Driving Deployment Of Fiber to the Home

In today's economic environment, most deployers are cautious about FTTP projects. What can be done to get fiber to more homes and businesses?

By Costas Troulos ■ *Diffraction Analysis*

Though nearly 60 countries now have some sort of fiber-to-the-premises activity, there are many more countries and regions with little or no FTTP deployment than there are regions where deployment and adoption are booming. Examining the rollout strategies for the different players in the market helps to show what the main drivers for deployment are.

The active players in the broadband access market can be categorized according to five broad groups. Three can be considered existing telecommunications access players, and two are new entrants.

- **Incumbent operators** correspond to the current or former state-owned monopoly in each country. They own the copper twisted-pair networks that are used to provide telephony services to consumers.
- **Cable TV operators** provide television content via coaxial cable networks. They typically own access networks up to the customer premises, and in this regard they have market power similar to the incumbents, in the areas where they are present.
- **Alternative operators** (usually called competitive providers in the United States) arose as a result of liberalization in the telecommunications market. At the outset, these operators owned no infrastructure. They usually offer services over copper telephone networks by reselling wholesale products provided by incumbents. An incumbent that deploys FTTP outside its legacy network footprint is considered an

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alternative operator in that market for the purpose of this analysis.

- **Public or semipublic agencies** are new entrant operators directly or partially owned by the public sector. They are typically public utilities or newly established organizations charged with executing a broadband plan. They often own the rights-of-way needed to deploy new infrastructure.
- **Real estate developers**, another category of new entrant, build large housing developments, apartment communities or office complexes. They also usually own the rights-of-way within their development areas.

The strategies of these players may appear similar, but they are driven by different requirements. The prevailing general strategies for each type of player in the market are summarized in Table 1.

INCUMBENT OPERATORS

Incumbents are the historical guardians of copper telephone networks. They usually enjoy a monopoly over access that leads them to want to protect their copper networks, and the revenues they generate, for as long as possible. Incumbents have the option to migrate customers directly to all-fiber networks, but many choose the less expensive step of deploying some fiber to intermediate nodes in their access networks and offering VDSL-based services instead. When incumbents do deploy FTTP, their strategy is determined by the following:

- Market developments: Alternative operators often react to incumbents' reluctance to invest by building their own access infrastructure, which can lead incumbents to deploy FTTP as a competitive response.
- Geography and demographics: Population and housing densities are

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Strategy	Incumbents	Cable TV operators	Alternative Operators	Public New Entrants	Real Estate Developers
Timing	Prevailing strategy is "wait-and-see"	Larger operators like to wait-and-see and invest in DOCSIS 3.0. Smaller operators often invest in FTTP as a differentiator.	Usually first movers in markets where they have critical mass or no access to LLU.	Fast, once funding has been secured	Immediate in new developments, wait-and-see in existing developments
Selective roll outs?	Cherry picking in high-demand areas to protect inherent competitive advantages	Cherry picking in areas of high demand or in areas where they have a competitive edge	Cherry picking in areas of high demand	Standard practice when utilities are involved	Yes. They deploy only to their own properties and prefer to invest in Greenfield sites
Aggressive roll outs?	Only in response to competitive threat. Often expand to new areas by acquiring smaller players	Only in response to competitive threat. Often expand to new areas by acquiring smaller players	Only in areas with developing demand and outside the reach of incumbents and cable operators	Standard practice when public funding is available	Yes, for the properties qualifying for FTTP
Co-operation	Rarely	Rarely	Yes, with increasing frequency. Cooperate with incumbents, other access providers and utilities.	Yes. Typically public new entrants ally with existing or new access providers	Yes. Typically real-estate developers partner with existing or new access providers
Technology choices	Point-to-multipoint technologies are generally preferred	Point-to-multipoint technologies are generally preferred	Point-to-point and point-to-multipoint are both used, depending on circumstances	Point-to-point technologies are generally preferred	Point-to-point technologies are generally preferred

Source: Diffraction Analysis, 2012

Table 1: Strategies of the five major types of FTTP deployers

crucial factors in selecting areas in which to deploy FTTP because they influence the level of investment required. Local demographics and demand expectations are therefore very important factors influencing incumbents' rollout decisions.

- Regulatory regime: Regulation also plays a significant role in incumbents' rollout strategies. Incumbents want to avoid regulatory mandates to open their FTTP networks to competitors and often exercise their political power or structure their rollout plans (including technology choices) to help them achieve this end.

