Lessons from the Real World Webinar Series

Making the Business Case for Smart Meters

Broadcast on October 14, 2010
Your Presenters

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Pepco
Smart meter business case

1. Identifying and valuing benefits & costs

2. A unique smart pricing pilot in the nation’s capital

3. Building the AMI business case
Housekeeping

- Use the question box to type questions at any time
- If we run out of time, we’ll answer by email as a FAQ
- We’ll also email you a link to the slides
- Our contact info is at the end
1. Identifying and valuing benefits & costs

2. A unique smart pricing pilot in the nation’s capital

3. Building the AMI business case
Evolution of the Business Case

• 1990: first comprehensive AMI business case
• 1997: NY PSC working groups refine business case
• 2003: CPUC issues business case guidelines
• Smart meter rollout business cases approved (partial list)
  – 2004: Pennsylvania Power & Light
  – 2005: PG&E
  – 2007: SDG&E
  – 2008: CenterPoint, Portland General Electric, Oncor,
  – 2010: BGE, Pepco (MD), SoCalGas
• Sources for following analysis
  – Over 50 utility business cases performed over the past 5 years and filed with regulators

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Smart Grid Business Case Summary – Utility Perspective

Annualized Savings and Costs for U.S.
(150 million electric meters)

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Annualized Savings and Costs for U.S.
**Utility Operating Savings**

<table>
<thead>
<tr>
<th>Field Service Benefits</th>
<th>Monthly Per Meter Range</th>
<th>Annual Totals Range (millions of dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced manual meter reading cost</td>
<td>$ 0.61 $</td>
<td>$ 1,098 $</td>
</tr>
<tr>
<td>Reduced problem investigations</td>
<td>$ 0.85 $</td>
<td>$ 1,530 $</td>
</tr>
<tr>
<td>Improved meter accuracy</td>
<td>$ 0.05 $</td>
<td>$ 90 $</td>
</tr>
<tr>
<td>Reduced meter testing</td>
<td>$ 0.01 $</td>
<td>$ 18 $</td>
</tr>
<tr>
<td>Elimination of lock rings</td>
<td>$ 0.04 $</td>
<td>$ 72 $</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Back Office and Administrative Benefits</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced estimated bills</td>
<td>$ - $</td>
<td>$ - $</td>
</tr>
<tr>
<td>Reduced theft</td>
<td>$ 0.10 $</td>
<td>$ 180 $</td>
</tr>
<tr>
<td>Improved read-to-bill time</td>
<td>$ 0.05 $</td>
<td>$ 90 $</td>
</tr>
<tr>
<td>Improved bill-to-pay time</td>
<td>$ 0.05 $</td>
<td>$ 90 $</td>
</tr>
<tr>
<td>Reduced uncollectibles</td>
<td>$ 0.03 $</td>
<td>$ 54 $</td>
</tr>
<tr>
<td>Improved accounting</td>
<td>$ - $</td>
<td>$ - $</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Customer Service Benefits</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Call center cost reductions</td>
<td>$ 0.10 $</td>
<td>$ 180 $</td>
</tr>
<tr>
<td>Improved asset utilization</td>
<td>$ 0.10 $</td>
<td>$ 180 $</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System Operating Benefits</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Outage reporting</td>
<td>$ 0.01 $</td>
<td>$ 18 $</td>
</tr>
<tr>
<td>Improved outage management</td>
<td>$ 0.06 $</td>
<td>$ 108 $</td>
</tr>
<tr>
<td>Reduction in lost outage sales</td>
<td>$ - $</td>
<td>$ - $</td>
</tr>
</tbody>
</table>

**TOTAL**                                                  | $ 1.21 $                | $ 2,178 $                               |

Source: Cambridge Energy Research Associates

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Utility Operating Savings

AMI Benefits

- Settlement (2-4%)
- Standards & Construction (15-20% Capex)
- Collections (15-25%)
- Field Work Management (3-7%)
- Safety (2-5%)
- Load Forecasting (9-14%)
- Metering (2-4%)
- Demand Management (2-22%)
- Vegetation Management (3-7%)
- Outage & Restoration (3-8%)
- Tariff & Regulatory (1-4%)
- Asset Management (4-19%)
- Billing & Customer Care (2-7%)
- System Control (4-11%)

