

Finding value of utility applications key to BPL success

Veteran automation firm has a plan

The electric industry is unusual in its lack of awareness of many of the most basic costs and values integral to its operations, Lawrence Silverman told us Wednesday.

The Broadband Energy Networks (BEN) founder and CEO showed a slide at the Platts BPL conference this month with a list of industry metrics but only two had been assigned values.

The cost of a monthly meter reading is generally considered to be 50¢ to a dollar/month, so automatic meter reads at 15-minute intervals should be worth at least \$3/month, Silverman explained.

That doesn't leave a lot of room to justify an investment in AMR, he added.

The value of demand response was listed at \$5/month on average -- a number Silverman reached by calculating the economic value of a megawatt of demand response against the equivalent cost of spinning reserves.

Most utilities, as regulated monopolies have traditionally based the price of electricity on their total investment to provide it — not what it actually cost to generate their product, Silverman explained.

Many of the costs were simply never measured.

Ask a utility its cost for customer acquisition and it won't have an answer, Silverman noted. Anyone in the cell phone business knows their own answer to that question, he added.

No issue next week: We publish 50 issues a year and next Monday is one of the two omitted. The next one we'll send you will be dated Jan 10 — next year.

The slide listed outage detection, theft detection, network monitoring, distribution asset management, customer use analysis, energy management and substation camera security -- all with question marks listed instead of dollar values.

When you have to roll a truck and replace a failed transformer and your customers have lost power — if you can avoid that what is it worth?

Other industries have metrics for that kind of thing.

BPL business models being crafted today look like cable and DSL models, Silverman noted, and a good model based on the utility side of the business doesn't exist.

Putting values on the missing metrics will help create a sales pitch for BPL and for Broadband Energy's utility applications, said Silverman.

He plans to start finding the missing metrics starting with a mixed commercial and residential project providing utility applications with the New York State Energy Research & Development Authority (NYSERDA).

The project goes live in New York City next Spring, in time for the air conditioning season. The project is using cable and DSL broadband, considering the existing deployment of broadband in the city.

"We hope to include a BPL component," said Silverman, and he's looking for support from NYSERDA on that.

QUOTE OF THE WEEK:

The utility industry is beginning to realize that the internal applications for utilities are key to the utility BPL business model. It's easy for a utility to recognize that using its own wires is less expensive than using someone else's network ... but using the data that can flow on those wires for internal purposes such as

Automation career led logically to BPL

"How do you get to Broadway," asks a visitor to New York City in the old joke.

For Lawrence Silverman (above), "practice, practice, practice" might have been part of it but a career devoted to automation played a big role.

Since his MIT days in the 60s, Silverman has been automating all sorts of things including lights and other control systems for Broadway shows Pippin, Hair, Chicago and Jesus Christ Superstar, he told us Wednesday.

Next were interactive lighting control systems at the New York Hilton, the World Trade Center's Windows on the World restaurant and lighting electronics for Saturday Night Fever and Studio 54 with technology he invented and patented using sound to automate lights.

Fast forward to the mid '90s to find Silverman running a firm he founded called Light Media Interactive -- a name chosen to reflect his vision of computer-controlled automated

environments.

The firm teamed with Raytheon to create a demand side energy management system called the ECS2000 that was used at Southern Co's Chatelaine Project, Detroit Edison's Intelligent Link and Central & SouthWest's (CSW, now part of AEP) Laredo Project.

CSW built a hybrid fiber/coaxial (HFC) network (what the cable TV firms use) to support the system in '95 and '96 — a time when Anderson Consulting was promoting utility/cable partnerships, Silverman reminisced.

The Laredo project used AMR and gave customers information about their energy use including an estimated bill and let them control their spending — a very popular feature with retirees and others on limited incomes.

LightMedia was invited by EPRI in 1997 to add energy management software to the "energy network computer," a project using ...

(Continued on page two)

AMR, demand response, grid monitoring in the medium voltage sections, installing cameras in substations — those applications need to have a value in dollars and cents established. That's the next stage of the evolution of BPL and our focus in the work that we're doing today with utilities on pilots and test deployments is to document a measurable value for these applications.

