Fixed Broadband deployment in the Netherlands: Success and failure in policy and technology or the paradox of successful competition

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- D R A F T –

- N O T F O R C I R C U L A T I O N -

Fixed broadband deployment

in the Netherlands:

Success and failure in policy and technology

or the paradox of successful competition

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Summary

The Netherlands has a unique fixed line access infrastructure. It is among the most densely cabled countries in the world with two local loops which are available in over 90% of the homes. Both infrastructures have been rolled out before the liberalisation of the telecommunications market. Both were mainly government financed/owned. The privatisation of these networks resulted in today's market with strong competition between CATV-operators and the incumbent KPN. Remarkable in the Dutch NGA development was the initial investor-led roll out of fibre to the home. Mobile broadband has been developed - and solely financed - by private players and is – until now - mainly seen as complementary. Therefore, we focus on fixed infrastructure.

This paper describes the underlying policy and technological/market framework that created this situation of two competing local networks. We will explain why and how the present strong fixed infrastructure competition could develop by using an integrated multi-disciplinary approach. On the one hand technological developments have changed the market situation of two non-competing networks (POTS versus CATV, both servicing unique functions) into competing networks (by using technology innovation). Historical policy decisions created the basis for this (both networks were built before issues such as government subsidies/ownership and unauthorized state aid started to become relevant). However, combined with the European/national general policy choices to liberalize and privatise the telecommunications market (as formulated and put into place in the early nineties, strong incentives were created for market driven competition (instead of detailed regulatory intervention being the main driver). The paper shows that the impact of both technological/policy created market convergence and the creation of a 'triple play'-product have resulted in a disruptive situation where vacancy rates in both networks are increasing. We estimate that more than 40% of the local loops is no longer active.

The role of early government interference (national and local authorities building the local infrastructure) was crucial for the present competitive environment. At the same time it is signalled that sufficient market and financial incentives seem to lack in order to guarantee the development of a future proof broadband infrastructure beyond the goals set out in European policy.

This paper is a work in progress. We recognize that more work needs to be done.

It should not be quoted or distributed.

1. Fixed broadband infrastructure

1.1 First phase: before the European liberalisation

The original legal framework for telecommunications in the Netherlands was based on a monopoly of the national incumbent, the PTT, a state owned company. Based on the monopoly it build the Dutch telephony network, creation full national coverage in the seventies. The bulk of this roll out was in the post world war II era and financed by the government and later on 'self-financed' by the incumbent, but also based on political decision making by budget assignments and tariff regulation)[1]. Original plans to make the monopoly absolute were abandoned in the late sixties. Amendments to the Telecommunications Act introduced a framework to build CATV-networks next to the telephony network. The building of the CATV-networks was strongly supported by the municipalities. They were mainly motivated by two arguments: better reception and for esthetical reasons : the removal of rooftop antennas. Although several changes in the regulation took place, the regulatory system can be summarized as follows: the build out of the CATV networks was subject to a licensing system, which granted a preferential right to the municipalities. The ministry of telecommunications handed these licenses out to the municipalities. No particular costs were connected to these licenses. However license holders had to meet certain license-criteria. In particular two were of importance: a) the networks needed to meet certain quality criteria and b) the license holder was under the obligation to connect every household within it's geographic license area (a kind of universal service obligation)[2]. Also the incumbent was allowed to build CATV-networks (through a subsidiary called CASEMA). Originally only small scale networks – linked to the size of the municipality - were envisaged, but connecting networks happened in practice and legal limitations were taken away. CATV-networks were only allowed to distribute broadcasting programs. Telecommunications activities remained part of the monopoly of the PTT. Nevertheless, originally thousands of small CATV networks were built during the seventies and eighties. In 1996 98,4% of the homes were passed and 92.7% connected[3] (by connecting/merging individual networks, the number of licensed networks was reduced to several hundreds), which meant that the Netherlands had two separate local loops/networks covering most of the country.

