

The Netherlands: FTTH deployment overview 4Q2006

This list provides an overview and status of all Fibre-to-the-Home, Building-and-Curb projects in the Netherlands known to Stratix Consulting. The first table lists the number of connections as at December 2006. The second table lists the plans for 2007 and announcements made in the press for rollout plans up to 2009/2010. The first two tables list deployments that require the complete wiring of the local loop into the house or flat. We finish with a description of Cable companies and Telco incumbent upgrades that do not require building new infrastructure in the homes.

Table 1 provides an overview of deployments at the end of 2006. The list contains four categories: local initiatives, GNEM activities with the housing corporations Portaal, de Alliantie and Patio, Lijbrandt networks and the initiatives of Student dormitory corporations. Lijbrandt's services for student dormitory corporations are listed in the fourth category to avoid double counting.

Table 1 *Fibre-to-the-Home, Building-and-Curb status report for December 2006*

| Municipality/Region | Initiator | Operator | Tech. | Max. Bitrate up/down | Dec. 2006 connected | Dec. 2006 served |
|--------------------------|----------------------|-------------|-------|-------------------------|------------------------|---------------------|
| Local initiatives | | | | | 29,822 | 22,475 |
| Almere | Municipality | Unet | FTTH | 100/100 Mbps | 1,700 | n.a. |
| Almere | KPN | KPN | FTTH | ? | 400 | 400 |
| Amersfoort | Casema | Casema | FTTH | ? | 1,000 | 1,000 |
| Amsterdam | Municipality/GNA | Bbnet | FTTH | 100/100 Mbps | u.c. | u.c. |
| Amsterdam | Silodam | IJ-net | FTTH | 1/1Gbps | 400 | 400 |
| Deventer | Rentre Wonen | Y3-net | FTTH | 100/100 Mbps | 1,200 | n.a. |
| Eindhoven | Onsnet Eindhoven | NEM | FTTH | 100/100 Mbps | 6,500 | 4,200 |
| Enschede | Woonplaats/Domijn | KPN-Casanet | FTTH | 100/100 Mbps | 8,500 | 8,500 |
| Naaldwijk | CaiW | CaiW | FTTH | 30/30 Mbps | 700 | 700 |
| Nuenen | Onsnet Nuenen | NEM | FTTH | 100/100 Mbps | 7,200 | 6,500 |
| Nijmegen-Hazenkamp | Glazenkamp | UCI-KUN | FTTH | 100/100 Mbps | 28 | 28 |
| Rotterdam | Municipality | Bbnet | FTTH | 100/100 Mbps | 1,500 | n.a. |
| Utrecht | Lomboxnet | Lomboxnet | FTTH | 100/100 Mbps | 1,000 | 1,000 |
| Utrecht- Leidsche Rijn | Kersentuin | Xs4all | FTTH | 100/100 Mbps | 94 | 47 |
| GNEM | | | | | 26,800 | 855 |
| Amersfoort | De Velden/Portaal | GNEM | FTTH | 100/100 Mbps | 900 | 855 |
| Amersfoort | De Alliantie/Portaal | GNEM | FTTH | 100/100 Mbps | 3,000 | n.a. |
| Arnhem | Portaal | GNEM | FTTH | 100/100 Mbps | 3,500 | n.a. |
| Bussum | Patio | GNEM | FTTH | 100/100 Mbps | 1,000 | n.a. |
| Hilversum | Patio | GNEM | FTTH | 100/100 Mbps | 2,000 | n.a. |
| Leiden | Portaal | GNEM | FTTH | 100/100 Mbps | 6,000 | n.a. |
| Naarden | Portaal | GNEM | FTTH | 100/100 Mbps | 1,000 | n.a. |
| Nijmegen | Portaal | GNEM | FTTH | 100/100 Mbps | 4,000 | n.a. |
| Soest | Portaal | GNEM | FTTH | 100/100 Mbps | 900 | n.a. |
| Utrecht | Portaal | GNEM | FTTH | 100/100 Mbps | 4,500 | n.a. |

