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INTEGRATION | AUDIO/VIDEO | NETWORKING | CONTROL | CONVERGENCE

SPECIAL SECTION: High-Performance Audio Rocks!
PAGE 53

POWER PLAY

How a two-man firm is maximizing the potential of the smart grid. PAGE 44

+

What's on Tap for EHX PAGE 72

Greg Moon, left, and Tom Jacob, Foothill Integrated Systems, Pasadena, Calif.

Energy Management INTEGRATORS

Two-man operation Foothill Integrated Systems is integrating its energy management offering with a giant utility's smart grid solution.

by Jason Knott, photography by Rafael Ortega

IS "THE PERFECT STORM" BREWING that will elevate integrators' role as an energy management contractor? The guys at Foothill Integrated Systems (FIS) in Pasadena, Calif., certainly think so. In fact, they're banking on it.

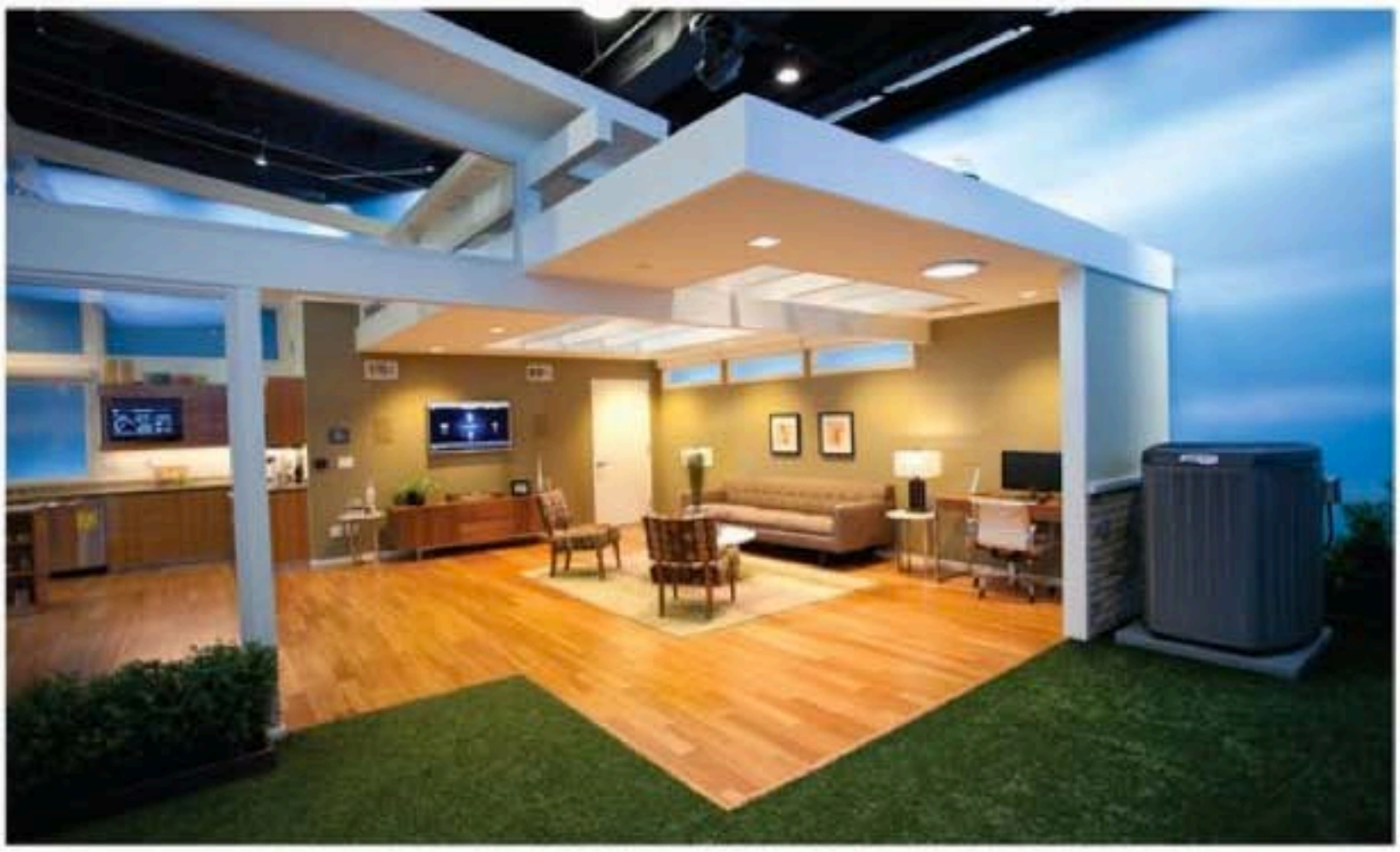
Indeed, the two-man operation is billing FIS as an energy management integrator and has aligned itself closely with the region's major utility — Southern California Edison (SCE). FIS has already installed a prototype Control4 system at SCE's "Smart Energy Experience" inside its Customer Technology Application Center (CTAC) demo facility in nearby Irwindale, Calif. The system showcases how the electrical utility's new smart meters can be tightly bound to a home automation system for monitoring demand and usage, along with controlling various home functions.

