

## Chapter 3. Planning environment

Long-term planning occurs in the context of evolving law and policy, technological advances, economic conditions, advancing scientific understanding of the effects of climate change, and general environmental concerns. Each of these factors impact resource economics, customer prices, community benefits and the resource decisions Portland General Electric (PGE) makes in the best interests of its customers. This chapter explores the broader planning context influencing our overall resource strategy to reliably and affordably meet customers' energy needs while achieving emissions reduction and other regulatory requirements.

### Chapter highlights

- Federal and state policy impacts the planning environment for PGE's Integrated Resource Plan (IRP) and Clean Energy Plan (CEP).
- Regulatory policy may need to adapt to changing dynamics created by state and regional decarbonization objectives.
- Thermal resource retirement in Oregon and the West creates challenges for resource adequacy as the region decarbonizes.
- Continued uncertainty related to labor markets, supply chains and the macroeconomy presents challenges to decarbonization efforts.

### 3.1 Federal and state law and regulatory policy

Since PGE's last IRP was acknowledged with conditions and directives on March 16, 2020, federal and state policies related to clean energy and greenhouse gas emissions have evolved significantly. As discussed in **Chapter 2, Accessing support for energy transition**, the federal government recently advanced transformative comprehensive climate policy with the passage of the Inflation Reduction Act (IRA) and the Infrastructure Investment and Jobs Act (IIJA). It also passed the CHIPS and Science Act, which has direct implications for our service territory. At the state level, new executive orders, state agency rules and legislation related to electric sector greenhouse gas emissions, energy efficiency, transportation electrification and building decarbonization impact the planning environment for this IRP.<sup>25</sup>

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<sup>25</sup> 2021: HB 2021, HB 2475, HB 2482, HB 2027, HB 2165 and HB 3141;  
2022: HB 5202, SB 1536 and SB 1518.

### 3.1.1 CHIPS and Science Act

Congress recently passed the CHIPS and Science Act of 2022 (H.R. 4346).<sup>26</sup> This legislation is designed to boost US competitiveness and innovation. It is expected to support future scientific research and development funding that could help clean energy advancement through future appropriations the Act authorizes. It also provides funding to support domestic semiconductor chip manufacturing, which may help address supply chain issues as chips are so prevalent throughout goods, and their shortage has impacted supply chains. The CHIPS Act directs \$280 billion in spending over the next 10 years. The spending is allocated to scientific research and development (R&D) and commercialization (\$200 billion authorization), semiconductor manufacturing, R&D, and workforce development (\$53 billion), tax credits for chip production (\$24 billion), and programs aimed at leading-edge technology and wireless supply chains (\$3 billion). As a result of the CHIPS Act, Oregon Business Council and ECONorthwest research estimate Oregon could see upwards of \$40 billion of investment over the next 10 years, with tens of thousands of jobs and \$2-3 billion in local tax revenue. Service territory semiconductor investments will directly impact PGE's load growth.

In this IRP, we consider a broad range of load growth scenarios to account for potential impacts. This is further described in **Section 4.2, Need Futures**. Furthermore, PGE has also assessed how energy and capacity needs would change if the load grew faster than the high case. This is further described in **Section 6.10.2, Accelerated load growth sensitivity**.

### 3.1.2 Oregon House Bill 2021

In the 2021 Legislative Session, the Oregon Legislature enacted House Bill (HB) 2021.<sup>27</sup> This bill requires PGE to reduce the greenhouse gas emissions associated with electricity sold to retail electricity consumers in Oregon. Specifically, the bill requires utilities to reduce those emissions by at least 80 percent below a 2010-2012 average baseline level of emissions by 2030, by at least 90 percent below baseline emissions levels by 2035; and to 100 percent below baseline emission levels by 2040.<sup>28</sup> Program implementation is shared between the Public Utility Commission of Oregon (OPUC or the Commission) and the Oregon Department of Environmental Quality (ODEQ). ODEQ's primary responsibility is collecting greenhouse gas emissions data, determining baseline emissions, calculating the reductions necessary to meet the targets and verifying projected emissions reductions. ODEQ's determination and

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<sup>26</sup> The Creating Helpful Incentives to Produce Semiconductors and Science Act of 2022 (CHIPS Act) was signed into law on August 9, 2022.

<sup>27</sup> ORS 469A.400 469A.475, amended by OR Laws 2021, Chapter 508, available at: <https://olis.oregonlegislature.gov/liz/2021R1/Downloads/MeasureDocument/HB2021/Enrolled>

<sup>28</sup> ORS 469A.400 469A.475, amended by OR Laws 2021, Chapter 508, Section 3, available at: <https://olis.oregonlegislature.gov/liz/2021R1/Downloads/MeasureDocument/HB2021/Enrolled>

verification is based on emissions data reports submitted by the electricity providers under OAR-340-215-0120 to Oregon's Greenhouse Gas Reporting Program.<sup>29</sup> The Commission must ensure that utilities demonstrate continual progress toward the greenhouse gas targets.<sup>30</sup> Utilities must develop a CEP to meet the targets concurrent with each IRP development and convene a Community Benefits and Impacts Advisory Group (CBIAG) to solicit feedback from environmental justice (EJ) communities and low-income customers. This combined filing of PGE's CEP and IRP complies with HB 2021's requirements and related guidelines adopted by OPUC.<sup>31</sup>

PGE will continue to submit annual reports to ODEQ as it does now. As of 2021, ODEQ has required third-party verification of PGE's annual emissions reporting. PGE received a positive verification statement by the deadline of September 30, 2022, for the 2021 annual ODEQ Investor-Owned Utility emissions reporting. In the compliance years 2030, 2035, 2040 and every year thereafter, the OPUC will use the greenhouse gas emissions data reported to ODEQ for that compliance year to determine whether the emissions targets are met. This program is based on the actual emissions associated with the power served to retail customers and does not use renewable energy certificates (RECs) to track compliance.<sup>32</sup> The bill contains a reliability pause and a cost cap to ensure the targets are reached affordably and reliably.<sup>33,34</sup>

HB 2021 also includes a range of clean energy provisions not directly related to the Greenhouse Gases (GHG) targets at the heart of the bill. These include:

