Fiber carriers across Europe are ideally positioned to benefit from the growth in demand for bandwidth, which is expected to reach US levels within the next three years. The demand for high bandwidth fiber connections is expected to explode due to the strong growth in individual data consumption, usage of bandwidth-intensive cloud applications, and increasing penetration of broadband-enabled mobile devices.

Fiber carriers’ ultimate objective is sustainable and profitable revenue growth per fiber mile. To achieve this, Solon recommends they incorporate five actions into their strategies:

- Identify and leverage the ‘uniqueness’ of the own fiber routes
- Tailor the B2B sales approach
- Capture mobile backhaul opportunities
- Focus on return-driven expansion of the network footprint
- Find a selective approach for residential FTTH

MARKET UPDATE: CURRENT DRIVERS OF EUROPEAN FIBER DEMAND

Europe is still two to three years behind the US in business fiber demand, mainly because bandwidth demand has been lower in Europe. Another factor is that Europe’s network layout allows for higher bandwidths over the traditional copper infrastructure. However, this
situation will change shortly as bandwidth demand increases rapidly due to the following influences:

- **B2C bandwidth race – the slow but certain death of ADSL?** The answer depends on the country, but residential markets across Europe show strong growth of individual data consumption mainly driven by services like streaming, over-the-top video and remote storage. With these developments, Solon expects the average peak downstream capacity per user to grow by approximately 50 per cent every year. As a result, legacy copper products like ADSL will struggle to serve the bandwidth needs of customers. In contrast, almost all cable operators have upgraded to DOCSIS 3.0, and FTTx players offer superior speeds and products. Not being able to compete on speed, ADSL players are often driven into an intense price war. Portugal is one of the European residential markets that have already seen the transformation to a fiber/NGA market. The dominant broadband players ZON and PT are squeezing ULL players out of the market with their high bandwidth offers. We expect this trend to be replicated in other European countries within the next few years.

**GRAPH 1**

**Next generation access lines Portugal**

<table>
<thead>
<tr>
<th>Q1:09</th>
<th>Q2:09</th>
<th>Q3:09</th>
<th>Q4:09</th>
<th>Q1:10</th>
<th>Q2:10</th>
<th>Q3:10</th>
<th>Q4:10</th>
<th>Q1:11</th>
<th>Q2:11</th>
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<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>70</td>
<td>80</td>
<td>90</td>
<td>100</td>
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**Unbundled local copper loops Portugal**

<table>
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<th>2004</th>
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<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
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<tr>
<td>0</td>
<td>100</td>
<td>200</td>
<td>300</td>
<td>400</td>
<td>Unbundled copper lines (DSL)</td>
<td>Unbundled copper lines (DSL)</td>
<td></td>
</tr>
</tbody>
</table>

- **B2B – the rise of cloud computing.** The B2B sector shows increasing workforce mobility with data-intense cloud applications driving the enterprise demand for high-bandwidth fiber lines. This trend is underlined by a 21 per cent year-on-year growth of business IP traffic in Western Europe between 2010 and 2011. As a consequence, the B2B telecommunications market shifts towards flexible and scalable fiber services. Whereas legacy copper-based services are declining, fiber carriers benefit heavily from growth opportunities based on new services and increasing bandwidth demand. Two data points underline this:
• In Germany, fiber-based revenues are up 11 per cent compared to down 2 per cent for the total telecommunications market. (CAGR 10-13)¹
• In the US, fiber-based revenues are up 20 per cent compared to down 1 per cent for the total telecommunications market. (CAGR 10-13)²

**Mobile – smartphone boom and 4G roll-out.** We expect mobile data traffic to grow at even higher rates than fixed data traffic, driven by an increasing penetration of smartphones and tablets, mobile working applications and the roll-out of 4G mobile networks. This will lead to a growth of mobile data consumption in Western Europe of more than 90 per cent per year in the next five years. Key enablers of the ‘exploding’ mobile traffic are attractive pricing schemes of MNOs, more capable mobile devices and the large amount of bandwidth intensive mobile content.

This development will put pressure on mobile operators to upgrade the connections of their mobile towers and base stations. With scalable, dense and future-proof infrastructures, fiber carriers are in the front row to win in the mobile backhaul game.

**GRAPH 2**

Although European fiber carriers clearly face a large and growing market opportunity, we think that bandwidth demand alone does not guarantee business success.

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¹ Solon market model  
² Solon/AV&Co market model
A STRATEGY FOR FIBER CARRIERS: FIVE IMPORTANT ACTIONS

At Solon, we consider the following five actions to be important pillars of a strategy for achieving the ultimate objective: sustainable and profitable revenue growth per fiber mile.

1) **Identify and leverage the ‘uniqueness’ of the own fiber routes**
   In order to fully exploit the potential outlined in the previous section of this paper, fiber carriers need to know the level of competition and market potential surrounding their network footprint, ideally on a street-by-street or postcode level. This knowledge is the most important category of preparation and the basis for moving quickly and ultimately maximizing the revenue per fiber mile. Sales representatives can be precisely steered and differentiated pricing guidelines can be developed that respond to specific competitive situations. Gathering the ‘route uniqueness’ and surrounding market data is also an important element in our due diligence work on fiber carriers.

2) **Tailor the B2B sales approach**
   An essential aspect of a successful fiber strategy is the implementation of a lean sales approach to fully capture the revenue potential as described in action point 1.

   The B2B sales approach should be based on the following simple principle: offering the right products to the right customers in the right markets.