[1] Dr. G Hogesteeger, Van lopende bode tot telematica, History of the Dutch PTT, 1989, part IV, chapeters 5-7

[2] It's because of this second restriction that the service area defined in the license often didn't include the rural parts of the municipality.

[3] Arthur D. Little, *Cable Review*, Report to the European Commission, IV/C1/D/1093 (97), appendix c, page 15.

The build out – by local municipalities, housing corporations or third parties often acting on behalf of municipalities (or through contractual relationships) - was financed using several instruments. In most cases the subscribers had to pay a connection fee (several hundreds of euro's per household), municipalities and (social) housing corporations contributed through subsidies (including cheap financing), some housing corporations includes the costs of the build-out into their rental fees. CASEMA and other projects built and exploited networks at their own risk, i.e. the financing and accompanying risks were put into the hands of third parties (including non-profit foundations). Because third parties were working under the license which was granted to the municipality, retail tariff regulation was applicable and allowed the subscribers fee to be at cost level (often between 5-10 euro per month for a analogue package of 30 television and 30 radio channels).[4] But a lot of the municipalities also introduced a special levy for the rights of way, turning the cable networks into to resource of income/as way to skim off profits.[5]

1.2 Second phase: European liberalisation

Pushed by the European liberalisation process that started to have significant impact in the nineties, The Netherlands removed (in 1996/1997), all restrictions on the offering of telecommunications services. In 1998, the liberalisation process was concluded with the coming into force of a new Telecommunications Act that, to a large extent, incorporated the new European telecommunications guidelines. As mentioned before, under the old legislation there was one concessionaire (the incumbent telecommunications operator, KPN) with almost unrestricted rights. Competitive offer, which was subject to a system of licences, was an exception to this unusual position. Under the new Telecommunications Act, all providers received equal treatment. A licence was only required for the use of frequencies. All other public telecommunications networks and public telecommunications services were only under a registration obligation. There were no obligations for this registration other than those determined by the law. This implied an exceptionally liberal system beyond the European context. Among other things, licences were abandoned for public telecommunications networks: thus, in the Netherlands anyone was free to construct a telecommunications infrastructure. Moreover, the law granted all providers of public telecommunications networks (including the cable television networks) rights of way.

[4] Parliamentary documents 1998/1999, 26.602, no. 1 (indicating 1991: 18 channels/15 guilders; 1995: 25 channels/17.5 guilders; 1999: 30 channels/21 guilders).

[5] Unfortunately, comprehensive documentation on the financing of the build out could not be found within the restrictions of this project.

In conformance with the European rules, the law determined that special obligations applied to market parties with significant market power. The dominant telecommunications operator, KPN (the privatised PTT), was designated as party with significant market power in the market for a period of two years (until 15 December 2000). This meant that - in accordance with the European directives - KPN had special obligations to grant access to its network to other (competing) parties. KPN was also responsible for providing universal service (primarily the traditional voice telephony service).

Competition in the 1990s was mainly on telephony services based on carrier (pre) select, allowing competition to KPN in the consumer and business voice markets. On the local loop level not much happened apart from new entrants that wired up business premises of (large) corporates.

After the introduction of ADSL in the consumer market, several alternative providers entered the market using the access network of KPN, basically the same model as the aforementioned developments in telephony.

1.3 Third phase: (towards) the present

The second phase has highly impacted the liberalisation of the market. In fact, the situation of the second phase is more or less still the existing one. The incumbent KPN continues to be under the obligation to provide access to its copper local loop network. These access obligations also apply to KPN's fibre access networks to residential and business premises..However, due to the fierce competition between KPN and the CATV operators, only very few alternative providers remained. According to the telco-regulator ACM these providers have not much impact on the competitiveness of the market anymore.

