

So, while focused naturally on Boardman, we urge the Commission to consider the larger climate goals established by the State when acknowledging the Plan. Closing Boardman is an important first step (and conversely, *not* closing Boardman would be a serious obstacle to meeting those goals.), but by itself would pretty much only stabilize current CO2 emission levels. We need to also begin working on a truly comprehensive plan that reduces those emissions significantly for the next IRP round.

PGE's Oregon-compliant plan in this IRP relied upon a nuclear plant that PGE acknowledged was not really actionable. We are confident that active engagement of Staff, PGE, ODOE and other parties can develop a better Oregon-compliant portfolio. It might also be appropriate to seek out a third-party consultant to assist in this process.

In developing a portfolio that meets Oregon's climate goals, we note that the Company's risk metrics actually place no weight on CO2 emissions. As noted in our opening comments (pp.15-16), by averaging portfolio scores of high and low carbon cost scenarios, PGE's risk metric essentially cancels out carbon risk. Given that the risk of not controlling GHG pollution is highly asymmetric, we should not be weighting low and high cost carbon scenarios equally.

Recommendation 2 -- The Commission should require that future IRPs make addressing the state's carbon reduction goals a critical and well-vetted component of portfolio testing and include a risk metric that measures CO2 emissions directly.

PGE's 2040 backstop plan should not be acknowledged

The NW Energy Coalition strongly supports a strategy to close Boardman no later than 2020, and we reiterate our support for a plan along the lines of PGE's BART III or DEQ's option 2 if DEQ and the Company can reach agreement. However, PGE's backstop plan if it cannot get DEQ approval for its 2020 plan is unacceptable, and should not be acknowledged by the Commission. A 2040 closure is too costly, carries high risk, and is not in the interests of customers or the environment.

PGE's backstop plan, for which it is requesting acknowledgment in case BART III is not approved, is called "Diversified Thermal with Green." It includes the investment of over a half a billion dollars in pollution controls and continued operation of Boardman through at least 2040. Putting aside the fact that among the portfolios PGE examined that keep Boardman open, Diversified Thermal with Green was not the top scorer, DEQ's 2015/16 ("DEQ-3") option is PGE's best alternative.¹

The decision before the commission regarding the backstop plan is whether or not to acknowledge PGE's investment in full pollution controls with the expectation that

¹ "Diversified Green with On-Peak Energy Target" actually was a much better portfolio than PGE's alternative. It was marginally superior on cost and risk metrics but, as we demonstrated in our opening comments, those differences were statistically meaningless. More important, however, is that it would generate significantly less GHG pollution.

Boardman should run at least through 2040. Not acknowledging the full pollution control investment is essentially the same as approving DEQ's Option 3 (2015/16 closure) due to the fact that without those controls, the plant could only operate until then. Thus the choice before this Commission regarding the backstop is 2040 vs. DEQ-3. Our comments in this section compare these two plans.

PGE's analysis shows that these two plans have almost identical cost and risk scores—certainly within any appropriate margin of error. In fact the 2015/16 plan has lower costs under the reference case, but also under the low gas and low load growth sensitivities that we think are more likely futures--although we repeat that we do not believe that these cost differences are large enough to be meaningful. The 2015/16 plan also has much lower CO2 emissions (around 15% lower), an amount that is significant, and a factor that we argue should be a key "tie-breaker" in the case that other metrics are too close to call. (See slides 44, 47, 48 of PGE's 8/23 workshop presentation.) This CO2 reduction assumes gas-fired replacement power compared to the operation of the plant to 2040. However, the emissions reductions would be much greater if replacement power was provided by even cleaner power sources.

In any case, PGE does not rely upon its IRP modeling analysis to justify choosing 2040 over DEQ-3. Instead, the Company introduces another set of factors.² These include: near-term rate impact; inadequate time to put a long-term replacement resource in place; the risk of not being able to acquire sufficient firm replacement power at an affordable price, if at all; and, insufficient transition time for employees and the Boardman community. (PGE Reply p. 8)

We address these issues in turn.

