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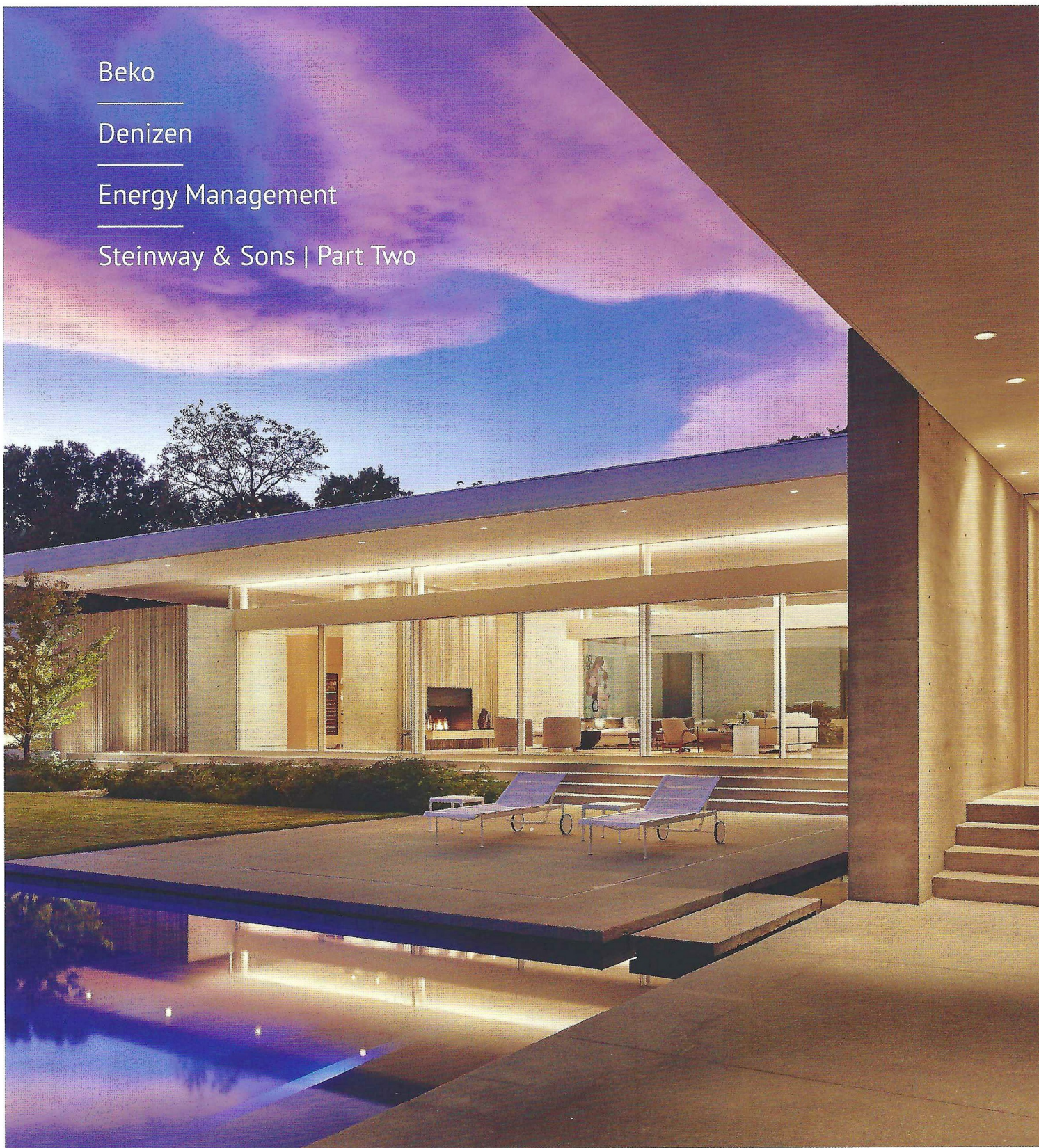
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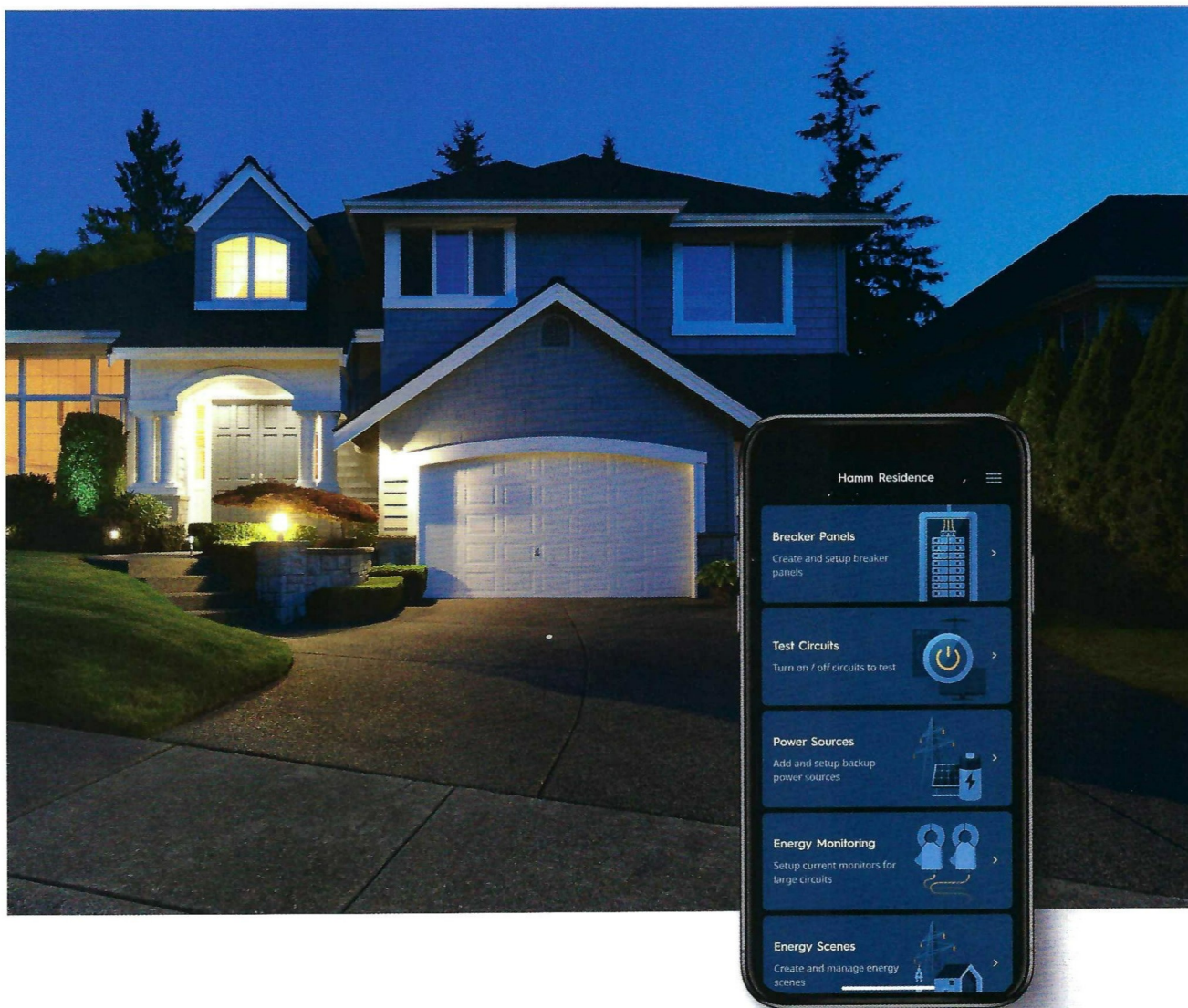
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SMART ENERGY MONITORING AND MANAGEMENT