- **Allows community-wide clean energy tariff:** Sets forth the process for developing and approving a community-wide green energy tariff. PGE is actively engaged with the cities we serve to develop such a program.<sup>35</sup>
- **Bars new emitting facility site certificates:** Prohibits the Energy Facility Siting Council (EFSC) from issuing a site certificate for a new generating facility that produces electric power from fossil fuels unless the new generating facility will generate only non-GHG-

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<sup>29</sup> Information about Oregon's Greenhouse Gas Reporting Program is available at:

<https://www.oregon.gov/deq/ghgp/Pages/GHG.aspx>

<sup>30</sup> ORS 469A.400 469A.475, amended by OR Laws 2021, Chapter 508, Section 4(6), available at:

<https://olis.oregonlegislature.gov/liz/2021R1/Downloads/MeasureDocument/HB2021/Enrolled>

<sup>31</sup> *In the Matter of Public Utility Commission of Oregon, House Bill 2021 Investigation into Clean Energy Plans*, Docket No. UM 2225, the OPUC adopted CEP expectations in Order Nos. 22-206 (Jun 3, 2022), 22-390 (Oct 25, 2022) and 22-446 (Nov 14, 2022).

<sup>32</sup> ORS 469A.400 469A.475, amended by OR Laws 2021, Chapter 508, Sections 1-3, available at:

<https://olis.oregonlegislature.gov/liz/2021R1/Downloads/MeasureDocument/HB2021/Enrolled>

<sup>33</sup> ORS 469A.400 469A.475, amended by OR Laws 2021, Chapter 508, Section 9, available at:

<https://olis.oregonlegislature.gov/liz/2021R1/Downloads/MeasureDocument/HB2021/Enrolled>

<sup>34</sup> ORS 469A.400 469A.475, amended by OR Laws 2021, Chapter 508, Section 10, available at:

<https://olis.oregonlegislature.gov/liz/2021R1/Downloads/MeasureDocument/HB2021/Enrolled>

<sup>35</sup> ORS 469A.400 469A.475, amended by OR Laws 2021, Chapter 508, Section 20, available at:

<https://olis.oregonlegislature.gov/liz/2021R1/Downloads/MeasureDocument/HB2021/Enrolled>

emitting electricity. Further prohibits EFSC from approving a site certificate amendment for an energy facility powered by fossil fuels in a manner that would “significantly increase the gross carbon dioxide emissions that are reasonably likely to result from the operation of the energy facility.”<sup>36</sup>

- **Small-scale Renewables Requirement:** Increases the existing small-scale renewable mandate in the Oregon Renewable Portfolio Standard from an 8 percent capacity standard to a 10 percent capacity standard.<sup>37</sup>
- **Community Renewable Energy Grant Program:** Creates a \$50 million fund at the ODOE to provide grants for planning and developing community renewable energy and energy resilience projects.<sup>38</sup>

### 3.1.3 Oregon Climate Protection Program (CPP)

Oregon Governor Kate Brown issued Executive Order 20-04 in March 2020, directing state agencies to adopt policies and programs as allowable under existing law to help the state meet statewide emissions targets. In response, the ODEQ established the CPP, a new regulatory program that began in 2022 aiming to dramatically reduce greenhouse gas emissions in Oregon over the next three decades. The CPP sets a declining limit, or cap, on greenhouse gas emissions from fossil fuels used throughout Oregon, including diesel, gasoline, natural gas and propane, used in transportation, residential, commercial and industrial settings. The program also regulates site-specific greenhouse gas emissions at manufacturing facilities, such as emissions from industrial processes, with a best available emissions reduction approach. The CPP does not apply to Oregon's electric utilities, energy service suppliers or electricity-generating facilities.

In 2022, PGE contracted with Evolved Energy Research (EER) to undertake an independent analysis exploring pathways to deep decarbonization across all energy sectors in its service area. (“Deep Decarb Study Update”).<sup>39</sup> This study updated an earlier Deep Decarb Study in

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<sup>36</sup> ORS 469A.400 469A.475, amended by OR Laws 2021, Chapter 508, Section 28, available at: <https://olis.oregonlegislature.gov/liz/2021R1/Downloads/MeasureDocument/HB2021/Enrolled>

<sup>37</sup> ORS 469A.400 469A.475, amended by OR Laws 2021, Chapter 508, Section 37, available at: <https://olis.oregonlegislature.gov/liz/2021R1/Downloads/MeasureDocument/HB2021/Enrolled>

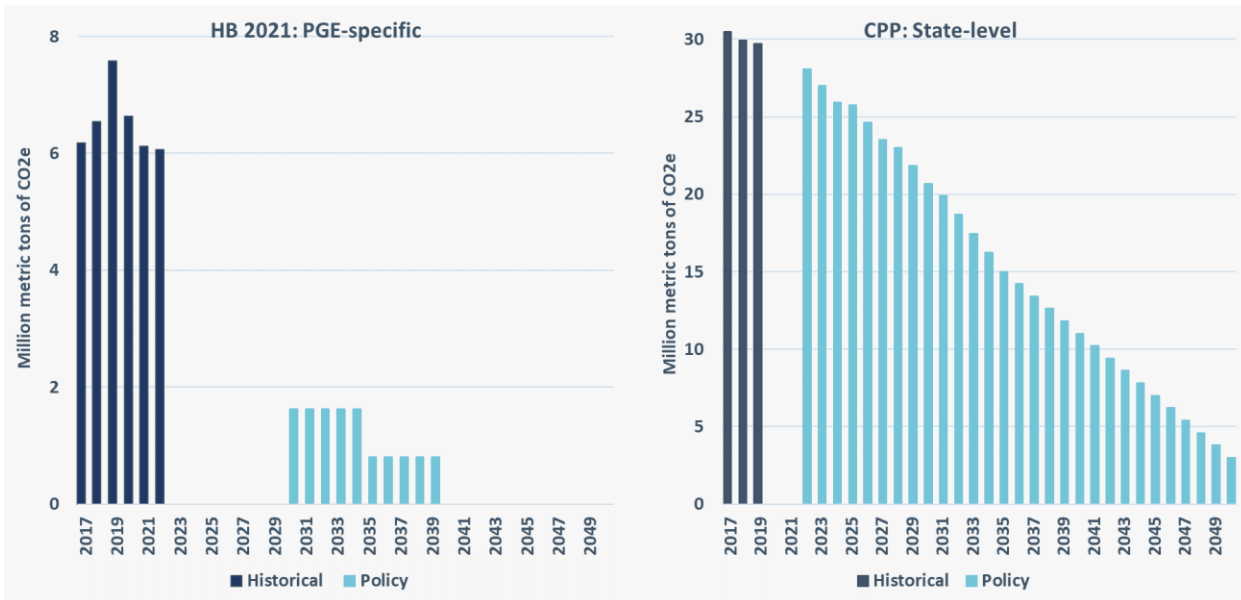
<sup>38</sup> ORS 469A.400 469A.475, amended by OR Laws 2021, Chapter 508, Section 29, available at: <https://olis.oregonlegislature.gov/liz/2021R1/Downloads/MeasureDocument/HB2021/Enrolled>

