



# Smart Meter 2020 Vision

*New Options for Customers  
to Save Money, Time and Energy*

**MLGW Committee Meeting  
5/7/2013**



# Smart Meter Adoption Rates among TVA Distributors

- More than 37 million smart meters have been installed in the U.S.
- TVA distributors with smart meter deployments:
  - Chattanooga 170,000 smart meters, 100% of total meters
  - Gibson County Electric 35,000, 100% of total meters
  - Clarksville 31,000+, 100% of total meters
  - Bolivar Energy Authority 11,000+, 100% of total meters
  - Volunteer 112,000 meters, 99% of total meters
  - North Georgia 99,000 meters, 99% of total meters
  - Nashville 30,000 smart meters, 8% of total meters
  - Knoxville 6,000 smart meters
  - Huntsville preparing for summer deployment
- **MLGW 1,200 smart meters, 0.2% of total meters**



# MLGW's Journey to Smart Meters

- 10+ years of researching advanced meter technology, applicability to MLGW operations and customer benefits
- 1,000-meter Smart Grid Demo, 2010-12
- 2013 originally proposed budget included 6,000 additional smart meters
- City Council's vision directed MLGW to revise the budget by expanding from 6,000 to 60,000 meters in 2013



# *BENEFIT:* Outage Management and System Monitoring

- Minimize or eliminate outage hotline contract (~\$250,000 annually)
- Expedite utility outage awareness and troubleshooting
- Reduce service restoration times
- Increase customer satisfaction through fewer and shorter outages
- Increase operational knowledge of MLGW electric, gas and water systems



## *BENEFIT:* Labor and Transportation

- Meter Reading stats
  - 12.3 million reads annually (E,G,W)
  - 92 Meter Readers
  - Average 24 vacancies per year; 26% annual attrition rate
- 150-200 net positions could be cut through full-scale smart meter deployment due to improved operating efficiencies and reduced service requests
  - Positions throughout Customer Care division, primarily Meter Reading and Field Operations
  - Reduction will be achieved through attrition, not layoffs
  - Associated vehicle, maintenance and fuel savings
  - Some new positions would be created



## *BENEFIT:* Safety

- Meter Readers
  - Drive 500,000+ miles per year
  - 55 Meter Reader injuries in 2012
    - Vicious dog attacks (14)
    - Spider, bee and insect bites (10)
    - Slips, trips & falls (24)
    - Miscellaneous injuries (7)
  - Risk exposure to crime, hostility and severe weather



## *BENEFIT:* Billing

- Reduce estimated reads/bills (~3%)
  - Meter access issues (locked gates, bad dogs)
  - Manpower (light duty, turnover, vacation)
  - Extreme weather (temps  $>100^{\circ}$  or  $<32^{\circ}$ )
- Reduce meter reading errors (<1%)
- Reduce billing inquiries and mistrust
- Identify and reduce utility theft
  - 11,000 resolved diversion cases



# *BENEFIT:* Time-of-Use Rate Option

- Completely voluntary
- Provides financial incentive for customers to monitor and adjust electricity use during “on-peak” hours
  - **On-Peak:** Dec-Mar, weekdays, 4am-10am  
Jun-Sept, weekdays, 12pm-8pm
  - **Off-Peak:** All other hours, including every weekend; every day in April, May October and November; plus weekday observances of six designated holidays
- **87% of hours in the year are off-peak**
- Impact on electricity cost depends on customer’s willingness to modify use (conservation, energy efficiency and load shifting)





# *BENEFIT:* Customer Awareness

- Average Annual Household Electric Use in Tennessee is 38% higher than national
- MLGW customer average is 32% higher
- Viewing daily, hourly and even 15-minute data enables customers to better identify when and how home uses electricity
- Water leak alerts, consumption alerts and bill-to-date alerts provide added awareness



# Learn About Your Electricity Use in My Account at [www.mlgw.com](http://www.mlgw.com)

My Account My Home Energy Advisor

Bill History Bill Analysis My Bills My Payments My User Profile

**My Account Dashboard**  
Welcome F... This is your personalized My Account... for managing, understanding and controlling your MLGW bills. Use **Bill History** to see more details about your utility bills. Go to **Bill Analysis** to find out more about why your bills vary from month to month. Use the **Go** button (right) to access our newest feature—the Carbon Footprint Calculator, which shows the environmental impact of your energy, water, transportation and recycling actions.

Questions?  
Live Chat (M-F, 9am-5pm)

Memphis Light, Gas and Water  
**Bill Payment Express**  
Click Here to View/Pay Your Bill

Account Summary

**Account status as of 4/30/2013**  
Last Payment \$314.01  
Received 4/8/2013 - Thank you!  
**Account Balance \$342.57**  
Pay Bill

**Bill Summary ending 4/26/2013**  
Previous balance \$0.00  
Budget Billing Assessment Amount \$342.57  
**Amount Due 5/14/2013 \$342.57**

**Bill Highlights**  

- The amount due on this bill is based on your Budget Billing plan.
- Your gas usage decreased for this bill.
- The weather decreased your bill by \$29 - \$48.
- Your gas costs per unit increased this month.
- Your energy charges were \$16.94 lower for this bill.
- Your Budget Billing amount increased.
- Your average electric usage per day of service increased for this bill.
- Your electric costs per unit increased this month.
- Other "non-energy" charges totaling \$48.90 are included in this bill.

