To: Public Utility Commission and Staff

From: Elizabeth Graser-Lindsey Elizabeth Graser-Lindsey
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Date: April 27, 2023

Re: PGE CEP/IRP Report filed in Docket No. LC 80

In the interest of Oregon's low-risk and low-cost goals for electricity, PGE needs to take the front-loaded path in emission declines (the front-loaded decarbonization glide path) rather than the linear path in emissions decline (linear decarbonization glide path).

Figure 78. Decarbonization glidepath portfolios

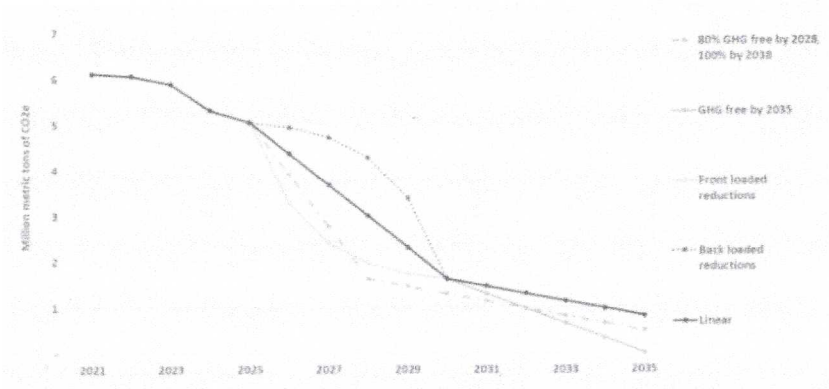


Figure 79. Cumulative emissions 2024-2043, accelerated decarbonization glidepath portfolios

The front-loaded emission reduction is the lightest gray between 2026 and 2030. Fig. 79 p. 262.

There are a variety of reasons for this:

- We all know: "If you want to be on time, be early." And, if we want to go to a new destination we have never been before, we leave extra time. Moving from primarily fossil-fuel electricity to 100% clean takes PGE into unexplored territory. It is difficult to project and it is risky to extrapolate into the upcoming years of rapid change (after years of relatively slow change); the future years have no precedent and poor predictability.

  Widespread electrification of cars, households and industry will accelerate demand more rapidly that PGE's initial projections especially when Oregon and surrounding states selected close deadlines for ending the sale of fossil-fuel-powered cars. Rapid development of clean energy, storage and transmission capacity must occur at expected rates with expected availability and cost. New technologies must be developed.

It is predictable that PGE will encounter unanticipated obstacles to the transition and lots of unexpected detours along the way. Front-loading gives the necessary flexibility to deal with obstacles and devise solutions without being short of suitable clean energy.

- The easiest part of the emission reduction is steadily adding clean energy which is what PGE plans to do through 2030 and beyond. The more difficult part of the emission reduction is in the final years when PGE eventually no longer provides natural-gas electricity to its customers in 2040. Leaving the most difficult part until the end is a risky proposition. Taking the front-loaded emission glide path AND detaching it from the linear curve at 2030 and attaching it to the linear path at 2040 – that is, remaining front-loaded through 2040 rather than going to linear at 2030 – would greatly reduce the risk of failing to meet the Clean Energy Goals while providing enough electricity and enough reliability to its customers.

- A graph shown to the IRP monthly Roundtable recently (likely early April – the meetings are no longer posted) indicates that after 2030 electricity prices will go up much faster than before 2030 presumably as PGE works to move past reliance on the five natural gas plants. (The graph showed a short segment – likely a year or two – of the electric prices after 2030; this segment gave the direction and slope of price). To manage risk, this graph should be fully shown. To avoid the costly and risky rapid price escalation after 2030, the front-loaded emission reduction gets PGE on the safer/less risky path for our future.

- PGE's consideration of risk quantifies some risk, but misses other real risk factors that are likely to increase over time. Some examples are: (1) Competition for clean energy with other electric utilities across western states with similar rapid transition targets as well as competition for ground to place solar installations ideally near limited transmission lines makes the assumption that clean energy will be easy to locate and will cost less in the future risky. Solar installations are now fully or partially prohibited in some Oregon counties such as Yamhill and Marion and in some Washington counties such as Yakima and Klickitat County and elsewhere. Front-loading reduces these risks possibly keeping Oregon ahead of the competition for ground and locked-in contracts. (2) Barriers exist to developing needed transmission lines e.g. public opposition and/or litigation, time constraints; recession, federal debt and inflation; national emergencies like pandemics and war. (3) Over time the need for climate mediation and adaption might make Oregon farmland more precious for producing local food (to avoid long-distance shipping) than for producing energy. These are highly-likely risks that haven't been quantified.

