Pepco Holdings, Inc

Climate & Society Course

A focus on the intersections of climate and selected frames of relevance (e.g., energy)

presented by

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September 29, 2011

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Pepco Holdings, Inc.

3 states and Washington DC in mid-Atlantic US

Transmission & Distribution – 90% of Revenue

atlantic city electric
A PHI Company

delmarva power
A PHI Company

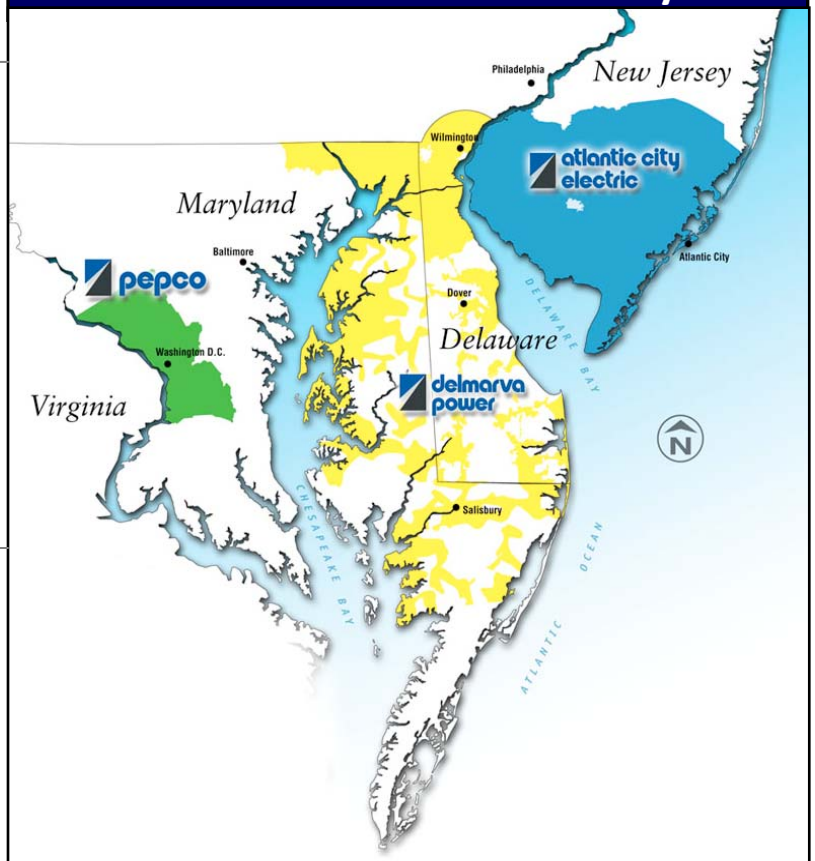
pepco
A PHI Company

Competitive Energy / Other

pepco Energy Services

PHI Investments

Combined Service Territory



Regulated transmission and distribution is PHI's core business.

