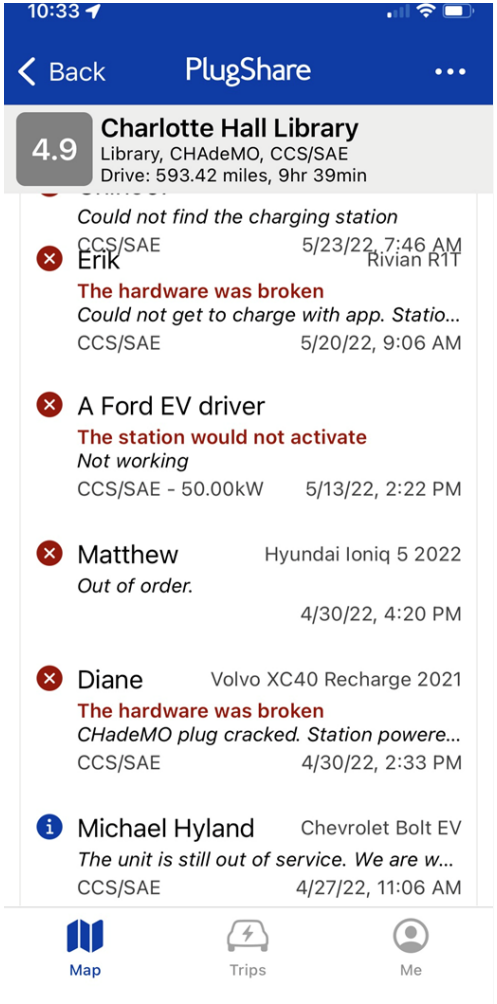
KEY Takeaway – you can filter on a variety of variables.

- Speed/strength of unit
- Cost
- Type of ports available
- PUBLIC Score!!!!

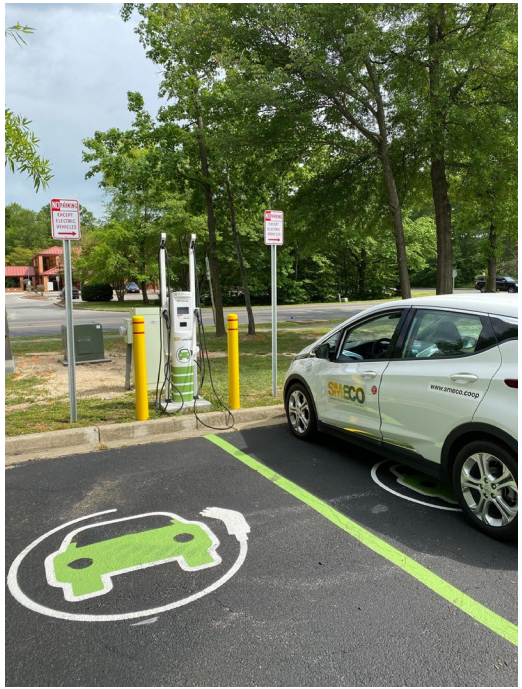


Social Media wins

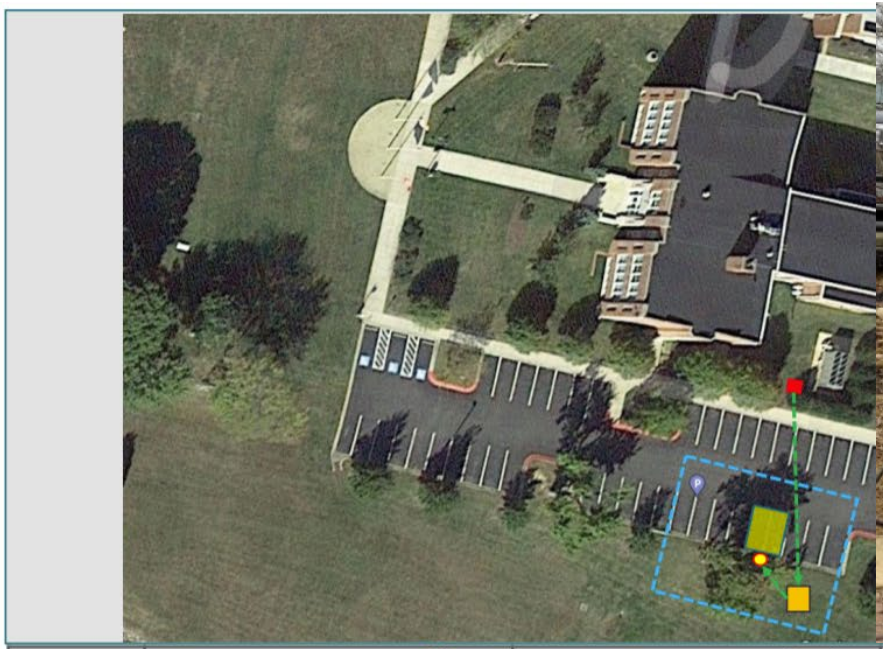
- Need for community engagement
- We went to Twitter, Face book, Insta
- We decided to brand our efforts.



