



U.S. Department of Energy
Energy Efficiency and Renewable Energy

NativeSUN:

A Model for Sustainable Solar Electric Systems on Indian Lands

June 27, 2006

Debby Tewa

Sandia Contractor

Sandra Begay-Campbell, Technical Advisor

Connie Brooks, Co-Author



Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy under contract DE-AC04-94AL85000.





Tribal Energy Program



- Promote tribal energy sufficiency, economic development and employment on tribal lands through the use of renewable energy and energy efficiency technology
- Offers financial and technical assistance to Tribes through government-to-government partnerships that:
 - Allow Tribal leaders to make informed decisions;
 - Bring renewable energy and energy efficiency options to Indian Country;
 - Enhance human capacity through education and training;
 - Improve local Tribal economies and the environment; and
 - Make a difference in the quality of life of Native Americans.
- Tribal Energy Program Website:
<http://www.eere.energy.gov/tribalenergy/>

- Development Projects (5)
- "First Steps" Projects (9)
- Feasibility Studies (31)

Over the last two years, DOE has funded 45 tribal energy projects totaling \$8.4 million.



Sustainability

- There must be a need for solar electrification; that need must fit with and blend with cultural values
- The infrastructure for delivering PV systems must be in place, including supply, installation, service, maintenance, and financing.
- A customer must be “vested” in his or her system.
- There must be a “champion” supplying the system.
- Consumer education is key: There must be full disclosure of non-technical information presented in a way that consumers can best learn it
- Expectations must be realistic. Customers must realize that solar electricity is not the same as grid electricity



The Hopi Tribe



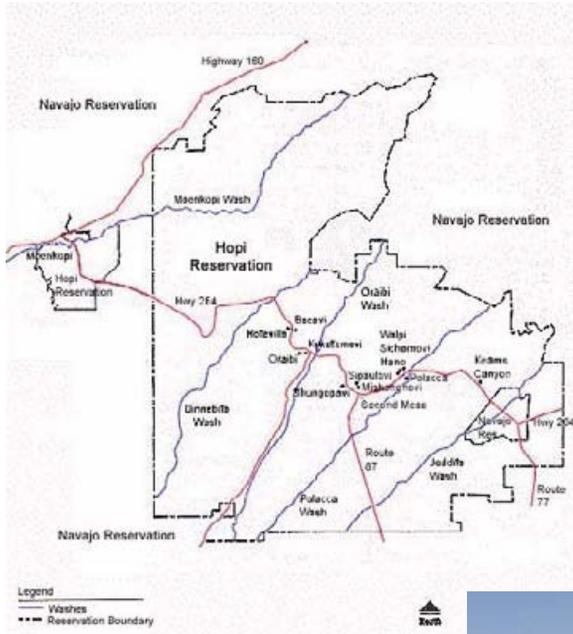
- The Hopi reservation was established in 1882
- The annual rainfall is 8” – 12” with mild winters
- The natural springs are nestled below the mesas
- The land is dotted with small shrubs and pinion trees on and below the mesas
- The Indian Reorganization Act of 1934 established the modern form of government

The Total Acreage of the Hopi Reservation is 1,561,213



A Closer Look Inside the Hopi Reservation

- There are approximately 7,000 people who live and work on the Hopi reservation
- It is estimated the total population is 12,000
- There are thirteen villages with five villages without the modern infrastructure



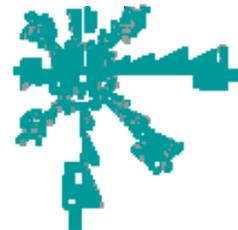
The modern and traditional lifestyles are intertwined to sustain the Four pillars – Cultural, Social, Economic and the Environment



THE HOPI FOUNDATION

LOMASUMI'NANGWTUKWSIWMANI

Our Mission:
"Help People Help Themselves"



Native Sun offices in Arizona





NativeSUN

The Hopi Solar Electric Enterprise



- 1985 – Began as a non-profit under the Hopi Foundation
- 1991 – Invested in a modular building that host other RE products
- 1998 – Television debut in “Honey We Bought the Company”

