

# Utilities as Broadband Infrastructure Providers

How to capitalize on existing utility infrastructure and compete in new markets

By Douglas T. McMurray, PacketFront

Technology has opened an interesting opportunity for utilities: providing broadband network services. The expansion of broadband access, the shift from analog to digital, and the development of new services like e-education and e-medicine show great potential.

But while incumbent network providers are often forced to make the best of existing copper networks, new players such as gas, electric, water and sewage utilities can provide new fiber-optic infrastructure along their existing rights of way, to the same markets they are already serving. In general, utility companies have succeeded remarkably well in establishing themselves as broadband fiber infrastructure providers.

Fiber has become the natural choice

for new networks. What's more, North America is the fastest growing market for fiber-to-the-premises (FTTP) subscribers – more than 8 million homes passed and more than 1.4 million customers as this issue goes to press (see Figure 1).

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## Advantages for Electric Utilities

Electric utilities in particular have many strategic advantages in building and operating fiber broadband networks. Broadband users are the same customers that use electricity today. Broadband also has the same physical delivery channels as electricity, as it is wired directly to the customer premise. Besides these hard realities, there are several other underlying synergies that directly affect the successful launch of an added broadband business.

First, deploying and maintaining both the utility infrastructure and the broadband infrastructure requires basically the same knowledge and skills.

Second, local brand awareness and

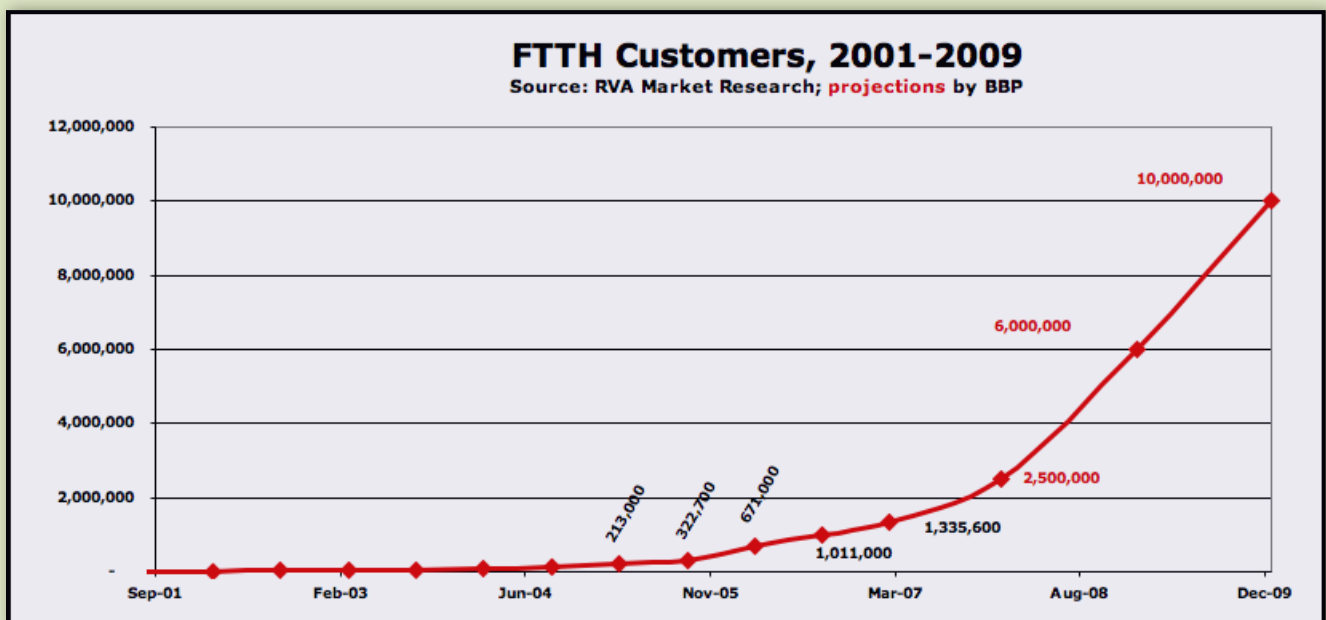


Figure 1: Projection, North American fiber-to-the-home subscribers.

owning the right of way means that no one can build and market the network at a lower cost.

