



# Chelan County PUD AMI Finding and Recommendations

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UtiliWorks™

# Agenda

- Scope of Work
- Findings and Recommendations
  - AMI Goals
  - AMI Vendor Analysis
  - Updated Business Case
  - AMI Benefits
  - Deployment Approach
- Recap and Next Steps
- Q&A



# Scope of Work

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- Update/validate project goals, success factors, and identify risks
- Outline the various AMI technologies
- Develop a comprehensive list of AMI system requirements/capabilities to be included in a future RFP
- Update the business case and revisit the benefits assumptions
- Update/assess the Information Technology (IT)/Operational Technology (OT) systems architecture
- Recommend AMI and MDMS acquisition relative to the ongoing CIS project
- Develop an AMI Project Management Plan

# AMI Goals

# AMI Goals

- During the Assessment phase, UWC worked with the District to derive the underlying business goals and objectives for AMI. The outcome of these discussions identified five (5) key goals:
  - Improve Customer Service
  - Improve Asset Management/Reliability
  - Improve Safety
  - Reduce Operating Expenses
  - Enhance Revenues
- These goals were confirmed with District staff during discovery

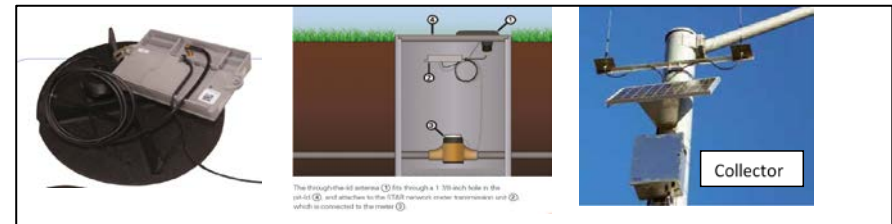
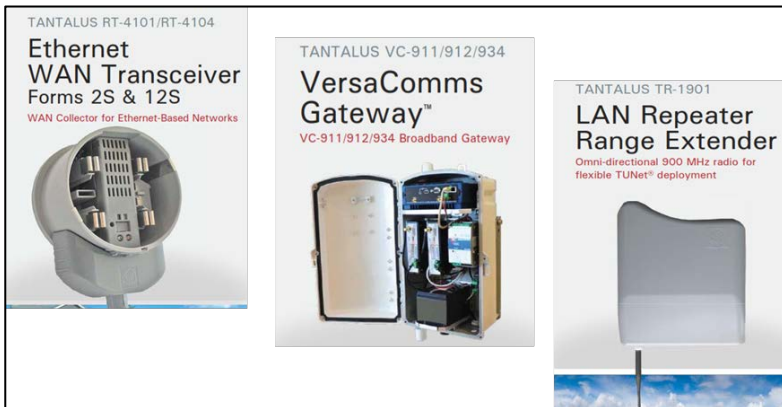
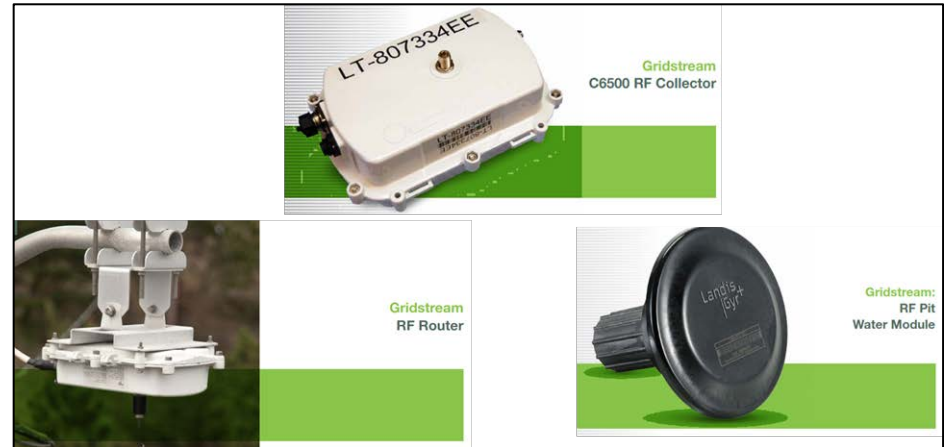
# AMI Vendor Analysis

