



# Electric Island: Utility Perspectives on Medium/Heavy Duty Fleet Charging

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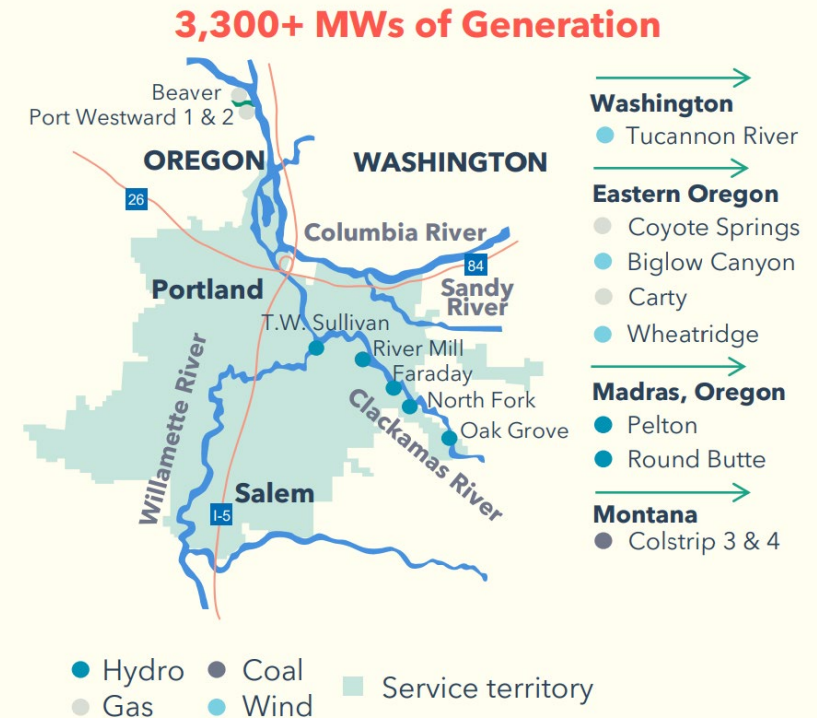
# PGE at a glance

## Quick facts

- Vertically integrated electric utility encompassing generation, transmission and distribution
- 900,000 retail customers within a service area of 2 million residents
- 46 percent of Oregon's population lives within PGE service area, encompassing 51 incorporated cities entirely within the State of Oregon
- 75 percent of Oregon's commercial and industrial activity occurs in PGE service area

## Leading the way to a clean energy future for Oregon

- ~50k EVs today estimated to grow to 400k in 2030
- 45% clean energy supply today (hydro, wind, solar)
- 80% reduction in greenhouse gas emissions by 2030
- 100% clean electricity by 2040



# Planning for Heavy Duty Charging

**PGE partners with fleet customers** providing fleet electrification analysis at no cost and gaining insights into fleet customers' plans

**Early engagement with the utility** is critical, especially for heavy duty charging sites

## **Challenges to rapid deployment:**

- Some fleet sites will require significant electrical upgrades on site and on the distribution system
- Supply chain delays for vehicles, chargers, electrical infrastructure

**State and federal funding can help build public heavy-duty charging;** West Coast Clean Transit Corridor Initiative provides a framework



# PGE Fleet Partner: A turnkey solution for fleet electrification

- Free planning and technical services for fleet customers
- Installation of make-ready infrastructure with custom cost incentives
- Rebates for qualified Level 2 chargers
- Fleet Partner Phase 1 reserved all funding, hoping to expand January 2024

**Reduces cost and complexity associated with transitioning to electric fuel**



Commercial

Municipal

School

Non-profit

Transit fleets



# Partnering with Fleet Customers

## Fleet Partner Plan



- ✓ Electric vehicle feasibility assessment
- ✓ Charging analysis
- ✓ Total cost of ownership analysis
- ✓ Site assessment
- ✓ Preliminary design and cost estimate
- ✓ Summary of incentives
- ✓ Presented in a Fleet Partner Study

**No cost; no commitment**

**Typically 1-2 months**

## Fleet Partner Build



- ✓ Turnkey final design and construction of make-ready infrastructure
- ✓ Make-ready incentive based on forecasted energy use of the chargers
- ✓ PGE ownership of make-ready infrastructure

