

Economics of an ERT Overlay System

Katherine Crouse

Marketing Manager, Electricity Metering, Itron

Matthew Goodman

Director, Electricity Metering, Itron

Tammy Zucco

Chief Marketing Officer, Tantalus

Laura Wright

Marketing Communications Manager, Tantalus

TABLE OF CONTENTS

Introduction 3

Benefits of ERT Overlay System 3

Infrastructure 3

Business Case and Return on Investment 6

Improved Customer Satisfaction 6

Conclusion 6

INTRODUCTION

The public power industry is in the midst of a significant shift in how energy is generated, delivered and used. Municipals and cooperatives are seeking smart grid technologies, from trusted partners, for a variety of needs: to optimize the efficiency and reliability of their delivery systems; to empower consumers to manage energy usage; and to integrate clean and distributed energy resources into the grid.

Listening to the needs of the public power industry, Itron and Tantalus have collaborated to deliver an integrated two-way smart grid solution built on the foundation of our existing proven technology. The solution offers utilities a multitude of operational and customer benefits—with minimized deployment and infrastructure costs.

The joint solution incorporates Itron's industry-leading electric meters (CENTRON® II & SENTINEL®) and water, electric and gas modules (100W, 100G, R300, 60W) into a next-generation smart grid communications and applications platform— driven and unified by TUNet®, Tantalus' proven and widely deployed communications network.

The result is a flexible and powerful network, tuned to meet the specific needs and challenges of the public power sector. Its expanding array of applications provides a host of operational, security and economic benefits. The overlay strategy of TUNet over Itron ERT devices provides a practical migration path to immediately adopt smart grid functionality while extending the useful life and value of non-amortized capital assets.

BENEFITS OF ERT OVERLAY SYSTEM

The key benefit of implementing a TUNet + ERT overlay is that AMR-only utilities are provided an option to leverage and protect existing ERT investments as part of a strategic and sensible migration path toward more advanced capabilities as they're required. Other key benefits include:

1. Avoid stranded assets by extending the useful life of ERTs

With an overlay solution, the utility may elect to establish a base AMI network for communications and then replace older ERT modules over time and as the business case justifies. Existing CENTRON electric meters that are not fully depreciated can be retrofitted and incorporated into the overlay network.

2. Enable strategic deployments

Rather than an all-or-nothing approach, the overlay is designed to allow a utility the flexibility to strategically deploy AMI based on application drivers such as reducing bad debt through remote disconnect/prepay. This managed approach ensures the lowest capital cost AMI solution while creating the most favorable business case for future application expansion.

3. Leverage Itron MVRS software with an integrated TUNet head end

The overlay is designed to minimize changes to existing software tools and proven business processes while incorporating enhanced functionality into utility operations. The utility may retain existing billing and other software interfaces while streaming both ERT and other AMI system data simultaneously to external utility applications.

4. Easily integrate water and gas AMI

For many utilities, the challenge of upgrading from one-way AMR to two-way AMI for electric endpoints is a significant task. Incorporating water and gas presents its own unique set of challenges as well. The joint overlay solution is designed specifically for ERT customers and seamlessly incorporates electric, water, and gas ERTs into a single communications network and interface for a full range of smart grid functionality.

Many other benefits of AMI apply to any utility, with or without ERTs. In fact, after a basic installation, existing TUNet customers have reported a 95 percent reduction in unnecessary truck rolls due to line blinks and momentary power outages, reliable outage detection in 10 seconds or less, as well as decreased instances of theft, and improvements in operational decisions due to access to timely power quality information.

