TO: Oregon Public Utility Commission
FROM: Oregonians for Renewable Energy Policy (OREP)
RE: PGE Proposal to Close the Boardman Coal Plant

June 23, 2010

Oregonians for Renewable Energy Policy appreciates the opportunity to comment on Portland General Electric's (PGE) proposal to close the Boardman coal plant by 2020 and replace the 380MW of energy it currently provides to PGE ratepayers. Our chief concerns with the 2020 plan are: 1) that it will continue for yet another decade to pollute Oregon's air and environment beyond the levels permitted by the Oregon Regional Haze Plan and the Oregon Utility Mercury Rules; 2) that Oregon ratepayers will pay for pollution controls to a plant that will soon be closed; and 3) that it does not move quickly enough to incorporate renewable energy sources into PGE's portfolio.

As ratepayers, we acknowledge that the transition from fossil fuels will have a price tag, but would rather see rate increases go to reduce demand through energy efficiency and build the infrastructure needed to capture energy from non-polluting, unlimited renewable sources which in themselves have no fuel costs. We believe the time is long overdue for Oregon to replace fossil fuels with energy efficiency and renewables and that it makes both environmental and economic sense to do so as soon as possible and to a much greater degree than the 2020 Plan envisions. Let's move on energy efficiency and renewables in a big way and in a manner that is specifically aimed at reducing the cost of energy from renewables. There is a policy that accomplishes this. It is known as a Feed-In Tariff and OREP believes Oregon must adopt a robust program of feed-in tariffs capable of reducing the price of all renewables to reach price parity with fossil fuels.

Introduction

Portland General Electric's (PGE) proposal to seek closure of the Boardman Coal Plant is to be commended. Global climate change, mercury contamination, and other pollution impacts from coal-generated electricity are driving decisions to eliminate our dependence on this dirty, finite fuel source. For Boardman to remain open, whatever the timeline, will require PGE investment in pollution control upgrades, the cost of which will presumably be passed on to ratepayers and shareholders.

Energy demand in Oregon should at least remain at current levels, and most likely will increase so the energy output from Boardman will have to be replaced as closure of the plant proceeds. Currently Boardman generates 380 MW of base-load electricity for PGE's portfolio. One of the biggest questions then appears to be exactly when to close Boardman, with proposals ranging from 2014, to 2020, to 2040.

Clearly, there are far greater costs to society and PGE ratepayers and shareholders than just pollution control investments that need to be considered when evaluating Boardman's future. PGE estimates in their IRP that closing Boardman by 2014 will cost

ratepayers $600 million. Closing Boardman in 2020 would cost ratepayers $40 million dollars but would not provide the pollution abatement that full closure will. Ernie Niemi, et al, estimate that taking a business-as-usual approach[1] to climate change could incur costs as much as $3.3 billion to Oregonians. Any costs to install renewable energy replacement power must be measured against a business-as-usual approach to climate change.

Energy Conservation

IRP Guideline 6 as presented in OPUC Order 07-047 notes that to the extent that a utility controls the level of funding for conservation programs in its service territory, the utility should include in its action plan all best cost/risk portfolio conservation resources for meeting projected resource needs, specifying annual savings targets.

According to PGE's 2009 Integrated Resource Plan Addendum (IRP), 19% of Boardman's replacement output can be obtained by the end of 2021 through energy efficiency improvements to new and existing buildings within the PGE service territory. According to the Sixth Northwest Conservation and Power Plan, there is "enough conservation to be available and cost-effective to meet 85 percent of the region's load growth for the next 20 years", (Pg 1). If Boardman were to be closed in 2014 and some of the $500 million required to retrofit the plant was invested in energy efficiency measures, OREP wonders if this target could be reached more quickly or even exceeded.