SMECO's EV Program - Branding



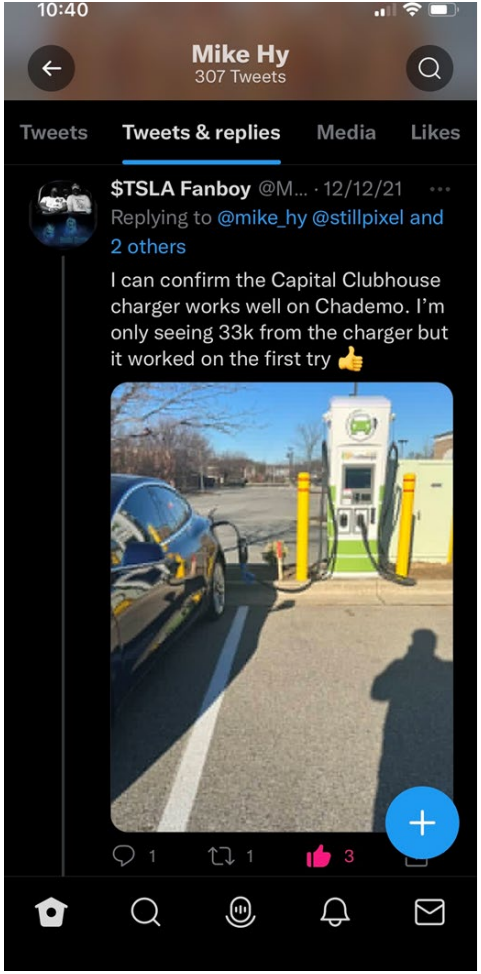
SMECO Deployment in Practice



LEGEND							
	L2 EQUIPMENT		DC FAST CHARGE		DC HIGH POWER		ADA STALL
	EXIST. POWER SOURCE		POSSIBLE EASEMENT		EQUIP. PAD		SURVEY AREA
	NEW TRANSFORMER		SECONDARY RUN		EV SPACES		MID SPAN POLE

The Car Community started to love us vs. hated us prior to our reach out

They want EV's to grow
They want better Charging infrastructure
They sit behind computers and don't provide cell phones
They criticize at their first reaction
We met them on social media



