


## **BUILDING A SMART GRID, ONE SMART HOME AT A TIME**

En-Touch of Texas sidesteps larger rivals by offering broadband telecom and green energy services



Based in Houston, Texas, En-Touch Systems (En-Touch) offers bundled triple-play services using fiber optic networks. En-Touch serves 25 Master Planned Residential Communities of which it boasts a 60% penetration rate amongst its homeowners.

## CUSTOMER PROFILE

Since 1996, En-Touch has served over 18,000 homes and businesses by positioning itself as the 'preferred technology company' of developers in the region. As the voice, video and data market evolved, En-Touch started to implement fiber versus its traditional twisted pair copper and coaxial plant, in an effort to begin providing a technology that would leapfrog existing technologies, provide greater quality and reliability and avoid the constant upgrade requirements driven by converging technologies and services in the home.

For En-Touch Systems, leveraging the capabilities of its fiber network to offer more than advanced voice, data, HDTV and security monitoring services was crucial to securing a competitive advantage against much larger service providers eager to expand into its backyard. En-Touch is a facilities based local exchange carrier that provides Fiber-to-the-Home (FTTH) services to 25 Master Planned Residential Communities in the Houston area. It has provided broadband services since 1996 and in 2005 deployed a GE-PON fiber network supported by the TRIDENT7 Universal Access Platform from Enableness Technologies, a provider of broadband access systems for FTTH networks.

With its GE-PON FTTH network, En-Touch offers triple-play services – 50 Mbps high-speed Internet, telephone and television that includes more than 40 HD channels. In addition, the telco provides 24-hour security monitoring over the network, and advanced in-home technologies such as surveillance and energy management. The system allows subscribers to remotely monitor their homes over a PC or cell phone and receive immediate automated notifications via text message or email if a problem arises or any movement is detected in the home. Homeowners can also control through their cellular phone the alarm system, as well as thermostats and garage doors.

Despite offering such advanced services, En-Touch was still challenged to differentiate itself from the competitive threat posed by larger service providers in the area, who, like many national players, have rolled out their own triple-play services across the U.S., supported by aggressive marketing programs. However, one service area these larger rivals had not yet touched was power and utilities.

En-Touch already enjoyed a strong relationship with a Houston area real estate developer Land Tejas Cos. In 2008, Land Tejas broke ground on a new planned community unique in the U.S. – a green development called Discovery at Spring Trails in which each home would generate a portion of its power with its own solar unit. Through a partnership with General Electric's ecomagination Homebuilder Program, each home would be 40 to 50 per cent more energy efficient than average, with building envelopes that would meet the highest environmental standards for energy conservation

according to the criteria set forth by Environments for Living, a leading national energy efficiency program developed by Masco Home Services.

En-Touch's competitors, however, were already seeking exclusive marketing agreements to muscle in on serving the telecommunications needs of the new community. En-Touch management brainstormed about how their company could differentiate itself as the obvious choice for Land Tejas to partner with on the project. En-Touch ultimately decided to build FTTH infrastructure into the community and get into the retail power business by creating a subsidiary called En-Touch Energy, providing it with the unique capability to offer both traditional broadband telecommunications and smart energy services tailored to the unique needs of the green community.

Of course, this didn't happen overnight. En-Touch had to apply to the state government and work through a rigorous certification process to become approved as a retail energy provider. It took the better part of six months to acquire the necessary approvals and demonstrate that it had all the resources and capabilities required to offer new services. However, according to Jason Bone, En-Touch's director of engineering, the purpose for which the company wanted to move into the retail energy market greatly facilitated the process.

"The fact that our purpose was to put both energy management tools and retail electric plans into the hands of consumers that would encourage them to conserve power and save money made a big difference," said Bone. "En-Touch demonstrated to state regulators its ability and desire to provide these services to consumers. Ultimately, everyone benefits from this new model of consumer education, leading to conservation of our scarce resources."

Today, En-Touch's telecommunications network, which includes its traditional twisted pair copper and coaxial plant, passes 26,000 premises in 25 communities, with a penetration rate of 66 per cent – higher than the industry norm. Its FTTH services pass more than 4,300 homes, with a penetration rate of almost 70 per cent, including the homes of Spring Trails.

The Spring Trails development is the highlight of En-Touch's fiber builds. More than 2,000 homes are being built, each equipped to generate at least one kilowatt of solar power, which, will be enough to offset a home's peak power load. In homes with more solar installed, the solar, at times, will be enough to serve all of a home's power needs. For En-Touch, Spring Trails demonstrates the future-proof capabilities offered by the almost unlimited bandwidth of an FTTH network to move beyond triple-play services into areas that improve quality of life and environmental sustainability.

"First and foremost we remain a broadband company, with a focus on providing Internet, telephone, video, alarm monitoring and advanced in-home technology," said Bone. "Our energy services are layered on top of that. But the unique thing about Spring Trails is that it allows us to demonstrate that usage consumption in the home, including power and water, as well as solar generation, can be monitored in real-time so that homeowners can implement their own conservation programs and become users of renewable energy. For the first time our customers can make conscious decisions to conserve and use renewables. But this is only the beginning of where this kind of advanced network architecture allows us to go."

#### LONG TERM PARTNERSHIP WITH ENABLNESS

Of course, a successful fiber deployment to support advanced broadband services depends on choosing the right solution from the right vendor. It's a selection process that must look beyond mere product specs and price points to find a vendor committed to a long-term collaborative partnership. For En-Touch, that partner is Enableness.