At the same time, CATV networks remain largely unregulated (with the exception of content/must carry regulation). The telco-regulator is of the opinion that the CATV market has no significant market power. Therefore, access regulation does not exist. During a limited period of time, the regulator tried regulating access (based on the assumption of significant market power). However, these decisions were challenged in court and never reached any material effect. Recently the Dutch parliament introduced two amendments (to the Telecommunications Act and to the Media Act) as part of the implementation of the new European telecommunications framework to regulate wholesale access to the so-called 'analogue basic package'. However, these provisions have been challenged by the European Commission, who started an infraction procedure against the Netherlands and were recently annulled by a Dutch Court. The Dutch government has announced

that it will withdraw the provisions from the law. It should be noted that the wholesale offering never existed in practice.

1.4 NGN-roll out

During the liberalisation of the telecommunications market, public authorities (mainly municipalities) divested – mainly in the 1990s - their interest and sold their CATV networks. Public policy included leaving investments into communications infrastructure to the market. Nevertheless some municipalities started in the early 00s developing plans to build a local fibre optic network. Also, some independent market players built local fibre networks. All these small scale initiatives resulted in limited overbuild of the KPN copper and cable operators' coaxial local loop. For some time a provision was put into the Telecommunications Act forbidding municipalities to invest in telecommunications. Although this provision is no longer in place, municipalities have largely refrained from investing into NGN-networks.[6] There are some plans left to stimulate NGN-networks in uncovered (in EU lingua "white") areas (an estimated 500-600k households and business premises have no direct access to broadband).

The Dutch government has committed itself to the European strategy regarding NGN (state aid is allowed in underserved or white areas), by concluding that the countries has hardly any underserved areas which means that no governmental – financial – support on a national level is needed. Support programmes are under development by some regional governments (provinces) and municipalities today. It should be noted that the European Digital Agenda has set two goals. By 2020, 100% of the households should have access to 30Mbps broadband and 50% to 100Mbps.[7] According to government figures 95% of the Dutch population has already access to 100mb or more (mainly because of internet offered by CATV networks and fibre).[8]

[6] We assume this hesitation was based on financial risks and on uncertainties created by discussions about the regulatory environment including state aid

[7] European Commission, IP/10/581, 19 May 2010.

[8] Parliamentary documents, 2013/14, 32637/24095, no. 97. Recent EU-figures confirm the high deployment of broadband in the Netherlands (European Commission, IP/14/609, 28 May 2014).

2. Market developments

The Netherlands is among the countries with high penetration of broadband services. In 2013 6.7mn residential connections were counted, i.e. close to 90%[9] of all households. There are 3 dominant access technologies in the residential market : DSL, Cable/Docsis and Fibre to the Home.

2.1 Copper based xDSL

The fixed line broadband market has been dominated by applying DSL technologies on the traditional copper loop of KPN, this kicked off in the Dutch market in the late 1990s. This appreciation of DSL based services among consumers accelerated on the back of the ULL regulation imposed by the NRA.[10] The obligation for KPN to provide local loop access to competing ISPs led -after some delay due to practical implementation issues- to a rapid growth of DSL connections., Bear in mind that in the late 1990s in the nascent market of consumer broadband, CATV based products led the market. After the ULL obligation and appetite of market parties to provide DSL based service took over the market lead from CATV-based offers in the early 00s. The main parties taking unbundled lines were Tiscali, France Telecom owned Wanadoo (now owned by DTH provider CanalDigitaal), Versatel (now Tele2), Telecom italia owned BBNed (now Tele2).

The Dutch market of unbundled local loop service was one of early and fastest growing markets in Europe (see figure 1). In the first half of the 00s, competition was on marketing and price and access speeds were in the 1-10MBps range. The graph also shows the decline in unbundled lines in 2005, as the result of KPN acquiring ISPs, a.o. Cistron, Demon, Tiscali, Freeler. The feverish market of ISPs providing services based on ULL or bitstream wholesale service entered a calmer phase as from 2007 onwards. The focus moved to sub-loop unbundling but the market dynamics came from increased competition between DSL based vs. cable based services.

[9] TelecomPaper, Dutch Broadband Report Q3 2013, Nov 19, 2013. Confirmed in a recent EU study, See: http://ec.europa.eu/digital-agenda/en/scoreboard/netherlands

[10] *Broadband Services and Local Loop Unbundling in the Netherlands*, Nico van Eijk, Institute for Information Law, IEEE Communications Magazine, October 1999.

