

# **The Electricity Sector's Role in Oregon's Carbon Emissions**



**Portland General Electric**

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## **Addressing Carbon Emissions in the Electricity Sector**

PGE was one of the first utilities in the nation to acknowledge the role electricity generation plays in global climate change, and we have since been taking significant actions to reduce our impact. We are developing new renewable power resources, including the region's largest solar power installation and one of its largest wind farms. We are launching new campaigns to encourage energy efficiency. We are making existing power plants more sustainable, and we are conducting research and development into carbon capture technologies.

On the policy front, PGE has cooperated with regulators and legislators to develop responsible environmental policies. We worked with Gov. Ted Kulongoski and the Oregon Legislature in 2007 to adopt one of the nation's most stringent Renewable Energy Standards, which requires that 25 percent of Oregon's electricity come from renewable sources by 2025.

PGE is committed to working with the federal government, the Oregon Legislature and the Oregon Public Utility Commission to adopt responsible legislation to reduce carbon emissions.

The decisions Oregon makes in 2009 will directly impact our state's economy. Legislation which imposes an undue burden on utilities will drive up our costs, which must be passed on to Oregon businesses and families.

Oregon needs to seriously consider the impacts of carbon reduction policies on electricity costs and reliability. PGE believes several fundamentals should be considered in adopting climate policy.

- A cap-and-trade system for carbon emissions should be implemented at the federal level. Oregon already has implemented guidelines to reduce carbon emissions. Adopting a state-by-state or inadequate regional cap-and-trade system, as proposed by some, will put Oregon's economy at a disadvantage.
- A timeline is needed that avoids short-term price spikes and allows carbon technologies to develop. In the short term, there is no alternative to existing fossil-fueled electricity generation in the Northwest that can produce enough power to meet customer demands and reliability requirements.
- Since carbon emissions come from all sectors of the economy, all sectors should share in reducing our state's emissions.

Oregon can adopt these fundamentals and still make significant progress in reducing carbon emissions. We can pursue a strategic action plan to aggressively address climate change, including increasing energy efficiency and paving the way for more renewable energy.

# An Action Plan

## **What the Oregon Public Utility Commission can do**

- Develop and direct an action plan for Investor Owned Utilities to lower carbon emissions.
- Use existing processes to review utility options and cost impacts.
- Establish a timeline that avoids short-term price spikes.

## **What utilities can do**

- Accelerate further development and deployment of energy efficiency and renewable energy technologies.
- Build new transmission.
- Upgrade the efficiency of existing transmission and distribution networks.
- Increase communications and control to enable “smart meters” and develop a “smart grid.”
- Support customer-based demand options like direct load control and distributed generation.

## **What policy makers can do**

- Increase funding for energy efficiency.
- Improve education, marketing and delivery of energy efficiency.
- Adopt building and appliance codes.
- Allow acquisition of renewable power from sites in Canada.
- Expand transmission access.
- Support research into new technologies.

## **What customers can do**

- Reduce demand by using energy wisely and making energy efficiency improvements in homes and businesses.
- Sign up for one of PGE’s renewable power options, which increases demand for carbon-free resources and helps build new local sources of renewable energy.
- Participate in public discussions held by the Oregon Public Utility Commission and the Oregon Legislature.

## **What is smart?**

- Adopt cap-and-trade at the federal level.
- Increase and promote energy efficiency incentives.
- Remove barriers to more renewable energy supplies.
- Meet load growth with low or zero-emission resources, where possible.
- Build a foundation for future carbon reductions.
  - Invest in efficiency of transmission and distribution system and develop network capability to support “smart grid.”
- Establish reasonable timelines that avoid short-term price spikes and allow time to develop new technologies.
- Let the OPUC process for reviewing utility resource decisions and costs work.
  - The OPUC’s thorough and open processes can identify options for reducing carbon while maintaining reliability and managing rate impacts over time.

## **What should we avoid?**

- New, unnecessary and unduly complicated bureaucracies.
- Confusing and dysfunctional markets for carbon.
- State or regional schemes that put Oregon at a disadvantage with other states that haven’t done as much to reduce carbon emissions, and/or have lower goals.
- Jeopardizing the reliability of the electricity system.
- Sending ratepayer dollars to other states.
- Increasing the disparity between investor-owned utilities (which serve more than 70 percent of Oregonians) and publicly owned utilities in the Northwest.

# Frequently Asked Questions

## ABOUT PGE

### ***Who does PGE serve?***

Portland General Electric (PGE), headquartered in Portland, is Oregon's largest utility. We serve about 810,000 customers in 52 cities and six counties. PGE employs about 2,750 people in electricity generation, distribution, engineering, research and development, customer service and central services.

