



Implications and Applications of Smart Grid in Tennessee: An MLGW Perspective

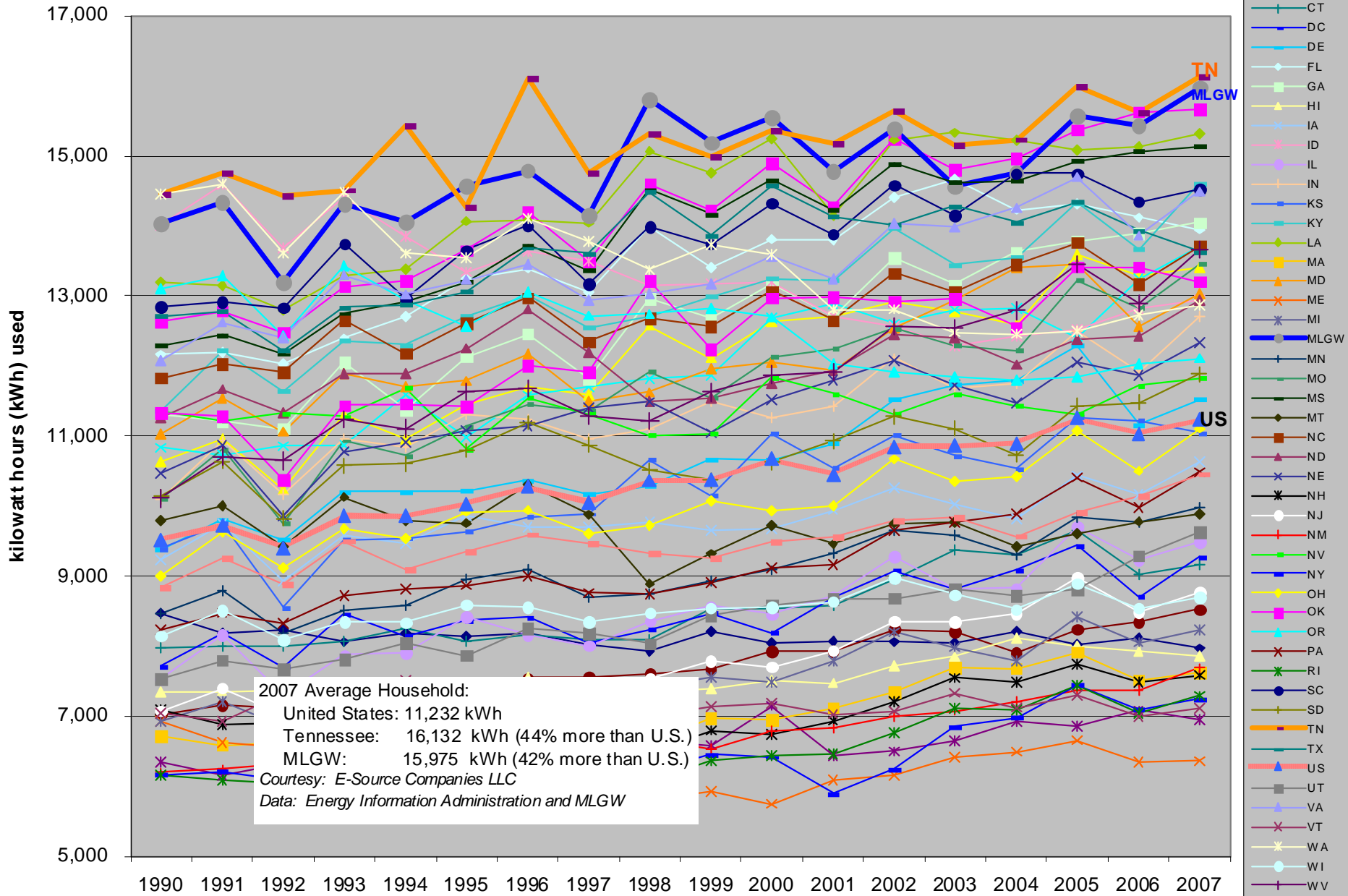
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Memphis Light, Gas and Water

- Nation's largest three-service municipal utility
- Distributor of TVA power
- Serve all of Shelby County
 - 410,000 Electric customers (~90% residential)
 - 320,000 Natural gas customers
 - 250,000 Water customers

Average Annual Household Electric Use by State, 1990-2007 with MLGW Average Appended





MLGW Smart Grid Initiatives

- Submitted phase 1 proposal for Smart Grid Investment Grant; awarded \$5 million
- Intended to submit large-scale deployment proposal in phase 2, which was cancelled when DOE awarded all money to phase 1 applications
- Proceeding with smaller-scale implementation and demonstration project

Smart Grid: Downtown/Medical Center Project

Project Facts

- MLGW will add sensors and controls to the Downtown/Medical Center electric grid.
- Build a fiber optic communications network to support system.
- The total project cost is estimated to be about \$10.5 million with \$5 million reimbursement from DOE.