1. Near-term rate impact – The Commission should reject the idea that near-term rate impact—especially on the order of only 0.5% spread over 10 years (slide 23 of 8/23 presentation showing a 3.9% vs. 3.2% rate impact between BART I and DEQ-3)—should be now put forward as a compelling reason to take the risks inherent in making a half-billion dollar investment to run Boardman through 2040.

We remind the Commission that this analysis is based on a single deterministic reference case with many arbitrary assumptions, especially the load growth and gas price forecasts. As discussed at length in our opening comments (pp. 8-10), the margins of error that should have accompanied these numbers are much greater than 0.5%. In reality there is no evidence that the two options have statistically significantly different costs or rate impacts, given the uncertainty in forecasts of key assumptions.

2. Inadequate time to put a long-term replacement resource in place – PGE states that DEQ-3 does not give it enough time "...to put a long-term replacement resource in

² Putting aside the particular plans, it is disturbing that PGE appears to rely upon its IRP analysis when the results support the Company's proposals, but introduces new criteria after the fact if that same analysis seems to favor a different result.

place. The average time to construct a CCCT is six to seven years..." (PGE reply p.8) But it is not clear that a new CCCT is necessary or that the 6-7 year development time frame is appropriate given the transmission, substation and site at Boardman. Our opening comments challenged the Company's growth forecast for being a marked increase from the previous decade, failed to account adequately for the current recession (PGE does not use its own latest forecast update in the analysis), and pointed out how different it was from the Council's Oregon forecast.

PGE's reply was to argue first, that the past decade was unusual, that previous decades were more the norm, and it was confident that growth would return to a level of about 1.9% a year. Given the depth of the current recession, we find it unlikely that loads will even return to 2008 levels by 2015, much less be over ten percent higher congruent with PGE's forecast.

Second, PGE argued that the Council's Oregon forecast should not be used, because it was for the whole state, not PGE's territory. Yet in its initial IRP filing PGE argued that its "...energy growth forecasts are consistent with the Northwest Power and Conservation Council's Draft Sixth Plan forecasts..." (IRP p. 37), evidently endorsing the Council's analysis. We pointed out (NVEC opening comments p. 6) that in fact the Council's forecast was significantly below PGE's: 0.34% vs. 1.91% per year, PGE's reply comments now discount the relevance of the Council's numbers. The Council's forecast has been thoroughly reviewed and represents the best bottom-up analysis available. While it may be true that PGE's territory is somewhat different than the whole state's, this difference is not enough to justify a four- to six-fold difference in annual load growth. Using the Council's forecast of average energy load growth after conservation--0.47%/year for 2010-15, compared to PGE's forecast of 1.72%--would reduce the overall resource need in 2015 by about 150-160 aMWs, or about half of Boardman's output.

Corroborating this result is a study by the Western Electricity Coordinating Council's (WECC) State and Provincial Steering Committee (SPSC), which contracted with Lawrence Berkeley National Lab (LBNL) to analyze western utilities' IRPs in regard to whether their load forecasts accurately accounted for conservation programs, especially soon-to-be issued federal appliance and device efficiency standards. LBNL looked at PGE's forecast and determined that these new standards had not been assumed in the utility's forecast. As a result, PGE's 2020 forecast for energy was reduced by 4.1%, and capacity by 4.2%, or about 182 MWs for peak—again, about half of Boardman. (See attachment A.)

Third, PGE argues that the load growth forecast isn't really material because it has other needs for new resources, especially contract expirations. We readily agree that expiring contracts create new need, but the Company's overall IRP accounts for that need, plus load growth. If loads grow more slowly, the overall need is less. If that difference is significant, it is likely that *immediate, full replacement for Boardman will not be required.*

It should also be noted that about 350 aMW of PGE's "need" by 2015 is not due to load growth, retiring resources or expiration of contracts. It is instead due to a strategic decision to lessen its current exposure to the market of about 400 MW to only about 50 MW (see, for example, slide 19 from PGE's April 26, 2010 presentation to the Commission.) This decision wasn't analyzed in the IRP as a resource choice, and it adds a Boardman-sized resource requirement over a short period of time. If this movement to less market-exposure were delayed or slowed down somewhat, and combined with a more realistic load forecast, one could safely conclude that there is little need for quick full replacement of Boardman in the case of a 2015/16 closure.