Percentages based on Real Savings at AMI Deployments

Source: Capgemini
Grid Operating Efficiencies

• Line loss minimization
  – Sources
    • Energy theft
    • Equipment issues
    • Unbalanced feeder lines
  – Potential savings
    • Today’s typical losses: 7%
    • Likely improvement: 15%
    • Net savings: 15% x 7% ~ 1%
      • 1% x $350 billion total retail revenues = $3.5 billion per year

• Conservation voltage reduction
  – Energy efficiency realized by managing voltage more precisely
  – Potential: reduce average voltage served by 2.5%
  – Net savings: 2.5% x $350 billion = $9 billion per year

• McKinsey estimate: $63 billion per year
Energy Efficiency

• Energy information feedback
  – Real-time displays
  – Next-day online
  – “Pushed data” (monthly bill inserts, etc.)

• Efficiency mechanisms
  – Behavioral changes: turn lights off, reduce vampire loads, etc.
  – Equipment changes: buy more efficient appliances over time

• Results
  – University of Oxford estimate: 5-15% energy efficiency
  – Savings: 10% x $350 billion = $35 billion per year

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Peak Reduction/Demand Response

- **Mechanisms**
  - Dynamic pricing (Peak Time Rebate, Time-of-Use, Critical Peak)
  - Automated equipment and appliance control

- **Program results**
  - 67 pilot & rollout programs
  - Dynamic pricing: 10-20%
  - Automated control: 10-30%
  - Combined: 30-40%

- **Savings estimate**
  - 10% peak reduction
  - Capacity cost of $100 per kW-year
  - Savings: 800 GW x 10% x $100 = $8 billion per year

Source: Brattle Group

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Integrating EVs and Renewable Sources

• Problem: NERC requirement that natural gas (or other) plant needed as backup for intermittent solar and wind
• Solution: automated load following
  – Storage
    • EV charging (and discharging)
    • Building thermal storage
    • Refrigeration
  – Scheduling
    • Appliance & equipment timers
    • Process control
• Savings estimate
  – Automate 10% of load
    • Provides 80 GW of renewable sources backup
  – Capacity cost of $100 per kW-year
  – Savings: 80 GW x $100 = $8 billion per year

