Taos Pueblo Renewable Energy Feasibility Study

Taos, New Mexico

2004-2005

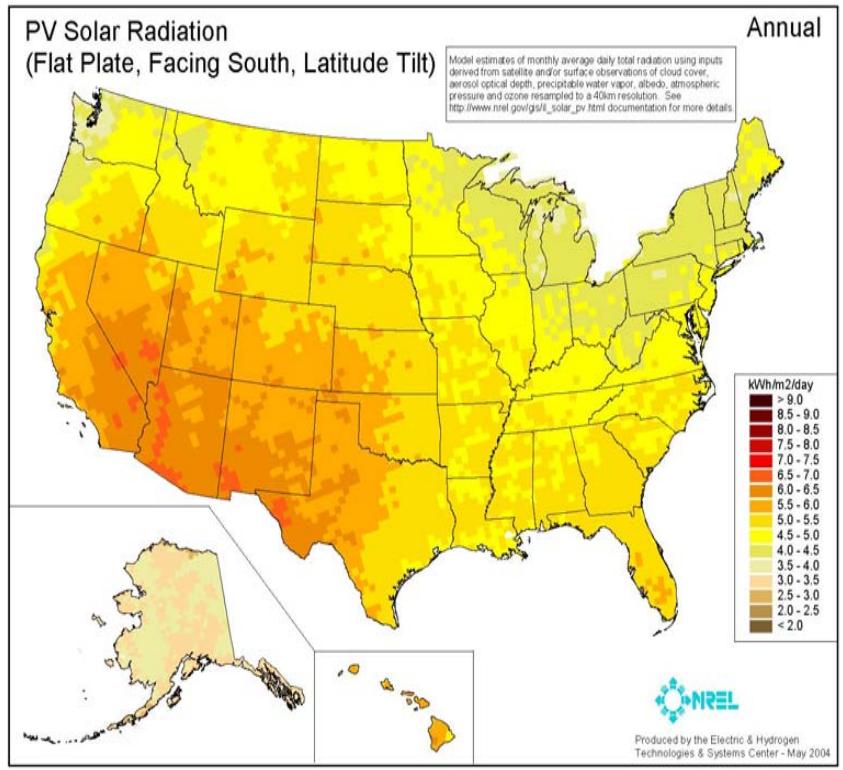
Funded by DOE Tribal Energy Program

Scope of Study

- Solar
- Wind
- Biomass
- Hydro
- Concept development based on resources
- Tribal Council review
- Business plan development

Solar

- New Mexico sunshine abundant even in winter
- Demonstration Projects: greenhouse rock- storage system, p.v.-powered well pump
- New housing will utilize passive-solar and solar-thermal hot water.



Greenhouse heating and cooling system

Installation of 1st layer of heating pipe

Completion of 2nd layer of pipe

Low-cost solar greenhouse

Cultural Issues

- Traditionalists at Pueblo consider use of solar and wind technology against spiritual teachings
- “Progressives” consider use of solar and wind the right thing to do.