PGE is an investor-owned utility – a publicly held company whose stock is traded on the New York Stock Exchange. Oregon's three investor-owned utilities (PGE, Pacific Power and Idaho Power) serve about 70 percent of Oregon's population. The remaining 30 percent of the state's residents are served by publicly owned utilities.



More than 90 percent of PGE's revenues come from residential and commercial customers. The remainder comes from industrial customers such as steel, pulp and paper, metal manufacturing, and high tech industries like Intel and Solar World.

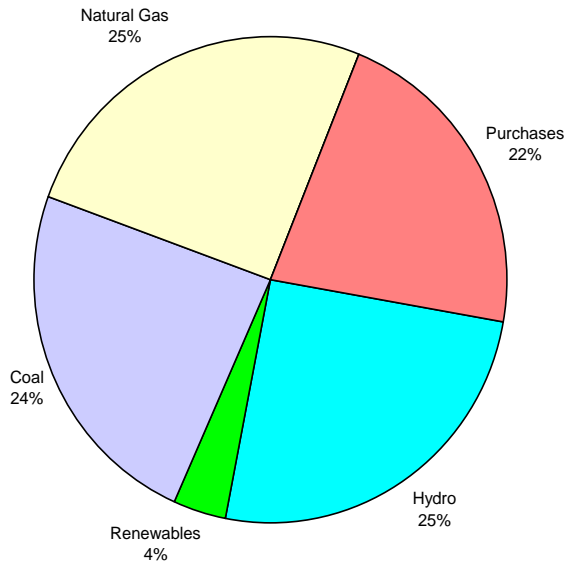
### ***How does PGE provide electricity to its customers?***

For the most part, investor-owned utilities must generate or purchase their own electricity. Most power generated by the Bonneville Power Administration goes to publicly held utilities.

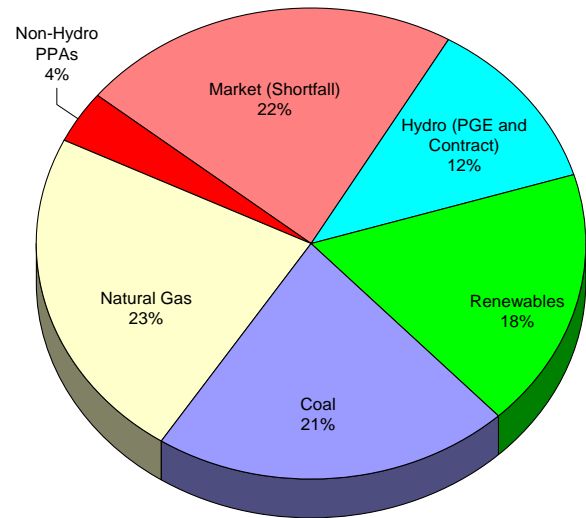
PGE generates electricity through a diverse set of resources which allow us to maintain a reliable, affordable and increasingly sustainable source of power. These resources include wind, hydroelectric, solar, gas-fired and coal-fired plants. To supplement our own generation, we buy power on the wholesale market, which is typically more expensive than the power we generate.

PGE owns substations and transmission and distribution lines in Oregon that deliver power to our customers. We also own major transmission rights to the Pacific Intertie, the West Coast electrical superhighway. These power exchange lines give us the flexibility to buy and sell power with other utilities. These are all capital-intensive activities, requiring significant investments in the infrastructure needed to acquire and deliver supply to customers.