3. Shorter-term "bridge" PPAs are not available -- If a 2015/16 or 2018 closure option is agreed to, a bridge PPA could extend the time needed to replace Boardman's output. PGE has raised two objections to this strategy. First, it might not be able to acquire power on the market for any price, given the tightness of the market and transmission constraints. Second, PGE argues that even if it could find power, the financial risk of possible high prices is unacceptable to customers.

We agree that over reliance on the market can be risky and detrimental to customers and the Company, as was the case during the 2000-01 energy crisis.³ Yet, described above, PGE currently acquires short- and mid-term power from the market. The long, unexpected Boardman outage from May through August, 2009 is additional evidence that market power is available. The Power Council details a healthy surplus of generating capacity in the region and in the WECC.

This brings us to the financial risk issue. Given the current and future state of surplus forecast by the Council due to the recession and increased RPS requirements (both within the region and California's), prices on the market are not likely to rise and stay high for many months at a time. In fact, many utilities, including Bonneville have been expressing concern that these factors may well permanently depress the market price for power, severely cutting into the value it can get for its surplus sales.

Also it is important to note that PGE's preferred BART III plan takes on a similar risk of having to go to the market for what could be an extended period in order to acquire and install pollution equipment if federal MACT standards or the Sierra Club *et al* lawsuit forces it to install full pollution controls:

We recognize the risk remains that the outcome of either MACT or pending litigation could require PGE to install controls at Boardman similar to those required to operate the plan through 2040...there is also a risk that DEQ may not

³ It should not be forgotten that there is also financial risk from carrying surplus resources during a period of market surplus. The region lost billions of dollars in the seventies and eighties caused by overbuilding of expensive, unneeded, thermal resources. Evidence for the value of maintaining some degree of market exposure is PGE's market portfolio. While as a "pure play" it is obviously too risky, it does show that exposure to the market has a large positive upside "risk" for customers. PGE has not presented evidence that this amount of exposure creates a large financial risk.

issue a Title V permit that is consistent with its action on our BART III proposal in a timely manner, which could result in temporary closure of the plant until the permit is modified. We request that the Commission acknowledge that it is prudent for PGE to proceed with its 2020 proposal despite these risks. (Reply p.16)

Clearly, while there is some risk to modest market exposure, PGE believes it is worth taking to enable it to go ahead with its 2020 proposal. We presume that the Company would not even consider taking this risk if it had serious reliability concerns about doing so. Similarly, we believe it is worth that same risk—exposure to the market for 1-2 years after a 2015/16 (or 2018) Boardman shutdown—to give the utility the space to acquire cleaner replacement resources.

4. Insufficient transition time for employees and the Boardman community – Five-years is an unusually long notice period for plant closure in most industries. It provides ample time for PGE to retrain and/or relocate younger workers and provide early retirement to older ones. We urge PGE to be proactive and generous in dealing with this transition. The Boardman area could be a centerpiece for clean energy resources that produce jobs that could be offered these workers as a priority, plus replacement tax base for the county. While painful, we cannot avoid closure forever given the enormous environmental damage caused by the plant: damage that is affecting the financial and physical health of many other workers in the Gorge area.

Recommendation 3 – Based upon a finding that PGE has overstated its immediate need for replacement power and its ability to acquire it at reasonable financial risk, the Commission should reject the Company's request for acknowledgment of its 2040 backstop plan and accompanying investment in pollution controls at Boardman.

II. Overall IRP Issues

Response to PGE's replies regarding NWEC's opening comments on the IRP analysis.

We wish to respond to a number of arguments that PGE has brought forth in its reply to our opening comments. We will focus here on the major issues that were of most importance and not already addressed earlier in these comments. We will discuss PGE's replies to three of our comments: (a) appropriateness of PGE's reliability metric; (b) our call for more "optimization" of the tested portfolios; and, (c) the use of statistics and stochastic modeling.

