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Smart Grid Progress and Plans

Pepco Holdings, Inc

Robert Stewart
Manager, Advanced Technology and New Business

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

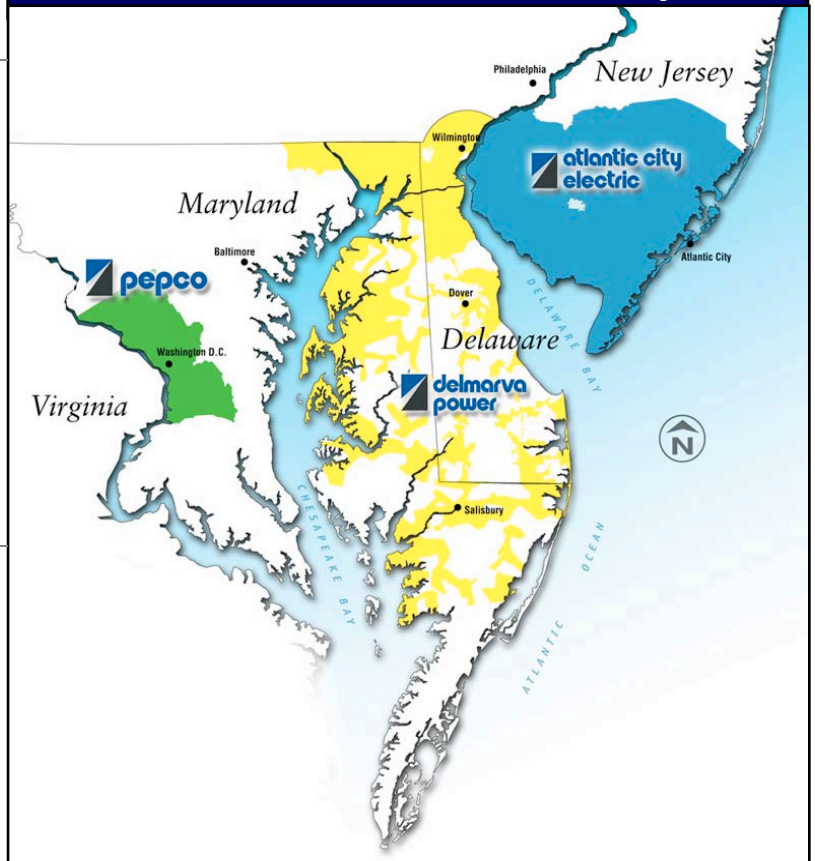
pepco
A PHI Company

Competitive Energy / Other

pepco Energy Services

PHI Investments

Combined Service Territory



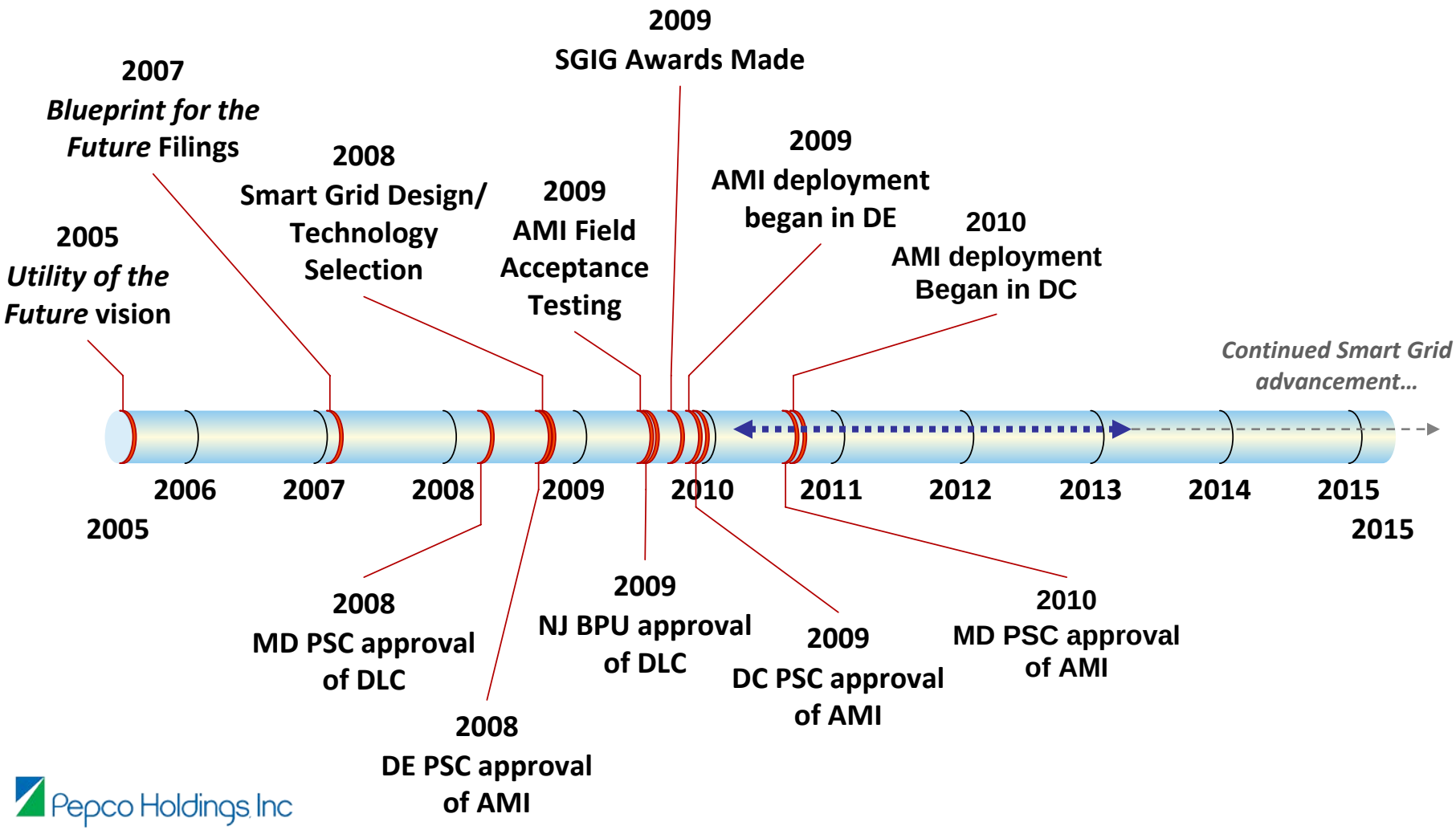
Regulated transmission and distribution is PHI's core business.

PHI's Smart Grid

- Modernizes the grid while utilizing existing wires, transformers and substations
  - Lays more sophisticated information delivery system over electricity delivery system
  - Brings new advanced meters, sensors, communications equipment, automation and computers to the existing grid
  - Collects and transmits data wirelessly
- Provides valuable energy cost and usage information to customers and system performance to operators
- Promises significant advances in load reduction, customer service, outage detection, service restoration, and system operations & planning
- Facilitates deployment of renewable / green energy alternatives

Path to the Smart Grid

PHI began its Smart Grid planning in 2005 and has been progressing rapidly in its implementation



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Success Stories: Advancing the Smart Grid