Silverman calls that "a real challenge," but for BPL to reach "mass deployment" a solid business case must be made to the utilities.

The intelligent home and office have been "five-years away" for decades, noted Silverman, who calls BPL the "disruptive technology" that finally broke that five-year barrier.

He believes the prices for BPL technology will continue to fall bringing more of the smart grid's elements within reach, plus finally finding the value in utility applications will make the long-predicted intelligent grid inevitable.

Duke BPL trial to add 10,000 customers

Fonix Telecom subsidiary LecStar Telecom and Duke Power plan to boost their North and South Carolina BPL trial from 500 homes to 10,000 or 15,000 businesses and homes.

The selected markets for the expansion are to be picked in the first quarter of 2005 and service should be available mid-year.

Customers today are hungry for fast, flexible, cost-effective ways of getting voice, data and media, said Dale Smith, senior vice president and general manager for Fonix Telecom, adding that BPL "delivers on the promise of ubiquitous, high-speed internet and voice services."

Partnering with Duke Power gets Fonix Duke's expertise, reputation for quality and leadership and established customer relationships, said Michael Britt, vice president of channel development and BPL project manager for Fonix Telecom.

"[BPL] provides our customers the

freedom to choose a plan that meets their needs better than DSL or cable," Britt added.

Thus Duke is going with creation of a wholesale "pipe" for service providers such as Fonix Telecom and others, "to provide consumers with another broadband option for their homes and businesses," said Bob Gerardi, Duke Power's power line communications program manager.

Duke picked LecStar for the trial to help bring "this exciting technology to market because of their commitment to this technology, their ability to move quickly and their long history of successful collaboration with the utility industry," Gerardi added.

Fonix is continuing to test its VOIP in the Duke trial and the service is expected to be available to all customers in the next phase of the trial by midyear. The firm signed a deal last month to buy Empire One Telecommunications (*BPL Today*, 11/29).

Automation career led logically to BPL

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... Oracle's diskless TV set-top computer that pulled its software from the internet -- a challenge to Microsoft aimed at every TV in the US.

Silverman had learned from Laredo customers in a focus group that saving enough cash to buy an extra pizza each month wasn't enough incentive to use AMR.

That session crystallized for him the need to package energy automation with other services, said Silverman.

"We proposed to EPRI that what was needed was a bundle of broadband services ... clustered around energy."

The goal is meeting the needs of utility and the user.

He created a prototype.

But when the pressure for utilities to diversify and survive in a deregulated world fizzled, the focus shifted to acquisitions and mergers and DSM just didn't get much attention.

Fast forward again to 2002 when Silverman created Broadband Energy Networks "to continue to develop the bundle of utility applications and other services that could be delivered over broadband to build a compelling business case."

Silverman calls his firm "BEN" in tribute to Ben Franklin who he believes

would have appreciated the connection.

The firm acquired the assets of LightMedia and Coactive Networks, maker of a utility gateway that was used widely in pilots and trials in Europe and the US between 1999 and 2001.

"We saw that broadband was becoming pervasive and believed it would be the medium of choice for communications not just for internet access but for voice and other things including utility automation."

The firm's original sales prospects included utilities plus cable internet and DSL providers — since HFC was the prevailing architecture for broadband networks in the US.

Utilities had the advantage of owning rights of way needed to build their own HFC networks, but found them too costly to support a viable business model — plus by then utility employees weren't trying to sell their CEO on a communications network considering the bath many took in the telecom business.

Silverman had been using narrow band power line communications for 20 years, he noted, but when he saw United Utilities' early BPL trials in the UK, he realized that BPL could solve a basic business problem for utilities that

he had faced for 10 years — letting those firms affordably deliver the bundle of utility applications he was developing.

BEN rebuilt the Coactive applications server, adding the ability to communicate with a very wide variety of proprietary HVAC, air quality monitoring, lighting and automation systems used in commercial buildings and home-automation systems.

The idea was to create a device, that Silverman now calls an "automation computer" that could connect the smart systems in a building to create an entire smart home or building and then link it to other smart devices over an intelligent electric grid.

