



**Uniting the Best Interests of  
Utilities and Consumers**  
Case Study:  
Wake Electric Membership Corporation



Wake Electric Membership Corporation in Wake Forest, N.C. is a rural electric cooperative that provides energy and related services to more than 34,500 residential and commercial members in 7 North Carolina counties. Wake Electric represents 55,000 Heating Ventilation Air Conditioning (HVAC) units, water heaters and pool pumps, which are high energy consuming devices.

Today, Wake Electric purchases power from North Carolina Electric Membership Corporation that in turn buys power from Duke Energy and Progress Energy. Wake Electric sought to create a more efficient and environmentally responsible electrical grid. The goal was to improve demand forecasting and manage peak loads while ensuring their members were able to control their comfort level and save on energy bills. The need for a real-time Advanced Metering Infrastructure (AMI) system, integrated control software, the ability to meet renewable legislation requirements and backhaul led them to implement Consert's Energy Management Solution and test its effectiveness in a pilot program.

"Smart grid is the way of the future, and fits into Wake Electric's long history of helping its customers manage energy use and become more energy efficient."

- Jim Mangum, CEO of Wake Electric

Working closely with Consert, Wake Electric conducted this pilot program with 100 members in its service area. The Consert Energy Management Solution is based on a wireless smart grid technology which allows members to conserve energy and offer it back to Wake Electric as a source of capacity and energy reserves. Within two weeks of announcing the pilot program, Wake Electric received responses from more than 200 members willing to participate.

## Why was it Wake Electric's time for change?



Wake Electric saw the need to look at new technologies that could manage loads more effectively, especially in periods of peak demand. It sought sources of capacity to provide flexibility and reliability, in addition to helping improve its planning needs.

"Our goal for this project was to provide customers with improved energy use information and automation. We wanted to give customers the ability to use a new technology to have choice and control over how they use energy."

- Don Bowman, Wake Electric Manager of Engineering

The cooperative also needed to put practices in place to comply with North Carolina's Renewable Energy Portfolio Standards legislation which mandates it must meet 10% of its energy needs through renewable energy resources or energy efficiency measures.

An assessment of its existing energy landscape and member needs led Wake Electric to seek a comprehensive smart grid solution.

Wake Electric knew its members' needs were simple - keep the lights on, keep rates low and keep providing excellent service. It saw the opportunity to meet these requests by moving beyond an AMI-only solution to a demand side management solution.



## An Outstanding Outcome

Wake Electric and Consert completed a successful 8-month smart grid technology pilot that **achieved all intended goals including actualizing operating reserve capacity through Consert's Energy Management Solution as well as tracking renewables. Pilot participant energy savings throughout the program relative to non-participating members was approximately 6%.**

## Addressing Wake Electric's Needs

Wake Electric and Consert jointly wrote the pilot test plan following specific goals to demonstrate the significance of the Consert Energy Management Solution. Goals assigned to the pilot included:

- Meet member needs: keep power on and rates low
- Offer an energy management system for members to utilize
- Measure and verify reductions in energy usage
- Measure and verify energy savings

Consert hosted a specialized operations center configured for evaluation purposes including a Customer Service Representative Utility Portal which gave Wake Electric a range of capabilities.

### **Interruptible Loads; start, edit & stop control events**

The ability to initiate control events to adjust member loads with real-time feedback allowed Wake Electric access to data to improve demand forecasting, outage and asset management. During the event, Wake Electric could manage Control Group energy usage to shed load for the duration of the event by powering down assigned devices or letting them drift to the maximum or minimum temperatures as assigned by the member. If members found the event interfering with their comfort, they could opt out at any time using either the Opt Out button on their online member portal or by adjusting their thermostat.

### **Manage Members**

Wake Electric was able to easily search for, edit and add member records. Members also could be activated and deactivated as needed.

### **Read Power Meters**

By reading electric meters remotely in real-time, Wake Electric could generate reports showing current kWh values for individual and selected groups of meters based on its billing cycle.

### **Create Utility Reports**

Generating reports through its portal, Wake Electric could summarize and gather detailed information about members, control events and device usage.

### **View System Load Profile**

Wake Electric could view a graphical representation of system energy consumption incrementally over 24 hours projecting loads based on the analysis of previous days' energy consumption and outside air temperature forecasts.