**Bill Analysis**  
Still have questions about this bill? Find out more about why your bill has changed.

live green. reduce your footprint GO

**Rate Comparison Calculator for Time-of-Use option**

When does my home use electricity?  
1

Actual Daily Electricity Use & Average  
kWh — Average — Total

4/24 4/25 4/26 4/27 4/28 4/29 4/30

Meter: Electric - 809619

**Meter Highlights**

- Electric Cost-to-Date: \$25
- Electric Use-to-Date: 189 kWh
- Days of service so far: 5/1/2013 -- This is \$48.90 per day for current billing period.
- Your projected electric cost for the current billing period is: \$60 - \$112. Note that this is a simplified projection based on current rates and the pace at which you have used electricity so far in your current billing period.
- Your current billing period will end on 5/24/2013.

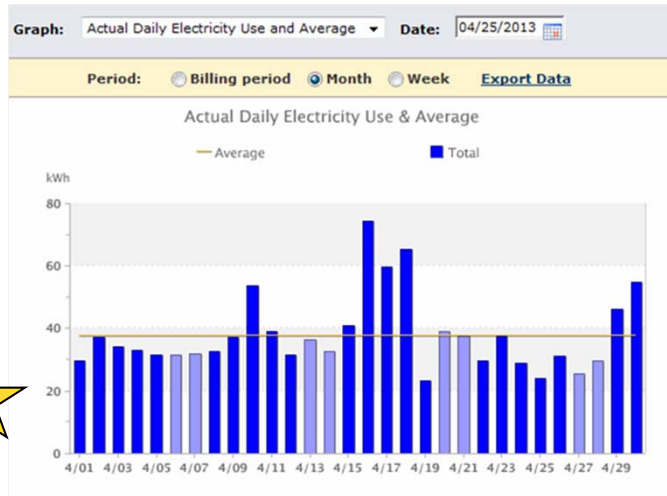
**Electricity Use Analysis**  
View your smart meter data for details on when you use electricity.

How does my home use energy?  
1

Get personalized information on how you use your energy.

Complete a quick home profile for personalized information!

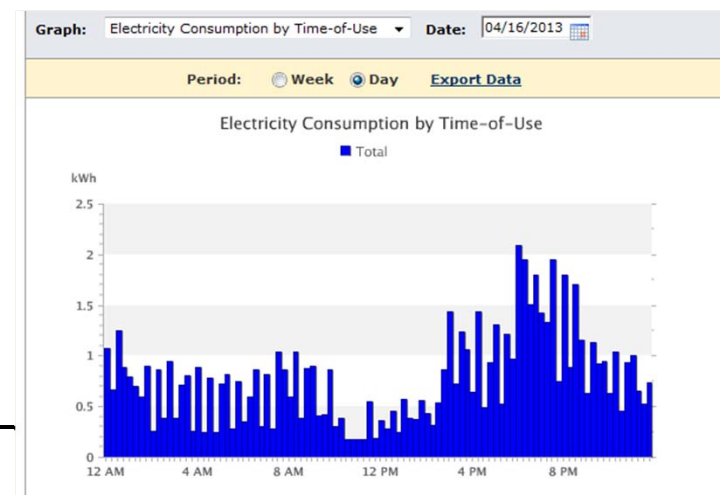
Graph my home's energy use.



View shows a customer on **standard electric rate**, with blue bars reflecting use.

ABOVE: Highest weekday use (74 kWh) occurred on 4/16

RIGHT: This shows 4/16 electricity use in 15-minute periods





# Learn About Your Electricity Use in My Account at [www.mlgw.com](http://www.mlgw.com)

My Account Dashboard

Account Summary

Account status as of 1/9/2013

Bill Summary ending 1/8/2013

Bill Highlights

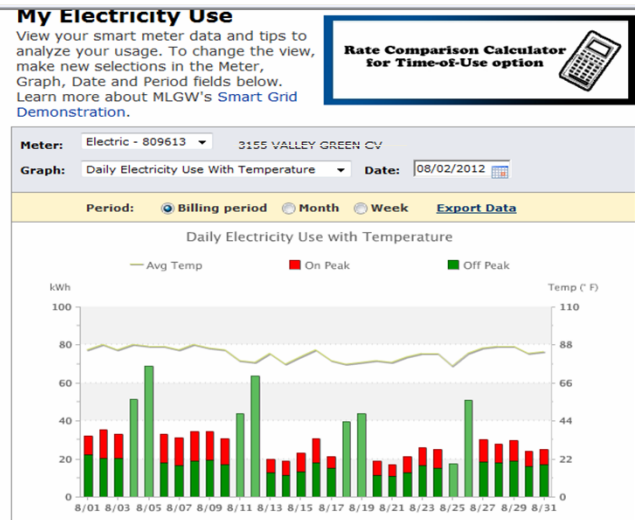
How does my usage compare?

