

# FTTH solutions

for the communication needs  
of the future



# The last infrastructure revolution in telecommunications



**Colocation (Telehouse)**

**City networks**

**Access network / Fibre to the Building**

**Fiber to the Home (FTTH)**



## Fiber to the Home (FTTH)

Over the last ten years, demand for bandwidth and the accompanying expansion of bandwidth in industrialised countries has increased ten-fold. The move from traditional, analogue TV consumption to individual digital television, Video on Demand, online gaming and Voice over IP means that copper is gradually approaching its physical capacity limits over the last mile. Glass will replace copper over the last mile – this is being called the ‘last infrastructure revolution in telecoms’.

Interest in Fibre to the Home (FTTH) projects has therefore grown steadily both in Europe and worldwide. Prominent flagship cities are Amsterdam, Västerås, Vienna and Zurich. Due to the great complexity and multi-dimensional nature of FTTH projects during the planning, implementation and operating phases, the companies involved must have in-depth expertise in a wide range of disciplines including the business management, legal and technical fields. Great attention must be paid to the development of business cases in order to ensure that investors enjoy long-term financial success.

Energy supply companies and local utility companies have a crucial part to play in FTTH projects. They are the only companies with access to the basic infrastructure which must be used if the high investments are to be kept within reasonable bounds. In addition to this, topics such as Smart Metering and Smart Grid are becoming increasingly important to both groups. It is relatively easy to integrate these technologies during FTTH installation.

However, energy supply companies and local utility companies frequently do not have the necessary expertise and resources to implement an FTTH project because they have traditionally concentrated on energy generation and distribution and communication has not been one of their core competences.

## Complexity of FTTH projects

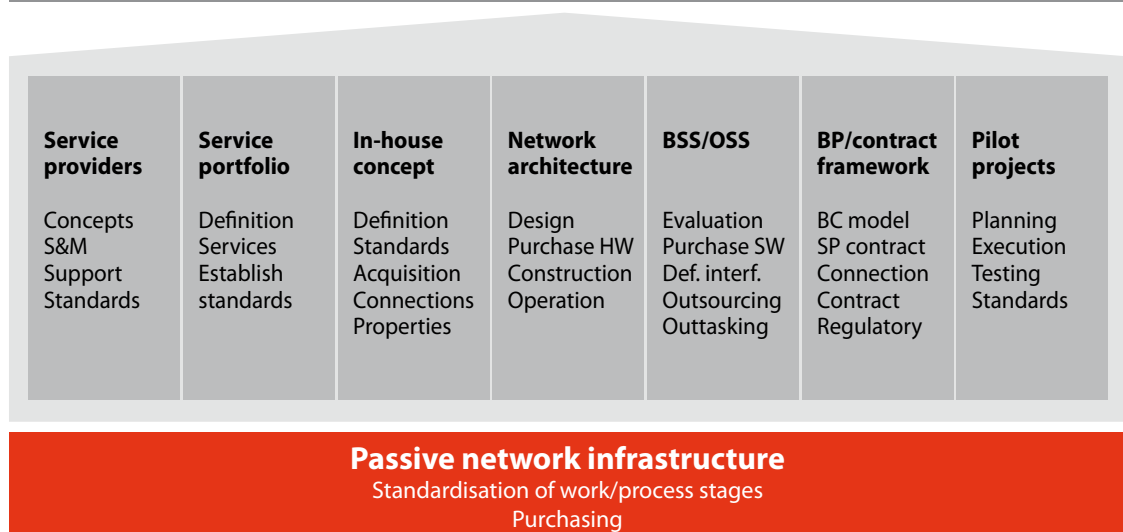
The energy supply company or local utility company will face a wide range of problems which will vary according to the strategy selected. For example, there is the question of whether the infrastructure (distribution network) should be made available to one provider or several, or whether the company itself should provide a service to customers, including triple play services.

The aspects listed clearly indicate that a large number of disciplines are involved in an FTTH project.

