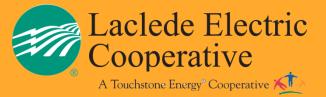
## **Smart Grid Update**



### Laclede Electric Cooperative

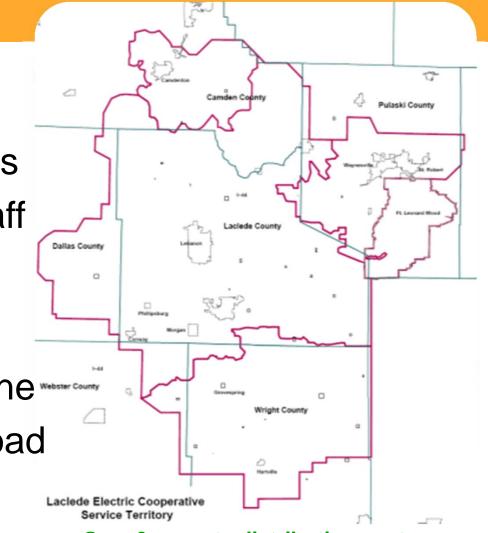
### Terry Rosenthal, P.E. Manager of Engineering





## **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

### Distribution System Reliability

Operational Efficiency & Cost Control

- Expand strategies that strengthen relationship with members, communities and leaders
- Develop a comprehensive long-term reliability plan for the distribution plant to ensure:
  - highly efficient operations
  - high level of electric service reliability
- 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

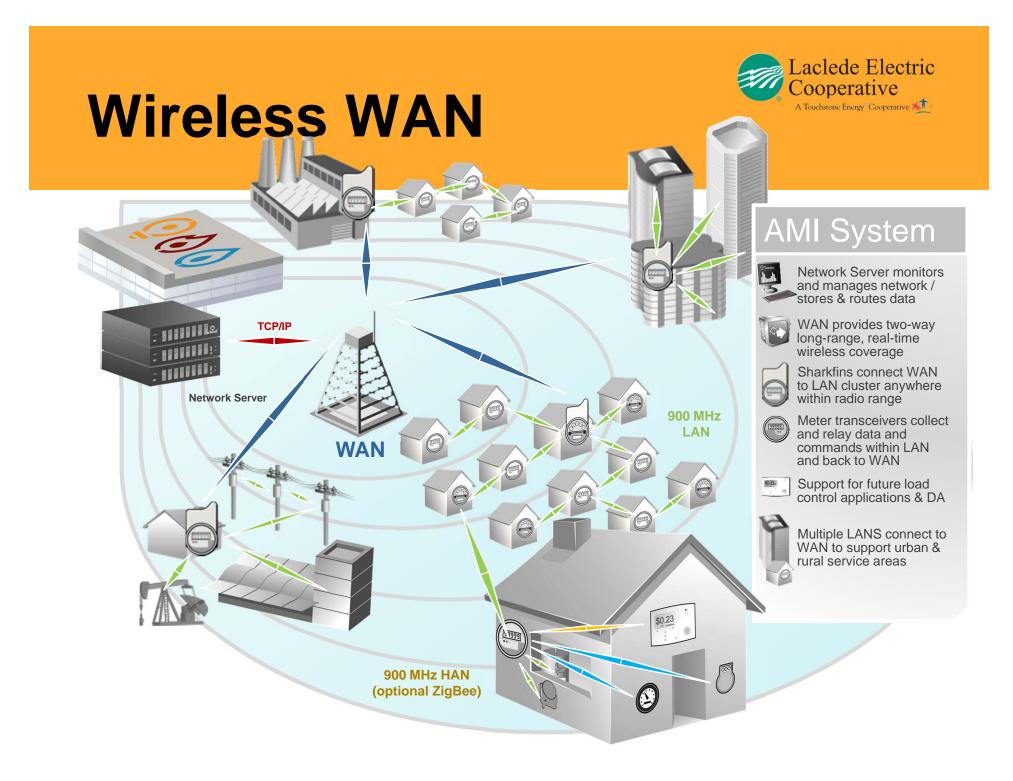
### **Driving Change**

- 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



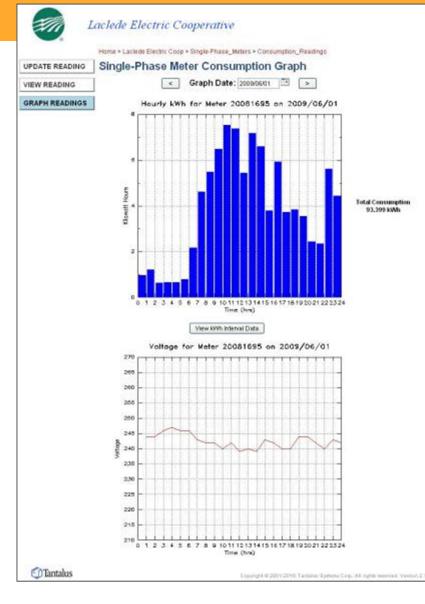
### **AMI System Highlights**

- 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





### **AMI** Data





#### Laclede Electric Cooperative

Home > Laclede Electric Coop > Single-Phase\_Meters > Consumption\_Readings

UPDATE READING	kWh Interval Data for 20081695		
VIEW READING	Interval Ending	kWh	Cumulative kWh
GRAPH READINGS	2009/06/01 01:00:00 (CDT)	0.967	5637.987
	2009/06/01 02:00:00 (CDT)	1.218	5639.205
	2009/06/01 03:00:00 (CDT)	0.642	5639.847
	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
	2089/06/01 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	

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# **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