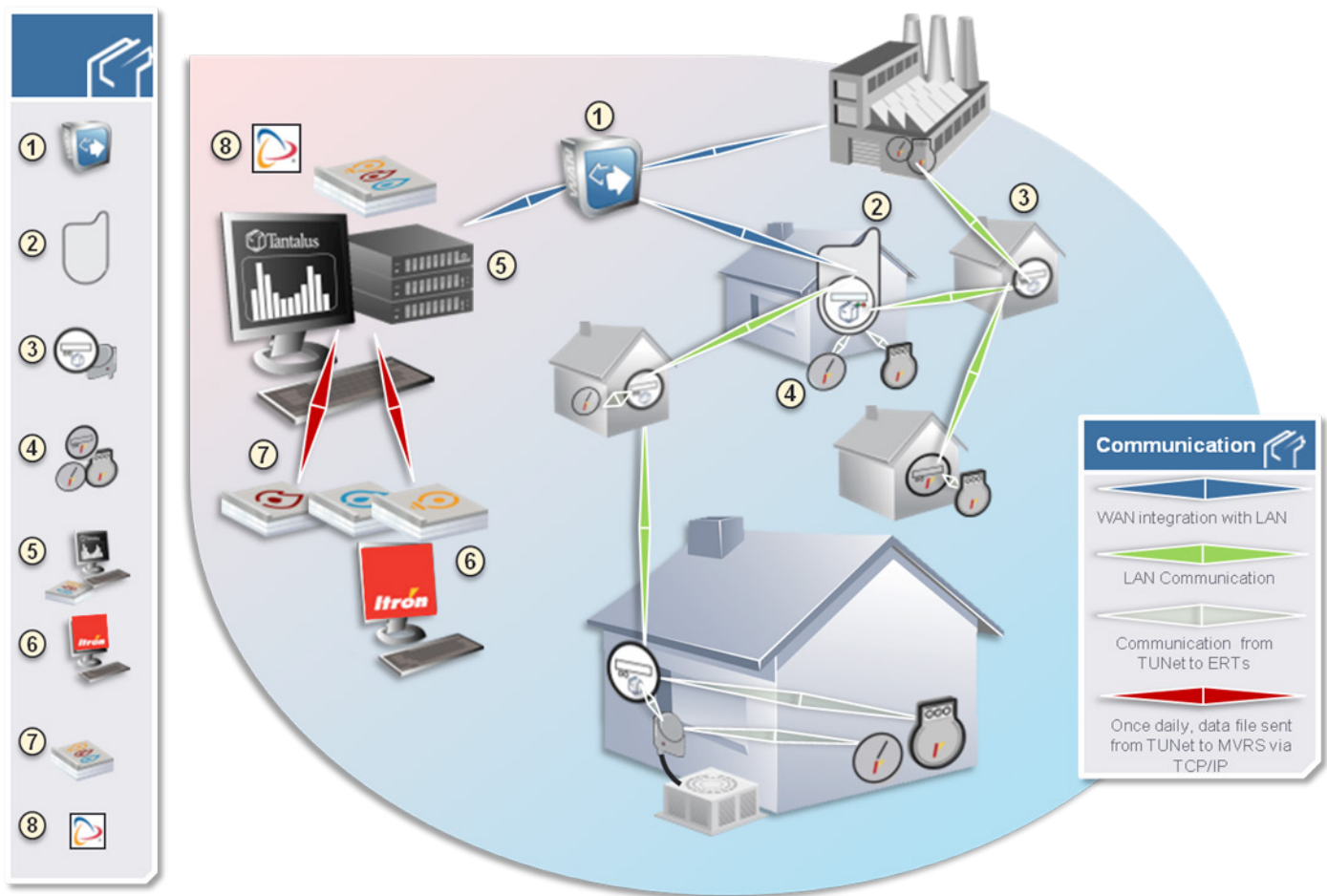
INFRASTRUCTURE

Most utilities are migrating to the smart grid only when a flexible, scalable and economically justifiable solution is available. An easily implemented and maintained communications infrastructure, capable of serving multiple customer segments, is often a key factor in an AMI decision for many utilities.

The TUNet-enabled SENTINEL meter allows utilities to immediately provide real-time interval data, advanced demand measurements, real-time power quality monitoring, and flexible demand reset capabilities to their high-use commercial customers. This expanded functionality positions the utility to offer a significantly greater level of customer support while simultaneously enabling commercial customers to manage costs and complex pricing schedules more quickly and effectively.

A basic ERT plus TUNet overlay is outlined in Diagram A. Once the meter's ERT module is combined with TUNet's two-way advanced communication platform, the result is a highly flexible smart grid solution capable of supporting many applications.

