SCIENCE, TECHNOLOGY AND TELECOMMUNICATIONS COMMITTEE

September 27, 2010

Jon Hawkins

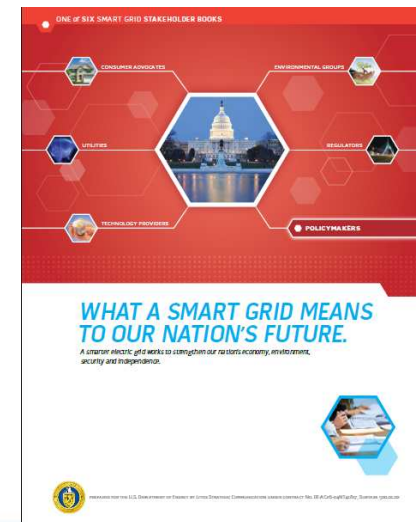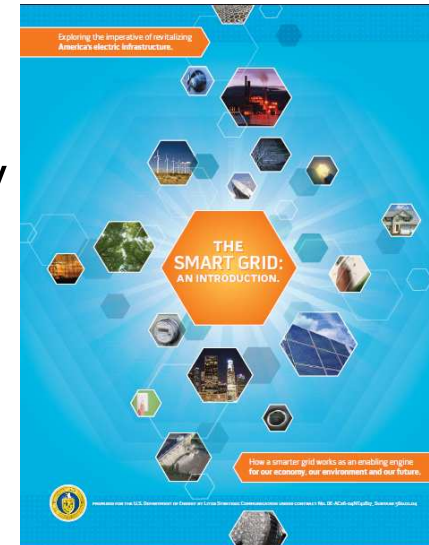**Manager, Advanced Energy Technology and Strategy**

PNMR

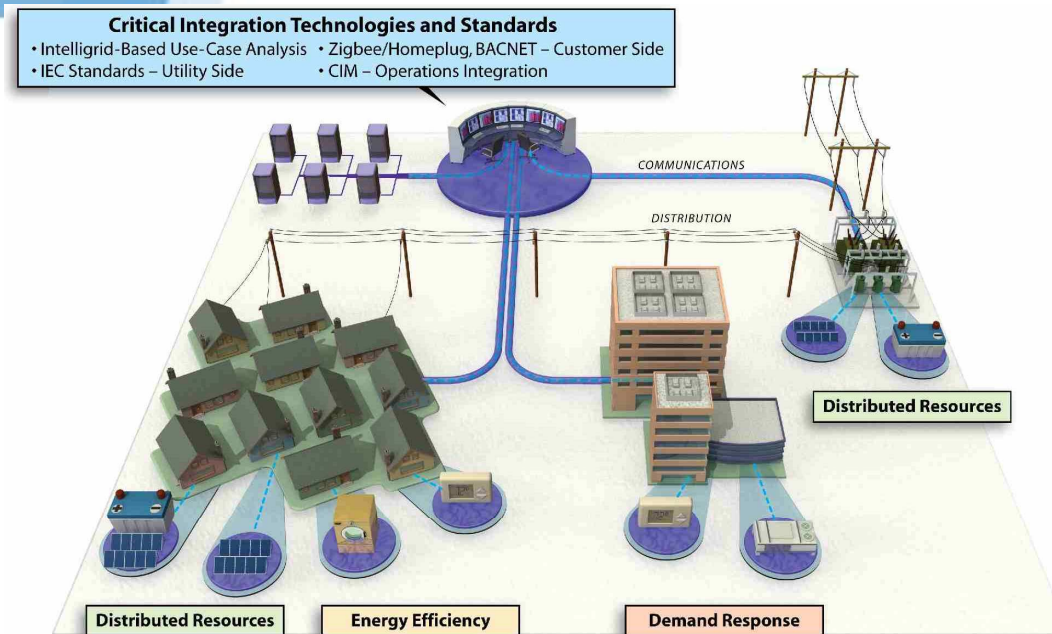The power to make life better. *Together.*

PNM

What is smart grid?

• Combining computer and network technology with the traditional utility grid

• Long term, how does this benefit customers?

