

East River Electric Power Cooperative

Program Description

The East River member cooperatives' load management system has been operating for over 22 years and has saved almost \$90 million in avoided wholesale power costs. Over 60,000 different electric loads in homes, farms and businesses of member consumers throughout eastern South Dakota and western Minnesota are connected to the system. These loads include electric water heaters, air conditioners, irrigation systems and large industrial processes.



Control is initiated monthly through a highly sophisticated system that communicates with control receivers connected to the various loads. East River operates the system on an aggregated? basis on behalf of its member systems to moderate wholesale power costs, improve system efficiencies and provide member consumers with energy options.

To see the current status of East River's load management system, visit http://www.eastriver.coop/FTP/EREPC_lm_general.asp

Design Strategy

Demand Management Objective

Peak load reduction to avoid wholesale power purchases on behalf of the distribution cooperatives served by this transmission entity.

Customer Segment Targeted

Primarily residential with some farm and industrial customers.

End Use Targeted

Water heating, air conditioning, irrigation and large industrial processes that are able to shut down or switch to co-generation during peak demand times.

Decision-making Drivers:

Twenty-five years ago the East River System was experiencing farm closures and wholesale power cost increases which caused them to implement a Load Management system to control wholesale power costs. Since then, steady load growth has resulted in its allocation of power provided by Western Area Power Administration being reduced from 50% to approximately 25% of its entire load served.

Implementation Tactics

Customer Incentive Strategy/levels

Incentive levels are left to distribution cooperatives to determine.

Promotion/Marketing/Recruitment Activities

East River provides advertising and marketing programs that the distribution systems use. Most distribution cooperatives give customers a monthly bill credit in addition to offering water heater rebates to encourage customers to install larger, better insulated equipment like that manufactured by Marathon Water Heaters. As a result, most residential customers never know the utility is cycling their use. Industrial and irrigation customers are more aware because the utility may disrupt their service.

Customer Enrollment/fulfilment Process

Customers enroll through their distribution cooperative which sends staff to the customer site to install the load control equipment. The equipment is then operated remotely by East River system operators.

Roles

On-the-job training and experience has helped the system operators improve their ability to predict monthly peak based on historical use patterns and weather. Their goal is to target the maximum peak demand reduction possible without incurring end-user inconvenience.

As the SCADA indicates that East River is approaching its monthly peak load thresholds, dispatchers operate the master controller to send digital microwave signals to 48 injector sites. At these sites control pulses are injected onto the 115 or 69 kv (spell out) system to operate control receivers located at the end use. Loads to be controlled can be segmented to allow for cycling.

The master control unit is manufactured by Cannon Technologies, as are some of the system's newer high frequency plc (what does that mean?) receivers. Other low frequency plc receivers are manufactured by Brown Brevari and Zelweger and Enermet.

Results

How Measure Success

In 2006, East River reduced wholesale power costs to its cooperatives by about \$6,000,000.

Evaluation and Verification Activities

East River recommends that distribution cooperatives establish a maintenance program to visit the customer sites to inspect the operation of the load control devices once every 3-5 years.

Program Results to Date

Over the past 22 years, East River estimates it has saved almost \$90 million in avoided wholesale power costs. Over 60,000 different electric loads in homes, farms and businesses of member consumers throughout eastern South Dakota and western Minnesota are connected to the system

Lessons Learned

Key Success Factors

East River credits on-the-job training and years of experience with improving its system operators' ability to maximize peak load savings with minimal customer inconvenience. As a result, system operators have achieved sustained peak load reductions of 16 hours in duration while ensuring that no single customers' water heater is turned off for more than 4 continuous hours with sufficient time to "recharge".

Key Lessons Learned

Managing a load management system that extends across a 36,000 square mile territory can be a daunting task. However, enhancements in equipment performance have allowed East River to improve its response time from 20 minutes down to 2 minutes per occurrence.

Planned Program Enhancements

East River has the potential to load-control 80 megaWatt (MW) of electric heat customers but has not done so since 1994 due to a lack of power cost incentives. But this is being reconsidered as whole power demand profiles shift and rates change. Also, although the load control system communication is one-way, power line carrier technology today, East River is considering the integration of the load control equipment with the smart metering systems being installed by member cooperatives to achieve two-way communications.

To Learn More

Utility Overview and Key Contact:

**Tom Holt, Member Services and Marketing Manager, tholt@eastriver.coop,
Larry DeKramer, Substation & Dispatch Manager, ldekramer@eastriver.coop,
East River Electric Power Cooperative, (605) 256-4536, www.eastriver.coop**

East River Electric Power Cooperative is a wholesale electric power supply cooperative serving 20 rural electric cooperatives and one municipally-owned electric system. Its 36,000 square mile service area covers the rural areas of 41 counties in eastern South Dakota and nine counties in western Minnesota.

Trade Ally Overview and Key Contact

**Charles Parsons, Director Demand Response Solutions, cparsons@cannontech.com,
Cannon Technologies/Cooper Power Systems, (763) 543-7776, www.cannontech.com**

Cannon Technologies was founded in 1987 to deliver software for load management and automated distribution to electric utilities. Today, Cannon Technologies' customers include nearly 400 electric utilities across North America. Its systems are used by many of the country's largest utilities to manage peak load, improve system power factor and improve substation reliability.