Resource Planning Advisory Group feedback report

Meeting details

- Wednesday, June 18, 2025, 11:00 a.m. - 12:00 p.m.
- Virtual webinar hosted by PSE and facilitated by Triangle Associates
- Links to:
  - Presentation
  - Meeting recording

Feedback

The following records participant questions and PSE responses from the public comment opportunity and comments submitted via online feedback form or email to isp@pse.com. Meeting materials are available on the Integrated System Plan website. *PSE responses are shown in teal italics.*

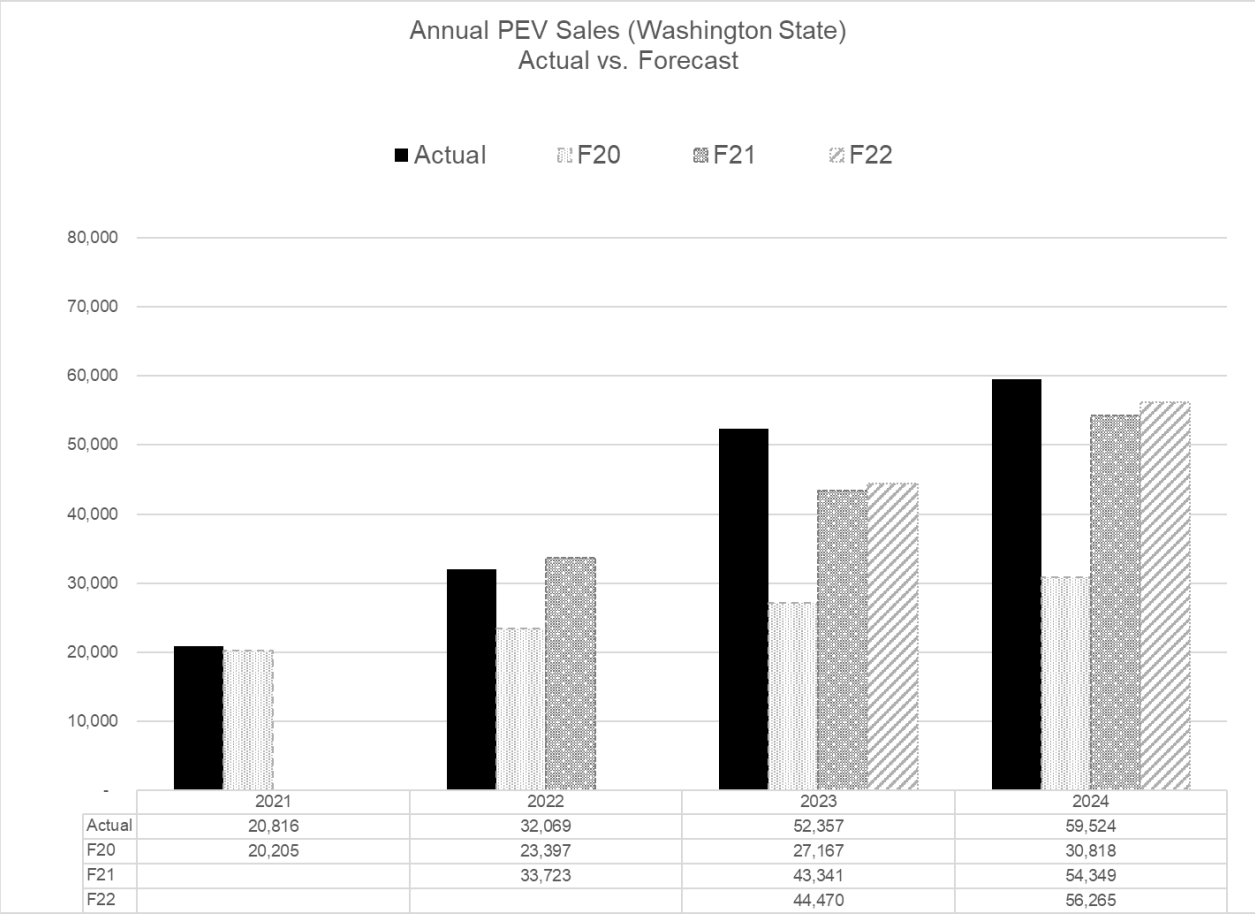
Note: PSE aims to provide clarity in responses but subsequent follow-up may be required at times. Please direct any follow-up clarifications to isp@pse.com.

RPAG member feedback

1. JP Caravallo on behalf of Lawrence Berkeley National Laboratory, June 18, 2025 via isp@pse.com

Guidehouse has been forecasting EV adoption and operation for PSE since 2019. Could you share a retrospective analysis of the accuracy of your 2019 and 2020 forecasts now that there are 5-6 years of data? How did those forecasts made back in 2019 and 2020 - both in terms of number of EV adopted, energy consumed, and peak impacts - compare to actuals?

Each year, as Guidehouse prepares an updated forecast for PSE, the performance of the prior forecast is reviewed to determine if recent actual trends are diverging from the forecast and adjust the updated forecast accordingly. Older forecasts of annual EV sales that were developed in 2020 (F20), 2021 (F21), and 2022 (F22), under-forecasted the actual sales activity as shown in the chart below.