 • *Better reliability*

 • *Integration of more renewable energy*

 • *Better information to the customer*

 • *Integrating plug in vehicles*

 • *Reducing carbon footprint*

 • *Customer energy savings dependent on use*

Publications available at
http://www.oe.energy.gov/SmartGridIntroduction.htm

Electric Power Research Institute (EPRI) Demonstration Project

Critical Integration Technologies and Standards
- Intelligrid-Based Use-Case Analysis
- IEC Standards – Utility Side
- Zigbee/Homeplug, BACNET – Customer Side
- CIM – Operations Integration

COMMUNICATIONS

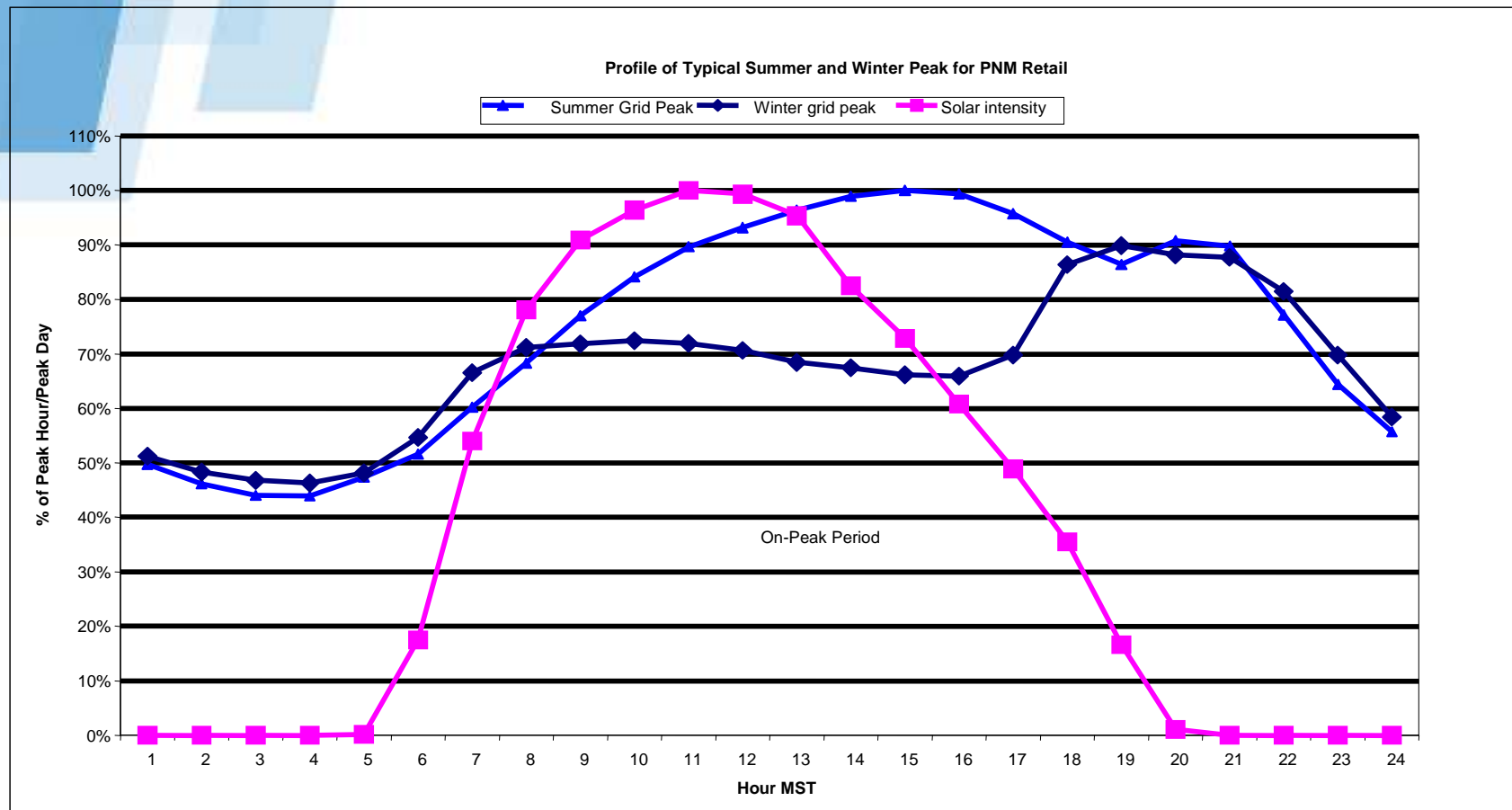DISTRIBUTION

Distributed Resources

Distributed Resources | Energy Efficiency | Demand Response
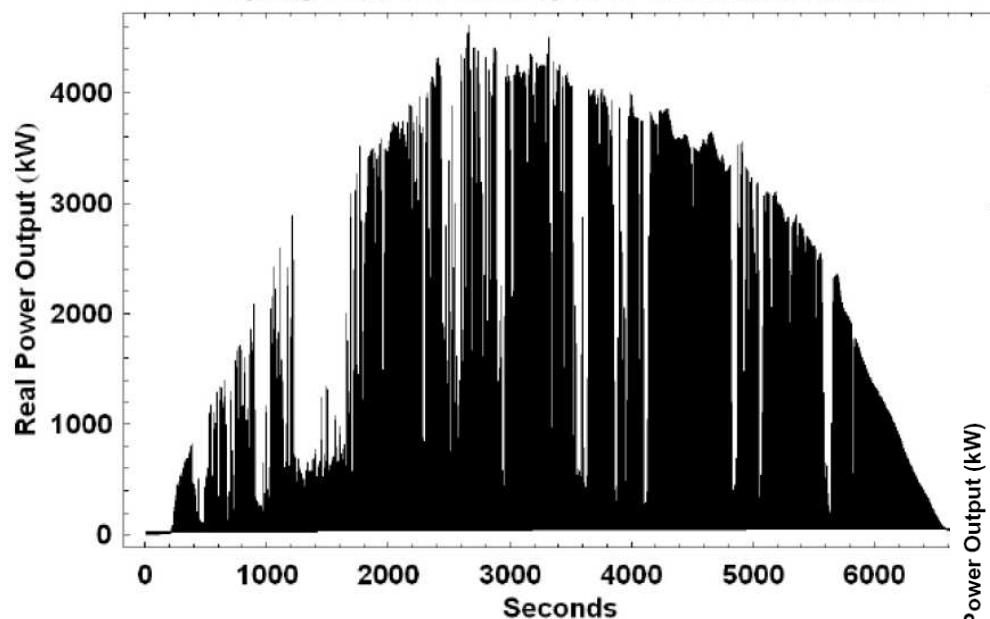
Project

- One of 11 EPRI Demonstration projects worldwide

