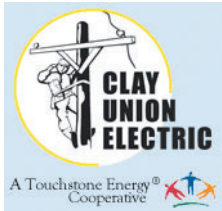


CUSTOMER PROFILE

**CLAY UNION ELECTRIC COOPERATIVE**



**STATISTICS**

**Primary Industry:**

Agriculture

**Primary Use of AAT:**

AMR and Member Information System

2,600 Members

930 Sq. Miles

3200 Rate Meters

1500 Sub Meters/Credit Meters

Average 2.6 Meters per Mile of Line

**Objectives:**

Reduce Meter Reading Costs

Reduce Difficult or Dangerous Meter Reads

Improve Remote Irrigation Pump Management for Customers

**Results:**

NRECA awards 2005 Innovators Certificate of Merit Award to Clay Union for implementing AMR solution at a fraction of the cost of alternative AMR offerings

**About Clay Union Electric Cooperative**

Clay Union Electric Cooperative is the oldest electric coop in South Dakota and has provided reliable, cost-efficient electricity to member/owners in Southeast South Dakota since 1936. While providing reliable, cost efficient, energy is their prime purpose, it is customer service that drives the innovation and development of new technology offerings.

---

*Leo Powell stated, "The AAT solution supports our need for a low total cost solution for AMR by eliminating most of the AMR infrastructure costs while providing remote monitoring to our members."*

---

**Clay Union Electric Faces Unique Challenges**

Clay Union Electric is located in the southeastern corner of South Dakota and provides electricity and other energy management services to over 4,700 meters spread out over more than 900 square miles. The vast fields of grain, corn, and soybeans, dot the landscape with four small communities comprised of fewer than 300 people each. Clay Union Electric supports over 3200 electricity revenue meters plus about 1500 sub or credit meters. Long distances between meters, low meter density of 2.6 meters per miles of line, and difficult, sometimes dangerous terrain mark this area of South Dakota.

In addition, the sprawling farms and associated irrigation wells offered severe meter reading accessibility and safety challenges to Clay Union. As important to Clay Union Electric as reducing meter reading costs was providing a higher level of customer service to the farmers that depend on their irrigation pumps to maintain their crop yields. These 100+ irrigation pumps are distributed throughout the many farms and fields running along the Missouri river. The meters are often 2-3 miles from any road and access to the meter is through thick farmlands along muddy, narrow, paths.

Clay Union Electric was seeking a solution to two primary problems. First, to provide more cost effective, and safer meter reading. Prior to choosing an affordable AMR solution, a team of service personnel using ATVs crisscrossed the backfields of farms to take monthly meter readings. This task is often difficult, and dangerous, and Clay Union service personnel have often had close calls with equipment and animals barely escaping injury. In addition, the costs associated with personnel hours, equipment, and maintenance was high. Second, the problem was to provide the farmers with real-time load profile/load management information and eventually remote control over irrigation pumps. During high peak load times, Clay Union Electric's wholesale power transmission supplier, East River Electric, remotely controls loads on a voluntary basis. At these times pumps are often shut down to reduce costs to both the member and the cooperative. While some pumps have automatic restart capabilities, the majority do not. Auto restart is not always reliable. The farmer was then faced with traveling long distances to restart or check on

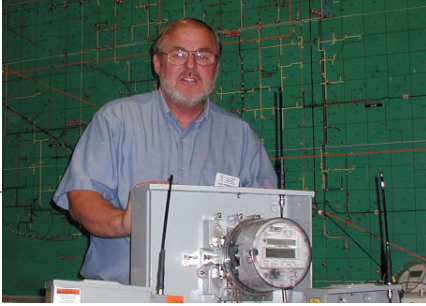


irrigation pumps to insure that the fields get the moisture needed to maintain growth in the dry and sandy soils of the Missouri River basin.

**Alternatives Considered**

Leo Powell, Operations Manager for Clay Union

Electric and a member of the East River Technology Integration Committee began searching for an offering that could serve the AMR needs of both Clay Union Electric and that of the 22 other coops of the East River Electric system. Chuck Lohsandt, East River Electric's Information and Technology Manager heads the East River Electric Technology & Integration Committee and is part of the Cooperative Service Alliance through which participating East River Electric members benefit



from group procurement of supplies, services and new technology.

Mr. Powell was faced with identifying a solution that could overcome some of the challenges presented by Clay Union Electric's operating environment. These challenges included the low meter density and long distances between meters. The density/distance problem made traditional Power Line Carrier (PLC) and telephone line based systems difficult to justify from a cost/benefit perspective. Many of the remote irrigation pumps were too far from any road to run the prohibitively expensive telephone lines. PLC infrastructure, with an estimated cost of \$35-\$40,000 per each of Clay Unions Electric's eight distribution substations, made the initial investment in PLC infrastructure far too high. In addition, some PLC solutions didn't support three phase commercial and industrial meters. Clay Union was concerned about making large investments in telephone or PLC infrastructure plus high ongoing costs which would have a negative impact on member's electric rates given the payback period. It was clear an innovative solution had to be found.