   - **Product portfolio.** Fiber carriers should avoid complexity and streamline their product and service portfolio. Most fiber carriers, therefore, should focus on the infrastructure part of the ICT value chain, which is centered on enabling services like the connection of buildings and the cross-connections within datacenters.
     Offering housing and hosting solutions is not a ‘must have’ whereas Cloud Computing and Managed Services are too complex to handle and do not offer acceptable return levels for smaller fiber carriers due to the competitive nature of the market.

   - **Targeted customers.** To move quickly in the right direction and address the most promising customers within the identified market, as described in action point 1, business sales should focus on three key target groups: large enterprises with 50 or more full time employees (FTE), multi-office buildings, and small and medium enterprises (SMEs).
     Large enterprises typically split their sourcing (‘best-of-breed buyers’), and non-incumbent fiber carriers should focus on becoming the secondary provider for large enterprises with basic connectivity services (redundant lines, MPLS, Ethernet and Managed LAN).
Additionally, fiber carriers should focus on connecting multi-office buildings with a high number of SMEs. These buildings are ideally on-net or near-net. In multi-office buildings low-priced shared fiber services can be offered to all companies at a high return. To address SME customers, who usually prefer to buy basic bundled services from one-stop suppliers, it is recommended that fiber carriers act as a primary service provider by offering the full product range.

- **Core markets.** To fully benefit from the growing demand for business fiber, it is important to concentrate on the right markets. The key is to focus sales activities on regions with a large market potential and limited competition, as defined in action point 1. This is probably one of the most challenging parts of the strategy due to the dynamic nature of the markets. On the one hand, competitors will continue to develop their network footprint. On the other hand, the good news is the number of enterprises demanding fiber connections will increase as more and more SMEs start to use cloud-based services.

3) **Capture the mobile backhaul opportunity**

Mobile backhauling generates an additional upside potential for fiber carriers. The key aspect here is deciding on which go-to-market approach to take based on two alternative models: dark fiber or bandwidth services. Offering mobile backhaul via dark fiber enables a capex-light approach with limited complexity and stable revenues due to long-term contracts. However, dark fiber connections have a very limited revenue upside potential from increasing traffic and all future growth has to be driven by additional lines.

With bandwidth-based backhaul products, fiber carriers can capture more of the potential from growing bandwidth demand due to the scalability of bandwidth connections. Furthermore, fiber carriers keep full control of their strategic assets and can potentially achieve a higher price per fiber mile. The downsides of bandwidth backhaul services are a higher required capex and opex as well as a higher complexity of the product portfolio and sales organization. For fiber players offering mobile backhaul via dark fiber, it is essential to compare the revenue potential from offering bandwidth, and identify areas with low competition in which higher-priced bandwidth services can be offered.

The decision criteria used by mobile carriers regarding backhaul are usually based on five variables: demand, competition, regulation, contract terms and payback expectations.

Having considered these variables, it is clear that there is not a ‘silver bullet’ for fiber carriers offering mobile backhaul solutions. The fiber carriers need to assess their situation carefully on a case-by-case basis and develop analytical tools that enable them to compare returns for dark fiber and bandwidth-based mobile backhaul offerings.
4) Return-driven expansion of network footprint
When evaluating the payback of new business fiber connections involving construction work, the potential cash contribution is sometimes too low to justify the network extension. Considering the results from matching market potential with the ‘uniqueness’ of the own fiber routes, as described in action point 1, enables fiber carriers to assess the additional B2B revenue potential surrounding a targeted building. When taking into account neighboring business as well as neighboring wholesale potential (for example, mobile towers), the payback can be high enough to allow a smart build of the fiber density. Additionally, concrete sales commitments from wholesale and business sales forces are required to develop the network on the back of contract wins.

5) Find a selective approach for residential FTTH
In the face of cable operators rolling out DOCSIS 3.0, which enables them to provide bandwidths of more than 100Mbit/s, numerous incumbents across Europe have started to roll out FTTH or FTTC to counter the threat. The success rates of these roll-outs vary significantly by country.

GRAPH 3

<table>
<thead>
<tr>
<th>Fiber deployment adoption</th>
<th>Homes connected / homes available, rebased to launch year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portugal Telecom</td>
<td>3%</td>
</tr>
<tr>
<td>14%</td>
<td></td>
</tr>
<tr>
<td>BT Infinity</td>
<td>2%</td>
</tr>
<tr>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>14%</td>
<td></td>
</tr>
<tr>
<td>Deutsche Telekom VDSL</td>
<td>3%</td>
</tr>
<tr>
<td>20%</td>
<td>Verizon Fios</td>
</tr>
</tbody>
</table>

Source: Company information, Solon
Two key conclusions can be drawn from these roll-outs:

a. **Content is driving success.** Without a best-in-class content offering for both linear and non-linear TV, telecommunications companies struggle to compete successfully against cable operators.

b. **Limited ARPU uplift potential.** Most FTTx players were not able to achieve a significant price premium for high bandwidths. Carriers that used high bandwidths to win market shares by pricing only slightly above market standard rates have seen much higher adoption rates.

To draw a complete picture, it is important to also look at smaller, regional fiber players focusing on second-tier cities in Europe. Some of these have been very successful and achieved significantly higher FTTH penetration rates, with 30-70 per cent of homes connected per homes passed. The most promising approach for these regional players is to have an open access strategy. This means the fiber carrier provides the infrastructure on a wholesale basis and partners with larger, residential telecommunications or media brands. Potential partners for such a strategy can be both ADSL players facing incumbent FTTx and cable competition, and cable operators seeking to expand their marketable footprint without investing their own capex.

Fiber carriers across Europe are ideally positioned to win in the bandwidth game, but they have to move quickly without selling their products and services at too low prices. The five action points have helped our clients in Europe and in the US to maximize their revenues per fiber mile and diminish price pressure.
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