- The project is foundational to ensure that all of the new equipment will work together correctly and securely

- The project helps us coordinate with many utilities to help decrease the risk of obsolescence

- Focused on integrating renewables like solar, wind, etc.

- EPRI provides no equipment

Solar Peak vs. System Peak

Profile of Typical Summer and Winter Peak for PNM Retail

Summer Grid Peak — Winter grid peak — Solar intensity

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Intermittency and Impact of High Penetration

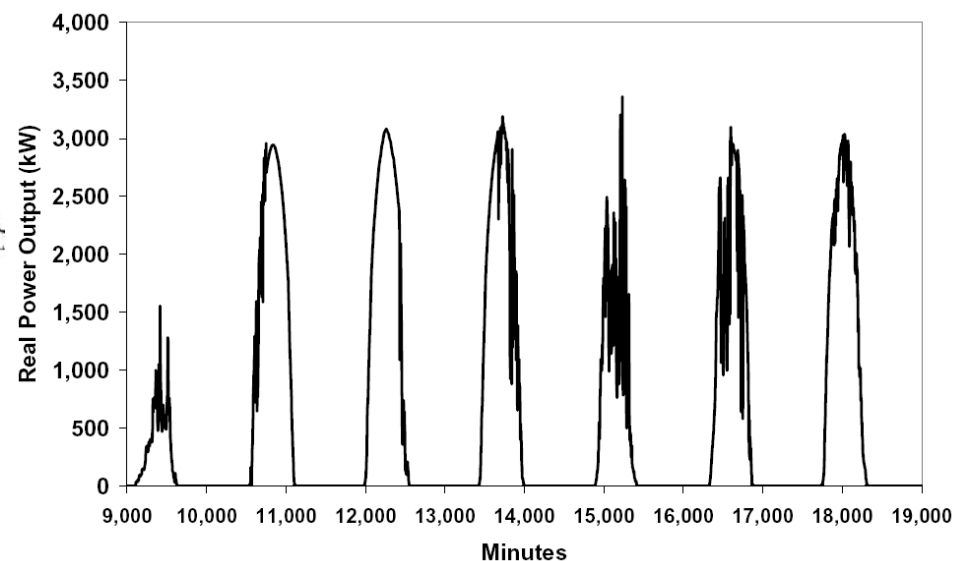**"High penetration" - Installed PV amounts to 15-20% of feeder peak load**

Springerville AZ, One Day at 10 Second Resolution

A single 1MW PV resource (distributed generation) can push a feeder into high penetration

