



Reducing pollution by going green on a commercial level

ELM Energy boosts the ROI of renewable energy by simplifying microgrid management and improving resource utilization with a smart gateway based on Dell IoT solutions.



Customer profile



Company	ELM Energy
Industry	Energy
Country	United States
Website	www.elmlc.com

Business need

ELM Energy wanted to make independent energy sources — including solar panels and turbines powered by wind and water — an affordable and reliable option for more customers.

Solution

The company built an innovative, microgrid control solution based on an intelligent Dell Edge Gateway that's device-agnostic, affordable, reliable and fast enough to provide real-time insight and control.

Benefits

- Reduces pollution and energy consumption
- Makes renewable energy viable for a diverse customer base
- Boosts ROI and minimizes risk by ensuring local, centralized control
- Speeds time-to-market of an innovative offering
- Supports numerous protocols and devices

Solutions at a glance

- [Application & Data Integration](#)
- [Internet of Things](#)
- [OEM Solutions](#)

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Aron Bowman, Vice President of Product Development, ELM Energy

For nearly a century, public grids have powered industrialized nations. However, pollution and reliability concerns, as well as the need for power in remote areas, are fueling innovation in distributed energy systems, or microgrids. These solutions supplement or replace grid power with electricity from generators, solar panels, wind and water. Despite significant interest in microgrids, adoption has been slow because the solutions have been difficult to manage.

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ELM Energy helps global organizations be energy independent with custom solutions that include microgrids built with third-party components, such as wind turbines, microturbines and solar panels. Until recently, one of the biggest challenges ELM Energy and its customers faced was the significant time required to manage and tune solutions to boost efficiency and resource utilization. That’s because each component had a dedicated control panel and used different technologies for sensors and communications. Aron Bowman, vice president of product development at ELM Energy, says, “There wasn’t a control solution out on the market that pulled together all the different components so that they operated as one system. We decided to develop a console that allowed us to monitor and control different assets.”

Breaking barriers requires a new kind of device

ELM Energy began developing the software for its visionary product, which it called FieldSight Controller. To facilitate real-time monitoring and control of distributed systems in any geographical location, the company needed a device that could operate in all climates, as well as connect to disparate components using ports common in industrial solutions such as CANbus and Modbus. The device also needed to collect data from a variety of industrial protocols, filter it, and send only specific information to a remote database to facilitate management. To minimize costs for customers, the device had to be affordable. And to deliver excellent

customer service, ELM Energy needed to get the device from an original equipment manufacturer (OEM) that provided high-quality products, rapid order fulfillment and reliable services. For years, the company was unable to find a device that met all of its requirements.

Gains the technology needed to facilitate innovation

The doors of opportunity opened for ELM Energy with the emergence of the Internet of Things (IoT). Company engineers immediately contacted leading vendors including Dell to see what IoT solutions were in development. “We realized we could finally build the type of microgrid control solution we wanted with the Dell Edge Gateway

Products & Services

Services

Dell OEM Services
Dell ProSupport

Hardware

Dell Edge Gateway Model 5000 with Intel® Atom® processors
Dell PowerEdge R730 servers
Dell laptops

Partner

Windows operating system
Wind River Linux operating system

Model 5000,” says Bowman. “We’d be able to use it to connect four or five different components and then control them with our FieldSight Controller software. And the gateway can live in harsh environments with wide temperature swings.”

In addition, Dell Edge Gateway devices feature expanded input/output connectors so customers can scale networks without having to use expensive dongles to connect the gateways to other devices. And the intelligent gateway’s dual-core Intel® Atom® processors deliver the performance needed to process large amounts of data locally at the network edge, close to sensors. They can also operate in low-power environments, and they support Wind River Linux and Windows operating systems.

Commenting on other third-party IoT gateways, Bowman says, “Devices with similar capabilities couldn’t give us the competitive cost point we needed to scale our solution. Other companies also approached us with their products, but they didn’t give us the confidence that they could deliver on a commercial level the way that Dell can.”