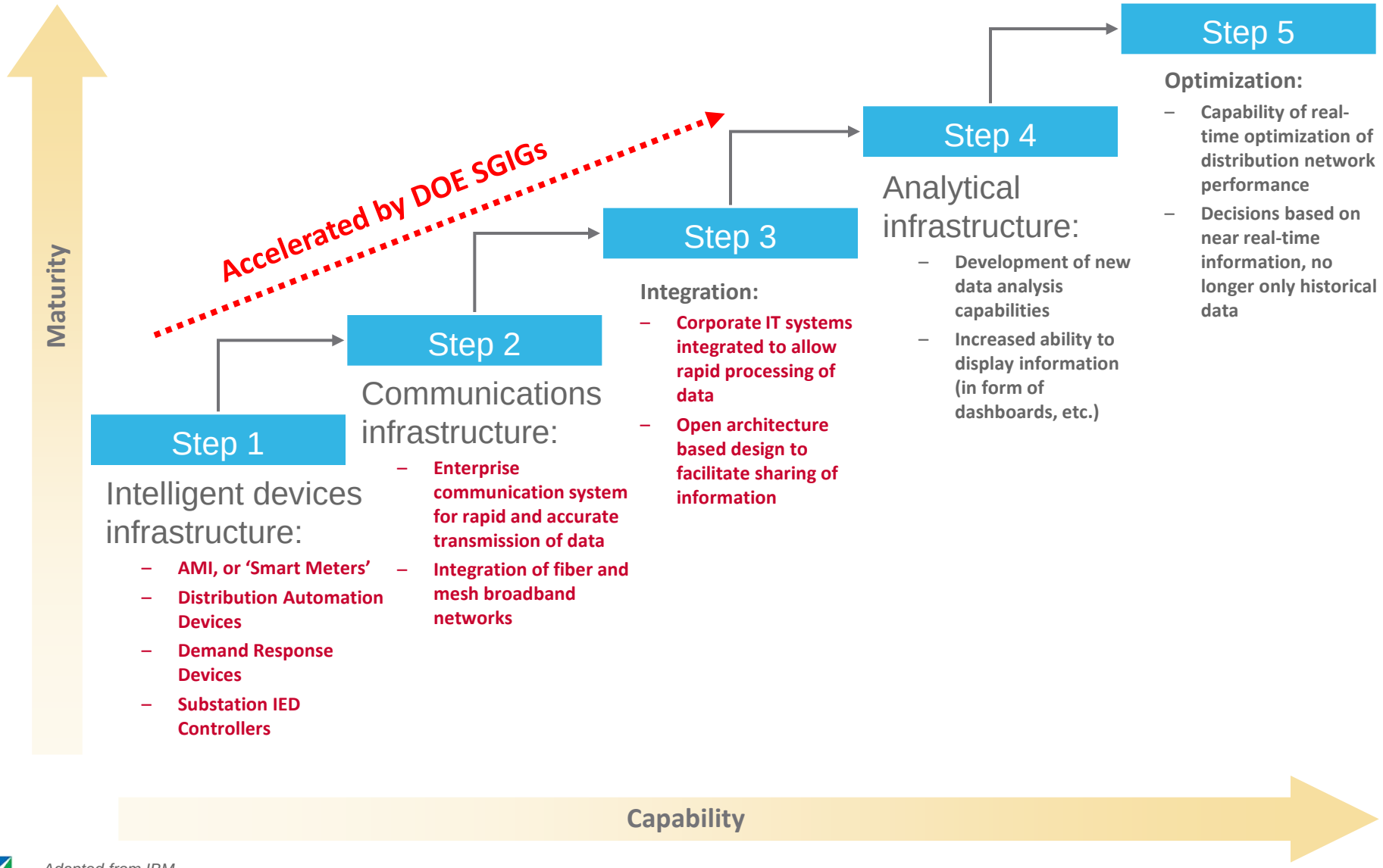
- Regulatory authority to move forward
  - Delaware, District of Columbia, Maryland

- American Reinvestment & Recovery Act – DOE $173.5 million awarded
  - Maryland $104.8
  - District of Columbia $ 44.6
  - New Jersey $ 18.7
  - Smart Grid Workforce Training Grant $ 4.4

- Smart meter installation
  - Under way in Delaware since 2009, in the District of Columbia since 2010 and in Maryland since June this year