Source: CA ISO
Smart Grid Costs

- Vary by utility
- Smart meter costs well documented

<table>
<thead>
<tr>
<th>Location</th>
<th>Meters</th>
<th>Total Cost (000s)</th>
<th>Cost per Meter</th>
</tr>
</thead>
<tbody>
<tr>
<td>BGE</td>
<td>Maryland, USA</td>
<td>2,090,000</td>
<td>$482,000</td>
</tr>
<tr>
<td>CenterPoint Energy</td>
<td>Texas, USA</td>
<td>2,400,000</td>
<td>$639,600</td>
</tr>
<tr>
<td>Central Vermont Public Service</td>
<td>Vermont, USA</td>
<td>153,000</td>
<td>$40,800</td>
</tr>
<tr>
<td>Consolidated Edison</td>
<td>New York, USA</td>
<td>4,800,000</td>
<td>$712,800</td>
</tr>
<tr>
<td>Idaho Power Corporation</td>
<td>Idaho, USA</td>
<td>500,000</td>
<td>$70,900</td>
</tr>
<tr>
<td>Modesto Irrigation District</td>
<td>California, USA</td>
<td>107,000</td>
<td>$21,300</td>
</tr>
<tr>
<td>New York State Electric &amp; Gas</td>
<td>New York, USA</td>
<td>1,134,000</td>
<td>$177,000</td>
</tr>
<tr>
<td>Oncor</td>
<td>Texas, USA</td>
<td>3,400,000</td>
<td>$690,000</td>
</tr>
<tr>
<td>Pacific Gas &amp; Electric</td>
<td>California, USA</td>
<td>10,444,000</td>
<td>$2,361,000</td>
</tr>
<tr>
<td>PPL Electric Utilities Corporation</td>
<td>Pennsylvania, USA</td>
<td>1,300,000</td>
<td>$160,000</td>
</tr>
<tr>
<td>Portland General Electric</td>
<td>Oregon, USA</td>
<td>851,000</td>
<td>$132,200</td>
</tr>
<tr>
<td>Rochester Gas &amp; Electric</td>
<td>New York, USA</td>
<td>673,000</td>
<td>$91,000</td>
</tr>
<tr>
<td>Sacramento Municipal</td>
<td>California, USA</td>
<td>600,000</td>
<td>$81,000</td>
</tr>
<tr>
<td>San Diego Gas &amp; Electric</td>
<td>California, USA</td>
<td>2,300,000</td>
<td>$530,000</td>
</tr>
<tr>
<td>Southern California Edison</td>
<td>California, USA</td>
<td>5,300,000</td>
<td>$1,715,000</td>
</tr>
<tr>
<td>Texas New Mexico Power</td>
<td>Texas, USA</td>
<td>231,000</td>
<td>$123,000</td>
</tr>
<tr>
<td>U.S. AVERAGE (weighted)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Smart grid costs
  - $100,000 per feeder
  - $1 million per substation
  - Additional for transmission grid

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Summary

• All figures annualized
• U.S. total
  – 150 million meters
  – 150,000 feeders
  – 6,000 substations
• Costs: $15.3 billion per year
  – Smart meters: $11.3 billion per year
  – Smart grid: $4 billion per year
• Benefits: $68.5 billion per year
  – Utility operating efficiency: $5 billion per year
  – Grid efficiency: $12.5 billion per year
  – Energy efficiency: $35 billion per year
  – Peak demand reduction: $8 billion per year
  – EV and renewable resource integration: $8 billion per year
• Another data point
  – McKinsey estimates savings of $131 billion per year...
Questions?
Smart meter business case

1. Identifying and valuing benefits & costs

2. A unique smart pricing pilot in the nation’s capital

3. Building the AMI business case
A Unique Smart Pricing Pilot in the Nation’s Capital

Rick Morgan
Commissioner, D.C. Public Service Commission
Chair, Smart Meter Pilot Program, Inc.
History of the District’s smart metering pilot

• 2002: Pepco/Conectiv merger case
  – settlement earmarks $2M for “smart metering pilot”

• 2005: SMPPI created, representing five D.C. entities:
  – D.C. Office of the People’s Counsel
  – Pepco
  – D.C. Public Service Commission
  – D.C. Consumer Utility Board
  – IBEW Local 1900
History of the District’s smart metering pilot (cont’d)

• 2005-6: consultants hired to design and implement residential smart meter pilot:
  – Chris King, eMeter Strategic Consulting
  – Patti Harper-Slaboszewicz, UtiliPoint Intl/Bass & Co

• 2007: Meters and PCDC rate designs approved by PSC; participant recruitment & implementation begins

• July 2008 - October 2009: live billing of PCDC participants on types of dynamic pricing
• 2010: PCDC completion
  – final report issued September 9
• 2007 - 2010: Pepco proposes District-wide:
  – AMI deployment
  – dynamic pricing
  – AMI-enabled direct load control
• 2010: PSC approves Pepco deployment of AMI
Unique features of PowerCentsDC

• Integrated approach to smart grid experience for participants, including:
  – Dynamic pricing
  – Energy information feedback
  – Automated controls (smart T-stats)

• Broad stakeholder involvement
  – Utility -- Regulators
  – Consumer advocates -- Labor
Unique features of PowerCentsDC (cont’d)

• Side-by-side testing of three distinct dynamic pricing plans
• Strong emphasis on customer education
• Focus on low-income population
• Location in the Nation’s Capital
  – National visibility
  – Participation by national policymakers
PowerCentsDC highlights