**Customer must purchase/install qualified Level 2 or DC fast chargers**

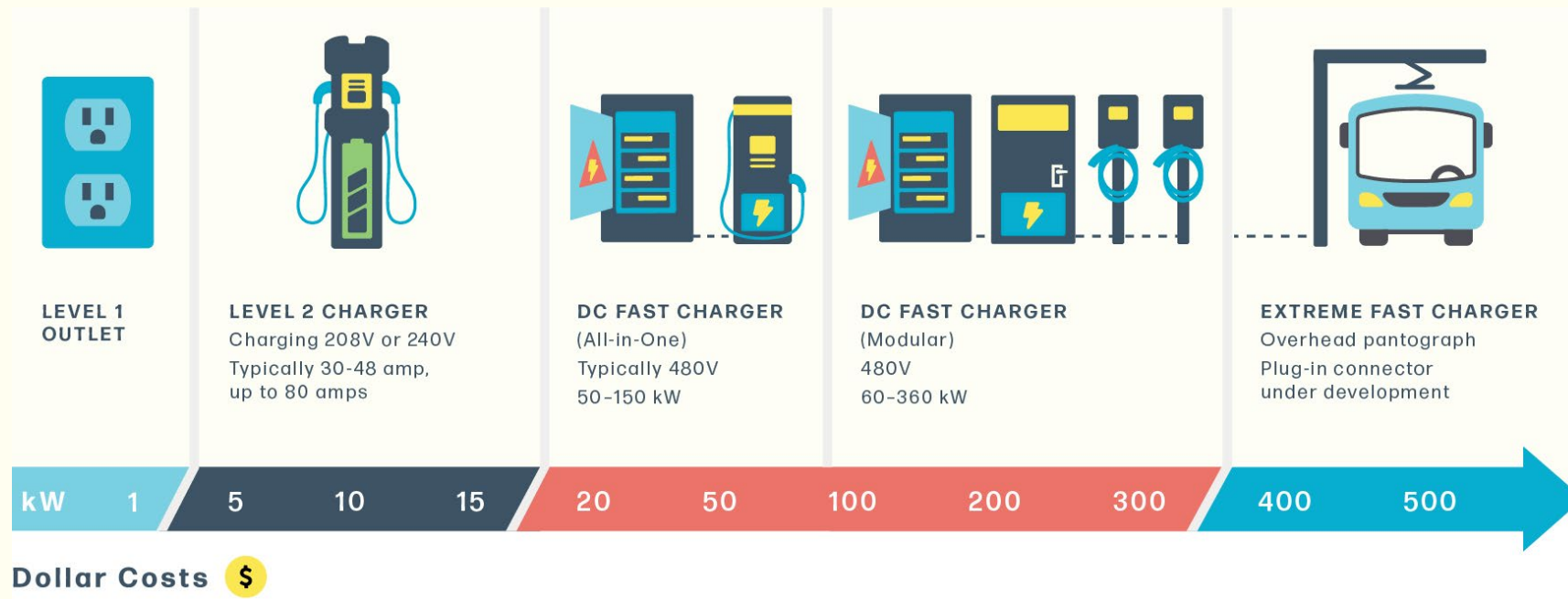
**Typically 6-16 months**



# How to charge your fleet

## Slow, overnight charging is the most cost-effective way to charge an EV:

- A lower charge rate means less expensive equipment and infrastructure.
- Customers benefit from lower demand and off-peak electricity pricing.
- By using charge management software, customers can optimize charging and further reduce costs.