The updated system can interact with security systems, for example, to base HVAC settings for a whole building or zones based on whether or how the building is occupied.

"The intelligent BPL grid will enable large-scale automation for every device and system installed on the network — meters, loads, motors, transformers, capacitors, distributed generators, even solar and wind systems.

End-to-end intelligent automation on the grid allows new "information-based capabilities and value-added services for utilities and their customers," plus a much-needed boost "in efficiency and reliability for the entire electric system."

Rural co-op leader uninspired by BPL

Density, distance dampen hopes

National Rural Telecommunications Cooperative (NRTC) is planning BPL pilots at two co-ops with the NRECA's Cooperative Research Network next year and in 2006, NRTC's Steven Collier told the Platts BPL conference this month.

Collier is vice president of emerging technologies for the NRTC. He calls himself "cautiously optimistic" that BPL will find a place in rural America.

Getting broadband to rural America is a top priority for NRTC, said Collier, who calls broadband "the new electricity," in terms of its importance to people everywhere.

Collier sees the low relative density of rural co-op customers plus distance from a high-bandwidth connection to the internet as big hurdles to bringing service to rural America, whichever network

technology is used.

A rural utility might typically have 20 mile radial (point-to-point, not in a loop) power lines and need 40 to 60 signal regenerators to serve each one with BPL, he explained.

That creates not only a cost consideration but questions about reliability, latency and throughput.

At the near end of the line BPL is fairly easy to justify, but not at the far end, he added.

Federally guaranteed and provided low interest money was used "to get those distribution facilities built in the first place but we don't have that today."

The only way to get broadband deployed is to borrow money at rates pretty close to market rates "and you have to repay it," he warned.

Collier hopes that will change because broadband is so "crucial" for rural America.

"Of our membership, 700 of the 1,200

are electricians and they want BPL to work and they want us to help it work if we can," yet he feels a need to be "realistic about what it will take to make that work."

Where it works, Collier noted, is the pockets with customer density "that you see the [BPL] vendors targeting with their business development."

Where it doesn't work is the place everyone gets the most excited about because the power lines are already in place, argued Collier, "that irrigation pump out in the middle of the panhandle of Texas or that consumer out at the end of the 30 mile dirt road in Wyoming."

For a co-op with 30 homes in a subdivision, BPL could be a great solution, he added.

"Put it in, let the stuff operate, let it survive a thunderstorm, show me that you can stay in business selling it at the prices you are promising to be able to sell it at and I'll believe it and we'll put it in."

The US has about 950 rural electric co-ops in 35 of the 50 states serving about 35 millions Americans, 24 million through homes and the rest through businesses -- with about 15 million meters, Collier reported.

The problem for BPL is that rural co-ops account for just under 10% of the national kilowatt hour sales but own over 50% of the miles of distribution lines.

They have few customers and serve them through over half of the distribution miles, he added.

Can we make that equation work for BPL, asked Collier.

The answer is "no" for those who want to use BPL to serve all their customers, said Collier, "but the answer may be 'yes' for some."

Only a dozen co-ops have more than 100,000 residential accounts.

About 40 others have over 50,000 and 532 have fewer than 10,000.

The average is about 7,000 residential accounts, "so you can see how many really small ones" pull that average down.

The average density of rural co-op consumers is eight to 10 customers/mile of power line.

The one with the least density has the largest land area -- Rio Grande Electric Cooperative in Brackettville, Tex, with 1.1 customers/mile versus the one with the greatest customer density 25/mile, said Collier.

"What we're going to be looking for is pockets of density in there for most traditional broadband solutions including broadband over power line."

Co-ops aren't vertically integrated utilities with generation, transmission, distribution and retail customers. They

Rural Texas gets hybrid BPL/WiFi

Big Texas ISP Internet America (IA) teamed with HILCO Electric Cooperative and Amperion to offer a combined BPL and WiFi internet access solution in North Central Texas.

Amperion's BPL solution includes crossing from the medium-voltage power distribution lines to the premises via a WiFi connection that's built into every signal repeater.