<sup>39</sup> Evolved Energy Research. (2022, August 15). Deep Decarb Study Update Technical Report. Portland General Electric Resource Planning. Retrieved February 14, 2023, available at: [https://assets.ctfassets.net/416ywc1laqmd/3KDEMrOpMkbjduyiBeen3z/88464626dbcd98c97f669289cb0dbd7d/EER\\_PG\\_E\\_Deep\\_Decarb\\_Study\\_Update\\_Memo\\_.pdf](https://assets.ctfassets.net/416ywc1laqmd/3KDEMrOpMkbjduyiBeen3z/88464626dbcd98c97f669289cb0dbd7d/EER_PG_E_Deep_Decarb_Study_Update_Memo_.pdf)

2017 by EER to include Oregon’s recent adoption of HB 2021 and ODEQ’s CPP.<sup>40</sup> The study found that while the CPP does not directly regulate the electric sector, end-use electrification is likely to be a key CPP compliance strategy in transportation and building sectors. Electrification will increase PGE’s total load (and corresponding resource requirements to meet HB 2021), but it will also create the opportunity to leverage flexibility from newly electrified loads like smart electric vehicle charging and water heating. As noted earlier, in **Section 4.2, Need Futures**, and **Section 6.10.2, Accelerated load growth sensitivity**, we consider a broad range of load growth scenarios to account for potential impacts of federal and state policy drivers of electrification.

A comparison of the emissions reduction goals of HB 2021 and the CPP is given in **Figure 16**.<sup>41</sup>

**Figure 16. Emission reduction goals HB 2021 and CPP**



<sup>40</sup> Evolved Energy Research. (2018, April 24). Exploring Pathways to Deep Decarbonization for the Portland General Electric Service Territory. Portland General Electric Resource Planning. Retrieved February 14, 2023, available at:

[https://assets.ctfassets.net/416ywc1laqmd/7tc4cXtpYgEOTM8my6rxsP/987f9f746e1bae5072204693a34c1b68/exploring-pathways-to-deep-decarbonization-PGE-service-territory\\_1\\_.pdf](https://assets.ctfassets.net/416ywc1laqmd/7tc4cXtpYgEOTM8my6rxsP/987f9f746e1bae5072204693a34c1b68/exploring-pathways-to-deep-decarbonization-PGE-service-territory_1_.pdf)

<sup>41</sup> PGE Deep Decarb Study available at:

[https://assets.ctfassets.net/416ywc1laqmd/7zH0ggWpupl16cMDeEGme5/46b024e14df63f3256a428c982f9708e/PGE\\_Deep\\_Decarb\\_Study.pdf](https://assets.ctfassets.net/416ywc1laqmd/7zH0ggWpupl16cMDeEGme5/46b024e14df63f3256a428c982f9708e/PGE_Deep_Decarb_Study.pdf)

### 3.1.4 Transportation electrification

The 2021 Legislature enacted House Bill (HB) 2165 to extend and improve Oregon’s electric vehicle (EV) rebate and support utility investment in electric vehicle infrastructure.<sup>42</sup> House Bill 2165 removes the 2024 sunset on Oregon’s EV Rebate program and makes other targeted changes to support underserved communities better. House Bill 2165 also requires PGE and Pacific Power to collect a charge set to 0.25 percent of the total revenues collected by the utility, at least half of which is to be spent on TE in underserved communities. The bill updates ORS 757.357 to clarify OPUC authority to allow utility cost recovery for TE infrastructure measures and recognizes that utility investment to support TE includes behind-the-meter infrastructure.

Oregon’s state agencies are also working to advance TE in response to Governor Brown’s Executive Order 20-04. In March 2021, the Oregon Environmental Quality Commission (OEQC) adopted revised Clean Fuels Program rules to increase the amount of clean fuels credits generated from EV charging, and the EQC has extended the Clean Fuels Program another 10 years to 2035. The EQC also adopted California’s Advance Clean Trucks rule that requires manufacturers of medium- and heavy-duty vehicles to sell a certain percentage of zero-emission vehicles and has adopted a similar standard for light-duty vehicles through the Advance Clean Cars II rule.

The Oregon Department of Transportation (ODOT) is working to implement the federal 2021 Infrastructure Investment and Jobs Act, which provides formula funds and flexible funds that ODOT plans to use to deploy EV charging across the state. The Department has announced more than \$100 million in combined state and federal funding for transportation electrification over the next five years.

These state efforts to support, fund and accelerate TE are expected to complement PGE’s utility- and Clean Fuels-funded programs. These policies are also expected to drive load growth from TE, as reflected in PGE’s load forecast. As noted earlier, in this IRP, we consider a broad range of load growth scenarios to account for potential impacts of federal and state policy drivers of electrification in **Section 4.2, Need Futures**, and **Section 6.10.2, Accelerated load growth sensitivity**.

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<sup>42</sup> HB 2165 (2021), available at: <https://olis.oregonlegislature.gov/liz/2021R1/Downloads/MeasureDocument/HB2165>

### 3.1.5 Energy efficiency and building decarbonization

Energy efficiency is an important resource for PGE to meet its decarbonization targets and helps customers save money in the process. House Bill (HB) 3141 was enacted in the 2021 session to enable the continuity of energy efficiency programs for PGE customers by modernizing and extending the Public Purpose Charge beyond its scheduled expiration.<sup>43,44</sup> The bill extends the Public Purpose Charge to 2035 from its current expiration in 2025. It removes energy efficiency funding from the Public Purpose Charge, moves it into rates, increases funding for low-income weatherization and modifies the existing renewables provision to include storage and grid optimization investments that enhance resilience, reliability and renewable power integration.