Third, the fundamental revenue model – maintaining a product directly to the customer’s premises – is similar in the utility and broadband industries. Both require delivering high-availability service and both produce revenue streams through collection of fixed and variable fees.

Fourth, utility companies are perceived as trustworthy and stable, characteristics that give them a substantial advantage when deploying and connecting the infrastructure to landlords and homeowners, as well as when attracting service providers.

Fifth, utility companies plan and execute long-term investments. This makes it easier for them to fully comprehend and evaluate the financials of an added broadband business.

Finally, utility companies have strong ties to local authorities, hospitals and schools in their communities. Connecting these players creates

great positive societal effects and economic growth, in addition to providing the broadband operator with ideal early customers. This has proven to be a good launching pad, resulting in a quick jump start for the broadband business, as well as fueling demand for additional future services.

### Understanding the Potential of Broadband

More and more household spending on communications and entertainment is being channeled to services via broadband. But as Figure 2 shows, incumbent telecom operators have mostly been focusing on providing access to data and telephony services.

The goal for broadband infrastructure providers is to reach customer max in terms of monthly household spending. One obstacle is that infrastructure providers require new service knowledge. In many cases, a new organization is required to reach the customer max. Also, existing copper networks

have not been able to manage multiple services with regard to bandwidth and quality of service, because both decrease as you move farther away from the customer.

To take advantage of the pent-up demand for these services, an infrastructure provider must design a network that can handle these services both commercially and technically.

By deploying a purpose-built network that allows multiple services and service providers, utility companies have a golden opportunity to position themselves in relation to existing competition and successfully enter the broadband market.

### Choosing the Business Model

There are several possible strategic, as well as technical, approaches to deploying a next-generation network. It is important that these decisions align with the utility’s resources as well as with its overall strategy. Overall strate-