Our Power Delivery Business

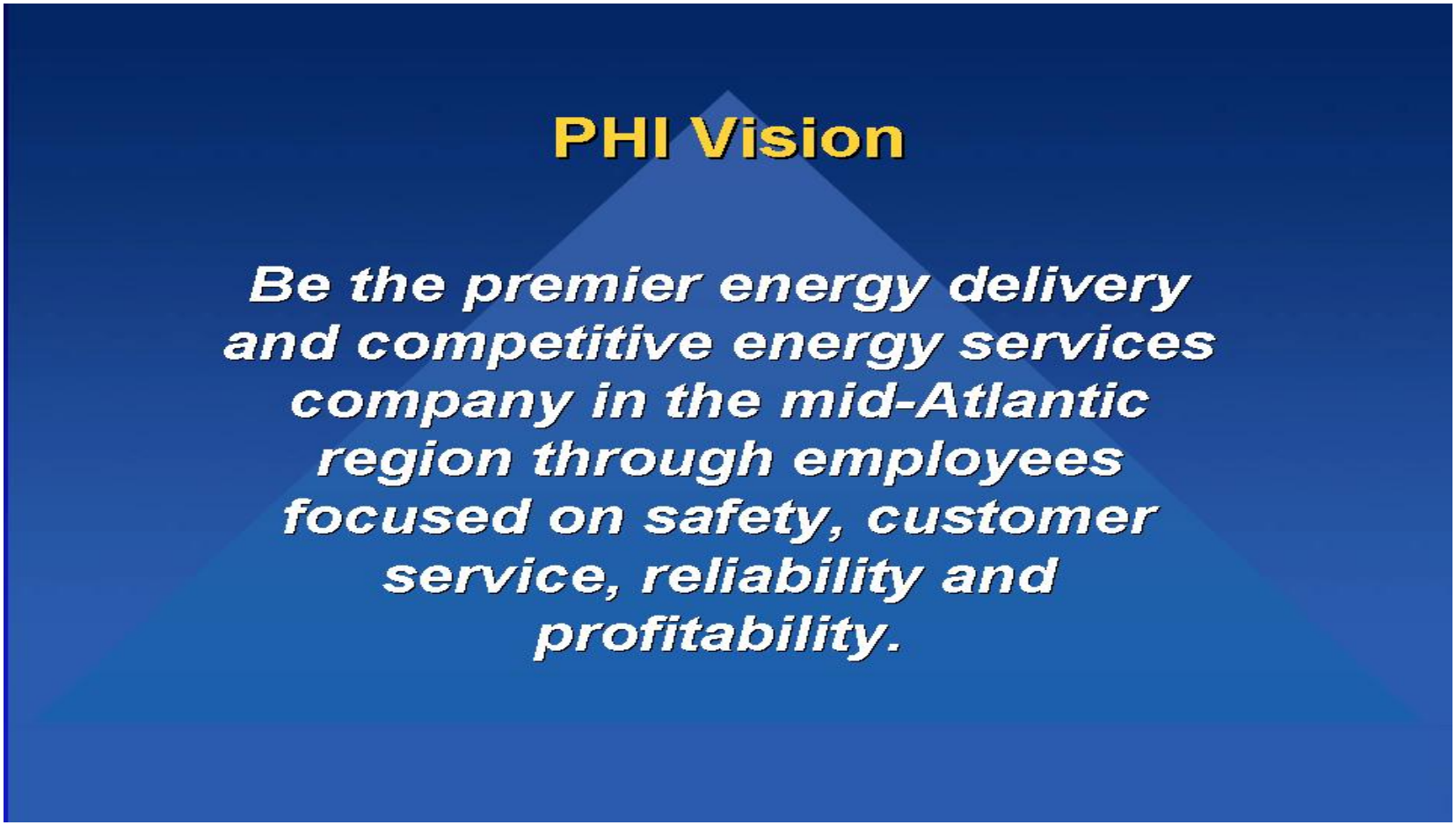
Power Delivery

	pepco	delmarva power	delmarva power	atlantic city electric
	Electric	*Electric*	*Gas*	*Electric*
Customers	778,000	498,000	123,000	547,000
GWh	26,549	12,494	N/A	9,659
Mcf (000's)	N/A	N/A	19,044	N/A
Service Area (square miles) & Geography	640 District of Columbia, major portions of Prince George's and Montgomery Counties	5,000 Major portions of Delmarva Peninsula	275 Northern Delaware	2,700 Southern New Jersey
Population	2.1 million	1.3 million	.5 million	1.1 million

3 states, and Washington DC, Jurisdictional focus

Note: Based on 2009 annual data

PHI vision is to be the premier energy delivery



PHI conducts our businesses in accordance with our corporate values as well as applicable laws and regulations.

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PHI Values

- *Safety*
- *Accountability*
- *Integrity*
- *Diversity*
- *Excellence*

PHI's Employee Workforce

- 4,600+ employees
- Over 50% employees represented by IBEW
  - 4 Union Locals
- All four generations represented

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PHI Smart Grid - in a Picture

Blueprint for the Future

Commitment to our Customers

- **Overview.** Consists of advanced technologies/an "intelligent" grid and **energy efficiency programs** that are designed to improve service to our customers and empower them to manage their energy use and costs.
- It includes **Smart Meters, Smart Thermostats, Energy Efficiency incentives, environmental programs, and strategies in reducing our carbon footprint.**
- The estimated cost is approximately $650 million over approx. 5 years
- PHI's Blueprint for the Future has received national (Washington Post, ABC World News Tonight) and even a bit of international news coverage (BBC); specifically, the smart meters associated with the program.
- **Benefits.** Help customers manage their energy use and cost
- Enhance reliability and customer service
- Provide the location of outages without customers having to call in

PHI's Smart Grid in Words

Our definition aligns with the DOE and EISA 2007 vision of Smart Grid

- Modernizes the grid while utilizing existing wires, transformers, and substations
- **Enables deployment of renewable / green energy alternatives**
- Brings new advanced meters, sensors, communications equipment, automation and computers to the existing grid
- Collects and transmits data to computers wirelessly
- Provides appropriate energy cost and usage information to customers and system performance to operators
- Promises significant advances in customer service, outage detection, service restoration, providing customer usage information, and reducing the number of estimated bills

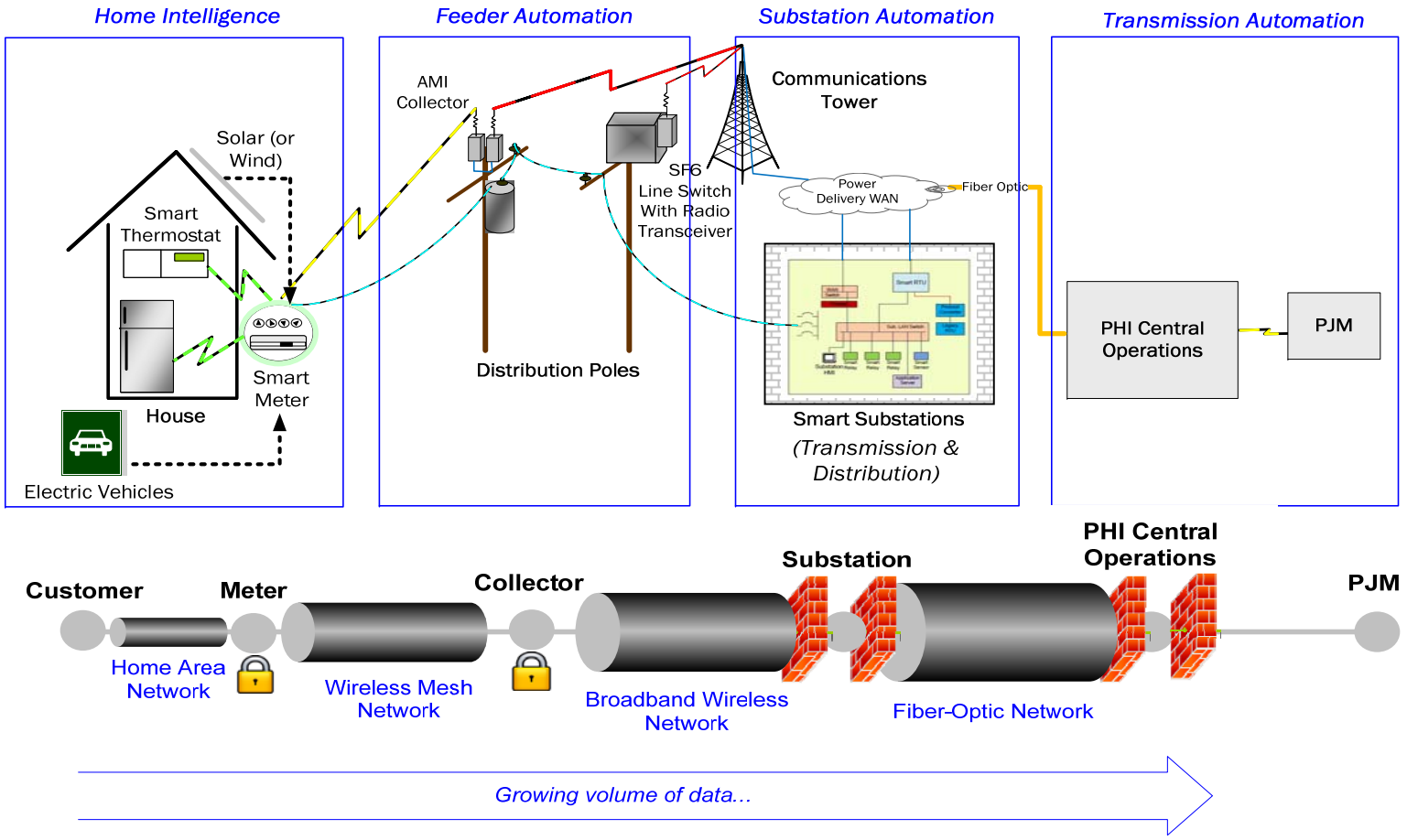
Investing in the Smart Grid- US Utilities focus