At present, multiple bodies receive and disburse funding for energy efficiency investments in Oregon, including the Oregon Health Authority (OHA), Oregon Housing and Community Services (OHCS), ODOE and Energy Trust of Oregon (ETO). OHA administers the Healthy Homes Program established in the 2021 Legislative session via House Bill (HB) 2842.<sup>45</sup> The program provides funds to assist low-income households in repairing and rehabilitating their residences. The funds can be used to maximize energy efficiency and make improvements to make a home more fire-resistant or seismically resilient, among other health and safety measures. OHCS administers the Low-Income Home Energy Assistance Program (LIHEAP), Low Income Weatherization Assistance Program (WAP) and the Multifamily Energy Program, and Weatherization Training and Technical Assistance (WX T&TA). ODOE administers the Heat Pump Incentive Program established by Senate Bill (SB) 1536 (2022), Energy Efficient Wildfire Rebuilding Incentive established by House Bill (HB) 5006 and the Energy Efficient Schools Program and works to shape codes and standards for the built environment.<sup>46,47</sup>

In the 2022 Legislative Session, the Legislature enacted the Emergency Heat Relief Bill (SB 1536), including an allocation of \$25 million to the ODOE to support the installation of heat pumps in the state through two distinct programs. The Heat Pump Deployment Program will support residential customers by providing grants directly to individuals to cover up to 100 percent of the cost of the purchase and installation of a heat pump. The grant funds can also be used to support related upgrades needed to support or enable the new heat pump,

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<sup>43</sup> HB 3141 (2021), available at: <https://olis.oregonlegislature.gov/liz/2021R1/Downloads/MeasureDocument/HB3141>

<sup>44</sup> More information about the Public Purpose Charge, available at: <https://www.oregonlegislature.gov/lpro/Publications/Public-Purpose-Charge-Background-Brief.pdf>

<sup>45</sup> HB 2842 (2021), available at: <https://olis.oregonlegislature.gov/liz/2021R1/Downloads/MeasureDocument/HB2842/Enrolled>

<sup>46</sup> SB 1536 (2022), available at: <https://olis.oregonlegislature.gov/liz/2022R1/Downloads/MeasureDocument/SB1536/Enrolled>

<sup>47</sup> HB 5006 (2021), available at: <https://olis.oregonlegislature.gov/liz/2021R1/Downloads/MeasureDocument/HB5006/Enrolled>

including new or upgraded electrical panels, weatherization and upgrades to improve the airflow of the home. The bill also establishes a residential heat pump program that will provide rebates to contractors for the “purchase and installation of air-source or ground-source heat pumps” for residential customers, not to exceed 60 percent of the purchase price. Since 2002, ETO has administered energy efficiency programs for industrial, commercial and residential sectors on behalf of, and in collaboration with, utility funders. PGE and ETO have realized conservation, on average, of greater than 30-megawatt average (MWa)/annually for the past 10 years and at a levelized cost of energy (LCOE) of less than \$0.0375/kWh. In the 2021 Legislative Session, the Legislature enacted HB 3141 which maintained funding levels for OHCS low-income weatherization, low-income affordable housing and energy conservation in schools while tying energy efficiency funding to the cost-effective amount available as determined through planning.

House Bill 3141 required greater budgeting coordination between utilities and ETO. PGE and ETO are now identifying opportunities to leverage programmatic funding as well as other sources of funding to. Coordinated programmatic efforts between ETO and PGE can improve our collective efforts to manage deployment dollars and stack incentives and benefits of both energy efficiency and flex load to enhance grid reliability. In addition to enabling flexible resources that may be called upon to support decarbonization targets and address both equity and grid constraints via non-wires solutions, energy efficiency investments serve to enable beneficial electrification, which has the potential to foster beneficial load growth and stabilize rates.

Given that the 2022 Federal Inflation Reduction Act (IRA) will provide tax credits, incentives and loans for energy efficiency investment, we are also working closely with the ODOE as we collectively work to leverage activity to help those facing energy cost challenges to attract and deploy federal energy efficiency funding dollars.

### 3.1.6 Local climate action planning

Nine cities and counties served by PGE have already established climate-related goals through community processes and plans, and at least four more are in the process of developing plans. These plans typically cover a variety of goals and objectives, including those concerning greenhouse gases, energy use, transportation, waste, land use, health and safety, and economic development. **Table 5** captures a list of local governments with existing plans (or in some phase of developing one) and some key electricity and emissions goals.



**Table 5. Local governments’ climate action plans**

Local government	Emissions Goals	Plan under development
<b>Beaverton</b>	Net zero emissions from electricity by 2035; 100% reduction of GHGs by 2050	
<b>Clackamas County</b>		X
<b>Gresham</b>		X
<b>Hillsboro</b>	General initiative to reduce carbon emissions	
<b>Lake Oswego</b>	Net zero emissions from electricity use in buildings by 2035; Carbon neutrality by 2050	
<b>Milwaukie</b>	Net zero emissions from electricity by 2030; Carbon neutrality by 2045	
<b>Multnomah County</b>	100% renewable electricity by 2035	
<b>Portland</b>	100% renewable electricity by 2030; 50% emissions reduction by 2030; carbon neutrality by 2050	
<b>Salem</b>	50% emissions reduction by 2035 and carbon neutrality by 2050	
<b>Sandy</b>	Carbon neutrality by 2050	
<b>Silverton</b>	100% carbon free electricity for City buildings	
<b>Tigard</b>		X
<b>Tualatin</b>		X
<b>West Linn</b>	50% reduction in buildings by 2040; 100% reduction in transportation by 2040	

Several cities and counties have timelines for their decarbonization goals that align with our HB 2021 targets. For those local governments that want to decarbonize on a faster timeline, PGE’s Green Future Enterprise and Green Future Impact are being used to support clean energy goals. Many of our large commercial and industrial customers also use these and other programs to meet their decarbonization goals.

PGE has been working with local governments since 2020 to develop a community-supported renewable program to support those local governments that have adopted

community-wide climate goals. During the 2021 legislative session, PGE worked in partnership with several of our local governments to pass language within HB 2021. The program will allow local governments to work with PGE to accelerate the procurement of non-emitting energy to meet their climate goals. Since the bill's passage, PGE staff have been meeting regularly with local governments to solicit feedback on the design so that the program will meet their goals and desired approach. As PGE continues to engage with local governments, collectively we will determine the right time to file the tariff to support the program.

