Draft 2023-2025 Transportation Electrification Roadmap

Workshop 2

Potential scope and scale to meet customer, stakeholder and market needs

JUNE 14, 2022

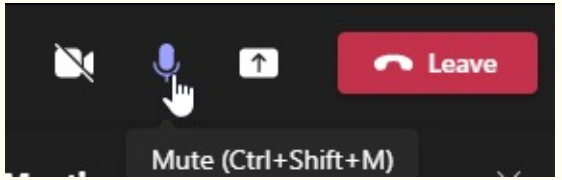
Meeting Logistics

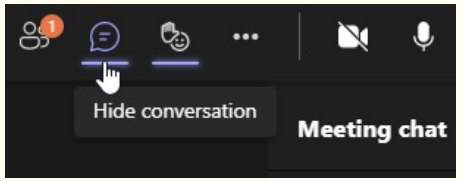
Teams Meeting

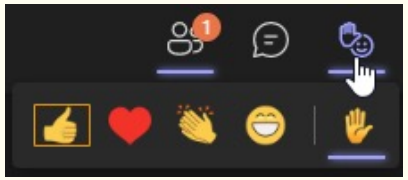
- Please click the meeting link sent to your email or [Click here to join the meeting]
  - +1 971-277-2317 (dial this number into your phone for best results)
  - Phone Conference ID: 312 868 111#
  - Please use **Microsoft Edge** or **Google Chrome** with Teams as it will give you the best experience

During the presentation:

- All attendees will be muted; to unmute yourself via computer, click on the microphone that appears on the screen when you move your mouse
- To unmute yourself over the phone, **press *6**
- If you call in using your phone in addition to joining via the online link, please make sure to **mute your computer audio**
- Use the chat feature to share your comments and questions.
- Raise your hand icon to let us know you have a question







Operating Agreements

Establishing norms with our communities is foundational to building trust.

To create a **safe space**, we establish **common agreements** such as **respect** and **inclusivity**.

Practice curiosity and **seek to understand different perspectives**.

Stay Engaged

Experience Discomfort

Speak your Truth (knowing it's only part of the truth)

Expect and Accept Non-closure

Share the Airtime. Step up, Step back.

The courageous conversations framework
By Glenn Singleton and Curtis Linton

Agenda

1. General remarks – 10 mins
2. Draft 2023-2025 TE Roadmap – 45 min
3. Draft portfolio cost estimates – 30 min
4. Break – 5 min
5. Draft program details with cost estimates walk throughs – 60 min
6. Break - 5 min
7. Continued – draft program details with cost estimates walk throughs – 60 min
8. General discussion and Q&A - 20 min
9. Closing and Next Steps – 5 mins

“New item” – coming soon EVSE technical requirements workshop

General remarks…

1. Speaker introductions
2. Background - the result of PGE's discussions with stakeholders and our vision for TE
3. TEINA guidance = foundational assumptions driving PGE forecast of potential scope and scale for portfolio and programs
4. Future costs are estimates only – nothing is settled
5. Objectives
    1. Present in a way that invites dialogue
    2. Share selected feedback themes we've received from stakeholders and responses
    3. Review of draft portfolio and program details and cost estimates - we're excited to get your feedback today and over the coming months
6. No decisions today, only input and feedback
7. What we don't have today
    1. Rate impact
    2. RE: future funding source potentials – for many new programs, General Rate Case as funding source is **conceptual only**

Draft TE Roadmap

2023-2025

Key feedback themes so far (Recent feedback, comments in UM 2165, AR 654)

Key themes from stakeholders	Actions we are taking
Include demand side management and load control in plan to minimize customer costs, optimize grid resources and investments	• Residential Smart Charging is a direct load control program • Schedule 50 (rate at PGE-owned chargers) has on-peak surcharge • Fleet sites are eligible for Sch 26 (Energy Partner) • All commercial rates are TOU; plan to explore residntl & commercl EV rates
Identify and **engage with underserved communities**, integrate needs into program design	Engaging in existing proceedings with community groups in attendance (DSP Community Partners workshop), inclusion in all TEP events.
Price parity between residential rate and public charging owned/funded by utility; support for Schedule 50 rate;	Existing Schedule 50 provides parity through subscription for PGE operated chargers. Considering updates to Schedule 50 in coming year; priorities for Sch 50 are simplicity, flexibility, price parity and grid-friendliness.
Support public **MHD charging beyond fleet depots**	Expansion of Heavy Duty Charging
Provide **accessible payment** and language options	Considering requirements for PGE-funded chargers for payment options and pricing. Considering language options in EVSE qualification process.
Establish **charger reliability** requirements	Considering requirements for PGE-funded chargers for charger uptime: looking to ensure positive site host experience, manage administrative burden, recognize maturing technology
Ensure **PGE programs are coordinated** with ODOT, PCEF, Cities.	Meeting with state and municipal entities to share program details and solicit input

Key feedback themes (continued)

Key themes from stakeholders (continued)	Actions we are taking
Engage communities in **right of way/public charging project placement** and development	PGE is mapping disadvantaged community areas using a range of data sources. PGE will support the local governments' community engagement for the municipal charging program.
Ensure chargers supported by the utility are **capable of OCPP standard and not locked to vendor**	This is, and will continue to be, a requirement of PGE's qualified product list.
Define the appropriate **role of the utility** in the competitive market	PGE is designing its portfolio so that customers have options among hardware/software and choices as to program design.

Received feedback from:

- Chargepoint / EVGo
- Climate Solutions
- CUB
- Flo
- Green Energy Institute
- OPUC staff
- NRDC
- ODOT
- Shell Recharge
- TeraWatt
- WeaveGrid
- NWEC

Outreach in progress or planned:

- Transit Agencies
- Community Based Organizations
- Small Business
- Labor
- Municipalities

Feedback? Someone we should reach out to? Resource we should look to?