Usage Comparison

December, 2012: 495 kWh  
January, 2013: 601 kWh

Bill History

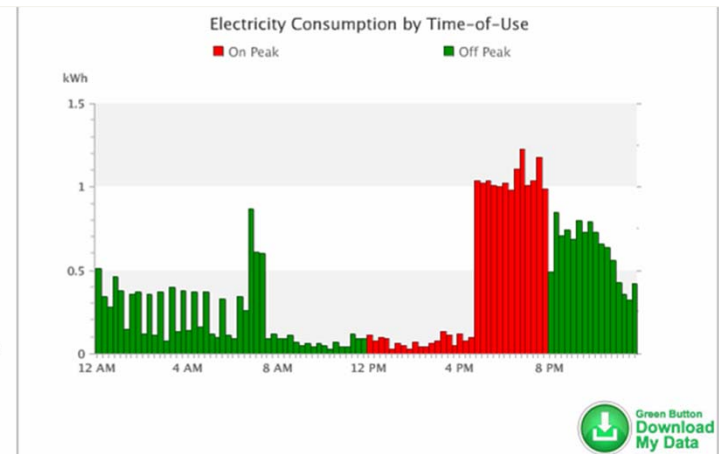
Congratulations! Your home used less energy than most of the similar homes in your area.



ABOVE: Highest weekday usage (35 kWh) occurred on 8/2, when average temperature was 88°

RIGHT: This shows 8/2 electricity use in 15-minute periods

View shows a customer on optional TOU Rate, with red bars indicating on-peak use and green bars representing off-peak use





## ***BENEFIT:*** Customer Savings Opportunities: Reduce Energy and Water Usage

- Conservation—an *action* that results in the use of less energy or water
  - Adjusting thermostat, closing exterior doors, turning off lights in empty room, taking shorter showers
- Energy Efficiency—a *purchase* of a more energy-efficient item to replace a less efficient item
  - Replacing HVAC, installing attic insulation, using CFL or LED lights, replacing refrigerator (but only if you discard the old one!), repairing leaky faucet
- Voluntary Load Shifting—an *action* that delays the hour in which energy is used
  - In Summer: running dishwasher at 8:00pm instead of 7:00pm, drying clothes at 10:00am instead of 3:00pm, running pool pump overnight instead of during day



# *BENEFIT:* Customer Savings Opportunities: Lower Service Fees

	Analog or Digital Meter	Smart Meter	Customer Savings
New Service Connection, same day	\$54.00	\$25.21	\$28.79
New Service Connection, next day	\$44.00	\$25.21	\$18.79
Non-payment reconnect	\$25.00	\$11.44	\$13.56
Reconnect with exception	\$25.00	\$20.44	\$4.56
Additional deposits, per reconnect, beginning with second occurrence	\$50.00	\$0	\$50.00 per occurrence
Special Trip Meter Reading Charge, monthly	\$9.13	\$0	\$9.13 per month



## *BENEFIT:* Community Impacts: Environmental

- Water leak detection alerts customers to problems before they may be noticeable, preserving water resources
- Improved air quality through reduced utility vehicle emissions and reduced power generation
- Avoided emissions from electricity use reductions equivalent to removing 59,000 to 89,000 vehicles from the road



# Potential Avoided Emissions

(Smart Grid Demo Results Extrapolated to All Residential Customers)

<b>Study Group</b>	<b>Avoided kWh, Total Residential Customers</b>	<b>Carbon Dioxide (CO2) Lbs per Year</b>	<b>Sulfur Dioxide (SO2) Lbs per Year</b>	<b>Nitrogen Oxides (NOx) Lbs per Year</b>	<b>Equivalent to # Passenger Vehicles Removed from Road</b>
<b>All Smart Meter</b>	403,794,897	577,343,423	1,368,959	433,645	59,354
<b>Standard Rate, Smart Meter</b>	392,011,849	564,927,435	1,339,519	424,320	57,622
<b>Time of Use Rate, Smart Meter</b>	608,410,913	875,327,125	2,075,518	657,462	89,430

Calculated using EPA's web calculators and 360,000 residential customers



## *BENEFIT:* Community Impacts: Helping Impoverished Customers

- 27% poverty rate in Memphis (2012 U of M study)
- Smart meters
  - Reduce connect and re-connect fees
    - Potential savings: \$1M to \$2.1M annually
  - Provide opportunity to track usage and better control utility cost
- Smart meters with pre-pay service option (similar to cellphone offerings)
  - Eliminate and reduce fees
    - Potential savings: \$5.3M to \$10.6M
  - Eliminate need for deposit
    - Potential one-time impact: \$3.7M to \$7.5M





# *BENEFIT:* Community Impacts: 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
- Smart Meter Demo results:
  - **\$30 million** in potential annual utility savings
  - **456 new jobs**