### PGE 2008 resource mix



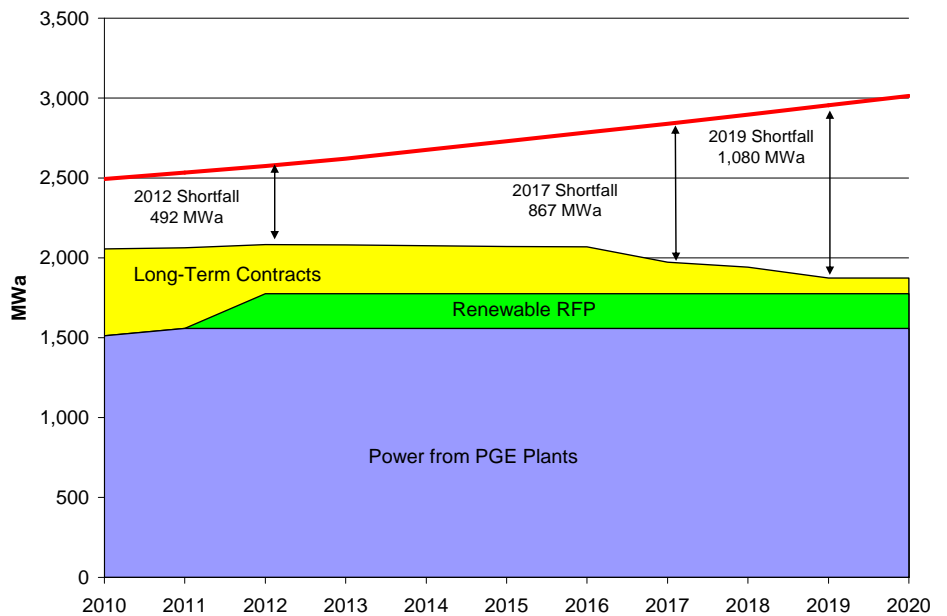
### Projected 2014 resource mix



### How is Oregon’s population growth affecting how PGE serves its customers?

Over the last 20 years, demand for PGE power has grown an average of about 1.8 percent per year. It is expected to continue that same rate of growth, resulting in an increase of 50 percent over the next 20 years. This growth creates an ever-increasing gap between the amount of power generated by PGE and the amount needed to serve our customers.

PGE projections show this gap will be about 1,100 megawatts in 2020. To put that in perspective, our gas-fired Port Westward plant generates about 400 megawatts and our coal-fired Boardman plant generates about 585 megawatts. All our generating resources are needed to maintain reliability and avoid an even greater gap.



PGE Future Energy Needs, 2010-2020

## **ELECTRICITY, THE ECONOMY AND THE ENVIRONMENT**

### ***How do electricity prices impact Oregon's economy?***

Oregon is able to attract new business in part because of our affordable electricity rates. Oregon has a higher-than-average number of companies that are heavy users of electricity, including high-tech companies, solar production companies, pulp and paper manufacturers and others.

Businesses and government agencies depend on reasonably priced electricity to keep the economy moving and provide jobs for Oregonians. Simply put, if electricity prices get too high – especially in these industries – companies will reduce operations or move to more affordable areas.

In addition, families and individuals, especially lower-income Oregonians, need electricity prices to remain stable and affordable.

PGE understands the impact of our prices on our customers and the economy, and we work hard to find greater efficiency and cost savings every day. Over the past 25 years, our average residential cost has remained flat, when adjusted for inflation.

### ***How will carbon legislation affect Oregon's economy?***

Carbon legislation is likely to drive up PGE's costs, which will be passed on to our customers. This is why we believe a cap-and-trade system should be implemented at the federal level. Adopting state-by-state standards will put Oregon's economy at a disadvantage. We also need a timeline that avoids short-term price spikes and allows carbon technologies to develop.

This does not mean Oregon should stand still. Our state can pursue a strategic action plan to aggressively address climate change, including increasing energy efficiency and paving the way for more renewable energy.

### ***What is PGE doing to reduce its environmental footprint?***

In 2007, PGE worked closely with Gov. Ted Kulongoski and the Oregon Legislature to craft the state's Renewable Energy Standard, requiring that 25 percent of the electricity used by Oregon utilities come from renewable sources by 2025.

Our Biglow Canyon Wind Farm, located on 25,000 acres near Wasco in Sherman County, is PGE's largest renewable energy project. When it is completed in 2010, we expect it to develop up to 450 MW of installed capacity, producing enough electricity to power about 100,000 homes.

We recently partnered with the Oregon Department of Transportation to create the nation's first solar highway installation, at the intersection of I-5 and I-205. We also have developed the Pacific Northwest's largest solar power installation, on the rooftops of warehouses in northeast Portland.

Meanwhile, we are upgrading the efficiency of all our plants so they can produce more electricity with fewer resources. We also are making fish-passage improvements at our hydroelectric plants so we can maintain these no-carbon sources of electricity for generations to come.

In addition, we have proposed significant investments in emission reduction systems at our Boardman coal plant. The Boardman plant is one of PGE's most cost-effective sources of power, producing electricity at a variable cost of one-third to one-half the price of electricity on the wholesale power market. Boardman provides about 15 percent of PGE's total generating capability, making it a key resource in meeting our customers' current and future energy needs.

### ***Why does PGE use natural gas and coal to generate electricity?***

Until new technologies are developed, utilities like PGE must rely on thermal plants to produce much of our region's electricity. Today, no alternatives exist that can produce enough power to reliably meet our customers' needs.

Meanwhile, PGE is conducting scientific research to identify ways to reduce carbon emissions. In a pilot project at our Boardman plant, we are growing algae which can consume the carbon dioxide produced by the electricity generation and turn it into biomass. We are encouraged by these results, but the electricity sector needs more time and resources to invest in research and development on carbon sequestration.

## **UTILITY REGULATION AND COSTS**

### ***Who regulates utilities?***

The wholesale electricity market, including transmission, is considered interstate commerce and is regulated by the Federal Energy Regulatory Commission. Retail service within Oregon is regulated by the Oregon Public Utility Commission (OPUC).

### ***What is the Public Utility Commission's role in regulating PGE?***

Customers depend on PGE to satisfy their needs for electricity and the Oregon Public Utility Commission to make sure this is done prudently.