Email us at TEP@PGN.com

Vision: Ecosystem Outcomes

1. People have the information they need to transition to EVs
2. Charging is equitable, affordable, reliable and accessible
3. Businesses & cities achieve emissions goals by electrifying fleets

4. Electric vehicles are efficiently integrated into the grid
5. Electric mobility is available to all

Customer Segments

PASSENGER EV

RESIDENTIAL

EV Driver

EV Considerer

Non-Driver

NON-RESIDENTIAL

Multifamily Property

Business

Public

FLEET

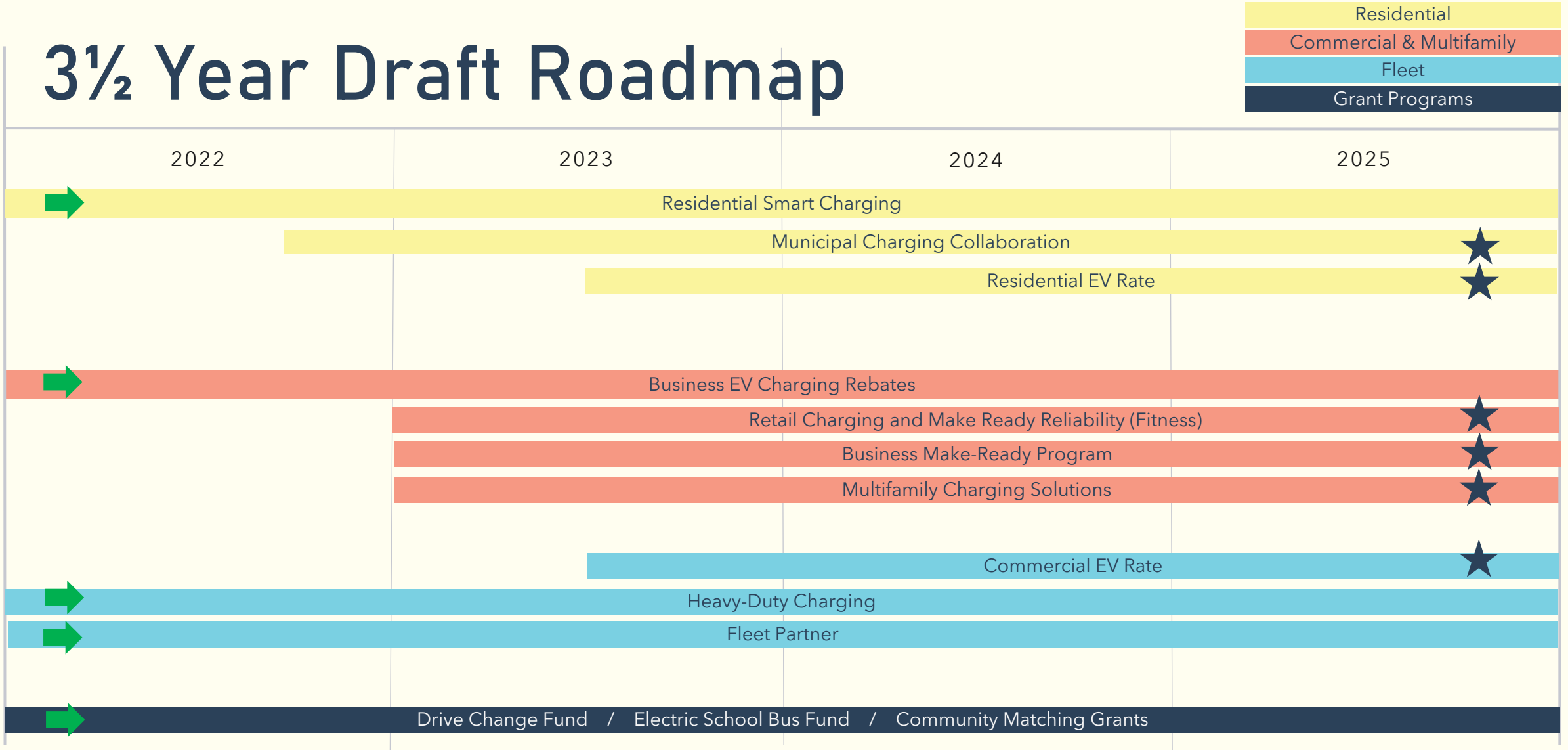
Private

Transit/School Bus

Municipal

PGE

3½ Year Draft Roadmap



Cross-Segment Activities:

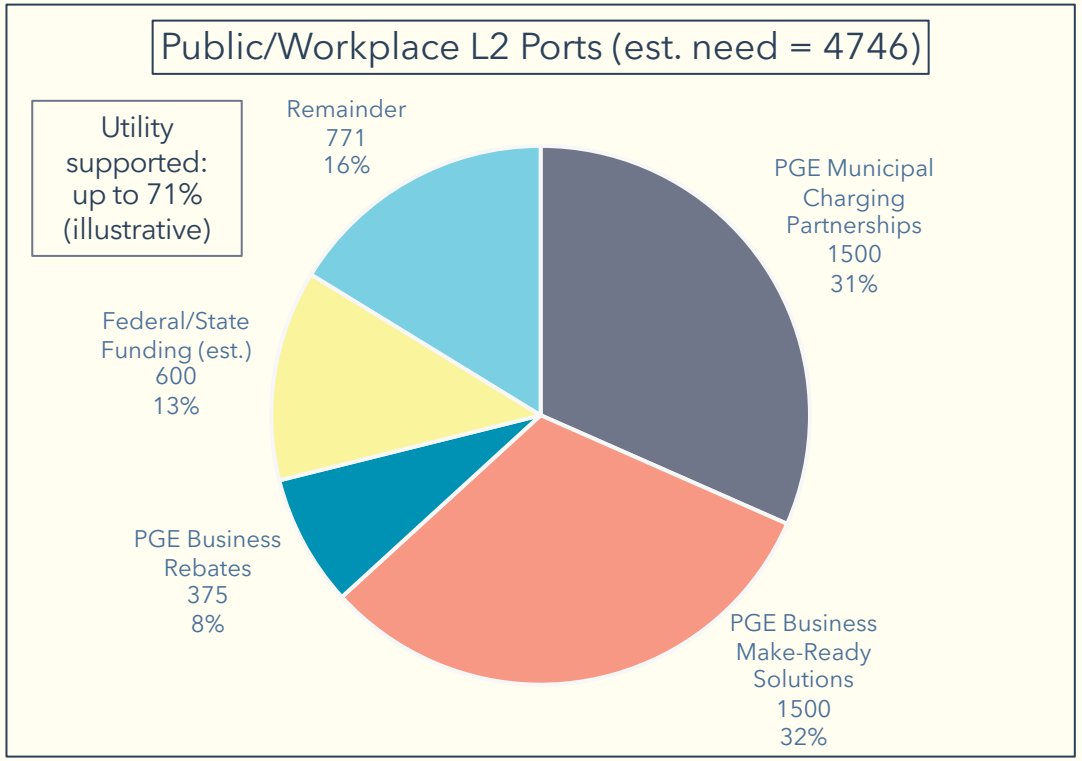
- Education and Outreach
- Statewide Campaigns
- Emerging Tech R&D (V2G, etc.)
- Workforce Development
- Community Matching Grants
- Micromobility Strategy