The partnership will bring broadband internet to underserved rural markets, said IA Wednesday, starting at a planned community in Glenn Heights, TX called Gateway Estates.

The service is called ExpressLane Wireless.

That product is priced now at \$39.95 at IA's website (www.internetamerica.com) in the towns of Hillsboro and Whitney at "up to 2 mbps," compared with ExpressLane DSL in Dallas/Ft Worth and Houston for \$29.95 and at "up to 6 mbps."

IA CEO Billy Ladin sees the new project as a great opportunity "to bring high-speed, broadband service to under-served markets" where access to DSL and cable modems is lacking.

BPL helps deliver broadband "to the masses because the infrastructure is already in place," letting the firm extend its service footprint, Ladin reported.

"Similar to bringing electricity to rural areas in the 1930s, we feel this project is an important step in the improvement of the overall quality of life and economic development of the less populated areas in Texas," said Jerry Lemmons, CEO and general manager of HILCO.

"Very soon, the high-speed communication technology that drives e-commerce, educational research and state-of-the-art communication opportunities in urban and suburban areas" will be available in rural areas, said Lemmons, adding that the service "is truly a 'quantum leap' in bringing value-added amenities to the spacious rural areas of our great state."

Partnerships between a service provider, a utility and an equipment vendor "is increasingly becoming the model of choice for BPL deployments," said Jeff Tolnar, Amperion's vice president of sales, marketing and business development.

Each entity can reap the benefits of a new service "with limited risk as they each work within the strengths of their core competencies."

IA is based in Dallas and offers a range of businesses and home internet access options ranging from dial-up to wireless broadband, dedicated high-speed access, DSL and website hosting.

are basically a series of feeder systems spotted around a geographical area served by a G&T co-op.

Thus a typical co-op might have 15 substations over a 300 square mile area.

Distribution lines go out from each of those substations to the customers.

For utility applications to be valuable enough to justify building — without selling any internet service — just doesn't play with distribution co-ops, Collier noted.

"You cannot save enough money on meter reading, SCADA, distribution automation and demand side management to build out [BPL] for 10 consumers/mile of line to make it work ... because these are not vertically integrated utilities."

The distance problem is this: being rural puts one far from a fiber or other

high-bandwidth connections to the internet, Collier noted.

A few co-ops in the US in the "heady days of diversified business ventures built fiber all over the place," including lots of fiber in Iowa, he added.

To get broadband to others may take building a fiber backhaul.

Co-ops in South Central Virginia and Indiana doing BPL deployments are using T1 or T3 connections, "but that's because they aren't serving very many customers," and aren't doing voice, video and data.

"If I'm going to have customers that are dragging down five or 10 mbps, I've got to have a backbone internet connection — a serious wireless or fiber link."

Collier predicts bringing broadband to

these areas will take a "hybrid mosaic," with some DSL.

NRTC's rural telecom members have built DSL out to over 70% of their wires, he reported.

"They were smart enough to do that while they are still operating under the monopoly franchising -- getting universal service fund and long distance access fees.

"Got that cash, let's spend it on DSL so we've got it when we need it."

Rural communities with the best customer density to support BPL are covered with DSL so BPL may or may not be competitive in that community.

He predicts co-ops will use a variety of methods including DSL, wireless and even sees fiber to the home at some rural telecom co-ops in Minnesota.

Digital divide hampers rural livelihood

Co-ops can't afford 'forklift' upgrades

The folks in rural America have as much access to the internet and use it as much as those in more densely populated areas, Steven Collier (above) said but they use dial-up.

The digital divide exists, he added.

Studies show rural internet use accounts for more dollars spent and queries answered, facts that aren't surprising to Collier because those people are further away from any alternatives.

Collier saw research showing only 10% of those living in rural America have access to broadband, likening it to the 1930s when 80% of the US had electricity but only 15-20% in the country did.

Collier puts on several "youth panels" each year and asks young people if they had to give up the internet or their cell phone, which they would choose.

They would give up cell phones first, he discovered.

