Pueblo of Jemez:

Leading the Way to a Renewable Future

Impacts from climate change are increasingly apparent in the southwestern United States, and Sandoval County in New Mexico, home to the Pueblo of Jemez, is no exception. Over the last 100 years, temperatures have increased throughout the state, with summer temperatures increasing twice as fast as winter temperatures. This warming trend, especially apparent in the Jemez Mountains, is expected to continue and will place regional ecosystems under increasing stress. Mean precipitation levels have decreased as well, and the Intergovernmental Panel on Climate Change (IPCC) projects that this trend will also continue.

Jemez Pueblo takes climate change seriously and has initiated mitigation efforts throughout the Pueblo, including renewable energy projects (solar, geothermal and biomass), energy efficiency, and energy planning. Education and outreach to young tribal members and the community has become another important part of their effort.

Renewable Energy Projects

Solar Energy

The Jemez area has, on average, 310 sunny days a year. This sacred resource is becoming a significant renewable energy source in the Southwest. Moving from fossil-fuel energy sources to renewable sources such as solar and wind will help the country in reducing greenhouse gas emissions. The Pueblo of Jemez is leading the way among tribes in embracing solar energy.

For the past four years Jemez Pueblo has been busy planning and negotiating a contract to sell the electricity to be produced from a four-megawatt solar power plant now under development on Jemez land. This commercial-scale solar power plant will be the first in the nation on tribal lands. Although some tribes have used small-scale solar power for limited on-reservation structures (e.g. casinos and individual homes), Jemez Pueblo is a leader in developing a large-scale solar plant to provide power for purchase by outside customers. Thirty acres of Pueblo land have been set aside for the solar plant, which will include 14,850 solar panels and has an available transmission line.

Planned solar photovoltaic system. Photo courtesy of Pueblo of Jemez.

Jemez Pueblo expects the solar plant to produce enough electricity to power 600 homes while also offsetting over 278,876 tons of carbon dioxide (CO_2) throughout its service life. The estimated $22 million dollar project (financed through government grants, loans and tax credits, with additional in-kind help from engineers and legal firms) is expected to bring in roughly $25 million over the next 25 years. Revenue from the solar plant will go toward infrastructure improvements and community services on the Pueblo.

Looking northeast across proposed solar site. Photo courtesy of Pueblo of Jemez.

James Roger Madalena, a former tribal governor, was quoted in the Christian Science Monitor (2010): "It's very critical that we become innovative, creative, that we come up with something that will last generations without having a devastating impact on the environment." The benefits of this project to Jemez Pueblo are numerous. Revenue from this project is sustainable and could be used to address tribal infrastructure problems. Furthermore, the project elevates the Pueblo's status as a competent renewable energy project developer, which could lead to further renewable energy projects and developments while setting a positive example for not only Jemez students and citizens but tribes throughout the country. In addition to benefiting the Pueblo, the project benefits all living things by helping to reduce carbon dioxide emissions into the atmosphere.

Geothermal Energy

As above, so below—the Jemez Pueblo is looking not only to the heavens for renewable energy solutions but also to the Earth. With nearly $5 million of assistance from the U.S. Department of Energy (US DOE), the tribe is exploring the possibility of developing its geothermal resources. An area near Indian Springs on the Jemez Pueblo is believed to contain a potential geothermal resource. The Pueblo, in collaboration with Los Alamos National Laboratory and several universities, is compiling a detailed report of potential underground geothermal water resources. Two exploration wells between 3,000 and 6,000 feet deep will be drilled to identify the nature and extent of the geothermal resources. These resources could have a variety of different uses, such as commercial power generation, greenhouse agricultural operations, building heating systems, and/or a commercial spa.

Biomass

The Pueblo of Jemez sees another source of energy in the waste material from forest thinning projects. With financial assistance from the US DOE and the State of New Mexico Energy Minerals and Natural Resources Department, the Pueblo is designing a biomass boiler for the Walatowa Visitor's Center. The boiler will be fueled by "waste material" cordwood harvested from a Bureau of Indian Affairs-contracted forest thinning project.

Energy Plan

The Pueblo of Jemez received funding from the US DOE Office of Energy Efficiency and Renewable Energy to prepare a strategy to reduce energy costs of non-residential tribal buildings. Thanks to this funding, the tribe has estimated current energy use, developed an

energy plan, and is achieving energy reductions in buildings across the Pueblo.