Itron ERT + TUNet Overlay Solution



- 1) The TUNet platform utilizes a flexible WAN backbone network (220/900 MHz, Ethernet, public carriers, WiFi) to establish coverage and connectivity over the service territory
- 2) TUNet RT-3205 “sharkfin” collector provides a 220 MHz WAN to 900 MHz LAN gateway
- 3) TUNet-enabled devices, including Itron electric meters, provide complete support of Itron ERTs (ELectric-300 Series via SCM*, Water/Gas-100 Series via NIM**)
- 4) Itron electric, water, and gas ERTs are accessed and read via TUNet-enabled devices (meter, load management, smart thermostat, etc.)
- 5) TUNet communicates ERT (R300/100/60W) data via WAN TCP/IP to TUNet combined head end
- 6) ERT readings sent from TUNet to MVRs (electric includes TUNet reads + ERT read) and then to other utility systems (billing, CIS, etc.)
- 7) TUNet supports full two-way communications for TUNet-equipped smart electric meters, 100Ws, and 100G ERTs
- 8) All ERT data is stored by TUNet and can be easily integrated with billing and other systems via MultiSpeak® interfaces

A phased deployment option is available to ensure the highest level of continuous performance with utility systems. Following a propagation study and system design, the basic TUNet infrastructure is deployed to provide connectivity in strategic locations for specialized applications such as prepay or demand management or to provide full system coverage for a comprehensive AMI program. An optimized WAN (Wide Area Network) backhaul is established utilizing a flexible combination of wired and wireless, existing or new communication options best suited to each utility. All TUNet-enabled devices (meters, load control devices, collectors, etc.) unite to form a 900 MHz mesh network that optimizes coverage, connectivity, scalability, redundancy, and alternate data transmit path capabilities. ERT readings are captured via any TUNet-enabled device as they are transmitted.

Initially basic ERT communications are established for the collection of daily consumption reads from ERTs. TUNet listens for ERT signals and data is transmitted through the network, processed by the TUNet head end, and exported to Itron's MVRS system for forward linking to the utility's billing and other management systems.

TUNet can also be deployed surgically to meet specific business objectives or to serve isolated or hard-to-reach populations. In these cases, communication via 220 MHz is often ideal to supplement and broaden the network. For instance, in Diagram B below, a 200 MHz-based overlay solution is deployed to pick up and transmit ERT water readings from an isolated community. Depending on the topography and deployment scenario, a combination of network repeaters and meter adaptors can be co-located with water ERTs to create the two-way command and control network.

