

Fiber to the Home



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Executive Summary

The main question this final paper wants to answer is what the opportunities are for Fiber to the Home (FttH) on the Dutch market? In answering this question the Telecompaper report of 2008 and 2009 served as an important source, although 2009 was the main focus since this information was up-to-date.

First an introduction is given to the subject where the problem statement, central question, sub questions and research justification are named. In the second chapter general information on the FttH is given. To understand Fiber to the Home, it is important to know what glass fiber actually is and this is further elaborated in this chapter. Third chapter contains information on the position of Fiber to the Home in the Dutch market. Furthermore the players are discussed, the legal status on EU level is determined and the future plan in the next decade is explained. Chapter 4 is the SWOT Analysis, which will give an overview on the Strengths, Weaknesses, Opportunities and Threats of the Fiber to the Home business. In addition, the Marketing mix, which gives an explanation about the place, price, product and promotion, gives a clear perspective on the marketing. At the end of the final paper three strategies are given with help of the “Treacy & Wiersema Value Discipline model” where one strategy is selected. This is followed by an overall conclusion, reference list and appendices.

Glass fiber connection has a lot of opportunities to become the best since there is demand for fast and better connection. Nevertheless lack of awareness among households is a barrier that FttH faces in its current situation. This can be improved when marketing tools are applied accordingly for a better marketing position. In this final paper, Customer Intimacy is chosen as the primary strategy in reaching this goal.

While working on this final paper I became more aware of the position of FttH in the Dutch market. It is a brand new product for the customers as well as the players operating in this market. Because it is a new product, at times it was difficult to obtain the necessary information. Since it is a dynamic product it is of essence to write the final paper in a short period of time. In this way, I kept the final paper up-to-date.

By writing this final paper I wanted to contribute awareness for the FttH business for my close surroundings and myself. In addition, I hope to bring this awareness among my fellow students. I am convinced that FttH, e.g. glass fiber connections are essential for a better global connection.

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Preface

This paper was written as my final paper for the HEBO (European Studies), at The Hague University for Professional Education. The idea for this subject came about because my father works in the Fiber to the Home business. I wanted to choose a subject that I thought was interesting and of which I had access to a lot of information.

This final paper provides information about Fiber to the home connections and glass fiber connections on a surface level, as I did not want to go too deep into the infrastructure or technique. The purpose of this thesis is to give information on Fiber to the Home connections to people who know nothing or almost nothing about this subject. Personally, I feel that this is an important subject nowadays, because a lot of people are dealing with glass fiber connections at this time.

This final paper was written with personal guidance of Mr Frans Tuuk, interim Manager at Volker Wessels Telecom Infra. He has provided me with information and reliable sources. Furthermore, he verified the information and came up with new insights and ideas. I thank Mr Frans Tuuk for the time and effort he has put into guiding and helping me. Finally, I want to thank miss Nuray Dogan for supporting me and giving me helpful advice to finish this final paper.

Lisette Tuuk

1. Introduction

“Fiber to the x (Fttx) is a generic term for any broadband network architecture” (Wikipedia, “Fiber to the x”, 2010, para. 1). “It uses optical fiber to replace all or part of the usual metal local loop used for last mile telecommunications”(Wikipedia, “Fiber to the x”, 2010, para. 1). The focus of my final paper will be Fiber to the Home, FttH. I will specifically cover the glass fiber connections to Dutch households. I have limited my research only to the FttH in the Netherlands otherwise this final paper would be too broad.

Many changes and innovations have already been made in the telecommunication business and this will continue to be the case in the future. The world is constantly working on getting better and faster communication, for example within telephony, Internet and television. The devices and applications being developed are getting more advanced by the minute, just like with Blu-ray and HD. However, in order to use those devices one needs a cable that is strong and flexible enough to handle the increased amount of data that is pushed through. FttH is all about glass fiber connections that will be future proof and unlimited in terms of improving communication.

This chapter contains information on the research that was conducted. Note that in the following chapters Fiber to the Home will be used as FttH.

Problem statement

The research objective was to investigate whether Fiber to the Home has opportunities in the Dutch market. The following central question and sub-questions were formulated:

Central question:

What are the opportunities for Fiber to the Home (FttH) on the Dutch market?

Sub-questions

1. What is glass fiber?
2. What is Fiber To The Home (FttH)?
3. What is the Three-layer model?
4. What is the position of FttH in the Dutch market?
5. Who are the players in the FttH business? (Investors, Owners, Operators, RSP, Competitors)
6. What is the legislation on the FttH business?
7. What are the future expectations of FttH?

Research justification

The research conducted was quantitative. This research method was necessary to gain reliable information and therefore reflect a better outcome for the entire study as a whole.

The quantitative research was in the form of a report, which I gained from a reliable source within the Fiber to the Home business. It gives a good and objective insight in the business.

In addition, the report is verified by an expert in the FttH business. However, no official interview was taken.

Desk-research was required to get general information about glass fiber, but also to get a better picture of the FttH business.

2. Introduction to Fiber to the Home (FttH)

The FttH is what we call a next-generation access network, a network for the next generation. FttH Council (2010), a non-profit association consisting of providers of FttH services and other companies involved in planning and building FttH networks, defines FttH as follows: “Fiber to the home (FttH) is the delivery of a communications signal over optical fiber from the operator’s switching equipment all the way to a home or business, thereby replacing existing copper infrastructure such as telephone wires and coaxial cable (‘FttH Council’, para. 1).

Thus, FttH is a network that uses optical fiber to connect homes with a glass fiber connection for Internet, telephony and television. Other than only Fiber to the Home there are many different Ftt x, for example Fiber to the Business. However, this final paper will only focus on FttH.

2.1 Defining glass fiber

What is glass fiber?

“ A light material made from small glass threads pressed together, used for making sports cars, small boats etc ” (Longman, 2005, p. 586).

Glass fiber is a thin wire made of glass and plastic that is strong and flexible (Glasvezel Amsterdam, “Wat is glasvezel”, 2006, para. 1). They are used for a lot of products, for example illumination, helmets, boats, rods and the telecommunication infrastructure. Specially designed fibers are produced for a variety of other applications, including sensors and fiber lasers (Wikipedia, “Optical fiber”, 2010, para. 1). In the telecommunication business another special kind of glass fiber is used namely ‘optical fibers’. In a research into the history of ‘Fiber Optics’ (optical fibers) Timbercon (n.d.), a glass fiber technology company found the following:

As far back as Roman times, glass has been drawn into fibers. Yet, it was not until the 1790s that the French Chappe brothers invented the first "optical telegraph." It was a system comprised of a series of lights mounted on towers where operators would relay a message from one tower to the next. Over the course of the next century great strides were made in optical science. (“Timbercon”, para. 1)

According to Longman (2005), the definition of an optical fiber is “a long thin thread of glass or plastic along which information can be sent through a phone or computer system, using light”. (Longman, p. 1157). Timbercon (n.d.) also points out that fiber optics are used today for many industries including the medical, military, industrial, data storage, networking, broadcast industries and the telecommunication (“Timbercon”, para. 1). According to Glasvezel Amsterdam (Glass fiber Amsterdam) (2006), transferring information through glass fiber was first applied in 1970 for

submarine communication cables, which is a cable laid beneath the sea to transport telecommunications between countries. After that, glass fiber quickly became the most frequently used cable in the telecommunication business. (“Wat is glasvezel”, para. 1) Glasvezel Amsterdam (2006) also states that glass fiber connections are reliable, have an unlimited capacity and are steady for the future. In addition, glass fiber is technology neutral, this means that all kind of media can be transferred over glass fiber. 95% of the worldwide transport of television, telephone and different kinds of data traffic travels through glass fiber connections (“BasisinformatiemapNL”, p. 5). According to recent studies described on Wikipedia (2010), an optical fiber is a glass fiber that uses optical light signals to create a non-theoretical endless maximum capacity. Glass fibers are used because light signals travel through them with less loss and over large distances in a dependable manner (“Optical fiber”, para. 1). In addition, they are also immune to electromagnetic interference (EMI) also called radio frequency interference (RFI). This interference can interrupt, or limit the performance of the circuit. The source of this can be artificial or natural; it can carry rapidly changing electrical currents, such as an electric circuit or the sun (Wikipedia, “Electromagnetic interference”, 2010, para. 1).

