Smart Meter 2020 Vision

MLGW President’s Briefing
April 11, 2013
Smart Meter Demo Objective

- Demonstrate the operational and customer benefits of smart meter technology
  - Labor and transportation
  - Safety
  - Outage management
  - Billing
  - Dynamic rates (Time-of-Use)
  - Customer awareness and behavior
  - Customer energy savings
Smart Meter Demo Background

• 3-year project concluded 12/31/2012
• Metering
  – 1,000 electric smart meters installed at homes of volunteers
  – Additional 200 free meters added for vendor field trial in 2012
• Energy conservation communications
• Web tools to view smart meter data
• Ancillary pilots
  – In Home Display
  – Time-of-Use Rate
## Smart Meter Demo Results  
*(Relative to the Control Group)*

<table>
<thead>
<tr>
<th>Study Group</th>
<th>kWh Energy Savings Per Participant</th>
<th>Average Monthly Cost Savings Per Participant</th>
<th>Annual Savings Per Participant</th>
<th>Annual Savings Extrapolated to Total Residential Customer Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Smart Meter</td>
<td>-2.30%</td>
<td>$3.51</td>
<td>$42.12</td>
<td>$15.2 million</td>
</tr>
<tr>
<td>Standard Rate, Smart Meter</td>
<td>-2.13%</td>
<td>$3.34</td>
<td>$40.08</td>
<td>$14.4 million</td>
</tr>
<tr>
<td>Time of Use Rate, Smart Meter</td>
<td>-5.62%</td>
<td>$6.89</td>
<td>$82.68</td>
<td>$29.8 million</td>
</tr>
</tbody>
</table>

Incremental annual savings from the Control Group to Smart Meter with TOU is $29.8 million.
Smart Meter Demo Results
Avoided Emissions in Pounds per Year

<table>
<thead>
<tr>
<th>Study Group</th>
<th>Average Monthly kWh Reduction Per Participant</th>
<th>Carbon Dioxide (CO2)</th>
<th>Sulfur Dioxide (SO2)</th>
<th>Nitrogen Oxides (NOx)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Smart Meter</td>
<td>93</td>
<td>1,604</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Standard Rate, Smart Meter</td>
<td>91</td>
<td>1,569</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Time of Use Rate, Smart Meter</td>
<td>112</td>
<td>1,931</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Total Impact, All Smart Meter</td>
<td>1,756,414</td>
<td>2,524,032</td>
<td>5,985</td>
<td>1,896</td>
</tr>
</tbody>
</table>

Calculated using EPA’s Power Profiler website
Smart Meter Demo Results:
Avoided Emissions in Pounds per Year
Extrapolated to All Customers

<table>
<thead>
<tr>
<th>Study Group</th>
<th>Avoided kWh, Total Residential Customers</th>
<th>Carbon Dioxide (CO2)</th>
<th>Sulfur Dioxide (SO2)</th>
<th>Nitrogen Oxides (NOx)</th>
<th>Equivalent to # Passenger Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Smart Meter</td>
<td>403,794,897</td>
<td>580,267,646</td>
<td>1,375,892</td>
<td>435,842</td>
<td>59,354</td>
</tr>
<tr>
<td>Standard Rate, Smart Meter</td>
<td>392,011,849</td>
<td>563,334,981</td>
<td>1,335,743</td>
<td>423,123</td>
<td>57,622</td>
</tr>
<tr>
<td>Time of Use Rate, Smart Meter</td>
<td>484,345,150</td>
<td>696,021,226</td>
<td>1,650,360</td>
<td>522,785</td>
<td>71,194</td>
</tr>
</tbody>
</table>

Calculated using EPA's Power Profiler website and 360,000 residential customers
Energy Savings Can Spur Job Creation

- Economic Impact Study, Younger Associates, May 2010
  - $10 million in utility savings among customers would create **152 jobs** through increased discretionary spending in community
  - 2.5% reduction in local average household electric use yields more than $10 million in utility savings annually

- Smart Meter Demo results:
  - $30 million in annual utility savings
  - **458 new jobs** would be created through increased discretionary spending in community
Smart Meter Demo Impact Survey

• As a result of participating:
  – 77% installed more efficient light bulbs
  – 76% changed thermostat setting to save energy
  – 66% used fans for supplemental cooling
  – 57% considered time of day before doing laundry
  – 50% considered time of day before running dishwasher
  – 42% made minor home energy improvements
  – 27% made major home energy improvements
  – 25% changed electric water heater temp to save energy
Smart Meter Demo Impact Survey

• Benefits gained from participation:
  – **86% better understanding of home’s electricity use**
  – **75% saved money by reducing use**
  – **56% learned about new technology**
  – **54% able to teach self/family about electricity use**
  – **45% reduce environmental impact/carbon footprint**
  – **41% participate in TOU rate pilot**
  – **27% challenge others to use less electricity**
  – **21% leave gates locked on meter reading day**
  – **11% leave pets outdoors on meter reading day**

• **95% would recommend smart meter experience to a friend**
MLGW Smart Meter 2020 Vision

• Do what is in the best interest of our customers as a whole
• Lower the cost of utilities to our customers
• Enhance the delivery and maintenance of MLGW provided services
• Provide “all” customers the benefits of Smart Meter technology
• Improve environmental impact of our community
MLGW Smart Meter 2020
Affordable Energy

• Smart Meter leads to improved affordability
  – Informs and motivates our customers to wisely manage their energy usage resulting in lower bills
    • Monitor energy consumption
    • Reduction in peak demand consumption
    • Lower wholesale cost keeping rates down
    • Prepay and flexible billing
    • Time of use rates (voluntary)

