



February 3, 2004

## Energy/Telecom Convergence that May Actually Make Sense

Will 2004 be the year that energy/telecom convergence takes the world by storm? Wait a minute, most readers will be saying, we've already heard that. And didn't Enron Broadband Services, Montana Power and others destroy billions in shareholder value trying to make it happen? It would seem any energy executive worth his or her salary wouldn't even mention the word telecom, let alone contemplate making it a strategic part of their business plan. Yet despite a dismal start, two maturing technologies now have the potential to rapidly put telecom back on the plate of every gas and electric distribution utility.

You might be surprised to learn these technologies aren't just some engineer's lab project, rather, they are being rolled out successfully in the field right now. What are they? They are technologies called Power Line Communications (PLC) and Fiber-in-Gas (FIG) that have the potential to allow energy utilities to provide last mile broadband Internet connectivity to houses and businesses through the utilities' existing energy distribution facilities. To learn more, read on.

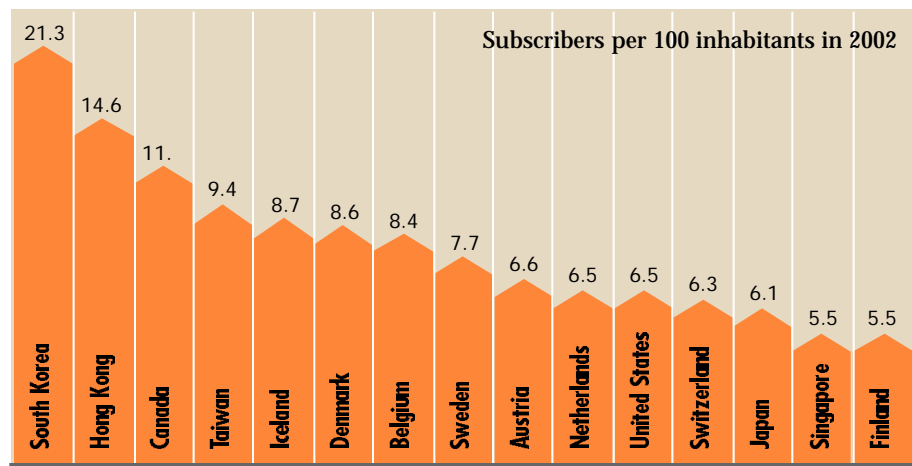
**History of the "Energy/Telecom" Convergence**  
Energy companies originally became active in telecom for a solid business reason. Back in the early growth years of the Internet (the distant 1990's!), pipelines and electric utility companies often already had fiber laid alongside their facilities for their own internal uses. And access to rights-of-way that could easily be used to install

fiber. Thus the development of backbone fiber was a natural. However, some energy companies wanted to diversify and tried to also offer services that were competitive to the telecom industry. There they met up with well-financed, aggressive and industry savvy competitors such as Level 3, Qwest, WorldCom, and AT&T. And when the telecom business came crashing down in the Dot.com bust, those energy companies who invested heavily in telecom crashed with them.

### The New Opportunity

One result of the Dot.com bust is a wealth of cheap, underutilized backbone fiber.

Top 15 Countries for Broadband Penetration



Unfortunately, this fiber isn't useful until connections can be made to the ultimate consumer (the so-called "last mile"). And it is the last mile where new opportunities lie. Currently, about 91% of American zip codes have at least one option for high-speed Internet connections. Yet only about 15% of possible consumers have chosen to subscribe. Contrast this to a country such as South

Korea where it is estimated that 60 to 70% of homes are connected to broadband services. In fact, the U.S. languishes at 11th in the world in number of broadband connections per inhabitant. This may be because service costs are also higher in the U.S., where broadband connections generally cost greater than \$40/month. Many of the countries with higher penetration rates have services that range from \$22 to \$35/month. Industry observers believe that both access to broadband service and lack of perceived value versus subscription costs are holding down penetration rates in the U.S. Yet in a rapidly globalizing world where even white collar jobs are moving to international locations, failure to join the broadband revolution has the potential to disadvantage many Americans.