Smart Grid benefits to the customer…

- Puts decision making in the hands of customers
  - **Improved information, programs and pricing options will allow customers to make informed energy choices**
  - **Gives customers better information about their service and use**
- Automatically accommodates changing conditions
  - **Fault isolation, quick automatic restoration, advanced grid sensors**
  - **Reroute power flows, change load patterns, improve voltage profiles**
  - **Automatic notification for corrective actions and maintenance activities, which minimizes workforce intervention**
- Enables us to operate the system with greater efficiency
  - **Better asset management by optimizing grid design and investments**
  - **Optimized grid operations, reduce losses**
  - **Greater reliability and security**
- Promotes green energy initiatives and enables participation of distributed, renewable energy resources and plug-in electric vehicles

Our Integrated Smart Grid Communications Infrastructure

Ensuring interoperability and cyber security at all levels

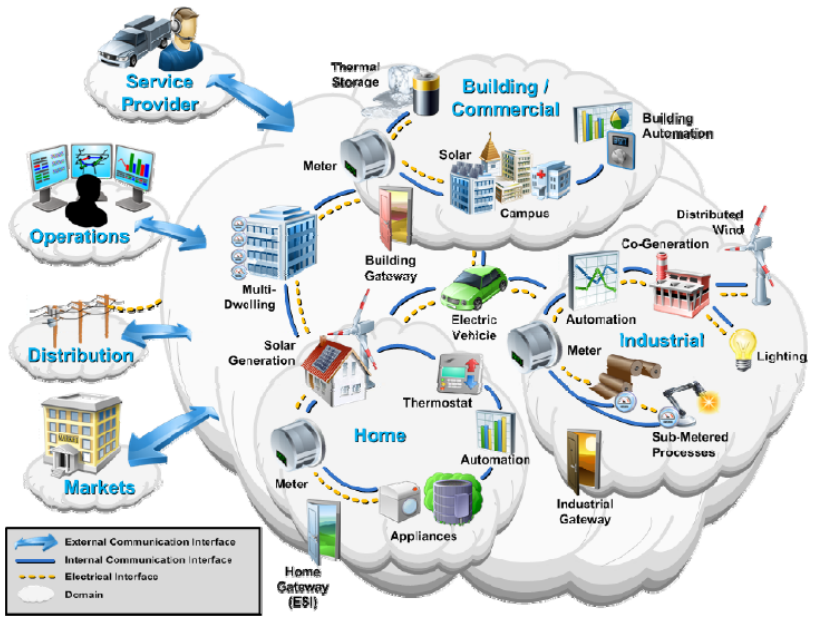


The Complexities of a Smart Grid Implementation
US Utilities Focus

This is the most significant technology transformation since the grid was first created.

A Smart Grid implementation involves:

- ***Multi-layered investments by the government, utilities and end-users***
- **Complex integration of a number of new technologies**
- **A rollout that takes several years (evolutionary)**
- **Necessary adoption of evolving technical standards for smart grid interoperability and cyber security**
- **Education and training of workforce**
- **Effective education and engagement of customers**

