

NAVAJO TRIBAL UTILITY AUTHORITY

Navajo Electrification Demonstration Program

**U.S. Department of Energy
Tribal Energy Program
2004 Program Review Meeting
Golden, Colorado
October 20, 2004**

Presented By:

Paul Denetclaw Jr.- Electric Engineer Supervisor

Larry Ahasteen- Renewable Energy Specialist

Overview of NTUA Presentation

- Introduction
- Project Overview
- Project Location----- Video
- Project Participants----- Video
- Objectives
- On-going projects
- Project Status
 - Accomplishments
 - Technical or Management Issues
 - Activities Yet to Be Completed
- Future Plans
- Navajo Electrification Demonstration Program –Video

OBJECTIVES

"Navajo Nation want to improve the lives of its people and to provide them access to electricity "

- Navajo Nation estimates that 18,000 out of 48,000 homes on the reservation are without electricity.
- Nationwide a total of 14.2% of Native American households have no access to electricity, as compared to only 1.4% of all U.S. households." **The Navajo Nation accounts for 75% of the households without electricity.**
- Navajo Nation, NTUA and the U.S. Congressional Office has taken action to develop plans and funding to address the need for electrification of homes on Navajo land.

Navajo Nation 2000 Census Data

According to the 'Census 2000' report from the Division of Economic Development, Navajo Nation.

- 47,603 - Occupied housing units on the Navajo Nation,
- 15,279 - Homes, or 31.9 percent, lack complete plumbing;
- 13,447 - Homes, or 28.1 percent, lack a complete kitchen facility
- 28,740 - Homes, or 60.1 percent, lack telephone service.

The Navajo Tribal Utility Authority has 29,125 residential customers reservation wide. To obtain the number of homes without electric power subtract total homes from the 2000 census data of 47,603 occupied homes on the Navajo Nation divided by 29,125. NTUA Residential homes with electric. This will give you an estimate of **18,478 homes of the Navajo Nation without electric power.**

Navajo Electrification Demonstration Program

Total Project- \$ 7,972,000.00

1560 Homes will receive electricity

Electric Line Extension

- FY-2002 581 Homes-Electric
- FY-2003 212 Homes-Electric
- FY-2004 650 Est. Homes-Electric

Total 1,443 Homes

Note: FY 2004 has awarded on Sept. 30, 2004

Project Leader:

Paul Denetclaw Jr. , Electric Engineering Supervisor

Solar Energy Program

- FY-2002 44 Solar projects
- FY-2003 63 Solar projects
- FY-2004 5 NHA Solar Projects
5 Solar Projects

Total 117 Projects

Project Leader:

Larry Ahasteen, Renewable Energy Specialist.

Navajo Electrification Demonstration Program

Total Funding Amount- \$ 7,972,000.0

Electric Line Extension

•	FY-2002	\$ 2,011,000.00
•	FY-2003	\$ 1,150,000.00
•	FY-2004	\$ 2,861,000.00
Total		\$ 6,022,000.00

Note: Grant Award for FY 2004 approved by DOE until September 30, 2004

Project Leader:
Paul Denetclaw Jr. , Electric Engineering Supervisor

Solar Energy Program

•	FY-2002	\$ 800,000.00
•	FY-2003	\$ 1,150,000.00
•	FY-2004	\$ -0-
Total		\$ 1,950,000.00

Project Leader:
Larry Ahasteen, Renewable Energy Specialist.

Navajo Electrification Demonstration Program

Electric Line- Issues

Key Issues

- Grant Management- Change in Regional Offices
- Utility Right of Way clearance.
- Delivery lead times of electric transformers
- Equipment break down
- Competing with other power line projects

Readdressing Key Issues

- Working with Navajo Nation on Right of Ways clearance.
- Purchase large quantities and scheduling deliveries on contracts.
- Rental of large equipments
- Working with District Superintendents and Manager concerning prioritizing NEDP projects

Navajo Electrification Demonstration Program

Solar Energy Program- Issues

KEY ISSUES

- Change in the funding for the NEDP grant- Electric Line construction is a priority.
- Funding for Solar Program.
- Cost of Solar-Wind Power Systems
- Cost to maintain these Solar Power systems.
- Backlog of potential customers
- Customer Education on Renewable Energy.
- More power –More dollars
- Request to maintain or troubleshoot other solar units



Future Plans

Electric Line Extension

- Closeout Cooperative Agreement with Golden Field Office for FY 2002-2003.
- Implement FY 2004 Program with DOE Chicago Field Office.
- Assemble NEDP Project Management team to begin work plan for FY 2004 projects.
- Work with Community Chapters/Elected officials on NEDP activities.
- Coordinate activities with Navajo Nation government.
- Meet with Federal Officials on reporting requirements for new grant funds.
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Future Plans

Solar Energy Program

- Closeout the Solar Program- submit final reports to DOE Albuquerque Support Office
- Finalize work plan with NHA on the Scatter Site Housing Development.
- Monitor the 107 Solar-Wind stand alone Solar Power Systems
- Work with Community Chapters on rural electrification.
- Develop new plan on micro-utility plant for scattered homes.
- Monitor and collect data for the Solar and Wind power systems.
- Develop new plans for Wind Power Systems
- Negotiate and sell Solar Credit
- Assist local communities colleges, trades schools, and high schools on Renewable Energy Project.