A girl and some friends had given up the internet for Lent and learned they would never do that again.

"They would give up almost anything other than the internet.

"That's a little bit hard for those of us at a certain age and beyond to understand but access to a robust, broadband, always-on internet connection is going to be the new electricity -- the thing that's going to define quality of life and productivity of business in the future.

"To the extent that rural America falls short of that, we think that's a huge problem and it defines what we are trying to do at NRTC."

Intellon ships 2 millionth BPL circuit

In-home market could hit 200 mbps in '05

BPL chip-maker Intellon claims that it's benchmark — the shipping of 2 million HomePlug 1.0 integrated circuits (IC) — is a milestone that reflects rising global demand for power line networking.

Its ICs are used in home networking, networked entertainment, commercial and BPL applications throughout the world.

Intellon created and patented the technology HomePlug 1.0 is based on that can deliver 14 mbps with encryption security and quality of service, the firm reported.

It recently introduced an 85 mbps HomePlug-compliant chip-set anticipating the needs of next-generation home entertainment applications such as standard definition video, IPTV and

whole-house audio, said the firm.

Look for Intellon's first HomePlug AV IC at 200 mbps in the second half of 2005. It's for distribution of multiple high definition video streams over existing in-home power lines with whole house coverage, low latency and robust quality of service.

The firm cited a recent report from In-Stat/MDR predicting the overall market for home networking semiconductors to grow 12%/year from 2004 to 2008 — from \$1.3 billion to \$2.3 billion.

The two drivers for this market growth are overall growth in home networking adoption and the sharper focus on media networking.

"As the home networking market moves beyond data-centric laptop mobility to whole house distribution of home entertainment, the demand for power line communications is exploding," said Bill Casby, Intellon sales vice president.

Broadband is not 200 kbps, said Collier.

It's hard to nail down a definition but "let me tell you what we're learning." Collier went this year to a meeting of telecom providers that are now or are trying to deliver TV to their customers.

NRTC is working with telecom firms trying to deliver the triple play -- voice, data and video -- via DSL to compete with cable TV firms doing the same.

To supply one channel of high-definition television (HDTV), a couple channels of standard-definition television, voice over IP and reasonable

surfing for a couple of computers in the home requires 12 to 15 mbps, Collier reported — "even if we assume we are doing the video at MPEG 4."

MPEG is an algorithm used to compress video and audio data to make it easier to send through networks such as the internet.

MPEG 3 was made famous as a way to compress digitally recorded songs to a size that could be transmitted over the internet -- and is known by the three letter extension on the end of their filenames -- MP3.

TV programmers aren't letting anyone

use the more advanced MPEG 4 today, Collier reported, opting for the less advanced MPEG 2.

The latter standard takes 3.2 megabits/channel for standard definition TV, Collier reported, and 15 megabits for high definition.

“Work that out -- six plus six plus 15 plus a couple -- that defines what

broadband *is* ultimately because broadband is going to be a path over which video, voice and internet access is going to be provided.”

WildBlue’s satellite broadband service will never get there, Collier noted.

Will BPL get there?

“That’s one of the defining questions about BPL -- can we achieve that kind of

bandwidth without a forklift upgrade?”

He means his members don’t want to put in lots of equipment expecting it to last 15 years only to have to use a forklift to haul it all out a few years later to replace it as obsolete.

“When they buy an automatic meter reading system they buy it for 30 years, not 10,” he added.

BPL vendors ‘unrealistic’ about rural market

Latency urgent for gamer demographic

When Steven Collier (above) tried to pin down BPL vendors on the market penetration needed by a deployment to create cash flow, he’s heard typically, “only” 20%, or “only” 40% in three years.

For him that’s “ambitious, optimistic, unbelievable [and] unattainable.”

President Bush’s plan to get broadband to everyone by 2007 isn’t going to happen, Collier predicted, because people are slow to sign up and broadband is expensive in rural America.

BPL will face competition, he warned, and even today it’s not any faster than WildBlue (above), he added.