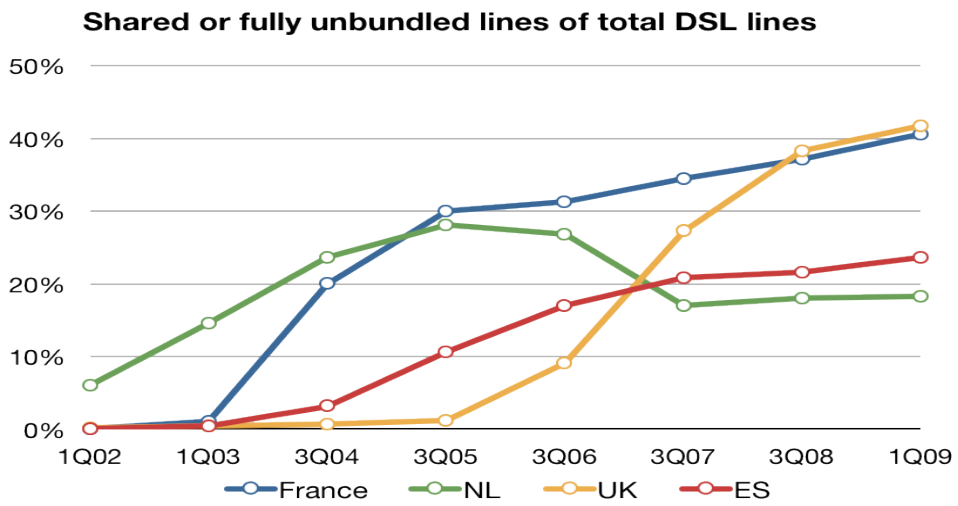

Figure 1: development of local loop unbundling in selected EU countries 2002-2009
(source: ECTA-DSL scorecards, Rabobank)

As of 2005 KPN focussed on dual play propositions (Internet plus fixed line telephony), basically abandon marketing its traditional PSTN based fixed line proposition for consumers. It upgraded its network to ADSL2+ to increase downstream access speeds to max. 24Mbps. Competitive ADSL providers with unbundled lines, upgraded their ADSL equipment as well.

In 2007 these parties were in negotiation with KPN about sub loop unbundling, the next frontier. Sub loops allow speeds in the 30-80 Mbps range over shorter copper loops enabled by VDSL-technologies. With this capacity it became feasible to offer TV in DSL-based consumer offerings. This change in technology and consumer offers were very much needed because cable operators started to deploy Euro-Docsis 3.0 technology (as of 2008) outpacing the performance of ADSL2+ based services on Internet speed and attractive triple play offers. VDSL technology grew, however sub loop unbundling never took of as ULL on the main distribution frame, which accelerated DSL penetration in the early 00s.

