



**Portland General Electric**  
121 SW Salmon Street • Portland, OR 97204  
portlandgeneral.com

June 15, 2022

Public Utility Commission of Oregon  
Attn: Filing Center  
201 High Street, S.E., Suite 100  
P.O. Box 1088  
Salem, OR 97308-1088

**Re: Second Supplemental Filing of Advice No. 22-10, Schedule 53 Heavy-Duty Electric Vehicle Charging Program Update**

On May 12, 2022, Portland General Electric Company (PGE) submitted a recently finalized contract under Schedule 53 for Commission approval. PGE then submitted a Supplemental Filing on June 1, 2022, at the request of Staff to extend the requested effective date from July 1, 2022, to August 24, 2022, to allow Staff more time to review the filing. Here, PGE submits additional information in support of Advice No. 22-10 filing to provide more details on learnings and benefits that this contract brings to PGE's customers. PGE also reports engagement with potential customers such as commercial truck stop operators, commercial vehicle dealerships, and transit operators to explore opportunities for additional deployments of high-powered charging systems and complementary grid edge technologies.

**Electric Island Phase II Value Proposition**

The contemplated Phase 2 work at Electric Island will allow PGE to better test the grid impacts of heavy-duty electric vehicle (EV) charging. The existing site contains eight DC fast chargers (DCFC) ranging in peak load from 60-200 kW each, with spots for seven additional DCFC. The Phase 2 Agreement would provide PGE and DTNA the opportunity to invest in higher powered EV chargers at the site, including Megawatt Scale Chargers (ranging from 500 - 1,500 kW) which represent a higher impact on the local distribution infrastructure. Based on preliminary analysis for 2022 Distribution System Plan, the Swan Island substation serving Electric Island is anticipated to receive up to 40 MW of additional peak system loading by 2030 (of which up to 5 MW will be contributed to Electric Island), largely due to other transportation electrification (TE) growth in the immediate area, which could affect how and when distribution system upgrades are necessary.

However, if the loading patterns at Electric Island deviate from other heavy industry customers (for instance, if the load peaks mid-day and tapers off in the evening), it may indicate that the level of required distribution system upgrades is not as severe as current planning practices would indicate. Using metering data and charger session data, PGE TE engineers will document and quantify daily load patterns at the site, which will inform modeling inputs to the distribution system planning.

Understanding the effects of higher-powered EV charging is a key goal listed in Schedule 53, and these efforts have the potential to inform distribution planning and investment practices.

Specific data gathered for the Electric Island site will include:

- Statistical distributions of arrival times (indicating expected loading patterns);
- Initial and final vehicle state-of-charge, and peak power usage (indicating per-vehicle power and energy requirements);
- Typical driver idle time at the site beyond immediate charging needs (indicating consumer behavior and whether pricing mitigation may need to be put in place to discourage idling); and
- Preference for specific DCFC models and power capacities (which may indicate superior customer experience and aid PGE TE engineers in recommendations to other customers)

To date, there have been a range of vehicles, from passenger cars to Class 8 trucks, utilizing the site. PGE anticipates that the mix of vehicles will skew more toward heavy-duty EVs as these vehicles become more prevalent, especially in the Swan Island industrial area where several local customers (Daimler, UPS, Amazon) are developing electrified fleets. The site may not exhibit the exact usage pattern of future sites that will host 10 or 20 trucks, but it will provide useful information that PGE can leverage to understand charging behavior of even larger facilities.

The existing site was designed and built to incorporate battery energy storage and solar generation. The Phase 2 Agreement would provide PGE and DTNA the ability to collocate these assets at the Electric Island site. These grid-edge technologies can mitigate the potential impacts of high-powered EV charging, but only if they are operated and optimized in a manner that complements the grid. The installation of these assets at Swan Island will provide PGE the necessary real world operational lessons and experience to optimize these assets against a host of use cases.

The batteries at Electric Island will communicate back to PGE's ADMS system. This system provides asset visibility for system operators leading to the optimization of asset performance. The collocated assets will enable PGE to test and learn to operate these assets for a range of use cases, including relieving local distribution constraints, providing frequency response, and providing contingency reserve services. Since these battery use cases represent a combination of both local and system-level objectives, they will present the opportunity of co-optimizing services and determine the most effective utilization of these resources.

Collocating batteries and PV generation with EV charging is gaining interest across the industry. As heavy-duty EV charging expands within PGE service territory, it will be imperative that the utility understands the effectiveness of this strategy, and specifically how best to size, located, and control battery energy storage and solar generation assets in order to ease distribution, and eventually transmission, system impacts from this charging. In this case, the site has room for two 10' x 20' pads to house battery energy storage equipment. This physical footprint limits the electrical capacity of any on-site batteries to roughly 1.5 MW. In a peak-shaving scenario, this would allow PGE to offset 30% of the peak site load for up to two hours. Coordinated testing between PGE transportation electrification and system operations engineers will determine whether and how this is sufficient to mitigate the impacts of peak loads. Schedule 53 calls for the assessment of non-wires solutions at charging locations, and this research will inform optimization models for cost-effective deployment of batteries and solar generation at future sites.

**Additional outreach conducted by PGE**

PGE also engaged with commercial truck stop operators, commercial vehicle dealerships, and transit operators to explore opportunities for additional deployments of high-powered charging systems and complementary grid edge technologies.

Customer Type	Key learnings from Engagement	Active Lead?
<b>Transit</b>	<ul style="list-style-type: none"> <li>• May be opportunity for light, medium, and heavy-duty vehicle charging stations – including transit chargers – to co-locate</li> <li>• Location could also support future on-route charging of PGE-owned heavy-duty vehicles</li> <li>• Centralized location key to serving multiple customer classes</li> </ul>	Yes
<b>Heavy-duty Truck Fleet Operator</b>	<ul style="list-style-type: none"> <li>• Customer interested in up to 50x DCFC is southern service area</li> <li>• Interest in mix of chargers dedicated to fleet vehicles and chargers open to the public</li> <li>• Customer interested in complementary grid edge technologies including storage and on-site solar generation</li> </ul>	Yes
<b>Truck Stop Operators</b>	<ul style="list-style-type: none"> <li>• Desire to separate passenger vehicle charging infrastructure from commercial vehicle charging infrastructure</li> <li>• Space constraints at some locations may limit opportunities for complementary grid edge technologies</li> <li>• Concerns regarding space required for pull-through heavy-duty vehicle charging</li> </ul>	Yes

The sheet remains as filed.

To satisfy the requirements of OAR 860-022-0025(2), PGE responds as follows:

Schedules 53 does not increase, decrease, or otherwise change existing retail rates or have anything other than a de minimis impact on revenues.

Please direct any questions regarding this filing to Teresa Tang at [teresa.tang@pgn.com](mailto:teresa.tang@pgn.com)  
Please direct all formal correspondence and requests to the following email address  
[pgc.opuc.filings@pgn.com](mailto:pgc.opuc.filings@pgn.com)

Sincerely,

*\s\ Robert Macfarlane*

Robert Macfarlane  
Manager, Pricing & Tariffs

cc: UE 389 Service List