5 evolutionary steps to achieving the Smart Grid

Smart Grid Investment Grant (SGIG) funding accelerated this process



Adapted from IBM

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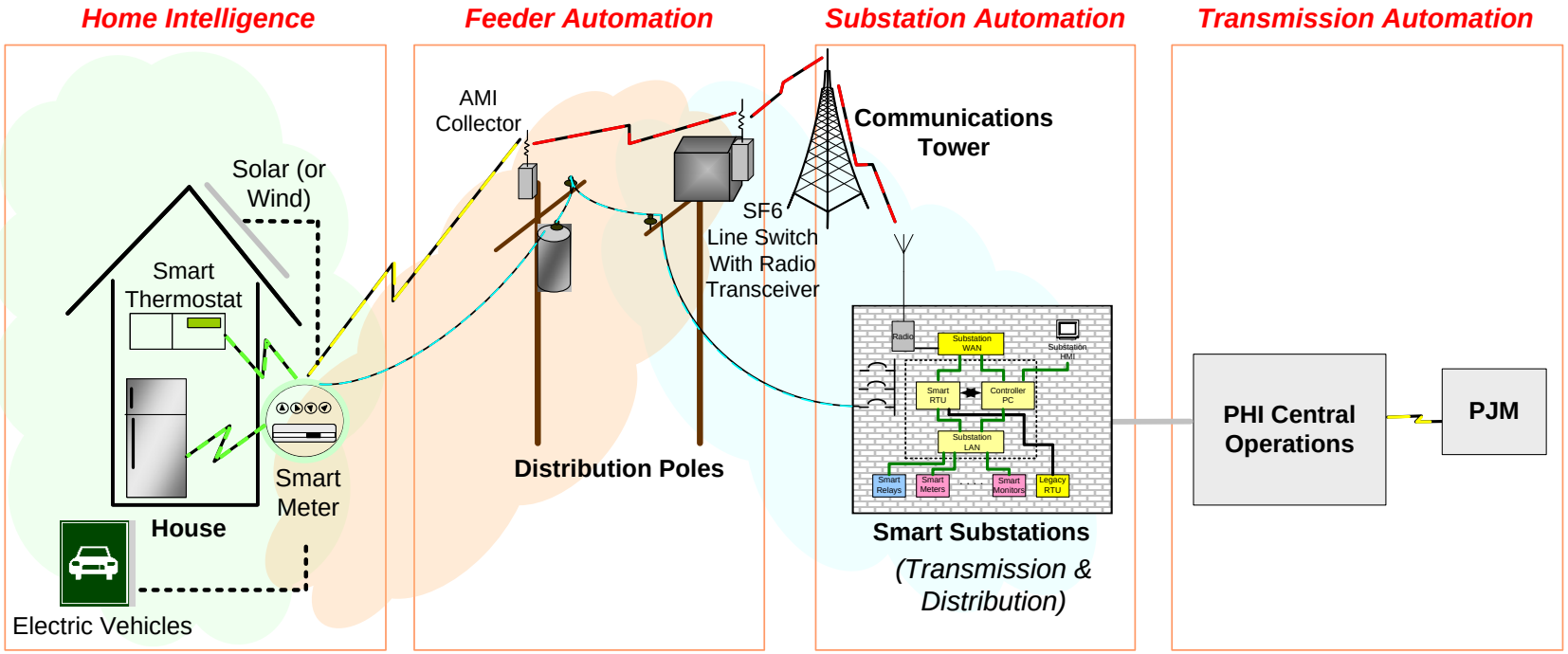
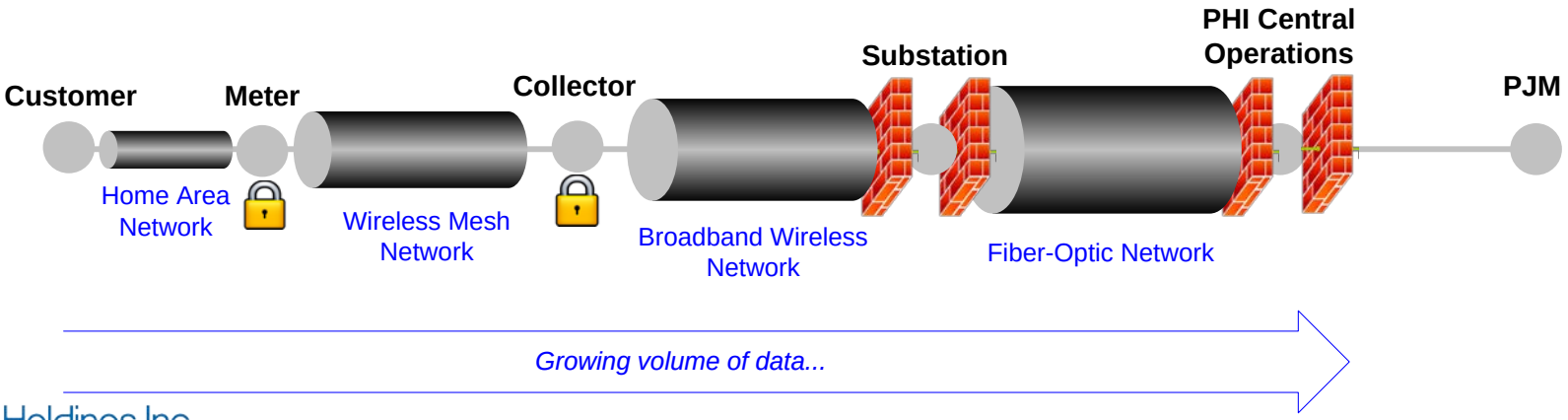
PHI's Smart Grid Domains and Integrated Communications Infrastructure