# Upcoming Resolutions

- Elster contract, \$10.15 million
- Aclara change order, \$100,750
- Voluntary Time-of-Use Rate



# Elster Contract

- \$10.15 million maximum value
  - Smart meters
  - Telecommunications
  - Meter data management system
  - Pre-pay system



# Elster Warranties/Equipment Life

- Elster products have solid warranties and performance
  - 24-month meter warranties
  - 20-year battery life
  - 25 to 30-year expected equipment life for electric and gas meters; 15-year life for water meters



# 60,000-meter Installation

- Approximately 24,000 households will receive smart meters
  - ~24,000 electric meters
  - ~20,000 gas meters
  - ~15,000 water meters
- Customers may opt-out and decline smart meter

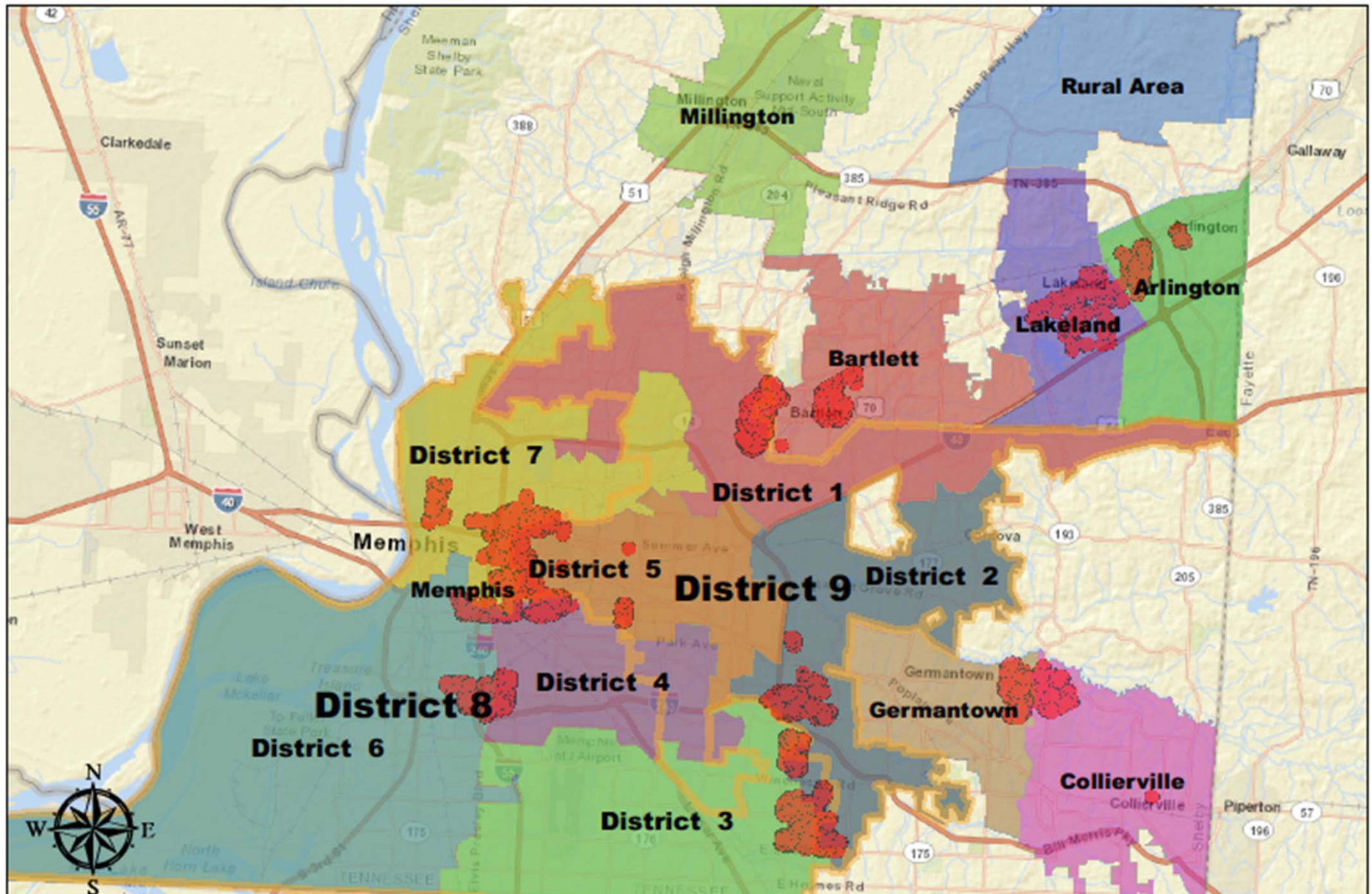


# 60,000-meter Locations

- 80% in City, 20% in County
- Locations in each Council district
- Capitalizing on existing MLGW infrastructure
- Clustered by meter reading routes, eliminating 3 to 6 routes per billing cycle, daily