Co-owners Greg Moon and Tom Jacob even drive a Prius plastered with Control4 logos to show their commitment. The duo believes even small integrators can take the lead in this energy niche, and form a strong working relationship with a utility.

TRENDS GUIDING ENERGY FOCUS

For many CE pros who built their businesses on energy-hogging consumer electronics, the transition to energy management can be tough. But according to Moon and Jacob, most integrators are already the primary energy contractor in the home, they just don't know it. According to Jacob, nearly every FIS installation relates back to energy.

"At first glance, you might look at our typical residential installation and calculate 15 percent or so of it is



"The percentage of our business devoted to energy management systems alone is very hard to measure. Because energy management is part of everything we install, it helps guide our clients to a fully integrated home."

—Tom Jacob, Foothill Integrated Systems principal.

Using what could become a template for smart grid connectivity, Tom Jacob (left) and Greg Moon installed an energy management and home control system at Southern California Edison's Customer Technology Application Center (opposite page).

QUICK STATS

Company: Foothill Integrated Systems, Inc.
Location: Pasadena, Calif.
Principals: Tom Jacob and Greg Moon, co-owners
Revenues (2010): $700,000
Years in Business: 6
Number of Employees: 2
Specialty: Custom audio, video and control serving the residential and commercial markets
Top 5 Brands: Control4, Sonance, Marantz, Lutron, Panasonic
FYI: Always give your customers consistent quality.

related to energy management, but it's much higher than that," says Jacob. He estimates that energy management touches some aspect of every system they install, from power management for home theaters to HVAC control to shade control to security to lighting control. Even more importantly, he sees energy management as the key discipline that helps sell customers into full-blown whole-house integration.

"The percentage of our business devoted to energy management systems alone is very hard to measure. Because energy management is part of everything we install, it helps guide our clients to a fully integrated home," says Jacob.

If integrators don't recognize the importance of energy management, then the typical client certainly doesn't understand. "Most homeowners don't even know their own total energy consumption," says Moon, adding that they also likely have no idea of how much electricity each home appliance or consumer electronics device uses. "Education is the key, and that will be a major part of our focus over the next few years."

TACKLING THE CTAC

Because of FIS' energy focus, it was logical that Control4 contacted them back in March 2010 to install an energy management system at Edison's CTAC demo room. After several months of planning, the installation itself took FIS only about two months.

The CTAC is a mock home built inside an industrial building where Edison conducts free docent-guided tours for homeowners on ways to reduce energy use. The Irwindale location is one of two the utility operates. In 2011, the 2,260-square-foot mock home will host some 200 seminars and 11,000 people. Architects, interior designers, engineers, homebuilders, developers and even legislators have toured the facility, in addition to consumers.

Using Southern California Edison's 2,260-square-foot mock home as a demo base for a Control4 solution, Foothill calls itself an "energy management integrator."

Edison will have retrofitted 5 million customers with its smart meters (dubbed Smart Connect) by the end of 2012. It has already installed 1.7 million meters and is converting up to 10,000 homes daily.

In a nutshell, the installation has two levels. Part 1 is a basic feedback mechanism using Control4 that provides load response

What's Fueling Energy Price Hikes?

We're in the midst of "the perfect storm" for energy management.

First, there is rising energy demand among consumers, especially as plug-in electric vehicles (PEVs) emerge. According to Southern California Edison, plugging in an electric car into your home at night is the equivalent of adding another house to the grid. Remember, the reason utilities want customers to be more efficient is that they cannot build new power plants. Environmental laws block the construction of new coal-burning and nuclear power plants — there hasn't been a new nuclear power plant built in the United States since 1977.

Second, utilities are creating "tiered usage pricing" plans that increase the price a consumer pays as the individual home's usage increases. For example, Edison has five tiers. A homeowner starts out paying 12 cents per kilowatt. After the individual home passes a designated plateau of usage throughout the month, the price jumps to 14 cents, then 24 cents, then 27 cents and finally 31 cents. So it costs more to run your dishwasher and other appliances at the end of the month than it does at the beginning of the month.

Third, utilities are created "tiered demand pricing" plans. This is different from usage pricing in that it is based on overall electricity demand by every home within the utility's subscriber base, not the amount used by the individual.

