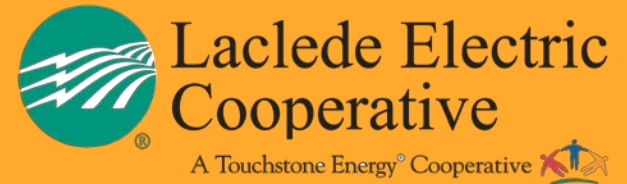
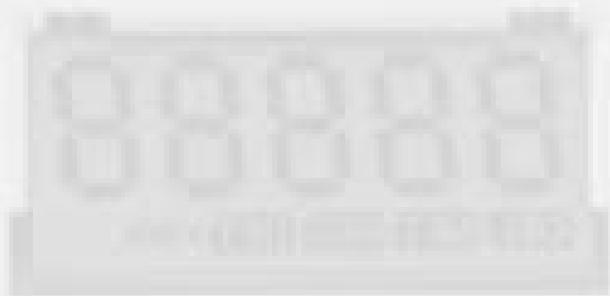


Smart Grid Update



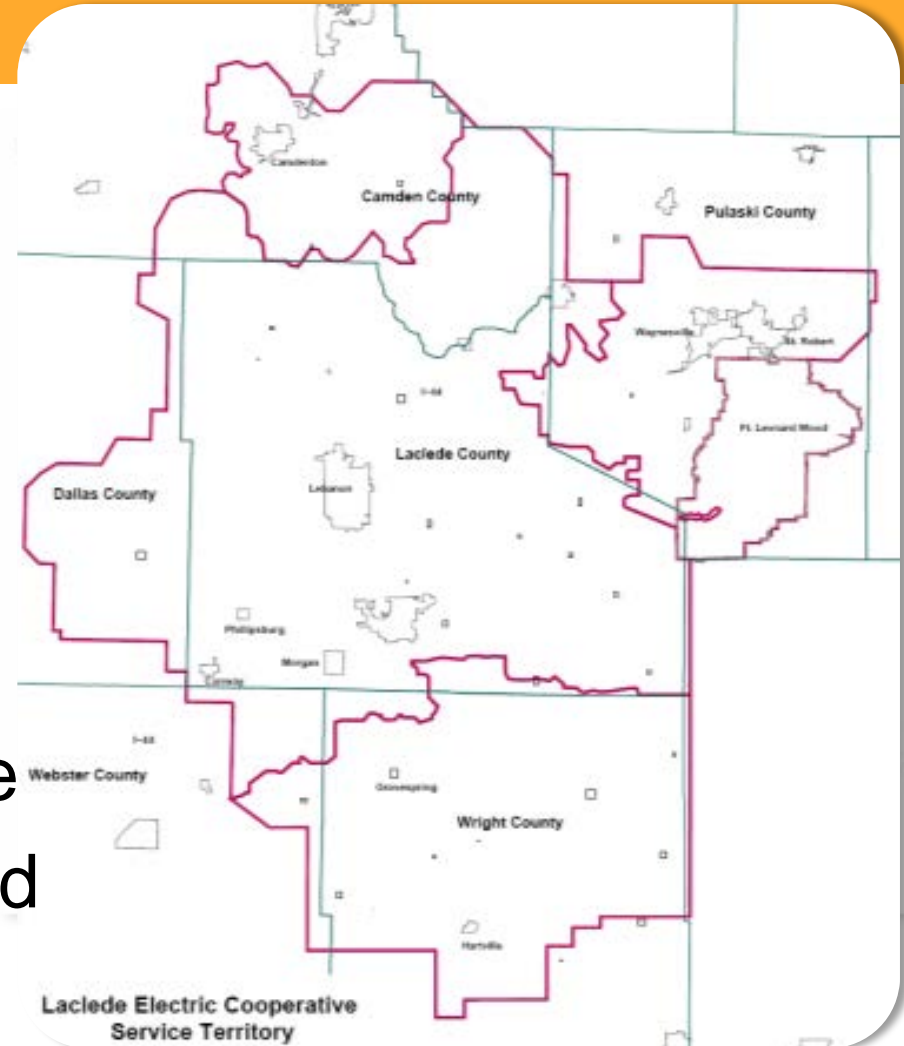
Laclede Electric Cooperative

Terry Rosenthal, P.E.
Manager of Engineering



Cooperative Profile

- Lebanon, MO
- Serve parts of 6 counties
- 3 district offices; 120 staff
- Approx 36,000 meters
 - varying member density
 - 7 per mile average
- Approx 5,000 miles of line
- Approx 200 MW peak load
- 27 substations



**Own & operate distribution system on
Fort Leonard Wood Army Base**

Smart Grid Goals

Technology Assimilation

- Evaluate, integrate & implement technologies to:
 - modernize operations & business processes
 - improve customer care

Member Relationship & Loyalty

- Expand strategies that strengthen relationship with members, communities and leaders