**The core elements of successful FTTH projects are:**

- Business model and business plan
- Service portfolio
- Collaboration with telecoms service providers
- ,Reeling in' the building owner, including building acquisition
- Drafting of contracts with service providers and end customers
- Conceptual network design, in-house/outdoor
- Survey of the existing infrastructure (routes, pipes, building connections, etc.)
- Availability of expertise, resources and organisation
- Establishing and evaluating business and operation support systems (BSS/OSS)
- Carrying out a pilot/reference project
- Process optimisation, eliminating work stages; cost optimisation
- Roll-out in the planned area
- Maintenance and servicing of the FTTH infrastructure

### FTTH projects



## The Dätwyler Cables solution

Dätwyler Cables realised the complexity of FTTH projects at a very early stage and developed a range of solution concepts which it has implemented successfully when planning and carrying out a variety of projects, both in Switzerland and internationally. It has become clear that standardisation and modularisation offer excellent possibilities for completing projects cost-effectively on an optimum time-scale.

With its wealth of project experience, Dätwyler Cables can support energy supply companies and local utility companies at every stage of a project. Dätwyler Cables has also proved that it is capable of taking on full responsibility for a project if required.

As a leading provider of high-quality total solutions for FTTH network infrastructure, Dätwyler Cables sees its task not only as providing support through products and conventional consultancy services. Its experience also makes it a specialist in implementing FTTH projects on the ground.

### **The Dätwyler Cables FTTH portfolio includes:**

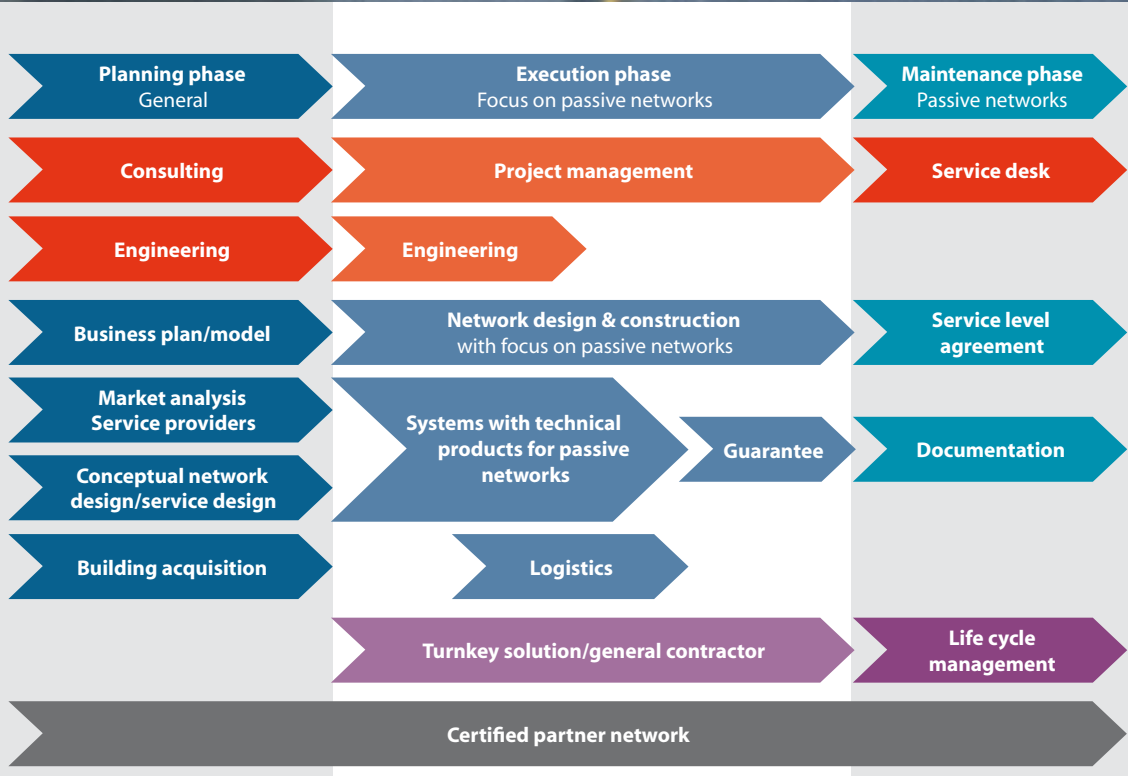
- Turnkey L1+ infrastructure solutions from one source (as a general contractor)
- Business model preparation, business case validation and planning
- Telecom service level definition and development
- Clarification of the regulatory framework
- Strong partnerships with the leading technology providers in the FTTH field
- Consideration and use of local partners during implementation
- Independence from telecoms service providers



Our FTTH solution is modular. The customer can assemble an individualised package of relevant services. This applies to all three phases of an FTTH project: planning, execution and maintenance.