Fourth, smart meters are being installed as replacements for older mechanical meters. These new meters have two-way wireless communication capability that allows the smart meter to speak to the control system inside the home and share demand and usage data. However, there is another byproduct from the switch: Because the smart meters are more accurate, the average homeowner in Southern California is experiencing an 8 percent increase in his monthly electric bill, according to an article in the *Inland Empire Daily Bulletin*. The article cites some homeowners who have had their electric bills double after the installation of a smart meter.

electrical usage and demand data for the homeowner via ZigBee-based smart meters. The new Smart Connect meters use ZigBee wireless technology to send demand and usage data to the Control4 EC-100 gateway device, which displays the information on a small 4.2-inch Control4 panel.

The panel itself is purely a feedback mechanism to show homeowners how much energy they are drawing (usage), as well as how much energy is being pulled from the grid (demand). For example, when a dryer is turned on, it draws 6 kW. Likewise, since it may be a hot day, the screen shows the moderate-to-high demand occurring on the Edison grid, with the corresponding increase in the kW price for electricity. *(Editor's Note: that portion of the display is simulated at this point because Edison is still in the midst of deploying its Smart Connect meters.)*

Studies show that feedback alone can influence a person to reduce energy usage by 15 percent. The phenomenon has been labeled "The Prius Effect" after the in-your-face screen inside a Toyota Prius that constantly show the driver his MPG.

FULL HOME CONTROL SHOWCASED

Another aspect of the Smart Connect installations is an upgraded, fully integrated home control system that not only alters electrical usage of smart appliances to cut homeowners' bills, but also provides control of lighting, automated shades and climate. FIS also commands theatrical lighting through a DMX system, which allows the exhibit to change from day to night. All of it is remotely controlled with an iPad running the Control4 app. The system can monitor mock wind turbines, solar panels and a plug-in electric vehicle (PEV) power station in the garage.

As visitors enter the CTAC exhibit, they are greeted by several kiosks with touchpanels. FIS did not install these kiosks, but did integrate their control functions. There is a mock outdoor area, kitchen, garage and living room. Visitors can use the kiosks to emulate daytime or nighttime, turn on and off appliances, activate the PEV charging station, spin the garage-mounted turbine, etc. The effect of each function on the power draw

is displayed on the color screen.

(Editor's Note: In addition to the demand simulation mentioned earlier, some of the usage functions are also simulated at the CTAC. For example, you can't really "activate" the PEV charging station because the car's electric battery never actually drains, because the vehicle is just sitting inside the faux garage and never being driven. So, the system turns on and off giant banks of lights on the roof of the building equivalent to the current draw of certain appliances.)

All the theatrics are designed for one primary reason: to help homeowners cut their energy bills. It doesn't hurt that the home control system also offers the homeowner increased convenience and communication. Those who signed up for Edison's Smart Connect program will receive $200 from the utility, which in turn means that SCE can "take over" control of your electrical usage by turning on and off devices inside the home when there is high demand on the grid.

Small garage-top wind turbines designed to catch California's evening seabreeze will mitigate the added power draw from electric vehicles charging in homes at night.

Homeowners can "opt out" of the "take over" by adjusting their thermostat or using the Control4 panel to override.

FIS's fully integrated solution takes it to the next level. For example, if the temperature in the home is rising, the system will automatically lower the shades.

According to Moon, Edison is not sure at this point whether it plans to distribute the EC-100 system to homeowners for free as part of the Smart Connect program, charge homeowners a nominal fee for the device, or refer them to an integrator. The utility cannot recommend an individual contractor.

That's where FIS comes in. The company can track the utility's Smart Connect installations by zip code online and market directly to those homeowners. If residences are typically experiencing higher electric bills with the smart meters, it appears to be a potentially hot sales opportunity.

"This is such a new and cutting-edge technology that the advantages are seemingly limitless for the future," comments Moon. "The most challenging aspect is that the energy management field is relatively new. It is still being developed, and there are many different technology companies working on ways to tackle the myriad of issues that exist. We feel that Control4 has a very compelling product and given its experience in the residential market, we see them as being a perfect gateway for energy management to enter the home."

So what's it like to work with a big utility? "Fantastic, very friendly," says Moon, even though Edison is not allowed to promote FIS to its customers. Jacob points to the fact that Edison went to the level of building the CTAC demo facility as evidence of the utility's commitment. "It's pretty amazing, I think," he adds. Edison has also created a series of educational videos using two cartoon homes called Carl and Eddy.

FIS has no plans on moving into the energy creation realm by installing solar panels or wind turbines. Instead, it partners on those jobs. The CTAC facility has also become sort of a surrogate showroom for FIS where Moon and Jacob can bring clients.

In the meantime, the duo is also excited about bringing energy management systems to the commercial market. "It's an even bigger opportunity," says Jacob. "Electrical use in residences is a small percentage of the overall power consumption. We see energy management as our entrée into the commercial market." CE Pro