1. Reliability -- PGE argues that we propose building all portfolios to the same reliability level which is "...impractical and would make reliability performance harder to evaluate." (PGE reply, p. 47)

This misconstrues NWEC's concern. Our point was first that PGE's reliability metric really measured exposure to the market, not loss of load—but more importantly, it was *independent* of the portfolio. That is, it was a characteristic that was related to

how "long" a portfolio was, not the nature of the portfolio, as shown in Figure 11A-23 on p. 79 of the addendum. Being an independent factor, it could be increased or decreased for any portfolio by adding a relatively small amount of extra capacity. Thus the metric should not be used to judge a particular portfolio. NWECC was not arguing that portfolios should be designed differently or evaluated differently (for this risk factor), only that *the metric was essentially meaningless for comparison purposes*. Since it is weighted 15% in the scoring, this is not a small concern. This metric should not be used.

2. Optimization of portfolios – PGE argues that our recommendation to optimize portfolios would strain their time and resources and that "More complexity does not always provide better answers; sometimes it just provides more complexity." The Company also mischaracterizes our suggestion as one that will only result in minor "tweaks" that would have little material impact yet have a big staffing cost. (Reply, p. 48-9)

At the beginning of the IRP process PGE committed to use the results of its "pure play" portfolios to develop a better preferred portfolio. We are not suggesting a whole new set of optimization runs at finer granularities. Instead, we argued that the results of the analysis showed that two factors in the portfolios tested were found to be beneficial in reducing costs and risks, so that it would be worth while to modify PGE's winning portfolios to reflect those results. In general, the insight developed from "pure play" analyses should be incorporated into the preferred portfolio(s).

3. Use of statistics in deterministic modeling – PGE argues that, "...applying statistical tests for significance is not applicable for most of our scoring because most of the analysis is deterministic in its nature." (Reply p. 49) It thus dismisses our use of statistical methods to call its analysis into question. PGE also argues that we have incorrectly applied our statistics to embedded + incremental costs, rather than to only incremental costs. If we had, PGE argues, their portfolio differences would have been more statistically significant.

NWECC understands the difference between stochastic and deterministic analysis, and we do not challenge the idea that scenario analysis (done deterministically by PGE) is much more important than stochastic analysis for the purposes of the IRP. (Indeed, we question the value of stochastic analysis for many factors, especially CO₂, because it averages high and low carbon cost futures in a way that makes carbon risk disappear.) We are not asking PGE to change its emphasis on scenario analysis.

Our point was that stochastic analysis should be used to provide the margins of error, or confidence limits, that inform deterministic analysis. PGE uses its deterministic runs, *relying on only one set of forecasts for load growth, gas prices, etc.*, to differentiate costs (and rate impacts) of its different portfolios. But that gives the parties no idea of whether the differences are meaningful. Is a \$100 million, or a \$500 million cost difference meaningful or not? Only a statistical analysis can tell us that. Given that the Company ran its portfolios through 100 different variations of its reference futures as part of its stochastic analysis, the runs provide a reasonable way

to calculate the expected variability and confidence interval when comparing particular single deterministic runs. This is what we presented in our opening comments. (p.9) The results showed that unless two deterministic runs have costs different by \$500 million or more, *one cannot assert that one costs less than the other with any reasonable confidence.*

PGE also argues that if we looked only at incremental cost differences, rather than NPVRR cost differences that include a large amount of common costs, the results would change—presumably showing that the differences in costs and rate impacts were more significant than we had found. (PGE reply, p. 50)

This comment does not apply to this type of statistical analysis. Removing a constant amount from every value has absolutely no affect on the measures of variability or statistical significance. If two means need to be \$500 million apart to be statistically significant, this result is not changed no matter what constant value is added or subtracted from each series of values or each pair of means tested.⁴

Recommendation 4(a) – The Commission should require all future IRP statements regarding costs, rate impacts and scoring metrics to include an estimate of the margin of error. The Commission should require, for example, that NPVRR results be reported at a certain confidence level (e.g., 90%, or plus-or-minus one or two standard deviations), or allow utilities to determine this level depending upon the particular value being reported. Without this elementary requirement, it is impossible for any party to understand whether comparisons are meaningful.