Distribution System Reliability

- Develop a comprehensive long-term reliability plan for the distribution plant to ensure:
 - highly efficient operations
 - high level of electric service reliability

Operational Efficiency & Cost Control

- Implement initiatives to:
 - optimize efficiencies
 - mitigate cost increases
 - enhance productivity

Smart Grid Initiatives

- **AMI Meter Deployment**

- Wireless system
- Fully deployed 2009 – 2010
- Hourly intervals residential
- 15 minute intervals C&I
- Remote Connect / Disconnect
- MDMS / Customer Portal Access

- **Distribution Automation**

- SCADA voltage / VAR controls
- Down-line feeder controls

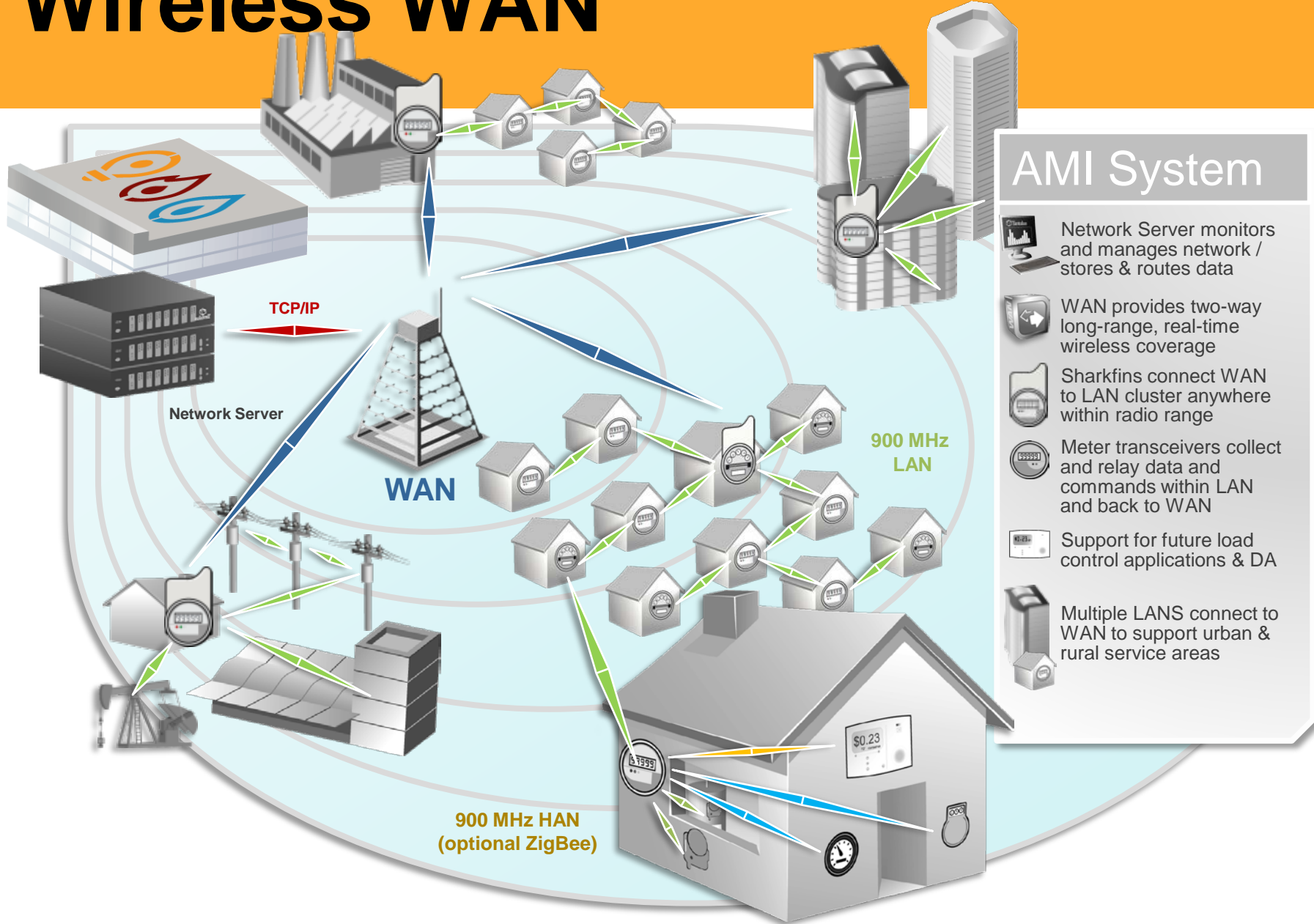
Driving Change

- Improve customer satisfaction
- Business process efficiency
- Develop accurate records and data for system statistics
- Utilize AMI as a means to improve outage response process
- Use the AMI systems for improved system reporting – voltage, amps, peak demand, high usage, etc.
- Possible Demand Response or other Smart Grid initiatives in future