Renewable Energy Technologies

Renewable energy technologies are another alternative to replace the energy from Boardman, and Oregon is rich with significant solar, wind, wave, biomass and other renewable resources. Research indicates that solar photovoltaics (PV) alone, could contribute significant additional capacity. In 2009, Ray Neff estimated Eugene, Albany, Beaverton, Bend, Gresham, Medford and Salem's solar capacity. [2] This small part of the state has a solar potential of at least 331 MW of capacity annually. These figures are very conservative, since they reflect only large commercial and public building

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[1] Niemi, E., et al. (2009) This report "illustrates some of the potential costs Oregon's families, businesses, and communities might incur over the next several decades if Oregon, other states, the U.S., and other countries were to extend a business-as-usual approach to climate change. Under this approach, we assume behaviors do not change and the emissions of carbon dioxide and other greenhouse gases would continue to grow at rates similar to those seen during recent years, leading to increases in global temperature such as those depicted in the high-emission scenarios described by the U.S. Climate Science Program, the Intergovernmental Panel on Climate Change (IPCC), and others." (Pg ii).

[2] Solar PV is a Significant Renewable Resource in Oregon. Ray Neff, a recent graduate of the Master of Community & Regional Planning program at the University of Oregon has conducted research on solar PV capacity and renewable energy feed-in tariff policy design. In 2006 Neff used GIS software and aerial photographs, and estimated Eugene's solar capacity to be 68 MW annually from distributed roof-top installation of solar PV on large commercial and public buildings. The potential capacity of distributed solar PV on the tens of thousands of residential and small commercial structures was not included in this calculation, but can be safely assumed to be significant.

installation opportunities and were deduced from only seven Oregon communities. Additional detailed research of this kind is urgently needed so that Oregonians can fully assess our true solar potential in the built environment.

Research and experience demonstrates that a well-designed Feed-in Tariff (FIT) is one of the most effective policy instruments to encourage widespread adoption of renewable energy technology and growth throughout the renewable energy industry. A well-designed FIT encourages community buy-in and support, builds the local economy with "green-jobs", permits distributed installation and therefore dramatically enhances national energy security and reliability, and provides stable markets that encourage local investment (Neff, 2009).

The IRP should include research to determine the full solar PV capacity in PGE territory, including residential installations. According to PGE's IRP, to comply with Oregon's RPS mandate for 2015 they will need to acquire an additional 122 MW of new renewables beyond their existing 550 MW of wind (year-end 2010). The 331 MW of distributed solar PV capacity on large commercial and public facilities in only these seven communities is more than adequate to meet that standard. It is the equivalent of 0.8% of total residential and commercial/industrial customer demand for 2007, and enough electricity to power close to 33,300 homes each year (U.S. Energy Information Administration (EIA), 2009; Oregon Public Utility Commission (PUC), 2008). Furthermore it is our understanding, the PGE coal-burning site near Boardman is approximately 550 acres.[3] If this available acreage was covered with ground-mounted solar PV our conservative calculations estimate it could generate as much as 90 MW of electricity.

Another alternative to replace the baseload energy from Boardman with renewables that should be considered is the opportunity to convert the facility to produce energy from local biomass. A very rough, back of the envelope calculation suggests that sufficient wheat straw may be available within fifty miles of the plant. Even if this is off by an order of magnitude, the transport distance is much shorter than for coal, and clean ash could be returned as a soil amendment.

Job Creation

Direct jobs in the solar industry include on-site labor for installation, auditors to conduct on-site energy analysis to determine optimal energy saving and generation opportunities, manufacturing, and to a lesser degree, maintenance. Oregon is already home to five companies that manufacture various components for the solar industry including silicon wafers, solar panels and inverters, and it continues to grow.

Rona Fried, president of SustainableBusiness.com, states that according to a 2007 University of California study of renewables, "Solar photovoltaics (PV) creates more jobs per megawatt of capacity than any other energy technology - 20 manufacturing

[3] Boardman Coal Plant: Tax Lot 102: 293.56 acres/6 = 48.93 MW; Lot 114: 259.49 acres/6 =43.25 MW; 48.93 + 43.25 = 92.18 MW (approximately 6 acres per MW)

and 13 installation/maintenance jobs per installed megawatt" (2007, para. 4). Excluding jobs lost in parallel industries that generate electricity for Oregonians, installing a modest 331 MW of solar in only a handful of communities across the state has the potential to create close to 11,000 family wage jobs in Oregon communities. An estimate from Renewable Finance states that energy efficiency retrofits to just 1% of Oregon homes could create 2335 jobs. Oregon is home to two nationally recognized community college renewable energy training programs. Lane Community College's Northwest Energy Efficiency Institute and the Columbia Gorge Community College Renewable Energy Technician Training program both prepare the next generation of energy efficiency, solar and wind technicians.