According to Glasvezel Amsterdam (2006), there are three kinds of connections: copper (cable), air (radio waves, satellite) and glass fiber (light). Copper is the oldest connection and has a lot of restrictions and limitations (“BasisinformatiemapNL”, p. 5). With copper connections the amount of data that can pass through is limited, therefore the cable cannot expand; compared with glass fiber connections the amount of data that can be transferred is endless. This is the most important advantage of glass fiber connections.

Furthermore, another big advantage of a glass fiber connection is that it is able to send and receive data at the same level, it has a symmetric bandwidth (Telecompaper, 2009, p. 13). This aspect has made a new series of communication services possible, like video chatting with high quality.

2.2 The FttH Infrastructure

In order to explain FttH, the infrastructure that is used has to be clarified. However, it will be kept as brief as possible because the technique and infrastructure are not the main objective of this final paper.

A glass fiber network exists of multiple rings, big and smaller ones. The Dutch FttH infrastructure frame is constructed as follows:

❖ FTTH Backbone

- ❖ The City ring is connected to the Backbone
- ❖ The Local loop is connected to the City ring

There exist three types of PoPs: A City PoP (CP), an Area PoP (AP) and a Distribution PoP (DP). The CP is placed to connect the Backbone with the City ring and the AP is placed to connect the City ring with the Local loop and the Local loop with the houses. The DP can be placed between the Local loop and the houses, but is not always placed in the network.

That is because if the distance between the AP and the houses is not long enough, the DP is not necessary. This is illustrated in figure 2 below.

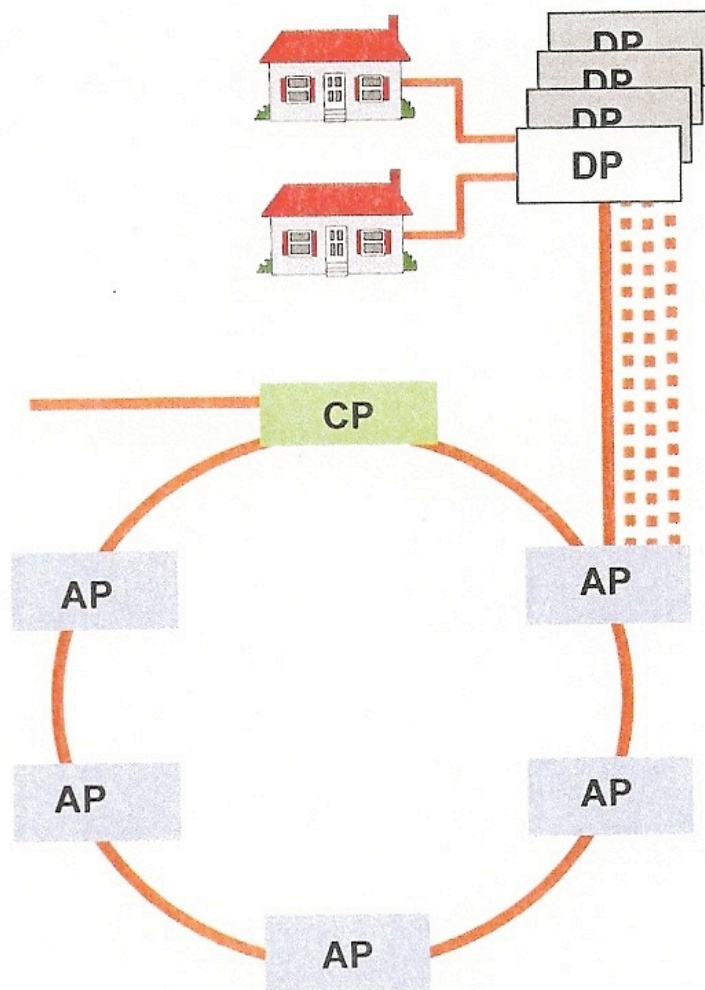


Figure 2: FttH Network (Volker Wessels Telecom, 2009, p. 3)

In essence, the FttH infrastructure is much like a Dutch highway:

- The highway represents the Backbone and is connected to the Ring
- The Ring, i.e. Ring Amsterdam, represents the City ring and is connected to the country roads
- The country roads represent the Local loop and is connected to the houses.

2.3 The Three-layer model

The Telecompaper report, an online telecom source, states that the whole FttH network works under the Three-layer model or Three-tier model. In this thesis the term Three-layer model will be used. The model is very much the same as the model that ADSL- networks work with. This is convenient because no new approvals have to be made in the legislation since they have already been made with the ADSL model. The report also states that the Three-layer model is fundamental for the FttH regulation by OPTA. (Telecompaper, 2009, p. 5) The OPTA stands for “Independent Post and Telecommunication Authority”. OPTA is further discussed in Chapter 3.2 “The Legislation?”.

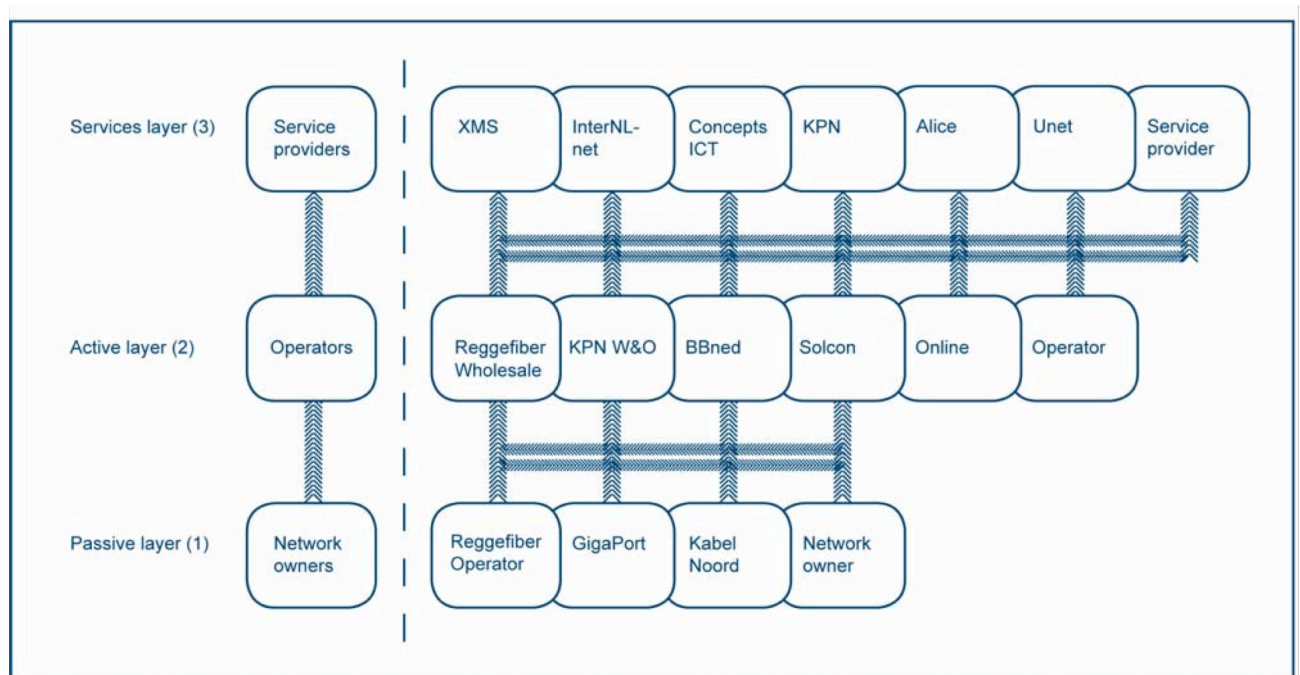


Figure 3: **The Three-layer model with examples of network owners, operators and service providers acting on the Dutch FttH market** (Telecompaper, 2009, p. 28)

Figure 3, shown on the previous page, gives an example of the Three-layer model with examples of network owners, operators and service providers on the Dutch FttH market. The Three-layer model according to the Telecompaper report (2008, p. 3) and the Telecompaper report (2009, p. 28) consists of the following layers:

❖ **Passive layer:**

The passive layer infrastructure is operated by the network owner and includes the physical cables (ducts for laying cables, fiber optics and PoPs, which include racks, heating, air-conditioning, power supply, etc. It also includes the technical space where network equipment is placed. The estimated depreciation time is 20-30 years.