**The New Technologies**

This leads us to two new technologies that may help bridge the gap. The first is Power Line Communications, also known as PLC or PLB (Power Line Broadband). PLC is technology that allows Internet signals to be carried from the existing fiber backbone across the medium-voltage lines that make up the electric distribution lines in your neighborhood and, in some cases, to be carried into your building and from room-to-room via your existing low-voltage electrical wiring. Imagine being able to plug your computer into the wall outlet and receiving both power and high-speed Internet access! Up until a couple of years ago, most engineers thought PLC was great in the lab but failed to perform in field tests. Suddenly we are seeing that the technology actually works and may be ready for large scale roll-outs. Three technology companies are currently active with field deployments – Amperion, Current Technologies, and Main.net. Each of these is working with utilities in field tests and a handful of utilities in the U.S. are beginning to go beyond tests and offer permanent high-speed internet services to customers. Active utilities include Ameren, AEP, Cinergy, ConEdison, PEPCO, Progress, PP&L, and

Southern Co. Meanwhile, in Europe where higher distribution voltages make the technology easier to use, PLC services are already available in countries such as Austria, Germany, Poland, Scotland, and Sweden.

The second technology is Fiber-in-Gas, or FIG. This technology allows fiber optic cable and conduit to be installed inside operating gas pipelines. The technology works in low to medium pressure gas distribution mains such as the lines that typically run through neighborhoods and commercial business districts. Like PLC, FIG offers a means of connecting existing fiber backbone to the homes and businesses of individual customers. FIG is being patented by Sempra Energy’s Sempra Fiber Links subsidiary and is being targeted towards dense urban areas where the cost of traditional trenching and/or directional boring installation techniques is high. Services have been rolled out in Long Beach, California, Fort Worth, Texas, and in Sempra’s own Frontier Energy gas distribution utility in North Carolina. The California Public Utilities Commissions has recently authorized Sempra to offer FIG services in the service territories of SoCalGas and San Diego Gas and Electric.

**Remaining Challenges**

While a combination of new Internet technologies and the existing gas and/or electric distribution system seems like a natural fit, a number of

**Technology Options**

<u>Company</u>	<u>Technology</u>	<u>Description</u>
Amperion	PLC/WiFi	Uses PLC to get the signal to the pole or power line outside your home. Then uses wireless network to get the signal into your building.
Current Technologies	PLC	Uses PLC all the way into your home and provides network throughout building wiring.
Main.net	PLC	Uses PLC all the way into your home and provides network throughout building wiring.
Sempra Fiber Links	FIG	Installs fiber cable into existing gas distribution pipe including the service main running into your building.

obstacles remain before utilities jump into the Internet business. Technology providers must still prove that the technology works reliably when rolled out to large numbers of customers in U.S. distribution systems. Regulatory approval is generally required both from the traditional energy regulator (the state public utilities commission) as well as from telecom regulators (the Federal Communication Commission). Some changes to FCC regulations may be required for PLC (but not for FIG). Perhaps more daunting is the question of whether utilities can create a solid business case for re-entering the telecom business and whether lenders will make capital available. A key question is whether PLC or FIG can provide a compelling enough alternative to the existing cable and DSL options. Key differentiators may include cost advantages in urban areas for FIG, possible cost advantages and ease of home networking for PLC, and the option to cost-effectively offer services in more rural areas for PLC. Another important question is whether energy companies can act quickly enough to enter the field before cable and/or DSL providers get too large of a market share to overcome.

### **The Future**

In the best case scenario, energy utilities will quickly invest in the new Internet technologies

and become the third major broadband pipe available to consumers. And by doing so, energy companies could quickly expand the availability of high speed access to more rural areas currently underserved by DSL or cable. If cost advantages touted by current technologies providers actually prove to be true, PLC or FIG may drive down the cost of high speed access leading to significantly higher broadband market penetration rates. This would greatly increase the value of existing gas and electric distribution systems and provide energy utilities with the revenue growth potential that has proved to be so elusive. It would also open the door to a new wave of energy-based services including real-time metering, remote load control, power quality services, and power outage notification. It could also enhance utilities' efficiency by providing the network for remote meter reading, outage monitoring, and load-responsive distribution systems. Lastly, it could revitalize the role of the retail marketer, who could add value by bundling these various services. Imagine being offered a Shell/Sprint service which provides electricity, natural gas, high speed Internet, and long-distance phone service all on one bill for a flat monthly rate. How's that for highly attractive consumer benefits from energy deregulation!

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