
AMI (“Smart Meters”) Coming To Your Co-op

WEC to Launch Automated System over the Next 18 Months

Sometimes it pays to be a leader. Washington Electric Cooperative has been a trail blazer in many ways – from breaking the economic grip of Seabrook (with its cost overruns) on New England utilities in the 1990s, to promoting energy efficiency and conservation when other utilities were still trying to get their customers to buy more power, to terminating its Vermont Yankee contract in 2004, to constructing its own methane-fueled generating station in 2005.

But sometimes it pays to be a follower. In the matter of “smart metering,” WEC’s Board of Directors chose to

let other utilities go first. Washington Electric’s sister co-op, Vermont Electric Cooperative, has been Vermont’s leader in creating a system-wide “smart grid”; begun in 1990, VEC’s conversion is now about 90 percent complete.

“We have admired VEC’s trailblazing work on this issue,” says WEC Manager Avram Patt. “For ourselves, though, we chose to watch the development of smart metering and wait for the technology to prove itself, while putting our energies elsewhere. That’s what we have done for the past 10 years.”

However, it’s now time to take the leap. “Smart grid” technology is the wave of the future, a future so immediate that it’s already here. It’s a

system of two-way digital communication between electric utilities and the meters installed at the homes and businesses of their members/customers. Rather than sending electric power out to those members and then having people drive out to

Vermont’s co-ops are using a “wired” technology called Power Line Carrier; the power lines themselves will carry meter information back to the central computer, so homes will not be equipped with transmitters.

read their meters once a month, members’ usage information will be sent electronically back to the Co-op, and recorded, several times a day. The advantages of this steady two-way communication are compelling for any company that wants to reduce the time involved in locating outages so that members’ power can be restored more quickly and cost-effectively, to help its members conserve their electricity, and to provide the most modern electric service available.

And it’s time for WEC to take the leap because the federal government will pay 50 percent of the \$2 million cost of WEC’s upgrade, through the 2009 American Recovery and Reinvestment Act (known as the “stimulus bill”). WEC will cover the balance of approximately \$1 million through its 2012-2015 Four-Year Construction Work Plan, the standard loan program for the nation’s electric co-ops. The construction-and-maintenance loans are financed by the U.S. Department of Agriculture’s Rural Development Electric Program.

The ARRA’s contribution – which is

not a loan, but a federal grant provided to a consortium of Vermont utilities – is an opportunity that won’t last forever. WEC Operations Director Dan Weston explained the schedule to Co-op members who attended Washington Electric’s community meetings in Moretown and Williamstown in October.

“Through the ARRA we have until April 2013 to get the job done,” said Weston. “Being frugal Co-op people, we’re going to have it on line, on time.”

Primer on smart metering

“Smart metering” – or AMI (Automated Metering Infrastructure) – was Topic Number One at the Co-op’s Moretown and Williamstown meetings. The annual October meetings give WEC’s members and leadership an opportunity to socialize and to trade information and opinions on WEC’s practices and policies. At this year’s meetings the discussion ranged from rate increases to sources of power to the flooding last May of Washington Electric’s office building, and more (see story, page 5). But the message the Board and staff carried to the meetings was that the changeover to smart metering is set to begin.

General Manager Patt began with an explanation. There can be many aspects to a fully developed smart grid, Patt said, “But for everyone in this room the change will come in the form of a computer chip inside the electric meter at your home or business. If you have a digital meter, in most cases we’ll just be able to install the new chip. If you have one of the older, analogue meters, it will be replaced.

“The primary benefit we will all receive will be a quicker restoration of power after outages, because it will take the Co-op less time to locate the cause. We’re a rural Co-op,” he reminded people, “so we’re not going to put an end to outages because they happen on a rural system. But we’ll get our crews to them more quickly and have the power on faster. And that means it will cost us less.”

Weston explained how that will work. The distribution system has hundreds of fuses upon its lines, and like fuses and breaker switches in people’s homes they are designed to be weak points on the system, to disconnect when there’s a power surge or interruption caused, for example, by a tree falling on the lines.

“When you lose power, nine times out of ten it’s a fuse,” Weston said. By disconnecting, the fuse protects members who live closer to the substation from losing their power, too.