Project Benefits

- MLGW operators will be alerted immediately of problems on the grid.
- MLGW's engineers and field personnel will be able to analyze real-time data to spot problems in advance.
- Failures will be reduced through preventive maintenance.

When a network grid fails, the results are dramatic.

Excerpts from news articles reporting on network grid failures:

- SAN FRANCISCO, CA, November 3, 2009 — A boom followed by a flash and smoke from a Financial District manhole was not an explosion but a cable failure, according to PG&E.
- SAVANNAH, GA, December 30, 2008 – An explosion in underground electrical cables blew off manhole covers and started several fires in downtown Savannah Monday morning
- WASHINGTON, D.C., November 26, 2008 - Manhole Explosion Cuts Power to *DCist.com* HQ. There was a manhole explosion at 7th and P St NW this morning, which has caused a subsequent power outage in the surrounding area.

Smart Grid: Electric Distribution Automation

Project Facts

- Install 40 automated electric distribution switches.
- Project costs are \$1.5 million.
- MLGW has experience with these type of switches.
- MLGW crews will install.

Project Benefits

- Reduced number of customers involved in outages.
- Quicker response times to outages.
- The switches report system data to:
 - Improve day-to-day balancing of the electric system.
 - Provide more data to help planning engineers run the system more efficiently.

Automated Switch



Automated Distribution Switch

Installation of Automated Switch



Smart Grid: Smart Meter Demonstration

Project Facts

- Install about 1,000 smart meters for customer volunteers.
- Educate volunteers through a mix of in-home displays, My Account information and/or printed reports on energy use.
- Project cost is \$1.0 million.
- MLGW staff will install the meters. No positions will be reduced.

Project Savings and Benefits

- Lower bills through energy conservation.
- Participants:
 - Will have information and tools to make wise energy choices.
 - Will not need to call during an outage.
 - Will not need to unlock gates or restrain dogs each month for meter reading.

What the President and Administration are saying:

- **President Obama, 1/8/2009**, "That means updating the way we get our electricity by starting to build a new smart grid that will **save us money**, protect our power sources from blackout or attack, and deliver clean, alternative forms of energy to every corner of our nation."
- **Vice President Biden, 4/16/ 2009**, "These necessary upgrades are going to allow us to modernize our electrical grid, **improve its efficiency** and reliability while stimulating local economies while saving consumers' money."

What the financial world is saying:

- **JP Morgan:** Smart Grids and Electricity Demand Side Management (DSM), is a major growth theme. Hundreds of million of homes and businesses globally will be equipped with smart meters and energy management solutions to optimize the distribution and use of electricity. DSM is providing the tools to optimize power consumption. Federal Energy Regulatory Commission (FERC) estimates that U.S. peak electric power consumption can be significantly reduced by using DSM, **yielding tens of billions of dollars of annual savings** and reducing CO2 emissions.



Customer Survey Results

- MLGW conducted a web and personal interview survey in late October to gauge customer interest in benefits provided by Smart Grid, with 2,581 customer responses
 - 95% prefer that MLGW be notified automatically when power is out.
 - 91% prefer their MLGW bill be based on actual readings, not estimates.
 - 88% are interested in checking their bill amount as it grows during the month--with 23% interested in checking daily
 - 86% prefer MLGW make capital investments to improve system monitoring and control, which would reduce outages.
 - 66% indicated they would be willing to consider reducing electricity use at certain times of day, while another 26% indicated they might.
 - 53% prefer to select their bill's due date.



Contact Information

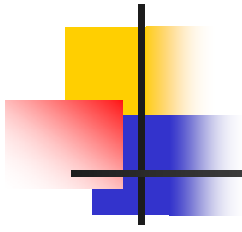
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Questions?