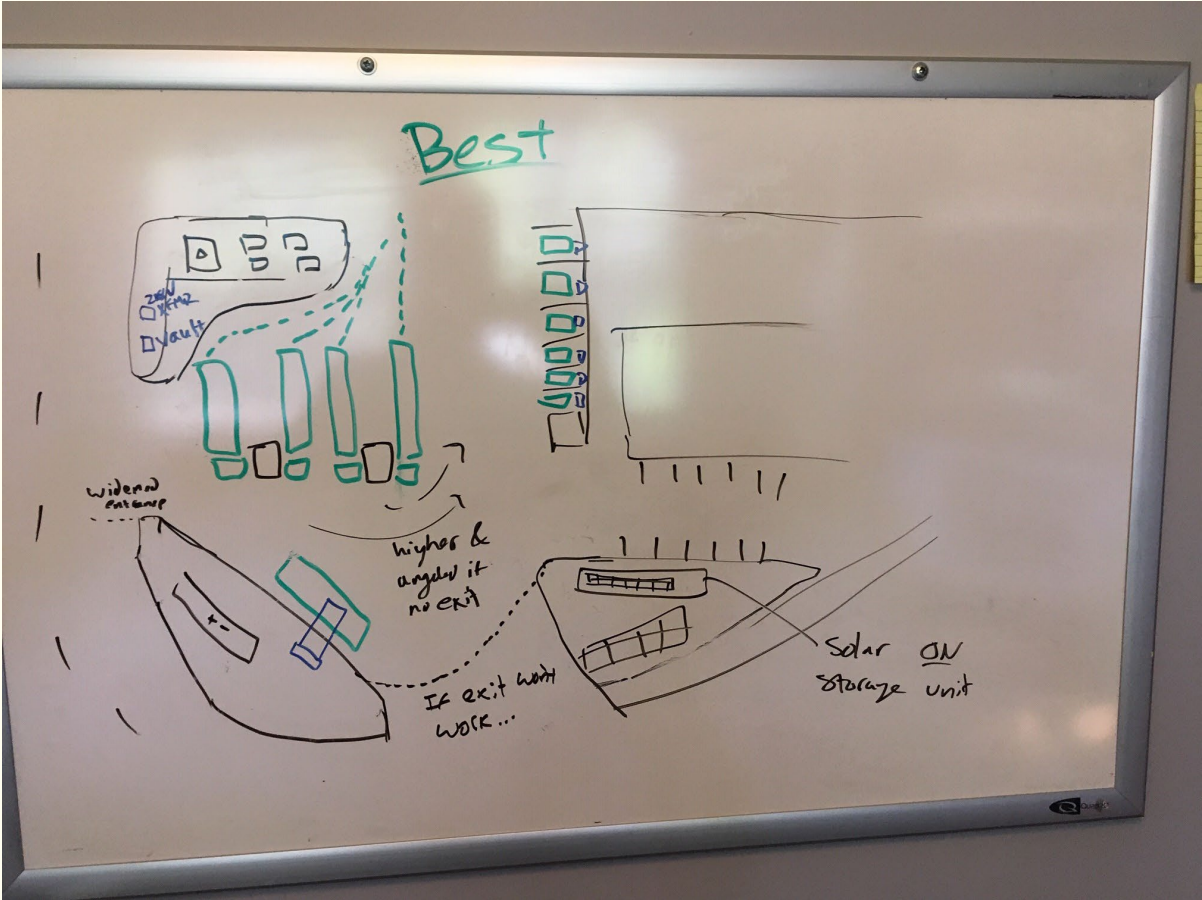


# Electric Island

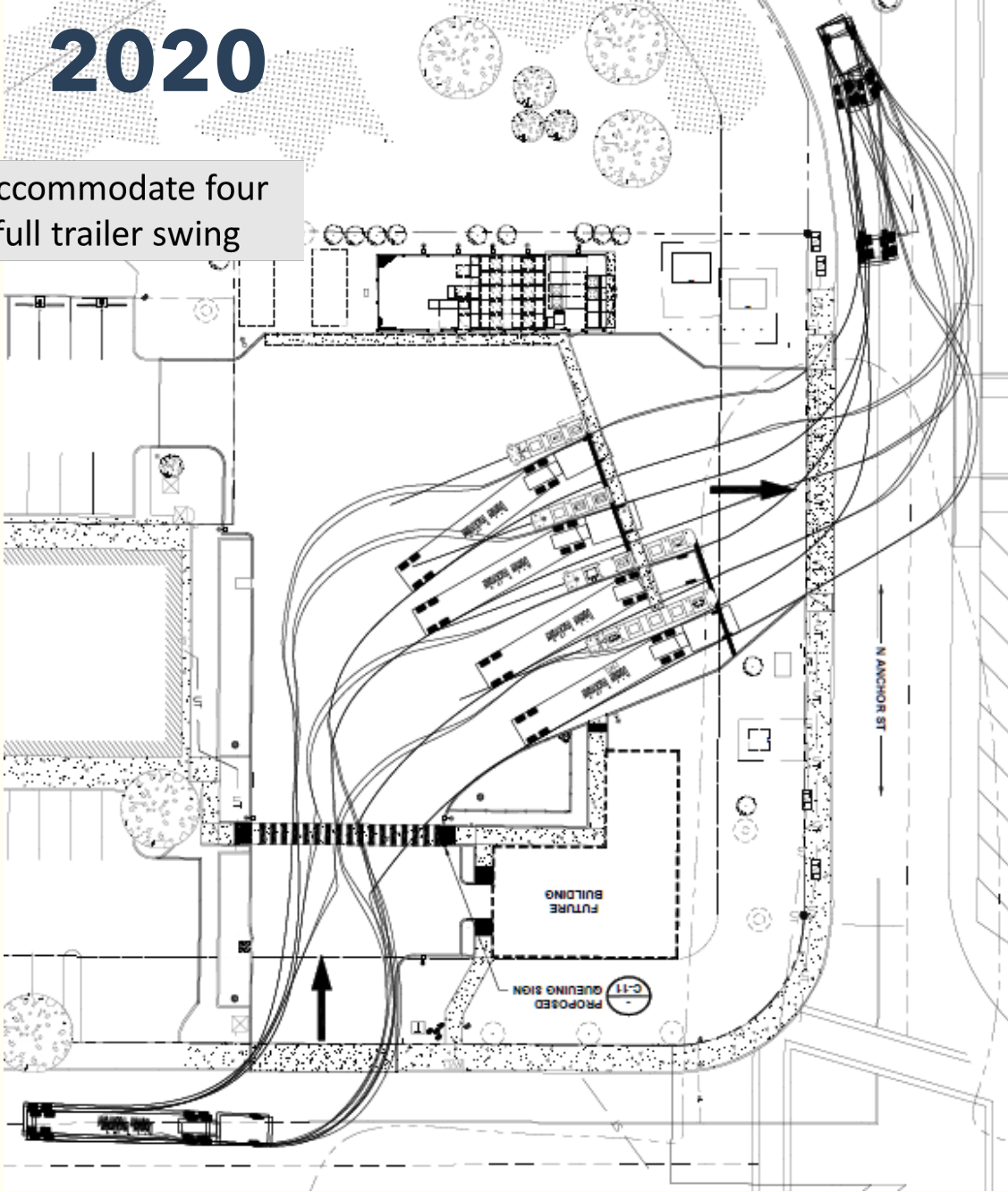


# Site Design

Facility designed to accommodate four Class 8 trucks with full trailer swing