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Transition to Smart Substations

Analog Substations

- Separate relays for each event
- Limited situational awareness
- Visual confirmation of failure event
- Limited station communication to Control Center

Digital Substations

- Multiple events managed by Smart Relays
- Increased situational awareness and analysis of events
- Increased status communication to Control Center

Feeder Automation

Automatic Sectionalizing and Restoration

Protects customers from sustained outages caused by feeder lock-outs

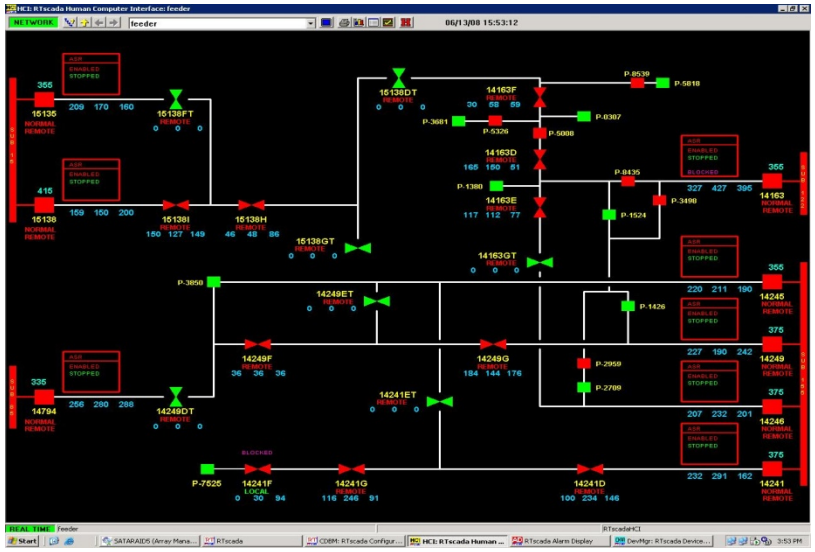
Segments feeders into 2, 3, or 4 sections using remote controlled switches or Automatic Circuit Reclosers (ACR's) in the field