# AMI Vendor Analysis Summary

- Vendor solutions exist that can cover the District's challenging territory
- Mesh, point-to-point, or hybrid network solutions are viable
- Careful consideration in selecting a solution in the future will be necessary as there are significant differences in the number of collector backhaul communications links that will be needed
- The vendor community is confident in their ability to provide the District with a solution designed for full system coverage



# Typical AMI Field Equipment



# Updated Business Case

# Updated Business Case Results

	Base Case - Updated January 2017 Electric Only AMI + MDMS \$36k/year Backhaul	Base Case - Updated January 2017 Electric Only AMI + MDMS \$75k/year Backhaul	Base Case - Original July 2015 Electric Only AMI + MDMS
Net Present Value	\$1.143 Million	\$598k	\$4.325 Million
Capital Costs	\$13.194 Million	\$13.194 Million	\$13.381 Million
Benefits Estimate (20-year life)	\$32.9 Million	\$32.9 Million	\$35.7 Million
Internal Rate of Return	8.1%	7.6%	10.1%
Payback Period	14 Years	14 years	12 Years

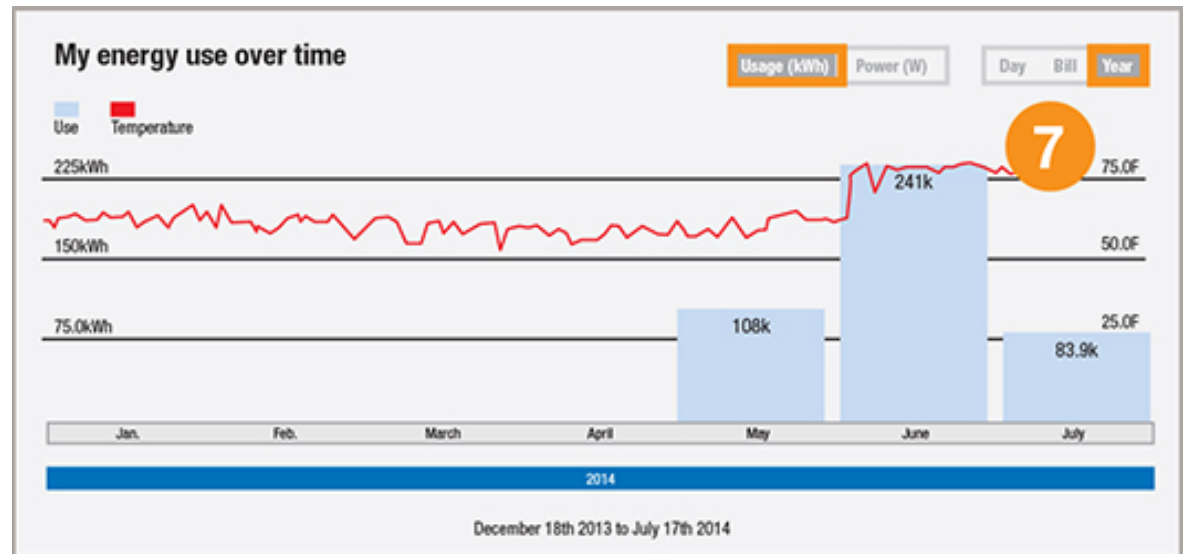
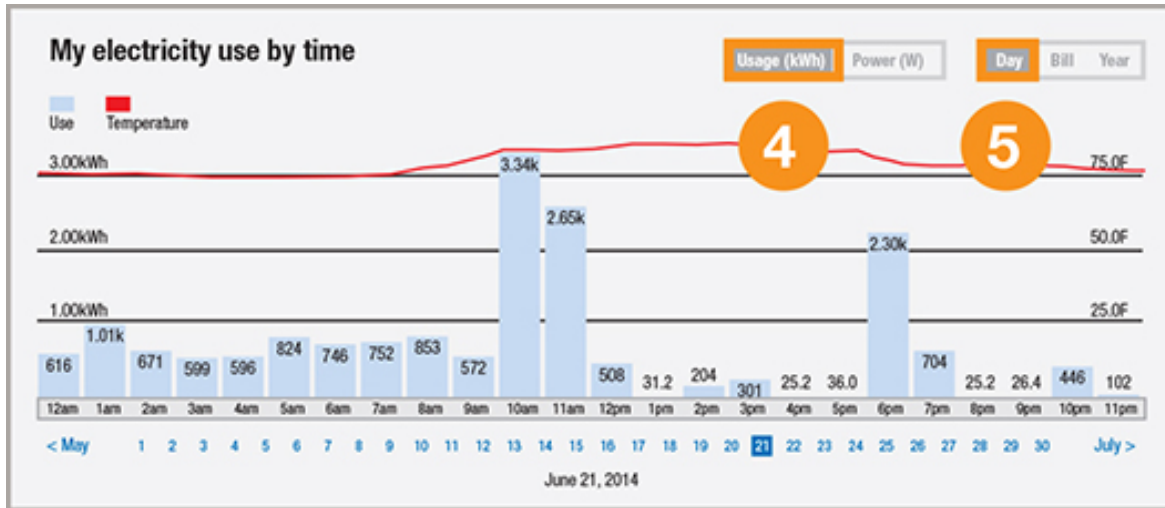
- Overall project NPV was lower compared to 2015, but positive
  - More conservative benefits assumptions
  - Higher annual software maintenance escalation rate (3% vs. 1.5%)
  - Higher discount rate used in the calculation (7% vs. 6.5%)
  - Capital cost estimate slightly lower