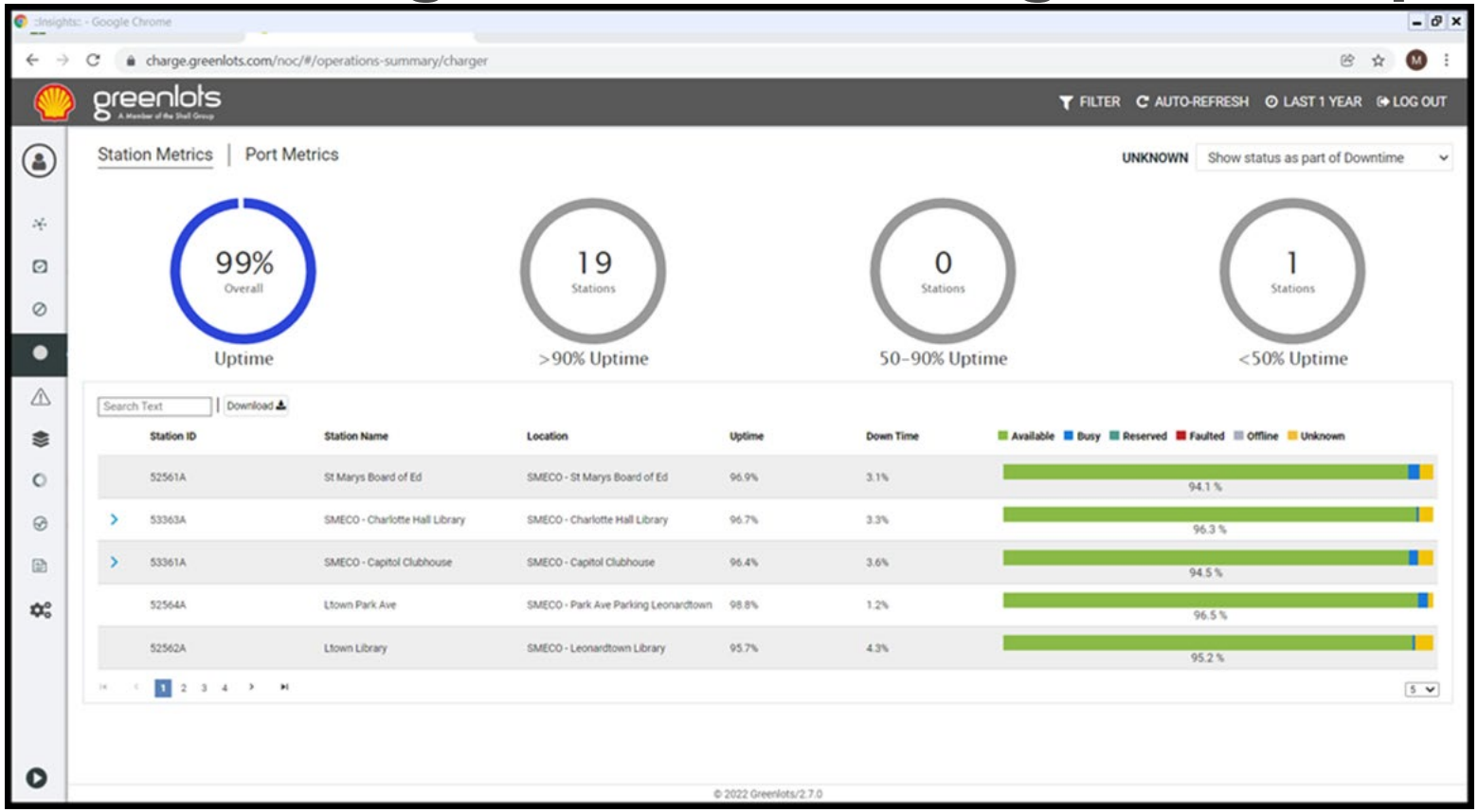
Reliability of EVSE's

- Utilities have Indices for reliability based on IEEE 1366
- SAIDI, CAIDI, SAIFI, MAIFI, ASAI
- No Indices exist for today's EVSE