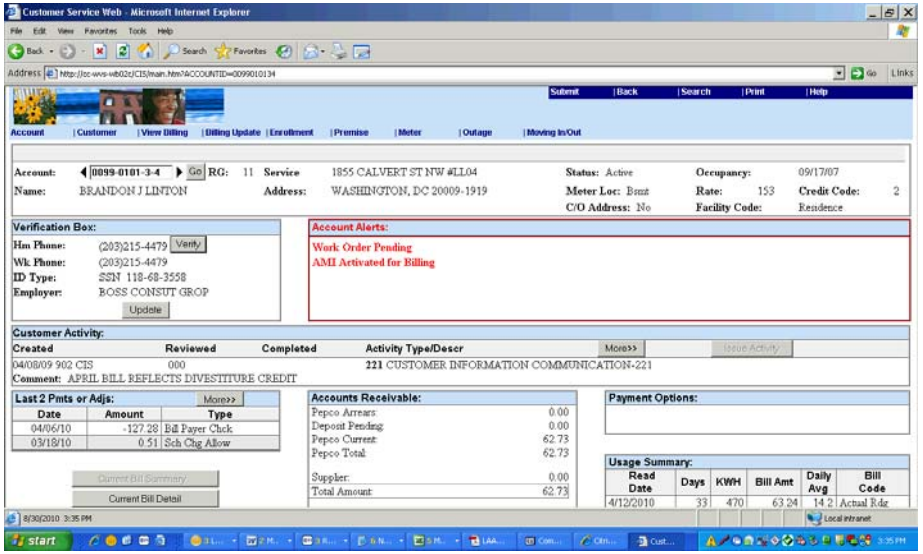


Significant Work is underway in US Utilities Consortiums such as EPRI, NIST, EEI to advance Smart Grid

New Smart Grid Jobs

The company will create new smart grid jobs & opportunities to include:

- Energy Advisors working throughout our PHI Call Centers
- Energy Engineers
- AMI Operations Analysts
- Training Specialists
- NOC Staff members



What are the Challenges

- tremendous external pressure, from Regulatory Commissions, Developers, and others
- NJ Energy Master Plan - distributed energy driving economic development in the state
- Current distribution system is designed and sized for one way power flow
- Quantity and scale of projects locating in South Jersey – Several feeders are at capacity
- Developers are getting frustrated with the required processes at both PJM and ACE
- Intermittency of Solar PV generation threatens integrity and reliability of system
  - Mitigating resulting power quality problems experienced by end-use utility customers ($$)
  - Additional wear and tear on utility equipment ($$)

The volume of this work in New Jersey is beginning to overtake our internal resources …

Mid-Atlantic Power Pathway (MAPP) Project

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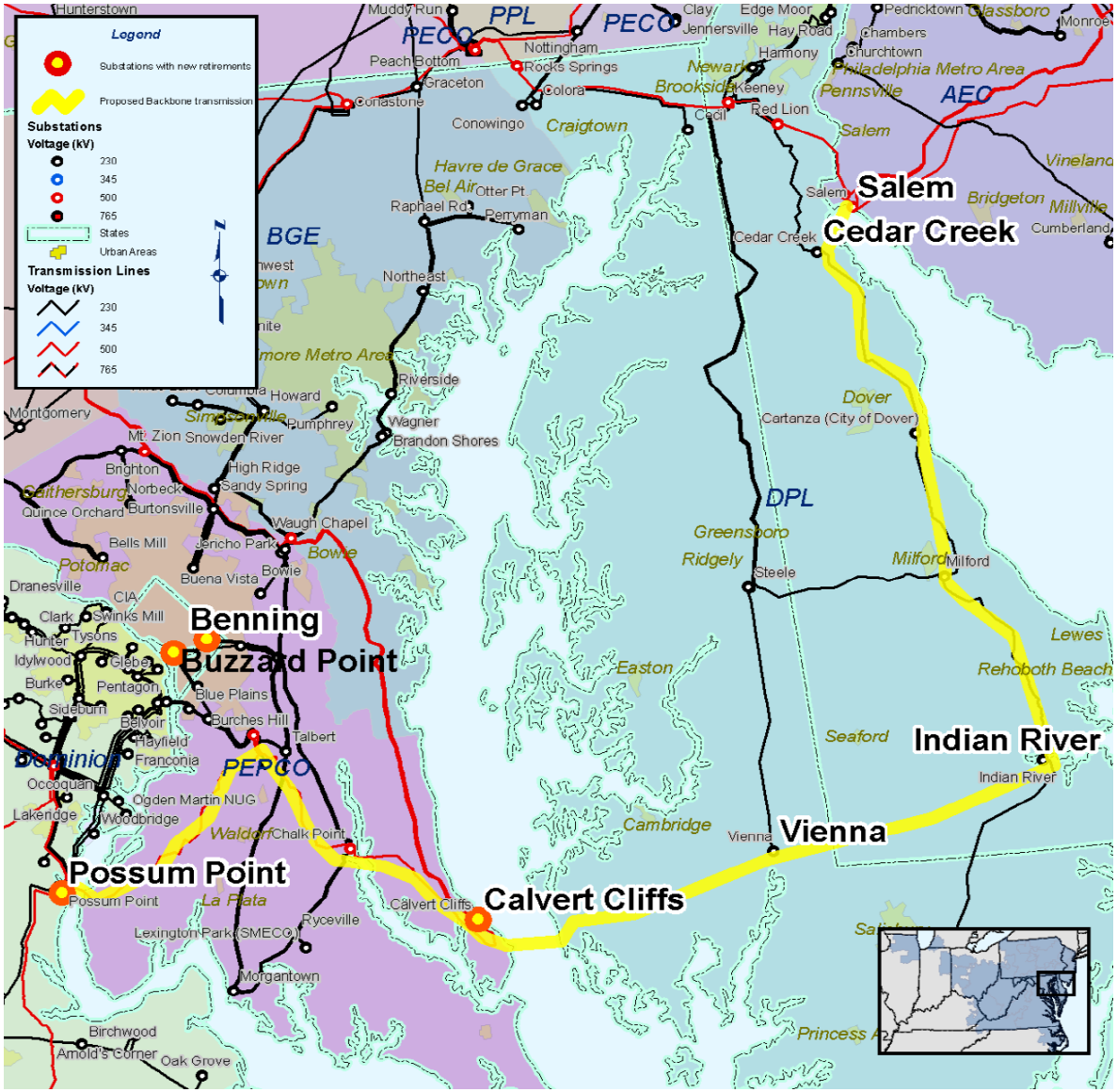