## Projected Sites for 60,000 - Meter Installation





# Aclara Contract Change Order

- Provider of web-based energy and bill analysis tools within My Account
- Adds email alert options
  - Weekly bill-to-date
  - Monthly threshold exceeded (based on customer-selected electric, gas and water usage or dollar amounts)





# Voluntary Time-of-Use Rate

- Optional for any customer with electric smart meter
- Effective 10/1/2013
- Replaces existing TOU pilot rate, which expires 9/30/2013
- Item requires Council to convene as a rate-making body

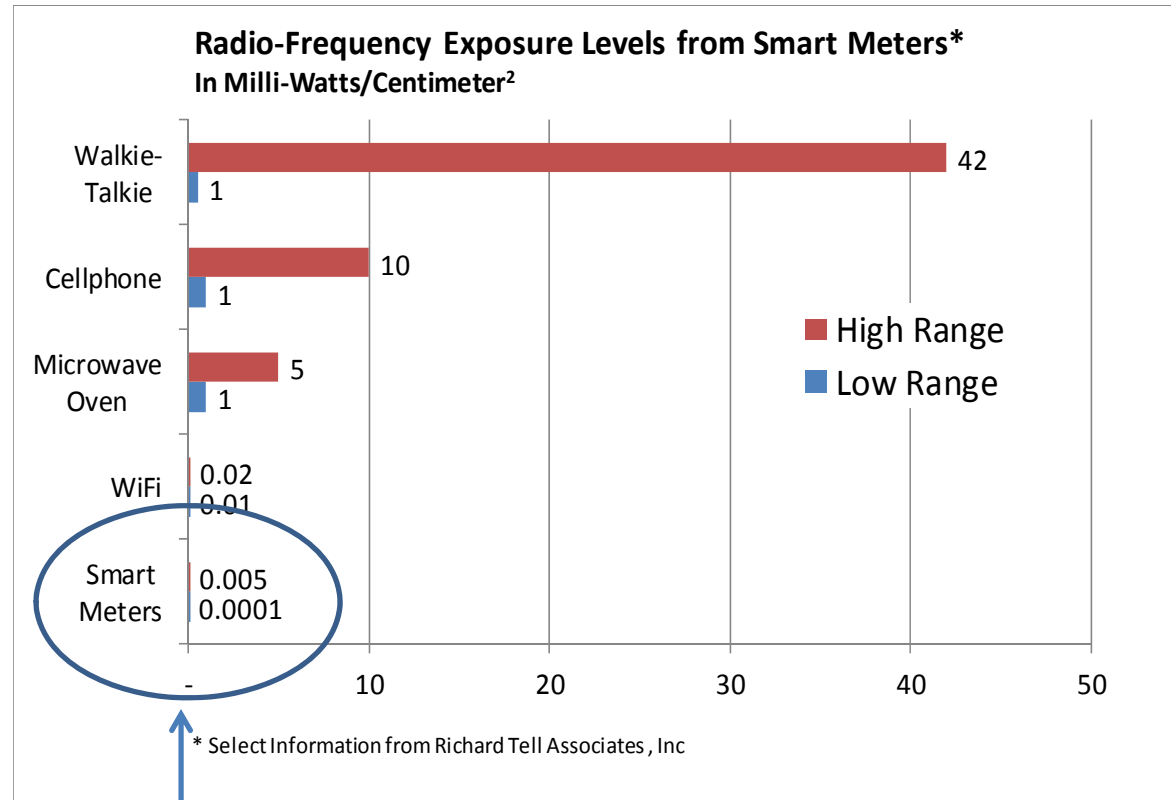


# Smart Meter Myths & Realities



# Myth: Smart Meters Emit Dangerous RF

- Every day, people use and keep near to them many devices that utilize radio frequency (RF) waves, including microwave ovens, cellular telephones and wireless home networks.
- The Federal Communications Commission (FCC) sets RF limits and requires that all radio communicating devices be tested to ensure that they meet federal standards .
- Smart meters emit less radio frequency energy than many other commonly-used wireless devices which, like smart meters, are safe and FCC-approved.
- Learn more at [www.mlgw.com/smartgrid](http://www.mlgw.com/smartgrid)



**Exposure from Elster smart meter selected by MLGW if operating in constant communication mode (100% duty cycle). Normal smart meter duty cycle is near 1%, so actual exposure is far less than value shown.**