CABLE TV OPERATORS
Cable TV operators are, in some respects, another type of incumbent, in some cases with national reach. They own the content or the content broadcasting rights and extensive access facilities. They can choose to upgrade their networks either by replacing parts of their coaxial distribution networks with fiber or by overbuilding with FTTP. As they are typically the second-largest players in the access market, the rollout strategies of cable TV operators often have a significant influence on the strategies of incumbents. The rollout strategies of cable operators are determined by the following factors:

- The condition and capabilities of the cable network: Cable TV operators using outdated technologies can combine network upgrades with the development of FTTP infrastructure. Introducing newer and more efficient network equipment goes hand in hand with partial or even complete replacement of coaxial networks with fiber.
- Competitive market dynamics: FTTP deployment by other operators often spurs cable TV operators to invest in infrastructure, although this is not the only consideration. Large cable TV operators with near-national coverage can afford to adopt a wait-and-see strategy, while those with local and regional reach tend to invest sooner to improve their triple-play offerings in the face of competition from larger players.
- Financial health: In recent years, mergers and acquisitions have led to a more significantly concentrated market. This trend of consolidation often leaves cable TV operators with low investment capacity.

ALTERNATIVE OPERATORS
Alternative operators are at a strong disadvantage in the access market. Where the regulatory regime permits, such as in Western Europe, they use local loop unbundling (LLU) products of the incumbent. In other parts of the world (Russia, India and elsewhere) alternative operators have no means to reach customers other than by building their own infrastructure. They usually deploy FTTP, therefore, either to avert the costs of LLU or to expand their networks to reach more end users. To a large extent, alternative operators' initiatives drive the investment activity in the access market. The factors that most influence the strategy of alternative operators are

- Strong market presence: Alternative operators often deploy FTTP in areas where they have reached a critical mass. They construct access infrastructure where they have enough customers to make operating an FTTP network sustainable.

Competitive conditions, regulatory regimes, the quality of existing networks and the market demand for services all play important roles.

Public-sector deployers and real estate owners have the advantage of owning rights-of-way.

- Availability of backhaul: As the smaller players in the market, alternative operators can expand only if backhaul networks are available at competitive prices. Backhaul is seen as prerequisite to the expansion of FTTP outside major urban centers.
- Regulatory regime: In regions where regulation of incumbents' copper networks is strong and effective, alternative operators have fewer incentives to deploy FTTP because, like everyone else, they can use incumbents' LLU products. The reverse is also true: Regions with poorly developed LLU regimes tend to exhibit substantial FTTP growth.

PUBLIC-SECTOR ORGANIZATIONS
The public sector considers investing in fiber access when it sees that the benefits of high-speed broadband outweigh the costs and risks. Typically, the public sector takes the initiative in areas where the private market is reluctant to go, such as remote, isolated small villages. Public endeavors can be supported by public funds (for example, European structural funds or other stimulus packages) or by public or semipublic businesses such as electric and water utilities.

One of the greatest advantages public FTTP developers have is that they typically own the rights-of-way for the construction of their networks. The rollout strategies of public-sector organizations are influenced by the following:

- Participation of public utilities: When utilities lead FTTP projects, rollouts frequently follow upgrades of their existing energy distribution networks and use the existing duct systems of those utilities. Constructing two networks at once is more cost-efficient than constructing them separately.
- Funding conditions: The use of public funds often comes with conditions attached, and the agencies that make those funds available carefully scrutinize rollouts and business strat-

egies. For example, the most popular type of public FTTP funding in Europe, state aid for services of general economic interest, requires 100 percent coverage of a region and provision of wholesale services on an open-access basis.
- Maturity of the market: The level of maturity in the broadband market has a major influence, especially in national broadband plans or in underserved subnational markets. When private access providers participate in publicly funded FTTP projects, rollout timing is significantly improved, and existing network facilities and duct distribution systems can be reused. These rollouts are typically aggressive and cover a substantial part of the population.