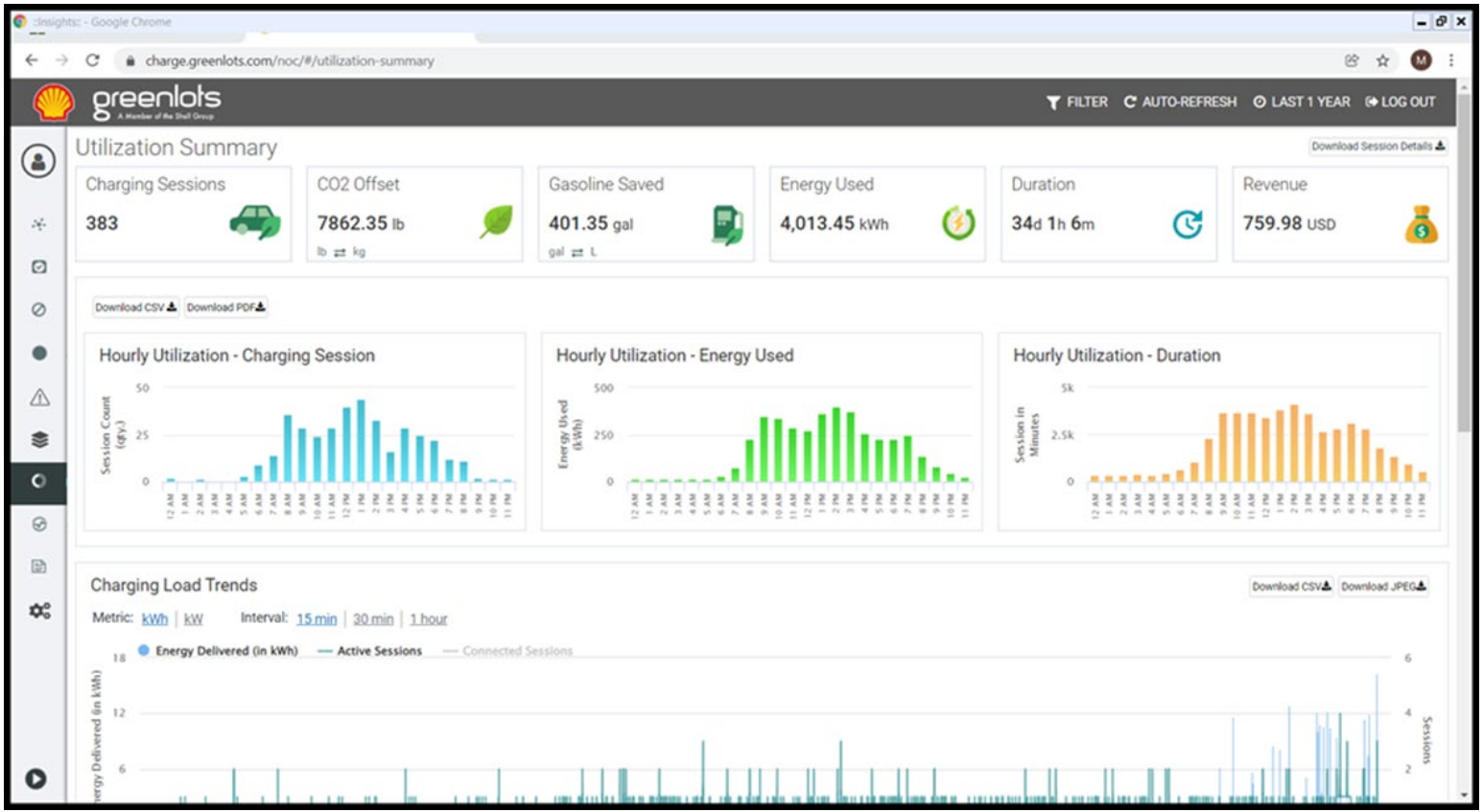
SMECO Charger Uptime

EVSE Location	Up Time
St. Mary's College	100
Leonardtown Library	99.8
Laurel Springs Park	99.8
White Plains Park	99.8
Waldorf Multi-Gen Center	99.8
Port Tobacco Community Center	99.7
Charles County Heath Dept.	99.7
So Maryland High Education	99.4
Calvert Marine Museum	99.4
Pax River Naval Air Museum	98.95