- PGE's approach to cost ignores and denies the realities just described i.e. that the easy locations will be taken early on ("the low-hanging fruit") leaving later development of clean energy to be more costly (just like fossil fuel extraction becomes more deep or more difficult as time goes by). PGE explains how its analysis approach has a built in favoring of delay:

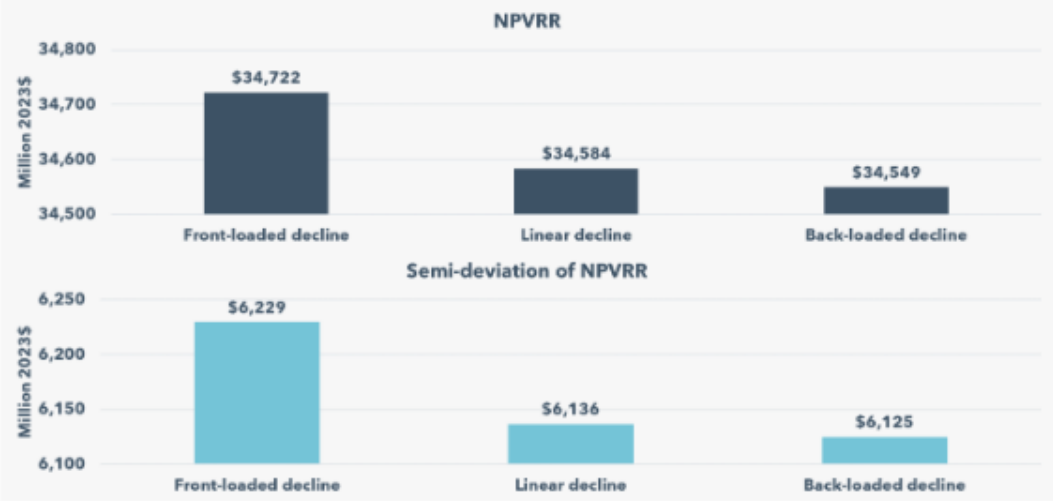
  > "The increase in cost is driven by the earlier resource additions required for early attainment. This increases costs due to two factors; the **discounting** of values in the calculation of net present value revenue requirement (NPVRR), which **weighs the impact of near-term costs more heavily than costs accrued later in time**, and the **declining cost curves of new resource options**… seen in the comparison between 'Back-loaded decline' and "Front-loaded decline'…" (bold added) p. 264

  These two factors defy reality: Even if solar panels became a bit cheaper and more available over time, optimal land locations won't. Discounting that weights the cost of near-term contracts, for example, more heavily than later contracts doesn't work on transmission line capacity which has become nearly unavailable and discounting may not work on solar or wind contracts in a highly competitive environment of multiple states seeking increasing amounts of new clean energy simultaneously. PGE's biases against near-term action need to be abandoned in favor of facing the realities of this period of transition. PGE needs to demonstrate how costs will be affected for front-loaded compared with linear as it **reverses its discounting** and **switches to a mark up on delays** to account for the anticipated highly competitive environment and an increasing cost curve for ground.

- (PGE's NPVRR and semi-deviation of NPVRR bar graphs exaggerate the differences between the portfolios by the use of truncated bars – to show just the

tip of the bar graph – and then a stretched vertical axis on the graphs.)

Figure 82. Cost and risk of accelerated decarbonization glidepath portfolios



p. 265
The risk differential is small, so the unquantified risks, mentioned in previous bullets, are likely to exceed the unspecified, but quantified, risks. If all the risks could be quantified properly, the front-loaded option would be the more rational preferred option.

- The global transition to clean electricity is susceptible to needing to accelerate as the science of climate change becomes clearer. We got just such a warning in the March 2023 IPCC report: “Humanity is on thin ice – and that ice is melting fast,” **United Nations Secretary-General Antonio Guterres** said. “Our world needs climate action on all fronts – everything, everywhere, all at once.” Stepping up his pleas for action on fossil fuels, Guterres **called for rich countries to accelerate their target for achieving net zero emissions** to as early as 2040… about a decade earlier than most current targets. He also called for them to stop using coal by 2030… **and ensure carbon-free electricity generation in the developed world by 2035**, meaning no gas-fired power plant either.” From the *Oregonian*, https://enewspo.oregonlive.com/data/32253/reader/reader.html?#!preferred/0/package/32253/pub/52467/page/1/article/1581030