❖ **Active layer:**

The active infrastructure is owned and operated by the network operator. The active layer includes network equipment for transporting data over the FttH network. This includes the required customer premise equipment and transmission equipment (switches). The estimated depreciation time for active components are usually 3-5 years. The active layer is usually associated with the ‘operator’ function.

❖ **Services layer:**

“The services layer includes all the services that can be provided over the FttH connection, such as telephony, radio and television, video-on-demand, camera surveillance, etc.”

(Telecompaper, 2008, p. 3) Besides enabling those services technically, this layer is also responsible for customer service.

In Figure 4 below, a clear view of the layers is shown. However this model has four layers because the FttH Council count the “End-user” as a layer.

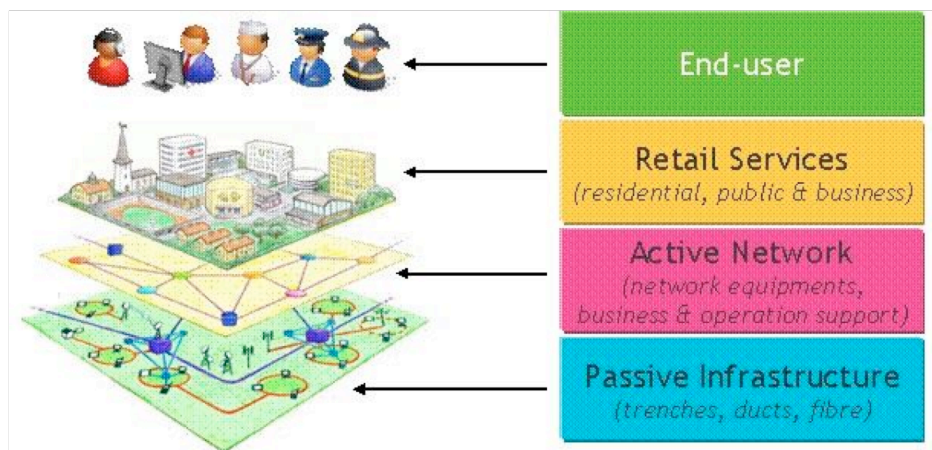


Figure 4: **Network layers** (FttH Council, 2010, p. 20)

2.4 Chapter conclusion

Special glass fiber is used in the FttH network, namely optical fiber. FttH is a network that uses optical fiber to connect homes with a glass fiber connection for Internet, telephony and television. The whole FttH network works under the Three-layer model, which consists of the passive layer, active layer and the service layer. The most important advantage of glass fiber connections in comparison with other connections is that it is endless.

3. Position of FttH in the Dutch market

According to Telecompaper report (2009, p. 16) the Netherlands is leading on the broadband market. The Netherlands maintains its number two position in this market at a European level, second to Denmark. However only 1.7% is representing the fiber connections.

This report shows that the Netherlands had 5.855 million broadband subscribers at the end of 2008 with ADSL at the top with 59,8% (3.51 million subscribers), cable following with 38,5% (2.26 million) and glass fibre with only an estimated 2% (1.7%). See figure 5 below.

When looking at the European glass fibre market, Sweden stands on the number one position. The Netherlands hits only the 7th place. Even though the Dutch broadband penetration ranks high in the broadband market, looking at the glass fiber market, the Netherlands is clearly lagging.

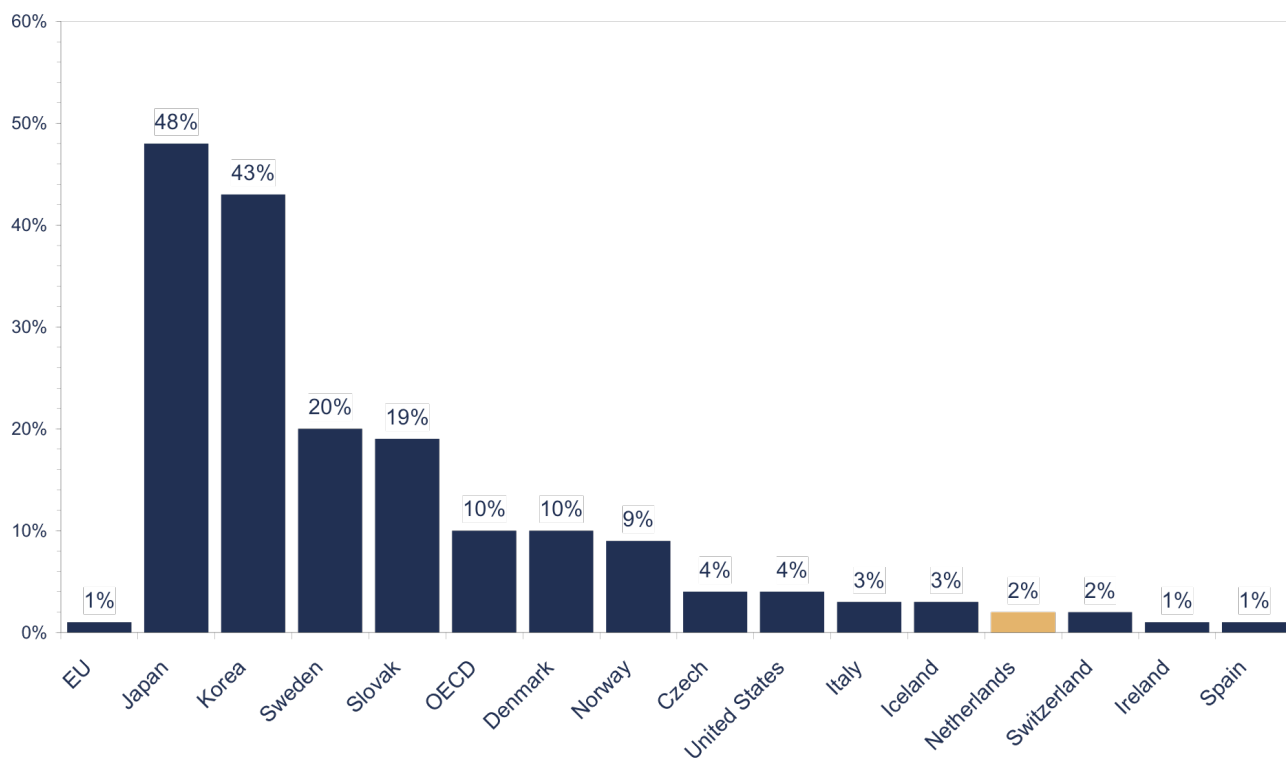


Figure 5: Percentage of fiber connections in the total number of broadband connections in 2008 (Telecompaper, 2009, p. 16)

3.1 Players in the FttH business

This chapter explains only the most important players, because not every player is relevant enough.

In chapter 2.3 “The Three-layer model” was explained that each layer has a corresponding function. The passive layer is operated by the network owner, the active layer is operated by the

network operator and the service layer by the service provider. In this chapter some players such as the owners, operators, Retail Services Providers (RSP), competitors, housing co-operators, investors and the government will be further discussed. The information on other players like suppliers and contractors will be kept to a minimum or will not be discussed at all because it is not relevant to this final paper.

Owners

As mentioned before, owners operate at the passive layer. In the current FttH business only two big players and a few small players are involved. The most important big players are Reggefiber and Glashart. The small initiatives are Rabobank Bouwfonds, Open Onafhankelijke Netwerk Operator (OONO) and Ontwikkelingsbedrijf Rotterdam (OBR), but their size is very small and they will not be discussed further in this final paper. Telecompaper report (2009) writes that Reggefiber currently is the market leader in the Dutch FttH market with 90% of the Dutch fiber market. (Telecompaper, p. 16)

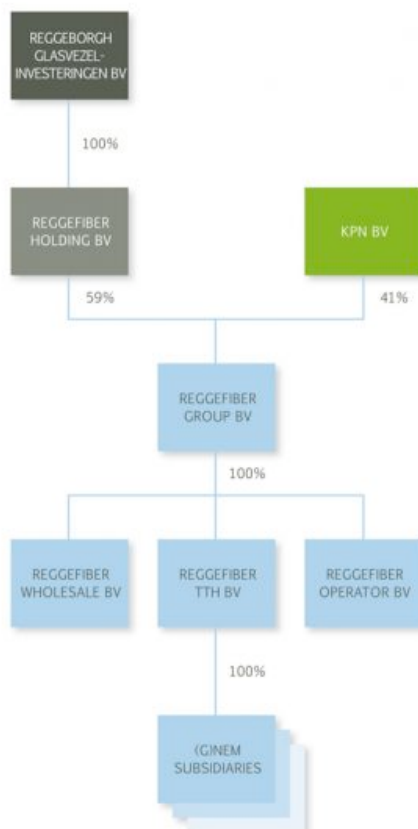


Figure 6: The Reggeborgh company structure (Reggefiber, “Structuur”, n.d., para. 1)

Reggefiber Operator BV

Figure 6, illustrated on the previous page, gives a good overview of the company structure of Reggeborgh.