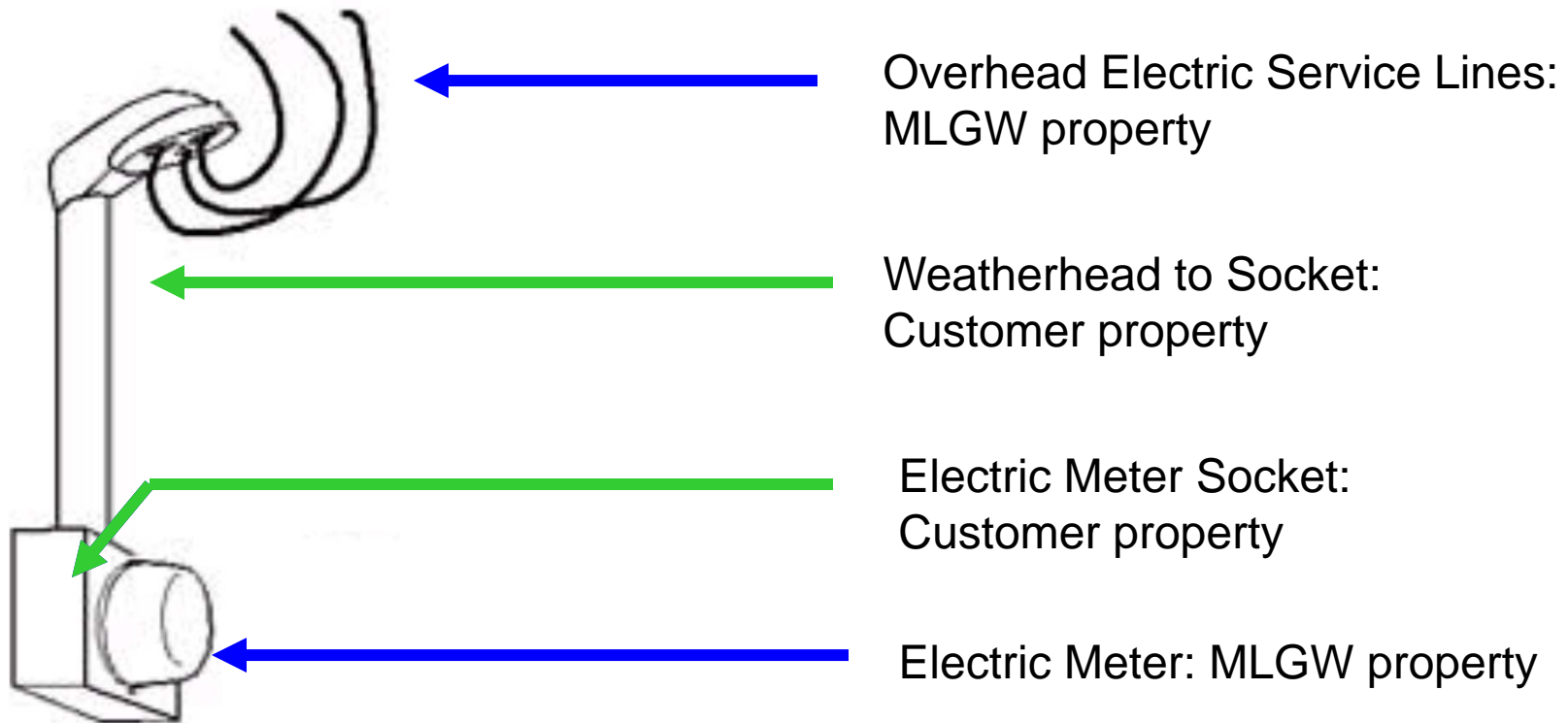


# Myth: Smart Meters Cause Fires

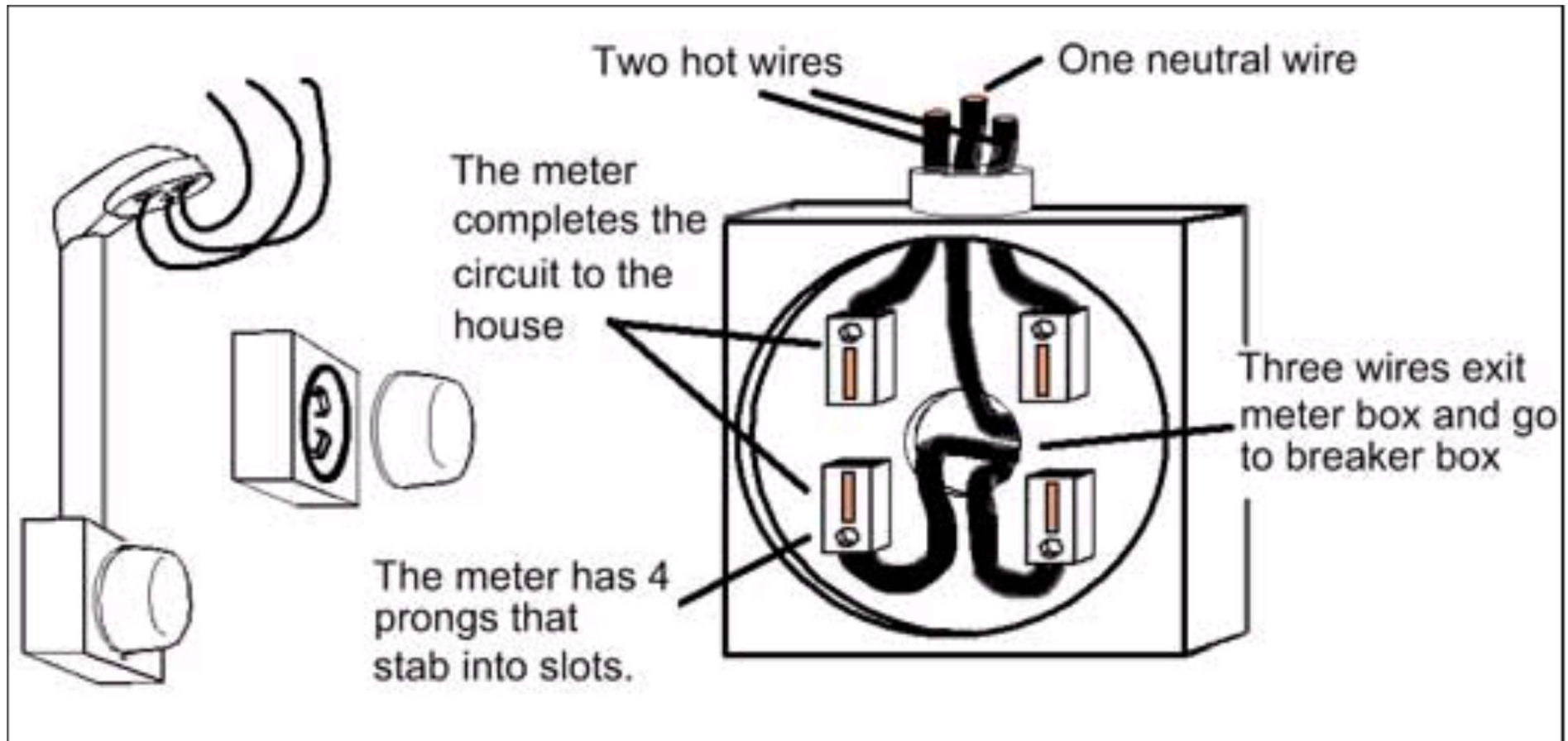
- Smart meters do not cause fires
  - As determined by Fire Marshal/Fire Department officials from around the world, including in Florida, Maryland, California, Canada and Australia
  - MLGW has had 0 fires from smart meters during demo and 0 fires from other electric meters
- Conditions in the customer-owned electric meter socket and wiring within the home can cause fires
  - Meter socket and electric wiring are installed by builder's electrical contractor at time of construction and are property of building owner