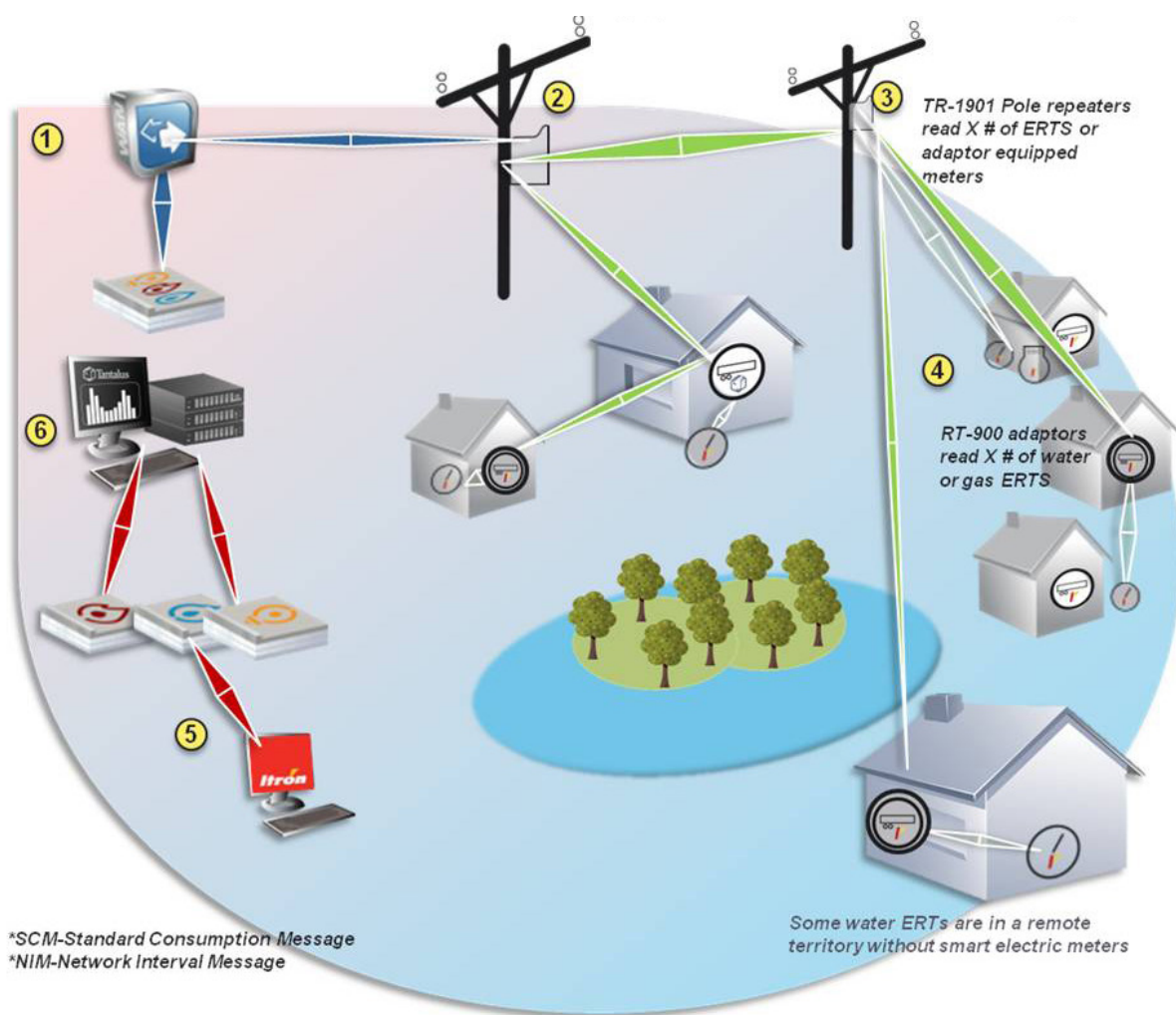


Diagram B: 220 MHz-based ERT overlay

- 1) TUNet connected WAN (220 MHz, Ethernet) serves as a backbone network for all E/W/G meter and ERT data
- 2) Crossband Repeater (XR-3100) serve as the link between the WAN and the 900 MHz LAN
- 3) TUNet 900 MHz enabled pole-mounted repeaters (TR-1901) communicate with Itron water and gas meter ERTs
- 4) TUNet-enabled electronic adaptors (RT-900 MHz repeaters) mount to electric meters where water ERTs are co-located; TUNet-enabled Itron meters are also supported
- 5) ERT readings sent from TUNet to MVRS (electric includes TUNet reads + ERT reads), then to other utility systems (billing, CIS, etc.)
- 6) TUNet communicates ERT (100/60W) data via WAN TCP/IP to TUNet combined head end

At the end of 2013, full two-way functionality will be available for water and gas through a unified and integrated head end. TUNet will transmit all logged hourly interval data, leak alarms, and tamper notification messages from 100-series water and gas ERTs. This series of ERTs also features a “bubble up” feature that allows the transmission of meter data over TUNet in five-minute packets.

BUSINESS CASE AND RETURN ON INVESTMENT

For most public power utilities, the core driver for smart grid is to implement ways to deliver power more reliably, efficiently, and provide greater value to the consumer. In order to achieve these goals, supplemental drivers such as optimizing operational efficiency and implementing advanced energy management applications such as remote disconnect and demand management strengthen the business case for AMI and smart grid. In the case of utilities with existing ERTs installed, it is often challenging to identify a prudent and cost-effective next step up from traditional one-way AMR to a fully automated two-way solution because the “low hanging fruit” of the business case has already been harvested.