• Results: Customers responded!
  – All customer segments reduced peak loads in response to price signals
  – Findings generally consistent with other smart metering pilots
  – Results provide useful insights re:
    • customer segments
    • pricing methods
    • enabling technology

*PowerCentsDC Final Report available from*

www.dcpsc.org
Overwhelmingly positive feedback from PCDC participants

National recognition: award from Assn of Energy Service Professionals (AESP)
  – “Outstanding achievement in pricing & demand response, 2010”

ARRA funding award received by Pepco (2010)

“PowerCentsDC proves that the smart grid can deliver solid benefits to all consumers, regardless of income levels. The results of this pilot are helping our national efforts on the smart grid to learn from best practices”.  – Dr. George Arnold, National coordinator for smart grid interoperability, NIST
Peak Demand Reduction By Price Plan

- Participants on all price plans responded to the price signals
- Higher price differentials led to greater peak demand reductions
- Winter results affected by small number of events (3)

<table>
<thead>
<tr>
<th>Price Plan</th>
<th>Summer Peak Reduction</th>
<th>Winter Peak Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPP</td>
<td>33%</td>
<td>13%</td>
</tr>
<tr>
<td>CPR</td>
<td>13%</td>
<td>(n/s)</td>
</tr>
<tr>
<td>HP</td>
<td>4%</td>
<td>(n/s)</td>
</tr>
</tbody>
</table>

Results are from final evaluation, covering July 2008 to October 2009.
Peak Demand Reduction By Rate Group

- Participants in all rate groups responded to the price signals
- These results are for CPR
- Limited income customers (RAD) also responded
- Winter results affected by small number of events (3)

<table>
<thead>
<tr>
<th>Rate Group</th>
<th>Summer Peak Reduction</th>
<th>Winter Peak Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-CPR</td>
<td>13%</td>
<td>7%</td>
</tr>
<tr>
<td>AE-CPR</td>
<td>12%</td>
<td>(n/s)</td>
</tr>
<tr>
<td>RAD-CPR</td>
<td>5%</td>
<td>(n/s)</td>
</tr>
<tr>
<td>RAD-AE-CPR</td>
<td>30%</td>
<td>(n/s)</td>
</tr>
</tbody>
</table>

Results are from final evaluation, covering July 2008 to October 2009.
Smart Thermostats

- Customers with smart thermostats had much higher peak reductions

<table>
<thead>
<tr>
<th>Rate Group</th>
<th>No Smart Thermostat</th>
<th>With Smart Thermostat</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-CPP</td>
<td>29%</td>
<td>49%</td>
</tr>
<tr>
<td>R-CPR</td>
<td>11%</td>
<td>17%</td>
</tr>
<tr>
<td>AE-CPP</td>
<td>22%</td>
<td>51%</td>
</tr>
<tr>
<td>AE-CPR</td>
<td>6%</td>
<td>24%</td>
</tr>
</tbody>
</table>

Results are from final evaluation, covering July 2008 to October 2009.
Customers reduced peak demand MORE when temperatures went up.

These results are for peak reductions hour by hour.

<table>
<thead>
<tr>
<th>Rate Group</th>
<th>Peak Reduction At 85°F</th>
<th>Peak Reduction At 97°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPP</td>
<td>26%</td>
<td>43%</td>
</tr>
<tr>
<td>CPR</td>
<td>8%</td>
<td>20%</td>
</tr>
<tr>
<td>HP</td>
<td>3%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Results are from final evaluation, covering July 2008 to October 2009.
Participants Liked the Program

Would you recommend PowerCentsDC electricity pricing to your friends and family?
- Yes: 89%
- No: 11%

Which price plan did you prefer?
- PowerCentsDC Plan: 93%
- Former Pricing Plan: 7%

Overall, were you satisfied, neutral, or dissatisfied with the PowerCentsDC program?
- Satisfied: 74%
- Neutral: 20%
- Dissatisfied: 6%
The future of dynamic pricing in D.C.: Where do we go from here?