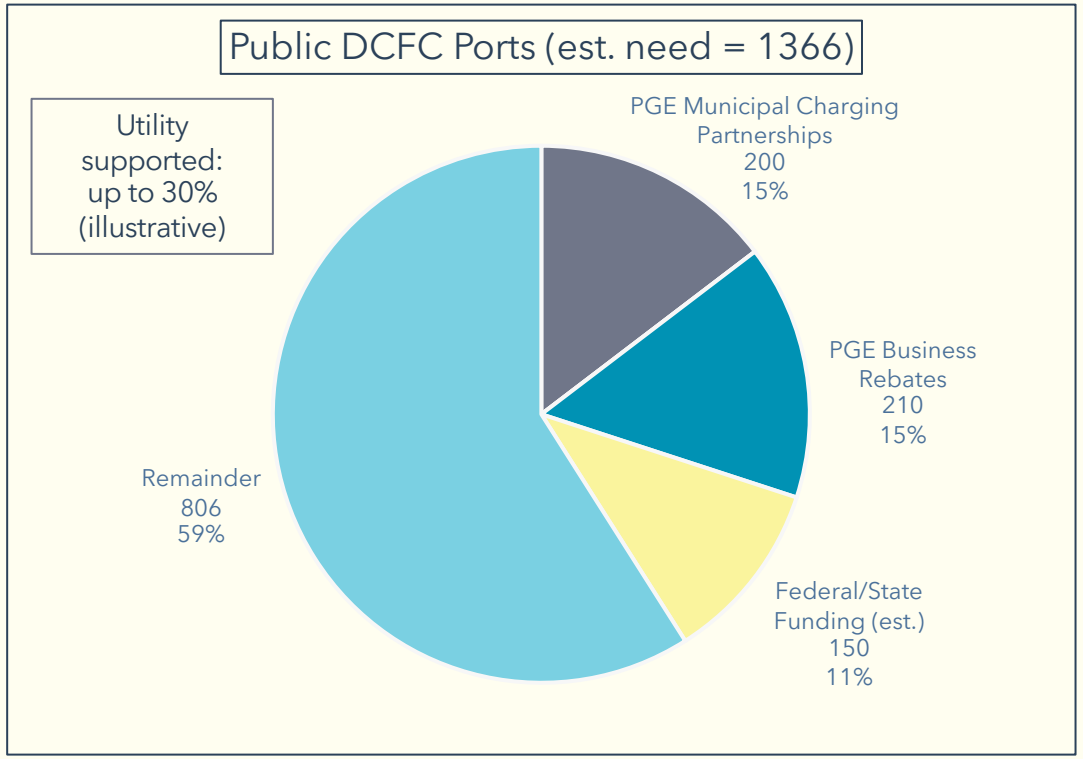
★ = new activity

➡ = continuing activity, addtl fund request

Estimated Public/Workplace Ports Needed by 2025

Using ODOT's TEINA as a starting point, PGE's service area may need an additional 4,746 public/workplace L2 ports and 1,366 public DCFC ports by the end of 2025. These charts show how envisioned PGE programs and other potential funding sources support these needs.





Assumptions:

- Total need is estimated from ODOT's 2021 TEINA study and includes public and workplace ports. PGE continues to use internal forecasts to tailor these estimates.
- Approx. 15% of federal/state-funded ports (NEVI funding and others) allocated to PGE's service area (this is an estimate)
- Approx. 30% of PGE's L2 make-ready rebates, and 50% of PGE's DCFC rebates, will be claimed by customers for public and workplace ports (remainder for fleet/multifamily, estimated)
- Approx. 75% of PGE's Business Make-Ready Solutions will be for public and workplace ports (remaining for multifamily), values estimated

A Portfolio of Funding Sources

	Line Extensions	Utility-Owned Make Ready	Utility-Owned EVSE	Rebates	Asset Maintenance	TOU and Flex Load Offerings	Admin, Marketing and Evaluation	Education & Outreach	Workforce Dev	Community Grants	R&D Projects
CapEx	X	X	X								
OpEx				X	X	X	X	X			
TE Charge				X	X	X	X	X	X		
Clean Fuels Program								X	X	X	X
External Grants (IIJA, etc.)											