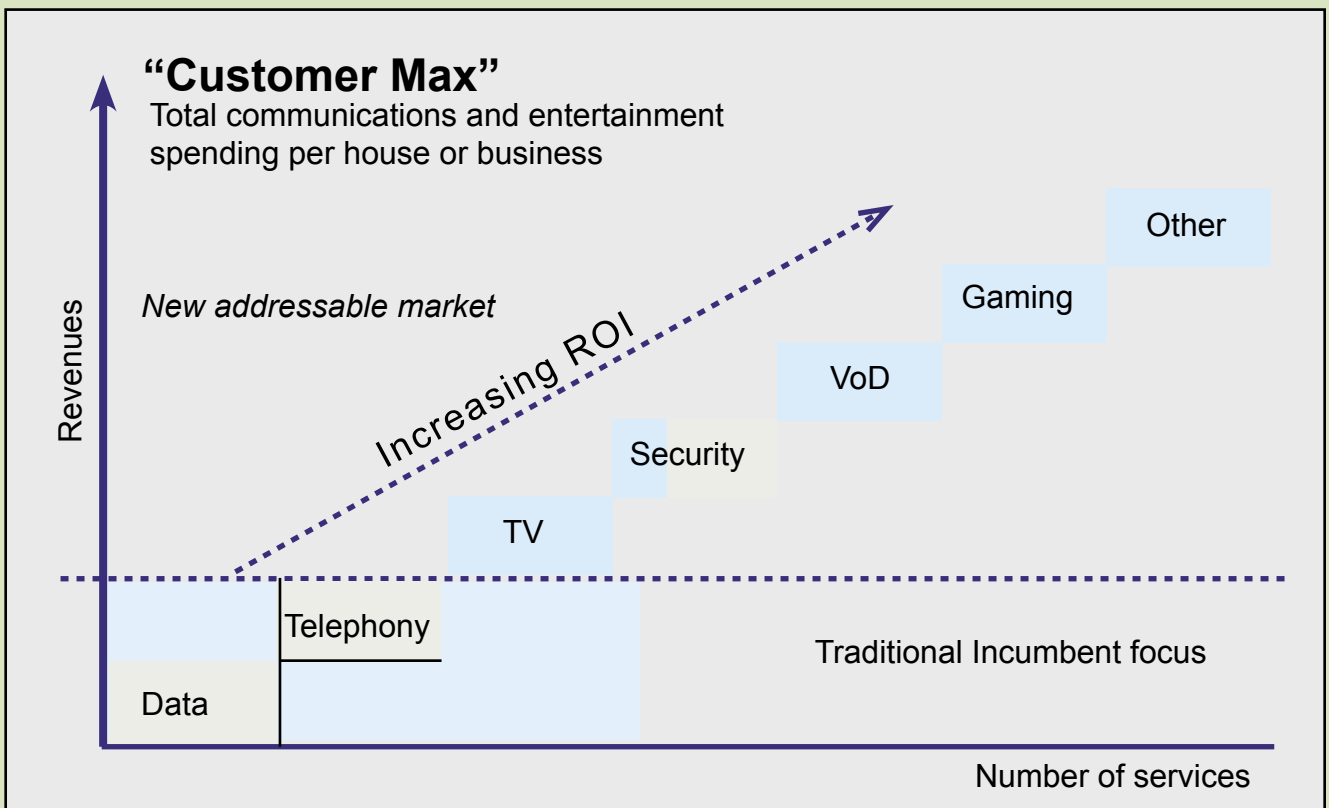


Figure 2: Incumbent telephony communications provider focus.

gy addresses risk tolerance and investment return requirements.

It is also important to decide on the infrastructure provider's expected level of activity in providing services. A good business model should harmonize well with existing strengths and compensate for weaknesses.

We have argued that in order to reap the maximum benefits and revenue from a network, diversified and highly desired services are a must. An infrastructure provider can create these services itself, but this implies the development of new skills and a large organization, which leads to high operational expenditures. To get reasonable economies of scale and scope with service provisioning, a national or even international scope have proven to be necessary.

Creating services also gives the infrastructure provider extended responsibilities, ranging from set-top boxes to marketing and customer support, which are easy to underestimate. This does not align well with most power utility organizations' focus on a confined local market and core business.

## The Open Access Model

An attractive alternative model that has proven to suit utility organizations very well in several markets internationally is called the "open access networks" model. Since 2001 PacketFront has built up a great amount of expertise in the deployment of open access networks. An open access model combined with PacketFront's leading technology has proven to be a good recipe for the dynamic deployment of next-generation networks, although hybrid business models can be tailored for different stages of the rollout.

In an open access network, ownership of the actual network infrastructure is separated from service provision. This shared approach encourages the separation of service development from all issues related to the underlying technical platform on which the services are delivered. As seen in Figure 3, three separated relations are central to the model, giving the involved play-

ers clearly defined roles and focus in their activities.

## Supporting the Open Access Model

PacketFront's solutions include technology to easily handle multiple and complex services in a single network. Using remote provisioning and auto configuration in the network allows customer support and maintenance to be held at a minimum. This means that a utility organization can own and operate a broadband network without any significant change to its current organization. By working with this proven technology and open access model, the utility organizations own an option for future services that a proprietary vertically integrated network cannot give.

