



Climate Change Solutions



Oregon Switches to Cleaner Power

Utilities and power plant developers across the nation can play a significant role in slowing global climate change. In 1996, Oregon took an important step in this direction when it approved the construction of a power plant that incorporates measures to offset its emissions of carbon dioxide, an important greenhouse gas. The new plant will be located in Klamath Falls in southern Oregon.

In 1997, Oregon went even further and enacted a landmark law that establishes a “carbon dioxide standard” for all new power plants of 25 megawatts or more. The CO₂ standard required natural gas-fired plants to achieve 0.7 pounds of CO₂ emissions for each kilowatt-hour of power produced—a reduction of 17 percent below the most efficient gas-fired plant then operating in the United States.

(In January 2000, this standard was updated to 0.675 pounds of CO₂ emissions per kilowatt-hour to reflect the construction of a more efficient plant in Vancouver, Washington.) The standard can be met by any combination of efficiency, cogeneration, offsets from off-site mitigation, or a contribution of \$0.57 per ton of CO₂ plus administrative costs to an offsets project fund. Funds from the monetary path are used to finance offset projects implemented by the Oregon Climate Trust, an independent, nonprofit organization.

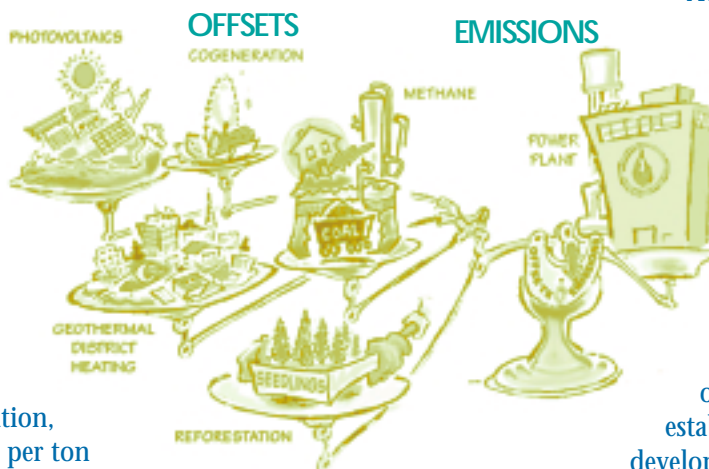
The Klamath Falls plant offered the following portfolio of mitigation measures to offset emissions from its proposed 318-megawatt power plant:

- A high-efficiency generator for *cogeneration* of steam that will be used by a lumber mill for kiln-drying lumber.
- *Reforestation* of 6,250 acres of Douglas fir in western Oregon.
- Expansion of *geothermal district heating* in the town of Klamath Falls to 78 additional buildings.
- Generation capacity of 32 megawatts from waste *methane* recovered from sewage treatment plants and coal mines in the United States.
- Capital support to install 182,000 20- or 35-watt *photovoltaic* systems over a 30-year period in remote households in India, China, or Sri Lanka to provide electricity to replace kerosene lamps.

According to the Oregon Energy Facility Siting Council, this is the first time in the United States that global warming has played a role in a major decision regarding the regulation of energy resources.

Historical Background

In 1971 Oregon passed a state law regulating the certification of new energy facilities. The law established a requirement that developers of new power plants must prove the need for a new facility. This “need for facility” or “need for power” standard required utility developers to demonstrate that present supply is insufficient to meet energy demand as shown in utility least-cost plans. A number of additional requirements must be met as well, including financial, public safety, and environmental standards such as impacts on wildlife refuges and other protected areas.



OVERVIEW OF KLAMATH'S PROJECTED RESULTS

- The plant uses a high-efficiency 484-megawatt natural gas-fired generator rated at approximately 6,800 Btu's per kilowatt-hour (the most efficient plant under the original standard was 7,200 Btu/kwh).
- The plant is expected to have gross emissions of 45.8 million metric tons of carbon dioxide during its projected 30-year life.
- The mitigation measures are predicted to offset 10.3 million metric tons of carbon dioxide over 100 years through photovoltaics, reforestation, and the other off-site measures, coupled with steam cogeneration.
- Klamath has committed \$4.1 million toward offsetting CO₂ emissions.
- The project is expected to result in offsets equivalent to taking 2.3 million cars off the road.

Very few power plants were constructed in Oregon during the 1980s. By 1995, representatives of the utility industry had persuaded legislators to introduce a bill that would eliminate the need for power standard. When it appeared that the governor would veto the bill, a one-time-only exemption was approved instead. Oregon's Energy Facility Siting Council established a competition to select a company to receive the exemption. At the same time, the governor and legislature created a task force to review the process of siting power plants.

The Klamath Cogeneration Project

The Klamath Cogeneration Project won the competition for the one-time exemption from the need for power standard. The competition was based on a comparative evaluation of proposed plants' environmental impacts on air, water, and land resources.

The first test was for air emissions of carbon dioxide, nitrogen oxides, and particulate matter. To rank the proposed projects, tons of emissions per kilowatt-hour were multiplied by a cost value for each pollutant in an effort to internalize environmental costs. The test employed values of \$10 per short ton of carbon dioxide and \$2,000 per short ton of nitrogen oxides and particulates.

In 1998, Klamath received permission to enlarge generating capacity to up to 500 megawatts. At this

point the CO₂ standard had gone into effect, so Klamath pledged \$1.3 million to the monetary offset fund to meet its requirement for the additional capacity. Construction of the re-designed, 484-megawatt plant began in August 1999, and the plant is expected to begin operation in 2001.

