



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

Sandia National Laboratories' Technical Assistance DOE Tribal Energy Program

Sandra Begay-Campbell

Principal Member of the Technical Staff



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.





Energy Policy Act (EPAct) signed at Sandia



Sandia showcased its energy future vision for the White House guests

- The Tribal Energy Section of the Energy Act was a part of the presentation
- Several tribal leaders were invited by the White House to attend the ceremony

President Bush signed the Energy Policy Act in 2005



Sandia's technical assistance to tribes



Field Visit to Ramona Ecotourism Center

As part of the DOE Tribal Energy Program team, Sandia's activities & responsibilities include:

- Program technical support
- Project-specific technical support
- Capacity building in Indian Country
- Publications and outreach
- Student Internship

Specific support as requested by the tribes (grantees):

- Ramona Band of Cahuilla
- Hualapai Nation
- Navajo Nation
- Hopi Nation
- Laguna Pueblo

Tribal Energy Projects are showcased at the annual
DOE TEP Project Review



Ramona Ecotourism Center





Sandia's technical assistance to Navajo Nation



Navajo delegation included Tribal Council members and tribal staff

Navajo Nation is implementing a wind feasibility study

Navajo Nation delegates toured the New Mexico Wind Center

The tour was a partnership between

- Sandia National Labs
- Navajo Tribal Utility Authority
- Public Service Co. of NM
 - Florida Power & Light

Guests included

- DOE's Native American Wind Powering America program
- Crownpoint Institute of Technology students & instructors

The tour included a visit to the NM Bosque Redondo State Monument



Leveraging other DOE technology programs



Field Visit to Navajo Tribal Utility Authority
PV system – Monument Valley, UT

Sandia & TEP leverages support from DOE's Solar Program & Wind Powering America Program

- Research for the DOE Reliability Database for Off-grid residential O&M
- Outreach participation for Arizona tribal wind interest groups





NTUA's Technical Changes

..1993.....1999-2001.....2002-2003.....2003-2004.....