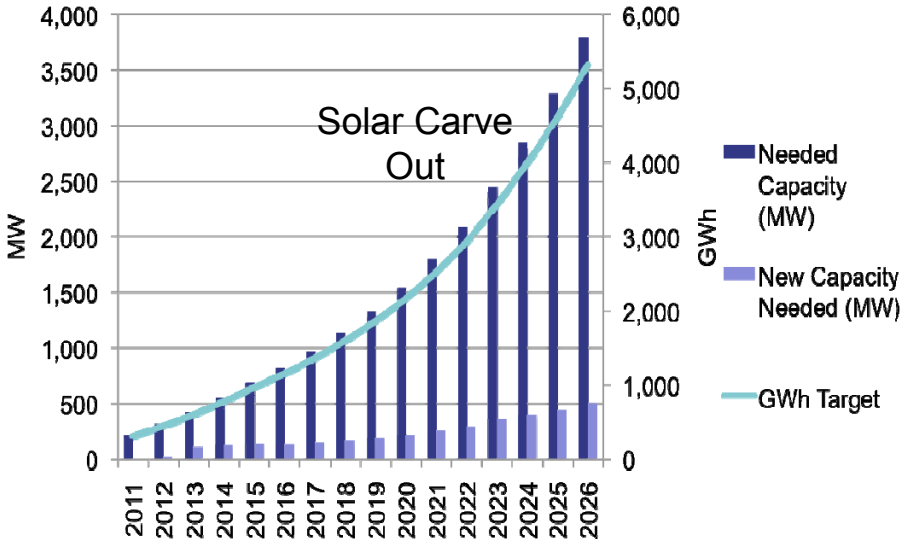
Commitment to Reliability

- **Overview.** The MAPP project is a 230-mile transmission line that would significantly increase the region's ability to import power crossing four states.
- MAPP has a target completion date of 2013 and the entire project is expected to cost about $1 billion.
- **Benefits.** Improve the flow of electricity throughout the eastern Mid-Atlantic region
- Increase the region's power import capabilities
- Connect numerous points on the grid that are currently underserved
- Enhance local power distribution systems through multiple upgrades
- **Provide a pathway for clean, renewable energy (such as wind and solar power) to move across the region**
- Benefits all utilities in the region including co-ops and municipals

New Jersey State Renewable Plan

NJ's existing Energy Master Plan Goals by 2020:

- 20% reduction in energy consumption;
- 5,700 MW reduction in peak energy demand;
- 30% of NJ's energy needs met through renewables.



- By 2026, NJ expects to have 150,000 solar installations for over 5GWh of generation, producing 80,000 jobs
- The New Jersey solar market is growing at an exponential rate, driven by generous incentives and ambitious renewable portfolio standard (RPS) targets

There are 345 licensed solar installers in NJ, 275 have been in the business less than 2 years