Klamath is committing a total of \$4.1 million to offset CO₂ emissions. The offset projects, along with the steam cogeneration, should offset 10.3 million metric tons of CO₂ over a period of 100 years, well beyond the 30-year lifetime of the plant. The offsets will equal a quarter of the plant's expected emissions—and would be even more if the methane benefits were factored in. The carbon dioxide offsets over 100 years are equivalent to taking 2.3 million cars off the road.

The offset projects, along with the steam cogeneration, should offset 10.3 million metric tons of carbon dioxide over a period of 100 years.

Lessons Learned

The competition encouraged innovation

The competition encouraged a diversity of proposals for innovative offset measures. One of the two losing competitors, for example, proposed guaranteed sequestration of 1.1 million tons of CO₂ through conservation easements intended to extend the average life of protected forests. Unlike the Klamath project, which offset carbon dioxide emissions through new tree plantings, this proposal offered offsets from managing growth in existing forested areas. Managing existing forests is intended to ensure that those trees will continue to sequester carbon dioxide.

The other applicant proposed a mitigation fund of \$7.5 million without specifying measures. The council selected the Klamath package because it had significantly greater offsets. It also offered greater innovation, cogeneration, reforestation, geothermal heating, methane recovery, and photovoltaics.

The council required guarantees of offsets in those areas that are within the developer's control. The developer is

required to live up to the representations made. If the Klamath plant fails to achieve the estimated efficiency or cogeneration goal and the actual emissions are greater than the projections, the developer is required to compensate through new offsets. The council did not require guarantees for off-site projects.

Competitions reduce the time for siting power plants, but setting a standard is preferable

The competition was a unique situation that fit the circumstances at the time. Under the usual siting process, the Energy Facility Siting Council can negotiate with the developer if the proposal fails to meet the standards and suggest amendments so that it complies. A developer who does not accept the amendments can withdraw. With a competition, however, no amendments or modifications were allowed. “Because it was a competition,” says Sam Sadler, an energy analyst with the Oregon Office of Energy, “the council had to take a hard line and make them stick to what was first proposed.”



Architect's rendering of the Klamath Falls power plant, which is expected to go into operation in 2001.

Proposals can be reviewed fairly

In addition to encouraging a diversity of proposals, the competition showed that it is possible to apply consistent evaluation standards for reviewing diverse projects. In quantifying offsets, for example, the council established conventions such as considering all three plants as operating at 100 percent capacity for a 30-year life.

Carbon dioxide offsets are financially viable

All three developers who participated are independent power producers who must produce energy at a competitive rate in order to sell it in the marketplace to utilities or large industrial customers. The fact that the independent power producers were willing to offer offsets showed that it is feasible to address global climate change and still remain competitive.

The offsets from the Klamath plant are equivalent to taking 2.3 million cars off the road.

The Task Force

The Energy Facility Siting Task Force created by the governor and legislature was charged with reviewing the process of siting power plants. The task force included seven members with diverse perspectives. Among them were a state senator and professor of political science, who was appointed by the president of the Senate; a state representative and businessman, appointed by the speaker of the House; a professor of economics and former Public Utility Commission chairman; an eastern Oregon county planning director; a labor union official and former state representative; a state environmental policy coordinator and former law school professor currently assigned to a federal natural resource agency; and a business council president and former state official—the last five appointed by the governor.

In the task force's final report, the chairman, Mike Katz, wrote: “The issues considered by the task force are contentious, to put it mildly. Parties at interest include utilities, environmentalists, power plant developers, consumer representatives, the Oregon Office of Energy, and the Energy Facility Siting Council.” He concluded, “Here is something notable: the task force's recommendations are unanimous.”

In a landmark decision, the task force called for a law requiring all new power plants to offset their carbon dioxide emissions. The task force's recommendation was incorporated in the law passed in 1997 to revise the siting standards for energy facilities. The law mandates that



Klamath Falls City Hall uses geothermal district heating.

natural gas-fired generating facilities intended for base-load use achieve a reduction of 17 percent below the emissions of the most efficient, combined cycle, combustion turbine, gas-fired plant commercially operating in the United States. Utilities, developers, environmentalists, and state energy agencies all supported the law.

The task force, in a quid pro quo with power plant developers, also recommended jettisoning the need for power standard, having concluded that it is outdated. Developers today choose to build plants that burn natural gas and are less polluting and cheaper than large-scale nuclear and coal-fired plants. The task force decided that these market forces rather than consideration of cost-effectiveness should determine the need for new power plants.

Additional Global Warming Activities

Oregon started in 1988 laying the foundation for these historic decisions. First, the state inventoried its carbon dioxide emissions and analyzed the potential impacts of global warming on Oregon. Next, the state received financial and technical support from the U.S. Environmental Protection Agency's State and Local Climate Change Program for an updated inventory of emissions and an action plan of cost-effective strategies. Oregon's latest plan was completed in 1995.

The state laid the groundwork through these studies, and then citizens' panels took action. In 1992, the Oregon Progress Board adopted a benchmark requiring that the state's emissions be held to 1990 levels. Then in 1995 and 1996, the Oregon Energy Facility Siting Task Force and the Oregon Energy Facility Siting Council—both citizens' panels—provided the leadership that set the carbon dioxide standard and conducted the competition that inspired the innovative Klamath project.

As the task force report states, Oregon has sent a signal to the nation that the state "is prepared to do its fair share" to address global climate change.

For More Information

For a description of the Energy Facility Siting Standards or the CO₂ Standard, visit the Oregon Office of Energy's website at

www.energy.state.or.us

To learn about the Oregon Climate Trust's role in implementing offset projects, visit

www.climatetrust.org

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