# AMI Benefits

# Qualitative Benefits

- Enhanced Customer Service
  - On-line management of usage and costs as they occur
  - Proactive notifications of unusual usage pattern
  - Prepay service
- Better Data for Ratemaking
  - More accurate cost of service data
  - More accurate revenue forecasting
- Analytics
  - Virtual metering to facilitate cross-functional analytics
  - Conservation programs

# How do I communicate the data to my customers and what can they analyze?



# Qualitative Benefits Continued

- Safety
  - Remotely read and disconnect meters
- Tools for Asset Management
  - Data beyond a monthly meter read
  - Voltage management
  - Outage management
- Societal Benefits
  - Reduce the overall carbon footprint
  - Conservation

## Cost of Outages to Customers

- Lawrence Berkeley Lab study in 2006 estimated customer losses due to electricity outages of **\$79 Billion / year**
  - Per our original assessment, AMI can reduce outage time by up to 20% with real-time meter outage notifications and pinging capabilities
  - Use of AMI data and functionality to manage outages can result in savings to District customers
- A preliminary update to this study released in 2016 shows that number now at **\$110 Billion / year**



The screenshot displays a utility management software interface. On the left is a vertical navigation menu with the following items: Reports, Dashboards, Routing/Maps, Communications, Meter Problems, Meter Reads, Meter Events, Outages (with sub-items: Outage Listing, Outage Statistics), Transformers, Actions, Setups, System Configuration, and Meter Data. The main area shows a map of a residential neighborhood with green icons representing meters. A large popup window is open over a meter at 580 N Rexford Dr, displaying the following data:

<b>Meter Name</b>	580 N Rexford Dr (100022 - 1000019)
<b>Alternate ID</b>	041361124
<b>Location Class</b>	RES
<b>Meter Type</b>	REX2
<b>Install Date</b>	2010/02/23
<b>First Communicated</b>	2010/02/23
<b>Last Communicated</b>	Today
<b>CIS Status</b>	ON
<b>Outages</b>	No Outages
<b>Collector</b>	Pole at Rexford and Santa Monica (53005)
<b>Dist. to Collector</b>	303.77 meters
<b>Hop Level</b>	7

Below the data is a row of icons representing various utility functions. A smaller popup window is also visible on the map, showing details for 501 N Rexford Dr (Alt ID: 041362066). Another window on the right shows a zoomed-in view of a transformer area with a popup for 570 N Alpine Dr (100059 - 1000038). The browser address bar shows the URL: <https://metersensedemo.aegisis.com/?met...>

# Tools to Assist with Outage Management

# Deployment Approach

# Deployment Approach

- **Procurement** - The procurement process draws on all the prior planning to facilitate RFP development, evaluation, selection, and contracting.
- **Planning for Operational Impacts** - Some business processes have to be re-engineered to support and realize AMI benefits. This creates a need to assess current business processes and resources and align them to meet Chelan business objectives.
- **Implementation and Deployment** - To best facilitate a methodical approach to deployment, UWC recommends a Proof of Concept phase to prove full system functionality.