Climate Change Considerations

The IRP Guidelines provide that the Utility should look at the cost to comply with greenhouse gas emission regulations.[4] The cost to close the Boardman coal facility or upgrade its equipment should include the costs associated with impacts of climate change that could be incurred by Oregon ratepayers.

In February 2009, Ernie Niemi, a Senior Economist and Policy Analyst with ECONorthwest and a Climate Leadership Initiative Fellow, along with a team of academic and private economists, produced *An Overview of Potential Economic Costs to Oregon of a Business-As-Usual Approach to Climate Change*. Recognizing the very complex nature of climate modeling and the difficulty of localizing the impacts that might occur as well as the full economic impacts of those potential changes, their work provides "an estimate of costs that might materialize if climate change is not reined in, not a forecast of how things will actually unfold" (p. iii).

Niemi and his colleagues analyzed 17 different types of costs that could result from a business-as usual approach to climate change based on a recent regional assessment of climate change impacts. These range from increased energy demand to costs associated with environmental and human health. By 2020 Niemi et al, estimate:

- increased energy-related costs could total $119 million dollars;
- reduced salmon populations, increased flood and storm damage, and wildfire costs could total $902 million dollars; and
- increased health-related costs could reach $764 million.

Additional costs from activities that contribute to climate change could include $1.3 billion dollars for inefficient consumption of energy and $33 million associated with increased health costs from coal-fired emissions alone. The total costs to Oregonians from a business-as-usual approach to climate change mitigation could reach $3.3

[4] Guideline 8: Environmental Costs. Utilities should include, in their base-case analyses, the regulatory compliance costs they expect for carbon dioxide (CO2), nitrogen oxides, sulfur oxides, and mercury emissions. Utilities should analyze the range of potential CO2 regulatory costs in Order No. 93-695, from zero to $40 (1990$). In addition, utilities should perform sensitivity analysis on a range of reasonably possible cost adders for nitrogen oxides, sulfur oxides, and mercury, if applicable. Order 07-047.

billion by 2020, or an average of $1930 per household. (See Appendix for the full table from this report.)

Niemi and his colleagues address three primary components regarding energy-related costs in detail that could result from climate change in Oregon — reduced hydropower generation, increased energy consumption for residential indoor air cooling, and increased energy loss during transmission. A reduction in streamflow could result in a 664 MW reduction in annual average productivity of the Pacific Northwest hydropower system by 2020. Regional assessment of climate change impacts also suggest that July-August temperatures will increase 2.9°C (5.2°F) by 2040. This could increase average residential electricity demand by 200 MW in the region due to increased demands for indoor air conditioning. Local, distributed energy generation reduces the impact of energy-loss as it is converted to waste heat during transmission. Higher temperatures during a heat-wave further increase the amount of this energy loss. According to the *American Planning Association Policy Guide on Energy*, the August 2003 blackout across much of the Eastern U.S. was not the result of a lack of power supply but instead "the inability of the stressed transmission system to deliver on the demand" (APA, 2004, P.15). Oregon's share of these energy-related impacts in 2020 are summarized in the following table:

	$Million	**MW**
Reduced Hydropower Generation	$74	175
Increased Indoor Air Conditioning	$16	23
Energy Loss During Transmission	$29	47
Totals:	**$119**	**245**

Overwhelming Public Support for Renewable Energy: More than 6 to1

The most recent major national poll on energy-related public attitudes dramatically illustrates both the challenge we face and the opportunity before us. The Pew Research Center for the People & the Press and National Journal, polling June 10-13, found:

> …Fully 87% favor including a provision in comprehensive energy legislation to require utilities to produce more energy from wind, solar or other renewable sources. More than three-quarters (78%) favor tougher efficiency standards for buildings and major appliances.
>
> By greater than two-to-one (66% to 29%), the public supports including limits on carbon dioxide and other greenhouse gas emissions in comprehensive energy legislation. (Pew 2010).