### An Innovative Solution

Working with other members of the East River Technology Integration Committee, Mr. Powell introduced Advanced AMR Technologies (AAT). Located in Peabody, MA, AAT provides wireless mesh-to-Internet AMR and Energy Management solutions. AAT utilizes innovative long-range wireless-to-Internet mesh network technology that requires no phone lines, cellular or radio towers to communicate data and is uniquely suited for low-density, long range AMR and energy management.

The Advanced AMR system is composed of three primary components — remote Wireless Monitors, Wireless Concentrators, and EICS software. In the field, wireless Remote Monitors attach to meters and read data. Each wireless Remote Monitor, in addition to reading meter data, is a radio transceiver and repeater, sending and receiving data from other monitors. The data is hopped via other wireless monitors to Wireless Concentrators strategically located to collect data from numerous meters. The concentrators transfer the data via the Internet to the Energy Information and Control System (EICS).

The EICS platform is the heart of the Advanced AMR solution collecting, collating, and analyzing the energy management data. It also provides network management for the Wireless Concentrators and Remote Monitors. The meter reading data is collected at 15-minute increments and transmitted to the EICS server where it is made available for billing purposes. As an added benefit, the real time data is available via the Internet to individual Coop members to review, analyze and graph their energy usage on an ongoing basis.

### Partnership Yields Benefits

Through AAT, Clay Union Electric found a cost effective solution that met it's need for a low cost meter reading solution. Clay Union Electric's staff no longer had to take time and incur costs to read meters manually and they are no longer exposed to hazardous reads. Clay Union also provided the added customer service benefits of providing farmers with the ability to remotely check that their pumps were running and actually see their systems run on the Internet. Using the two-way capabilities of the AAT network, farmers can manage their pumps to reduce costs during periods of peak demand and shut down pumps or

remotely re-start them at the end of a control period. By offering these enhanced capabilities remotely, Clay Union's irrigation customers no longer had to travel long distances to check the status of their pumps.

Clay Union worked closely in an innovative partnership with AAT to develop AAT's current product offering to meet the needs of the industry. The \$54,000 pilot program called for the installation of meter reading equipment and radio transmitters for 250 of the Coop's most difficult irrigation, large power industrial and rural meter sites. Without Clay Union having to make significant investments in infrastructure to support the communication network, the AAT solution provided the same level of service at a fraction of the cost of other AMR alternatives. The AAT solution also allows Clay Union to share, via the Internet, the EICS platform with the other East River coops. Sharing meter data collection systems reduces the systems costs to members while the shared real time energy usage data allows the coops to better manage power quality service issues. Leo Powell stated, *"The AAT solution supports our need for a low total cost solution for AMR by eliminating most of the AMR infrastructure costs while providing remote monitoring to our members."*

### Award Winning Solution

So successful was the Advanced AMR/Clay Union partnership that the Cooperative Research Council awarded Clay Union Electric an "Innovators Certificate of Merit Award" at the NRECA/Touchstone Energy Connect 2005 Conference in the category of Distribution Cooperatives under 8,000 meters. The award recognizes leadership in adopting innovative technologies to improve customer service and satisfaction.

**About Advanced AMR Technologies** Advanced AMR Technologies, based in Peabody, MA, offers innovative solutions for Automated Meter Reading (AMR), Outage Management and other energy management services. AAT's wireless-to-Internet technology creates a reliable communications network that relays energy information in near real-time at a fraction of the infrastructure cost of other AMR systems and eliminates monthly communications charges. AAT solutions are based on patented AES-*IntelliNet* technology used in hundreds of thousands of locations in more than 50 countries worldwide since 1992. For more information visit [www.advancedamr.com](http://www.advancedamr.com) or call 978-826-7660.



Toll Free (866) 826-7660

285 Newbury Street Peabody, Massachusetts 01960 USA  
Tel: +1 (978) 826-7660 Fax: +1 (978) 826-7663  
Email [info@AdvancedAMR.com](mailto:info@AdvancedAMR.com) Web [www.advancedamr.com](http://www.advancedamr.com)

Copyright 2005 Advanced AMR Technologies LLC  
AES-*Intellinet* is a registered trademark of AES Corp.

CUEC/6/05/R1

AES Corporation is not in any way related to or affiliated with NYSE listed AES Corporation of Arlington, Virginia