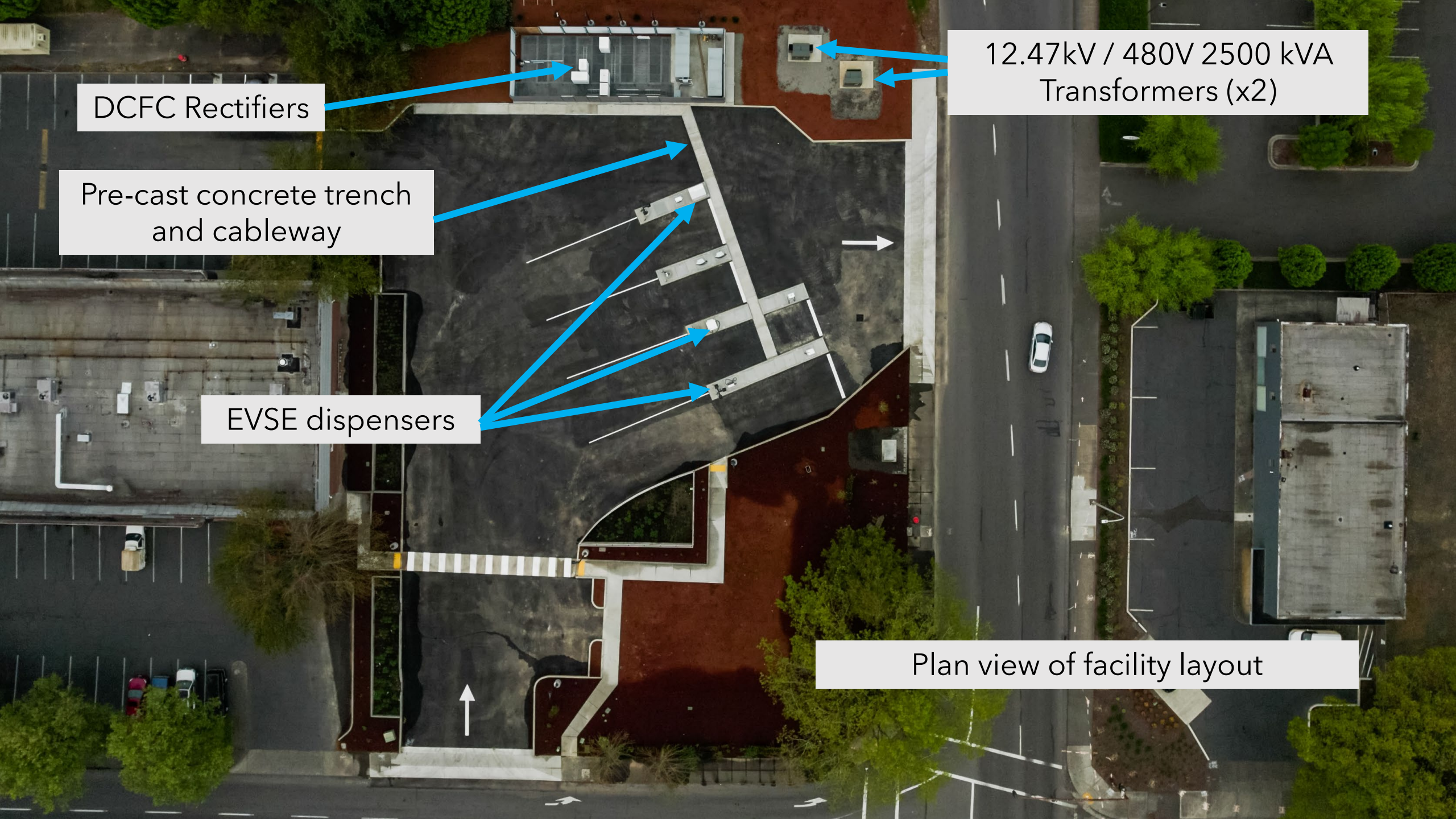


2019



2020





DCFC Rectifiers

Pre-cast concrete trench and cableway

EVSE dispensers

12.47kV / 480V 2500 kVA Transformers (x2)

Plan view of facility layout

Located adjacent to Daimler Trucks North America HQ, as well as several other industrial fleet customers in Portland, OR





Tons of conduit!  
(for long-term electrical capacity)