*Education and Outreach is key component of a successful AMI project*

# Education and Outreach

- Development of internal education campaign
- Customer outreach and awareness
- Redefining customer engagement

## RUSTON Power Smart

The CITY OF RUSTON is building an electric system that is more efficient, resilient, cleaner, reliable and responsive—a Smart Grid.

### THE SMART GRID AND AMI

The City of Ruston is at the forefront of the Smart Grid movement. The electric industry as a whole is making the transformation from a centralized, producer-driven network to one that is more interactive for consumers. The Smart Grid is characterized by a two-way flow of electricity and information. By incorporating innovative technologies into an improved electric infrastructure, the Smart Grid will advance utility performance and provide better service to customers.

The foundation of the Smart Grid is a term coined "Advanced Metering Infrastructure" or "AMI". An AMI system utilizes smart meters which automatically communicate consumption and other system data directly to the utility. These new meters measure and record usage data at a minimum, in hourly intervals, and provide usage data to both consumers and energy companies at least once daily. Most utilities currently have one month ready, which is used to estimate consumption and billing.

**AMI technology enables:**

- Revenue recovery
- Identifying product losses
- Implementing variable rate structures
- Improving meter and billing accuracy
- Reducing labor costs
- Reducing customer complaints and errors
- Enabling customers to manage consumption

**Smart Grid extends these benefits to include:**

- Enabling active participation by consumers
- Operating resiliently against physical and cyber attack
- Accommodating all generation and storage options
- Optimizing assets and operating efficiently

### BRIGHT DEVELOPMENTS FOR RUSTON LIGHT & POWER

The City of Ruston successfully completed the design, procurement and implementation of a Smart Metering Pilot Project in 2009. During the course of the pilot, the City applied for the U.S. Department of Energy Smart Grid Investment Grant Program. Ruston was selected late October, 2009 to receive \$4.3 million in funding as one of only one-hundred recipients nationwide. Utility Automation and Engineering T&D Magazine awarded the City of Ruston the Smart Grid Project of the Year in March, 2010 for its innovative design in the grant application.

**Goals for the Smart Grid Grant project include:**

- Renewable energy generation for targeted city buildings
- A 50% reduction of distribution system interruptions
- Fuel reduction of 7,500 gallons
- A 5% energy reduction overall for customers
- An estimated community cost savings of over \$5,266,674

According to Darrell Caraway, Public Utility Manager, the three-year project also focuses on enhancements to customer account software, automation of the electric distribution system, and testing of energy storage devices including electric vehicles.

Mayor Dan Hollingsworth said that when fully deployed, the new system will make Ruston's power grid more efficient and user-friendly. "These improvements will save Ruston customers on their power and water bills. It will also ensure more accurate meter readings," says the Mayor.

The City retained Utiliworks, a Baton Rouge-based firm that builds smart utility solutions, to assist with the pilot and the grant application. Dale Pennington, Utiliworks' Managing Director, explains that the project fully accommodates all critical components of a smart grid as defined by EPRI—the Electric Power Research Institute. "Incorporating all these components which cut across so many technical disciplines will make this one of the forward thinking smart grid projects in the United States," says Dale Pennington.

## AUSTIN WATER MOBILE APP

[CLICK HERE](#)

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**For Immediate Release**

### City of Monroe Meter Project Status Update

*April 6, 2012 – Monroe, LA* – The City of Monroe is now implementing an innovative set of technologies to benefit their customers—an Automatic Meter Reading (AMR) System. From July, 2011- August, 2012 the City's residences and businesses will be upgraded with a new digital water meter at no additional cost to the customers.