At the core of En-Touch's fiber network is Enableness's TRIDENT7 chassis, which supports a Gigabit Ethernet Passive Optical Network (GE-PON). After looking at a number of vendors, En-Touch chose Enableness due to its reputation in the marketplace, competitive pricing, deep knowledge of fiber deployment and proven expertise in deploying point-to-point technology.

"Enableness's TRIDENT7 provides us with the unparalleled symmetrical bandwidth we need to provide competitive triple-play and security monitoring services," said Bone. "And its world-class customer service made for an effortless implementation that gives us confidence for the future as we look to expand our coverage area and range of services."

“Enableness's TRIDENT7 delivers unparalleled symmetrical bandwidth allowing us to provide full triple-play services. Furthermore Enableness's world class customer service allowed us to implement the fiber network effortlessly.”

**JASON BONE**  
DIRECTOR OF ENGINEERING  
EN-TOUCH SYSTEMS

#### THE DASHBOARD

En-Touch provides its smart energy services through a wall-mounted Energy Monitoring Dashboard from GE that resembles a large programmable thermostat with a touch screen.

The dashboard provides the homeowner with current and historical feedback on indoor energy and water consumption, as well as solar generation and emission levels. It functions as a typical programmable thermostat to control the home's heating and cooling system, but can also be integrated with other systems, such as the home security system, to provide smart home functionality. For example, with the touch of a button, one can automatically set the alarm, turn off the lights and reset the thermostat to conserve energy and save money.

The dashboard's programmability allows homeowners to set specific targets, say, to cut energy usage by 10 per cent. Since it tracks and provides feedback on indoor energy usage, it will inform the homeowner when A/C must be turned down or other steps must be taken to remain on target. The dashboard also tracks the power generated by the home's solar unit and graphically charts for the homeowner a record of how much energy the home is generating on its own versus what it is pulling from the local grid. Again, all of this can be viewed and controlled remotely.

Homeowners also benefit from real-time problem detection through the dashboard. Bone cited one instance in which a spike in water usage allowed the homeowner to track down a leak in the lawn sprinkler system. What the dashboard does not yet have is direct communication with the smart meter -- a separate outdoor unit. While En-Touch sells electricity to the community, installs the solar systems and helps homeowners manage the power generated from solar, a different company, CenterPoint Energy, handles electricity delivery and smart reader installation and reading. CenterPoint uses a wireless network to read and manage the smart meters.

## REAL-TIME DEMAND-RESPONSE

At present, the smart meter allows each individual home's power usage to be read in 15-minute increments and the connection to the local grid to be remotely turned on and off. The dashboard is reading power after it has already gone through the meter, instead of providing real-time data at the meter.

"Having the dashboard and the meter communicate directly with each other will improve accuracy in terms of tracking how power is being used inside the home," said Bone. "Being able to automatically respond to that information will provide us with demand-response capability in real-time."

This kind of capability will be particularly useful in summer months when thousands of A/C units running at capacity threaten to bring down the local power grid. Houston itself has seen rolling summer brownouts in recent years during peak demand. With demand-response capability, the utility can directly control systems within a home in real-time to reduce consumption and avoid a brownout. Homeowners will be able to choose how much control they are willing to give the utility for cycling systems such as A/C, lawn sprinklers and pool pumps. They may even choose to let the system make these choices for them. However, for demand-response capability to work, the first step is for the meter to communicate with the dashboard. "This is a capability that we are working on now," said Bone. "The other advantage of having the meter communicate with the dashboard is that the dashboard will have access to actual metered power usage, instead of measuring usage in the home separately through a current transducer that is installed on the house side of the meter and is subject to a possible variance, although minimal, from the metered usage."

While it could be argued that these smart grid applications don't require bandwidth of the scale that fiber provides, fiber does provide a level of responsiveness, reliability and low maintenance unmatched by other architecture options, such as wireless and copper. And as the number of homes on a fiber grid grows from a few thousand to tens of thousands, all those relatively small bits of data flowing back and forth begin to add up when the network is also carrying advanced TV, Internet and telephone services.

"When it comes right down to it, everything that is happening in Spring Trails with energy management could conceivably happen on an HFC network broadband connection," said Bone. "However, with greenfield construction, when you have the opportunity to build such advanced systems into the home for triple-play services, it doesn't make sense to put in an old technology such as HFC that is already showing its limitations."

Rich Gerstemeier, En-Touch's president and CEO, makes an added point -- Land Tejas was only interested in deploying fiber in its new community. HFC architecture was not an option.

"For many of the developers we are working with, there is no choice but fiber," Gerstemeier said. "On the other hand, if the developer is open to all technologies, we will usually win with our Enableness FTTH option over other strong contenders with competing broadband system architectures."

The key advantage of deploying fiber, of course, is the future-proof benefits afforded by its near unlimited bandwidth, Bone added. It is a cost effective choice that allows a service provider to support today's advanced services with a robust infrastructure that will easily scale to support more advanced services and increased bandwidth demands for decades to come without having to pull new cable through a neighborhood or rewire a home.

En-Touch's decision to deploy an FTTH network was supported by the economics of new construction, unlimited bandwidth and higher reliability with a technology the company believes will take it well beyond any applications it can foresee over the next 20 years. "The endless process of costly modernization and upgrade of our DSL and HFC technologies in the field lend further support to our decision to deploy FTTH back in 2005." Bone said. "It is likely that in the near future, our consumers, in addition to all of the traditional applications, will use their broadband connections for virtual doctor visits, utilize high resolution cameras in the home, access 3D-HD television over the Internet and control most devices in their home and cars via broadband controls and applications."

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