“Reggefiber constructs, manages and exploits optical fiber to the home networks and intends to provide every dwelling in the Netherlands with a connection to their optical fiber network” (Reggefiber, “About Reggefiber”, n.d., para. 1)

Recent research into Reggefiber by the Telecompaper report 2008 and 2009 found the following information. Reggeborgh Holding founded Reggefiber in 2005. Reggeborgh Holding also holds companies within the Reggeborgh Holding including VolkerWessels Telecom (construction company) and Eurofiber (backbone, business services). Reggefiber is primarily operating in the infrastructure business and sells Optical Distribution Frame (ODF) access to third-party operators. ODF is a frame where the operators can be connected to the glass fiber connections. The ODF is placed in the CP (Telecompaper, p. 22) .

Glashart (Glass heart)

Glashart is the consumer-oriented name of the Reggefiber/KPN joint venture. It is concerned with constructing the FttH network. Glashart operates on the passive and active layer. The Reggefiber Wholesale will be the network operator and XtramediaServices (XMS) the service provider. The Telecompaper report (2009) writes that in 2008, Reggefiber and KPN started a joint venture when KPN bought a 41% stake and contributed its own FttH networks as well as EUR 174 million in cash. Reggefiber's stake is valued at 59%. Although the stakes are not divided equally, they share 50/50 percent control (Telecompaper, p. 21).

Operators

Operators act on the active layer. They offer the services of the network to the Retail Service Providers (RSPs). There are several operators in the Dutch FttH market. The focus of this thesis will be on the most important ones, which are: Reggefiber Wholesale & Operations division, KPN Wholesale unit and BBned.

Retail Service Providers (RSP)

The RSPs are active on the Service layer. They offer services such as the Triple Play service

(Telephony, Television and Internet) to the end-users. There are a lot of RSPs active in the Dutch FttH market and few of them are KPN, XtraMediaService (XMS) and Edutel.

Housing co-operations networks

Housing co-operations networks are important to mention, because they set an example for the communities in terms of FttH connections. The people that are member of a housing co-operations network will be the first ones to be approached by the FttH. The housing co-operations can inform people about FttH and stimulate them to become subscribers. Some examples of housing co-operations networks are Portaal, Dudok Wonen, Stadswonen and RentreWonen.

Investors

Investors are a big threat to the FttH business. Due to the recent financial crisis it is hard to find investors. Currently, the two largest investors are the government, which will be further explained in the next paragraph, and the Reggefiber Group BV. (Telecompaper report, 2009, pp. 6, 1, 19) It must always be clear which layer is concerned when talking of investing in FttH infrastructure. A positive pull factor of the FttH business is that it is an improving business case. This could attract investors. An improving business case means that the more time the FttH is active, the more players get involved. This will lead to a drop in the cost of material and processes will become more efficient. Therefore, the business case continually improves. (Telecompaper, 2009, p. 5)

Government

The Telecompaper report (2009) writes that the government does more than only the regulation part. Especially in these hard times, they offer help by providing financial aid to boost investments. Also they force government agencies to become a solid tenant on new FttH networks and help to support and promote the FttH connections in their work area (Telecompaper, p. 6).

The government also benefits from supporting the FttH business. The FttH provides overall economic, environmental and educational benefits of which the governments profits. The GDP (Gross Domestic Product) increases, there is lower carbon emission through reduced travel and because students have unlimited and fast Internet connection the quality of the education improves.

3.2 The legislation

There are two important overseeing institutions in the Dutch FttH business; the Independent Post and Telecommunication Authority (OPTA) and the Netherlands Competition Authority (NMa).

OPTA

OPTA is an overseeing institution that seeks to promote and secure competition in the interest of the consumers. They also encourage innovation in the telecommunication business. (OPTA, “About OPTA”, 2009)

According to OPTA (2009) the telecommunication business changes every day. New business is starting and developing in a rapid speed. OPTA analyses the markets for electronic communication services every three years. It does so through examining the price variations, the breakdown of the market and the opportunities for companies to enter it. In order to protect the consumers interests it checks whether the companies involved in the telecommunication business comply with the law and it will deal with companies that do not. They also inform the consumers about their rights and obligations through ConsuWijzer, an information Web site for consumers. The OPTA Website (2009) gives a few examples of the activities the OPTA is involved with are:

- Tracking down and fining spammers and spyware distributors;
- Monitoring and assessing telecom tariffs;
- Ensuring that the legally set minimum level of service is provided in the postal and fixed telephony sectors (“About OPTA”, para. 1).

The FttH market is a relatively new market and so is its legislation. However, the legislation is very much the same as ADSL with the Three-layer model. According to the Telecompaper (2009) report the Three-layer model is fundamental to oversee the competition (Telecompaper, p.28).

In Figure 7, shown on the next page, the Operator models with the regulations is shown. The S, A and P stand for the three layers (Passive, Active and Service). The horizontal line is divided in Vertically Integrated, Passive Sharing, Active Sharing and Full separation.

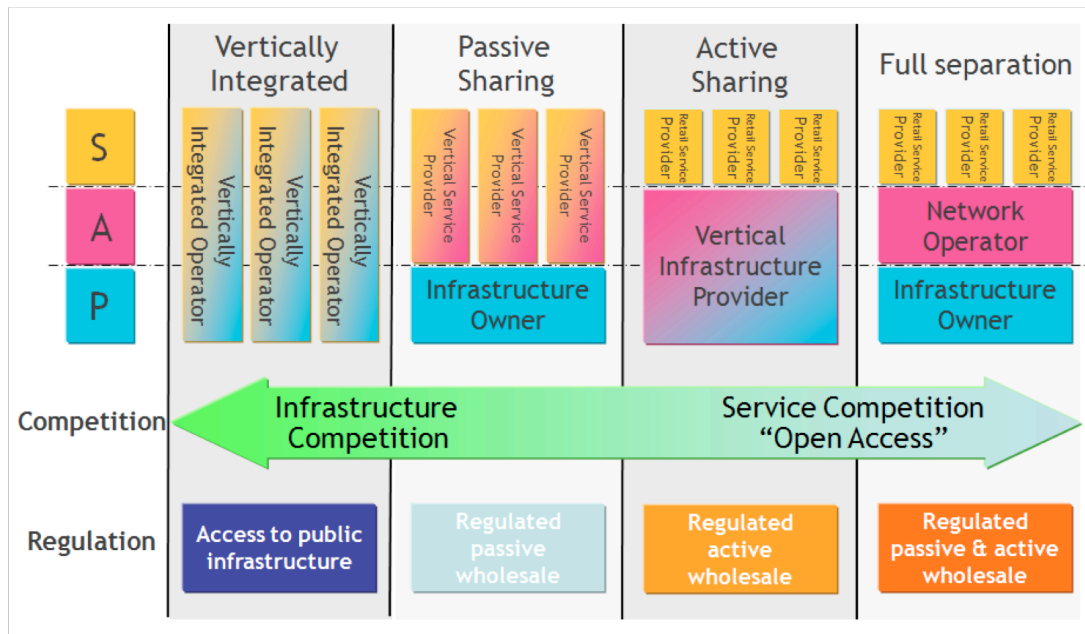


Figure 7: **Operator models and regulation** (FttH Council, n.d. p. 22)

The FttH Council points out that these are typical FttH models. The model will be explained briefly according to FttH Business Guide of the FttH Council (n.d.).

Vertically integrated

One company controls all three layers of the network. If another company wants to do business in the same area, he will have to build his own infrastructure and become vertically integrated as well. This is a form of infrastructural competition. The Reggefiber and KPN are active on all three levels, so they are vertically integrated. Some companies think this is a form of monopoly. The OPTA and NMa are still in discussion with those companies.

Passive sharing

The passive layer is owned by a single company and the active and service layer are owned by different companies.