- AMI deployment underway
  - completion expected year-end 2011
- Dynamic pricing rate design
  - Mandatory vs. voluntary; opt-in vs. opt-out
- Customer education/engagement
- Integration of dynamic pricing with Pepco’s procurement for default service
- Integration of dynamic pricing with wholesale electricity markets (PJM)
- Cost recovery

PCDC results will inform D.C.’s smart grid policy going forward!
Questions?
Smart meter business case

1. Identifying and valuing benefits & costs

2. A unique smart pricing pilot in the nation’s capital

3. Building the AMI business case
Regulated transmission and distribution is PHI’s core business.
• PHI began its Smart Grid planning in 2005 and has been progressing rapidly in its Smart Grid implementation with the Smart Grid Investment Grant (SGIG) awards.

PHI received 3 grants from US DOE for $168 m for Smart Grid and one for Workforce Training for $4.4 million
Constructing the Business Case

AMI Business Case Considerations

- Regulatory Approval Process
- Legislative Environment
  - Driving Mandates
- Regional Market Drivers
  - Restructured Markets
  - Energy Supply Conditions
- Customer Receptivity
- AMI Overall Costs
- Benefits – Quantifiable vs. Difficult to Quantify
  - Utility Operational
  - Supply Side
  - Service Quality
- Time Period
- Projected Customer Bill Impact
Under any one of the projected market scenarios, this initiative promises an overall net present value for PHI and its customer base...

**Conclusion:**
- AMI is a net-positive investment even in the lowest-value scenario
- The benefits from AMI-enabled DR will be more than doubled if *dynamic pricing* is the default rate structure

### AMI Business Case

<table>
<thead>
<tr>
<th>Scenario #1</th>
<th>Voluntary Participation</th>
<th>15 year Present Value</th>
<th>Delivery Company Benefit</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>$119</td>
<td>$149.5</td>
</tr>
</tbody>
</table>

### Scenarios for Demand Response for Delaware

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Type</th>
<th>Participation</th>
<th>Present Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario #1</td>
<td>Voluntary</td>
<td>Growing to 20%</td>
<td>$36</td>
</tr>
<tr>
<td>Scenario #2</td>
<td>Voluntary</td>
<td>Growing to 20%</td>
<td>$38</td>
</tr>
<tr>
<td>Scenario #3</td>
<td>Voluntary</td>
<td>Growing</td>
<td>$47</td>
</tr>
<tr>
<td>Scenario #4</td>
<td>Mandated</td>
<td>Dropping to 80%</td>
<td>$81</td>
</tr>
<tr>
<td>Scenario #5</td>
<td>Mandated</td>
<td>Dropping to 80%</td>
<td>$85</td>
</tr>
<tr>
<td>Scenario #6</td>
<td>Mandated</td>
<td>Dropping to 80%</td>
<td>$107</td>
</tr>
</tbody>
</table>

*Upside based on market variables, Lowest case based on market variables*
Benefit Estimates

‘connecting the Smart Grid dots’

<table>
<thead>
<tr>
<th>Smart Grid activities</th>
<th>Customer benefits</th>
<th>Economic growth benefits</th>
<th>Environmental and social benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart Grid activities</td>
<td>Lower energy cost</td>
<td>Improved reliability</td>
<td>Improved restoration</td>
</tr>
<tr>
<td></td>
<td>Improved billing</td>
<td>Improved energy info</td>
<td>Improved energy info and control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>More green options</td>
<td>Job creation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Energy independent</td>
</tr>
<tr>
<td>Smart Grid activities</td>
<td></td>
<td></td>
<td>Enables new markets</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>High inter-operability</td>
</tr>
<tr>
<td>Smart Grid activities</td>
<td></td>
<td></td>
<td>Reduced energy usage</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Increased green energy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Combat global warming</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Improved planning</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Resists attack</td>
</tr>
</tbody>
</table>

- Energy efficiency
- Smart premise automation
- Advanced metering
- Demand response and green rates
- Direct load control
- Distribution automation
- Distributed storage and generation
- Transmission automation