Charles County Courthouse	98.5
Calvert Courthouse Annex	98.5
Park Ave - Leonardtown	98.4
Charlotte Hall Library	98.1
Capitol Clubhouse	97.5
Fairview Library	97.4
Three Notch Theater	97.3
Lexington Park Library	97.2
St. Mary's Board of Education	96.3

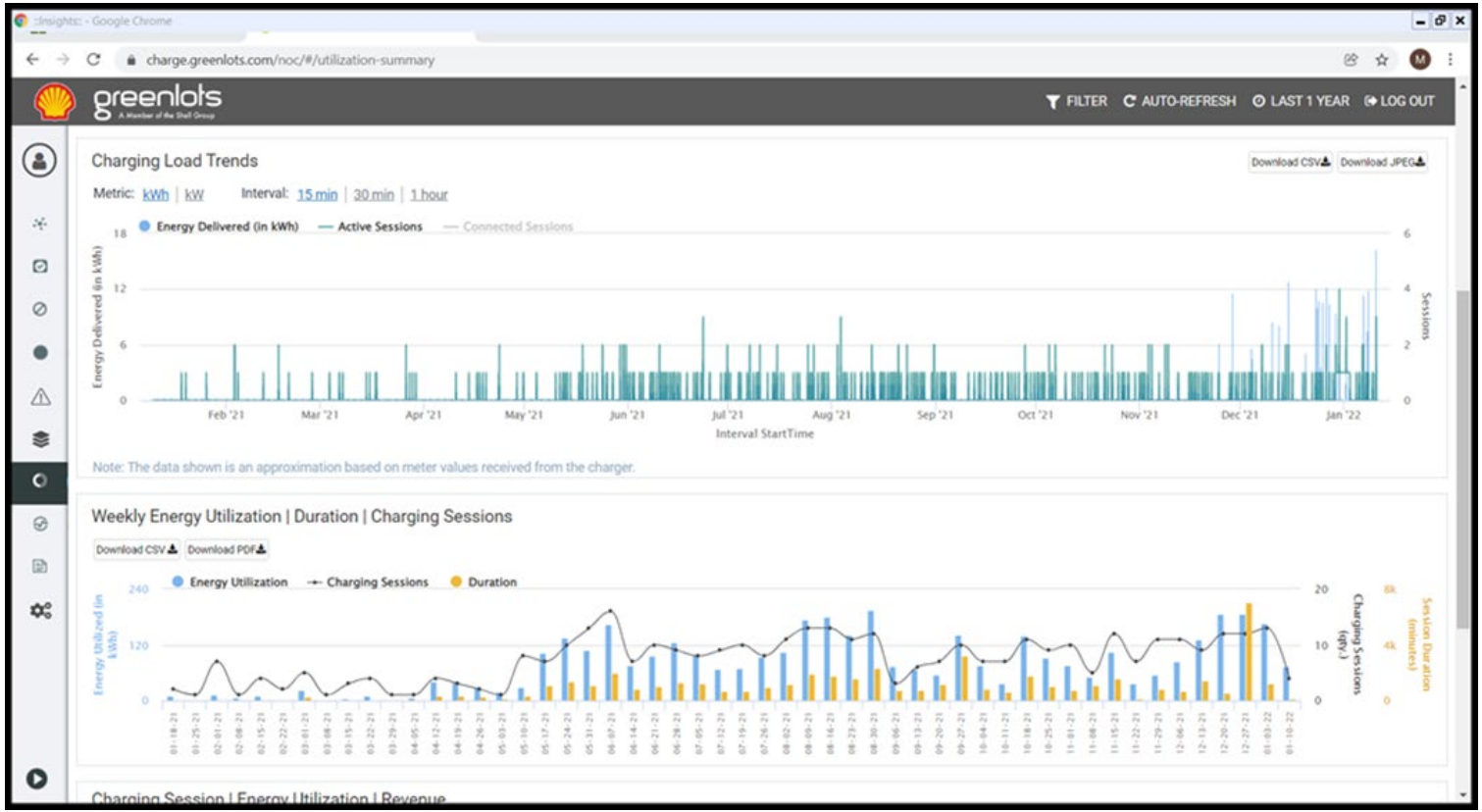
SMECO's Program – Interesting Stats - Uptime