Reduces risk by using IoT technology

By building its product on a Dell Edge Gateway, ELM Energy can provide its customers with greater reliability and fewer dependencies. “Controllers that can’t filter non-useful data at the network edge end up with a flood of information coming back to the database, so then network speed and reliability become critical,” says Bowman. “With our FieldSight Controller, the internet connection can be slow and even be lost, but the system will still operate as it should because our automated monitoring and management processes will be running on the Dell Edge Gateway, right alongside the equipment.”

Speeds time-to-market

ELM Energy has done what it can to develop its solution as quickly as

possible. “We’ve worked closely with Dell engineers to understand the functional capabilities of the Dell Edge Gateway,” says Bowman. “Dell’s entire OEM Services team is also fantastic to work with, and we’re talking to them about options for customizing device settings. Our Dell sales team has provided us with excellent support, too. For example, just last week our Dell account manager actually came to a customer meeting with me. So, across the board, the different teams at Dell have been really great about working with us to get our solution to market.”

Makes “going green” viable for organizations

ELM Energy’s FieldSight Controller provides the insight and control that companies need to use microgrids to supplement or replace power from public grids. “We make going green an easier option with our FieldSight Controller on the Dell Edge Gateway Model 5000,” says Bowman. “It can connect and capture data from all kinds of systems including banks of solar panels, lithium ion batteries, windmills and water turbines — as well as device sensors that monitor vibration, temperature and RPM readings. Operators can see the information they need in real time from the web-based management console.” They can also configure automated management processes as well as alerts via text, email and phone.

Boosts ROI and cuts toxic emissions

ELM Energy is working with a company that has relied on diesel generators to power a marina and 100 homes on an island in the Caribbean. “This organization had invested in solar panels, but then saw no value from it,” Bowman says. “We showed the company how it can cut harmful emissions by 90 percent and utilize its solar investment by deploying our FieldSight Controller that runs on the Dell Edge Gateway Model 5000 — and by adding some batteries and replacing two diesel generators with a natural gas generator. At all times, our system shows how much power

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the solar panels are generating and how much power is in the batteries, so the generator only fires up when it's needed. And no one on the island sees power blips, because the transition between components is smooth. The organization will also save money, because it will use less gas, plus natural gas is cheaper than diesel."

Gives customers more options from one vendor

By working with Dell, ELM Energy can tap the expertise of the Dell OEM team to help create partial or end-to-end IOT solutions for customers that include various services and technologies, including networking, servers, client devices, security and analytics. "We can bring a complete ecosystem of solutions to market with Dell," says Bowman. "For example, some customers prefer to manage their own data instead of using our cloud, so we're talking to them about loading our database software on Dell PowerEdge servers which they would keep onsite. Other customers are interested in using a Dell Latitude Rugged laptop to connect directly to the Edge Gateway and control the solution onsite with a touch screen."

Supports diverse requirements and future growth

To support and facilitate demand, ELM Energy is talking to Dell about future options. "As we start to roll out our FieldSight Controller solution in mass quantities, I don't plan on having a lot of employees in the back of the building installing software," Bowman says. "We want to use Dell OEM Services to deliver the Edge Gateway devices with our software already loaded. We may also have Dell add the ELM Energy logo to

devices' faceplates. We're not sure about this yet, though, because there's value in keeping the Dell name on our device. It's a brand our customers trust."

ELM Energy is also planning to tailor its solution in other ways. "What's fantastic about building our FieldSight Controller solution on the Dell Edge Gateway Model 5000 is that we have a single hardware platform that we can scale up and down to support different customers' requirements, as well as new applications that can deliver additional reporting and monitoring capabilities," says Bowman. "It's just nice to finally be able to merge operational and IT efficiencies by using IoT devices from Dell, to achieve the kind of energy innovation that we've all wanted for a long time."



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