### **Smart Grid/AMI Features & Operational Benefits**

During the pilot, Wake Electric was able to read meters more effectively and in real-time, collect and use data to increase reliability, present energy usage information to members and empower them to manage their energy consumption. Going forward, Consert will be able to integrate its database with Wake Electric's billing software provided by National Information Solutions Cooperative (NISC).

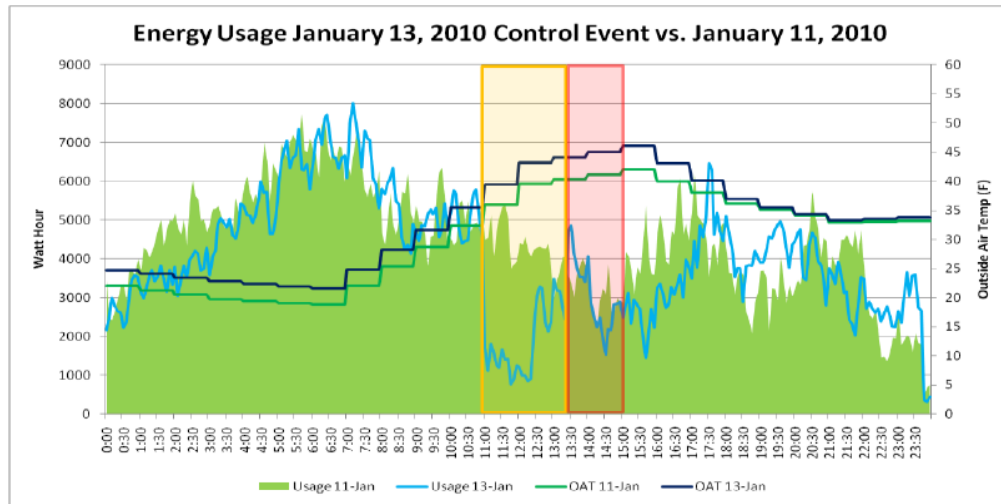
## Taking Control

Wake Electric ran a control event capturing energy usage on two climatically comparable days. The first day served as a reference day and the second as a control day in which the Consert Energy Management Solution was demonstrated.

“Our pilot participants perceived energy savings ranging from 7 to 54 percent with an average of 19 percent and responded favorably about the ease-of-use of the Consert Solution.”

- Jim Mangum, CEO of Wake Electric

By systematically adjusting pilot participants' devices to power on or off within the approved parameters each participant had set, Consert was able to demonstrate **an energy reduction of 38.71% and savings of 73.04 kWh over a time period of 2 hours and 26 minutes**. Consert also was able to **account for and report 248 lbs. 3.38 oz. of carbon credits saved during the control event**.



## Beyond AMI

Additional benefits the Consert Energy Management Solution provided Wake Electric included:

- Operating reserve capacity through the Consert Virtual Peak Plant
- Flexible, real-time and measureable and verifiable capacity
- Eliminating the need for permits, due to the use of existing wireless infrastructure

## Adding Value

In addition to the operational benefits demonstrated through the Consert Energy Management Solution, Wake Electric was able to add value to their service offerings for members including:

- Empowering members to gain knowledge and take control of their energy consumption in real-time; **98% of members reported that they were more aware of their energy usage**
- Achieving an average monthly energy savings
- Educating members on their energy usage in terms of their carbon footprint
- Offering web-based remote access and an easy-to-use, secure portal to manage their personal energy management programs

“I am saving energy that I didn't know was being used. I thought we were saving energy pretty well but with this new system we really do save money. I love this system and I hope we keep it.”

- Wake Electric Pilot Participant

## A Look Ahead

Wake Electric is finalizing plans with Consert to commercialize its solution for voluntary adoption by all interested residential and small commercial members.

## View from the Top

“The Consert Solution provided us with the unique opportunity to leverage energy conservation as generation and harness it in a way that will meet our capacity needs,” said Jim Mangum, CEO of Wake Electric. “Paired with the valuable benefits we can now offer our members, these capabilities make Consert the ideal partner for creating our smarter grid.”

“Satisfaction among our members was extremely high,” reported Don Bowman, Wake Electric's Manager of Engineering. “At the same time, the utility was able to collect more data more quickly than ever before. It's the kind of information we used to get only once a month by sending out meter-readers. Consert offers a complete solution that we should adopt.”



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