In the next two weeks, the City's meter installation company, Vanguard Utility Service, Inc., is expected to be working in the following locations:

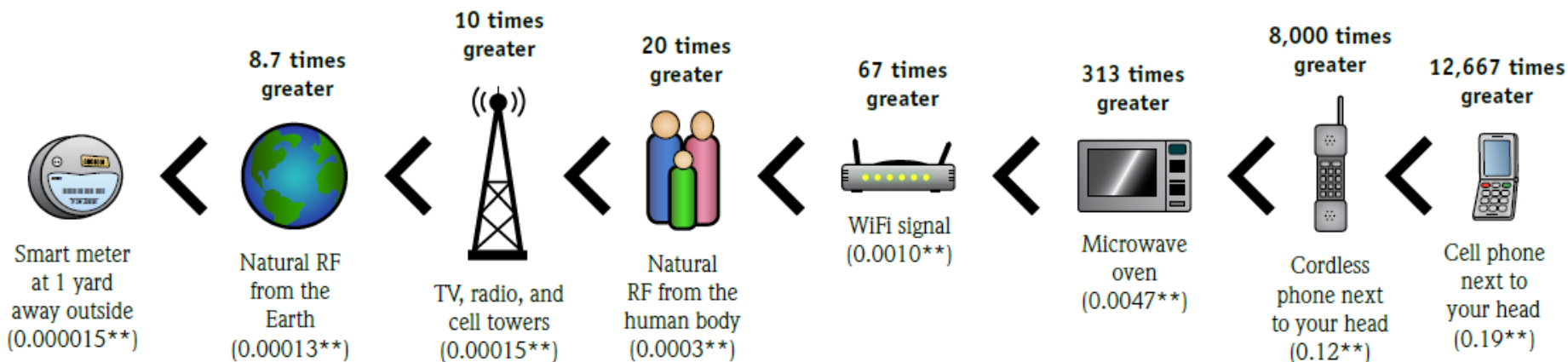
1 <sup>ST</sup> ST	BIENVILLE ST	HARVESTER DR	PARKER ST
2 <sup>ND</sup> ST	BON AIRE DR	HICKORY ST	PARKVIEW DR
3 <sup>RD</sup> ST	BONNER DR	HUDSON LN	PEACH ST
4 <sup>TH</sup> ST	BROADMOOR BLVD	HWY 165	PEARL ST
5 <sup>TH</sup> ST	BRYANT ST	JOFFREE ST	PECAN ST
6 <sup>TH</sup> ST	BURG JONES LN	JOHNSON CIR	PETERS ST
7 <sup>TH</sup> ST	BURROUGHS ST	KENAWAH ST	PHILLIPS ST
8 <sup>TH</sup> ST	BYERS RD	LAKE DESIARD DR	PIERCE DR
9 <sup>TH</sup> ST	CAGLE DR	LAMY LN	PLANTATION DR
10 <sup>TH</sup> ST	CAMP ST	LIDELL ST	PLUM ST
11 <sup>TH</sup> ST	CARROLL DR	LOCK DR	RALEIGH DR



## RF Health Concerns

- Exposure to RF energies, from common household devices create RF levels several thousand times greater than that from an AMI meter
- Factors that affect exposure: Characteristics of the energy source, Time of exposure, Distance from source, Shielding from source
- Graphic developed by Central Maine Power is an easy to follow guide

### RF exposures from smart meters are much lower than other RF sources\*



# Recap and Next Steps

# Summary Findings and Recommendations

- Multiple AMI vendors can meet the unique characteristics of Chelan in a cost effective fashion
- The District has one of the best-prepared IT environments for AMI/MDMS that we have seen to date
- UtiliWorks recommends the District phase deployment to include a Proof of Concept (POC) with a AMI/MDMS solution integrated with the new CIS in a controlled setting
- The District should commit resources to complete the CIS and acquire an AMI/MDMS to realize the financial and qualitative benefits

## Next Steps

- District to commence Community Outreach Effort early 2017
- Go / No-Go decision in April 2017 to proceed with AMI procurement starting with the development of a request for proposal (RFP) and inclusion into the 2018-2022 business planning cycle





# Questions