**With its own engineering and service organisation and its existing network of highly qualified, certified partners, Dätwyler Cables can execute all aspects of turnkey FTTH projects in the role of a total or full service general contractor. Customers may also prefer to appoint Dätwyler Cables to execute individual modules within an FTTH project.**

## Overview of project phases and modules



## Building blocks for success

**It is easier to understand the complexity of an FTTH project if the project is broken down into a number of phases and modules. Phases describe the progress of an FTTH project over time and modules describe the individual main disciplines within the project.**

FTTH projects can generally be divided into three phases:

**Planning phase, Execution phase and Maintenance phase.**

The **planning phase** focuses primarily on establishing strategies, identifying the current statuses, planning the network, and acquisition of service providers and customers. Another important aspect of the planning phase is contract management.

During the **execution phase** important tasks include collecting and assimilating the experience gained and constantly optimising processes on the basis of the information obtained. Other core areas are logistics management, management of the interfaces between the different companies involved and cost management.

During the **maintenance phase** the focus is on arranging service level agreements and life cycle management. These aspects are often underestimated.

The individual **project modules** may extend over several phases. The pages below describe the most important modules within an FTTH project. Some of these modules will be discussed in more detail by way of example. The list will give some insight into the complexity of an FTTH project but does not claim to be exhaustive.



## Business plan and Business model

### **Business plan/Business model:**

The business plan presents the financial and business management aspects of the project, illustrates how the project will be refinanced and explains the specific inter-relationships for a “non-specialist public”. The investment costs are very heavily influenced by the infrastructure conditions in the area to be connected. Projected general figures do not provide an adequate basis. Every business plan must be based on a detailed analysis.

### **Important points are:**

- Definition of the business model, the portfolio and the depth of value added during the preliminary stages
- Detailed analysis of the existing infrastructure
- Utilisation of synergies with the existing infrastructure (e.g. communication and electricity ducts)
- Optimum project planning in order to minimise project duration



## Market analysis, service providers

### Market analysis and negotiations with service providers:

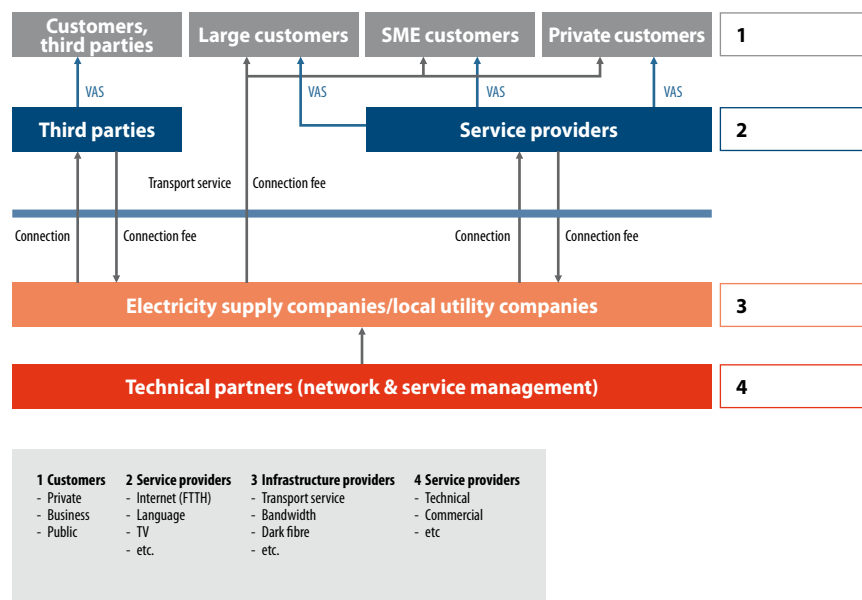
Contracts which deal with a number of points such as service level agreements (SLA) and fibre transfer points for services are concluded before the infrastructure and services are handed over to potential telecoms service providers. They also regulate the product portfolio on the part of the energy supply company or local utility company and the financial arrangements of the service provider in the form of connection fees which are paid to the energy supply company or local utility company.