It’s better than WildBlue because it doesn’t have the ¼ to ½ second

latency that makes satellite a poor choice for services such as VOIP and online gaming, except that once you start regenerating a BPL signal latency is created, Collier explained.

If you think you don’t need to support online gaming, “you’re not in touch with what the future is about.”

He asked the audience to guess the average age of male, online multi-party gamers.

His answer: 24.

Age 34 and above account for 10% of male online gamers, Collier reported.

These numbers are only going to go up and by leaps and bounds, he added.

We believe the number of female gamers is rising fast — and not just thanks to relationship simulations like the Sims, but playing all forms of action and adventure games, too.

Collier asked attendees to guess the percentage of NFL football players that do online, multi-party gaming during the

off-season.

He guessed 99.999%.

This is a demographic that needs to be well understood, he offered, and suggested that attendees read a book called *Got Game: How the Gamer Generation is Reshaping Business Forever* by John Beck, published by Harvard Business School Press in October.

He called the book “astonishing” as it explains the mostly positive effects that a generation of people who grew up playing video games is having on the workplace, said Collier.

“They realize that to gain skill you have to work at it.

“You’ve got to put the hours in to get to level 13 on Doom 4,” Collier observed.

“They have no respect for authority unless that authority has gotten to level 13 on Doom 4,” he quipped.

Co-ops want hands-on but without the risks

Most electric utilities aren’t run like Progress Energy, said Steven Collier (above).

They aren’t very good at competitive, diversified business activities and thus not well situated to pursue ISP businesses.

“Many of my members had bad experiences with ISPs,” he noted.

“They bought one or started one, lost money with it for several years, then got out.”

About 180 still have ISPs, Collier noted, and about 100 are making money at it but only about 70 of them are happy.

NRTC members that started telecom ventures had poor results and one even went under as a result and others wrote off large amounts of value and loan amounts.

“We had a number that just had a bad experience in general with deregulated, diversified businesses.”

If you sell hamburgers to those who want hamburgers and they can only call

you, that’s a different business from competing with other hamburger marketers, he explained.

The only reason most of them went into other businesses was the belief they were going to be deregulated.

It’s the same reason every ILEC in the country has a CLEC, because they realize they are going to lose the revenue from their ILEC, said Collier, but the rural electricians believe that deregulation is gone forever so they are not highly motivated.

About one in nine rural electricians, Collier added, plan to deliver broadband “because it’s the right thing to do ... for their community,” but Collier calls his members “a pretty conservative group of folks.

“They are also discouraged by their national trade association and their national bank, the CFC (Commerce Funding Corporation), from engaging in non-core activities,” he added.

The CFC likes its loans repaid with monopoly money, said Collier, because

loans that aren’t monopoly money don’t get repaid.

“You’d think that would make these guys ideal candidates for the landlord model but they don’t like that model.

“They like to have control,” to be participants, to be involved so long as there’s no risk since it’s a fairly difficult market to penetrate.

The industry is going to need to show a full deployment of BPL working over a significant period of time, “and that hasn’t happened yet.

“We’ve had pilots and field trials.

“Show me 100,000 of these things that have been in service for two years, through two thunder storms,” with not more than a half percent replacement rate on the pole-top and consumer premise equipment.

“Then I’m going to start believing that this is commercially viable” and he’ll begin to take an interest.

“Otherwise I’m not all that interested unless I am a leading rural electric co-op

and there aren't enough of those to sustain a business. "It's only then that we're going to know what this really costs versus what the guys can sell it to us at right now while they're venture capital funded.

"I need to know what's this stuff going to cost and what are the economics of running my ISP business with [BPL] in a real deployment."

With each day that BPL hovers in the pilot and trial stage, WiMax moves a day closer to market and the latter has a standard, Collier said.

Having a standard is big. It means all vendor equipment is interchangeable and a utility doesn't have to forklift out all the hardware if it decides to change vendors, he added.

Tell us what you think. We want to hear from you. Send your comments, questions and suggestions about this week's *BPL Today* to sam@ghinews.com.

Abbreviations: To see a glossary of *BPL Today*'s abbreviations, go to www.bpltoday.com/glossary.htm.

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