Recommendation 4(b) -- In this IRP, the Commission should give no weight to cost and/or rate impact or scoring matrix differences that are not statistically significant to at least a modest degree. Thus, applied to this IRP, NPVRR differences of less than about \$500 million or a rate impact difference of less than about 1.2% over several years should be given no weight in the Commission's decisions.⁵

⁴ PGE seems to have confused percentage changes with absolute value changes. For example, assume two portfolios have means of \$50 billion and \$50.5 billion, and are just barely significantly different. The difference itself is about 1%. Now, subtract a constant \$45 billion from each value used to compute the two means. Now the new means are \$5 billion and \$5.5 billion, and indeed the percentage difference is much larger: 10%. *But it still requires a half-billion dollar difference to be statistically significant!* So in the first case, only a difference greater than 1% is significant, and in the second it requires a difference of 10% to be significant, because the denominator has changed by a constant value—but the actual difference needed is still \$500 million. As we showed, the difference in higher scoring plans is nowhere close to that amount, so the differences should not be given any weight regardless of the treatment of common costs.

⁵ We certainly do not wish to argue that differences of several hundred million dollars are not important to customers! Instead, our point is that unless there is some (statistical) confidence that a cost or rate impact projection is real, we have no idea whether or not the millions of dollars in forecasted difference will show up or not given the uncertainties in the assumptions that generated the forecast. In PGE's case, the individual stochastic runs had differences of over \$10 billion. Thus to state with any certainty that one single run is the "true" value, is irresponsible.

Transparent decision and evaluation criteria are essential for good public process

As discussed in our opening comments (pp. 10-12), PGE introduced new criteria to reject portfolios that seemed to score well. For example, PGE's top-performing portfolio, "Green with On-Peak Energy Target," and "Diversified Green," (which has the same amount of new wind) were declared to be not practical, because they have too much wind in them. Clear and specific decision and evaluation criteria are fundamental to transparent assessment of portfolios and the assumptions used to build those portfolios. This is true even for factors that will be applied in ranking a portfolio after it is scored.

It is important that all important planning decisions, especially changes in current strategies, are modeled and discussed in the IRP process. For example, as mentioned earlier, without much discussion and no analysis, PGE changed its position on market exposure. Changes in strategy or policy that impact portfolios must be clearly articulated to all stakeholders early in the IRP process and available for analysis. While it can be valuable to model portfolios that the utilities believe would be difficult or impossible to fulfill (such as PGE's "pure plays"), it is important to know that fact before comments are due.

Recommendation 5 – The Commission should require utilities in future IRPs to identify all policy and strategy changes as well as decision and evaluation criteria that will be used to assess portfolios at the outset of each IRP process.

III. Conclusion

- NWEC fully supports PGE's attempt to work with DEQ, PUC and other stakeholders to find a consensus closure strategy that protects customers and the environment. We urge the Commission to reject the 2040 backstop plan proposed by PGE for the reasons detailed in these comments and to either delay acknowledgement of the Boardman section of the IRP until parties can reach agreement or allow for an amended IRP to be filed.

We have made 5 recommendations in this docket that we repeat here for convenience:

NWEC Recommendation 1 -- The Commission should indicate the boundaries of an acceptable closure plan in its Order, so that PGE has the assurance that an agreement with DEQ and stakeholders will in all likelihood be acknowledged if it is within those boundaries.

Recommendation 2 -- The Commission should require that future IRPs make addressing the state's carbon reduction goals a critical and well-vetted component of portfolio testing and include a risk metric that measures CO2 emissions directly.

Recommendation 3 – Based upon a finding that PGE has overstated its immediate need for replacement power and its ability to acquire it at reasonable financial risk, the Commission should reject the Company's request for acknowledgment of its 2040 backstop plan and accompanying investment in pollution controls at Boardman.

Recommendation 4(a) – The Commission should require all future IRP statements regarding costs, rate impacts and scoring metrics to include an estimate of the margin of error. The Commission should require, for example, that NPVRR results be reported at a certain confidence level (e.g., 90%, or plus-or-minus one or two standard deviations) or allow utilities to determine this level depending upon the particular value being reported. Without this elementary requirement, it is impossible for any party to understand whether comparisons are meaningful.

Recommendation 4(b) -- In this IRP, the Commission should give no weight to cost and/or rate impact or scoring matrix differences that are not statistically significant to at least a modest degree. Thus, applied to this IRP, NPVRR differences of less than about \$500 million or a rate impact difference of less than about 1.2% over several years should be given no weight in the Commission's decisions

Recommendation 5 – The Commission should require utilities in future IRPs to identify all policy and strategy changes as well as decision and evaluation criteria that will be used to assess portfolios at the outset of each IRP process.