### The following points must be clarified in advance:

- Provision of equal access for all service providers if at all possible
- Encouraging multiple provision by the maximum number of service providers
- Equality of opportunity in access to end customers for all telecoms providers
- Improving the availability of value-added services to business customers

It is extremely important to develop an appropriate marketing concept which will depend on whether the energy supply company or local utility company decides to make its infrastructure exclusively available to telecoms providers or wishes to provide its own value-added services. A critical factor for success is whether sufficient subscribers can be attracted to the network created for the services on offer.

The model below illustrates the four levels from the customer (1) to the service provider (2) with its VAS (Value-Added Services) via the infrastructure provider (3) with the fibre-optic network to the technology partner (4) for network and service management. It is important for energy supply company/local utility companies to enhance their core competences in the infrastructure field but to leave VAS and network operation and services to other contractors in the telecoms and technology field. The infrastructure can then be used as a common platform by several service providers and each energy supply company/local utility company also has the option of making the infrastructure exclusively available to a third party service provider.



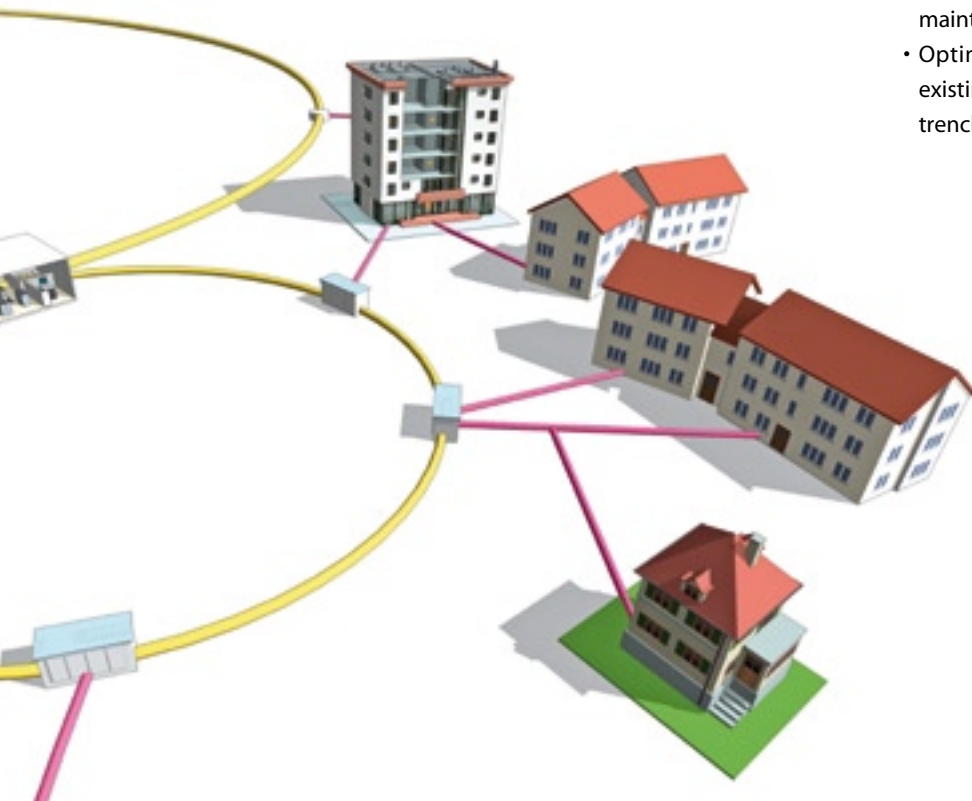
## Network layout and service design

### Conceptual network design/service design:

The network layout depends primarily on cell segmentation and dimensioning together with the existing network infrastructure. It covers aggregation of core, distribution and access POPs plus dimensioning of network capacities, the redundancy question and interfaces to service providers

### Important points are:

- Adoption of a meaningful planning, management and naming concept - maximum compatibility with the systems used to date (automatic cable number allocation)
- Optimisation of the number of POPs - more POPs means that less pipe capacity is generally required; however, large numbers of locations means that the operating and investment cost is significantly higher.
- Development of an innovative, highly future-proofed total concept alongside flexible, adaptable infrastructures
- Standardisation of components and technical systems; this reduces both investment (CAPEX) and maintenance (OPEX) costs
- Optimised use of existing pipe capacities; using existing electricity supply pipes reduces the cost of trench work



## Building acquisition

### Management of building owner contracts and building acquisition:

Building acquisition and contract management are the biggest, most important modules for the success of the entire project. They also place high demands on planning and logistics.