Pre-cast concrete trenches during construction





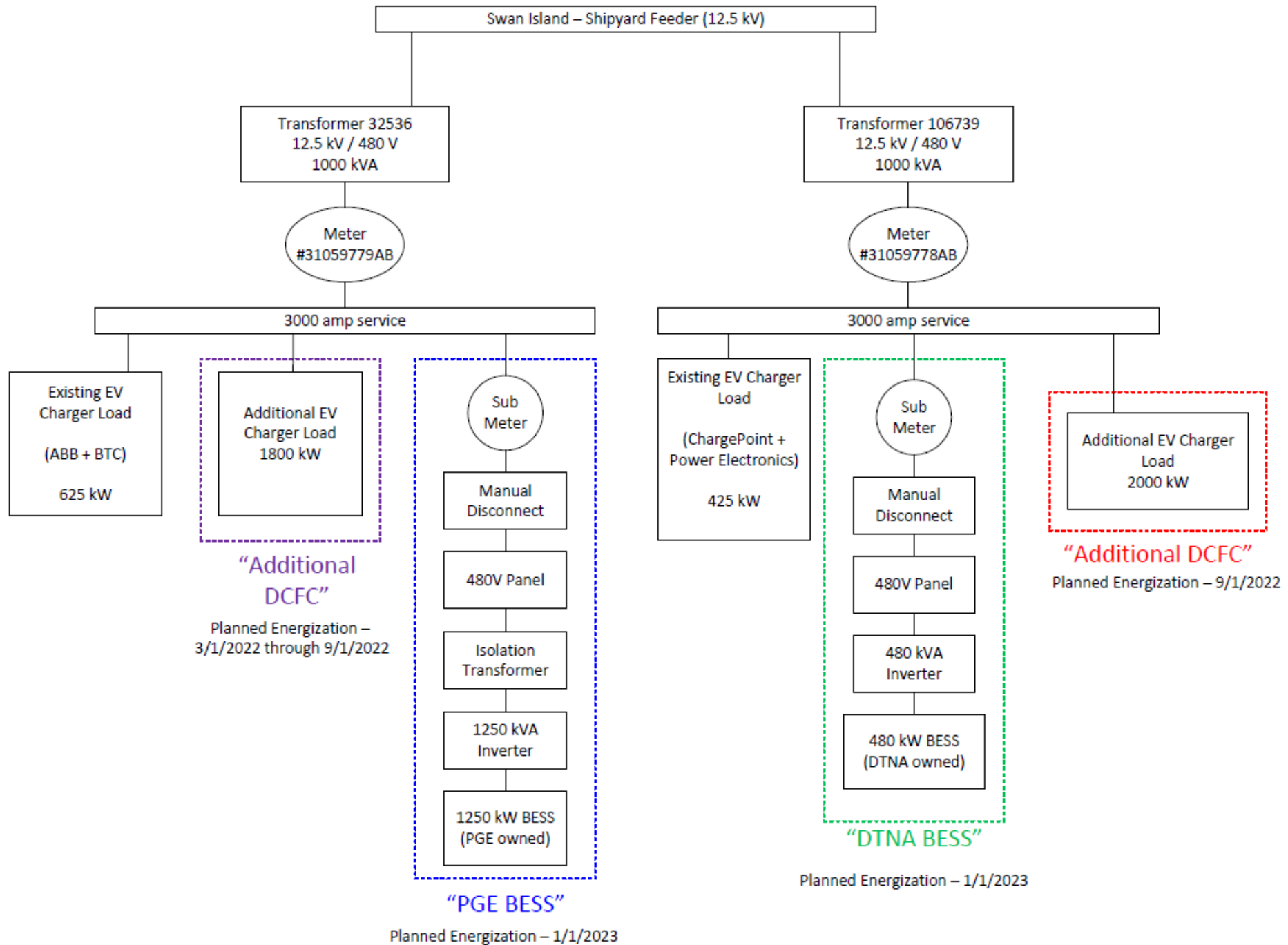
Steel mounting plates for EV dispensers allow for easier install/removal as chargers are replaced





Finished site - note the extra bollards to prevent any accidents during truck maneuvering

