NAVAJO NATION
RENEWABLE ENERGY INITIATIVES

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• NTUA Background & Services
• Renewable Energy/Green Initiatives
  ▪ Green Building Initiatives
  ▪ Off-Grid Residential Power
  ▪ Other Initiatives
• Utility Scale Renewable Energy Generation
• The Navajo Tribal Utility Authority (NTUA) is a non-profit enterprise created 1959 to provide utility services to the Navajo Nation.

• Navajo Nation Council oversees NTUA through:
  ▪ Government Services Committee
  ▪ Economic Development Committee.

• Governed by a seven-member Management Board, which is appointed and confirmed by the oversight committees.

• Lead by a General Manager, who is selected by the NTUA Management Board and confirmed by the Navajo Nation Council.
NTUA provides a range of services on the Navajo Nation in Arizona, New Mexico, and Utah:

- Electricity
- Natural Gas
- Photovoltaic
- Waste Water
- Water
NTUA OPERATIONS

- Organized for the operation, maintenance, and expansion of utility services to customers within the Navajo Nation
  - To promote employment for Navajo people
  - To improve the health and welfare of the residents of the reservation
- Operates as a non-profit corporation
- May participate in electricity generation and telecommunication services
- Codified by Navajo Nation Code
NTUA OPERATIONS AND SERVICES DELIVERY

- Six District Offices
- Three Sub-Offices
  - Crownpoint
  - Nageezi
  - Red Mesa
- Matrixed Organization
  - W/WW/NG Construction
  - Electric Construction
• NTUA Background & Services

• **Renewable Energy/Green Initiatives**
  - Green Building Initiatives
  - Off-Grid Residential Power
  - Other Initiatives

• Utility Scale Renewable Energy Generation
GREEN BUILDING INITIATIVES

• Construction of LEED-certified buildings:
  ▪ Chinle District Office
  ▪ Crownpoint Sub-Office
  ▪ Headquarters Building

• LEED building initiative focusing on:
  ▪ Energy Efficient Design
    • Radiant Heating
    • Ground-source Heat Pump
    • Natural Lighting
    • Materials
  ▪ Renewable Energy System Integration
    • Photovoltaic Solar (rooftop/ground)
    • Solar Water Heating
OFF-GRID RESIDENTIAL POWER

- Offers an alternative energy solution for access to residential power away from the electricity infrastructure
- Photovoltaic technology is skid-mounted for ease of installation; augmented by wind power
- NTUA currently has 182 installed photovoltaic systems
• The current offering includes 680w PV and 880 PV-wind power systems
• In 2010, NTUA is introducing a new generation of hybrid systems which include a 1,080w PV array and 400w wind turbine with an Energy Star refrigeration solution
OTHER NTUA INITIATIVES

• Energy Auditing and Weatherization
• Energy Efficient Appliances
• Smart Grid: AMI Metering
• Net Metering
• Energy Efficiency and Conservation Information Campaign
• NTUA Background & Services
• Renewable Energy/Green Initiatives
  ▪ Green Building Initiatives
  ▪ Off-Grid Residential Power
  ▪ Other Initiatives
• Utility Scale Renewable Energy Generation
• Development of utility-scale renewable energy resources on the Navajo Nation
• Prospective wind project sites:
  ▪ Boquillas Ranch, Seligman, Arizona
  ▪ Gray Mountain, Cameron, Arizona
  ▪ Black Mesa, Kayenta, Arizona
• Prospective solar project sites:
  ▪ Reclamation Mine Sites
  ▪ Chapters initiatives
  ▪ Non-Trust lands (e.g. Boquillas Ranch)
Big Boquillas Wind Project

- Boquillas Ranch is located west of Flagstaff, AZ
- Phase 1A and 1B will be located on the Aubrey Cliffs (Tribal fee land and AZ State land)
- Navajo Nation’s first utility scale tribally-owned Green Energy generation project
## Big Boquillas Wind Project
### Project Summary

<table>
<thead>
<tr>
<th></th>
<th>Phase 1A</th>
<th>Phase 1B</th>
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<tbody>
<tr>
<td><strong>Project Size</strong></td>
<td>85 MW</td>
<td>Up to 200 MW</td>
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<tr>
<td><strong>Construction Start Date</strong></td>
<td>December, 2011</td>
<td>December, 2012</td>
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<tr>
<td><strong>Construction Completion Date</strong></td>
<td>December, 2012</td>
<td>December, 2013</td>
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*The Cliffs at the Big Boquillas Ranch, Coconino County, AZ*
NTUA has formed a for-profit wholly owned corporate subsidiary to develop, finance, construct, own and operate wind generation projects at Boquillas Ranch

- NTUA Wind, Inc., formed in 2010

NTUA Wind, Inc. will have a majority ownership position

NTUA Wind, Inc. will share in the management of the project
Big Boquillas Wind Project
NTUA Involvement Key Points

• Majority Ownership by NTUA through NTUA Wind, Inc.
• The project will create a revenue stream to the Navajo Nation central government
• NTUA can economically resell renewable electricity to its customers, the Navajo people
• NTUA can foster green job training and employment for Navajo Nation citizens
• NTUA can obtain a revenue stream to fund other infrastructure improvement projects, including rural electrification
Utility Scale Solar Initiatives

NTUA Involvement Key Points

- Discussions with the Navajo Nation, Chapters (local governments), EPA, NTUA, and land owners have created the foundation for solar projects
- Creation of internal organizational infrastructure
- Assessment of potentially viable photovoltaic technologies
- Preliminary site analyses documents the available resource

Source: SunCarrier
Utility Scale Solar Initiatives
Next Steps

- Evaluating PV technology options
  - Fixed and Single-axis tracking Photovoltaic
  - Crystalline, thin film and concentrating systems
- Developing technical, financial, economic, and environmental impact models to inform technology selection
FUTURE OUTLOOK

• Electricity distribution has been the core service for NTUA -> Broadband, Renewable generation and other utilities developments will change this mix
• NTUA currently purchases almost all of its electricity from external suppliers -> Renewable generation will allow NTUA to self-generate
• NTUA looks forward to partnering with other Navajo Nation entities to utilize the Navajo Nation’s vast resources, including renewable energy -> NTUA works closely with the Navajo Nation Renewable Energy Team to achieve its goals
• The Navajo Nation, with the support of NTUA, will gain control over its energy future
THANK YOU!

• For additional information about the NTUA Renewable Energy Program:
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