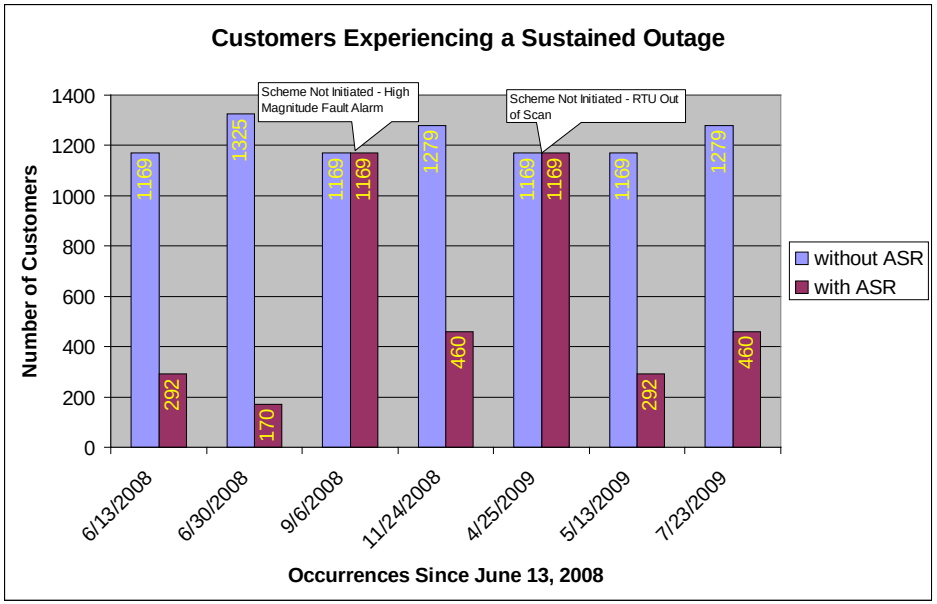
For a fault in any one section:

- ASR opens closed switches to isolate the section
- ASR restores the other sections by reclosing the feeder breaker and/or closing open tie switches to other feeders

Generally ASR operates in less than a minute

1 year Field Test yielded 7 operations and over 50% improvement in feeder performance





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AMI Deployment – Initial Functionality

- **Over the Air Meter Reads**
- **Remote Disconnect/Reconnect**
- **Outage Detection and Notification**
- **Web Presentation of Customer Usage Data**
- **Launching Interval Billing and Dynamic Pricing – Critical Peak Rebate – in 2012**

Meter Installation Progress

99% complete in Delaware – 307,000 meters installed

74% complete in Pepco-DC – 200,000 meters installed – complete in 2011

6% Complete Pepco-Maryland – 35,000 meters installed – Complete in 2012

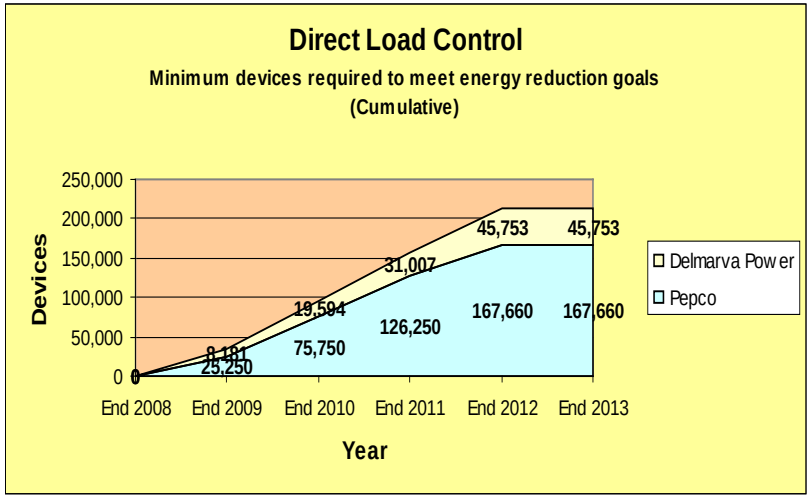
Awaiting PSC Order for Delmarva Power - Maryland

DLC and the Path to AMI Compatibility

Energy Wise Rewards NJ

- **Comverge selected as vendor**
- Smart Thermostats and Outdoor switches
- Program Currently Underway
- 25,000 Devices

Energy Wise Rewards MD



- **Comverge selected as vendor**
- Smart Thermostats and Outdoor switches
- Program Currently Underway
- 222,000 by Devices by 2013
- Compatible with AMI