We look forward to continued discussion of these important issues for Oregon and the planet's climate.

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State-Adjusted Load Forecasts (2020)

Balancing Authority	Annual Energy (GWh)				Peak Demand (MW)			
	LRS Load Forecast	Adjustment	SPSC Load Forecast	% Change from LRS Forecast	LRS Load Forecast	Adjustment	SPSC Load Forecast	% Change from LRS Forecast
AESO	108,555	0	108,555	0.0%	15,049	0	15,049	0.0%
APS	35,990	-1,472	34,518	-4.1%	8,407	-354	8,053	-4.2%
AVA	15,078	-254	14,824	-1.7%	2,882	-57	2,825	-2.0%
BCHA	63,241	0	63,241	0.0%	11,393	0	11,393	0.0%
BPA	57,815	-3,268	54,547	-5.7%	10,377	-434	9,943	-4.2%
CFE	17,484	0	17,484	0.0%	3,250	0	3,250	0.0%
CHPD	4,080	-179	3,901	-4.4%	719	-36	683	-5.0%
CISO	265,869	-15,248	250,621	-5.7%	54,731	-4,665	50,066	-8.5%
DOPD	2,148	-115	2,033	-5.4%	458	-23	435	-5.1%
EPE	10,665	-477	10,188	-4.5%	2,135	-96	2,039	-4.5%
GCPD	5,198	-310	4,888	-6.0%	865	-63	802	-7.2%
IID	4,707	-114	4,593	-2.4%	1,242	-54	1,188	-4.3%
IPC	19,615	-1,124	18,491	-5.7%	4,229	-181	4,048	-4.3%
LDWP	32,597	-3,099	29,498	-9.5%	6,778	-456	6,322	-6.7%
NEVP	28,302	-1,131	27,171	-4.0%	6,583	-252	6,331	-3.8%
NWMT	11,484	-1,046	10,438	-9.1%	1,866	-165	1,701	-8.9%
PACE	56,108	-932	55,176	-1.7%	10,884	-219	10,665	-2.0%
PACW	20,753	-546	20,207	-2.6%	3,904	-121	3,783	-3.1%
PGE	23,569	-964	22,605	-4.1%	4,294	-182	4,112	-4.2%
PNM	16,219	-725	15,494	-4.5%	2,852	-146	2,706	-5.1%
PSC	49,663	0	49,663	0.0%	9,320	0	9,320	0.0%
PSE	26,482	-587	25,895	-2.2%	5,355	-130	5,225	-2.4%
SCL	10,929	-443	10,486	-4.1%	1,924	-83	1,841	-4.3%
SMUD	19,153	-556	18,597	-2.9%	4,886	-333	4,553	-6.8%
SPP	12,765	-510	12,255	-4.0%	2,137	-113	2,024	-5.3%
SRP	40,382	-1,652	38,730	-4.1%	8,800	-397	8,403	-4.5%
TEP	16,478	-3,387	13,091	-20.6%	3,660	-671	2,989	-18.3%
TIDC	3,147	-281	2,866	-8.9%	787	-61	726	-7.8%
TPWR	5,438	-468	4,970	-8.6%	1,031	-94	937	-9.2%
WACM	29,775	-1,024	28,751	-3.4%	4,651	-194	4,457	-4.2%
WALC	7,550	-314	7,236	-4.2%	1,591	-73	1,518	-4.6%
WAUW	634	-26	608	-4.1%	118	-5	113	-4.2%

LC 48 CERTIFICATE OF SERVICE

I hereby certify that I served the foregoing **Reply Comments of NWEC in Portland General Electric's 2009 Integrated Resource Plan (LC48), including Attachment A**, on the following persons on September 1, 2010 by hand-delivering, e-mailing, or mailing (as indicated below) to each a copy thereof, and if mailed, contained in a sealed envelope, with postage paid, addressed to said attorneys at the last known address of each shown below and deposited in the post office on said day at Salem, Oregon.

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