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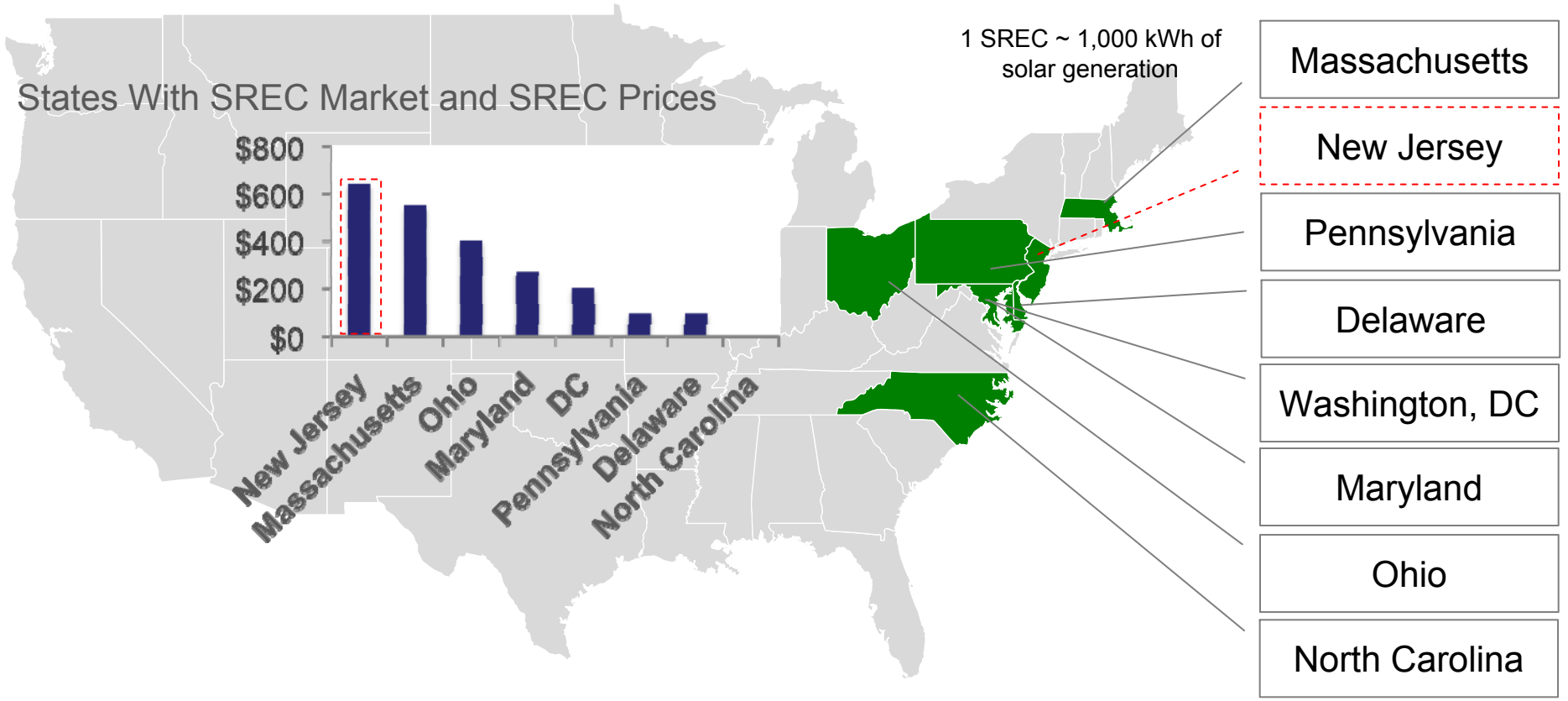
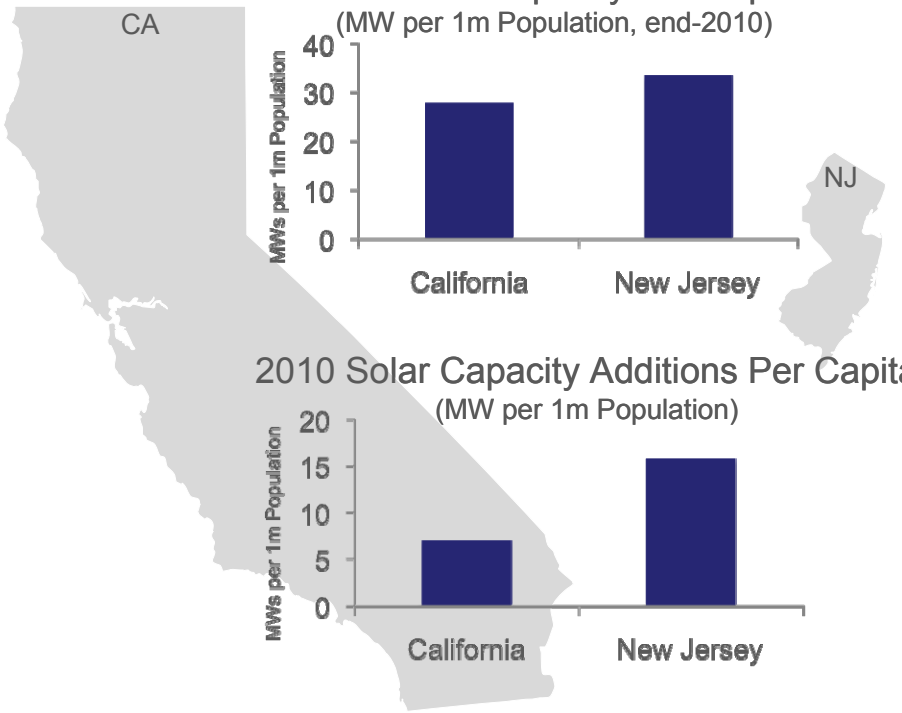
Solar Renewable Energy Certificates



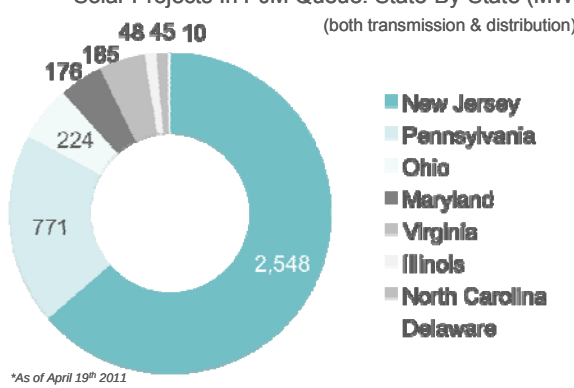
The current value of the SRECs in NJ has made it an extremely profitable enterprise for customers and developers … There's gold in those rays of sun!!!