  - MLGW will fund the repair or replacement of problematic meter sockets during smart meter installation



# Meter Socket is Point of MLGW Service Delivery



# Inside an Electric Meter Socket





# Myth: TOU Rate Forces Customers to Do Laundry at 2:00am

- Time-of-Use (TOU) electric rate is **optional**
- TOU rate gives customer the option of paying less for electricity use during off-peak periods (when electricity demand and generation costs are lower) and more for electricity use during on-peak periods (when demand and costs are higher)
- **87% of hours in a year are off-peak**





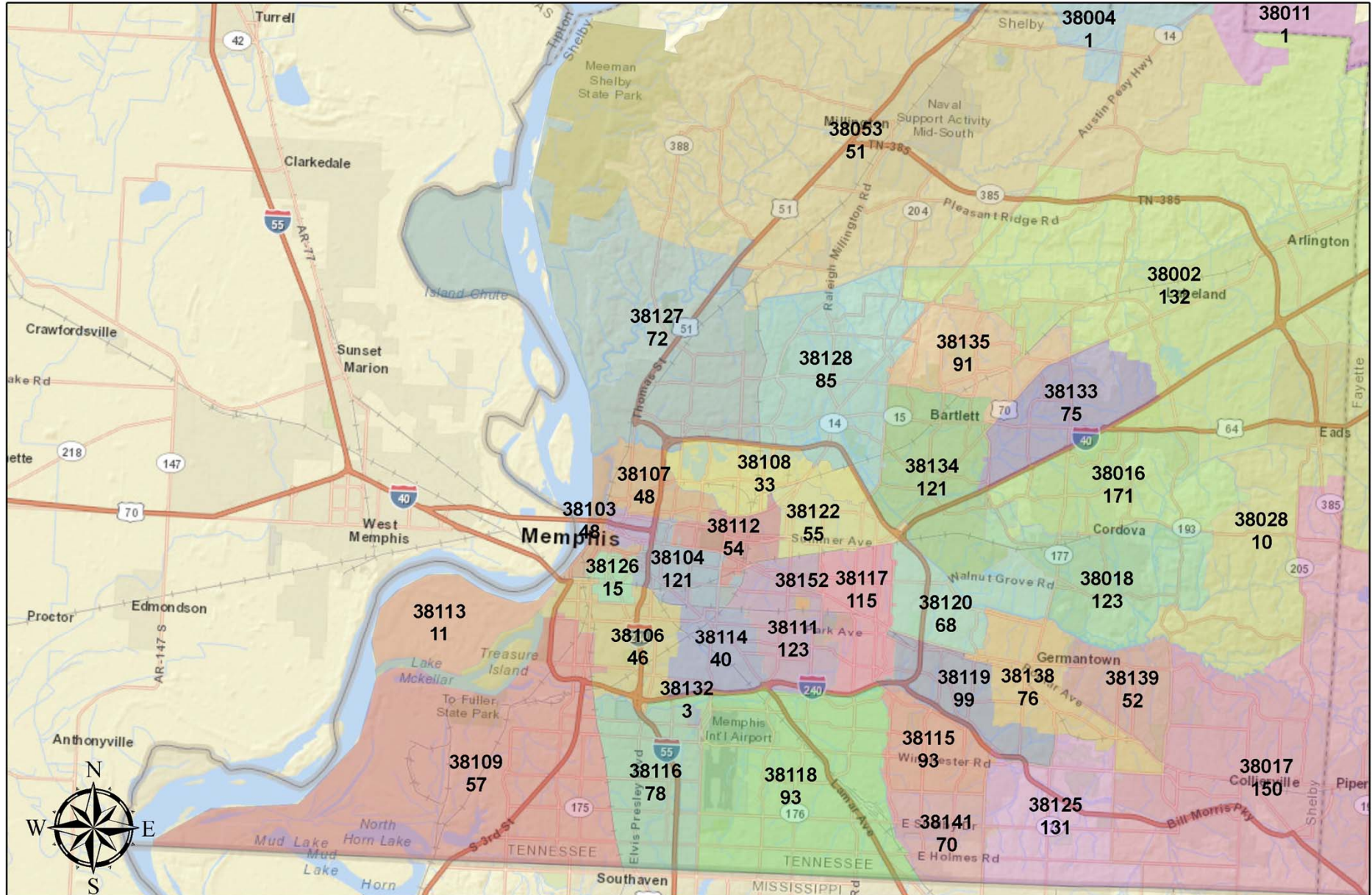
# MLGW Customer Interest in Smart Meter Benefits