### 3.1.7 Regulatory policy: Direct access

Oregon Electricity Service Suppliers (ESSs) have their own clean energy targets as part of House Bill (HB) 2021 Section 3(1) and are responsible for decarbonizing the electricity sold to direct access customers. IRP guideline 9 does not allow PGE's resource planning to include customers that have elected to receive their power through direct access from an ESS, even though PGE retains the responsibility of Provider of Last Resort. To be eligible for direct access, nonresidential customers must have a facility capacity of at least 250 kW and an aggregate load of 1 MWa. This direct access option was initiated in 1999 with the passage of Senate Bill (SB) 1149, "[r]elating to restructuring of electric power industry." The legislature's goals, articulated in the preamble, took into "consider[ation] national trends toward electric deregulation" at the time.<sup>48</sup>

Senate Bill (SB) 1149 included the provisions for direct access, which was defined as "[...] the ability of a retail electricity consumer to purchase electricity and certain ancillary services, as determined by the commission for an electric company [...], directly from an entity other than the distribution utility."<sup>49</sup> These are the entities known as ESSs. Much has changed since the passage of this deregulation law, particularly Oregon's greenhouse gas reduction goals to address climate change.

The design of the various direct access offerings has largely been left to the discretion of the Commission. PGE began offering a one-year direct access/market price option effective March 1, 2002, consistent with legislative provisions.<sup>50,51</sup> In the 2003 service period, PGE added the option for eligible customers to opt out of cost-of-service energy supply for a minimum of five years (long-term direct access) with a pre-specified transition adjustment

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<sup>48</sup> Oregon Laws 1999, Chapter 865, available at: [https://www.oregonlegislature.gov/bills\\_laws/lawsstatutes/1999orLaw0865.html](https://www.oregonlegislature.gov/bills_laws/lawsstatutes/1999orLaw0865.html)

<sup>49</sup> *Id.*, at Section 1(6).

<sup>50</sup> *Id.*

<sup>51</sup> HB 3633 (2001), available at: [https://www.oregonlegislature.gov/bills\\_laws/archivebills/2001\\_EHB3633.pdf](https://www.oregonlegislature.gov/bills_laws/archivebills/2001_EHB3633.pdf)

fee.<sup>52</sup> PGE's long-term direct access program has a cap of 300 MWa.<sup>53</sup> In 2020, PGE launched a new large load direct access option capped at 119 MWa, allowing customers with a "new load" (uncommitted to PGE and expected to grow to 10 MWa or more over three years) to avoid cost-of-service (PGE Schedule 689).<sup>54</sup> These direct access caps are essential to help mitigate the potential for cost shifting.

The Commission began an investigation into IRP requirements in 2002.<sup>55</sup> Five years later, the Commission adopted IRP Guideline 9 relating to the treatment of direct access loads: "[a]n electric utility's load-resource balance should exclude customer loads that are effectively committed to service by an alternative electricity supplier."<sup>56</sup> The Commission believed that long-term direct access customers are "[...] 'effectively committed to service' under direct access and should be excluded from the IRP load-resource balance over the planning horizon."<sup>57</sup> This has led to a situation where the Commission has limited insight into the extent that ESSs plan to serve their loads reliably, while electric utilities cannot plan for long-term direct access customers. As Commission Staff have observed, "IOUs don't plan for long-term opt-out customers, while ESSs generally have short-term contracts with the opt-out customers [...] the mismatch between contract length, and resource lifecycles could lead to a situation where no entity is planning for the RA of long-term opt-out customers absent Commission intervention."<sup>58</sup> At the end of the September 2022 long-term direct access election window, approximately 11 percent of PGE's net system load had opted out of cost-of-service supply.

The Commission opened an investigation into long-term direct access in 2019, focusing on resource adequacy, the costs and benefits of direct access and lessons learned from other states.<sup>59</sup> At the beginning of 2021, a separate proceeding was opened to specifically investigate the topic of resource adequacy in Oregon (see **Chapter 4, Futures and**

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<sup>52</sup> Transmission Access Service Schedules: 485 Large Nonresidential Cost of Service Opt-Out (201-4,000 kW); 489 Large Nonresidential Cost of Service Opt-Out (>4,000 kW); 490 \*Sch 490 must aggregate to >30MWa. This change became effective May 9, 2022, with UE 394\*. Large Nonresidential Cost of Service Opt-Out (> 4,000 kW and Aggregate to >100 MWa). These all have a Minimum Five-Year Option and a Fixed Three-Year Option.

<sup>53</sup> In ADV 02-17 when we filed the first Sch 483. It had been discussed in a workshop for AR 441 and parties discussed the 300MWa in a workshop but decided it shouldn't be in the rules but should be included in the rate schedule.

<sup>54</sup> See PGE Schedule 689, New Large Load Cost of Service Opt-Out (>10MWa), available at: [https://assets.ctfassets.net/416ywc1laqmd/1Cpia6NCTgU4OMLbqcru7J/52d5f28218bf70eb66366a9d677f682f/Sched\\_689.pdf](https://assets.ctfassets.net/416ywc1laqmd/1Cpia6NCTgU4OMLbqcru7J/52d5f28218bf70eb66366a9d677f682f/Sched_689.pdf)

<sup>55</sup> *In the Matter of Public Utility Commission of Oregon, Investigation Into Integrated Resource Planning Requirements*, Docket No. UM 1056 (Jul 26, 2002), available at: <https://apps.puc.state.or.us/edockets/docket.asp?DocketID=10081>

<sup>56</sup> Docket No. UM 1056, Order 07-002 at 19 (Jan 8, 2007), available at: <https://apps.puc.state.or.us/orders/2007ords/07-002.pdf>

<sup>57</sup> *Id.*

<sup>58</sup> *In the Matter of Public Utility Commission of Oregon, Investigation Into Resource Adequacy in Oregon*, Docket No. UM 2143, Staff Report at 9 (Mar 24, 2022), available at: <https://edocs.puc.state.or.us/efdocs/HAU/um2143hau154059.pdf>

<sup>59</sup> *In the Matter of Alliance of Western Energy Consumers, Petition for Investigation Into Long-Term Direct-Access Programs*, Docket No. UM 2024, ALJ Ruling issued February 21, 2020, adopting phasing proposal, Attachment A, available at: <https://edocs.puc.state.or.us/efdocs/HDA/um2024hda12440.pdf>

**uncertainties**).<sup>60</sup> In addition to this investigation, Oregon investor-owned utilities and some ESSs are committed to the binding phase in the Western Power Pool's Western Resource Adequacy Program (WPP WRAP), as discussed in **Section 3.2, Regional planning: resource adequacy**.