Future Plans

Renewable Energy Program

- **Expand the Navajo Wind Project to monitor wind speed on the Navajo reservation.**

Cat-5,6,7

Grey Mountain (Approved by Chapter to install tower)

Cat 4,5

**Espil Ranch, and Big Boquillas Ranch
Blue Gap Arizona**

Cat 3

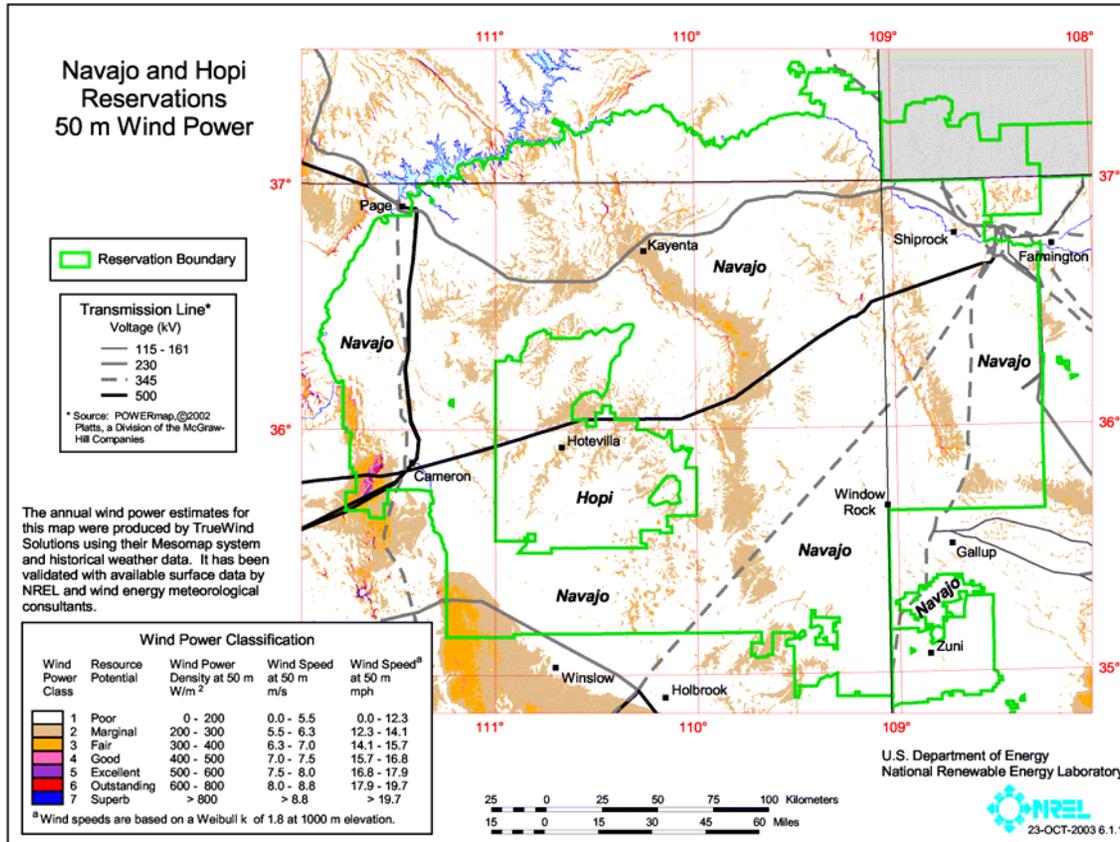
**Cow Spring and Steamboat, Arizona
Rough Rock Az., Tohatchi, NM and Crownpoint NM.
Winslow Tract**

Preliminary report to be completed by 12-31-2005

NN Council- Oversight Committee and NN President express interest in touring Wind Farm and meeting on Renewable Energy.

- **Investigate feasibility of a Bio-Mass Plant on the Navajo Nation.**
Navajo, New Mexico- Closed Sawmill Plant
- **Investigate and inventory renewable energy resources on the Navajo Nation.**
- **NTUA plans to host Southwest Native American Renewable Energy Leadership Summit-2004-2005 in Window Rock, Arizona**

Navajo Wind Project



ARIZONA

- Grey Mountain, Az.
- Luepp Az.
- Blue Gap, Az.
- Cow Spring Az
- Steamboat, Az.
- Rough Rock, Az.
- Chilchinbeto, Az
- Black Mesa, Az.
- Sanders, Az.