Education

All in all, the Pueblo is making great strides in developing its renewable energy resources and becoming a more energy-efficient community. However, the Pueblo recognizes that it must engage its youth and the overall tribal community to attain energy sustainability. Like many other Native American communities, the Pueblo of Jemez has seen young adults leave the community for employment opportunities elsewhere. Jemez Pueblo has taken a proactive position to address this concern. The Pueblo is developing education and training programs to generate a skilled workforce within the tribe that would specialize in the green job arena. Tribal members have the opportunity to become acquainted with geothermal energy through programs that includetraining in specialized technical surveys.

In planning for the long-term capacity of its tribal renewable energy workforce, the Pueblo is integrating renewable energy into the school curriculum:

- Elementary students are learning about robotics and solar-powered cars through a partnership with Los Alamos National Laboratory.
- Students learn about design models of solar-powered homes.
- Staff from the Pueblo's Department of Resource Protection teach high-school students about the geothermal, solar, wind, and biomass energy potential of the region through lectures and field trips.
- Kevin Shendo, the Pueblo's education director, uses the tribe's renewable energy resources to teach math, science and technology in experiential learning activities to better prepare students for jobs in a local green economy.

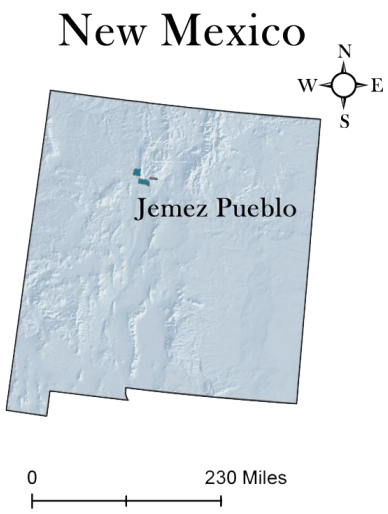
Challenges and Lessons Learned

The Pueblo's biggest challenge with their solar project was not the anticipated financing of the project, but rather finding a buyer for the renewable energy. New Mexico has three utilities that can realistically purchase power from the Pueblo's solar energy project; thus far, however, an agreement for the purchase of this power has not been established. Other tribes or organizations attempting renewable energy ventures such as the commercial solar power plant should first find a purchaser for the electricity. According to Greg Kaufman, Director of the Jemez Natural Resources Department, "It is imperative to find a buyer for the renewable energy." Additionally, tribes should identify power markets and figure out how the power will be transmitted to those markets.

Jemez Pueblo is on a path to a more sustainable future not only for its tribal members, but also for the local and global environment. Renewable energy, energy efficiency, and sustainable communities are crucial to the future survival of our planet; Jemez Pueblo realizes this and is doing its part to create a better world for current and future generations.

About the Pueblo of Jemez

It is widely accepted that the Pueblo people of New Mexico migrated to the area in the 1200s, and experienced their first contact with non-indigenous peoples in the 1500s. Today the federally recognized Pueblo of Jemez is located in Sandoval County in New Mexico, 55 miles northwest of Albuquerque. The Walatowa Puebloan village is home to the majority of the estimated 5,200 Pueblo of Jemez tribal members. The Pueblo of Jemez is a sovereign nation and operates its own tribal government and tribal court systems, as well as a governing body that deals with traditional matters.



The Pueblo manages its natural resources through the Natural Resource Department that was established in 1994. This branch is responsible for managing, monitoring and protecting the land and resources in a caring and respectable way that sustains Pueblo culture. The Pueblo encompasses approximately 89,000 acres of land, 2,000 of which sustains agriculture through *acequias* and irrigation. Open rangeland beyond the valley bottom of the Pueblo serves as pastureland. Vegetation in this region consists of piñon and juniper in areas lower than 7,000 feet in elevation, and mixed conifer and ponderosa pine above 7,000 feet.

The Jemez area is one of the most biologically diverse areas in New Mexico, and Jemez Pueblo is involved in a variety of projects including water quality, air quality, environmental education, soil and water conservation, cultural resource inventories, renewable energy assessment and conservation law enforcement that works towards protecting natural and cultural resources for future generations.

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