DRAFT 2023-2025 potential portfolio cost estimate

‘23–’25 total portfolio cost estimate[1] by fund source, segment, activity – potential for scope and scale shown

1. Includes existing approved funding and proposed, estimated additions. Values may not add due to rounding.
2. Column sums do not add to total - $44M (est.) in Clean Fuels funding across segments

	Mass Market				Fleet		Other			
	Residential	**Non-Residential** (e.g., business, non-profit, public charging)	**Municipal**	**Multifamily**	**Fleets** (e.g., public, private, transit, school bus)	**Public Medium/ Heavy Duty**	**Emerging Tech**	**Education & Outreach**	**Portfolio**	**2023-2025 Estimated Totals**
Capital Expenses		Make ready Charging reliability	Make ready EVSE ownership	Make ready EVSE ownership	Make ready	Make ready			IT integrations Reliability	**$232 MM**
Operating Expenses, supported by TE Charge	Admin Managed charging Rebates Program marketing & evaluation	Admin Maintenance Rebates Program marketing & evaluation	Admin Maintenance Rebates Program marketing & evaluation	Admin Maintenance Rebates Program marketing & evaluation	Admin Maintenance Rebates Program marketing & evaluation	Admin Maintenance Rebates Program marketing & evaluation		Community engagement Capacity building Workforce development	Rates dev and integration	**$98 MM (~$16 MM from TE Charge)**
Clean Fuels Funding		Grants	Grants	Grants	Grants		Micromobility R&D	Oregoin’ Electric Ride and Drives	Clean Fuels Program	**$44 MM**
2023-2025 Estimated Totals[2]	$5.6 MM	$75.7 MM	$99 MM	$57 MM	$46.8 MM	$38.6 MM	$2.2MM	$4.4 MM	$4.4 MM	**$374 MM**

Programs

Residential

-Residential EV Smart Charging
-Municipal Charging Collaboration Program

Residential EV Smart Charging

Description: Current Residential EV Smart Charge Pilot Rebate + Product Enhancements (Panel Upgrade Rebate, Trade Ally Network)
Customers served: Single-family residential customers

Existing Offer

	Objectives, expected outcomes, goals	Major milestones and progress to date	Energy	Customer make-ready	Utility make-ready	EVSE & rebates	Load mgmt/rates
Today	• Successfully call Demand Response events for customer Level 2 chargers at home • Provide rebate for purchase and installation of Level 2 chargers and annual rewards for participation • Create dealership referral program. • Accelerate EV ownership with low-income by offering $1,000 rebate • 5,000 connected vehicles, delivering 2.25 MW by 2024	• Pilot launch on 10.23.2020 • Supply chain and COVID issues caused numerous delays • Successful 1st DR season, Oct 21-Mar 22, 80% evPulse earned their seasonal reward for satisfying participation requirements. • 1,000+ customers enrolled in pilot • Launched Salesforce in April 2022 • Adding TOU customers to optimize charging	• Sch 7	• Customer owns charger	• NA	• $500 standard rebate • $1,000 for income-qualified customers • $50 BYOC qualified charger • NEW $50 evPulse (set to start/continue June 10) • Plus, a $25 seasonal reward for DR participation (2x year)	• Schedule 7 rates • Customers may select TOU/TOD/PTR • Daily DR events called
	Approved date range: 10.23.2020 – 12.31.2024 **Funding source(s):** Deferral	**Total approved budget:** (%CapEx/OpEx) : **$5.6M** (0/100) **Total expenditures to date:** **$.58M** (0/100) **Forecast:** **$6.1M** (0/100)	**What we've learned:** EVSE integrations with DRMS platform is time consuming. Customers don't have issues with participating in Smart Charge events – very few complaints or customers dropping program. Vehicle telematics is becoming an important technology of the future due to ease of integration, and customer enrollment, along with improving cost effectiveness.				

Future	**Program modifications and rationale:** • Panel upgrade rebate for L2 charger installs • Larger panel upgrade rebate for LMI customers • Create Trade Ally Network for easier installs • Additional 1,500 enrollments in 2025	**Load management/rates:** • Schedule 7 customers • Supported by Schedule 8	**Objectives, expected outcomes, goals:** • Increased enrollment in Res EV Pilot – especially with LMI customers • Projecting 250 customers will receive panel upgrade with 57 being LMI • With increased low-income threshold from 80%-120%, expect increase in LMI customers from 9% to 15%-25% • Increased customer satisfaction • Remove barriers for L2 at-home chargers • Accelerate EV ownership	**Major milestones:** • Product enhancement launch by October 2022 • Trade Ally Network MVP launched by October 2022 • 50 customers receive panel upgrade rebate in 2022 • Trade Ally Network plan with other internal products mapped out
	Proposed date range: 10.01.22-12.31.25 **Proposed funding source(s):** TE Charge Fund	**Estimated funds:** (%CapEx/OpEx): **+$524K** (0/100) **Total program forecast:** **$6.1M** (0/100)		

Municipal Charging Collaboration Program

Description: a platform to collaborate with public entities to design, build, own, operate & maintain chargers on public property
Customers served: EV Drivers

New Offer

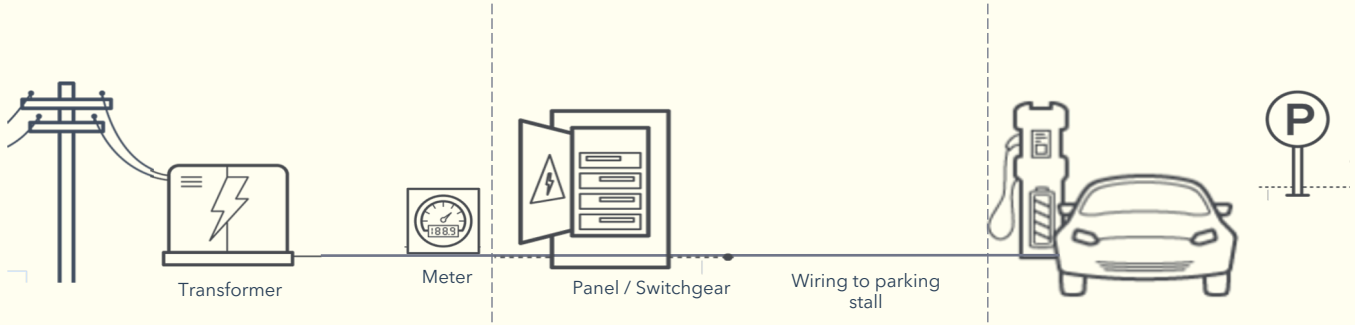
	Objectives, expected outcomes, goals	Major milestones and progress to date	Energy	Customer make-ready	Utility make-ready	EVSE & rebates	Load mgmt/rates
Future	• Meet charging needs of underserved communities • Support charging adequacy and customer confidence in charging availability • Help Municipalities reach climate action goals • Offer pricing equity through retail charging rate and transparent regulatory process • Accelerate deployment of EVSE • Leverage existing assets where possible • 1,500 Public L2 ports • 200 Public DCFC ports	• Leverages PGE experience with pole charging demonstration, electric avenues, Oregon electric bi-ways, and other public charging infrastructure • Municipalities have come to PGE expressing want of ROW charging and help with climate action goals • 10 letters of support	• Retail Charging Rate	• N/A • Owned by PGE	• Owned by PGE • Paid by PGE	• All EVSE owned, operated and maintained by PGE	• Sch 50. Signals • Leverage learnings from Residential Smart Charging
	Proposed date range: 2023-2025 **Proposed funding source(s):** GRC, TE Charge	**Estimated funds:** (%CapEx/OpEx) : **$99M** (75/25)	**Learning objectives:** • Muni charging installation successes and challenges • Understand success of different installation types • Identify implementation successes and challenges • Track customer satisfaction with offering				