Figure 2 broadband connection by access technology development 2007-1H2013

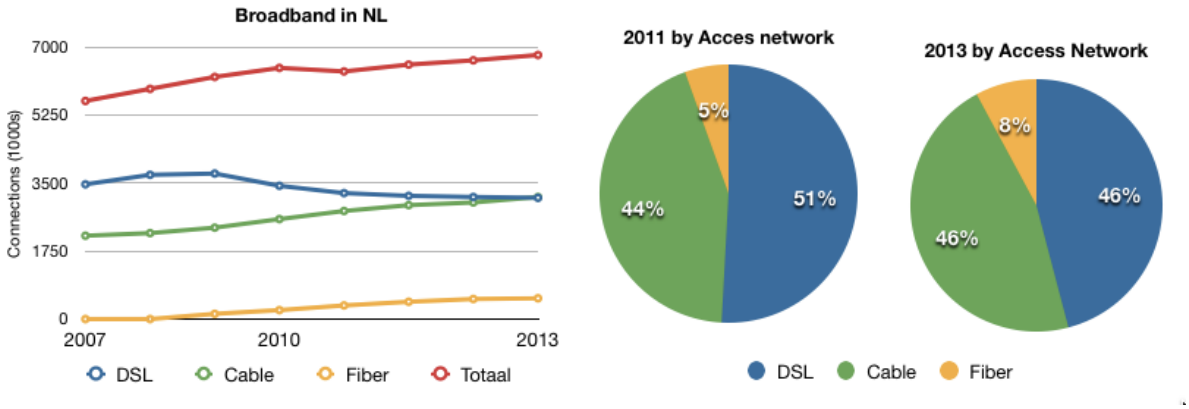

Figure 2 broadband connections by access technology development 2007-2013 and growth of fiber loops from 2011-2013 (pie charts)

The leap to VDSL and increased competition from cable was the start of the decline of the role of alternative DSL providers like BBNed, Wanadoo (France Telecom) and others. Only Tele2 (former Versatel) deployed CO-VDSL (2009), installing VDSL equipment in the central office and launched it as a product under the name 'Fibre Speed'. With this approach Tele2 expected to reach out to 1 million households less than 1 km away from the central office.

Despite the work on VDSL, the energetic days of DSL in the first half the 00s has ended and KPN and Tele2 are the only substantial facility based DSL providers on the Dutch market. Figure 2 shows to steady decline of DSL subscribers as of 2009 and DSL and Cable are on par since the end of 2013.

2.2 CATV-networks

In the early nineties the CATV-market was extremely fragmented. In phase one (before European liberalisation) the country had hundreds of licensed CATV-networks covering just one block of houses up to entire cities. Some of these networks were already interconnected to reach scale and technological efficiencies. Due to the liberalisation, a consolidation started (see par. 1.2). Utilities (energy), CASEMA (the former cable branch of KPN) and UPC (UPC started as a joint venture between Philips and US West) led the consolidation. Already in 1997 the landscape had drastically changed, shown in the upper part of table 1. Consolidation moved forward and in the lower part of table 1 the situation ultimo 2013 is shown.

Starting in the early nineties almost all cities divested their direct or indirect interest in cable companies (including the five larges cities Amsterdam, The Hague, Utrecht, Rotterdam, Eindhoven). The price level was around 1500 guilders[11] per subscriber). Also cities moved their direct interests into the hands of regional utility companies (Essent, PNEM, Delta, etc.)

Ownership and market share of CATV-networks (1997)	
Utilities	53%
Casema	20%
UPC	15%
Municipalities	6%
Various	6%
Ownership and market share of CATV networks (2013)	
Ziggo	55%
UPC	35%
Caiway	6%
Delta (Utility owned)	3%
Various	1%
Table 1, cable consolidation in NL	

The present situation represents a picture in which municipalities have more or less completely divested their direct or indirect interests (table 1: various 1%). there are two dominant cable operators: Ziggo and Liberty Media owned UPC, servicing 90% of all cable subscribers. Caiway, number three, represents an investment project supported by pension funds and other financial parties. Delta is the remaining and only example of a regional utility company (in the province of Zeeland). Early 2014 Liberty Media has announced that it intends to buy Ziggo subject to approval by the competition authorities. The transaction is under investigation by the European Commission.[12] We expect a further consolidation: due to its financial situation, it's not unlikey that the utility company Delta divests its cable interest.

[11] Indicative: Amsterdam (1995): 700 mln guilders/1450 guilders per sub; Haarlem (1999): 150 mln/2300 guilders per sub; The Hague USD 900 (1996); Essent Kabelcom (2006) 2.6 billion Euro/1.47m subs.

[12] European Commission, IP/14/540, 8 May 2014.

