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)

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

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

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

Calculated using EPA's Power Profiler website

Smart Meter Demo Results:
Avoided Emissions in Pounds per Year Extrapolated to All Customers

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

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

Savings Category	Estimated Annual Savings Range From*	Estimated Annual Savings Range To*	Estimated 15 Year Gross Savings Range From*	Estimated 15 Year Gross Savings Range To*
1. Customer Savings	$8	$39	$120	$585
2. MLGW Operational Savings to Customer	$13	$23	$195	$345
3. TVA to MLGW to Customer	$1	$8	$15	$120
Savings Total	**$22**	**$70**	**$330**	**$1,050**
*** 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

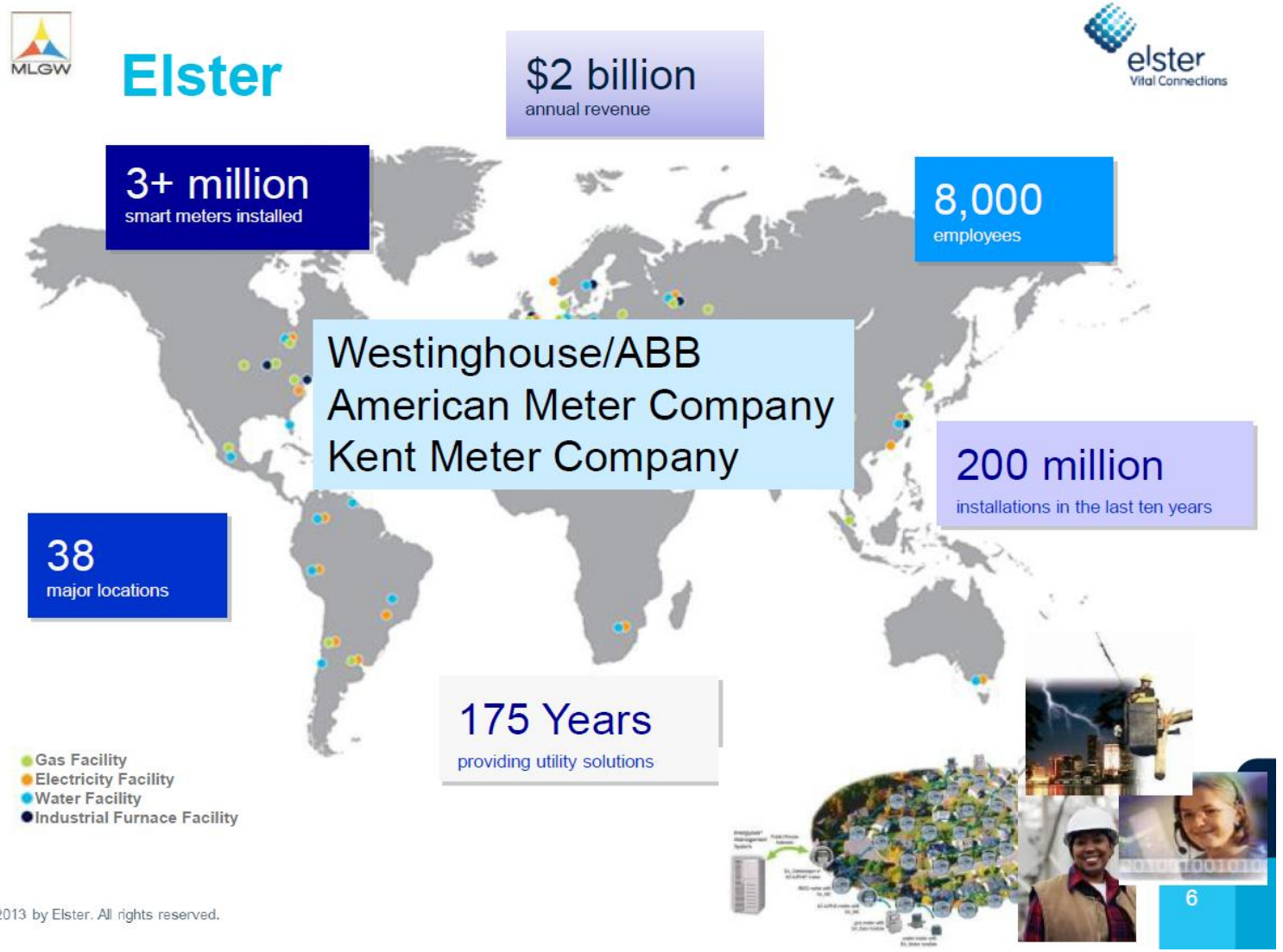
Evaluation Summary

- Responding Vendors
  - Elster
  - Landis + Gyr
  - Sensus
  - Itron
  - AT&T
  - GE
  - Silver Springs