My Specific Involvement with NativeSUN

- Trained at Solar Energy International, Carbondale, CO
- Set up five photovoltaic systems for demonstration and marketing
- Teamed with NMSU-SWTDI
 - Found several key issues regarding grounding and wiring





Typical PV Systems Sold By NativeSUN

- 75 watt to 1.2 kW array with Balance of System (BOS)
- The typical load on PV systems is lighting, small kitchen appliances, small power tools, sewing machine, television, and radio
- The cost of the PV system ranged from \$1,000 to \$10,000
- The total cost of the system varies due to the size of the building that usually required electrical wiring.

NativeSUN transferred ownership to the customers by training them in the O & M of the PV System, especially in battery care





Financing Mechanisms for the Business & Customers

- 1990 – NativeSUN received \$150,000 from the Arizona Energy Office of the Department of Commerce, a financial turning point for a young micro-enterprise
- 1991 – major contributors to the revolving loan program were the Hitachi Foundation, Joyce Mertz-Gilmore, the Arizona Community Foundation
 - Financing of PV systems
 - 12% to customers
 - 8% to 65 years and up
 - Provided loans depending on customer budget
 - Encountered default on loans and repossession of PV system
- 2000 – NativeSUN became Limited Liability Corporation

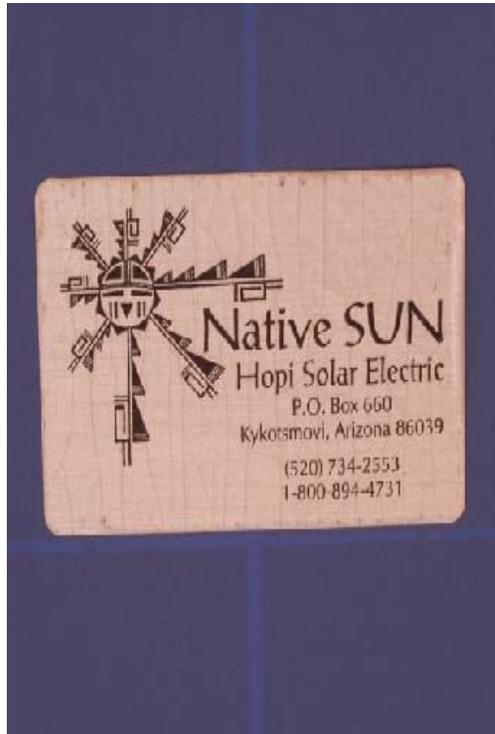
There is a strong need for entrepreneurs who have a strong financial background to lead a successful enterprise in Indian Country





Lessons Learned

- Be patient doing business in Indian Country because professional skills may not be easily accessible
- It takes time to establish and know your customers needs and budget and explain RE in layman's terminology
- Be aware of many facets of business, including marketing, finance, education, and keeping up with technology
- Emphasize O & M of the hardware for Sustainability





Media Outreach

- “Hopi Power: One of Their Own Gives the Gift of Electricity to Her Native American Tribe,” by Ted O'Callahan, Seed Magazine.com, 2006.
- “Empower Your Customers to Perform Their Own PV Maintenance,” EC&M Magazine, 2006.
- “Light-bringer Debby Tewa Provide Expert Advice about Photovoltaic Units to People on Indian Reservations,” by Chris Burroughs, Sandia Lab News, 2005
- “Solar Power Lights Homes on Indian Reservation,” New Mexico Business Journal, 2005.
- “Solar Self-Reliance,” by Winona LaDuke, Mother Earth News Magazine, 2004.
- “Powering Native American Lands,” by Craig Cox, Solar Today Magazine, American Solar Energy Society, 2002.
- *The Solar Way: Photovoltaics on Indian Lands*, Sandia National Laboratories, 2001.



Debby Tewa
dktewa@sandia.gov

For information on Program:
www.eere.energy.gov/tribalenergy

For Information on Project Development
www.eere.energy.gov/tribalenergy/guide