- 2009-2010 survey of new service opportunities
  - Internet
  - Community events
  - MLGW Community Offices
- 2,737 respondents, 95% confidence +/- 5
- All ZIP Codes represented





# Smart Grid Survey - All Respondents by ZIP Code





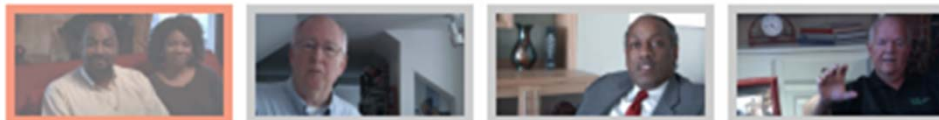
# What Customers Said They Want

- 95% want MLGW to be notified automatically when power is out
- 91% want their MLGW bill to be based on actual readings, not estimates
- 88% want to know their bill amount as it grows during the month—with 22% interested in checking daily
- 86% want MLGW to make capital investments to improve system monitoring and control, which would reduce power outages
- 66% indicated they would be willing to consider reducing electricity use at certain times of day, while another 26% indicated they might
- *...and these desired benefits/services can only be achieved by installing smart meters*



# What Demo Customers Said

- With a few **simple changes**, we made a significant reduction in our consumption. Stephen T
- Smart Meter offers an **effective way to change** homeowner's behavior by providing timely feedback on actual energy usage. For those interested in becoming involved in managing energy usage, this is a smart approach. Roosevelt A
- Saved a lot of money learning when to use appliances, LED usage and ceiling fan usage during summer and winter...It was actually **fun to learn how to save**. Brad & Carolyn D
- I think **everyone should have a smart meter** and the ability to look at their home's energy graphs online. David B
- We love the SmartMeter and the data it provides. It has become a **challenge in our house to reduce the energy consumption**. The Time-of-Use rates are also a great benefit. David K
- Electricity is invisible, the meter **helped me understand** something I couldn't see. Iva D
- I **learned how to monitor my energy resources** more efficiently. Esther W
- I really liked the program. It was **informative and beneficial** to me. I welcome any opportunity to learn about my energy consumption and ways to reduce it. Anthony D
- I like this project. It has made me a **better informed consumer**. Pamela F
- It has **changed the way we use power**. Andrew I
- This **project opened eyes** and was very meaningful in that it caused me to look at energy usage, availability, conservation and technology in so many new and exciting ways. Tim F





# MLGW's Business Practice is Standard Service, with Options to Opt-Out

## **STANDARD**

1. Printed bill
2. Bill for actual monthly usage
3. Cycle billing
4. Pay by mail/office
5. Pay bill in full
6. Smart meter

## **OPT-OUT OPTION**

1. eBilling
2. Budget Billing
3. Net Pay
4. AutoPay
5. Potential payment arrangements
6. Non-smart meter



# Evolution of Technology

- Horse and buggy to car
- Typewriter to computer to tablet
- Operators to rotary phone to push button to smart phone
- Bank teller to ATM to mobile banking from smart phone
- Wooden cabinet TV to big screen to watching on smart phone
- Film camera to digital camera to smart phone
- Candle to light bulb
- *Analog meter to digital meter to smart meter is just another technological advancement*



***Smart Meters Deliver  
New Options for Customers  
to Save Money, Time and Energy***