Installed to Date

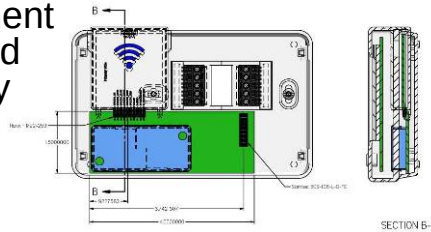
69,000 in Pepco

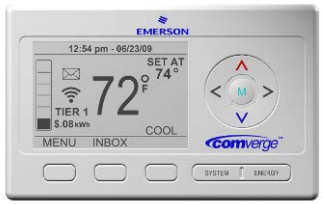
20,000 in DPL-MD

16,000 in ACE

Comverge NextGen Solution

- Changed platform from segment touch screen to dot matrix and keeping same font size of key elements
  - Flexibility & capability
  - Built-in IHD
  - More user friendly
- Full remote firmware upgradability
  - Ability to migrate to future Smart Grid functions
- U-SNAP swappable communication module option





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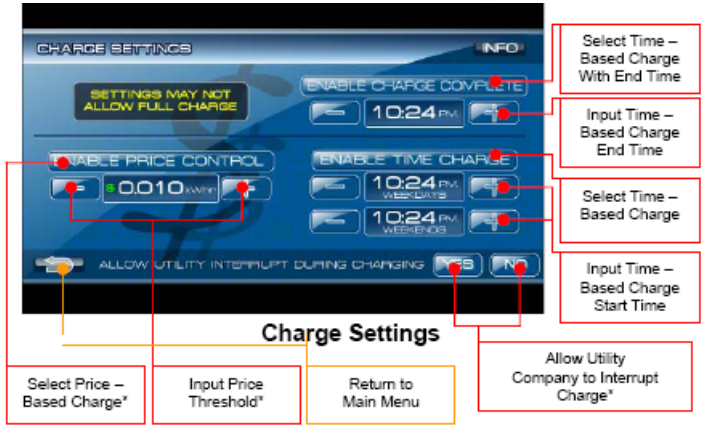
Smart Grid Benefits for Renewable Energy

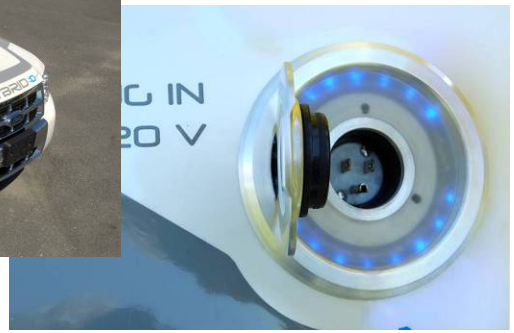
- Net Metering and Net Billing, which support and encourage solar installations, become easier to implement because AMI smart meters can separately record flows of energy in each direction
- AMI enables the increased use of solar by making it easier to integrate them into the grid
- With AMI enabled dynamic pricing customers with solar can lower energy costs by monitoring prices and choosing to use more of their solar resources during peak pricing
- Customers with solar will not have to compromise by reducing electrical usage during peak pricing periods

Smart Grid Future-PHI Plug-In Vehicles

- PHI is currently working with EPRI to evaluate the Ford Escape PHEV
- Have 10 Chevy Volts
- Smart Grid technology will allow for full integration of PEVs into grid
- 2 EVs equal approximately one average house load
- Charger control will reduce risk



*- Denotes that option is only available if Utility Zigbee interface is present. If option is selected