Programs

Non – Residential

-Business EV Charging Rebates
-Business Make-Ready Solutions
-Multifamily Charging Solutions
-Retail Charging Reliability (Fitness)

Non-Residential Product Menu



Business EV Charging Rebates	Business Make-Ready Solutions	Multifamily Charging Solutions
Sites of any size (best for up to 6 L2 ports)	Non-res sites (retail, workplace, destination, multifamily, municipal) Minimum 8 L2 ports	Multifamily sites only Minimum 8 L2 ports
Customer manages site design and installation	PGE manages site design and installation	PGE manages site design and installation
Rebate of 80% of the make-ready and installation costs Rebate of $1,000-$2,300 per installed L2 port	PGE pays for make-ready costs Customer pays for charger installation and maintenance and energy costs Rebate of $1,000-$2,300 per installed L2 port	PGE pays for make-ready and charger installation costs PGE provides charger maintenance PGE bills EV drivers and collects charger revenue

Business EV Charging Rebates

Description: current Business EV Charging rebate, future Business EV Charging rebate pilot enhancements, and DCFC rebates
Customers served: Non-residential customers, including businesses, municipalities, and multi-family dwellings.

Existing Offer

	Objectives, expected outcomes, goals	Major milestones and progress to date	Energy	Customer make-ready	Utility make-ready	EVSE & rebates	Load mgmt/rates
Today	• Support EV adoption by ensuring adequate charging infrastructure is available to meet customers' charging needs • Reduce the cost and complexity of installing EV Supply Equipment that can preclude Customers from deploying charging infrastructure • Create a network of demand-side resources to reduce the costs of serving EV loads by supporting efficient grid operations and future renewables integration • Projected total port count = approx. 600	• Pilot launched on 12.18.2020 • 58 rebates have been issued to date	• Cost of Service Rate	• Owned by customer	• Owned by PGE	• L2 only, owned by customer • $1,000/port std rebate • $2,300/port MF rebate	• Commercial TOU Rate
	Approved date range: 2.15.2019-12.31.2023 **Funding source(s):** Deferral (UM 2003)	**Total approved budget:** (%CapEx/OpEx) : **$1M** (0/100) **Total expenditures to date:** **$156K** (0/100) **Forecast:** **$23M** (0/100)		**What we've learned:** Current stand-alone offering insufficient to drive adoption; incentive does not cover the cost difference between a non-networked and networked charger. Per evaluation data from PGE's technical assistance program, business customers receiving technical assistance and not installing chargers remain concerned about site upgrade costs greater than the charger costs.			
Future	**Program modifications and rationale:** • Addition of rebates for make-ready infrastructure • Remove income qualification for MF rebate • Add DCFC rebates • Extend program through 2025	**Load management/rates:** All customers will remain on a PGE cost of service rate with TOU pricing signals; option to move to a Commercial EV rate when available		**Objectives, expected outcomes, goals:** • Expand and enhance program to better address customer needs, meet state goals • Make-ready rebates: 80% of make-ready/installation costs, up to $6k per port and $36k/site • DCFC rebates: $350/kW up to $25k/port		**Major milestones:** • Through 2023, fund 500 L2 ports, 250 L2 make-readies, and 20 DCFC ports • In 2024-2025, fund 1300 standard L2 ports, 700 multifamily L2 ports, 1000 L2 make-readies, and 400 DCFC ports	
	Proposed date range: 10.01.2022-12.31.2025 **Proposed funding source(s):** TE Charge → GRC	**Estimated funds:** (%CapEx/OpEx): **+$22M** (0/100) **Total program forecast:** **$23M** (0/100)					

Business Make-Ready Solutions

Description: PGE will provide turnkey design and installation of make-ready infrastructure for installations of 8+ L2 ports
Customers served: Non-residential customers installing semi-public charging (retail, workplace, destination, multifamily, muni)

New Offer

	Objectives, expected outcomes, goals	Major milestones	Energy	Customer make-ready	Utility make-ready	EVSE & rebates	Load mgmt/rates
Future	• Support EV adoption by ensuring adequate charging infrastructure is available to meet residential customers' charging needs • Reduce the cost and complexity of installing EVSE as an amenity • Create a network of demand-side resources to reduce the costs of serving EV loads by supporting efficient grid operations and future renewables integration	• Install 2,000 L2 ports in PGE's service area by the end of 2025	• Cost of service rate	• Owned by PGE • Paid for by PGE	• Owned by PGE • Paid for by PGE	• L2 only, owned by customer • Selected from qualified product list • Eligible for L2 EVSE rebate	• Commercial EV rate (to be developed) • Non-residential TOU rates
	Proposed date range: 01.01.2023 – 12.31.2025 **Proposed funding source(s):** GRC	**Estimated funds:** (%CapEx/OpEx) : **$37M** (76%/24%)	**Learning objectives:** • Document charging installation successes and challenges • Understand load curve of EV charging based on site type • Identify implementation successes and challenges • Track costs of installing EVSE • Track customer satisfaction with offering				

Multifamily Charging Solutions

Description: PGE provides turnkey design, installation and ownership of L2 EVSE at multifamily locations with 8+ ports
Customers served: Multifamily dwellings