During the merger and acquisition activities in the 1990s until 2006 (the year Ziggo was created by private equity Cinven and Warburg Pincus) the networks were kept technological up to date. Nearly all connections are 862MHz and can carry traffic in both directions; the predominant network structure is HFC. The traditional fibre node size in the Netherlands is approx. 1,500 households. Due to the fact that the access part of the network is based on star structures there is ample room for splitting the nodes in smaller groups of households to increase the available capacity per household. Based on this HFC foundation the Dutch cable operators were well positioned to roll out broadband Internet services. In the late 90s based on proprietary technologies, but in the first half to the 00s Euro-Docis2 became the dominant broadband technology in the Dutch cable market. Euro Docsis 3.0 was introduced at the end of the decade (2007 by UPC and 2009 by Ziggo) and speeds advertised as high as 200Mbps are offered.

Despite the increased data transfer capacity due to Docsis, TV distribution over cable is still based on broadcasting technologies. Both analogue (basic bouquet) and DVB-C, the European standard for digital TV transport over cable, are in use. The TV services are a prerequisite to be able to get other service from the cable companies (a so-called 'buy through'-obligation). With Docsis 3 and growing appetite among consumers to buy triple play services, the popularity of cable has grown as the triple play provider of choice. The incumbent telco KPN stopped the growth of cable triple play with aggressive and differentiated offers over VDSL and FttH networks, with a focus on its TV services offering.

The observation is that an increasing number of Dutch households purged one of its 2 active telecom connections (copper and coax), as the consequence of the popularity of the triple play offers. Fascinating is the trend that the revenue per active connection (ARPU) is increasing while both networks lose customers. I.e. the two dominant access networks in the Netherlands (copper and coax) 'grow' more and more empty due to the triple play trend. Additionally the stock of access connections is rising due to FttH roll out, we will elaborate on in §3.4.

2.3 Fibre-networks

As mentioned in par 1.4, in the early years of the 00 decade there was some municipal driven activity to roll out fibre, e.g in Rotterdam, Amsterdam. A few small scale networks have been build and operated by smaller operators. The success, hence impact, was very limited and the roll out of fibre got only some traction when a private investor founded Reggefiber in 2005. Reggefiber started buying some of the small scale fibre networks like the approx. 40k connections FttH network in

Amsterdam. The company targeted small and mid sized cities to roll out full blown FttH. The business model was and is still based on letting fibre connections to service providers, i.e. a business model fully based on wholesale. At the end of (2013) Reggefiber has wired approx. 1,75mn of approx. 1,95mn fibred households.[13] The company indicated that it was constructing at a pace of 300-350k households per year. The construction of a network in a targeted area starts when at least 30% of households in the targeted area have committed to take a service with one of the service providers. Currently 33-34% of Reggefiber FttH connection constructed are in use, hence revenue generating, based on company information and press.[14]

In 2014 KPN (the incumbent) acquired control over Reggefiber. The Dutch competition authority has not yet agreed to this transaction which is still under investigation.[15] KPN has announced that it will reduce the roll out of fibre to max. 250k per year.. It seems not likely that all copper connections will be replaced, as KPN has a mixed xDSL/fibre strategy.

In 2008 CIF stepped up in the FttH market. This Communications Infrastructure Fund is to a large extend funded by Dutch pension funds and has a somewhat different strategy than Reggefiber. CIF acquired the small still independent cable operators and overbuilds the acquired coax network with fibre (mostly operating under the label 'Caiway', total market share approx. 6%). As opposed to Reggefiber CIF starts with 70-80% coaxial network occupation as point of departure. The service provider (Caiway) active on the CIF Coax and fibre networks upsells services to promote migration from coax to fibre. CIF incentivises the service provider to promote this migration and let its coax network 'grow' empty, with the aim to decommission the CATV network at some point in time. It is worth noting that CIF fibre networks face considerably less competition compared to Reggefiber. Service providers on the Reggefiber network face competition from cable and to a lesser extend from providers still active on the KPN copper network. Service providers of CIF only face competition from DSL providers. Reggefiber and CIF don't overbuild each other. The homes connected counter of CIF stands at the end of 2013 approx. at 200k FttH connections.

