



# NTUA WIND ENERGY FEASIBILITY STUDY ON THE NAVAJO NATION

DOE EE/RE Tribal Energy Program  
Fiscal Year 2008 Program Review

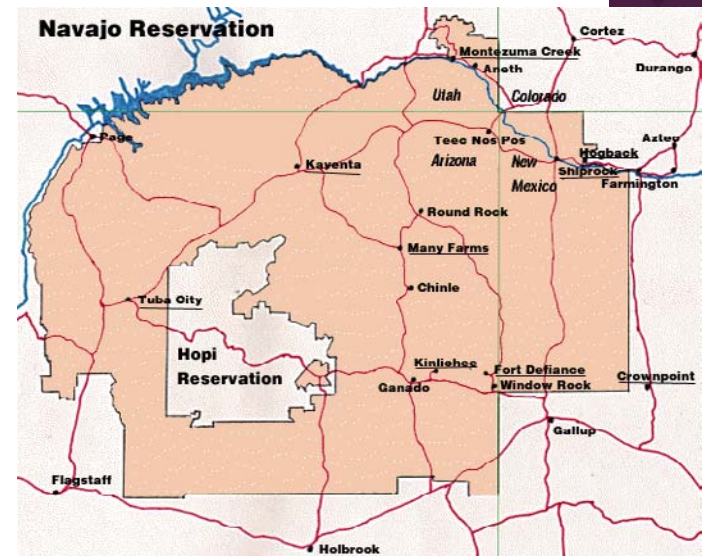
Denver, Colorado

Tuesday, November 18, 2008

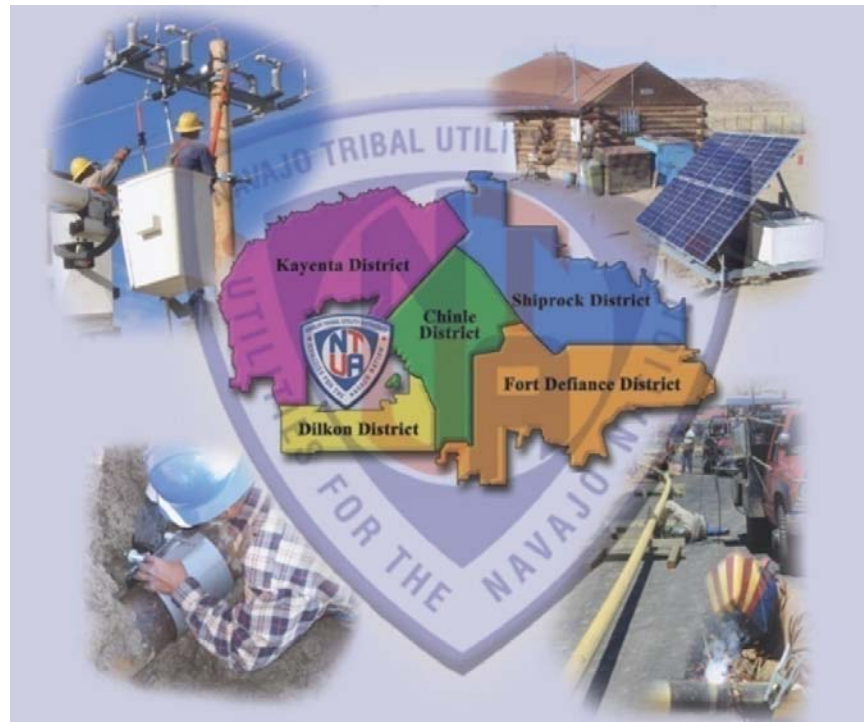


# THE NAVAJO NATION: A BRIEF OVERVIEW

- Ancient homelands in the American Southwest
  - On the Colorado Basin in the present states of Arizona, New Mexico and Utah
  - Reservation includes an area of 26,000 square miles, which is similar in size to state of West Virginia
- Traditional lifestyle of the Navajo
  - Lifestyle of herding and grazing
  - Land is bound by four sacred mountains in a high desert climate
- Electrification of the Reservation
  - 18,000 of 48,000 homes on the reservation do not have electricity services (37.5% of homes on the reservation)
  - Navajo homes represent 75% of U.S. tribal homes without access to electricity



# NTUA ORGANIZATION



- Founded in 1959
- Six District, One Sub-District Offices
- Headquarters Office in Fort Defiance, Arizona