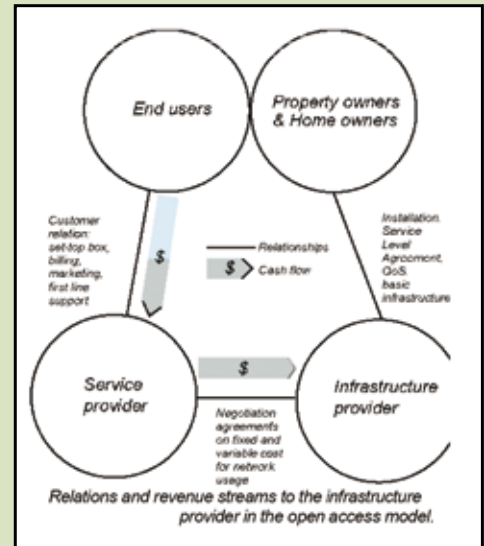
PacketFront's automated solution also gives service providers a low cost of entry into the broadband network in the first place.

The schematic view of an open access network in Figure 4 illustrates several of the advantages with the solution. For example, a new user can activate the system and use an automated portal to subscribe to all the services available on the network.

In addition, for service providers this automated solution makes customer support and network diagnostics completely straightforward. The solution enables and encourages the infrastructure provider to welcome many competing service providers within the same value segment (telephone, Internet, video, gaming and so forth) into the network.

This gives the infrastructure provider greater flexibility to choose the most suitable business model and level of activity. The flexibility also holds for incorporation of future community-based services like healthcare and education into the network.

As the schematic shows, the solution is technology-agnostic in the sense that it can feature and manage a num-



**Figure 3:** Relations and revenue streams to the infrastructure provider in the open access model.

ber of access technologies to the end users including (but not limited to) xDSL, wireless, Broadband over Power Line and fiber-to-the-home (FTTH). This allows the infrastructure provider to choose the optimal technology in each segment of the network.

## Investment Decisions

Most utility companies will enter the broadband market with financially driven motives. This implies that the main objective is to create a large base of profitable users. Important financial measures to consider are Average Revenue Per User (ARPU) and Total Cost of Ownership, which includes network operations, marketing, customer administration and support. With low operating costs, the infrastructure provider is in a strong position to generate substantial profits, and to effectively counter any competitive threats.

## Number of Customers

There are strong economies of scale for FTTH networks. Figure 5 shows the falling cost per subscriber as penetration levels increase. At a specific point, which varies depending on local factors and business model, fiber will be cheaper to supply than xDSL, and because it offers higher bandwidth, it will generate higher ARPU as well. Fiber is also said to be "future-proof"

– that is, the investment in fiber can be upgraded to capacities beyond any competing technology available today, guaranteeing the network significant economic life.

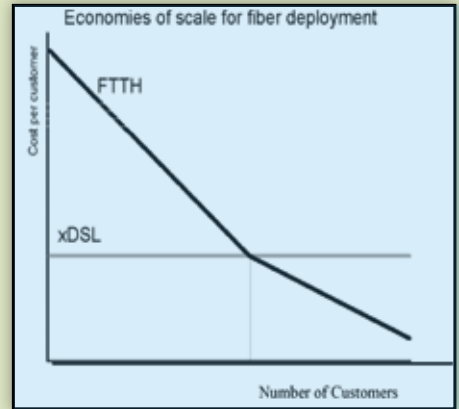
### Five-Step Process

The financial analysis for this investment is unique for each utility company. PacketFront has accumulated knowledge and full-fledged analytical tools in order to help utility organizations, and recommends a five-step process to fully understand the financial undertaking and business opportunities a next-generation network can offer.