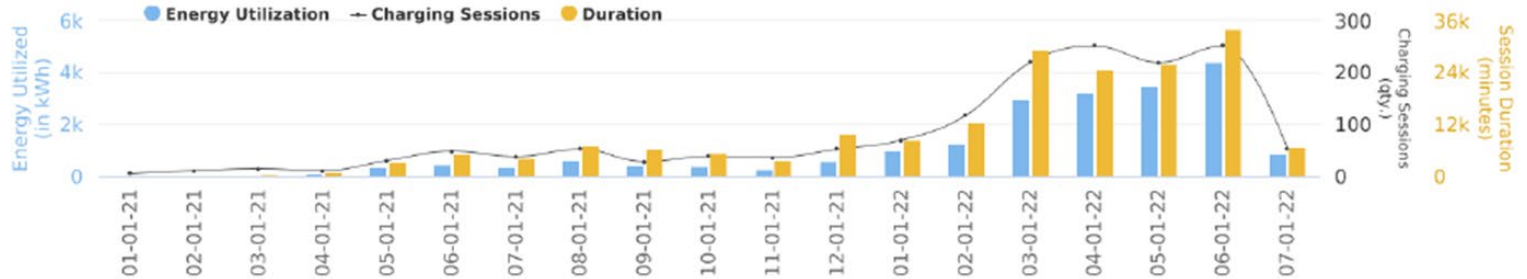
SMECO's Program – Time of Charging



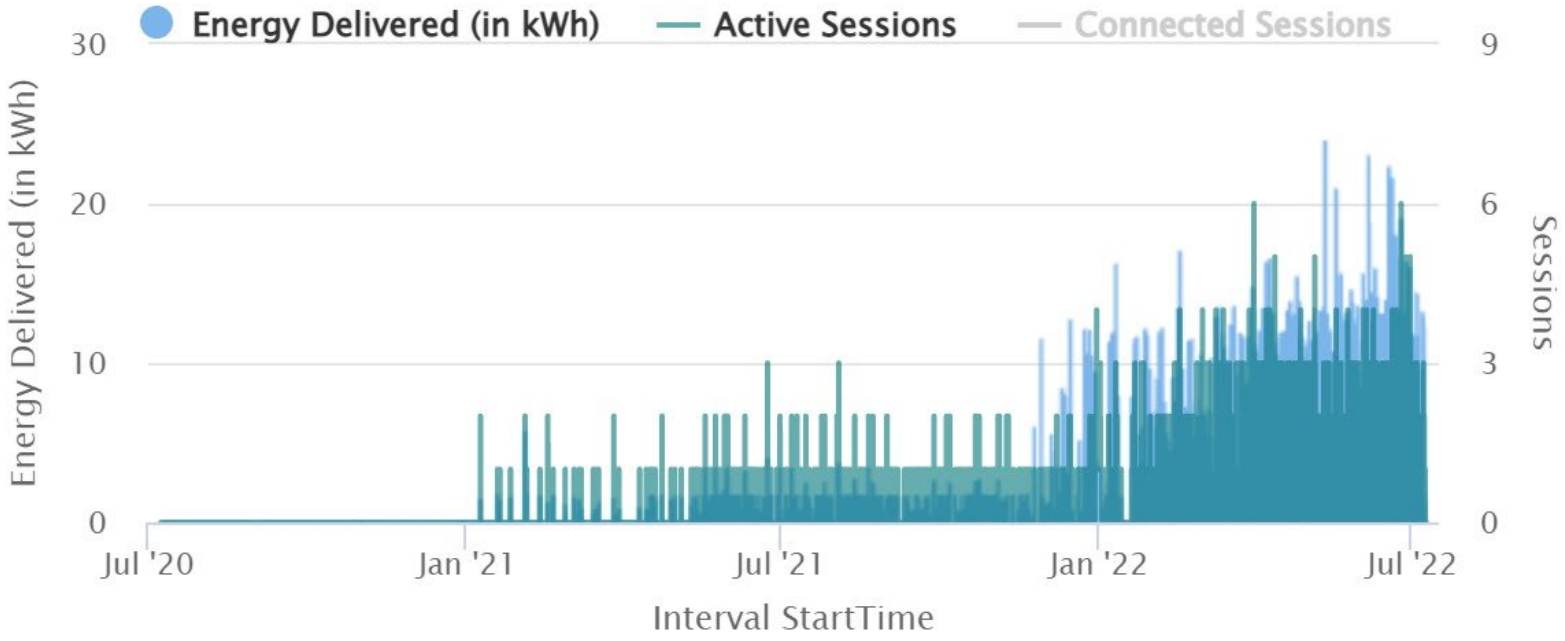
SMECO's Program – Total Sessions



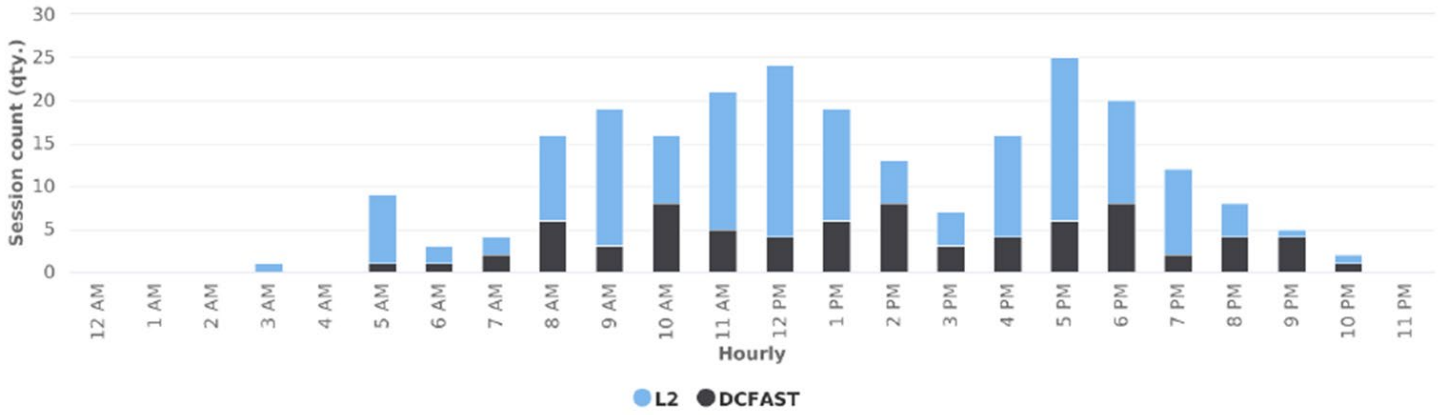
Monthly Energy Utilization | Duration | Charging Sessions



Utilization rates were relatively low.