Active sharing

With this model a single company owns and operates on the passive and active layer. On the service layer there will be multiple RSPs who will compete against each other.

Full separation

With Full separation each layer is owned by a different company. This model stimulates service

competition and created open access on the market.

NMa

NMa is a Dutch competition commission. They state that their duty is ‘making markets work’.

Furthermore it is stated that they monitor effective competition and help to make markets function.

They will take action against anti-competitive restrictions in order to boost the competitive power of the Dutch economy in general. The consumers’ benefit from the efforts the NMa makes to stimulate competition through an improved price/quality ratio and a wider choice of products.

The NMa is specially oriented to the energy and transport sectors. The specific regulation lies with the Office of Energy and Transport Regulation (DREV). NMa benefits from their cooperation among the market authorities at national level, including the OPTA, the Dutch Health Authority (NZa) and international partners (NMa, “About the NMa”, 2008).

3.3 Future expectation of FttH

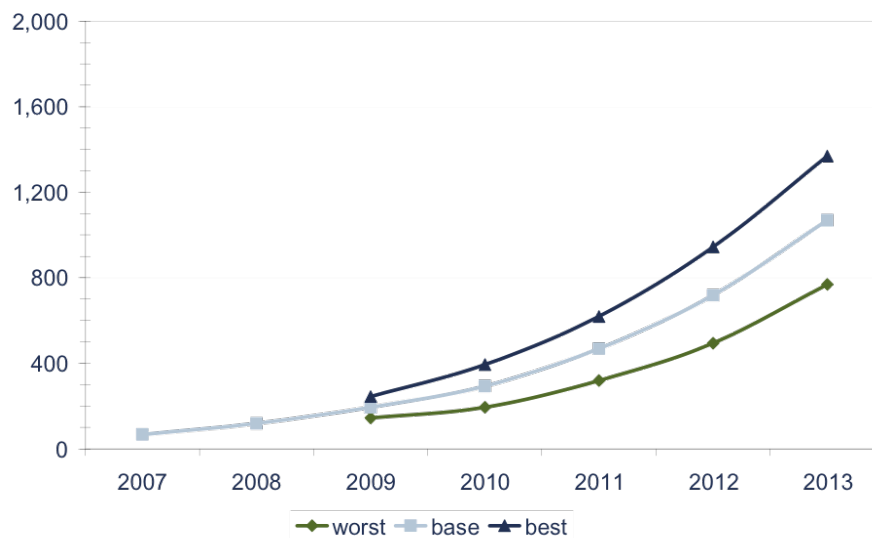


Figure 8: Homes activated in Dutch FttH market (x 1,000), in three scenarios
(Telecompaper, 2009, p. 40)

In the FttH business the future is important. The making of or “roll out” of the FttH connections take a lot of time because the whole glass fiber infrastructure had to be completely built. The glass fiber connections are said not to be necessary at the moment however it will be in the future. The Telecompaper report (2009) states that in about seven years the cable capacity at this moment will not be sufficient anymore. The FttH infrastructure takes an estimated 20 years to roll out.

Therefore in order to satisfy the needs of the customers in the future FttH has to build their infrastructure now (Telecompaper report, p. 10). Figure 8 shows the three scenarios Telecompaper report 2009 has predicted: Worse, base and best case scenario. According to Figure 8, the worst and best case scenarios, “the number of homes activated is set to grow to 769,000 and 1.37 million respectively by 2013” (Telecompaper, 2009, p. 40)

Speed is an important characteristic of glass fiber connections. The standard speed given right now is 100 Megabits per second (Mbps). However in the near future the upgrades will go up to 1 Gigabits per second (Gbps) (Telecompaper, 2009, p. 14). Innovations in applications are an important part of the future as well. One of the biggest advantages of FttH connections is that it has an endless amount of bandwidth. The amount of data that will be transferred with those applications will be of a much larger extent than it is now. The target of the FttH business is to eventually cover the Netherlands nationwide (Telecompaper, 2009, p. 10).

Reggefiber owns 90% of the Dutch FttH market. Therefore it is important to know what their future expectations are. The target of Reggefiber is to connect at least 2 million homes by 2013. The Telecompaper report (2009) indicates that Reggefibers’ main focus lies on constructing the passive layer of FTTH networks and wants to connect the entire Dutch population in the future. Reggefiber wants to build out the small cities first before the high buildings. Small cities have better social cohesion and the network construction is easier. The small cities generally vary between 10,000 and 40,000 inhabitants.

3.4 Chapter conclusion

According to Telecompaper report, the Netherlands is leading on the broadband market. However only an estimated 2% is representing the FttH connections in Europe. The target of the FttH business is to eventually cover the Netherlands nationwide. In addition, Reggefiber has its mind set on connecting at least two million homes by 2013. The Telecompaper report states that Reggefiber currently is the market leader in the Dutch FttH market with 90% of the Dutch fiber market. With the Three-layer model, players are connected. The passive layer is operated by the network owner, the active layer is operated by the network operator and the service layer by the service provider. Currently, investors are a big threat to the FttH business. Because of the recent financial crisis it is hard to find investors. There are two important overseeing institutions for the Dutch FttH business: The Independent Post and Telecommunication Authority (OPTA) and the Netherlands Competition Authority (NMa).

4. Competitor analysis

Figure 9 below shows the Porters' "Competitive Forces Model".

The Porters' "Competitive Forces Model" gives a clear indication of the attractiveness of the market. It is easier to react on the chances on the market, when keeping an eye on the competition.

The Five Forces That Shape Industry Competition



from "The Five Competitive Forces That Shape Strategy" by
Michael E. Porter, *Harvard Business Review*, January 2008

Figure 9

Bargaining power of buyers

End-users have a lot of bargaining power because they can choose between various providers. In every city there could be a different RSP operating the market. So the end-users can only choose the RSP that is active. If multiple RSPs are active, the end-users obtain more bargaining power. It is important for the RSPs to separate themselves through marketing and customer service.

Bargaining power of supplier

The suppliers in the glass fiber industry are levelled on the passive layer. They supply the owners or the construction companies with equipment to build the infrastructure. The owners set agreements with the suppliers about the price and quantity. When the business case improves, new vendors want to enter the market. The owners have multiple suppliers for their components. For example Draka Emtelle, Belcon and Wavin. The bargaining power of suppliers is relatively high, because the owners are depending on the components the supplier delivers. However, there are numerous suppliers available so the owner can choose the supplier that fits best. Thus when the supplier increases the price, the owner can shift to another supplier who is cheaper.

Threat of substitute products or services

The substitutes provide needs to the consumer that is similar to the needs served by FttH. The existence of close substitutes presents a strong competitive threat. This limits the price FttH can charge for their subscription and thus the profitability is negatively affected. In the case of FttH, the threat of substitutes is minimal. Only cable poses a threat to FttH. Even though the advantages of glass fibre connections are better in comparison to cable, the fact remains that cable already exists near nationwide and is known to a lot of people. In addition, cable is currently much stronger in terms of marketing. The cable providers can work more easily with price stunts and as a result outcompete FttH.

Threat of new entrants

The threat of new entrants is not applicable to FttH. Because there are no new innovative products like glass fiber.

The rivalry among the existing players

The rivalry exists between the RSPs. The RSPs are active on the service layer. There are various RSPs available of which the customers can choose from such as KPN, XtraMediaService (XMS) and Edutel. In order to compete with each other they can work with price stunts, so that they can offer lower prices than other RSPs. In addition, they can offer better service and subscriptions.

5. SWOT Analysis

This SWOT Analysis will give a good perspective of the FttH business. It shows the distinction between the advantages (Strengths), disadvantages (Weaknesses), Opportunities and Threats.