The Commission's investigation into long-term direct access led to an Informal Rulemaking in October 2021 aimed at narrowing the scope of issues under consideration.<sup>61</sup> Topics included the definition of non-bypassability (ensuring customers cannot avoid shared public policy costs by taking direct access), how to calculate a non-bypassable charge, the utility's role as the provider of last resort (PGE is required to serve direct access customers should an ESS fail) and rules for implementation of HB 2021 for ESSs. The Commission moved into Formal Rulemaking in October 2022, focusing initially on addressing provider of last resort risk. Stakeholders are currently exploring the option of preferentially curtailing (disconnecting) a direct access customer if they return to the utility at short notice and there is insufficient power to serve them.

### 3.1.8 Regulatory policy: Power cost adjustment mechanism (PCAM)

The PCAM framework is a central element of PGE's process to adjust customer rates to recover variance in power cost compared to the annual forecast. The PCAM allows for collection from, or refund to, customers of the power cost variance subject to power cost deadbands, sharing and earnings deadbands.

The current PCAM structure was adopted for PGE in 2007.<sup>62</sup> It originated from a Commission-established set of principles envisioned to ensure a well-designed PCAM and an appropriate balance of power cost forecast risk between PGE and customers. Sixteen years later, the circumstances to which PGE is exposed have changed significantly with respect to a changing resource mix, the impacts of climate change and changing wholesale market dynamics.

With the requirements of HB 2021, PGE's energy supply portfolio is shifting from predominantly high capacity, base load and dispatchable generation to a portfolio composed of increasing amounts of non-dispatchable and variable renewable energy resources. The renewable resource additions to PGE's and the region's supply portfolios

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<sup>60</sup> Docket No. UM 2143, *Investigation into Resource Adequacy in the State*, available at: <https://apps.puc.state.or.us/edockets/DocketNoLayout.asp?DocketID=22698>

<sup>61</sup> Docket No. AR 651, *In the Matter of Rulemaking Access Including HB 2021 Requirements*, Public Utility Commission of Oregon (Oct 1, 2021), available at: <https://apps.puc.state.or.us/edockets/docket.asp?DocketID=23063>

<sup>62</sup> See OPUC Order No.07-015 (Jan 12, 2007), available at: <https://apps.puc.state.or.us/orders/2007ords/07-015.pdf>

have been primarily wind generation (and some solar), which presents unique challenges with respect to predictability and coincidence with critical peak load conditions.

PGE's service area has experienced the impacts of climate change with increased frequency and magnitude of extreme weather events. Increasingly frequent severe weather events in peak months have resulted in a shift to energy demand with system record-setting loads experienced in 2021 and 2022 for utilities across the Western Interconnection.

These load excursions, coupled with the resource intermittency and the somewhat negatively correlated nature of most variable energy resources in the regional energy stack to high demand conditions caused by extreme weather, have stressed regional resource adequacy and exacerbated volatility in the market. During these events, PGE must serve higher load requirements and replace previously expected wind energy generally unavailable during very cold or hot temperatures.

Collectively, these changes increase the degree of power cost variability and create conditions that become difficult to predict or forecast. The frequency, duration and magnitude of disruptive events have led (and will continue to lead) to higher variability and extreme levels of power cost outcomes around any baseline forecast established initially in rates. PGE expects these circumstances to continue and potentially intensify as climate change drives more frequent severe weather events and we transform the energy system to achieve the decarbonization targets of 2030 and beyond. Regulatory policy can (and should) adapt to changing dynamics. Changing capacity constraints, load profiles, decarbonization policy and scarcity pricing necessitate revisiting the original PCAM principles and structure.

## 3.2 Regional planning: resource adequacy

Resource adequacy refers to planning to have enough resource generation, efficiency measures and demand-side resources to serve loads across a wide range of conditions with a sufficient degree of reliability.<sup>63</sup> Planning to be resource adequate is especially important as the region decarbonizes, as increasing penetrations of variable energy resources and retiring coal plants occur against a backdrop of increasingly extreme and unpredictable weather events. As states across the Western Interconnection decarbonize in response to state or utility-specific mandates or targets, resource adequacy increasingly depends on regional coordination.

The Western Power Pool (WPP) began gathering information about the need for a regional resource adequacy program in 2019, finding "[t]he impending retirement of several thermal

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<sup>63</sup> For example, NARUC Resource Adequacy Primer for State Regulators, July 2021, defines the resource adequacy long-term (years, months) planning focus as being "[a]ble to meet demand with sufficient supply side and demand-side resources", p.5., available at <https://pubs.naruc.org/pub/752088A2-1866-DAAC-99FB-6EB5FEA73042>.

generators within and outside the region (the Western US and Canada) mixed with increasing variable energy resources (VERs), has led to questions about whether the region will continue to have an adequate supply of electricity during critical hours.” These efforts led to the formation of the Western Resource Adequacy Program (WRAP), which began implementing a voluntary, non-binding (no penalties) program in October 2021. The earliest binding (charges for failure) season is scheduled for Summer 2025 (with participants providing an advanced ‘forward showing’ of their resource adequacy positions for that season in October 2024). Twenty-six load-responsible entities across 10 states and one Canadian province currently participate in WRAP development.

The WPP WRAP includes a forward-showing planning mechanism to identify the collective capacity needed to meet a 1-day in 10-year loss of load expectation (LOLE) target. The forward showing requires participants to plan and submit a portfolio of resources seven months ahead of operational need and will not replace the multi-year IRP planning process. PGE’s IRP and the WPP WRAP use different methodologies, footprints and timeframes to assess capacity adequacy, currently leading to differing resource effective load-carrying capabilities (ELCCs) and other capacity-critical hours. The OPUC’s investigation into resource adequacy could lead to a state-level framework that bridges the WRAP and IRP.