# NAVAJO TRIBAL UTILITY AUTHORITY

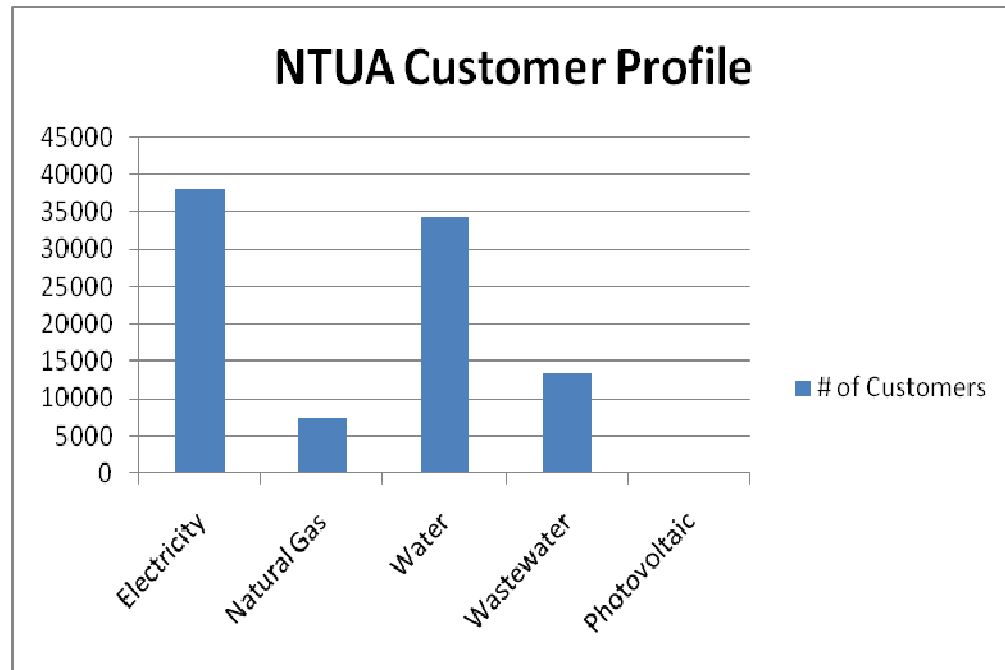
- Created to provide utility services to the Navajo reservation by the Tribal Council
- Governed by a seven member Management Board, which is appointed and confirmed by the Government Services Committee
- Headed by a General Manager, who is selected by the Management Board and confirmed by the Government Services Committee

# NTUA PLAN OF OPERATION

- Organized for the operation, maintenance, and expansion of utility services to customers within the Navajo Nation
  - To improve the health and welfare of the residents of the reservation
  - To promote employment for Navajo people
- Operates as a non-profit corporation

# UTILITY SERVICES

- Electricity
- Natural Gas
- Water
- Wastewater
- Renewable Energy



...in the Navajo Nation's 26,000 square mile reservation

# RENEWABLE ENERGY PROGRAM

- Residential Electricity Service
  - Renewable Energy Sources
    - Photovoltaic power systems
    - Hybrid Photovoltaic-Wind power systems
  - Net Metering
- Utility-Scale Generation
  - Wind Generation Exploratory Activities
  - Alternative Energy Sources
- May participate in electricity generation per the NTUA Plan of Operation