SWOT

<i>Strengths</i>	<i>Weaknesses</i>
<ul style="list-style-type: none"> ❖ Future-proof ❖ Endless ❖ Speed ❖ Latency is lower in comparison with cable connections ❖ Not sensitive for corrosion or lightening in comparison with cable connections ❖ Low maintenance costs and low operational costs (OPEX) ❖ Unshared and symmetrical bandwidth ❖ Economical benefits ❖ Social benefits ❖ Environmental benefits ❖ Educational benefits 	<ul style="list-style-type: none"> ❖ Investments and subscriptions are expensive ❖ Unawareness of the Dutch households
<i>Opportunities</i>	<i>Threats</i>
<ul style="list-style-type: none"> ❖ Future-proof ❖ Rise of the video ❖ More bandwidth will be needed in the future ❖ The innovation of application/devices ❖ Improving business case ❖ Job opportunities ❖ Ageing of the population 	<ul style="list-style-type: none"> ❖ Cable and ADSL ❖ The health and education sectors ❖ Reserved attitude of people ❖ Recent financial crisis

Strengths

❖ *Future-proof*

Future-proof is both a Strength as it is an Opportunity (see “Opportunities”). The Strength is that FttH is a secure connection for the future, because it has an unlimited available amount of bandwidth without having to change the equipment. (Telecompaper, 2009, p. 13)

❖ *Endless*

With copper connections the amount of data that can travel through is limited therefore the cable cannot expand. However with glass fiber connections the amount of data that can be transferred is endless. (Telecompaper, 2009, p. 13).

❖ *Speed*

The up- and download speed of a glass fiber connection is higher than any other connection e.g. cable.

❖ *Latency is lower in comparison with cable connections*

The biggest Internet problem is latency. Latency means that there is a delay and loss of signals in the network. For example, latency can interfere with 3D shooter games when the screen does not respond fluently.

❖ *Not sensitive for corrosion or lightening in comparison with cable connections*

(Wikipedia, “Optical fiber”, 2010, para. 1)

❖ *Low maintenance costs and low operational costs (OPEX)*

The FttH Council (n.d.) states that FttH networks have significantly lower operational costs (OPEX) than existing copper networks. Also they consume less electricity. The FttH Council further states that the maintenance costs of FttH networks are lower because of full automation techniques and software control. That means that fewer people have to be employed. In addition, optical components are more reliable than the components in other connections (“Service provider benefits”, p. 16)

❖ *Unshared and symmetrical bandwidth*

According to Telecompaper report (2009) and other resources like the FttH Council, a huge advantage the glass fiber connections have is unshared and symmetrical bandwidth (Telecompaper, p. 13). At some point glass fiber connections are not completely unshared. However, it shares a lot more bandwidth with far fewer users than cable. With symmetrical bandwidth is meant that the up- and download speed are equal. Thus, a glass fiber connection is able to send and receive data at the same level. With the current connections like cable, the upload speed is way lower than the download speed. So when providers offer their customers a certain amount of Mbps, they usually talk about the download speed.

❖ *Economical benefits*

The Telecompaper report (2009) writes that economical benefits will include higher productivity in the business world, partly because of the reduced travel time, and the attraction of business in the Netherlands. This will create increased GDP (Telecompaper, p. 10). FttH will also create more jobs especially in the beginning of the roll out through construction activities.

❖ *Social benefits*

With a faster and better connection people can easily share data with each other. This is especially important for the people that have disabilities such as social isolation but also physical disabilities.

❖ *Environmental benefits*

The FttH Business Guide (n.d.) states that the cable is made of just plastic and glass, which means that the cable degrades extremely slow. The lifetime of the glass fiber cable is expected to be approximately 25 years (*“Network design”*, p. 39). Because of this the ground can stay untouched for a long period of time and that is good for the environment. Another environmental benefit is reduced travel congestion and pollution. Because of a better connection it is easier to, for example set meetings through conference calls and telepresence. It also saves extra travel costs for the company and it lowers carbon emissions therefore it is also better for the environment. (Telecompaper, 2009, p. 5)

❖ *Educational benefits*

In the education sector the students cannot study without Internet. They need fast access to a lot of information to get the best results. With unlimited and fast Internet the quality of the education will increase.

Weaknesses

❖ *Investments and subscriptions are expensive*

A big weakness is that a lot of money has to be invested into the roll out of the infrastructure. This means that there have to be a lot of investments to finance the connections. It also means that there are a lot of costs connected to the FttH subscriptions.

❖ *Unawareness of the Dutch households*

Due to the fact that glass fiber connections are relatively new connections and not many marketing tools have been used yet, there is a lot of unawareness among the households. However, this is not the fault of the households, as they are not exposed to this new product.

Opportunities

❖ *Future-proof*

Future-proof is both a Strength as it is an Opportunity. It is used as an opportunity because the future will create more opportunities for the FttH business through innovation of devices and applications (Telecompaper, 2009, p. 5).

❖ *Rise of the video*

The Telecompaper report (2009) points out that the rise of the video is an important Opportunity for the FttH business. The innovations are moving fast from a standard definition to HD, 3-D, Blu-ray and maybe in the future even holography. With these innovations more bandwidth is needed because the video files simultaneously become larger. In addition, video is used a lot on the Internet, with Skype and other videophone applications (Telecompaper, p. 9).

❖ *More bandwidth will be needed in the future*

The Telecompaper report (2009) states that in about seven years the cable capacity at this moment will not be sufficient anymore due to innovations of applications. The FttH infrastructure takes an estimated 20 years to roll out (Telecompaper, p. 10). Therefore in order to satisfy the needs of the customers in the future FttH has to build their infrastructure now.

❖ *The innovation of applications and devices*

Multiple sources, including the Telecompaper report (2009) confirm that, because of the upcoming innovations in applications and devices, people will need more bandwidth (Telecompaper, p. 5, 9).

For example, the photo and video files are now send by email or are uploaded to sites like Facebook. With these kinds of actions, a fast connection is required. Also e-commerce is an important development that requires a fast connection.

❖ *Improving business case*

An improving business case means that the more time the FttH is active, the more players get involved. This will lead to a drop in the cost of material and processes will become more efficient. Therefore, the business case continually improves. (Telecompaper, 2009, p. 5)

❖ *Job opportunities*

The roll out of the FttH infrastructure creates a lot of jobs. This will be in the telecom sector as well as the construction sector.

❖ *Ageing of the population*

When the population is ageing, it automatically means that there have to be more facilities and services that enable older people to live their life till the fullest. FttH can be a helpful tool/service to secure that independence. Through better and faster communication people with a disability can better communicate with the outside world, for example with hospitals or pharmacists but also in social communication with family or friends.

Threats

❖ *Cable*

Cable is the biggest competitor of FttH. One of their advantages is that they already have an existing infrastructure. Another advantage is that they can work with price stunts, so that they can offer lower prices than that FttH providers can.

❖ *Health and education sectors*

According to the Telecompaper report (2009), the health and education sectors are conservative and suspicious of the ICT sector. This can mean that they can slow down the rise of the new services of the FttH connections (Telecompaper, p. 9).

❖ *Reserved attitude of the households*

Currently, households do not see the demand for glass fiber connections yet, because they do not need it today. The Telecompaper report (2009) states that in about seven years the current cable capacity will not be sufficient anymore due to innovations of applications. The FttH infrastructure takes an estimated 20 years to roll out nationwide (Telecompaper, p. 10). Therefore in order to satisfy the needs of the customers in the future, FttH has to build their infrastructure now. Usually

before the passive infrastructure is rolled out, 40% of the households of that area have to be subscribed to cover the roll out cost. The threat is that when the households do not see the necessity of glass fiber connections, they will not subscribe today which will lead to less FttH networks or delay in the progress.

❖ *Recent financial crisis*

A weakness that has currently occurred is the recent financial crisis. Banks will not invest money in FttH projects anymore. This means that the shortage of money can compromise the roll out of FTTH network.

Chapter conclusion

This SWOT Analysis explains that FttH connections have more strengths than weaknesses and more opportunities than threats. The most important strength is that the data that can be transferred through glass fiber connection is endless. Moreover, glass fiber connections have much more strengths available. It is future proof, transports data fast and has unshared and symmetric bandwidth. In addition, there are also the economical, social, environmental and educational benefits that hold great importance for the future of FttH connections. Nonetheless, there are disadvantages that currently are a problem in the FttH business. The financial crisis and the unawareness of the households in the Netherlands are few of these disadvantages. Due to the recent financial crisis it is hard to find investors. This can slow down the roll out of the FttH infrastructure.

6. Marketing mix

The marketing mix consists of place, price, product and promotion. By applying marketing mix on FttH a good and clear perspective on the marketing will be given.