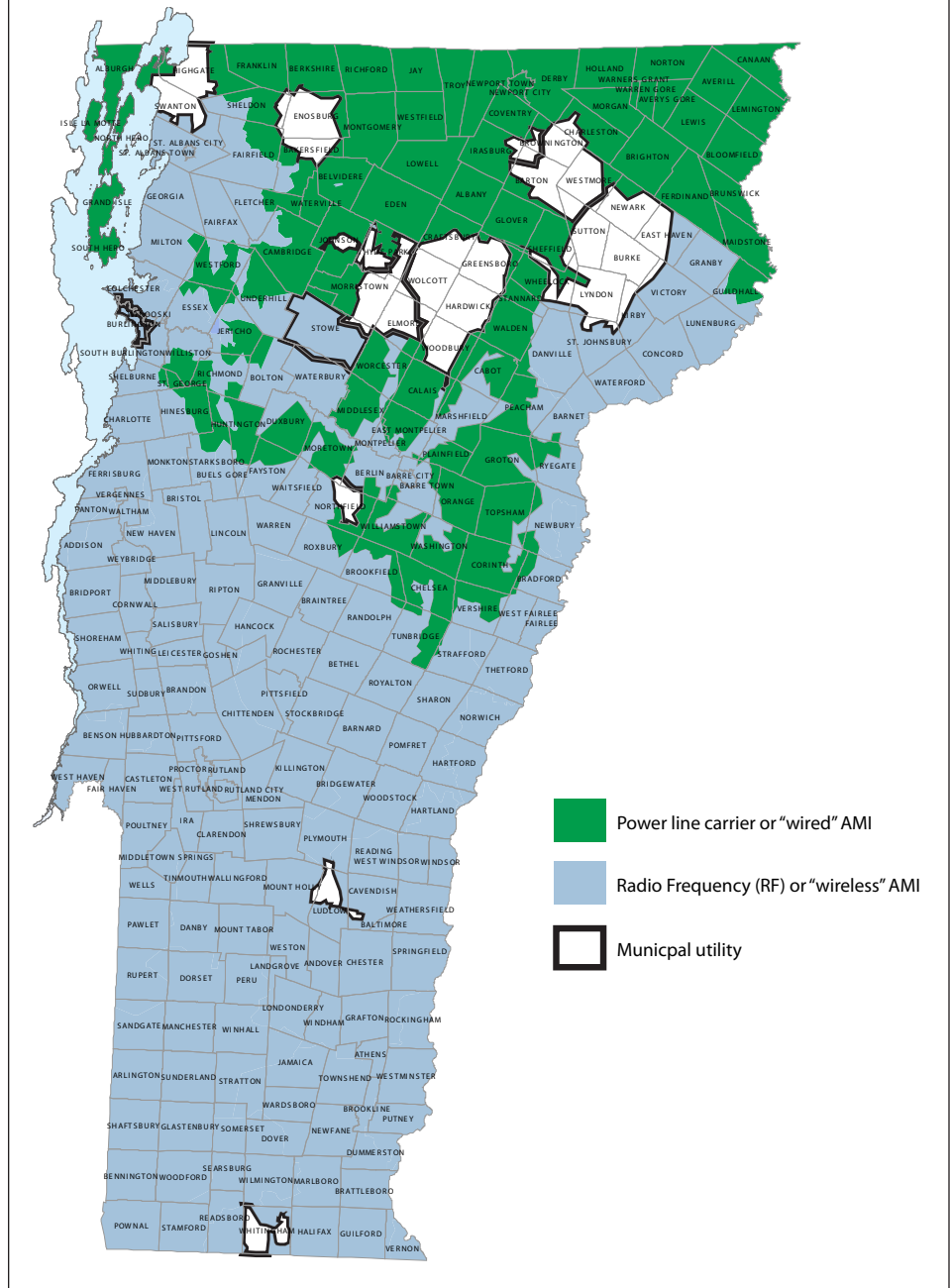
WEC needs members to call and report their outages, which won’t change under AMI. But by testing (Weston said “pinging”) people’s meters from the substation, linemen will be able to identify more quickly which meters aren’t pinging back – the two-way communication enabled by smart metering. Comparing that information to WEC’s computerized mapping system will then enable them to detect the disconnected fuse. That narrows the search for what caused the fuse to break in the first place.

Actually, WEC has some of these capabilities now, through similar but less-advanced technology. But with AMI’s two-way communications Co-op technicians will be able to locate problems without gathering as much information as the present system, so it will provide results far more quickly.