240-260 Watt



Business potential realized

640 Watt



Standardization achieved

Phase I 880 Watt Hybrid



Battery bank powered by hybrid design

Phase II 880 Watt Hybrid

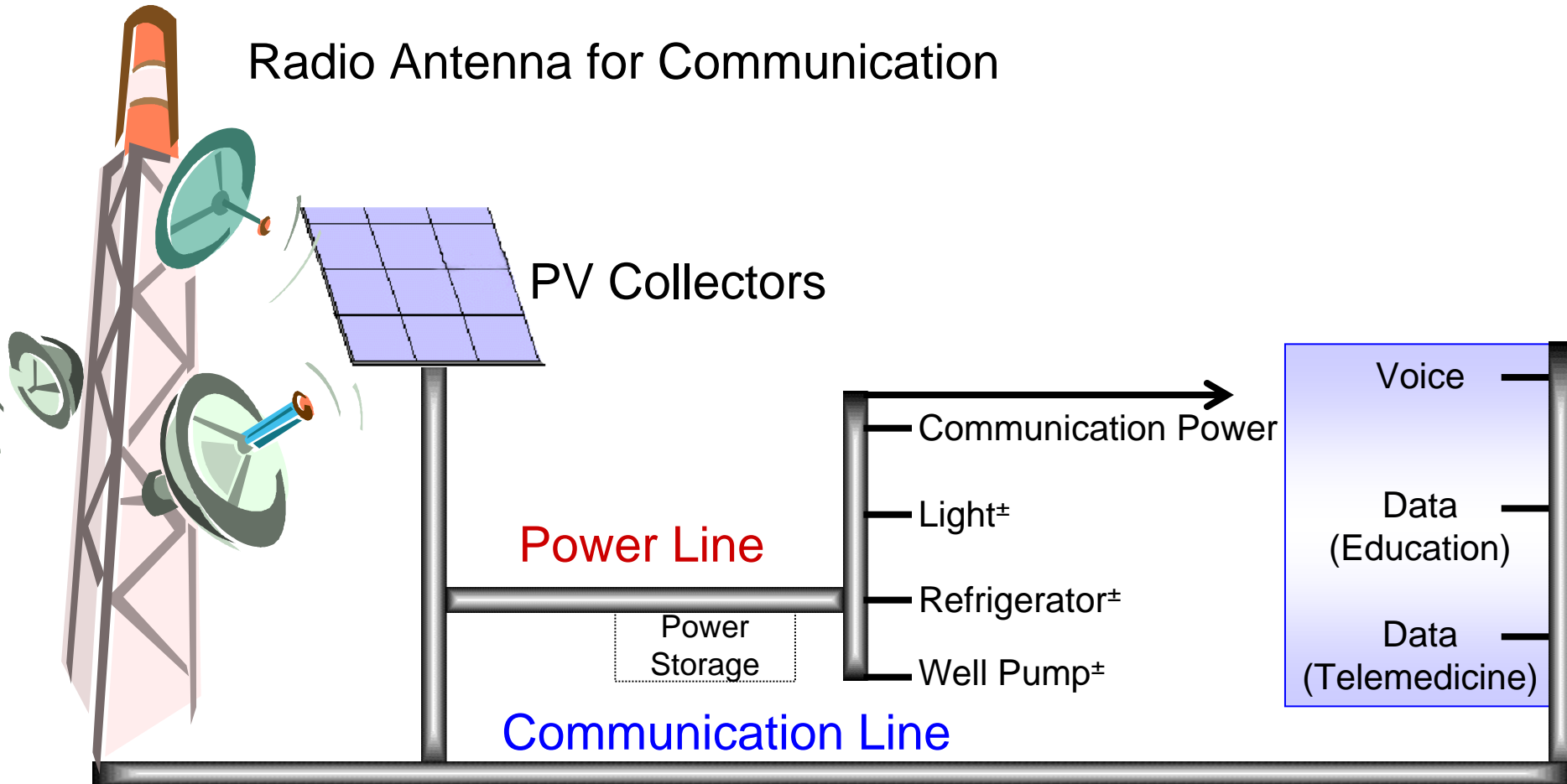


Economic Development: Units assembled on Navajo Nation

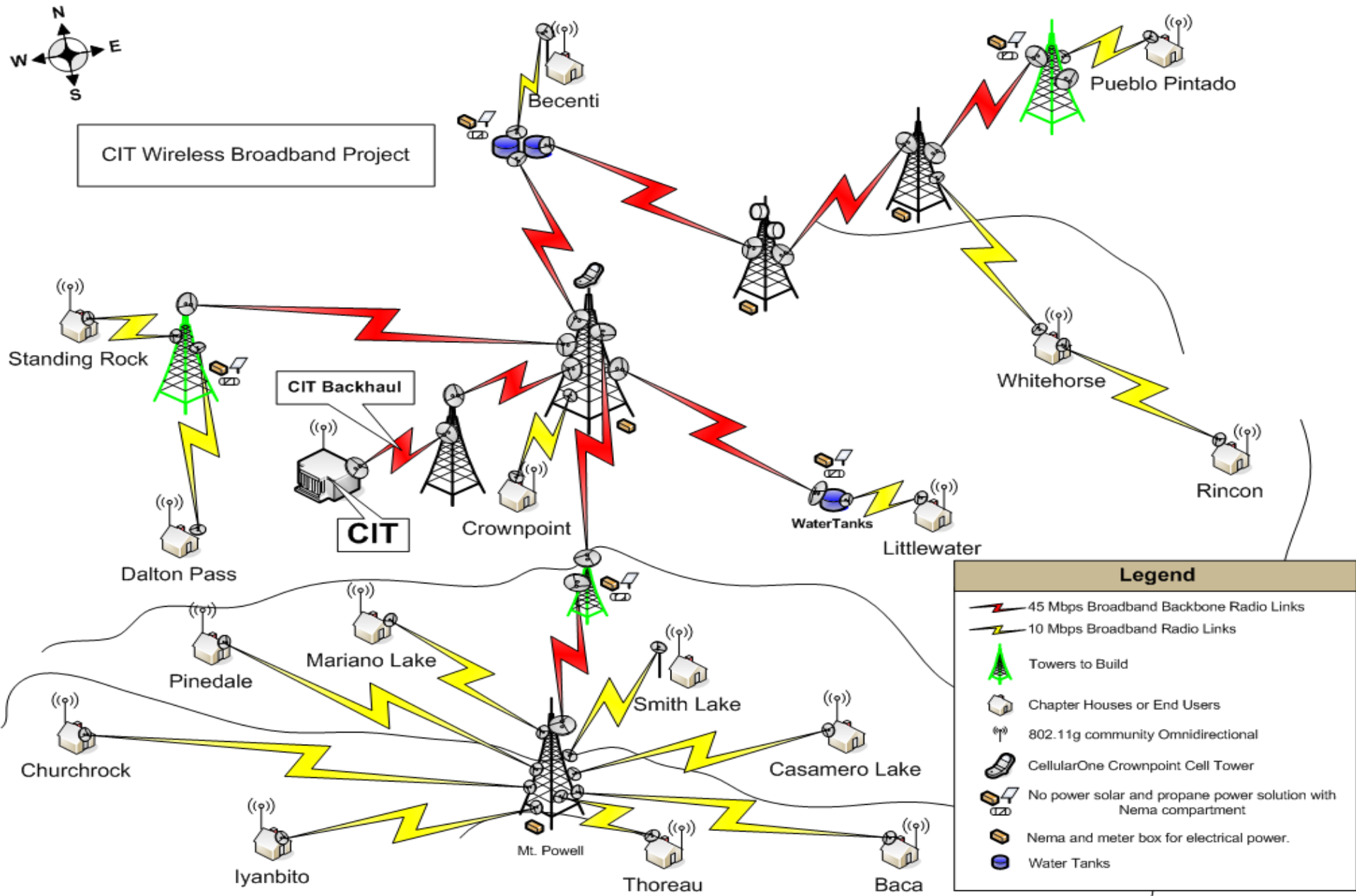


Integrated Systems Schematic for Off-Grid Use

Radio Antenna for Communication



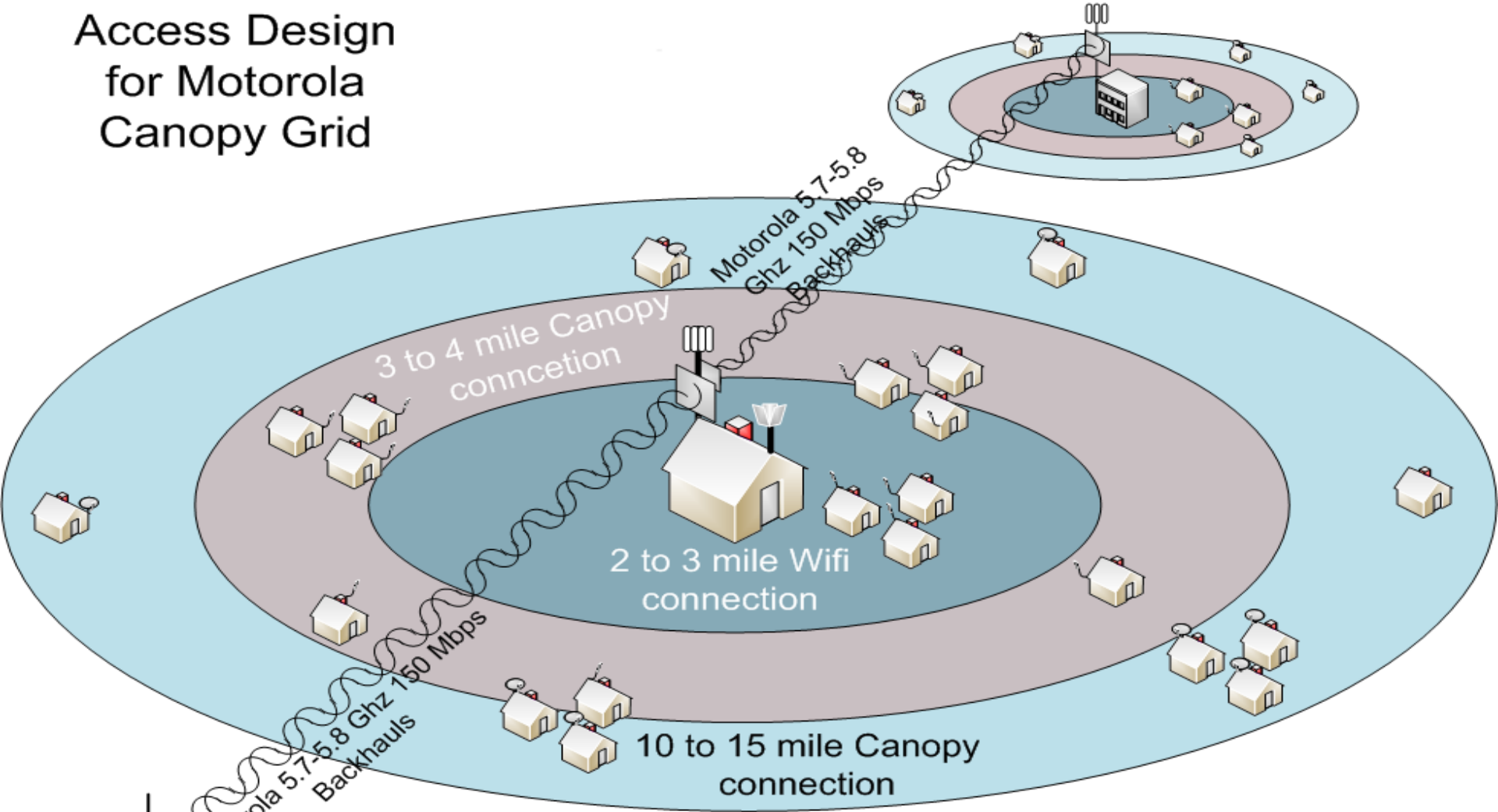
\pm High Efficiency



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Access Design for Motorola Canopy Grid



Motorola 5.7-5.8 Ghz 150 Mbps Backhauls



Homes with Canopy SM



Homes with Canopy SM and Reflector dish



360 degree wifi radios



Motorola Backhaul and Canopy Advantage AP cluster





2007 TEP/ Sandia College Interns



Pictured left to right:
Debby Tewa, Thom Sacco
Cherylin Wilson, Nick Johnson & Terry Battiest

Terry Battiest (Choctaw)

MS – Telecommunications
University of Colorado – Boulder

Nick Johnson (Three Affiliated Tribes)

BS – Mechanical Engineering
University of Colorado - Denver

Cherylin Wilson (Navajo)

BS – Biology
Oklahoma Panhandle University
AS - Environmental Science



2007 TEP/ Sandia College Interns



**Nick Johnson, Sandra Begay-Campbell & Terry Battiest
at Campo Wind Farm, San Diego County**