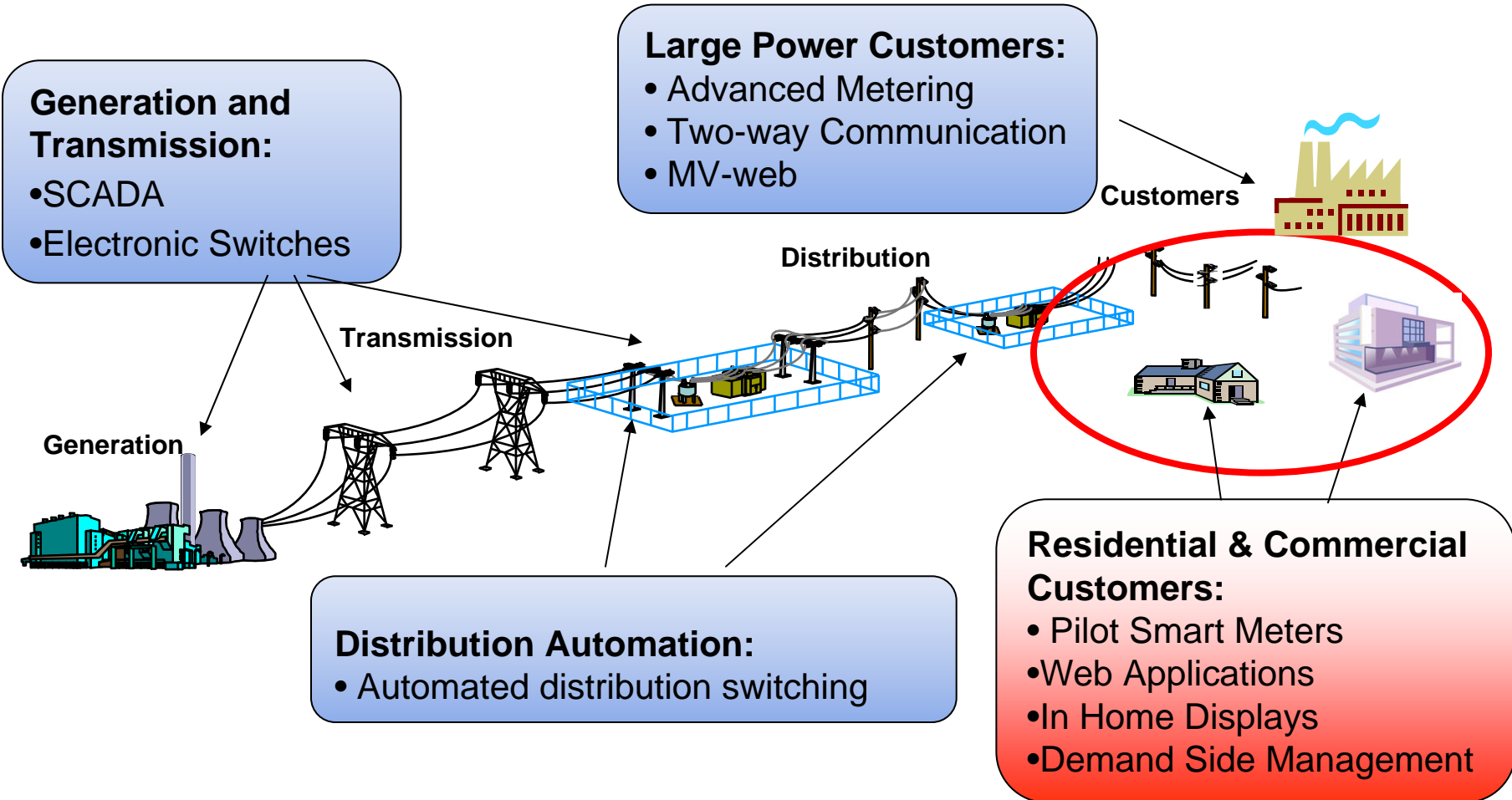


What is Smart Grid?

Smart Grid is a combination of equipment and communications that:

- Empower customers to lower their energy use.
- Provide enhanced reliability of the electric system.
- Smart Grid builds on many of the technologies already used by electric utilities in the U.S. and around the world, but adds communication
- Electricity meets the internet

What is Smart Grid?





Benefits of Smart Grid

- Increased automation of MLGW's distribution system to improve reliability.
- Automated tracking of outage and restoration status, which eliminates the need to report an outage.
- Increased property security, as meter readers no longer need monthly access.
- Enhanced billing, which includes selection of due date, elimination of estimated readings and access to bill-to-date information throughout the month.
- Reduced power generation emissions, as people turn information into action by implementing energy conservation measures that lower overall power generation needs.
- Supports the addition of renewable energy to the grid.