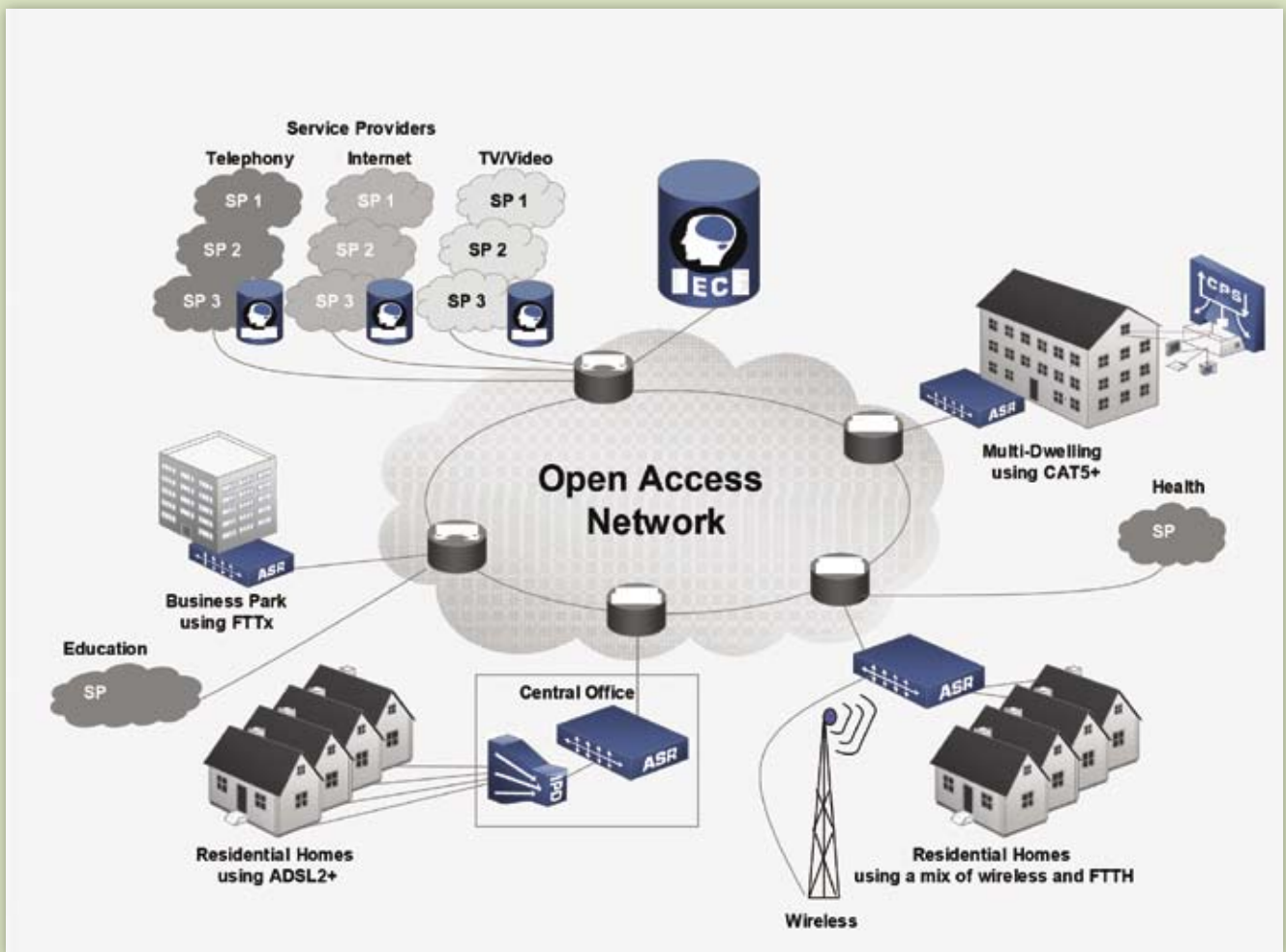
**THE FIVE STEPS ARE:**

1. Projection of the service territory potential market for broadband.
2. Economic analysis of suitable infrastructure technology.
3. Calculation of competitive advantage and levels of investment.
4. Estimation of total cost of ownership, including organization and operations.
5. Estimation of revenue from services.

These steps lead to the total ROI and serve as a basis for a decision to invest.



**Figure 5:** Economies of scale for fiber: Cost to serve a customer falls quickly as market size increases.



**Figure 4:** An open-access model deployed by PacketFront.