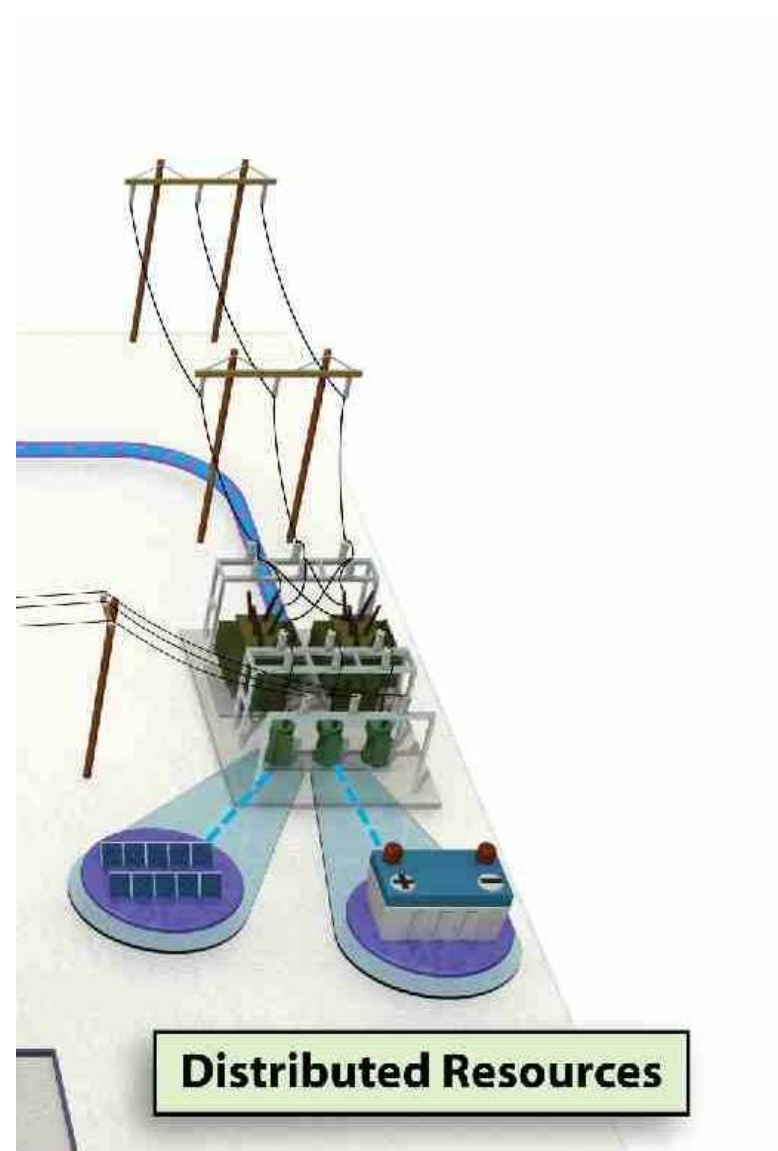Springerville, AZ 7 days at 1 minute resolution

DOE Project

Equipment

- 500 kW PV (energy for about 100 homes)

- 2 – 4 MWh Battery

Project

- Utility Scale

- One of two DOE ARRA funded projects in New Mexico

- Currently being designed

- Scheduled Construction 2011

Distributed Resources

PNM/DOE Smart Grid Demonstration Overview

The project targets using a large battery combined with a utility scale PV installation to:

- Smooth the fluctuations of the PV

- Store energy produced at the time the sun provides the best solar energy for use when the grid needs the energy the most

- Provide to the industry computer based models that will help us understand the behavior of storage with large renewable sites

- Provide improved algorithms to optimize control of the battery system – an industry need today

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New Mexico Project Ties

- Sandia National Laboratories - (design testing and evaluation) - project partner

- University of New Mexico (system computer models and analysis, battery control algorithm development) – project partner

- Northern New Mexico College (data analysis for the DOE project) – project partner

- Cameron Swinerton – PV Contractor

- Schott Solar – PV manufacturer

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NEDO Commercial Building

Project

- Large amount customer side generation
- Sophisticated building energy management system
- Many collaborative research information sharing with this project, as well as Los Alamos project
- Part of the New Mexico Green Grid Initiative
- Goal to be able to self sustain for short periods of time

Equipment

- PV
- Battery
- Fuel Cell
- Gas Engine
- Building Energy Management System
- Thermal Storage (hot and chilled water)

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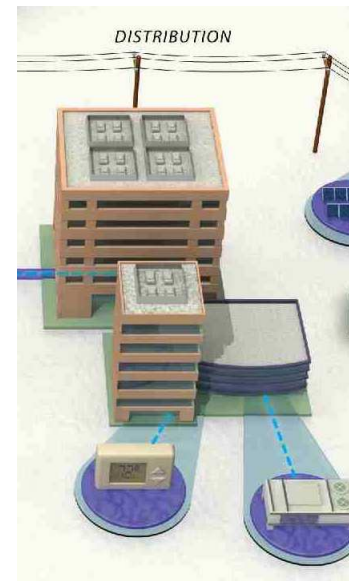
Other Current Efforts

- Working on the National Institute of Standards and Technology's (NIST) Smart Grid Interoperability Panel (SGIP)

  - Interoperability

  - Cyber security

- Battery Functional Testing

  - Sandia National Labs Distributed Energy Testing Laboratory facility

  - 25kWh Li-Ion package

- Electric Vehicles

  - Working with Auto makers (GM, Nissan, and Ford)

  - Developing customer information

  - Looking at our system to ensure we can accommodate the increased loads

- Smart Meters in Texas

  - Required by the Texas Public Utility Commission

  - Allowed cost recovery for smart meters in Texas

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Questions?