The total number of FttH connections in the Netherlands at the end of 2013 is approx. 1.95mn, i.e. 22% of households. Reggefiber, by far the largest FttH owner sees an occupation rate of the network

[13] Telecompaper, FttH in the Netherlands 2014, May 2014

[14] We note that these figure indicate that substitution from coax to fibre are low. Fibre mainly serves customer retention by the incumbent, while at the same time this migration strengthens the effect of 'empty networks', see par. 3.4.

[15] https://www.acm.nl/en/publications/publication/12925/Further-investigation-needed-into-planned-acquisition-of-Reggefiber-by-KPN/

is hovering between 33-35%, CIF don't disclose homes activated numbers, but FttH research of TelecomPaper (footnote 12), shows the network usage is comparable to Reggefiber. Although projections of Reggefiber and CIF are not public, it is reasonable to assume that uptake of fibre is below expectations, but growing, as shown in figure 2.

2.4 Constraints on building NGN's

Most of the fixed local loop infrastructure in the Netherlands was built in the post World War II era and CATV build out was concentrated in the 1970s and 1980s. The expected lifetime of the passive infrastructure was estimated at 30 years. If this expectancy still meets present standards, it means that replacing the local loops (both copper and coax) becomes more and more eminent. Replacing of the network based on age is however not as straight forward as it seems. There are three dominant constraints in the considerations to replace local loops: a) funds, b) necessity and c) network usage.

Replacing the local loop network is a capital intense project. These networks were basically constructed by government funds in far more regulated environment than we face today. The funds necessary need to be generated from the existing activities, no substantial amounts of money have been set aside by the operators. Contrary to – for example – the infrastructure for energy distribution, the networks are not under an obligation to make necessary reservations for replacement and keeping their networks 'state of the art'. Generating income to finance local loop infrastructure has become more complicated due to market circumstances.. Putting money in long fixed assets with ditto pay back times limits competitiveness against investors and competitors with different investment cycles.

The second reason is necessity, i.e. timing to deploy a new access network and provide NGA capabilities on upgrading existing copper and coax networks. Copper network owners like KPN deploy VDSL as described in §3.1 and invest in decreasing copper loop length by deploying fibre to the cabinet releasing pressure from deploying far more expensive full FttH. CATV operators upgrade their networks to NGA capabilities, as described in §3.2. We see more pressure is on incumbent operator to replace copper loops than on the CATV operators. The acquisition of Reggefiber sustains the argument on difference in pressure on KPN and cable operators to replace legacy loops by FttH.

Network usage is the third constraint on network replacement. Given the fact that upgraded copper, coax and fibre loops can fulfil the dominant demand for triple play services. This leads to increasing number of vacant local loops. Recent figures illustrate the networks becoming more and more 'empty'. Figure 3 shows that the NL is moving from an 'old normal' of 2 active loops per households

towards one. The decrease started already in the early 00s, when households started to buy broadband services and discarded their second telephone line, acquired for fax/Internet services. The speed accelerated from 2007 onwards when consumers started to appreciate triple play service and discarded either services on their coax or their copper loop, i.e. both networks 'grew' emptier. The graph also shows that active copper connections decreased in a faster pace than coax connections.