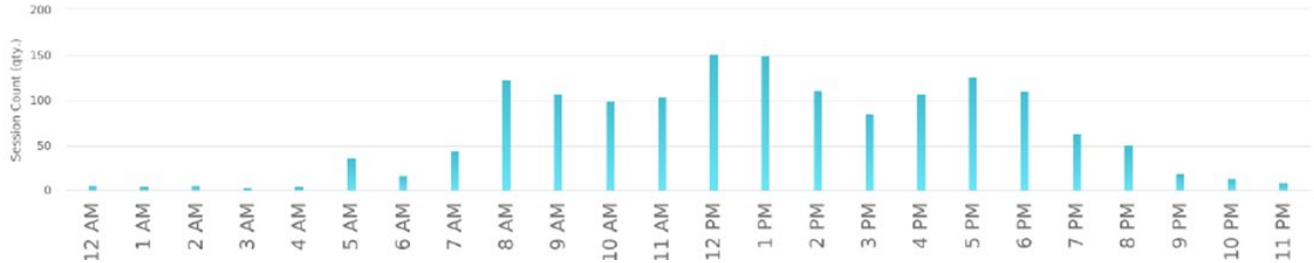


Custom Utilization Summary

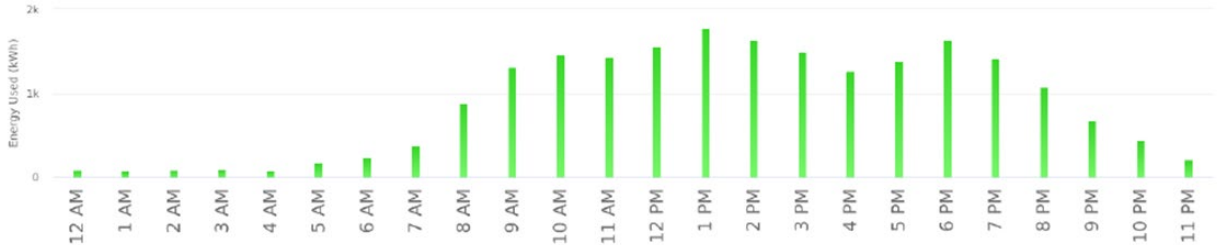


Date Range: 06-08-2022 to 07-08-2022

Hourly Utilization - Charging Sessions



Hourly Utilization - Energy Used



Hourly Utilization - Duration

When do we want EV's to Charge?????