Solar Expansion …
A National to ACE Perspective

1 More Solar PV Capacity Per Capita Than California

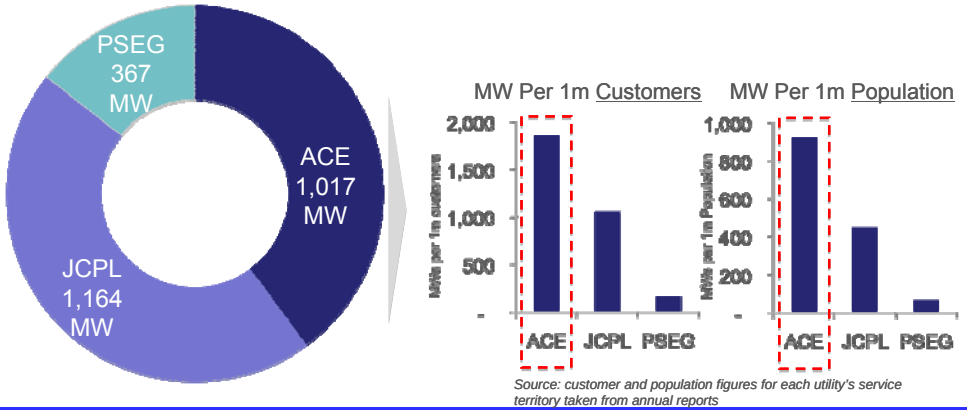


2 New Jersey Leads Other PJM States



New Jersey accounts for nearly 2/3 of the PJM solar project queue

3 ACE Leads the other New Jersey Utilities

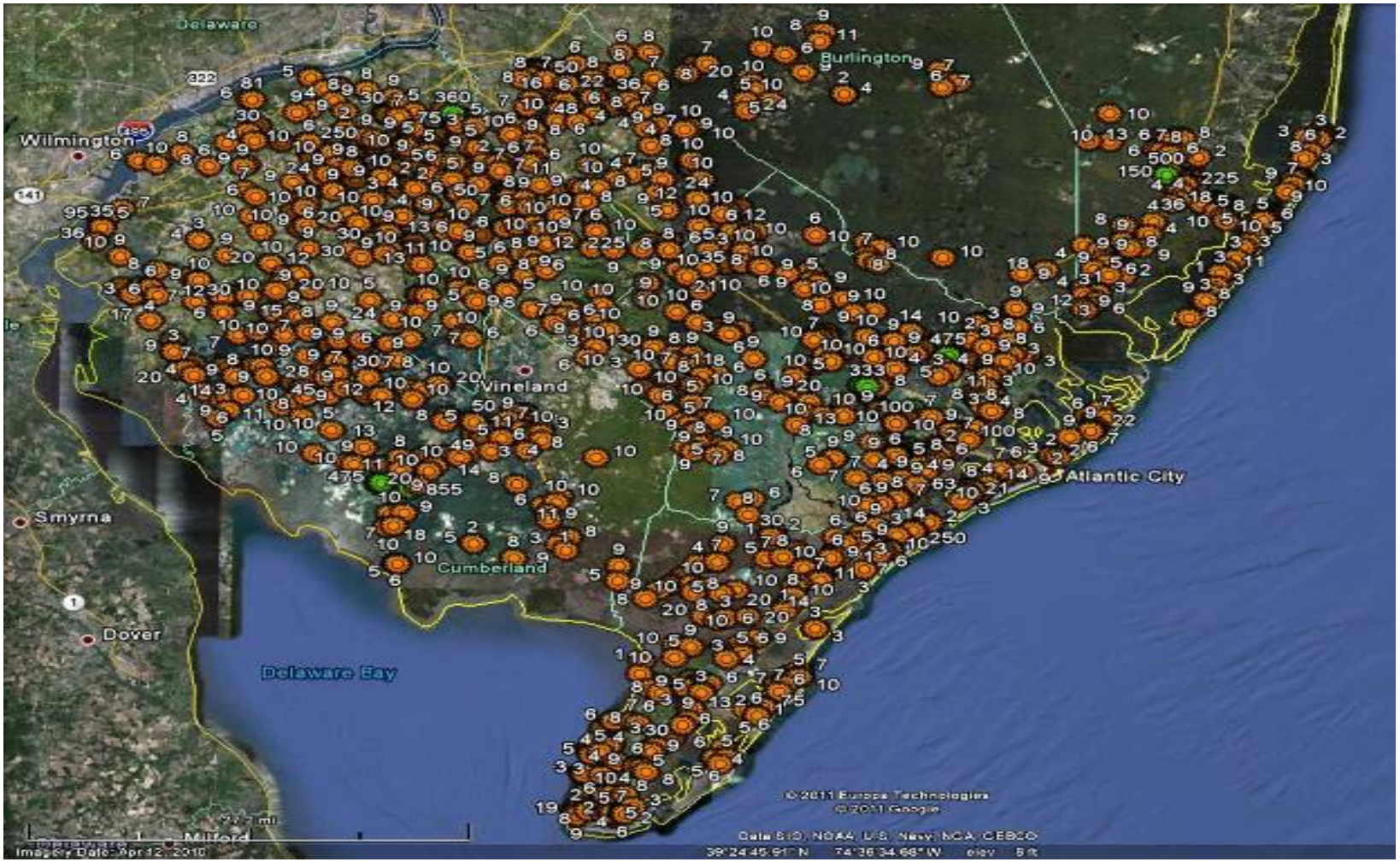


Source: customer and population figures for each utility's service territory taken from annual reports

*As of April 19th 2011

Active NEM in ACE

Active NEM in ACE

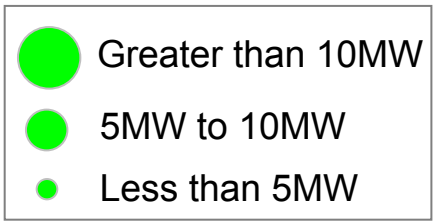


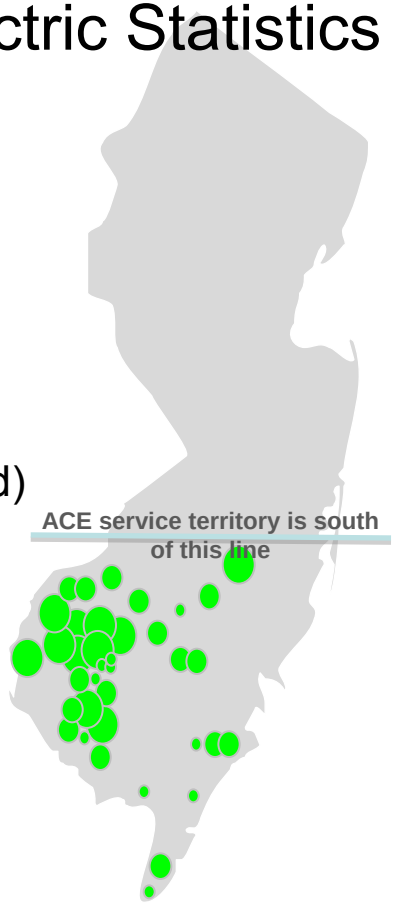
Atlantic City Electric Statistics

As of 5/18/2011:

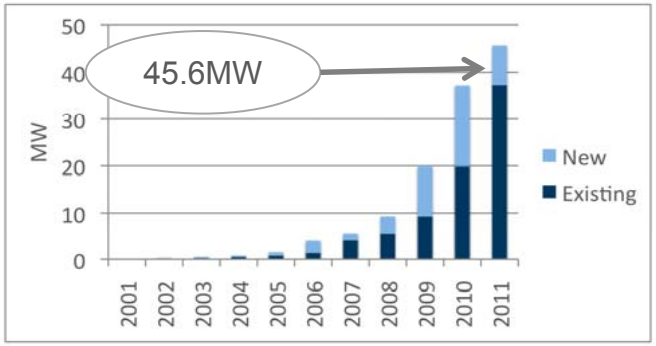
- Net Energy Metering (NEM)
  - Active – 2,025 Customers (45.6 MW); 22.5kW avg
  - Pending – 945 Customers (49.3 MW); 52.2kW avg
- PJM Queue (Grid Connected)
  - Pending – 69 (1,017 MW)

Merchant Generation Projects



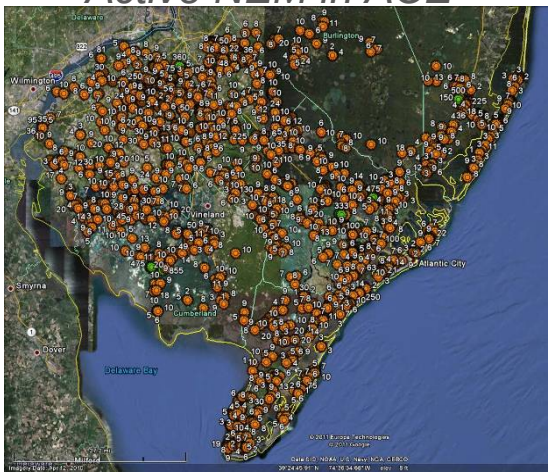


Installed Solar **NEM** PV Capacity*



**As of May 18th 2011*

Active NEM in ACE



The distribution infrastructure in NJ is rapidly transitioning from supplying load in one direction (generator to customer) to a multidirectional super highway … creating enormous complexity!

Types of Interconnection Requests

Net Energy Metering (NEM) projects – Residential / Commercial

- NEM projects are pursued when the interest is “netting” or “zeroing out” the on-site energy use of an end-use customer over the course of a year;
- NEM interconnection applications are managed by the local utility;
- The majority of NEM installations are “distribution sized” in the range of 5 to 25 KW with some as large as 2 - 4 MW.

Merchant generation projects – PJM Queue Projects

- PJM projects are pursued when the interest is generating and selling energy into the regional energy market, typically with little to no on-site energy use;
- Managed by the regional transmission organization (PJM in the case of ACE);
- Merchant generation installations are “transmission-sized” and range from a few MW up to 20 to 30MW or more.

What We're Doing

- ACE sponsored a New Jersey Solar Forum held in the summer 2010
- Working with Legislative leaders to move a bill that would allow large solar connections to Transmission grid (69kv and below) and receive SREC's.
- Developed a plan to build out the distribution network to accommodate more solar subject to BPU support / approval;
- Developing distribution system interconnection guidelines and criteria; education, research, standards development, participation in PJM stakeholder groups, working with local and other utilities, both inside and outside of the US;
- Contracting for additional resources from external engineering consulting services to help with the backlog;
- Continuous improvements to NEM application approval process;
- The GPC (Green Power Connection) Team is working feverishly to keep-up with requests.

Distributed resources are proliferating at a rapid rate and we have to manage the infrastructure, regulatory and political issues …This is our core business

The Characteristics of Carbon Performance Leadership

Strategy	●Integrate climate change risks and opportunities into overall company strategy ●Establish GHG emissions reduction target ●Engage with policy makers on climate policy
Governance	●Identify formal accountability for oversight and management ●Establish incentives for climate change-related activities
Stakeholder Communications	●Communicate in mainstream reporting or other regulatory filings ●Verify emissions data through an external third party
Achievements	●Implement energy or emissions reduction initiatives ●Achieve significant emissions reduction ●Capitalize on opportunities as a source of business value

Risk Management – Risk Identification and Mitigation

Economic Risks
Regulatory concern to raise rates to fund Smart Grid projects
Significant capital outlay for Smart Grid/AMI and other competing projects
Customer Engagement Risks
Necessary stakeholders do not sufficiently understand Smart Grid benefits/technologies
Customers are not adequately educated about PHI's offerings and programs
Technology Risks
Invested technology becomes obsolete before planned
Premature failure; mortality rate of the technology is higher than expected
Major design decisions precede completion of standards development
Data Privacy, Security and Safety Risks
Risk of cyber attacks
Unable to satisfy regulatory cyber concerns (both federal and state)
Undefined privacy and security policies
Sourcing, Procurement and Contractual Risks
Issues arising from interfaces/incompatibility between vendors/systems
Title/Risk of Loss, Escrow Agreements, patent challenges

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Questions?