Firstly, information must be provided to all residents in the cells in question, using a range of media, in order to make them aware of the possibilities and advantages of FTTH. The building owners must then be contacted and informed of the planned development and the increase in the value of their property as a result of the broadband connection. Personal appointments with building owners will enable them to sign an easement for the property in question.

### Important points are:

- Consideration of resources and lead times
- Informing residents and explaining the advantages of FTTH
- Highlighting the added value of the building as a result of installing FTTH
- Defining the processes and corresponding roles for acquisition (site visits, call centre) and continuously optimising them
- Availability of the signed connection contracts on schedule
- Drafting and use of suitable communication and marketing resources in good time





### **Engineering and module standardisation**

FTTH projects should protect investments and provide future-proof technology over a period of 20 years or more.

#### **The conditions required for this are:**

- Low investment and operating costs
- The possibility of achieving future expansion at low cost
- Excellent future-proofing

#### **Engineering measures required:**

- Development of solutions which are optimised from the technology and cost point of view, using the basic principles for engineering in the FTTH field which impose special requirements
- Standardisation of components and technical systems in order to minimise costs during execution and maintenance
- Appropriate modularisation of active and passive components in order to meet the requirements of typical FTTH environments such as in-house installations, distribution boxes, transformer stations, POPs, control centres and ducts

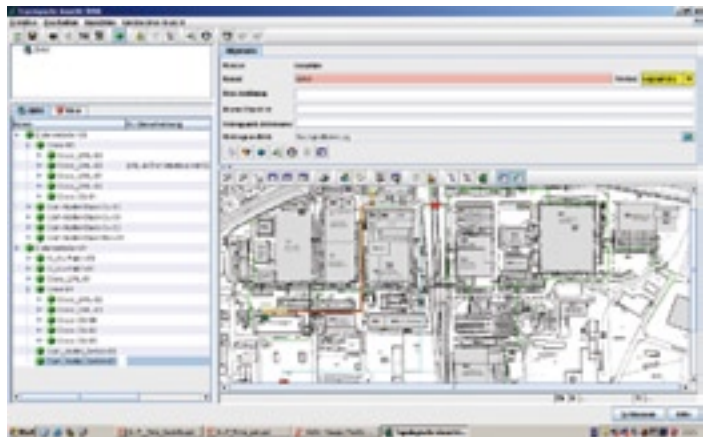
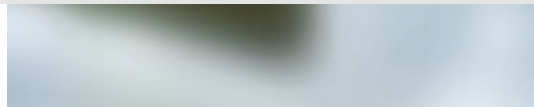
### Documentation and life cycle management

Management of the planning phase of FTTH projects is complex, the execution phase is demanding because of the extremely high degree of flexibility required, and the operating phase is costly because of the constantly changing customer and provider environment.

The operating phase guarantees the provision of services to the business and private customers who are connected to the network. These two groups of customers have very different needs which must be met by means of service level agreements (SLA) which differ in terms of the infrastructure and services provided.

An important part of the operating phase relates to life cycle management. Depending on the business model, the energy supply company or local utility company either concentrates exclusively on maintaining the infrastructure with move, add and change management, or develops its own service organisation with appropriate competences as a service provider. In the infrastructure field, it is extremely important to constantly update the documentation when the frequent changes that are expected actually occur.

The open access architecture, in particular, requires appropriate IT tools (network management software) and operating concepts. It is essential to use an OSS (Operating Support System) and a BSS (Billing Support System).



# Case study



**In 2009 the Swiss township of Dietlikon decided to link up all its households and businesses with modern fibre-optic connections. A qualified partner was identified in the shape of Dätwyler Cables who are responsible for planning and implementation of the fibre-optic network. In the wake of a pilot project in the industrial area, the whole expanse of the township can look forward to being supplied with Fibre-to-the-Home connections within four years at most.**

At the end of November 2009 the people of Dietlikon were balloted and voted to approve a special-purpose loan to enable the expansion of the township's own broadband network to go ahead on the basis of "Fibre to the Home" (FTTH). Over 82% voted Yes.