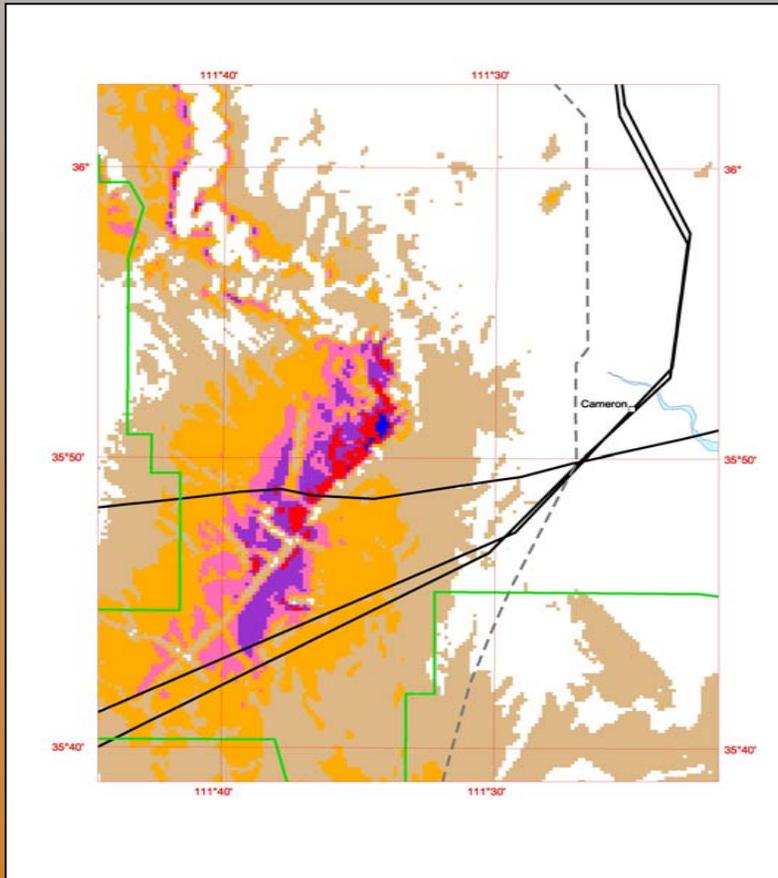
NEW MEXICO

- Crownpoint ,NM
- Hogback NM
- Deeza Bluff, NM

OTHER

- Winslow Tract
- Espila Ranch
- Big Bogueillas Ranch

Grey Mountain Wind Site



- Navajo Nation support of this project.
- Chapter land users approve the site.
- Cameron Chapter Support
- NTUA completed all land clearance and site evaluation.
- NAU will assist NTUA- 30 meter tower
- Preliminary Wind Study should be completed by December 2005.

Wind Power Class	Resource Potential	Wind Power Density at 50 m W/m ²	Wind Speed* at 50 m m/s	Wind Speed* at 50 m mph
0.00000	Marginal	0.00000	0.00000	0.00000
0.00000	Poor	0.00000	0.00000	0.00000
0.00000	Fair	0.00000	0.00000	0.00000
0.00000	Excellent	0.00000	0.00000	0.00000
0.00000	Superb	0.00000	0.00000	0.00000

* Wind speeds are based on a Weibull k value of 2.0



Grey Mountain Wind Site



South Side of Wind Tower Site



West Side of Wind Tower Site

Grey Mountain Wind Site



North Side of Wind Tower Site



West Side of Wind Tower Site



S/E Side of Tower Wind Site

NEPD Solar Program-2002-2003



- NTUA was awarded Federal Funds under Navajo Electrification Demonstration Program- PL 106-511- Sponsored by Senator Bingaman
- Under NEDP Phase 11- Solar Program was awarded \$ 1,950,000.
- 107 Solar PV were purchased
- 880 Watts PV array
- 770 AH Batteries
- 2500 Watts-120 V Inverter
- Self-Contained Steel Skid

NEPD Solar Program



Proposed Navajo Nation Feasibility Plan -Bio-Mass Project-



1. Navajo Nation-NTUA Future plan to generate electric power and resell to its customers.

2. Due to the shutdown of the sawmill- NTUA has an idling substation near this facilitate.

3. Navajo Nation will be able to manage its forest debris and reduce the chance of a wildfire.

4. Navajo Nation can utilize an existing sawmill plant at Navajo, New Mexico that was shutdown.

5. NFPI had a powerhouse that generated 10.6 Meg Watts of power .

Proposed Navajo Nation Feasibility Plan -Bio-Mass Project-



Proposed Navajo Nation Feasibility Plan -Bio-Mass Project-



Thank-you



Navajo Tribal Utility Authority
Post Office Box 170
Fort Defiance, Arizona
86504

928-729-6263

www.ntua.com

Paul Denetclaw Jr.

Pdenetclaw@ntua.com

Larry Ahasteen

Lahasteen@ntua.com