Weston added that members whose lights flicker at certain times of the day will also benefit from AMI. Once they report the condition, WEC’s technicians

Vermont 2011 Automatic Metering Infrastructure (AMI) Communication Platforms

“Wired” vs. “wireless” (power line carrier vs. radio frequency)



can study the information sent back from the meter and analyze whether there’s a loose connection somewhere, or the voltage is inconsistent, or another “load” is impacting power quality.

“Otherwise what we need to do is send out a crew to monitor your home for an hour sometime while you’re

there, and perform an outage or two for diagnostic purposes. It’s much less convenient,” said Weston.

Patt addressed an issue that’s important to some electric customers – how the electronic data get communicated. He displayed a state map with green and blue areas, the green representing the service

territories of WEC and VEC – Vermont’s electric co-ops – the blue where investor-owned utilities Green Mountain Power and Central Vermont Public Service operate. The latter (the IOUs) are implementing “wireless” radio-frequency (RF) systems for electronic communication, so there will be transmitters at people’s homes and businesses. The co-ops are using a “wired” technology called Power Line Carrier (PLC). That means the power lines themselves will carry meter information back to WEC’s central computer, so homes will not be equipped with transmitters.

“We’ve been watching AMI deployment, here and around the country, for ten years,” Patt said, “not wanting to jump into this until we knew what we wanted to do. We think that Power Line Carrier is a better technology for our system, and that’s what we’ll be using.”

The manager also spoke to another issue that has arisen for some people – basically, a concern over how much other people, including their power companies, know about their electricity consumption. Patt said that Washington Electric will offer a “functional opt-out” of the AMI system. The Co-op will put smart meters in all members’ homes and businesses to compile a record of their usage, which is necessary for billing purposes; but if they choose the “opt out” WEC will electronically read their meters just once a month so they can be charged for their power. (There will be no more manual meter reading on the Co-op’s system.)

Besides the Co-op, the people who stand to gain the most from the data accumulated by the utility are the members themselves. Member Services Director Bill Powell explained that people will be able to see the

same usage records the Co-op uses, by going to a password-protected web site and logging onto their individual accounts. (He emphasized that no one else will have access.) Powell also pointed out the limits of the system: The records will show, with an hourly bar graph, how much power the member’s home is using, but it

“The primary benefit we will all receive will be a quicker restoration of power after outages, because it will take the Co-op less time to locate the cause. And that means it will cost us less.”

— Avram Patt

will have no way of showing what “loads” in the home were in use when the consumption increased or decreased. For that, further analysis is needed (and you can call Powell at the WEC office for assistance). But tracking the hourly usage provides a great starting point for members to begin to reduce their power consumption and lower their electric bills.

Deployment of AMI will also pave the way for further innovations, should WEC and its members choose to pursue them. One possibility is to expand the Time of Use Rates, a system for charging different electric rates at different times of the day, which would enable members to operate high-usage appliances like clothes dryers during hours when the power would be less expensive. Expanded Time of Use rates are not in WEC’s immediate plans, but they could become an option for WEC members after the AMI system is in place and operational.

“There are future capabilities we aren’t even looking at yet,” said Patt. “They could be significant advances for us and our members somewhere down the road.”

FAQ (Frequently Asked Questions)

WEC members at both community meetings had questions about AMI. Here is a sampling.

How are you going to get started with this?

Weston said the Co-op will begin at the substations, which must be equipped to transmit the information between members’ meters and Co-op headquarters. Meters will then be installed at homes connected to those substations. The process will begin this winter in East Montpelier, the closest substation to WEC’s headquarters and workforce, which is favorable for launching a new technology.

Will AMI be able to provide internet service to the house?

Powell answered that it would not. “It will be providing only quick blips of digital information back to the Co-op – not enough bandwidth for downloads to your computer.”

How often will data be collected?

Powell said that the system will collect the data hourly, but transmit that collected information back to the Co-op only about three times a day. It will not be a constant back-and-forth.

Will the Co-op be adding IT staff (and therefore, payroll)?

Patt said WEC’s workforce would remain about the same size as now, though with turnover people with more IT-related skills might be brought on, reflecting the change in the industry.

WEC member and State Representative Sue Davis, of Washington, pointed out at the Williamstown meeting that the statewide adoption of AMI will mean that meter readers will lose their jobs. (WEC does not directly employ meter readers; the Co-op contracts with a company for those services.)

WEC President Barry Bernstein acknowledged Rep. Davis’ concern.

“We are sensitive to the point you’re raising,” he said. “There will be a loss of these part-time jobs for some Vermonters. It’s a trade-off for the benefit of providing better services for our Co-op members.” 