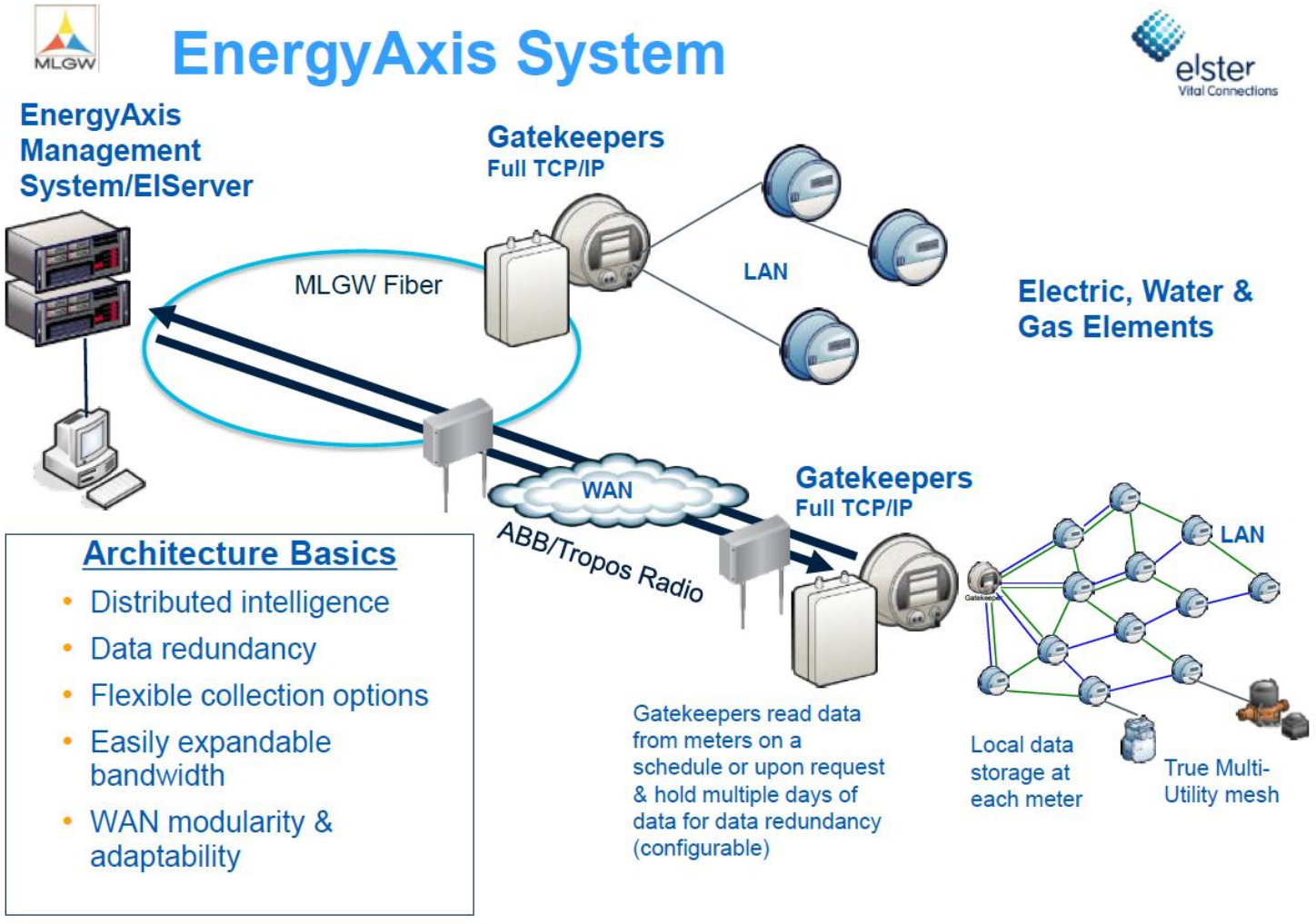
Recommended Smart Meter Vendor - Elster

- 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's Solution



Elster in the Tennessee Valley

MLGW Smart Grid

EMEPA We Care

BENTON COUNTY ELECTRIC SYSTEM

CITY OF DAYTON INCORPORATED RHEA COUNTY TENN.

Cleveland Utilities
Electric - Water - Wastewater

CPWS
Columbia Power & Water Systems

HOPKINSVILLE ELECTRIC SYSTEM

EPB
Bringing Glasgow the Future... Faster!

HUMBOLDT UTILITIES ELECTRIC GAS WATER

TRENTON LIGHT & WATER

EPB