RMLD Reading Municipal Light Department
RELIABLE POWER

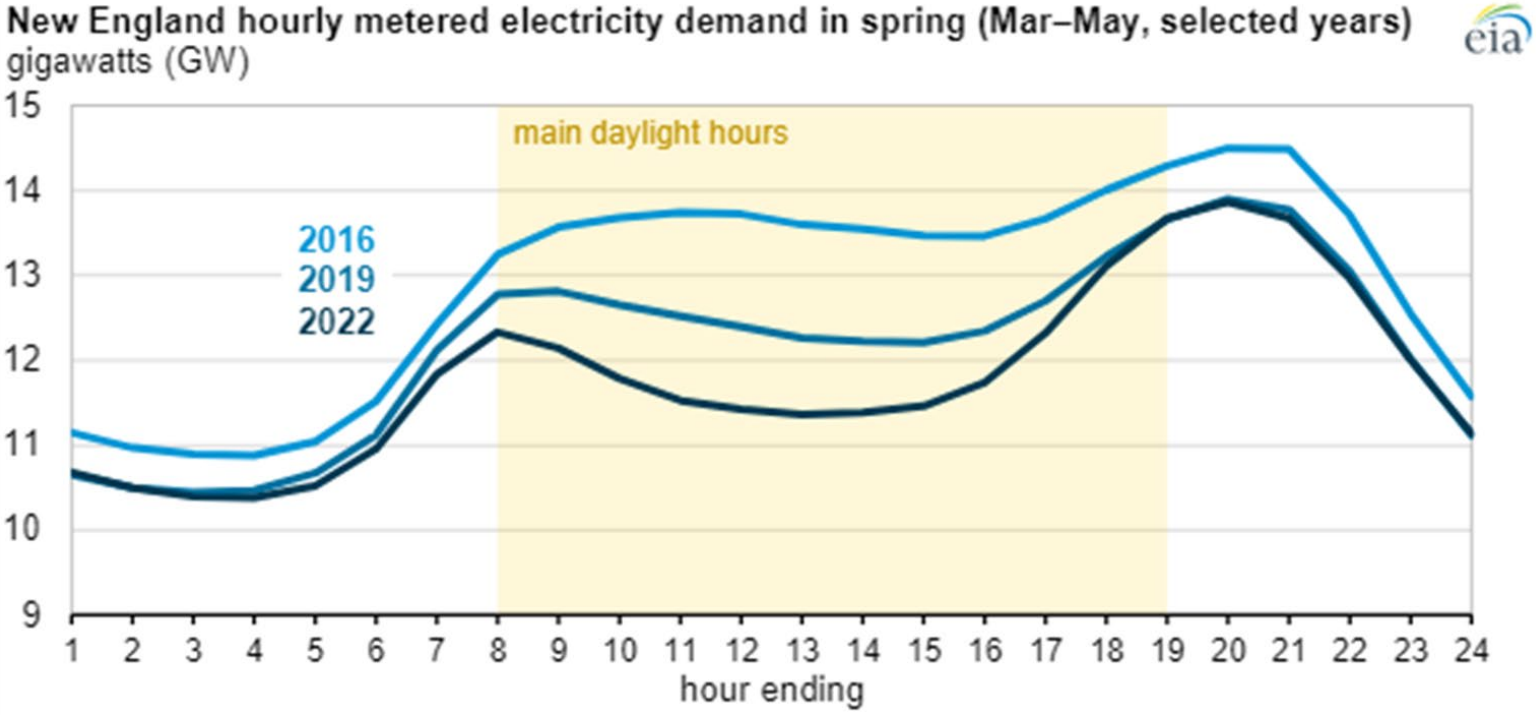
Shred the Peak ALERT

Peak electricity use is expected. Please conserve electricity on August 4th from 4 - 8 pm.

Conserving electricity during predicted peaks helps to:

- Keep electric rates affordable by reducing future power supply costs
- Reduce regional carbon emissions

Stay safe, and thank you for helping to *Shred the Peak*!


New England hourly metered electricity demand in spring (Mar–May, selected years)
gigawatts (GW)
eia
15
14
13
12
11
10
9
main daylight hours
2016
2019
2022
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
hour ending

Recharge Program – Lessons Learned

- Not Everyone likes/wants EV's
  - Don't debate – simply educate and get over it
  - Marketing via flyers, newsletters, etc.
    - Each one brings out the nay sayer's
- All Electrical Contractors are not the same
  - Important if you want a repeatable process with the exact look at all locations.
- Communications and over sight is key
  - One site started construction in wrong location. A very UNHAPPY librarian…..
  - One site had the contractor put pads and conduit on wrong side of the building. A very HAPPY county….. But an unhappy contractor…..
  - I prowled our installations……. Like a hawk….

Recharge Program – Lessons Learned

- Communications with phone carriers is paramount
  - Connection between EVSE and Greenlots Skynet
  - Connection between Customer phone network and Greenlots Skynet
  - A good handshake for EV charging is worth its weight in gold

- Develop Relationships with EV community
  - They can be the thorn in your side… or an aid to acceptance
  - Utility 1st EV Recharge ‘Meet & Greet’. 17 EV’s, 100+ Coop members
  - Assist in Commissioning our Level 3 units.

Recharge Program – Lessons Learned

- Location, location, location….and other reasons EVSE's are utilized
  - All installations are not created equal when it comes to consumers
  - Some locations have lots of charges since an employee owns an EV
  - Other locations have lots of charges since there is a hotel and B&B nearby….
  - Many locations have little charging…. COVID? Building used by non EV people?
  - Track your EV drivers/locations (Zipcode/Address) – we use MD DOT, MD MVA, EV sign ups.
- Location, location, location…matters on cost of installation….
  - Our Utility trying to be frugal and make the most of our $$
  - Level 3 fed off an existing 500 kVA pad vs installing a new 150 kVA pad
  - Level 2 fed from a local TX vs directional bore from 500 feet and a new TX.

Recharge Program – Lessons Learned

- Think Full cycle ownership in advance – failure and fix
  - Who fixes unit when EVSE fails?
  - EVSE manufacturer's 'Reliability' is different than Utility Reliability.
  - How will you handle vandalism? Stolen cable, broken screen, etc.
- Partner with your government agencies
  - They are being hit five different directions on EV, EV Fleet, etc
  - Become a partner, offer help
  - Ribbon Cuttings have been successful

Recharge Program – Lessons Learned

- Think Future
  - EV's will charge mostly at the residence & business's
  - Know where the EV's are in your territory
    - We used multiple DB's and sniffers.
  - EV's and Solar go together Early adopters of Technology
  - Which business fleets are electrifying in your territory?
    - Think Small business's too. (Ex – Pressure Washer Company)
  - Time-of-use Rates : Whole House and/or EV TOU
    - One meter w/AMI software vs Two meter.
  - Residential Rebates: how much? One time or annual rebate?
  - Multi-unit Dwelling installations
    - This is the one of the top issues for lower low to medium income acceptance.

Recharge Program – Other items of note

- Signage & Parking enforcement
- Idle time
- Meter accuracy
- Internal employee training – operations, call center, etc.
- You & the utility are the expert – so become the expert.

Q&A

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