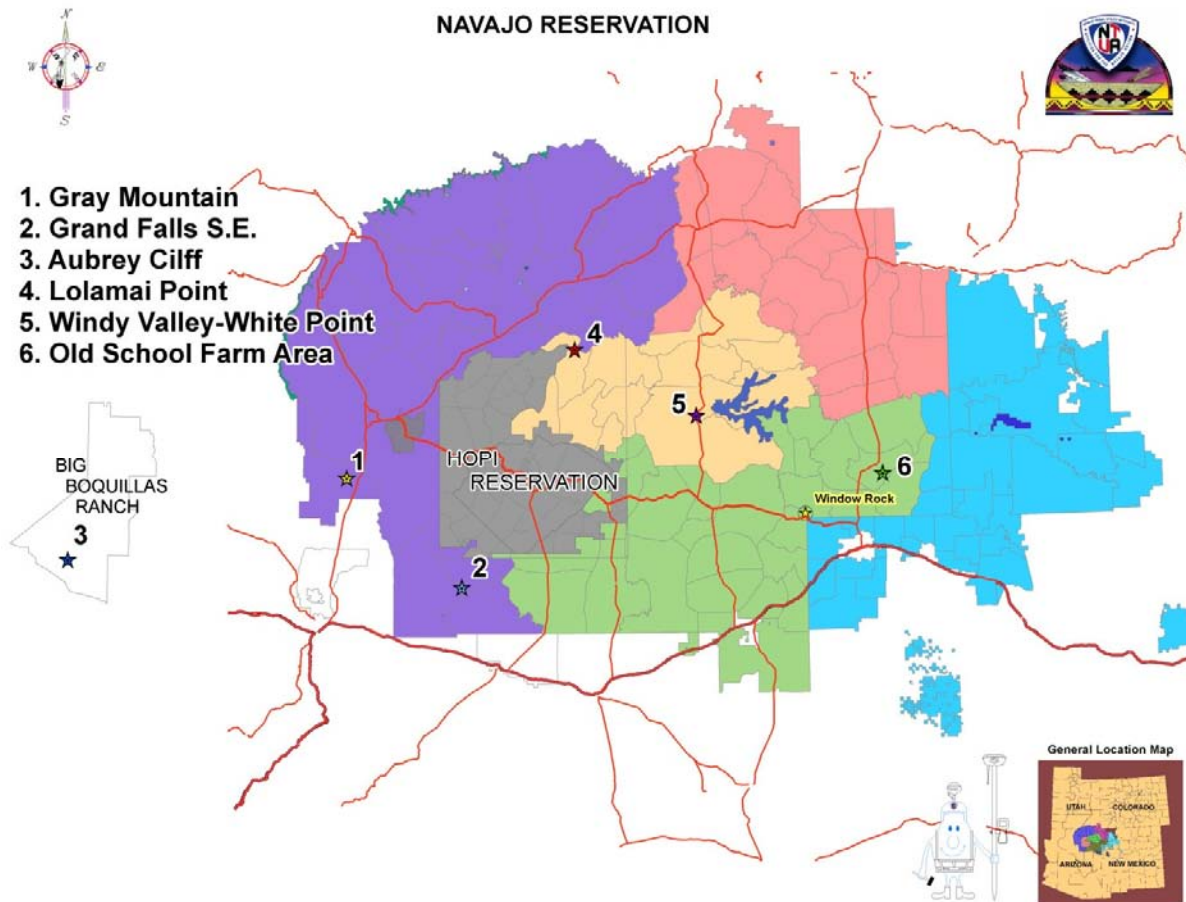
# RESIDENTIAL PHOTOVOLTAIC (PV) SYSTEMS

- Introduced to provide an electricity alternative for Navajo homes beyond the reach of the grid.
- Standardized Systems:
  - Self-contained
  - Stand-alone
  - Standard Service Entrance





# NAVAJO WIND FEASIBILITY STUDY



# PROJECT ACTIVITIES

- ✓ Establishment of Navajo Wind Team
- ✓ Visit to regional wind sites
- ✓ Site selection
- ✓ Outreach to tribal entities
- ✓ ROW/permitting process
  - Cultural, Environmental Assessments
- ✓ Avian Pre-Assessment
- ✓ Procurement of hardware
- ✓ Installation of anemometer kits
- ⊙ Collection of wind data
- ⊙ Analysis of wind data

# NTUA WIND ACTIVITIES: GRAY MOUNTAIN

- Installation: October, 2007
- On-reservation
- 50 meter met tower



# NTUA WIND ACTIVITIES: AUBREY CLIFFS

- ◉ Installation: May, 2008
- ◉ Off-reservation
- ◉ 50 meter met tower



# LESSONS LEARNED

- ◉ Scope will change based upon circumstances of the project
- ◉ Education is key to establishing and maintaining harmony among the people, the government and entities of tribes
- ◉ The most significant pre-development task, in terms of time, may be the permitting process
- ◉ Find those entities which are interested in Indian Country and the resources owned by Indian Country
- ◉ Even pre-development presents excellent opportunities for capacity building
- ◉ Navajo Nation must gain a degree of control over its energy future

# THANK YOU!

- ◉ Thank you for inviting the Navajo Tribal Utility Authority (NTUA) to present at the 2008 TEP Program Review.
- ◉ For additional information about the NTUA Renewable Energy Program:

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