PGE operates under a strong utility regulatory environment that includes a comprehensive public process conducted by the OPUC to evaluate and plan for future energy needs. This process produces an Integrated Resource Plan (IRP) that balances the needs of consumers, industry and the environment. To determine if utility investments are prudent, the OPUC compares the costs of alternatives to make sure the utility is making the lowest cost and most effective investments. This cost analysis includes the effect of external environmental factors such as carbon emissions.

### ***Is there a need for further oversight of utilities?***

No. The regulations the OPUC places on PGE create a reasonable and effective balance for the economy, the environment and the utility. An added level of oversight would generate unnecessary bureaucracy in an already effective system.

### ***What factors play a role in PGE costs?***

The costs for PGE to serve its growing customer demand have been steadily increasing as the prices of raw materials, transportation and labor have risen. In 2007, PGE placed the \$280 million 400 MW Port Westward in service. If PGE was to build the same plant today, the costs would be substantially higher.

PGE spent \$255 million to build Phase I of its Biglow Canyon wind farm, which began operations in 2007. Due to greater demand for wind turbines, the cost of a turbine has increased from \$1 million in 2003 to \$2.2 million in 2008. PGE will spend over \$700 million for the construction of Phases II and III of Biglow Canyon

The increased reliance on natural gas throughout the industry is also playing a role in rising costs. Natural gas fuels nearly one-third of PGE's generating capacity. It also is the source of much of the power that PGE purchases on the market and is the most readily available fuel to back up intermittent wind power. But as demand for natural gas has increased, the cost has steadily risen – 175 percent between 1999 and 2007.

PGE plans to add more than \$2 billion of investments to meet growing customer demand and improve network efficiency in the next 5 to 10 years. This does not include other costs that are likely to increase such as purchased power costs and energy efficiency funding contributions.

The costs of carbon reduction will create even more upward pressure on costs and rates, but will greatly depend upon how we are able to manage the carbon reduction strategy over time.

## **CARBON DIOXIDE EMISSIONS IN OREGON**

### ***Has the Oregon Public Utility Commission made any rulings on carbon emissions for Oregon utilities?***

Yes. Using the IRP process, the OPUC has decided:

- carbon costs will always be factored into decisions.
- utilities should not build new coal plants to serve Oregon customers.

Such guidelines demonstrate the OPUC's commitment to reducing carbon emissions from utilities in Oregon in a way that considers the industry, our customers and the economy.

In 2008, the OPUC adopted a guideline for the IRP process that requires utilities to develop carbon reduction strategies, including at least one which meets Oregon's emissions goals. The first strategic plans are due in mid-2009.

***How do Oregon greenhouse gas emissions compare to other states?***

Oregon's emissions are already among the lowest in the United States. In 2006, Oregon ranked 42nd in total carbon emissions from the electricity sector. In fact, Oregon's per capita carbon dioxide emissions resulting from electricity use are less than half that of the national average.

Our large base of hydroelectric power is a key factor in our low carbon emissions. In addition, Oregon's utilities are leading the country in investing in energy efficiency and renewable energy. While this is a source of pride for our state, it also sets a more challenging bar when we look for large, low-cost gains in carbon reduction, compared to states that have much higher emissions.

***How do Oregon regulations on carbon emissions compare to other states?***

Oregon is a pioneer in carbon reduction requirements. Among others, Oregon:

- was the first state to require carbon mitigation for new power plants (in 1997), a requirement still in law.
- adopted a requirement in 1999 that calls for all investor-owned utilities to collect a 3 percent fee from customers to fund conservation and renewable energy development through the Energy Trust of Oregon. PGE was granted authority in 2008 to add 1.1 percent to that amount to increase energy efficiency efforts.
- adopted one of the strongest renewable energy standards in the country in 2007, requiring 25 percent of energy supply come from renewable sources by 2025 for the state's large utilities.

***What are the state's goals in reducing greenhouse gases?***

The Oregon Legislature has set some of the most aggressive goals in the country to reduce greenhouse gases. In 2007, the Oregon Legislature adopted HB 3543, establishing non-binding carbon reduction goals for Oregon. These goals include:

- arresting growth in emissions by 2010 (accomplished by 2008).
- reducing emissions to 10 percent below 1990 levels by 2020.
- reducing emissions to 75 percent below 1990 levels by 2050.

***How might that impact electricity costs?***

It depends on how the state's goals are spread across the economy. If reductions create an undue burden on utilities, costs to produce electricity will increase and the economy will suffer. For PGE to replace 600 megawatts of coal generation with wind power, for example, the utility would need to build four more wind farms the size of our Biglow Canyon Wind Farm in Sherman County, plus gas-fired plants to provide back-up power when the wind is not blowing. This would cost billions of dollars, which would be paid by business and residential customers as part of their electricity rates.