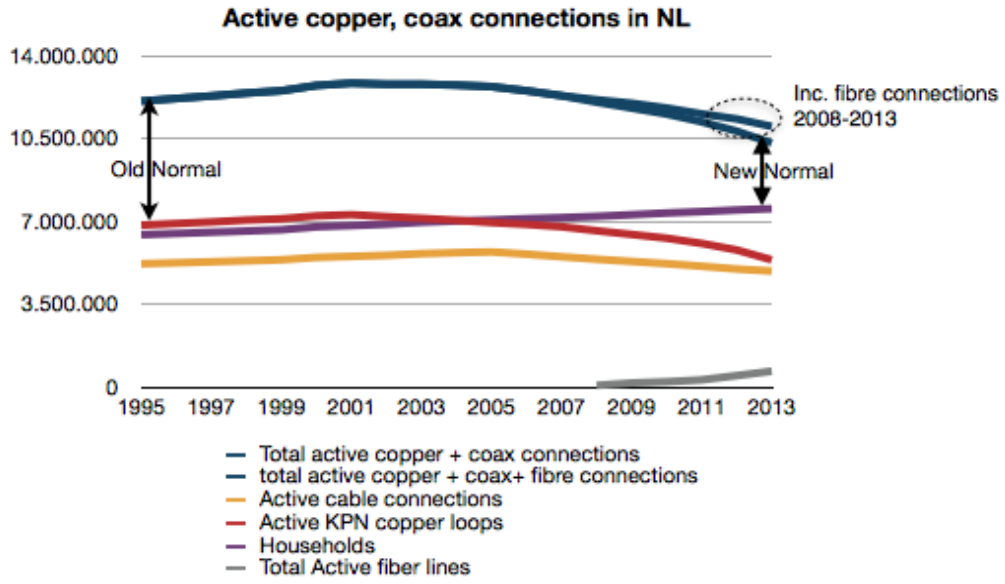

Figure 3 Development of access connections at Dutch households (sources, CBS, company info, Rabobank)

In the meantime the stock of access network connections is increasing, due to the roll out of FttH as described in §3.3. This seems a paradox, vacancy in both legacy networks increasing, while a third is being constructed. This concurs with the observation that traditional copper network is more under pressure than the coax-networks. KPN started in 2010-2011 to fully market services over fibre in the FttH footprint of Reggefiber. There is evidence that most fibre customers churn from copper, increasing the vacancy rate of the incumbent's legacy copper network. It's obvious that the role out of fibre to the cabinet (VDSL) by KPN is non-existent in FttH-areas. VDSL is however the technology of choice for those areas not or not yet planned to be fibred. This dual (VDSL and fiber) strategy is due to two reasons: a) fire role out is limited to approx. 350-450k connections per year given practical limitation and capital requirement (€300-350mn). This means that an additional 3mn FttH connections, toward 5mn households, will take approx. 8-9 years. The second reason is that FttH

connection doesn't (yet) make much of a difference in the offer to consumers, shown by the lacklustre take up of fibre connections, which is steady for 3 years in the low 30-ties.

3. Conclusions/assumptions

The Netherlands has a unique fixed line access infrastructure. It is among the most densely cabled countries in the world with two local loops are available in > 90% of homes. Both infrastructures have been rolled out before the liberalisation of the market (in line with the European framework). Both were more or less government financed/owned. The privatisation of these networks in combination with technological development resulted in today's market with strong competition between CATV-operators and the incumbent KPN. This is amplified by the roll out of FttH. This competition is supposed to be one of the main drivers behind the roll out of NGA-networks. Although one player in the CATV market (CIF) has an active strategy to upgrade from a coax-based NGA to fibre-based NGA. This strategy is also pursued by some small independent players (like Kabel Noord with 25k connections). The largest CATV-market players have no clear strategy to fibre the last mile and continue to commit their resources to keep their Hybrid Fibre Coax networks up to date and grow their subscriber base. The incumbent entered the fibre access network roll out by acquiring investor led FttH operator Reggefiber. During the presentation of 2013 yearly figures KPN announced a slowdown of its fibre roll out and seems to focus on a dual strategy keeping parts of the old copper network intact for xDSL-services.

This work to the development of the Dutch access network needs further research, especially improving the data sets of network stock and improving accuracy of business connection. Despite that we like to present with this paper the assumption that insufficient market incentives exist to upgrade the local loop infrastructure and to replace the existing copper and coax networks. These incentives are strengthened by the fact that 1) networks are 'getting empty' (due to the introduction of triple play, the number of users that subscribe to both networks is rapidly reducing) and 2) uptake of fibre based services by consumers is lack lustre..

Both local loops are close to reaching the end of their technical lifetime (as defined when they were build). This needs not to be an alarming aspect if it turns out that extending the life time is technologically acceptable. Otherwise, policy assumptions on building next generation (fibre) networks need to be reassessed.

We encourage more technological and economic research into this paradox of successful competition in countries with a dual communications infrastructure like the Netherlands.