New Offer

	Objectives, expected outcomes, goals	Major milestones and progress to date	Energy	Customer make-ready	Utility make-ready	EVSE & rebates	Load mgmt/rates
Future	• Support EV adoption by ensuring multifamily residents can access convenient and equitably priced home charging • Reduce cost and complexity of installing EVSE that can prevent multifamily dwellings from deploying charging infrastructure • Offer home EV charging to multifamily residents on an equitable rate comparable to what single-family residents experience • Ensure that multifamily home charging is grid-supportive through Schedule 50 price signals to encourage off-peak charging	• Install 2,000 L2 ports at multifamily dwellings in PGE's service area by the end of 2025	• Delivered by PGE directly to the EV driver on a Sch 50 rate	• Owned by PGE • Paid for by PGE	• Owned by PGE • Paid for by PGE	• L2 only, owned by PGE	• Sch 50 price signals
	Proposed date range: 01.01.2023 – 12.31.2025 **Proposed funding source(s):** GRC	**Estimated funds:** (%CapEx/OpEx) : **$57M** (78%/22%)	**Learning objectives:** • Document charging installation successes and challenges • Understand load curve of EV charging at multifamily dwellings • Identify implementation successes and challenges • Track costs of installing, owning and maintaining EVSE • Track customer satisfaction with offering (multifamily property owner and EV driver)				

Retail Charging Reliability

Description: Equipment replacement costs serving PGE's portfolio of utility owned chargers and make ready
Customers served: Non-residential, fleet

New Offer

	Objectives, expected outcomes, goals	Major milestones and progress to date	Energy	Customer make-ready	Utility make-ready	EVSE & rebates	Load mgmt/ rates
Future	• Ensure adequate funds are available to replace chronically underperforming charging infrastructure across the PGE Retail Charging Portfolio • Support industry-leading charging infrastructure uptime requirements by quickly addressing equipment performance issues • Instill confidence in customers who are transitioning to electricity as a transportation fuel	• Initial cost estimate and program concept created based on learnings from previous pilots and other utility infrastructure operations costs	• N/A	• N/A	Supporting: • 2022: 37 • 2023: 82 • 2024: 215 • 2025: 384	Supporting: • 2022: 184 L2 and 38 DCFC • 2023: 1,226 L2 and 172 DCFC • 2024: 2,988 L2 and 330 DCFC • 2025: 4,988 L2 and 495 DCFC	• N/A
	Proposed date range: 1.1.2023 – 12.31.2025 **Proposed funding source(s):** GRC	**Estimated funds:** (%CapEx/OpEx) : **$15.3M** (97/03)	**Learning objectives:** • Develop and set criteria for chronic underperformance (< 98% uptime, < 92% first pass charge rate, > 3 field repairs without improvement in performance) • Replace equipment within two weeks of identification as underperforming • Support network uptime goals of 98% or greater				

Fleet Programs

-Fleet Partner
-Heavy Duty Charging

Fleet Partner Pilot

Description: no cost to customer planning & technical services; make-ready infrastructure installation with custom incentives
Customers served: Non-residential Fleets (Commercial, Municipal, School, Non-profit, Transit) installing 70kW+ EV charging

Existing Offer

Today

Objectives, expected outcomes, goals	Major milestones and progress to date	Energy	Customer make-ready	Utility make-ready	EVSE & rebates	Load mgmt/rates
• Accelerate fleet electrification; reduce adoption barriers (cost, complexity) • Create DR enabled EV charging to support efficient grid & renewables • Identify customer & market barriers, areas of improvement • Construct EV sites across a variety of customer segments to generate an empirical data set	• Pilot launched 7/1/21 • 63 site applications received from 35 customers • 10 customer commitments to move into Build (construction) phase of program • Forecasted completion of 8 sites in 2022 (may be fewer, supply chain delays)	• Cost of service rate	• Owned by PGE • Custom incentives from PGE to cover cost based on energy usage	• Owned by PGE • Paid by PGE	• DCFC or L2, customer owned • $1,000/port L2 for qualified chargers • $350/kW DCFC (future)	• Sch 38 – TOU (up to 200 kW; no demand charges) • Sch 83 - TOU (31-200 kW) • Sch 85 – TOU (201-4,000 kW)

Approved date range: 7.1.21- 6.31.24
Funding source(s): GRC

Total approved budget: (%CapEx/OpEx) : **$9M** (74/26)
Total spend to date: **$593K** (54/46)
Forecast: **$47.4M** (80/20)

What we've learned: fleet customers are excited to participate: high demand & positive feedback, municipalities are largest customer segment to date, sales cycle is long (~1 year) , supply chain issues may slow down construction, data acquisition is complex

Future

Pilot modifications and rationale: increase funding & timeline to serve high demand; construct additional customers/sites

Load management/rates: Commercial EV Rates, Demand Response (Sch 26), V2G, Charging Optimization Software

Proposed date range: extend 07.01.24-12.31.25
Proposed funding source(s): GRC

Estimated funds: (%CapEx/OpEx): **+$38.4M** (80/20)
Total program forecast: **$47.4M** (80/20)

Objectives, expected outcomes, goals:
- Expand & scale fleet infrastructure pilot
- Use empirical data & learnings to overcome barriers & improve pilot
- Increased #s of light, med, & hvy duty fleet vehicles in PGE territory
- Enhanced efficiency of grid planning to serve TE loads
- Reduce greenhouse gas emissions, air & water pollutants

Major milestones:
- Utilization of charging data collection for grid planning and optimization
- Implementation of active load management for fleet customers

Heavy Duty Charging

Description: PGE construction and operation of Medium and Heavy-duty truck charging infrastructure
Customers served: Medium and Heavy-duty fleet owners and operators and others transiting through our service territory