We believe that much of the general public has little or no idea of how clearly feasible it is to replace major amounts of fossil fuel electrical generation with secure and sustainable alternatives now. A mandate by the Oregon PUC to create a comprehensive evaluation and assessment of the renewable-energy opportunities could be an

important factor in helping to educate the public and other stakeholders and decision-makers on the best ways to move forward.

Conclusion

We all agree that closing the Boardman coal plant is imperative, and the sooner the better. But neither the PGE IRP action plan nor any other decision-maker has yet produced the complete and comprehensive step-by-step analysis and action plan sufficient to make that feasible. OREP has suggested that not only is closure the responsible approach in the broader context of climate change mitigation and adaptation, but that existing technologies are available to fully replace Boardman's electricity generation. We do not yet have enough information to present the ratepayers, the shareholders, and the people of the state with a sufficient closure plan and schedule, but it is clear that this could be accomplished in short order (less than five years) with the right civic, political, and economic leadership.

An essential tool for accomplishing this goal in short order and one that will take advantage of the opportunity presented by closing the coal plant is establishing a true renewable energy feed-in tariff open to all potential energy-generators in the state, for all market-ready renewable energy technology. A well-designed FIT creates synergy between the parallel and interrelated issues of economic development and job creation, environmental protection, climate change adaptation, and energy security.

Another tool is a Property Assessed Clean Energy (PACE) financing program like Berkeley FIRST in California. Lane County is the first jurisdiction in the state to begin developing a PACE program. A PACE program allows building-owners to more easily and affordably obtain investment capital, while repayment is attached to the property tax account. Reducing the cost of investment capital, in turn, can significantly reduce the ratepayer impact of a FIT.

In Germany today, as a result of less than a decade of using well-designed FIT policies, energy from ground mounted solar is now no more expensive than energy from fossil fuels and they expect to achieve the same "price parity" for rooftop solar by 2013[5]

A whole-systems approach to closing Boardman provides an opportunity to protect our natural environment by reducing CO2 emissions and other pollutant discharge, while simultaneously providing significant economic stimulus at a time when it's most needed in Oregon—a win-win situation for all Oregonians.

[5] Renewable Energy World Webcast: The Future of German Feed-in Tariffs and its Impact on the German and Global PV Market; originally broadcast May 20, 2010
http://video.webcasts.com/events/penn001/34754/

Appendix X.1

Potential Economic Costs in Oregon Under a Business-as-Usual Approach to Climate Change, 2020, 2040, and 2080 (dollars per year)

Potential Cost	2020	2040	2080
Costs of Climate Change			
Increased Energy-Related Costs	$119 million	$328 million	$815 million
Reduced Salmon Populations	$632 million	$1.0 billion	$1.9 billion
Increased Flood and Storm Damage	$64 million	$132 million	$309 million
Reduced Food Production	$13 million	$35 million	$153 million
Increased Wildland Fire Costs	$206 million	$423 million	$941 million
Increased Health-Related Costs	$764 million	$1.3 billion	$2.6 billion
Lost Recreation Opportunities	$167 million	$390 million	$1.1 billion
Subtotal for Costs of Climate Change	*$2.0 billion*	*$3.6 billion*	*$7.8 billion*
Additional Costs from Business-as-Usual (BAU) Activities that Contribute to Climate Change			
Inefficient Consumption of Energy	$1.3 billion	$1.5 billion	$2.0 billion
Increased Health Costs from Coal-Fired Emissions	$33 million	$38 million	$52 million
Subtotal for Costs from BAU Activities	*$1.3 billion*	*$1.5 billion*	*$2.0 billion*
TOTAL	**$3.3 billion**	**$5.1 billion**	**$9.8 billion**
Avg. Cost per Household per Year	$1,930	$2,400	$3,500

Source: ECONorthwest.
Notes: These numbers illustrate different types of annual costs Oregonians potentially would incur if society were to continue with a business-as-usual approach to climate change. There may be overlap between the values for some of the different types of costs. Nonetheless, adding the different types of costs probably seriously understates the total potential cost of climate change because the table excludes many additional types of climate-related costs that Oregonians would incur under a business-as-usual approach. The numbers do not indicate the net effect of climate change, as they do not represent a forecast of how the economy will respond to the different effects of climate change, or account for potential economic benefits that might materialize from moderate warming and other changes in climate.

(Niemi, et al., 2009, Pg v)

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