Product

The FttH is what we call a next-generation access network. It is a network that uses optical fiber to connect homes with a glass fiber connection for Internet, telephony and television. The Longman (2005) definition of an optical fiber is “a long thin thread of glass or plastic along which information can be sent through a phone or computer system, using light” (Longman, p. 1157). The most important strength of FttH is that the data that can be transferred through glass fiber connections is endless. Moreover, glass fiber connections have much more strengths available. It is future proof, has transfer speed, unshared and symmetric bandwidth. In addition, there are also the economical, social, environmental and educational benefits that hold great importance for the future of FttH connections. Nonetheless, there are disadvantages that currently pose a threat to the FttH business. The financial crisis and the level of unawareness amongst the households in the Netherlands are few of these disadvantages. Due to the recent financial crisis it is hard to find investors. This can slow down the roll out of the FttH infrastructure. On the other hand, the level of unawareness can be resolved by strengthening the marketing strategies of the FttH business.

Price

The prices of FttH subscriptions are higher than that of cable, the biggest competitor of FttH. FttH has to make substantial monetary investment for the roll out of its infrastructure, which means that the costs are passed on through to the subscription prices. This subsequently means that FttH providers cannot compete with price stunt like cable providers are able to. However, FttH is an improving business case, which means that the more time the FttH is active, the more players get involved. This will lead to a decrease in material costs and thereby processes will become more efficient (Telecompaper, 2009, p. 5). With lower costs, FttH can eventually lower their subscription prices, thus better compete with cable providers.

Place

According to the Telecompaper report (2009) the Netherlands is leading on the broadband market. The Netherlands maintains its number two position in this market at a European level, second to

Denmark. However only 1.7% is representing the fiber connections (Telecompaper, p. 16). The whole FttH network works under the Three-layer model, which consists of the passive layer, active layer and the service layer. The Retail Service Providers (RSPs) are active on the Service layer. They offer services such as the Triple Play service (Telephony, Television and Internet) to the end-users. It is important that the RSPs provide the subscribers with high-quality services to gain trust and loyalty.

Promotion

Currently FttH is lagging behind with respect to their marketing activities. FttH has not invested sufficiently in its promotional activities for bringing glass fiber connections under the attention of potential consumers, which makes it difficult to sell FttH subscriptions. RSPs have distributed leaflets and folders to potential customers in their shops and at places where (potential) FttH projects are executed. However, this proved to be insufficient to bring FttH to the attention of people who do not have knowledge about telecommunication.

7. Strategies

Figure 10 below shows the “Treacy & Wiersema Value Discipline model” (T&W) (Alsem K.J., 2005, p. 66). This model will be used to explain the three strategies applied to FttH. T&W focuses on three values namely the Product Leadership, Operational Excellence and Customer Intimacy. This helps distinguish the value and the differentiations of FttH and what strategy is best to use to optimise FttH. After filling in the model, one Customer Intimacy is chosen as the focus strategy, which will be elaborated below. It is of essence that all three values have minimum starting level and one strategy will eventually stand out as primary.

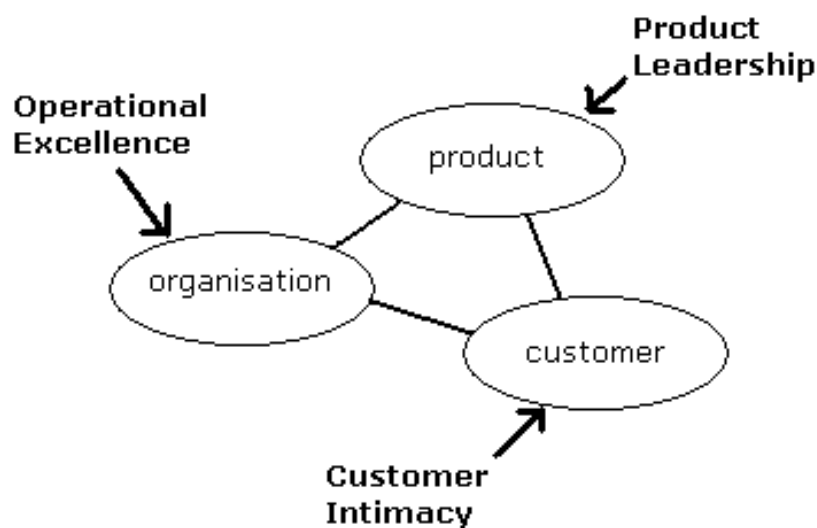


Figure 10: Treacy & Wiersema Value Discipline model ("Strategic Analysis, Management", 2006, " Value Disciplines Model", para. 1)

Product leadership

By developing innovative products like glass fiber connections, FttH differentiates itself from their competitor (Cable). The Product leadership is at a satisfactory level due to the fact that FttH has a new innovative product. The strategy that fits with this value could be that FttH would enhance the Mbps that is provided to the customers or end-users. This in return creates more product value.

Operational Excellence

The Operational excellence is not up to a sufficient level yet. There are still problems with connecting the homes. The households are frequently bothered with inconsistencies and mistakes. The competitive advantage of glass fiber is that it is a fast and unlimited connection. However, if there are too many problems with connecting the homes and the costs are too high, it is difficult to sell the subscriptions. A strategy could be that the construction companies work more efficiently and communicate better with the households. When the mistakes are taken to a minimum, the costs can be decreased.

Customer Intimacy

The Customer Intimacy is far from an acceptable level. The customer service and relationship building are not on the top of the priority list. FttH is not being marketed enough to bring sufficient awareness to be recognised by households. The strategy could be to boost up the marketing for more awareness of a better connection than cable. Another strategy would be improving the customer service and communication with the customer. Working on relationship building to gain the loyalty and confidence of the customers is another vital strategy.

After defining the three values, one strategy is chosen, namely the Customer Intimacy, which fits best when applied to FttH. There are few criteria, which are as follow:

- Make the Dutch households aware of the existence of glass fiber connections,
- get enough subscribers to build the FttH infrastructure,
- maintain subscribers on long-term relationships,
- cover the Netherlands nationwide with glass fiber connections.

Currently cable has a very strong marketing position and has gained the trust of consumers in the Netherlands. Therefore in order to get known, various marketing tools need to be performed by FttH. Firstly, leaflets can be spread out at housing co-operations, consumer mailboxes, supermarkets and telecom stores. An example of such a leaflet can be seen in *Appendix 1 "XMS, Basisdienst voor abonnees op het Portaal glasvezelnetwerk"* (Basic service for subscribers on the Portaal glass fiber network). Such a leaflet can be one page consisting bulletin points with FttH services, its advantages and comparison to other connections. Secondly, information evenings in cooperation with various municipalities can be organized. During these evenings, folders with detailed information about FttH can be spread. See example *Appendix 2 "XMS"*. These folders can

be published in various languages such as English, Arabic, Berber and Turkish. Later on, depending on the demand, these folders can be provided in other languages as well. Thirdly, service providers can carry out a yes or no survey among consumers to find out their wishes and on the basis of the results introduce FttH. The latter can be done by formulating questions such as, do you know Fiber to the Home, does latency often occur in your Internet connection? If yes, do you know that latency occurs far less with a FttH connection? In this way, the surveyor will be triggered to look into FttH and discover FttH and its advantages. Fourthly, visual advertising tools such as television commercials, billboards at bus stops, highways, city centres and advertisements in newspapers/magazines can be used.

When the marketing tools are working and more households are showing interest, it is of great importance to provide a good customer service. My experiences and observations with various cable providers show that the customer services are not sufficient enough. First of all there is often a very long waiting time. Secondly the installation box is often incomplete and it takes very long time until the missing parts are sent. Such poor services decrease the faith of the customers in their provider. In order to keep the future FttH subscribers with FttH, it is essential to give the subscribers all the service they need and whenever they need it. This can be done through hiring more people which in return lead to less waiting time when calling to a helpdesk. Constant information updates about the FttH business will also strengthen the customer and provider bond. This in return will increase the loyalty of the customer. In the end customers want to feel appreciated and valued by the provider.

Conclusion

The position of the Netherlands on the overall broadband market is outstanding. According to Telecompaper report, the Netherlands still stands at the top of the broadband market at a European level, second to Denmark. However only 2% represents the fiber connections. Cable, and especially ADSL scores high on the Dutch penetration level and this is why cable is the foremost competitor of glass fiber.