Existing Offer

	Objectives, expected outcomes, goals	Major milestones and progress to date	Energy	Customer make-ready	Utility make-ready	EVSE & rebates	Load mgmt/rates
Today	• Build infrastructure to support on-route charging for MHD vehicles in our territory • Support our trucking operators in their fleet electrification goals • Collaborate with other utilities to enable EV transit across I5 corridor • Support in-territory customers with on-route EV charging for day-to-day operations	• Built test case at Electric Island • Created Schedule 53 for recovery and future opportunities • Collaborated with WCCTC to identify Heavy Duty sites within PGE service area along the I-5/84 corridor	• Cost of service rate	• Financial cost share with site owner • Costs split with PGE based on TBD, operated by PGE	• Operated and owned by PGE • Paid for by PGE	• IF customer owned EVSE • L2, $1,000/port L2 for qualified chargers • $300/kW DCFC (future)	• Sch 38 - TOD • Sch 83- EV TOU • Sch 85 –EV TOU
	Approved date range: 03/2021-03/2023 **Funding source(s):** Schedule 53	**Total approved budget: $10M** (na in schedule 53) **Total expenditures to date: $5M** (85/15) **Forecast: $43M** (90/10)	**What we've learned:** There is a demand for strategically located HD pull-through charging. Additional learning will come through adding storage to sites and its use as a DR resource.				

Future	**Program modifications and rationale:** Add $30M in additional funding to Schedule 53 to enable PGE to add more sites.	**Load management/rates:** Commercial specific charging rates, DR structure for storage	**Objectives, expected outcomes, goals:** • Enable MHD EV trucks to transit I5 corridor • Collaborate with customers to meet their HD charging needs (on-route) • Deploy 3-5 more Electric Island type charging hubs	**Major milestones:** • Identify site owners and locations • Sign contractual agreements • Complete engineering • Begin construction
	Proposed date range: 01-01-23 to 12-31-25 **Proposed funding source(s):** Schedule 53 (PGE has applied to move the Schedule 53 termination date out to 12-31-27.	**Estimated funds: +$33M** (90/10) **Total program forecast: $43M** (90/10)		

Clean Fuels Program

Clean Fuels Program

Description: Support equitable deployment of transportation electrification in Oregon to the benefit of residential customers
Customers served: Residential

Existing Offer

	Programs to date	Major milestones and progress to date	2022	2023 Forecast	2024 Forecast	2025 Forecast	23-25 Total
Grants and Infrastructure	• Drive Change Fund • Electric School Bus fund • External matching funds • Public infrastructure updates	• DCF awarded 39 Organizations $6.8M to fund 93+ new EVs and 86+ chargers • ESB funded 12 school buses in 7 school districts	$5.5M	$9.7M	$11.6M	$12.4M	$33.8M
Education and Outreach	• Oregoin' Electric Statewide campaign • TCO tool • Ride and Drives • Workforce development	• Oregoin' Electric had 10 million + views in 2021 • Oregoin' Electric had a 15% engagement rate • Ride and drives Total cost of ownership tool	$.5M	$1.2M	$1.5M	$1.6M	$4.4M
Emerging Technology	• V2G charging • Pole charging • Residential smart charging	• First V2G charging in Oregon	$.35M	$.63M	$.75M	$.8M	$2.2M
Portfolio Administration	• Credit sales • REC purchases for incremental credits • Portfolio administration	• 2022 and on includes REC purchases for incremental credits	$.6M	$1M	$1.2M	$1.3M	$3.5M
Total	---	---	$7M	$12M	$15M	$16M	$44M

2023-2025 is an *estimated* forecast based on three variable market factors:

1. Residential EV counts
2. CFP Credit Price and Sales
3. REC Prices and Sales

2023-2025 is based on vehicle count from the DSP forecast. Numbers will be updated in summer 2022 to reflect the latest LD residential EV forecast.

Questions and discussion

Next steps

- Incorporate feedback from today's workshop
- Written informal comments requested by June 24th and welcome anytime at TEP@pgn.com
- Planning additional stakeholder discussion to inform TE plan filing later this year
- "New item" – coming soon, EVSE technical requirements workshop

Thank you!

Contact information

- Regulatory - Steven Corson steven.corson@pgn.com
- Questions, comments, logistics – Jeremy Litow jeremy.litow@pgn.com
- Please join our mailing list and follow our TE Planning website at www.portlandgeneral.com/tep

Let's meet the future together.

Appendix

Glossary of terms and acronyms (A-H)

Term	Definition
AC Level 2 Charger	AC Level 2 (L2) chargers can be found in both commercial and residential locations. They provide power at 220V-240V and various amperages resulting in power output ranging from 3.3kW to 19.2kW.
Charger	A layperson's term for the on-board or off-board device that interconnects the EV battery with the electricity grid and manages the flow of electrons to recharge the battery. Also known as electric vehicle supply equipment (EVSE).
Charging	Charging is the process of recharging the onboard battery of an electric vehicle.
Charging Level	The terms "AC Level 1", "AC Level 2" and "DC fast" describe how energy is transferred from the electrical supply to the car's battery. Level 1 is the slowest charging speed. DC fast is the fastest. Charging rate varies within each charging level, depending on a variety of factors including the electrical supply and the car's capability.
Charging Station	The physical site where the electric vehicle supply equipment (EVSE) (also known as the charger) or inductive charging equipment is located. A charging station typically includes parking, one or more chargers, and any necessary "make-ready equip-ment" (i.e., conduit, wiring to the electrical panel, etc.) to connect the chargers to the electricity grid, and can include ancillary equipment such as a payment kiosk, battery storage or onsite generation.
Demand Response (DR, V1G, direct load management, controlled charging, intelligent charging, adaptive charging or smart charging)	Central or customer control of EV charging to provide vehicle grid integration (VGI) offerings, including wholesale market services. Includes ramping up and ramping down of charging for individual EVs or multiple EVs, whether the control is done at the EVSE, the EV, the EV-management system, the parking lot EV energy-management system or the building-management system, or elsewhere.
Demand Side Management	See Demand Response
Direct Current Fast Charger (DCFC)	Direct current fast charging equipment is designed to rapidly deliver direct current to a vehicle's onboard battery. DCFCs commonly have power ratings of 50kW or higher.
DRMS	Demand response management system
Electric Vehicle Supply Equipment (EVSE)	Electric vehicle supply equipment, also often called an EV charger, is stand-alone equipment used to deliver power to the input port connection on an EV. This device includes the ungrounded, grounded and equipment-grounding conductors and the electric vehicle connectors, attachment plugs and all other fittings, devices, power outlets or apparatus associated with the device, but does not include premises wiring.
EV	"Electric vehicle" is the commonly used name for vehicles with the capability to propel the vehicle fully or partially with onboard battery power and contains a mechanism to recharge the battery from an external power source. EVs can include full battery-electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs).
Fleet EVSE	EVSE for use by business owned vehicles.
HDV	Heavy-duty vehicles have a gross vehicle weight above 26,000 pounds.

