

# SmartGrid Pilot Home

## How SmartGrid Works for a Homeowner Inside the Home

by Suzanne Lauer



SPONSORED BY:

## GRIDPOINT

It has been in our local paper and on the national news all year—Xcel Energy announced Boulder to be the first fully integrated “SmartGrid” city in the nation. So what will that mean for residents of Boulder? One family in Boulder knows. The McKenna family is learning firsthand, as they pilot the in-house aspects for one of Xcel’s partners, clean tech company GridPoint. To test different options for SmartGridCity™, several homes in Boulder will be retrofitted with various levels of GridPoint’s SmartGrid technology platform, which offers household energy management capabilities that benefit consumers as well as the electric grid. These include control of certain essential circuits, such as automatic lowering or turning off of air conditioning and hot water heaters; clean, battery-based backup power; and management of solar PV panel production. All of this helps maximize grid efficiency, savings, and environmental benefits.

One of GridPoint’s most exciting features is an online energy management system designed to take the mystery out of household energy usage. Everyone in the test homes will have access to this easy-to-use Web portal, which empowers homeowners to understand and control their consumption, resulting in increased efficiency, reduced costs, and a smaller carbon footprint.

GridPoint’s portal allows homeowners to create a personal energy profile to automatically monitor devices in the home that consume large amounts of energy, such as air conditioners, water heaters, and pool pumps, and to choose to run these appliances during off-peak hours. By analyzing a utility rate schedule against a customer’s current and historical energy consumption patterns, GridPoint provides the information necessary to use energy cost-effectively. This also saves the environment by lowering “peak demand,” which, if SmartGrid technology becomes

widespread, will reduce the number of new power plants needed. GridPoint also leverages historical energy consumption patterns to estimate the hours of backup power available in the event of an outage. For those with solar PV, like the McKennas, the portal allows for monitoring and management of their energy production, resulting in even more efficiency and savings.

Here’s how the McKenna’s home looks:

They have a 5.6 kW solar electric system. The PV system includes GridPoint’s battery backup with 10 kWh of storage connected to the GridPoint SmartGrid technology platform. When the power does go out, the GridPoint system runs only essential loads that have been carefully selected. For the McKennas, it means “keeping them warm and keeping stuff cold:” the refrigerator, furnace, electronics, electronic outlets, and some lighting.

Their house is connected to a meter that monitors the whole home’s energy consumption, in addition to seeing the energy produced by the solar PV system. The model they are testing gives the bigger picture of how energy is used in the house on an hourly basis. In real time, the GridPoint system shows how much energy is produced by the photovoltaic (PV) panels vs. how much energy is purchased. The system automatically sends reports on consumption, production, battery backup, and CO2 reductions. Their information is uploaded to the Web portal so that they can see, for example, how the steam shower creates a spike in energy use. As Andrew McKenna observes, “It has been great for empowering our family. It has changed our behavior. You don’t realize how much it [an appliance such as the steam shower] really sucks up juice until you see it. It definitely make you think about where the electricity gets used, so much so that our two small children, both under 7, have become our environmental police.” •

**Year Built, Remodeled:** 1954, 2000

**Home Size:** 3,000 sq.ft.

### Contractors:

- GridPoint (SmartGrid Technology Platform) (See ad on page 32)
- Bella Energy (Solar Thermal and PV System) (See ad on page 8)

**GridPoint Features** (not all are installed at the McKenna Residence):

- **Online Energy Management**—GridPoint Customer Portal, a password-protected Web portal, enables customers to reduce energy consumption according to their individual preferences. The portal also provides easy-to-understand environmental data based on an individual customer’s conservation efforts.
- **Advanced Demand Management**—Measures, controls, and verifies select loads (e.g., electric water heaters, pool pumps, home appliances) as well as adjusts thermostats within a few degrees
- **Supply Management**—Provides capacity and energy by discharging power to the electric grid from advanced batteries (including plug-in hybrid electric vehicles) or distributed solar systems during peak periods, as well as recharging batteries from solar systems or the electric grid during off-peak times
- **Solar PV Integration**—“Plug-and-play” integration and operation of residential and light commercial solar energy systems, paving the way for the commercial success of renewable energy
- **Instant Backup Power**—Provides clean, instant backup power through advanced batteries
- **Performance Monitoring and Customer Support**—Remote performance monitoring of distributed energy resources that preemptively addresses maintenance needs.

To learn more about Xcel Energy’s SmartGridCity™, please see [www.xcelenergy.com/smartgrid](http://www.xcelenergy.com/smartgrid), which provides educational materials and graphics illustrating Xcel Energy’s SmartGrid vision.