The forward showing aims to provide reliability benefits through consistent metrics and methodologies while providing increased visibility and transparency. PGE will still be responsible for determining what resources to procure from other participants and suppliers. Participants will demonstrate compliance with forward-showing reliability metrics seven months before binding seasons (summer and winter). They will be given three months to cure any resource adequacy planning deficiencies. The program will calculate the required planning reserve margin (PRM) to meet the LOLE target for each month of the binding seasons. Participants will then be required to show they have adequate resources (specified generation and contracts backed by specified generation) and enough firm transmission to meet their P50 (median) load plus the PRM during the months of the binding seasons. The charge for noncompliance and failure to cure the inadequacy will be based on the cost of new entry for a gas peaking plant.

At the end of 2022, PGE, along with a majority of other participating load-responsible entities, committed to continued support for the WPP FERC Tariff (rules of program, governance), which was filed in August 2022 and approved February 2023.

At the state level, the OPUC opened an investigation into resource adequacy in January 2021.<sup>64</sup> Throughout 2021, a state-level resource adequacy framework straw proposal was developed to complement the regional efforts in the WPP WRAP. The state framework would

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<sup>64</sup> See *Investigation into Resource Adequacy in the State*, Docket No. UM 2143, Order 21-014 (Jan 13, 2021), adopting Staff Report with Appendix A, available at: <https://apps.puc.state.or.us/orders/2021ords/21-014.pdf>

be mandatory for Oregon electric investor-owned utilities and ESSs, require forward showing of resource adequacy more than seven months ahead of a season (to enable time for physical resources to be built), and could be in place sooner than a binding WPP WRAP (set to go binding no earlier than 2025).<sup>65</sup> This would bring ESSs more into line with what utilities like PGE already undertake in IRPs, providing the Commission with visibility into how direct access loads are being planned for to ensure resource adequacy. OPUC Staff and stakeholders resumed consideration of this state framework in the fourth quarter of 2022. The current potential schedule could see rules in place by mid-2023.

### 3.2.1 Resource adequacy in the IRP compared to the WRAP

As discussed in the previous section, PGE is participating in the WPP WRAP. Binding participation (with penalties for failure) can occur no earlier than Summer 2025, with a forward showing of resource adequacy seven months ahead in October 2024. As PGE prepares for binding participation in the WRAP, it is necessary to consider how the IRP and WRAP may need further alignment to avoid future conflicts. Lawrence Berkeley National Laboratory (LBNL) identified four key IRP assumptions that will be impacted by participation in regional resource adequacy programs like the WRAP: reliability targets; resource capacity accreditation; transmission assumptions; and load forecasting.<sup>66</sup> Even with participation in the WRAP, it is important to note that the IRP still defines the resources that PGE can use to meet capacity needs, reliability and emissions targets.

The WRAP has adopted the resource adequacy standard of one event in 10 years LOLE, while PGE's IRP uses a one day in 10 years LOLE as a reliability metric. These reliability targets will need to come into closer alignment as utilities approach binding participation in a regional resource adequacy program. If PGE's IRP resource adequacy target led to a lower capacity need than the WRAP, there is a risk of being modeled as adequate at the balancing-authority level but not at the regional level. This could lead to the utility having to justify additional investments outside its acknowledged Action Plan. States and the WRAP will likely need to reach a consensus around reliability targets for use in state-level IRP planning.

The assignment of a capacity credit to a resource will also need to be more closely aligned between the IRP and the WRAP before participation in the regional resource adequacy program becomes binding. WRAP uses a variety of resource-specific methodologies to calculate the qualifying capacity contribution of a participant's generation resources during

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<sup>65</sup> Docket No. UM 2143, Staff's Process Proposal and RA Solution Straw Proposal, filed October 15, 2021, available at: <https://edocs.puc.state.or.us/efdocs/HAH/um2143hah145744.pdf>

<sup>66</sup> Juan Pablo Carvallo, Nan Zhang, Benjamin D. Leibowicz, Thomas Carr, Maury Galbraith, Peter H. Larsen. *Implications Of A Regional Resource Adequacy Program On Utility Integrated Resource Planning*, Energy Analysis and Environmental Impact Division, Lawrence Berkeley National Laboratory. November, 2020, available at: [https://eta-publications.lbl.gov/sites/default/files/ra\\_paper\\_1\\_-\\_final\\_version.pdf](https://eta-publications.lbl.gov/sites/default/files/ra_paper_1_-_final_version.pdf)

the region's capacity critical hours. PGE's IRP calculates the capacity contribution of individual resources using a stochastic model that optimizes resource generation to achieve a reliability objective. If an IRP relies on a different resource capacity accreditation methodology than that used regionally, there is a risk of different outcomes between state and WRAP adequacy assessments. A potential solution is for states and the WRAP to agree on capacity contribution values and incorporate them into IRPs.

The WRAP also considers the deliverability of power when determining a participant's resource adequacy. Any assumptions around transmission expansion should be consistent at both the IRP and the regional level, requiring increased coordination and information sharing between WRAP participants. There will also likely need to be increased standardizing on risk assumptions in load forecasts to avoid participants leaning on utilities that hedge more against forecast uncertainty.

PGE looks forward to working with WRAP participants and state regulators to ensure that state-level IRPs complement and work in harmony with regional resource adequacy programs.

## 3.3 Market, labor and supplier dynamics

The broader macroeconomic environment in the years following our 2019 IRP remains highly dynamic. While **Chapter 4, Futures and uncertainties** discusses a wide range of critical uncertainties addressed in IRP modeling directly, this section discusses additional trends contributing to market instability that impact PGE. Geopolitical unrest continues to contribute to volatile fuel markets and rising power costs for utility customers. Nationally and in Oregon, inflation remains high, labor markets are tight and the specter of economic recession looms. At the same time, PGE is experiencing highly localized growth in key areas of our service area. This imparts additional pressures on the transmission system, which is already highly constrained, as discussed in detail in **Chapter 9, Transmission**, and **Section 11.1.7, Transmission constraints**. Economic uncertainty, transmission constraints and labor and supply chain shortages may impact PGE's pace of acquisition and integration of non-emitting resources in the years ahead.