If the utility has identified that a driver beyond simple meter reading would benefit its service offering, the business case for an ERT overlay can be readily justified. In a simplified example, a municipal utility with ERTs fully deployed may decide that it wants to implement remote disconnect and a prepay program to reduce truck rolls, increase its cash flow, and expand revenue protection. In this case, the utility may achieve two-way system automation and coverage by overlaying as little as 10 -15 percent of its drive-by or handheld system with a TUNet network. **By utilizing this customized ERT overlay, more than 95 percent of the existing ERT investment is recouped while the foundation for a fully two-way AMI network is established.**

With the installation of TUNet and the ERT overlay system, utilities are experiencing a high return on investment by virtually eliminating remotely located manual meter readings and truck rolls, therefore saving time, fuel, and money. With the advent of remote disconnect/reconnect capabilities in the meter as well as the automation of routine service transactions, utilities will be able to further expand their savings opportunities. With the Itron Tantalus joint solution, utilities can now **obtain key information in seconds rather than minutes or days**, allowing them to make better decisions and reap significant savings.

The Itron/Tantalus system also provides a more conservative deployment alternative: utilities can continue to use legacy systems while strategically implementing the new system over time. Therefore, the **utility’s capital expenses are also spread over the span of several years** while the improved two-way AMI features simultaneously pay back to the business case.

IMPROVED CUSTOMER SATISFACTION

New research by Tantalus reveals that municipal and cooperative utilities are making customer service and value their highest priority in 2013. Tantalus recently surveyed a wide range of public power utilities in North America to address concerns and investment priorities they have for 2013. The number one issue to be addressed in 2013 is customer concerns, according to 42 percent of respondents. Other responses indicated an increased utility interest in adopting new technologies that keep rates low and minimally impact customers.

Reflecting these trends, many utilities are looking beyond the direct operational benefits of upgrading from a one-way AMR system to a two-way AMI network, and the fact that consumers also stand to benefit from advanced smart grid applications and programs. With rising demands on the existing grid and sources of generation, utilities have begun to focus more on effective methods to shave peak load while minimizing discomfort or inconvenience for the customer. Smart grid-driven programs like Closed Loop Voltage Reduction (CLVR™) allow utilities to use real-time voltage data from the meter to make incremental adjustments to voltage during peak periods while maintaining power quality within safe and acceptable limits. This behind-the-scenes program is a highly effective way for utilities to shave peak loads in a non-invasive way while helping to ensure low rates for consumers and avoidance of peak charges.

Maintaining and improving customer satisfaction will continue to be a high priority for utilities. By carefully researching and implementing smart grid functionality at a measured pace and at maximizing cost effectiveness, utilities can expect that consumers will be more willing to accept and support new applications.

CONCLUSION

The Itron-Tantalus ERT Overlay solution presents a practical next step for utilities who have invested in a reliable and proven ERT network. Rather than replace those existing investments, utilities now have an alternative path to adopt two-way smart grid functionality at a fraction of the cost and with minimized infrastructure deployment and maintenance requirements.

By adopting the flexibility to retain existing meters and collection systems, while implementing next generation communications networks and applications, utilities gain the advantage of utilizing information where and when they need it. The Itron-Tantalus ERT Overlay system represents an attractive, low-risk investment option to begin deploying a smarter, faster, more intelligent national power grid led by innovative municipal and cooperative utilities.



Itron is a global technology company. We build solutions that help utilities measure, monitor and manage energy and water. Our broad product portfolio includes electricity, gas, water and thermal energy measurement and control technology; communications systems; software; and professional services. With thousands of employees supporting nearly 8,000 utilities in more than 100 countries, Itron empowers utilities to responsibly and efficiently manage energy and water resources.

Join us in creating a more resourceful world; start here: www.itron.com

CORPORATE HEADQUARTERS

2111 N Molter Road
Liberty Lake, WA 99019
USA

Phone: 1.800.635.5461

Fax: 1.509.891.3355