Charge Data Summary

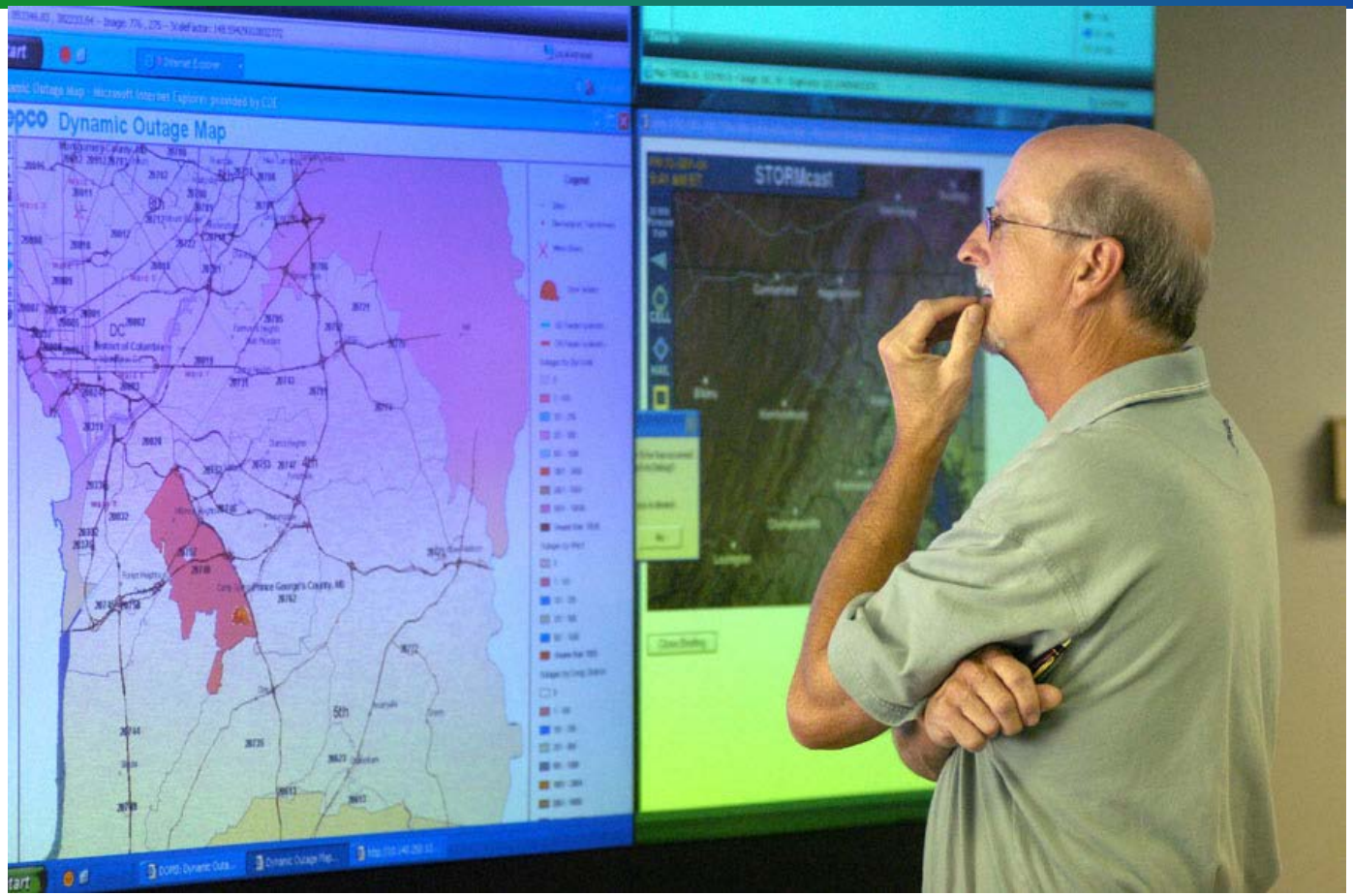
	Last 30 Days	Cumulative
Number of Charging Events	72.00	1,983.00
Average Number of Charging Events per Day	4.80	3.57
Average Number of Trips between Charging Events	14.67	5.98
Average Duration of Charging Events	0.99 hrs	0.82 hrs

Key Takeaways

"The smart grid will only work to the extent that customers win," Joseph Rigby, CEO of Pepco Holdings

- Customer Adoption and Participation is a key enabler
- Smart Grid will move at the *Speed of Value*
- Interoperability and Standardization are not spectator activities.
  - Utilities need to get involved and make their voices heard and be engaged as individual companies and as an industry
- Through the Smart Grid, Utilities will become "Technology" Companies
  - No longer the "best solutions" but rather iterations of "Better Solutions"
  - Similar to Electric System Operations, Communication Network Operations and enhanced Cyber Security will become part of our future DNA

Questions?



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