Enablers
- Security
- Communications

High contribution • Medium contribution • Low contribution
## Energy Delivery Benefits from AMI
### Summary of Delmarva – Delaware
**Electric and Gas Types of Service**

<table>
<thead>
<tr>
<th>Line</th>
<th>Benefit Category</th>
<th>In Projected 2008 Dollars, $ in 000s</th>
<th>Benefit Dollars as a % of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Electric</td>
<td>Gas</td>
</tr>
<tr>
<td>1</td>
<td>Eliminate Manual Meter Reading Costs</td>
<td>$3,564</td>
<td>$1,157</td>
</tr>
<tr>
<td>2</td>
<td>Implement Remote Turn-on/Turn-off Functionality</td>
<td>$1,592</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Improve Billing Activities</td>
<td>$484</td>
<td>$186</td>
</tr>
<tr>
<td>4</td>
<td>Reduce Off-Cycle Meter Reading Labor Costs</td>
<td>$372</td>
<td>$57</td>
</tr>
<tr>
<td>5</td>
<td>Asset Optimization</td>
<td>$219</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>Reduce Expenses Related to Revenue Protection</td>
<td>$88</td>
<td>$36</td>
</tr>
<tr>
<td>7</td>
<td>Eliminate Hardware, Software, Maintenance and Operations Cost for the Itron Handheld Data Collection System</td>
<td>$75</td>
<td>$30</td>
</tr>
<tr>
<td>8</td>
<td>Reduce Volume of Customer Call Types Related to Metering</td>
<td>$29</td>
<td>$12</td>
</tr>
<tr>
<td>9</td>
<td>Improve Complaint Handling</td>
<td>$24</td>
<td>$10</td>
</tr>
<tr>
<td>10</td>
<td>Total</td>
<td>$6,447</td>
<td>$1,488</td>
</tr>
</tbody>
</table>

**NOTE:** The quantification of these benefits will change as Delmarva conducts the procurement phase of its AMI project and evaluates the capabilities of the various AMI systems available in the market today. In addition, the quantifications will also change due to changing labor rates, payroll loading rates, inflation and other possible changes in the underlying assumptions used to derive the estimated value of the benefits.
# Dynamic Pricing Demand Reduction Estimates

## PowerCentsDC Pilot

<table>
<thead>
<tr>
<th>Rate Group</th>
<th>No Smart Thermostat</th>
<th>With Smart Thermostat</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-CPP</td>
<td>28.5%</td>
<td>48.9%</td>
</tr>
<tr>
<td>R-CPR</td>
<td>11.2%</td>
<td>16.8%</td>
</tr>
<tr>
<td>AE-CPP</td>
<td>21.7%</td>
<td>50.7%</td>
</tr>
<tr>
<td>AE-CPR</td>
<td>5.6%</td>
<td>23.8%</td>
</tr>
</tbody>
</table>
Originally Estimated Peak Demand Reductions
Default Application of Dynamic Pricing

![Graph showing peak demand reductions from 2009 to 2013 for different regions.
- ACE
- DPL MD
- DPL DE
- Pepco MD
- Pepco DC

Peak Reduction (MW)
- 2009: ACE 14, DPL MD 45
- 2010: ACE 42, DPL MD 96, DPL DE 39
- 2011: ACE 56, DPL MD 90, DPL DE 224
- 2012: ACE 90, DPL MD 251, DPL DE 78, Ace 108
- 2013: ACE 57, DPL MD 91, DPL DE 244]
NPV of Quantified Supply Side Benefits to DE Consumers

Supplier Response Scenario:
- Fast: Enrollment in CPP is Voluntary
- Slower: Enrollment in CPP is Voluntary
- Inadequate: CPP IS Default Rate Structure

NPV of Benefits through 2024 (million 2007 $s)

- Energy Capacity
- Short-Term Price Impacts
- Capacity Energy A/S Resource Cost Savings
- Capacity Price Impact
- Energy Price Impact
- Avoided A/S
- Avoided Energy
- Avoided Capacity
## Delmarva Power Customer Bill Impact

