What home energy technology will break through in the next 12 months?

What home energy technology do you expect to see as a breakthrough in the next 12 months?

Elly Schietse, General Manager GreenPeak Belgium, www.greenpeak.com [1]

Currently, many smart home applications we want and need are actually available, but they do not share a common communication platform. They each have their own control systems – their own remotes, and don't talk to each other. These systems are not integrated. A motion sensor used in the security system cannot be integrated in the light control system that switches off the lights when nobody is in a room. The HVAC system is not connected to window controls.However, once we have all these smart applications under the same open ZigBee communication standard, we can start thinking about integrating the different sensor applications and linking their intelligence to create the real smart home that no longer needs human intervention. The next step is simple to use, modular development kits that anyone can use to create their personal web based home control dashboard that can be managed from any smartphone or web connected device, tailored to our own specific needs and based on the sensor measurements in and around the house. Once we have these development tools available, everybody will be able to build his home of the future, adding intelligence where required. The list of smart home applications will be limited by only our imagination.

Tim Dry, Senior Marketing Manager – Smart Grid, Renesas Electronics America, www.**renesas**.com [2]

A key enabling technology for the Home Area Network (HAN) will be Smart Energy 2.0 Protocol (SEP2.0). In the HAN, energy consumed by smart appliances, water heaters, electric cars, etc., or generated by solar panels or wind turbines, will be reported back to the home owner and energy providers (e.g. utilities) via a smart meter or gateway device. SEP1.x was originally developed by the ZigBee Alliance to run on the IEEE802.15.4 2.4 GHz radios. SEP2.0 is based on IPv6 internet protocols and is compatible with portable devices like smart phones and tablets, enabling these devices as IHDs (In-Home-Displays). SEP2.0 was opened up to the WiFi Alliance to run on IEEE802.11x radios, and HomePlug Green PHY PLC. This real-time (or near) communication from the HAN to their IHDs allows consumers participating in Time of Use pricing (ToU)-type programs run by their energy providers to realize cost savings. Two examples include overriding thermostat settings for short periods of time to offset peak energy usage during extremely hot or cold periods, or temporarily switch off pool pumps. SEP2.0-capable smart meters, gateways and smart appliances devices are in development now and will start to appear in the next 12+ months. Renesas is a licensee of Grid2Home, one of the first suppliers and key driver in the development of SEP2.0. Renesas will use the SEP2.0 on a number of new solutions targeting smart meters, smart appliances, electric cars and EVSEs (chargers), etc.

Thomas Barber, Director of Marketing, ZigBee Products, Silicon Labs, www.silabs.com [3]

We are now at the beginning of the smart energy era. Over the past five years, smart meters have been widely deployed in the US, Europe, China and many other markets to connect the utility to the home, enabling home owners to receive real-time data on their energy consumption and real-time utility pricing. The rising costs of energy and the imbalance of energy supply and demand during peak periods has reinforced the need for in-home smart energy solutions in which lighting, climate control, and other significant energy-consuming devices and appliances can be managed more efficiently for the benefit of consumers, utilities and the environment. In the next phase of the evolution of smart energy, we will see the development and deployment of in-home smart energy networks that will take advantage of energy data to further enhance energy efficiency and convenience for consumers. In-home smart energy networks will begin to develop this year with relatively expensive devices such as in-home energy management displays and smart appliances where the differential cost of adding wireless connectivity is relatively low. As the cost of adding wireless technology decreases, we will begin to see lower cost smart energy network technology becoming available, giving consumers the ability to monitor and control individual electrical outlets or light fixtures. Small, economical smart energy devices are required for mass deployment of in-home smart energy networks. For example, a standard 110V outlet costs less than $0.50 retail, while the equivalent smart energy outlet costs more than $20. Innovative solutions are required to reduce the cost of these smart energy devices to a level approaching more affordable standard devices. The next phase in the smart energy evolution beyond this year will be the development of monitoring and control systems that allow consumers to access energy data and manage energy consumption on any cloud-connected device. These systems will allow home owners to remotely monitor and control home energy consumption including remotely disabling devices that are consuming energy unnecessarily such as appliances that have been accidently left on. These in-home smart energy innovations are gradually becoming available and affordable for mainstream consumers. This year and beyond, we will see the proliferation of easily deployed products that will drive the convergence of smart homes and smart energy.

Punya Prakash, Sitara smart home solutions business manager at Texas Instruments, www.ti.com [4]

Smart meters are not a thing of the past and will only continue to get “smarter.” As of August 2012, about 36 million smart meters were installed across the United States. In the European Union, smart meters continue to be deployed rapidly to meet the mandate that this technology reach 80 percent of households by 2020. The advanced metering infrastructure (AMI) is inclusive of intelligent meters that record electricity consumption on an hourly basis and provides feedback of this data to the utility provider as well as the consumer. The frequency of this data feedback ranges from an hourly feedback meter to real-time meters with built-in two-way communication and an inherit capability of recording and transmitting instantaneous information. This recorded data could provide deeper perception into the load of the various in-home end points that are actively consuming energy.

While customers seek a cost-effective energy provider, the service providers look for customer loyalty. Having more granular insight into the electricity usage provides the prospect of mutual benefit. Service providers can build smart applications that can achieve a strong customer base and allegiance, and consumers can benefit from a sustainable electricity pricing model. The user experience of the application(s) deployed by the utility companies will see a transformation in the coming days. The applications could be developed by targeting popular portable systems, home gateways or simply desktop solutions. The extent of information aggregated by these applications and its translation to an easily comprehendible format will play an important role. This year represents a dawn of a software infrastructure that will enable a pleasant customer experience and a viable green energy solution.

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