### 3.3.1 Localized load growth

Demand for data center capacity has grown exponentially across the globe and in the United States in the last 10 years, driven by factors such as the need for computing power, cloud and software-as-a-service offerings and entertainment. During that same time, certain areas of the PGE service area have become prime locations for data center siting. According to Cushman & Wakefield's 2023 Global Data Center Market Comparison, the Portland market jumped to a



tie for first place in the overall global standing this year.<sup>67</sup> We are seeing a rapid expansion of hyperscale activity in the Washington County submarket from new entrants and existing customers due to access to the Transpacific cable landing, relatively favorable pricing, sustainability options, low environmental risk, access to power and available land. This contrasts with primary markets, such as Northern Virginia and Silicon Valley, seeing power and land constraints.

In addition to data center demand, Oregon is a global leader in semiconductor manufacturing and R&D. Fifteen percent of US semiconductor manufacturing takes place in PGE's service area, with Hillsboro supporting the largest concentration of integrated device manufacturers and semiconductor innovation in Oregon. With the Federal Government's 2022 passing of the CHIPS & Science Act, billions of dollars of federal incentives have been made available to help spur unprecedented domestic investment in semiconductor manufacturing and development. Oregon is vying to bring its share of that investment to the state for the benefit of local jobs and economic development. It is anticipated that much of that investment will focus on the region PGE serves, particularly the North Hillsboro semiconductor ecosystem. Specifically, the Oregon Semiconductor Competitiveness Task Force has recommended the addition of two 500-acre parcels of land in the N. Hillsboro and North Plains area to support the location of major new semiconductor manufacturing facilities.

With both trends described previously, PGE is projecting significant hyper-local growth and surging electricity demand in these geographic areas. PGE is proud to have supported enormous business growth in Washington County and the Hillsboro area for many years, helping to pave the way for new jobs, revenue streams and opportunity for the state. To meet this continued rapid demand growth, PGE is working diligently to increase infrastructure capacity by collaborating with industry, stakeholders and customers to benefit Oregon's economy. These efforts include:

- Advancing more than a dozen transmission projects with significant involvement of local governments and jurisdictions, including the Bonneville Power Administration (BPA);
- Actively engaging with BPA to increase transmission capacity by collaborating to accelerate upgrades and reinforce key substations and transmission lines along our 230 kilovolt (kV) and 500kV systems. We are also working with BPA to identify new options for incremental capacity;

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<sup>67</sup> Information about the Global Data Center Market Comparison is available at: <https://www.cushmanwakefield.com/en/insights/global-data-center-market-comparison>

- Engaging residential and commercial customers to add value to the grid by participating in programs that compensate customers for lending their flexibility to the operation of the grid; and
- Deploying grid edge technologies such as remote sensors, dynamic line ratings and the use of advanced conductor materials.

At the time of the writing of this IRP, demand forecasts for North Hillsboro are being reviewed to ensure PGE is working from the most accurate load forecasts possible. We are working to understand customer timelines and flexibility, particularly around load delivery during peak usage times, to respond to new large load requests.

### 3.3.2 Workforce availability

Oregon's transition to the clean energy future will require investments in thousands of megawatts of new non-GHG-emitting resources and the people to build them. Oregonians are not unique in their desire for clean energy along the West Coast, which will lead to competition for the existing workforce to build those resources. Recognizing the need to be proactive, in mid-2022, PGE convened the Oregon Clean Energy Workforce Coalition (OCEWC). The OCEWC is a statewide coalition that includes utilities, renewable developers, unions, workforce investment boards, state agencies, pre-apprenticeship programs, local and regional governments, education providers and community-based organizations. The collective mission of the OCEWC is to build the clean energy workforce pipeline by intentionally engaging with historically underrepresented populations in the energy sector, including women and people of color. Ensuring the workforce pipeline will be able to meet the demand for clean energy will require all stakeholders to work together to support investments in pre-apprenticeship programs and educational awareness about the availability of jobs within the sector.

### 3.3.3 Supply chain

Like other electric companies nationwide, PGE continues experiencing delays in securing the material needed for development, maintenance and reliability.

These delays continue to be driven by material availability, labor constraints, shipping and transportation issues, increased construction demand and extreme weather, all exacerbating factors.

The situation is dynamic and is expected to continue. Therefore, we've taken these steps:

- We continue to take steps to alleviate the shortage impact on customers by delaying non-critical work, seeking new sources and adjusting material on order.

- We are working with industry organizations (like the Edison Electric Institute) and partners to advocate for measures to help address the shortage of critical materials.
- Partnering with distributors and manufacturers to increase forecasting and material ordering.

We will continue exploring options toward finding a solution to these issues.

### **3.3.4 Department of Commerce investigation into solar tariff circumvention**

On January 23, 2018, then President Trump placed tariffs on imported solar cells and modules (PV panels) from China. The tariff level was set at 30 percent, with a 5 percent decline rate per year over the four-year term of the tariff. On February 4, 2022, President Biden extended the tariffs another four years but made an exemption for bifacial panels (two-sided panels used predominated in the utility-scale solar market segment).

On March 28, 2022, the US Department of Commerce (US DOC) announced a year-long investigation, which was prompted by a February 2022 petition from US company Auxin Solar, into whether imports of solar panels from Southeast Asia (specifically Cambodia, Malaysia, Thailand and Vietnam) are circumventing the tariffs in place against China. The investigation could result in retroactive tariffs of up to 240 percent. Despite President Biden's exemption for bifacial panels in the tariff extensions, the investigation would impact all developments that involve crystalline silicon photovoltaic (CSPV) cells. About 80 percent of panels installed in the US in 2021 came from the four countries under investigation.

The US DOC announced its preliminary determination in December 2022 that four of the eight companies being investigated were attempting to circumvent the existing tariffs through each of the four Southeast Asian countries. The US DOC is scheduled to release a final determination, including the assessed duties, on May 1, 2023. President Biden issued a proclamation on June 6, 2022, which suspended the solar tariffs for two years. Therefore, duties cannot be collected on any solar import until June 2024.

The PV panel supply chain is likely to continue to experience disruption. Given the large share of PV panels originating in the Southeast Asian market, US-based developers may not find adequate supplies of replacement panels from other countries of origin. The limited supply of North American manufacturing capacity is largely sold through 2023, limiting the potential for alternative domestic supply to backfill Southeast Asian equipment. Amidst this supply chain disruption, solar developers are faced with disrupting choices, including 1) importing Southeast Asian panels and facing exposure to retroactive penalties, 2) sourcing panels from more expensive countries of origin, including China, whose PV panels are subject to ongoing tariffs, 3) waiting for the US DOC investigation to resolve.