<table>
<thead>
<tr>
<th></th>
<th>AMI &amp; Smart Stat</th>
<th>Accelerated Meter Recovery</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blueprint Filing</td>
<td>$3.02</td>
<td>$2.96</td>
<td>$5.98</td>
</tr>
<tr>
<td>Change to PVRR Model</td>
<td>$</td>
<td>(0.51)</td>
<td>(0.63)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$</td>
<td>(1.14)</td>
</tr>
<tr>
<td>Adjustments for Capex Levels, Deployment Schedule, Customer Counts</td>
<td>$0.21</td>
<td>$ (0.41)</td>
<td>($0.20)</td>
</tr>
<tr>
<td>Operational Savings</td>
<td>$2.04</td>
<td></td>
<td>(2.04)</td>
</tr>
<tr>
<td>Net Existing Meter Recovery</td>
<td>$</td>
<td>(1.16)</td>
<td>(1.16)</td>
</tr>
<tr>
<td>New Estimated Charge</td>
<td>$0.68</td>
<td>$0.76</td>
<td>$1.44</td>
</tr>
</tbody>
</table>

### Customer per Month Impact by Year with DR

<table>
<thead>
<tr>
<th>Year</th>
<th>AMI Charge Cost (total)</th>
<th>AMI Charge Benefit (total)</th>
<th>Demand Response</th>
<th>Net</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 0</td>
<td>$6.00</td>
<td>$4.00</td>
<td>$2.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Year 1</td>
<td>$5.00</td>
<td>$3.00</td>
<td>$2.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Year 2</td>
<td>$4.00</td>
<td>$2.00</td>
<td>$2.00</td>
<td>$0.00</td>
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<tr>
<td>Year 3</td>
<td>$3.00</td>
<td>$1.00</td>
<td>$2.00</td>
<td>$0.00</td>
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<tr>
<td>Year 4</td>
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<td>$0.00</td>
<td>$2.00</td>
<td>($0.00)</td>
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<tr>
<td>Year 5</td>
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<tr>
<td>Year 6</td>
<td>$0.00</td>
<td>($2.00)</td>
<td>$2.00</td>
<td>($2.00)</td>
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<tr>
<td>Year 7</td>
<td>($1.00)</td>
<td>($3.00)</td>
<td>$2.00</td>
<td>($3.00)</td>
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<tr>
<td>Year 8</td>
<td>($2.00)</td>
<td>($4.00)</td>
<td>$2.00</td>
<td>($4.00)</td>
</tr>
<tr>
<td>Year 9</td>
<td>($3.00)</td>
<td>($5.00)</td>
<td>$2.00</td>
<td>($5.00)</td>
</tr>
<tr>
<td>Year 10</td>
<td>($4.00)</td>
<td>($6.00)</td>
<td>$2.00</td>
<td>($6.00)</td>
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<tr>
<td>Year 11</td>
<td>($5.00)</td>
<td>($7.00)</td>
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<td>($7.00)</td>
</tr>
<tr>
<td>Year 12</td>
<td>($6.00)</td>
<td>($8.00)</td>
<td>$2.00</td>
<td>($8.00)</td>
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<tr>
<td>Year 13</td>
<td>($7.00)</td>
<td>($9.00)</td>
<td>$2.00</td>
<td>($9.00)</td>
</tr>
<tr>
<td>Year 14</td>
<td>($8.00)</td>
<td>($10.00)</td>
<td>$2.00</td>
<td>($10.00)</td>
</tr>
<tr>
<td>Year 15</td>
<td>($9.00)</td>
<td>($11.00)</td>
<td>$2.00</td>
<td>($11.00)</td>
</tr>
<tr>
<td>Year 16</td>
<td>($10.00)</td>
<td>($12.00)</td>
<td>$2.00</td>
<td>($12.00)</td>
</tr>
</tbody>
</table>
Additional Questions?
Thank You!

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