Wind

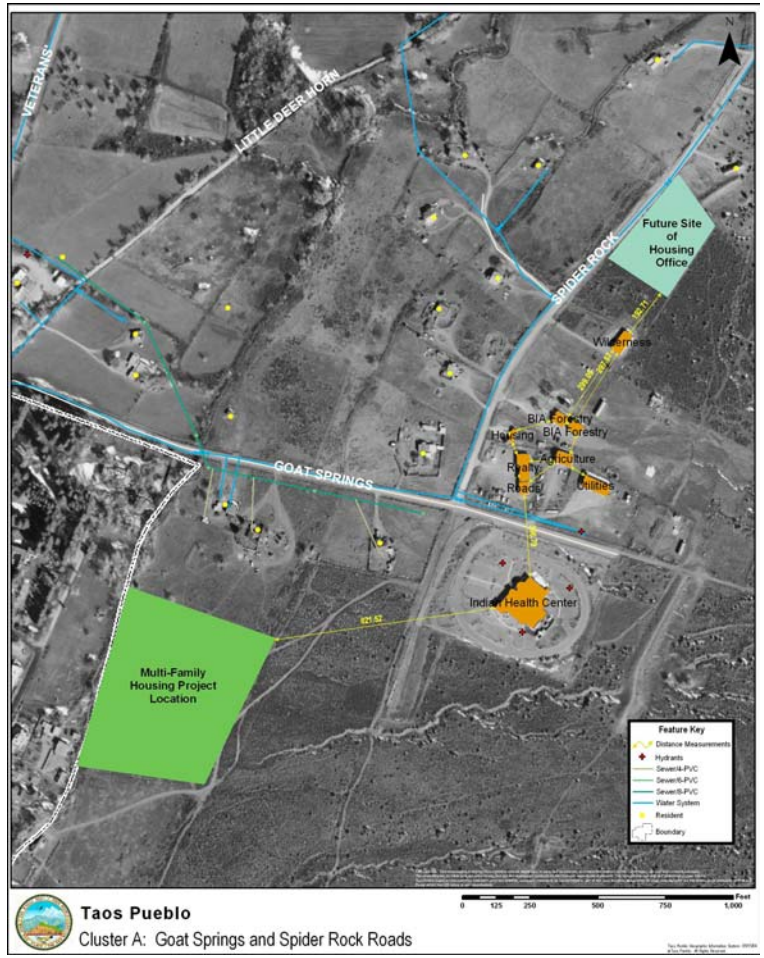
- Commercial grade wind sites are on mountain ridges which due to scenic and spiritual issues cannot be developed.
- Off-site wind farm in collaboration with other Pueblos is being considered.

Small-scale wind

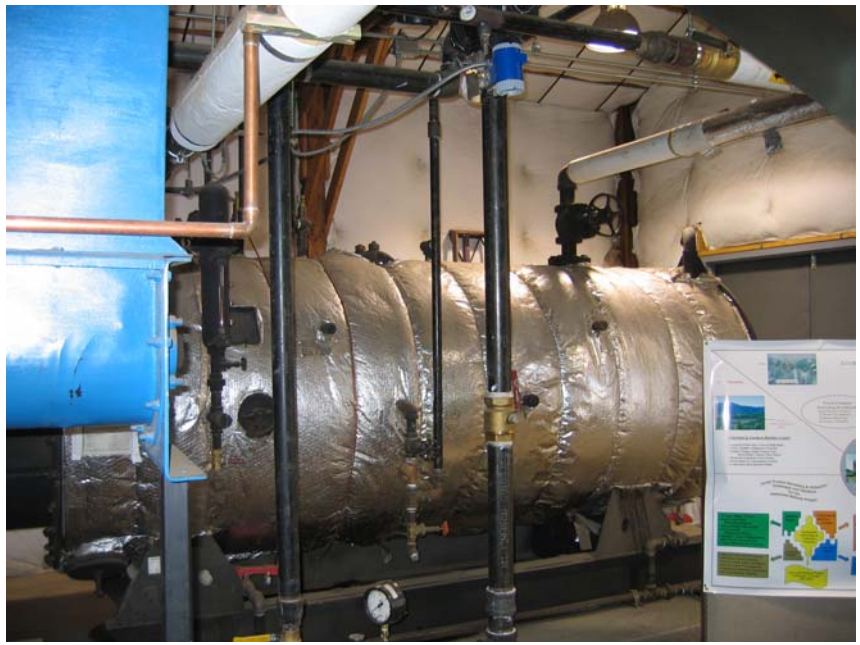
- Good wind resources in open rangeland and farmland for small-scale wind
- Pump water for buffalo and cattle, supplemental irrigation
- Supply power to Buffalo Barn & well
- Off-grid Residential

Biomass

- District heat and power system for cluster of office buildings, clinic, and commercial greenhouses
- Preliminary engineering plans by BioEnergy Corporation