  – Improved Operational Efficiency
    • Reduces theft
    • Reduces service calls and premise visits
    • Reduces losses through leak detection
    • Nearly eliminates estimated billing and rereads
    • Automates manual functions lowering operational cost
    • Reduces vehicles, maintenance and fuel consumption
MLGW Smart Meter 2020
Reliable Service

• Smart Meter improves system reliability & efficiencies
  – Theft detection
  – Quicker connects and reconnects
  – Power quality analysis
  – Improved leak detection
  – Reduced electrical losses
  – Automated outage notifications
  – Improved restoration management
MLGW Smart Meter 2020
Safety and Security

• Smart Meter provides improved safety and security
  – Reduced accidents
    • Vehicle
    • Vicious dog attacks
    • Slips, trips & falls
  – Security
    • Theft detection
    • Notification messages
    • Customer can leave gates locked
MLGW Smart Meter 2020
Environmental Sustainability

• Smart Meter enhances environmental sustainability
  – Reduced vehicles and fuel consumption
  – Reduced emissions and carbon footprint
  – Reduced electrical losses
  – Minimizes construction of new power plants and need to purchase power from energy suppliers outside Tennessee
MLGW Smart Meter 2020 Projections

• Mass deployment of smart meters and smart meter infrastructure for the electric, gas and water divisions

• Total capital cost of approximately $215 million

• Total gross savings over the expected 15 year life range (could be 20 years) from $330 million to $1.1 billion. Total annual savings range of $22 million to $70 million

• Involves net reduction of between 150 to 190 positions
  – Opportunities for retraining and assimilation
  – Most reductions through normal attrition

• Simple payback range of between 9 and 11 years
MLGW Smart Meter 2020
Customer Savings Opportunity

• Immediate customer savings through wise management of energy consumption
• Expect 1% to 5% reduction in energy consumption
• Range of savings possibilities: $8 million to $39 million annually
MLGW Smart Meter 2020
MLGW Operational Savings Opportunity

• Savings achieved through the reduction of positions and position related expenses
  – Includes benefits, vehicles, claims, workers compensation
• Reduction in system losses
• Savings achieved through reduction in theft of utilities
• Range of savings: $13 million to $23 million annually
MLGW Smart Meter 2020
Connects and Reconnects Savings to Customer

• MLGW collects $8.0 million in revenue to cover the cost associated with Connects and Reconnects. Under Smart Meter the projected cost will be $4.0 million, a 50% savings to this customer group.

• Operationally, MLGW will have a net projected reduction in revenues of $4.0 million and will have a projected reduced labor expense of $4.0 million associated with these services.

• Projected average annual savings for a reconnect (including avoided additional deposits) will be $42.
MLGW Smart Meter 2020
Peak Power Savings Opportunity

• TVA to send marginal cost price signals to distributors to reduce peak load.
• MLGW, working with customers, can reduce peak load which will reduce overall power cost for customers.
• Expect 0.5% to 3% peak load reduction
• Range of savings: $1 million to $8 million annually
### MLGW Smart Meter 2020

#### Cost Savings Opportunity Matrix

<table>
<thead>
<tr>
<th>Savings Category</th>
<th>Estimated Annual Savings Range From*</th>
<th>Estimated Annual Savings Range To*</th>
<th>Estimated 15 Year Gross Savings Range From*</th>
<th>Estimated 15 Year Gross Savings Range To*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Customer Savings</td>
<td>$8</td>
<td>$39</td>
<td>$120</td>
<td>$585</td>
</tr>
<tr>
<td>2. MLGW Operational Savings to Customer</td>
<td>$13</td>
<td>$23</td>
<td>$195</td>
<td>$345</td>
</tr>
<tr>
<td>3. TVA to MLGW to Customer</td>
<td>$1</td>
<td>$8</td>
<td>$15</td>
<td>$120</td>
</tr>
<tr>
<td><strong>Savings Total</strong></td>
<td><strong>$22</strong></td>
<td><strong>$70</strong></td>
<td><strong>$330</strong></td>
<td><strong>$1,050</strong></td>
</tr>
</tbody>
</table>

* In Millions of Dollars

- System cost approximately $215 million
- Estimated payback of 9 to 11 years at the low end savings range
60,000 Smart Meter RFP
Evaluation Summary

• Responding Vendors
  – Elster
  – Landis + Gyr
  – Sensus
  – Itron
  – AT&T
  – GE
  – Silver Springs
Recommended Smart Meter Vendor - Elster

• Benefits of Elster’s Solution
  – Highest rated evaluation
  – Best customer service for MLGW’s current business
  – Best RF mesh solution
  – Extensive dashboard for meter analytics & reporting
  – Proven water meter technology
  – Leverage Tropos wireless network for optional wireless broadband for MLGW operational needs countywide
  – Leading Pre-pay vendor solution
  – User friendly meter data management system
  – 100% MLGW backhaul
  – Existing meter contracts

• Contract award amount of $10.15 million
• Bringing the contract for Board approval on 4/18
• Total estimated project cost of original scope, $13.5 million
• Total project budget of $14.1 million
Who is Elster?

Elster

$2 billion annual revenue

3+ million smart meters installed

8,000 employees

Westinghouse/ABB
American Meter Company
Kent Meter Company

200 million installations in the last ten years

38 major locations

175 Years providing utility solutions

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Elster’s Solution

EnergyAxis System

Architecture Basics
- Distributed intelligence
- Data redundancy
- Flexible collection options
- Easily expandable bandwidth
- WAN modularity & adaptability

Gatekeepers read data from meters on a schedule or upon request & hold multiple days of data for data redundancy (configurable)

Local data storage at each meter
True Multi-Utility mesh

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Elster in the Tennessee Valley