Glossary of terms and acronyms (L-S)

Term	Definition
Level 1/Level 2 (L1/L2)	Level 1 is part of the charging standard defined by the SAE for charging equipment using standard 120V household electricity. Level 2: Level 2 is part of the charging standard defined by the SAE for charging equipment using 208V or 240V electricity, similar to the power level used for ovens and clothes dryers.
Make-ready	Make-ready describes the installation and supply infrastructure up to, but not including, the charging equipment. The customer procures and pays for the charging equipment, which could be funded by a separate rebate or other incentive by the electric company or other entity.
Managed Charging	Managed charging allows an electric utility or a third party to control the charging of an EV remotely. This entity could enable or disable charging, or could control the power level for charging.
MDV	Medium-duty vehicles have a gross vehicle weight more than 14,000 and less than 26,001 pounds.
MF (MUD)	Multi family, or multi-unit dwelling, are a type of residence in which multiple housing units are located within a single building or building complex (e.g., an apartment complex, duplex, condos, etc). This is synonymous with a multi dwelling unit (MDU). EVSE at MUDs are intended for use by MUD residents. EVSE located on hotel or motel properties are also included within MUD session data in this report.
OCPP	The goal for the Open Charge Point Protocol (OCPP) is to offer a uniform solution for the method of communication between charge point and central system.
Platform	The base hardware and software upon which software applications run.
Port (also Connector)	The plug that connects the electricity supply to charge the car's battery. J-1772 is the standard connector used for Level 1 and Level 2 charging. CCS or "combo" connectors are used for DC Fast charging on most American and European cars. CHAde-MO is the connector used to DC fast charge some Japanese model cars.
Public EVSE	Public EVSE can be found in multiple types of locations including but not limited to business parking lots, public buildings and adjacent to public right-of-way. Public AC Level 2 EVSE have a standard J1772 connector, while DCFC have a CHAdeMO and/or CCS connectors. Tesla vehicles may utilize public EVSE with an adapter; however, other EVs cannot use Tesla EVSE, as no adapters are available.
Residential EVSE	Located within a person's home, most often in a garage, residential EVSE are usually used by one or two EVs intended only for use by the homeowner.
Standard	An agreed-upon method or approach of implementing a technology that is developed in an open and transparent process by a neutral, non-profit party. Standards can apply to many types of equipment (e.g., charging connectors, charging equipment, batteries, communications, signage), data formats, communications protocols, technical or business processes (e.g., measurement, charging access), cybersecurity requirements, and so on. Most standards are voluntary in the sense that they are offered for adoption by people or industry without being mandated in law. Some standards become mandatory when they are adopted by regulators as legal requirements.

Glossary of terms and acronyms (L-T)

TCO	Total cost of ownership is a financial estimate that accounts for both purchase price and continued, variable operating costs of an asset.
TE	Transportation electrification
TEINA (Transportation Electrification Infrastructure Needs Analysis)	The TEINA study highlights gaps in the electric vehicle charging infrastructure and proposes solutions to help accelerate widespread transportation electrification in Oregon. The ODOT Climate Office, in partnership with the Oregon Department of Energy, completed the Transportation Electrification Infrastructure Needs Analysis study to identify the charging needs and gaps across Oregon.
TOU (Time of Use) Rate	"Time of use" often refers to electricity rates that can vary by the time of day. TOU rates can also be structured to vary by season.
Uptime	Defines the amount of time an EVSE is functionally able to provide a charge when requested, as opposed to a faulted state where no charge may occur. Depending on configuration settings, networked EVSE may still be able to provide a charge and maintain uptime status when offline from the network connection.
Workplace EVSE (charging)	Workplace EVSE are located on business property, primarily intended for use by employees. However, often the business owner will allow use by visitors or the public if it is located in an accessible location.
Underserved community	Communities of color, communities experiencing lower incomes, tribal communities, rural communities, frontier communities, coastal communities and other communities adversely harmed by environmental and health hazards
V2G	"Vehicle-to-grid" refers to vehicles capable of receiving power to the onboard battery from the electrical grid and vice-versa.

Program template guide – how to read program slides

Product title - one line

Description: One line, include key program criteria as appropriate
Customers served: One line, include eligibility as appropriate

	Objectives, expected outcomes, goals	Major milestones and progress to date	Energy	Customer make-ready	Utility make-ready	EVSE & rebates	Load mgmt/rates
Today	• X • X • X • X • X	• X • X • X • X • X	• Cost of service, schedule etc.	• Who owns and pays for this, available incentives	• Who owns and pays for this, available incentives	• types and quantities, incentives for chargers (EVSE)	• Relevant load management rate(s)
	Approved date range: date range from approved previous filing **Funding source(s):** funding source(s) range from approved previous filing	**Total approved budget:** (%CapEx/OpEx) : **$XM** (xx/xx) **Total expenditures to date:** **$xM** (xx/xx) **Forecast**: from May '22-Dec '25 **$xM** (xx/xx)	**What we've learned:** …from this activity				

Future	**Program modifications and rationale:** what changes PGE would make and why	**Load management/rates:** as above	**Objectives, expected outcomes, goals:** • X • X • X • X • X	**Major milestones:** • X • X • X • X • x
	Proposed date range: range of new activity or extension of existing activity – date may overlap previous date range to avoid program "gap" **Proposed funding source(s):** potential funding for this activity	**Estimated funds:** (%CapEx/OpEx): **+$XM** (xx/xx) New funds proposed for this activity **Total program forecast:** **$XM** (xx/xx) Forecast from May '22 – Dec '25		