Biomass System

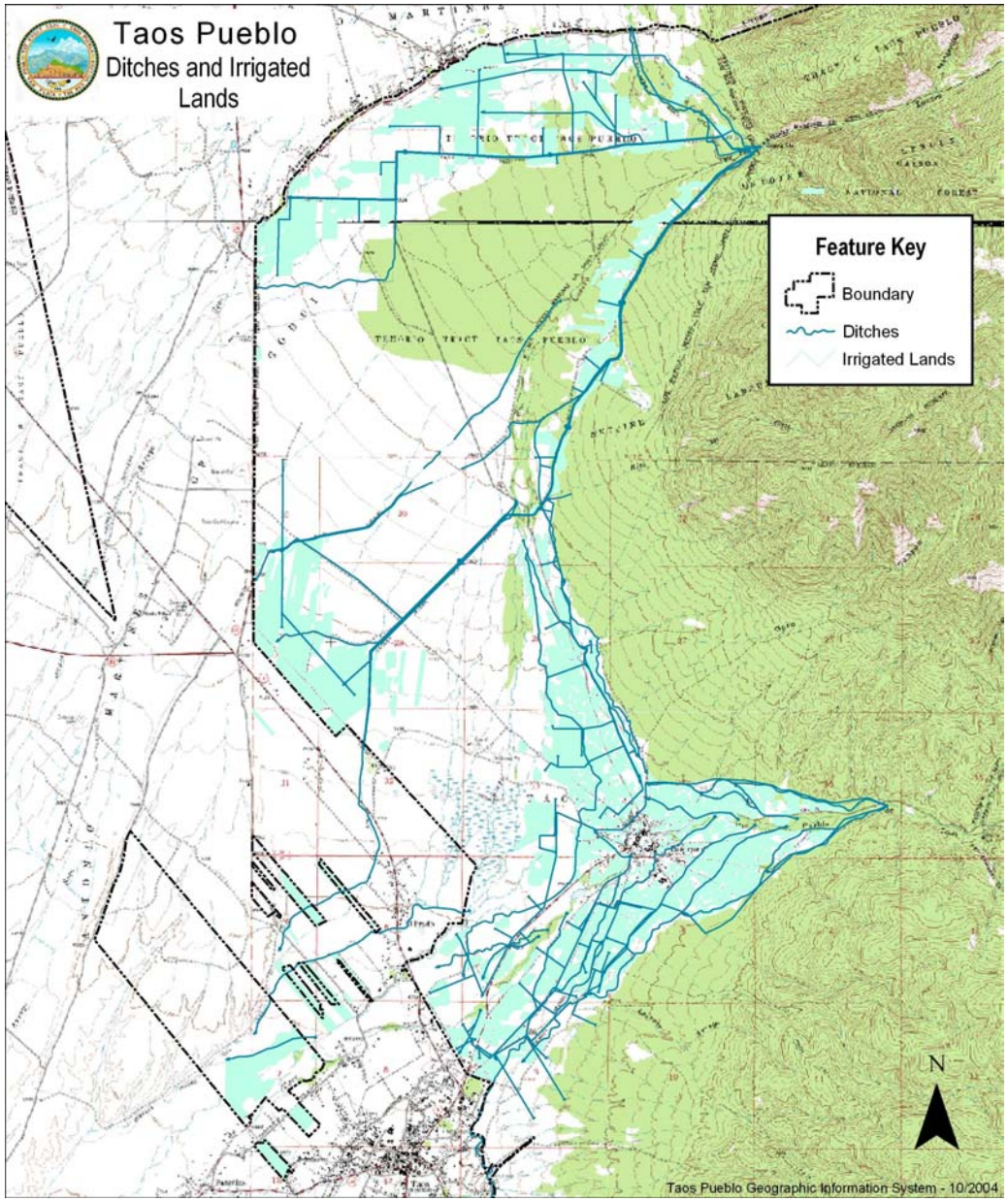


Biodiesel Crops

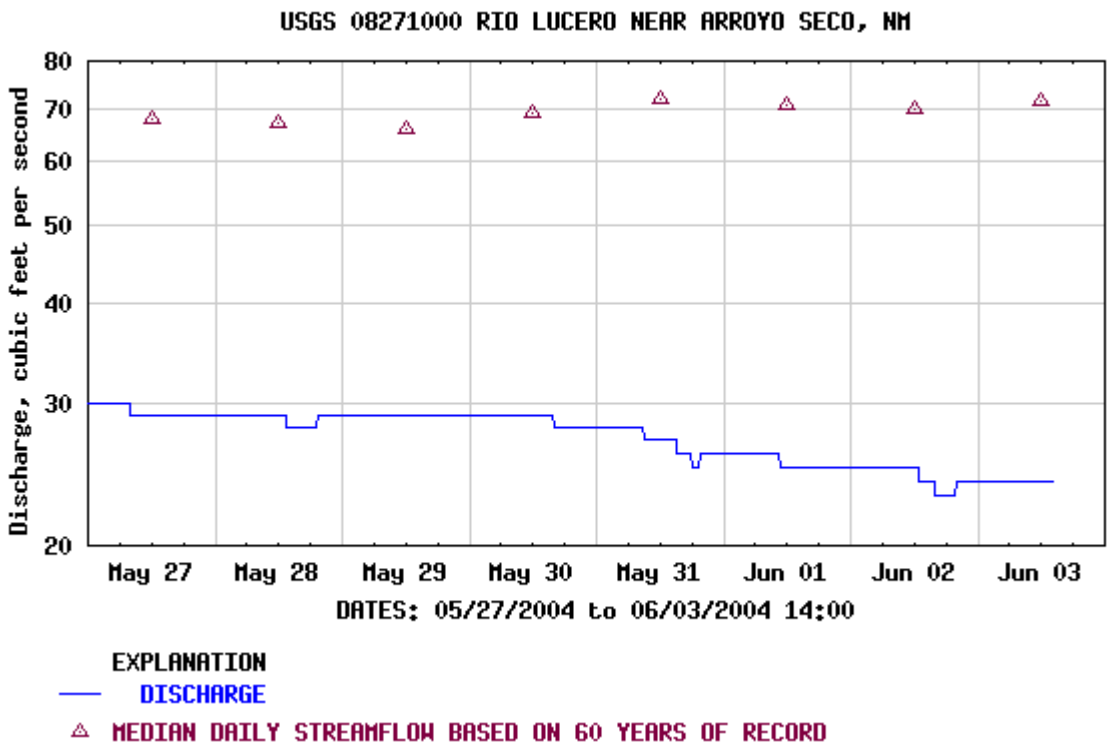
Biodiesel Crops

- Can be used as rotation crop with low water use
- Oilseed can be processed at planned processing plant in nearby area
- 1/4 section under cultivation could supply all the diesel used by Pueblo, including planned agricultural use (tractors, water pumping)

Hydroelectric


Taos Pueblo
Ditches and Irrigated Lands
Feature Key
Boundary
Ditches
Irrigated Lands
N
Taos Pueblo Geographic Information System - 10/2004

Drought


USGS 08271000 RIO LUCERO NEAR ARROYO SECO, NM
Discharge, cubic feet per second
80
70
60
50
40
30
20
May 27
May 28
May 29
May 30
May 31
Jun 01
Jun 02
Jun 03
DATES: 05/27/2004 to 06/03/2004 14:00
EXPLANATION
DISCHARGE
MEDIAN DAILY STREAMFLOW BASED ON 60 YEARS OF RECORD

Generation Potential

- Springtime/summer runoff peaks coincides with irrigation peak demands
- Run-of-river installation with 400 ft. head could supply 1,536,440 kWh from March through September.
- Supply enough power to irrigate about 2,000 acres with groundwater at 500 ft.
- Can be mated with biodiesel generator

Promising Results

- Wood-chip fired district heating & power system can enable new businesses such as commercial greenhouses and fish farm, as well as lower energy bills for existing and planned buildings.
- Wind and hydro electrical generation for pumping water can assist in agricultural revival which will secure water rights and further economic development.
- New generation of housing can be solar, and more land assignments can be used without power line extensions.