BY STEVE PANOSIAN



WE LIVE IN NORTHERN NEW JERSEY WHERE WE EXPERIENCE POWER OUTAGES from time to time. We are located in the beginning leg of about thirty homes up a mountainside and losing power, cable and fiber requires a backup solution. When we lose power, it means all of us have lost power, and because none of us have natural gas, we are limited to gasoline-powered backup generators. Although some of our homes are heated with propane, propane is not economical to run a generator for an extended period of time. This

problem, and the rising cost of energy, have brought me to consider residential power storage and smart breaker panels as a smart investment. These two solutions, when combined, are increasingly becoming more popular and being able to set smart energy scenes via the intelligent breaker switches in combination to charging batteries during off-peak hour rates is a powerful alternative compared to the whims of most regional power grids.

energy management

Personally speaking, with gasoline, energy and its impact on all costs skyrocketing, we are forced to revisit smart power breaker panels, power storage for backup and cost savings, and ultimately adding solar power. I like the idea of a smart circuit breaker monitoring power usage and collecting the status of each circuit throughout the day, week and month. While I am focused on cost savings and using less energy, the most basic home energy monitors that simply track how much electricity you use are not the final solution. It's the newer and slightly more expensive class of "smart" energy usage monitors for the home that are designed to measure where the energy usage is predominant. These smart energy monitors learn to differentiate the usage data and also help make decisions on the best time to run certain appliances. A daily schedule shifting and optimizing what's automated could very easily manage when a washing machine and dryer or charging an electric car would make sense to run — these are most efficient at the nighttime off-peak electricity rates. Or manage to power these events using the stored backup power if needed during peak hours. That's what real energy management looks like.

what's a smart home without a smart circuit breaker?