	2021	2022	2023	2024
Actual	20,816	32,069	52,357	59,524
F20	20,205	23,397	27,167	30,818
F21		33,723	43,341	54,349
F22			44,470	56,265

At this time, forecast performance can be assessed best by looking at vehicle sales given there is actual registration data available. Currently, PSE does not have actual energy consumption and peak load contribution from EVs. Unless there is a dedicated meter for the charging activity, PSE will not have actual energy consumed or peak contribution. PSE is currently working on algorithms to identify likely locations with EV charging and is seeking solutions to be able to estimate energy consumed and peaks from EV charging.

Why would LDVs meet policy scenarios and not MHD, especially when MHD EV are purchased by fleets that are easier to target for policy enforcement compared to atomized customers purchasing LDV EV? Why would you make the assumption for LDV and not MHD?

For the most recent forecast, Guidehouse assumed that Washington State targets will continue to be met for Light Duty Vehicles given the proportion of the total cost of the vehicle that is the penalty to the vehicle manufacturer (the per-vehicle penalty was $5,000 from 2018-2025, starting in 2026, the Advanced Clean Cars II rule implements a $20,000 per vehicle penalty). The per-vehicle penalty for a more expensive MHD vehicle is $37,500, which in many MHD cases is a smaller proportion of total vehicle cost than LDVs. Fleet managers have been slower than anticipated to transition to EVs, so MHD manufacturers may determine that it's more economical to pay the penalty for MDH vehicles than to meet PEV sales targets that are so aggressive.

Why use the unmanaged scenario to model EV operation in the base scenario? This is quite unrealistic, especially if the forecast assumes that MHD EV are also unmanaged (I'd say extremely unlikely). This applies to both near and long-term MHD EV operation.

We need to start with the unmanaged charging scenario so that we can perform a benefit-cost analysis for managing the load. That is, the portfolio model needs to see the unmanaged load and the load management program impacts/costs to demonstrate cost effectiveness.

Slide 11: Please clarify acronyms (MUD, SUD). Where is the residential charging (may be SUD)? Why isn't there nighttime charging in these results?

Single unit dwelling (SUD) refers to a residential building designed for one household. A multi-unit dwelling (MUD) includes buildings with multiple separate housing units, such as an apartment complex. Nighttime charging is indicated in the load profiles presented for both SUD and MUD.

Slide 12: What is managed charging managing for? Clearly not for peak demand, since it's almost the same as unmanaged charging. Many/most other EV forecasts assume much higher levels of management. Why is the assumption that managed charging will barely affect peak demand? A few quick examples:

- NYSERDA white paper from 2022 ("Managed Charging for Electric Vehicles") estimated a 50% reduction in EV contribution to peak by 2050. They estimate roughly 100% penetration of TOU rates in any type of commercial vehicle by 2040.
- LBNL study from 2023 ("Quantifying the Financial Impacts of Electric Vehicles on Utility Ratepayers and Shareholders") estimated a 29% reduction in peak impacts under a high EV penetration scenario and a 86% reduction under a low penetration scenario.
- DOE's Multi-State Transportation Electrification Impact Study from March 2024 calculates 50% reduction in peak load sizing substation transformers (study was focused on distribution system impacts, but substations can be a proxy for bulk power system impacts)

Guidehouse modeling shows that managed charging flattens loads from SUD impacts and pushes peak to the middle of the day, outside of peak hours. The aggressive unmanaged charging scenario has a 56% higher peak demand due to charging later in the day.

Managed could be aligning demand with potential solar production. Shouldn't it be more informative than to show the net demand after management, if this is the case? If not, what is the basis for such large residential demand in the early evening for the managed scenario?

The unmanaged EV forecast is used as a starting point to determine the potential for shifting load to other hours at various costs, participation rates, etc. The Guidehouse presentation included illustrative examples of impacts to EV-related load. The ultimate amount of load estimated to be shifted by DR including TOU rates is determined through the Conservation Potential Assessment and Customer Strategy analyses, and those amounts are netted from the demand forecast that will be used for the ISP analyses. Part of the ISP analyses will include assessing EV batteries as a resource.

Public feedback

3. Don Marsh on behalf of Washington Clean Energy Coalition, June 14, via isp@pse.com

I am puzzled why PSE continues to ignore the possibility that EVs could serve some portion of electric demand, especially during peak demand or emergency scenarios.

This omission is puzzling because PSE already has a pretty good Flex Battery program (in which I am enrolled). The capacity of the mobile battery in a customer's car is likely to outpace the capacity of stationary residential batteries for the foreseeable future. Also, the total capacity of EVs within PSE's service territory is likely to dwarf the capacity of residential batteries.

