



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

# Solar Technologies for Native America

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# *Sandia* **VISION**



**Helping our nation  
secure a peaceful  
and free world  
through technology.**



# Where is Sandia National Labs?



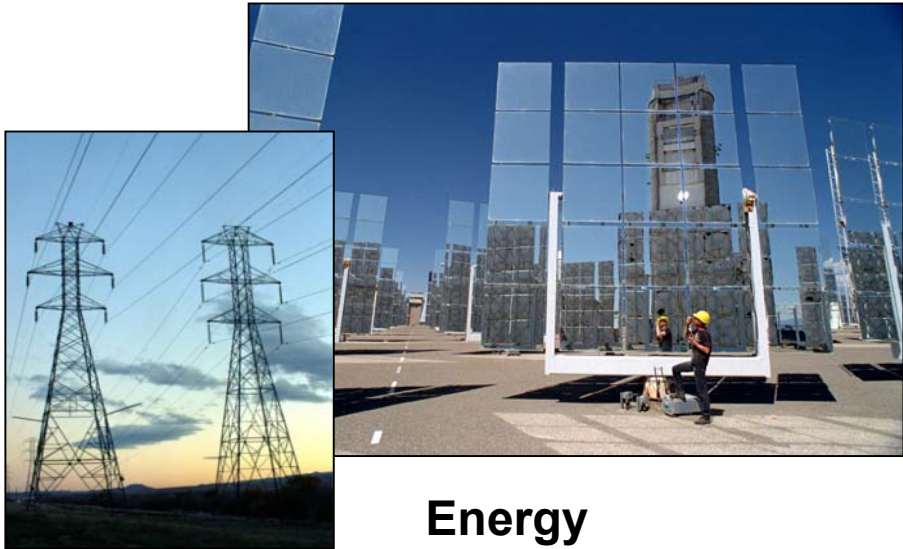
- **New Mexico**
- **California**

- **Nevada**
- **Hawaii**
- **Texas**





# We address the surety (safety, security & reliability) of critical infrastructures



**Energy**



**Transportation**



**Architecture**



**Communications**



# Sandia's activities are making an impact to create energy for rural areas

Sandia draws on over 20 years of systems engineering experience to provide technical assistance to Tribes:

- develop and implement DOE programs with technical assistance
- survey and encourage tribal applications
- develop a sustaining plan for Tribal Lands RE Program





# Sandia has provided successful photovoltaics tribal technical assistance

## Provided assistance for Navajo Nation

- Assistance with technical specifications and technical review
- Development of customer video assistance (storyboarding and technical producer interface)
- Offer to assist with acceptance testing & performance testing
- Offer to support maintenance process refinement and data acquisition.

Training and implementation of rigorous maintenance plans to assure successful operation is both a need and a goal

Development of a qualified database for long-term maintenance & reliability of Stand-alone systems

Sandia's Native American RE team won an employee recognition award



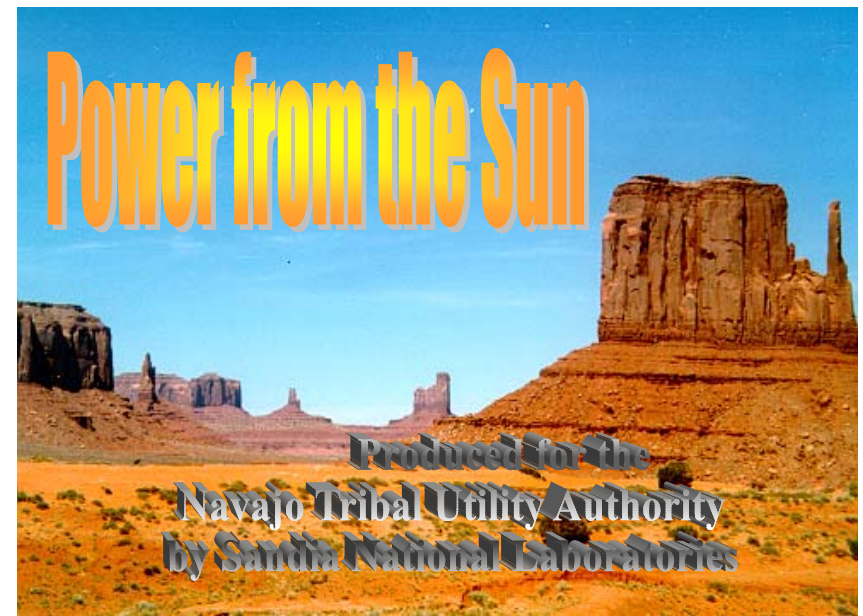
New NTUA Off-Grid Photovoltaic (PV)  
Hybrid Unit