## Fibre to the Home: Dietlikon starts a pilot project



As an initial step, a pilot project is being carried out in the "Dietlikon Süd" industrial area. This involves connecting all the buildings occupied by electricity consumers whose usage is in excess of 100 megawatt hours (MWh) to the state-of-the art fibre-optic network. Each of these companies will be issued with an optical termination outlet (OTO) fitted with four glass fibres. In order to provide the most comprehensive and high-powered range of services possible for Dietlikon industry, the township is making access to this top item of infrastructure available to all service providers (Sunrise, Swisscom, Cablecom, etc.). This step will have the effect of further strengthening and expanding the attractiveness of Dietlikon as an industrial location.

Because the local utility companies do not have sufficient resources at their disposal to implement a project of this nature successfully on their own, the local council decided to go for a general contractor

option. Opting for a "turnkey solution" means that the interfaces – and thus also the potential errors – can be reduced to a minimum. In addition, the responsibilities and costs are clearly defined.

Following extensive negotiations, the local council concluded a sole contractor agreement with Dätwyler Cables which is based in Altdorf (Uri), Switzerland. The pilot project is scheduled for implementation within just three months. The planned handover date for this fully operational sub-project is the beginning of August 2010. Assuming that the pilot project is successful, Dätwyler Cables will proceed with the planning and implementation of the FTTH network in the remainder of the township area in January 2011. Commissioning will depend on the progress of the construction work, i.e. will take place in stages. The intention is that, by the end of November 2014, the entire township will be linked up to FTTH.

## Switzerland

**Daetwyler Cables  
Unit of Daetwyler Switzerland Inc.**  
Gotthardstrasse 31  
CH-6460 Altdorf  
T + 41-41-875 12 68  
F + 41-41-875 19 86  
info.ch@daetwyler-cables.com  
www.daetwyler-cables.com

## Great Britain

**Datwyler (UK) Ltd**  
Unit B  
Omega Enterprise Park  
Electron Way  
Chandlers Ford  
GB-Hampshire SO53 4SE  
T + 44-2380-279 999  
F + 44-2380-279 998  
info.uk@daetwyler-cables.com  
www.daetwyler-cables.com

## Germany

**Dätwyler Cables GmbH**  
Auf der Roos 4-12  
DE-65795 Hattersheim  
T + 49-6190-88 80 0  
F + 49-6190-88 80 80  
info.de@daetwyler-cables.com  
www.daetwyler-cables.com

**Dätwyler Cables GmbH**  
Lilienthalstraße 17  
DE-85399 Hallbergmoos  
T + 49-811-99 86 33 0  
F + 49-811-99 86 33 30  
info.de@daetwyler-cables.com  
www.daetwyler-cables.com

## Austria

**Dätwyler Cables GmbH  
Office Austria**  
Tenschertstraße 8  
AT-1230 Wien  
T + 43-1-810 16 41 0  
F + 43-1-810 16 41 35  
info.at@daetwyler-cables.com  
www.daetwyler-cables.com

## China

**Datwyler Cables+Systems  
(Shanghai) Co. Ltd**  
Building 16, No. 1-111,  
Kang Qiao Dong Road  
Kang Qiao Industrial Zone, Pudong  
CN-201319 Shanghai, P.R. China  
T + 86-21-6813 0066  
F + 86-21-6813 0298  
info@datwyler-china.com  
www.datwyler-china.com

**Datwyler (Suzhou)  
Cabling Systems Co. Ltd**  
Block 31, 15# Dong Fu Road  
Suzhou Singapore Industrial Park  
CN-215123 Suzhou, P.R. China  
T + 86-512-6265 3600  
F + 86-512-6265 3650  
sales.harnessing@datwyler-china.com  
www.datwyler-china.com

## Singapore

**Datwyler (Thelma)  
Cables+Systems Pte Ltd**  
29 Tech Park Crescent  
SG-638103 Singapore  
T + 65-6863 1166  
F + 65-6897 8885  
sales@datwyler.com.sg  
www.daetwyler-cables.com