At least 10 EV models offer V2G capability now or within the coming year. Is it accurate to predict increasing demand due to EVs without accounting for the offsetting benefits EVs could provide as auto manufacturers continue to expand their V2H or V2G options? Personally, my wife and I are considering replacement of our 7-year-old EV, and we will not purchase a vehicle that does not offer at least V2H capabilities to protect us from long power outages like the one we experienced during the last bomb cyclone. A handful of car and energy companies are starting to offer V2G programs that are attractive to customers, especially when they effectively lower the monthly car payment. Is PSE going to cede V2G resources to these companies, or will PSE develop its own programs that allow the utility to better manage the grid? The clock is ticking.

If V2G is not an appropriate topic for the EV Forecast meeting, please inform attendees when PSE will provide insights about the future of V2G in PSE's service territory.

As previously stated, PSE is actively working to develop Vehicle to Everything (V2X) capabilities to leverage electric vehicle batteries to provide grid benefits, details of which can be found on our website. This is in addition to existing demand response and time-of-use programs that encourage customers to reduce or shift energy usage https://www.pse.com/en/pages/electric-cars/*. Vehicle-to-grid (V2G) is an emerging technology which requires customers to use a bidirectional charger and a vehicle that is compatible with two-way charging, both of which are not yet widely accessible. PSE initiated several technical demonstrations in 2025 for vehicle-to-home (V2H), vehicle-to-building (V2B), and V2G to evaluate the technical feasibility, operational requirements, and interconnection protocols, as well as to better understand customer interests to determine how to integrate V2X in future products. PSE's ISP will consider the potential benefits of V2X as a demand-side resource measure as a Battery Energy Storage resource. PSE will provide a V2X update in the July 29, 2025 RPAG meeting.*

4. David Nightingale, June 18, public comment opportunity

When you get to the managed charging part, with hundreds of thousands of EVs in PSE's territory that essentially is a huge battery resource for supplementing generation during peak times. That is an absolutely huge thing and manufacturers of EVs are more and more trending towards having bidirectional charging to provide those electrons back into the system. Cyber truck, F-150 Ford Lightning, and the Hyundai vehicles and other manufacturers are planning in the next few years to provide bidirectional charging. It's going to be a huge resource and in order to keep my rates and everybody else's down, that's going to be a pretty cheap way to get energy. There are technological problems that have to be overcome and systems, but it's a resource that should not be ignored.

Thank you for your comment. Please see our response to #3 above.

The other thing is just a little bit of a tweak – it's my understanding that the current tariff system that PSE has does not allow time of use if you have solar panels on your house. There are people out there that have EVs that would be happy to not charge them during peak times with the time of use, but they're disallowed right now because they have solar panels on their houses. I'd like to see that remedied.

Thank you for your comment.

5. Don Marsh on behalf of Washington Clean Energy Coalition, June 18, public comment opportunity

I think I can save a lot of time by enthusiastically seconding what David Nightingale just said. I'm making as a criteria for my next EV it has to have at least V2 if not V2G. There are a lot of car manufacturers that are offering that either now or will be in the next year or two. I want to see when we get to the managed charging part of the ISP; I want to see a lot of detail on what PSE is thinking that can contribute to both peak demand or emergency scenarios. It seems like a very good resource to take advantage of.

Thank you for your comment. Please see our response to #3 above.

6. Bradley Nelson on behalf of Burns McDonald Engineering Firm

I'm concerned with a lot of the assumptions that were included in EV projections, primarily around using the base case, which means meeting the ACC2 EV sales recommendations. I see that ACT assumed not meeting those EV sales requirements. No state is currently on track to meet the 2026 EV sales requirements, and I think using that as the baseline instead of the most aggressive case could create some potential issues as far as what you're assuming as far as the EV sales growth going forward. That might be something to consider when you do future projections. Additionally, when we had some of the workplace assumptions around load impacts, we are seeing very slow uptake in a lot of workplaces for workplace charging, and so assuming that will automatically flatten out the load I think is potentially overly optimistic. We're having a lot of challenges even seeing workplaces adopt these sorts of systems. Overall, those are the main two concerns with the EV adoption growth rates and the workplace charging going forward as how that will actually impact some of these load growth scenarios.

Thank you for your comment.

7. Tom Kraemer on behalf of Third Act Washington, June 18, public comment opportunity

Tom submitted a transcript of his verbal comments, shown in #8, below, along with PSE's response.

8. Tom Kraemer on behalf of Third Act Washington, June 19, via isp@pse.com

Thank you for the thorough presentation on the impacts of EVs. And the problems and opportunities this new category of electric load presents. The presentation struck an appropriate balance between elaborating the most important issues vs. covering all aspects of this complex topic.

I was disappointed that you did not mention the potential for **vehicle-to-grid programs**, which have the potential to offset some of the energy loads that EVs create. Vehicle batteries have a potential **storage capacity** that will be enormous as the number of EVs increases. This storage could provide significant load-shifting potential, reducing the need for new peaking plants.

And battery storage has proven effective in frequency and voltage stabilization as well.

In addition, the batteries would be widely distributed over the utility's service area. This distributed energy resource can help minimize the need for new distribution and transmission capacity as electrification loads increase.

Several large utilities have V2G pilot programs underway, including Pacific Gas & Electric and San Diego Gas & Electric in California. **I would like to see PSE among these leaders.**

Thank you for your feedback. Please see our response to #3 above.