REAL ESTATE DEVELOPERS
Real estate developers understand that fiber will increase the desirability and the value of their property and help them compete against other property developers. FTTP is often an easy service to bundle with their current offerings, which may include electricity,

heating and water distribution. Because they own the rights-of-way within their own buildings or campuses, many developers have no competition in the last mile. The rollout strategies of real estate developers are determined by

- Level of demand for broadband: When demand for high-speed broadband services is high, real estate developers equip their properties with fiber cables up to each apartment or dwelling unit. In areas with low demand, fiber is typically deployed to building basements, and existing internal copper cabling is used to reach apartments.
- New developments: Real estate developers considering FTTP deployment often look first to greenfield developments. In existing buildings, the decision to upgrade their telecommunications infrastructure to fiber is made on a case-by-case basis depending on the demand and characteristics of the local market.
- Availability of backhaul networks: In some cases, property developers have expanded their involvement to include provision of retail services to their properties, but they can do this only in areas where backhaul services are available at affordable prices. Table 2 highlights the deployment priorities for different types of FTTP

Geography	Incumbents	Cable TV operators	Alternative Operators	Public New Entrants	Real Estate Developers
Tier-1 areas: capitals, business and residential centers	Primary focus: exploit economies of scale for market domination	Attractive due to high demand: focus depends on scale and installed customer base	Attractive due to high demand: deployments to the existing customer base	National broadband plans include Tier-1 areas, often at a later phase	Only applicable to areas where the developer owns or is developing new housing/offices. These are often equivalent to Tier-4 areas in terms of size, but are more likely to be located in Tier-1 and Tier-2 cities and towns.
Tier-2 areas: mid-size cities and selected suburbs	Second priority areas, often addressed after competitors start to deploy FTTP	Attractive areas due to favorable competitive conditions	Deployments based on market share to gain first mover's advantage	National broadband plans include Tier-2 areas. It's harder to justify public subsidies or aids	
Tier-3 areas: smaller cities, towns and suburbs	Rarely	Deployments occur on a case by case basis, provided there is critical customer mass	Attractive areas due to favorable competitive conditions – depending on backhaul availability	Deployments occur in combination with plans for Tier-4 areas	
Tier-4 areas: villages and rural areas				Attractive areas for municipal projects (lack of private interest).	

Table 2: Deployment priorities of different types of FTTP deployers

players based on the geographic characteristics of the areas where FTTP is deployed.

CONCLUSIONS AND RECOMMENDATIONS

Governments and operators agree that fiber access networks need to be deployed in the relatively near future. However, although FTTP markets around the world are growing, in general they are growing much more slowly than anticipated. The actors in the market remain cautious about rolling out FTTP networks, and with good reason. The aggressive rollouts of the near past, made under false assumptions of prosperity and demand expectations, often failed.

Today, only government-led projects follow aggressive rollout strategies on any significant scale. The rest of the market takes small steps – sometimes too small – out of fear of utter economic disappointment.

Following are high-level recommendations to the various players in the ecosystem to help them better understand the challenges in deploying FTTP and increase their likelihood of success:

Recommendations for incumbents, cable operators and alternative operators:

- **The time to collaborate is now.** The FTTP business is associated with high risk, primarily because of the high up-front cost of investment. One way for access providers to avert premature economic failure is to share deployment costs with other stakeholders. Access providers should explore different forms of collaboration, such as reciprocal rights to lease a competitor's infrastructure.
- **Small markets have strong monopoly potential.** Although incumbents and large cable TV operators often shun Tier-3 and Tier-4 markets, practical experience shows that access providers that enter these markets often gain significant first-mover advantages. Put simply, small markets might appear economically unattractive, but they have good potential because there is less competition.
- **Exploit opportunities in wholesale markets.** Retail services are not the

only way to commercialize a fiber network. Access providers should evaluate the possibility of offering wholesale products to other retail service providers to increase network penetration. This allows the total cost of ownership to be amortized across a larger number of end users.

Recommendations for governments, regulators and policymakers:

- **Share what you can spare.** Sharing existing public infrastructures, such as utility ducts, trenches and poles, can help accelerate the rollout of FTTP. Public stakeholders, including municipalities, governments and policymakers, should explore ways that public infrastructures and rights-of-way can be made available to all parties interested in deploying fiber networks.
- **Facilitate collaboration among stakeholders.** Regulators and policymakers at all levels of public administration facilitate cooperation between access providers and rights-of-way holders. Collaboration can improve market dynamics, enhance competition and avert potential monopolistic practices.
- **Get the financing in place and on time.** One common shortcoming of public funding is that all the funds are typically made available at the start of the project. As a result, publicly backed projects start out cash-rich but do not necessarily have financing in place to support later phases. The timing of public financing needs to match the progressive nature of network deployment and cover all phases of network development and service marketing.
- **Don't neglect the backhaul market.** Backhaul is a prerequisite for the development of FTTP networks, and public policymakers should ensure that backhaul links are available at competitive prices. This can be accomplished either by appropriate regulation of the backhaul market or by channeling a portion of FTTP stimulus funds to the development of national interconnection infrastructure and exchange facilities. ❖