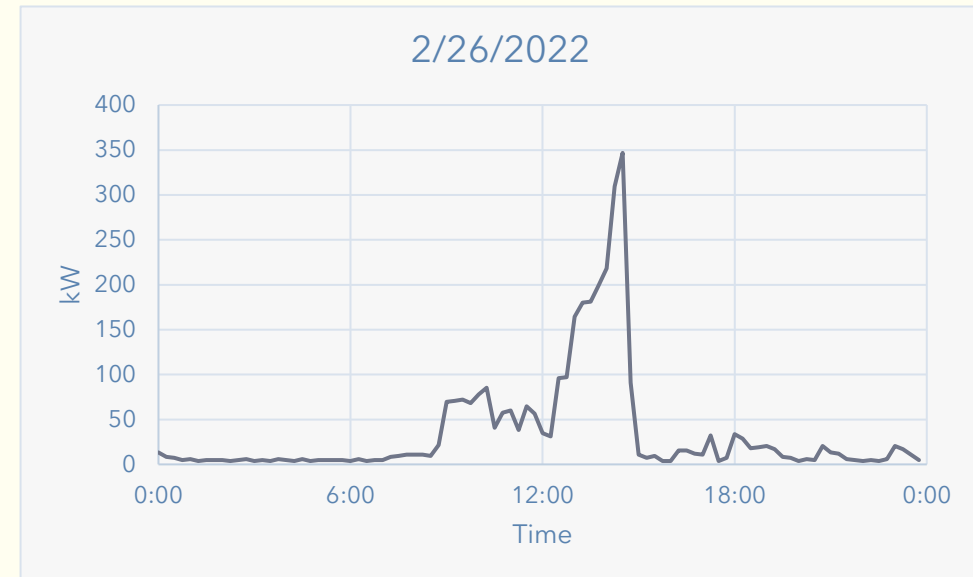
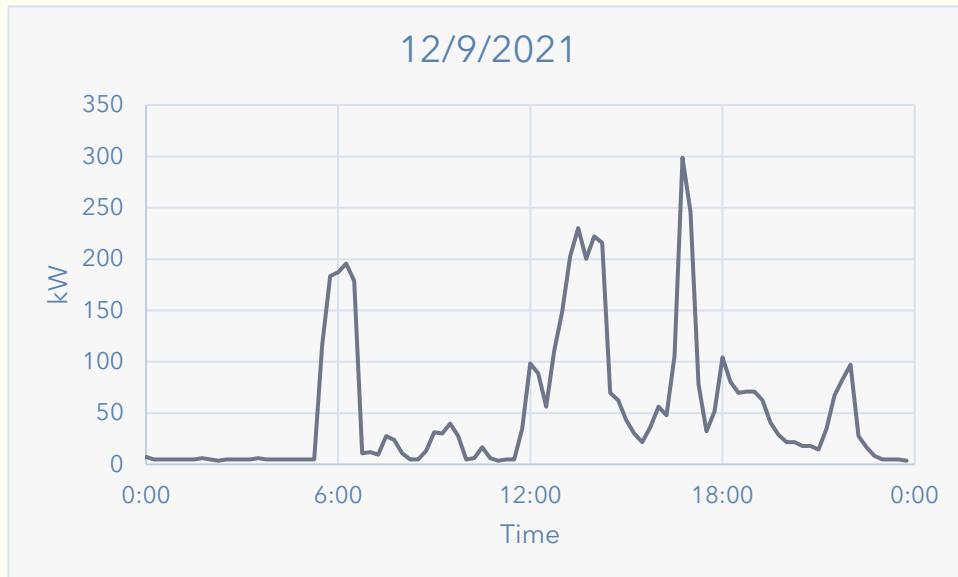




# Total site loading

Date	# of Sessions	Average Session Duration (min)	Average Energy Usage per Session (kWh)	Total Charging Duration (min)	Total Site Energy Usage (kWh)
<b>2021</b>	<b>1812</b>	<b>49.4</b>	<b>18.7</b>	<b>89,514</b>	<b>33,810</b>
Sep	356	42.3	12.3	15,042	4,364
Oct	484	49.0	17.1	23,740	8,295
Nov	506	52.6	22.3	26,626	11,301
Dec	466	51.7	21.1	24,106	9,849
<b>2022</b>	<b>1640</b>	<b>48.8</b>	<b>20.1</b>	<b>80,035</b>	<b>32,993</b>
Jan	547	46.2	19.1	25,267	10,459
Feb	484	56.1	19.8	27,159	9,579
Mar	609	45.3	21.3	27,609	12,954
<b>Grand Total</b>	<b>3452</b>	<b>49.1</b>	<b>19.4</b>	<b>169,549</b>	<b>66,802</b>

## Example Daily Load Profiles





# Learning and Testing at Electric Island

## Lessons in the first phase of the Electric Island project:

- Physical space to accommodate heavy-duty vehicles is key. Class 8 trucks are big!
- Civil infrastructure that makes it easy to swap chargers out can save on long term charging site O&M costs
- Electric loading from these sites can be very "peaky"

## In the next phase, we plan to:

- **Install extremely high-powered chargers** of 500-1,500 kW to help reduce the charging time and help PGE understand charging load profiles and system impacts
- **Add battery storage** to reduce feeder loads at peak times and provide voltage support for the feeder at high charging loads, and test second life truck batteries
- **Deploy solar generation** to study how co-located EV charging, energy storage, and renewable generation can be co-optimized to provide grid services
- **Use advanced controls** to manage charging and services such as load shifting, curtailment, and flexing



# Funding

## **Schedule 53: Non-residential Heavy-Duty Electric Vehicle Charging**

- New tariff which pays a portion of development costs for new heavy-duty charging sites
- PGE eligible to cost share up to 50% of site cost with customer

### **Purpose of Sched. 53 is to:**

- Better understand grid impacts from HD charging
- Obtain HD electric vehicle usage data and charging load profiles
- Provide opportunities to partner and provide guidance to customers in deployment of HD charging sites



# Questions?