Leviton, the popular manufacturer of electrical devices has introduced their smart circuit breakers for homeowners that are looking to enjoy remote energy management options such as real-time monitoring and tracking, remote tripping and system updates, and alerts sent via their app to a personal communication device. The interesting features support a variety of the things most homeowners might be interested in knowing about, like what's possible by integrating smart technology directly into the breaker box and individual circuit breakers, as well as:

- View real-time energy consumption: total aggregate, individual circuit, or trends by day, week, month and year
- Calculate your approximate total energy cost per month
- At a glance system status
- Receive alerts — critical circuit tripped, appliance ON (like an oven), no power (like a refrigerator)
- Set schedules, create activities, and AI voice control with Amazon Alexa and Google Assistant

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Electricians have attested that the Leviton installation design is very easy to upgrade from their standard circuit breakers to their advanced smart circuit breakers, and the reduced installation time is a major part of the appeal.

what else could we teach a circuit breaker to do?

Eaton, another major player in electrical devices, began a first-of-its-kind energy management field test in collaboration with the Electrical Power Research Institute (EPRI) and utility providers across the country. At its core is a circuit breaker that thinks and acts more like a smartphone. And it's poised to reset the way consumers manage their home energy use and fundamentally change the way we think about the electrical grid. Exploring innovative technologies that can benefit homeowners through the installation of smart breakers, Eaton's vision for the Home as a Grid is an approach to energy management that will ultimately enable homeowners to leverage renewables and storage and with the investment into solar, potentially supply power back to the grid.

"When we gather energy data and find patterns in how homeowners use energy, we can identify opportunities to reduce energy usage, balance EV charging and other loads in the home, and support integration of solar and storage when a homeowner is ready to upgrade," said Jennifer Ploskina, Eaton connected solutions segment manager for North America. "The goal is to work with EV, solar and storage OEMs, utilities and ecosystem partners to build system solutions

that benefit homeowners, support grid stabilization, and lead to further decarbonization in homes and buildings."

In the "grid of the future", managing the load is becoming just as important as managing energy at the source. To keep costs down and service levels up, consumers become a critical piece of the energy puzzle. Demand response programs to better manage energy usage require actively engaged consumers and highly connected homes.

Interestingly, Eaton sees that smart home technology has done a lot to open consumers' minds to new ways to increase their comfort while saving them money and energy. Inspired by the success of companies like Nest, the smart home market has been surging in recent years. In fact, some reports estimate it will be worth \$50 billion by 2026. And with the rush of new market entrants comes a tangle of new devices and new home networks, all different vendors, all running on different platforms and all generating data that utility companies can't see or use.

To really make a difference in energy efficiency, it's important to understand where electrical loads live. Approximately 80% of a home's electrical load is concentrated on a small number of dedicated circuit breakers, including the water heater, major appliances and HVAC systems.

Consumers are finding that smart thermostats like the Nest "learning thermostat" help them realize how technology can assist homes in adapting to their lifestyles while saving en-

ergy. Imagine the same thing, not just for the thermostat, but for 80% of the home's electrical load? Today, Eaton is moving quickly to do just that, making circuit breakers intelligent, responsive and more critically important than ever.

the Savant power system

No stranger to the world of smart home control and management technology, Savant is becoming a brand name that continues to move forward in providing solutions that are evolving in stride with consumer demand and requirements for installation compatibility and simplicity. From basic lighting to automated home control to power monitoring and storage, the Savant Power System is a complete energy management solution that provides utility-grade energy monitoring and circuit-level control. Paired with the Savant mobile app experience, homeowners can make intelligent energy choices based on weather conditions, time of use pricing, and the ability to manage their future energy sustainability investments.

What I find most attractive is the integration and scalability of almost everything we have talked about in this article, and more:

- Scalability – manage a couple of circuits, then extend to the entire home
- Non-proprietary installation compatibility with most breaker panel manufacturers
- Compatibility with generator and energy storage solutions
- Real-time energy monitoring
- Energy production and consumption history
- Flexible Load Management
- Energy insights
- Energy selections have custom settings for Eco, Power Outage, and Away modes
- Time of use mitigation

It is Savant's philosophy to place the most important design objectives top of mind is a foundational element of the design process that encompasses everything they do. They start with their software development and the supporting cloud-based services to the actual products that are being designed and delivered across the company's portfolio. Savant's energy management vision has evolved to become more than just a cornerstone of the company's expertise and service offerings, it has become foundational in nature and integrated with their smart home security infrastructure.

Designing a smart home is not complete without focusing on your home's energy usage and management. Implementing Smart Energy delivers custom control of a home's power usage. A home can be designed with a schedule that powers an EV, activates the home's ECO Mode to reduce costly time-of-use rates, or uses smart power to extend the available hours of your local battery. The system provides a tool to review the energy usage progress over time and intelligently adjust the settings directly from the Savant Power & Light app. In other words, smart energy management.