FttH connections have more strengths than weaknesses and more opportunities than threats. This shows the great potential of glass fiber connections. The target of the FttH business is to eventually cover the Netherlands nationwide. In addition, the Dutch FttH market leader Reggefiber sets the target to connect at least two million homes by 2013. However, to achieve this goal it is important for FttH to be recognised by households, which is currently not the case. In doing so the owners, operators and service providers need to boost up the marketing strategy for more awareness of a better connection than cable. Currently cable has a very strong marketing position and has gained the trust of consumers in the Netherlands. Therefore in order to get known, various marketing tools need to be utilized by FttH.

This final paper shows that FttH has opportunities in the Dutch market. In defining these opportunities, the following sub questions served as a tool to reach this answer:

1. What is glass fiber?

A light material made from small glass threads pressed together, used for making sports cars, small boats etc.

2. What is Fiber To The Home (FttH)?

Fiber to the home (FttH) is the delivery of a communications signal over optical fiber from the operator's switching equipment all the way to a home or business, thereby replacing existing copper infrastructure such as telephone wires and coaxial cable.

3. What is the Three-layer model?

The whole FTTH network works under the Three-layer model, which consists of the passive layer, active layer and the service layer.

4. What is the position of FttH in the Dutch market?

The Netherlands had 5.855 million broadband subscribers at the end of 2008 with ADSL at the top with 59,8% (3.51 million subscribers), cable following with 38,5% (2.26 million) and glass fibre with only an estimated 2% (1.7%).

5. Who are the players in the FttH business? (Investors, Owners, Operators, RSP)

- **Investors:** Currently, the two largest investors are the government and the Reggefiber Group BV.
- **Owners:** The most important owners are Reggefiber and Glashart.
- **Operators:** Reggefiber Wholesale & Operations division, KPN Wholesale unit and BBned
- **RSPs:** There are a lot of RSPs active in the Dutch FttH market and few of them are: KPN, XtraMediaService (XMS) and Edutel.
- **Housing co-operations networks:** Some examples of housing co-operations networks are: Portaal, Dudok Wonen, Stadswonen and RentreWonen.

6. What are the future expectations of FttH?

The target of the FttH business is to eventually cover the Netherlands nationwide.

My personal opinion about the opportunities for FttH stands parallel to the conclusion of this dissertation. The innovations are quickly rising and we constantly want more and better applications. In order to achieve this, we need a better and faster connection. However, it is vital that we start building the FttH infrastructure now so that we are ready to use it in about a decade. In addition, I feel it is important for FttH to boost up their marketing to seize every opportunity given.

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List of appendices

- Appendix 1: Leaflet: *XMS, Basisdienst voor abonnees op het Portaal glasvezelnetwerk*
(*Basic service for subscribers on the Portaal glass fiber network*)
- Appendix 2: Folder: XMS

Appendix 1

Leaflet

XMS, Basisdienst voor abonnees op het Portaal glasvezelnetwerk

(Basic service for subscribers on the Portaal glass fiber network)



Basisdienst voor abonnees op het Portaal glasvezelnetwerk

Xtra Media Services, een onderneming binnen VolkerWessels Telecom, maakt voor de abonnees op het glasvezelnetwerk van Portaal de 'Triple Play' basisdienst. Deze basisdienst bestaat uit de diensten televisie, internettoegang en telefonie. De dienstverlening wordt compleet gemaakt door de afsluiting van een abonnement op het Portaal glasvezelnetwerk. De Triple Play basisdienst ziet er als volgt uit:

1. Radio en Televisie

Het radio- en televisiepakket van Xtra Media Services is gelijkwaardig aan het huidige pakket van de kabelmaatschappij.

U heeft de keuze om dit pakket analoog te ontvangen of digitaal via een set-top box.

Later zullen ook extra pakketten worden aangeboden, waarvoor een aanvullende vergoeding zal worden gevraagd. De inhoud van deze pakketten is op dit moment nog niet vastgesteld.

2. Internet toegang

Xtra Media Services biedt de abonnees internettoegang via het Portaal netwerk, met de volgende specificaties:

- 10 Mb/s downloaden en uploaden via een Ethernetaansluiting;
- 2 e-mail boxen van 100 Mb met elk 5 aliases;
- Webmail (toegang tot e-mail via een webbrowser, vanaf een willekeurige PC);
- Maximale grootte van een e-mail bericht 10 Mb;
- 25 Mb homepage ruimte op www.portaal.net/~uwnaam;
- Gratis spamfilter en virusfilter;
- Geen datalimiet (Fair Use Policy*).

3. Telefonie

Xtra Media Services biedt telefonie en maakt daarvoor gebruik van het Portaal glasvezelnetwerk ('Voice over IP').

De telefoniedienst heeft de volgende kenmerken:

- Lage tarieven. Er wordt afgerekend op basis van een vast bedrag per maand ('flat fee') of op basis van seconden. (Bij flat fee abonnementen wordt een Fair Use Policy* gehanteerd, zie achterzijde);
- Bellen met andere abonnees van Xtra Media Services op het Portaal netwerk is gratis;
- Voor een tweede lijn worden geen extra abonnementskosten in rekening gebracht, wanneer deze bij de start van het abonnement wordt aangevraagd;
- Er kan één bestaand nummer worden behouden zonder extra kosten;
- Alle faciliteiten zijn kosteloos. Bijvoorbeeld voicemail, driegesprek, doorschakelen naar een ander toestel, nummerweergave, enzovoort.

een **VolkerWessels** onderneming



Consumenten Service Desk

Xtra Media Services wil haar klanten zo goed mogelijk ondersteunen bij het gebruik van het glasvezelnetwerk van Portaal. Daarvoor zijn diverse vormen van ondersteuning ingericht.

Binnenkort kan vanaf de website www.xtramediaservices.nl 24 uur per dag alle informatie over de basisdienst worden opgevraagd, zoals tarieven, zenderpakketten van radio en televisie, mogelijkheden van internet en telefonie faciliteiten. Ook kunt u zogenoemde FAQ's (veel gestelde vragen) vinden, met de bijbehorende antwoorden, waarmee u veel problemen zelf kunt oplossen. Via dezelfde website kunt u als abonnee inloggen om uw persoonlijke gegevens op te vragen over uw abonnement en rekeningen en om wijzigingen in het abonnement aan te vragen.

Daarnaast wordt een telefonische helpdesk ingericht, die zes dagen per week bereikbaar is en waar gespecialiseerde medewerkers hulp kunnen bieden.

Kosten Triple Play basisdienst

De abonnementskosten voor de basisdienst zijn € 50,- per maand. Er zijn geen entreekosten. Een glasvezelmodem wordt gratis ter beschikking gesteld en geïnstalleerd.

Telefonietarieven

De gesprekskosten liggen 20% lager dan gemiddeld in de markt. Actuele tarieven staan binnenkort op de website van Xtra Media Services (www.xtramediaservices.nl).

Flat fee tarieven (vast bedrag per maand):

Nederland*	€ 11,95
Wereld Pakket*	€ 24,95

* Van de flat fee tarieven zijn uitgesloten: mobiele telefoonnummers, betaalnummers en een aantal nader te benoemen buitenlandse bestemmingen.

* De 'Fair Use Policy' betekent dat de hoeveelheid gespreksseenheden of dataverkeer die een eindgebruiker in een bepaalde periode mag gebruiken niet gelimiteerd is tot een op voorhand vastgestelde waarde, maar dat voor het gebruik als norm geldt de hoeveelheid gespreksseenheden of dataverkeer die alle andere eindgebruikers in diezelfde periode gemiddeld hebben gebruikt.

Alle tarieven zijn inclusief BTW. Voor alle diensten gelden de algemene voorwaarden van Xtra Media Services. Wijzigingen voorbehouden.



Xtra Media Services
www.xtramediaservices.nl

Appendix 2

Folder

XMS

List of Abbreviations

AP: Area PoP

CP: City PoP

DP: Distribution PoP

FttH: Fiber to the Home

Gbps: Gigabits per second

GDP: Gross Domestic Product

Mbps: Megabits per second

NMA: The Netherlands Competition Authority

NZa: Nederlandse Zorg autoriteit

OBR: Ontwikkelingsbedrijf Rotterdam

ODF: Optical Distribution Frame

OONO: Open Onafhankelijke Netwerk Operator

OPEX: Operational costs

OPTA: The Independent Post and Telecommunication Authority

PoP: Point of Presence

RSP: Retail Service Provider

SWOT Analysis: Strengths, Weaknesses, Opportunities, and Threats

T&W: Treacy & Wiersema Value Discipline Model

XMS: XtraMediaServices