AMI System Highlights

- Leverage Existing Radio Towers and Fiber Network
- Member Acceptance
- Data Integrations
 - Customer Information System (Billing and MDMS)
 - Outage Management System
 - Geographic Information System
- Report by exception
 - Outage / Restoration
 - Power Quality (voltage, blinks, etc.)
- Fort Leonard Wood Energy Management
- Mission Critical System

Wireless WAN



AMI System

- 
 Network Server monitors and manages network / stores & routes data
- 
 WAN provides two-way long-range, real-time wireless coverage
- 
 Sharkfins connect WAN to LAN cluster anywhere within radio range
- 
 Meter transceivers collect and relay data and commands within LAN and back to WAN
- 
 Support for future load control applications & DA
- 
 Multiple LANS connect to WAN to support urban & rural service areas

AMI Data



Laclede Electric Cooperative

Home > Laclede Electric Coop > Single-Phase_Meters > Consumption_Readings

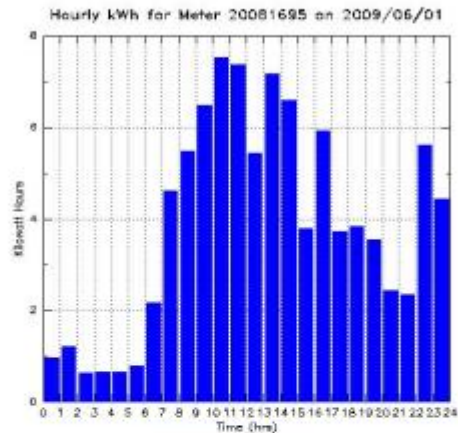
UPDATE READING

Single-Phase Meter Consumption Graph

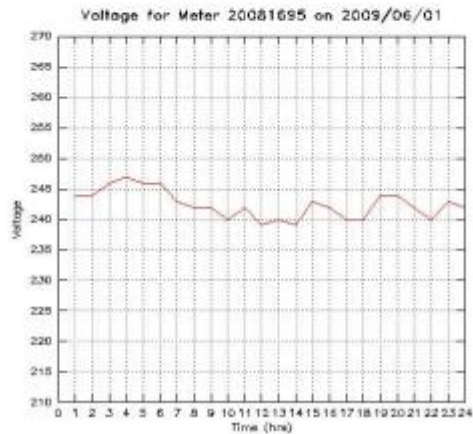
VIEW READING

Graph Date: 2009/06/01

GRAPH READINGS



View kWh Interval Data



Laclede Electric Cooperative

Home > Laclede Electric Coop > Single-Phase_Meters > Consumption_Readings

UPDATE READING

kWh Interval Data for 20081695

VIEW READING

GRAPH READINGS

Interval Ending	kWh	Cumulative kWh
2009/06/01 01:00:00 (CDT)	0.987	5637.987
2009/06/01 02:00:00 (CDT)	1.218	5639.205
2009/06/01 03:00:00 (CDT)	0.642	5638.847
2009/06/01 04:00:00 (CDT)	0.651	5640.498
2009/06/01 05:00:00 (CDT)	0.663	5641.161
2009/06/01 06:00:00 (CDT)	0.791	5641.952
2009/06/01 07:00:00 (CDT)	2.177	5644.129
2009/06/01 08:00:00 (CDT)	4.610	5648.739
2009/06/01 09:00:00 (CDT)	5.475	5654.214
2009/06/01 10:00:00 (CDT)	6.488	5660.702
2009/06/01 11:00:00 (CDT)	7.530	5668.232
2009/06/01 12:00:00 (CDT)	7.357	5675.589
2009/06/01 13:00:00 (CDT)	5.434	5681.023
2009/06/01 14:00:00 (CDT)	7.166	5688.189
2009/06/01 15:00:00 (CDT)	6.598	5694.787
2009/06/01 16:00:00 (CDT)	3.793	5698.580
2009/06/01 17:00:00 (CDT)	5.919	5704.499
2009/06/01 18:00:00 (CDT)	3.713	5708.212
2009/06/01 19:00:00 (CDT)	3.824	5712.036
2009/06/01 20:00:00 (CDT)	3.540	5715.576
2009/06/01 21:00:00 (CDT)	2.437	5718.013
2009/06/01 22:00:00 (CDT)	2.348	5720.361
2009/06/01 23:00:00 (CDT)	5.619	5725.980
2009/06/02 00:00:00 (CDT)	4.439	5730.419
Total:	93.399 kWh	

Go Back

Next Steps / Summary

- Business Process Review
 - Changes as needed to realize maximum AMI benefits
- Integrate to other information systems
 - Data support for other systems
 - Efficiency improvements
- Impacts entire organization

Possibilities for the Future

- Ability to alter billing cycles
- Consider different rate structures
- Pre-pay option
- Home Area Network:
 - DR options
- Multiple utilities:
 - electric, water, gas, etc.
- Distribution Management System