# Sandia & NTUA created a customer education video to communicate PV system capabilities

It is important for end users to understand the systems' capabilities

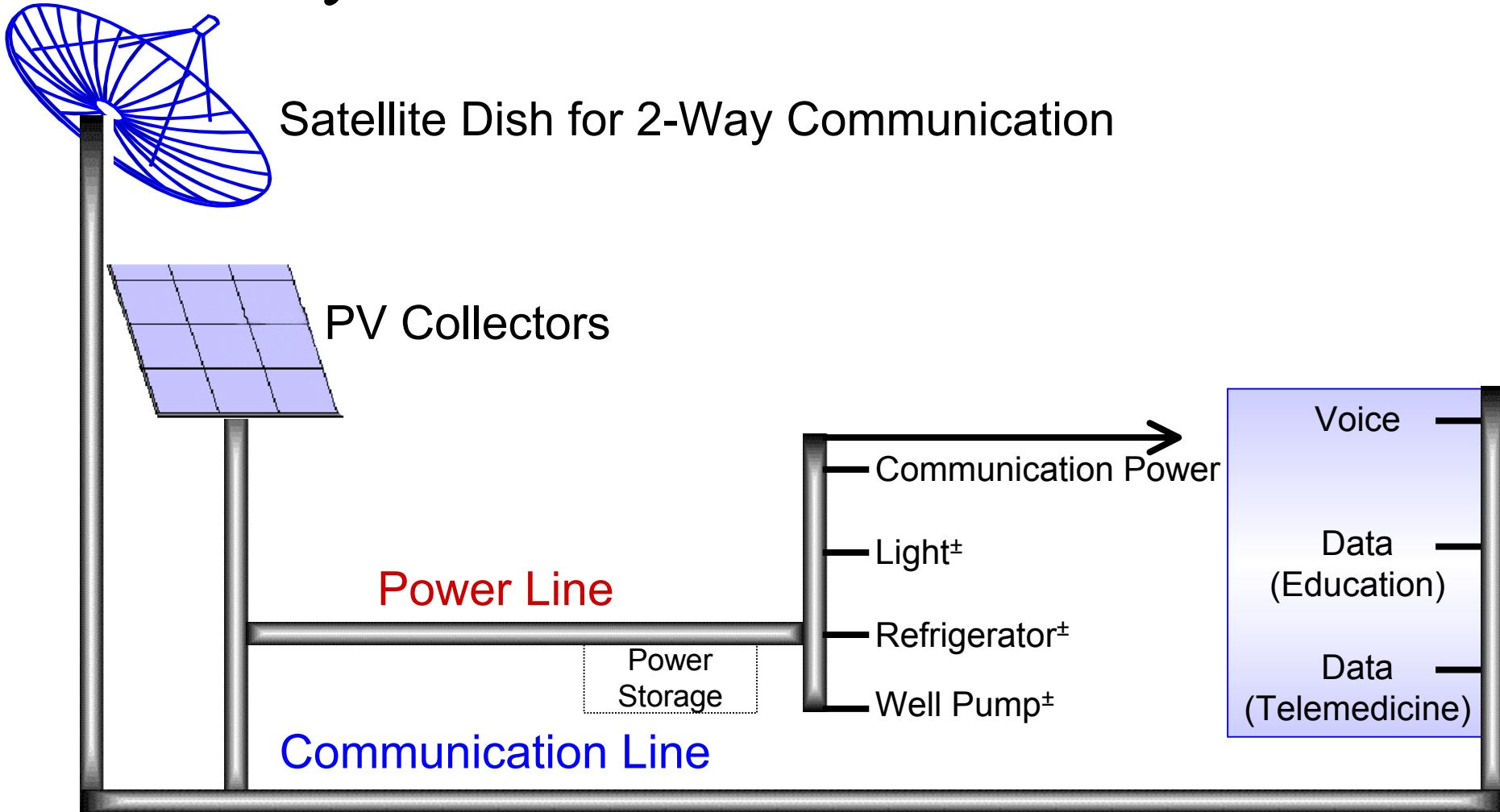
- Limited electricity available from the PV systems.
- Power availability must be gauged and energy use can be managed.
- PV panels must be cleaned and no shadows on the panels.



**The video is available in both English and Navajo for distribution to NTUA's district offices and Navajo community centers.**



# INET Systems schematic for Off-Grid Use



<sup>±</sup> High Efficiency





# Native American designed system tests completed thru Small Business Assistance Program



**Stand-alone/hybrid PV system**

Sandia has completed a thorough evaluation and experimental optimization of a stand-alone/hybrid photovoltaic system.

The PV/hybrid system is equipped with

**1200-Wp array**

**2-axis solar tracker**

**24 volt and 1000-Ah battery bank**

**charge controller and inverter**

**8-kW propane-fueled generator, and can be expanded to include an optional wind turbine**



# The Dish/Stirling System provides another remote power option

The objective is to develop and validate Concentrating Solar Power technology that meets the needs of the marketplace--remote power

Demonstration of 10 kW dish/Stirling power generation System

Water pumping selected for remote application

- Interest by remote Native American tribes

- Large potential market

- Avoids complex energy storage and power management issues (store water)

Reliability improvement requires a long-term concerted effort





# Contact Information

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