| Municipality/Region | Initiator | Operator | Tech. | Max. Bitrate up/down | Dec. 2006 connected | Dec. 2006 served |
|----------------------------|---------------------|-------------|-------|-------------------------|------------------------|---------------------|
| Lijbrandt | | | | | 14,150 | 12,450 |
| Hillegom | Lijbrandt | Lijbrandt | FTTC | 20/20 Mbps | 6,700 | 5,000 |
| Lisse | Lijbrandt | Lijbrandt | FTTC | 20/20 Mbps | u.c. | u.c. |
| Haarlem | Pré Wonen | Lijbrandt | FTTC | 20/20 Mbps | 450 | 450 |
| Various towns | Housing/Care corps. | Lijbrandt | FTTB | 20/20 Mbps | 7,000 | 7,000 |
| Student dormitories | | | | | 40,303 | 40,303 |
| Amstelveen | Duwo | Casema | FTTB | 100/100 Mbps | 3,000 | 3,000 |
| Amsterdam | De Key | PinkRoccade | FTTB | 100/100 Mbps | 3,000 | 3,000 |
| Amsterdam | Duwo | Lijbrandt | FTTB | 20/20 Mbps | 1,000 | 1,000 |
| Breukelen | Nijenrode | Nijenrode | FTTB | 100/100 Mbps | 200 | 200 |
| Delft | Duwo | TU Delft | FTTB | 100/100 Mbps | 5,000 | 5,000 |
| Den Haag | Duwo | Lijbrandt | FTTB | 20/20 Mbps | 350 | 350 |
| Eindhoven | Vestide | NEM | FTTB | 100/100 Mbps | 1,500 | 1,500 |
| Enschede | U Twente Campus | UT - ITBE | FTTB | 100/100 Mbps | 2,000 | 2,000 |
| Groningen | IN-Groningen | RuG RC | FTTB | 100/100 Mbps | 1,013 | 1,013 |
| Leiden | SLS | Lijbrandt | FTTB | 20/20 Mbps | 3,000 | 3,000 |
| Nijmegen | SSHN | UCI-KUN | FTTB | 100/100 Mbps | 4,000 | 4,000 |
| Oegstgeest | Duwo | Lijbrandt | FTTB | 20/20 Mbps | 540 | 540 |
| Rotterdam | Stadswonen | Bbned | FTTB | 100/100 Mbps | 5,500 | 5,500 |
| Tilburg | Breburg Wonen | Breburg | FTTB | 100/100 Mbps | 400 | 400 |
| Utrecht | SSHU | CapGemini | FTTB | 100/100 Mbps | 5,600 | 5,600 |
| Wageningen | SSHW | WU FB/ICT | FTTB | 100/100 Mbps | 4,200 | 4,200 |
| Total Netherlands | | | | | 111,475 | 76,383 |

A number of the initiators and operators listed above have made public announcements about their network roll out plans for 2007 and even about subsequent plans up to 2009/2010. Table 2 lists the public plans. Naturally, we do not disclose confidential plans that have come to our knowledge.

Table 2 Network extension plans for 2007 and company announcements for Year End 2009

| Municipality/Region | Initiator | Operator | Planned 2007 | Planned YE2009 |
|--------------------------|-------------------|---------------|----------------|----------------|
| Local initiatives | | | 139,094 | 181,094 |
| Almere | Municipality | Unet | 1,700 | 1,700 |
| Almere | KPN | KPN | 11,000 | 11,000 |
| Amersfoort | Casema | Casema | 1,000 | 1,000 |
| Amsterdam | Municipality/GNA | BBned | 37,000 | 37,000 |
| Amsterdam | Silodam | IJ-net | 400 | 400 |
| Deventer | Rentré Wonen | Y3-net | 1,200 | 1,200 |
| Deventer | Y3-net | Y3-net | 40,000 | 40,000 |
| Eindhoven | Onsnet Eindhoven | NEM | 7,700 | 7,700 |
| Enschede | Woonplaats/Domijn | KPN - Casanet | 25,000 | 25,000 |
| Helmond | Municipality | BBned | | 40,000 |
| Naaldwijk | CaiW | CaiW | 900 | 900 |
| Nuenen | Onsnet Nuenen | NEM | 8,000 | 8,000 |

| Municipality/Region | Initiator | Operator | Planned 2007 | Planned YE2009 |
|--------------------------------------|----------------------|-----------------|----------------|----------------|
| Local initiatives (continued) | | | | |
| Nijmegen-Hazenkamp | Glazenkamp | UCI-KUN | 500 | 2,500 |
| Rotterdam | Municipality | BBned | 4,000 | 4,000 |
| Utrecht | Lomboxnet | Lomboxnet | 1,000 | 1,000 |
| Utrecht | Kersentuin | Xs4all | 94 | 94 |
| GNEM | | | 129,500 | 129,500 |
| Amersfoort | De Alliantie/Portaal | GNEM | 10,000 | 10,000 |
| Arnhem | GNEM | GNEM | 60,000 | 60,000 |
| Arnhem | Portaal | GNEM | 6,500 | 6,500 |
| Bussum | Patio | GNEM | 3,000 | 3,000 |
| Hilversum | Patio | GNEM | 3,000 | 3,000 |
| Leiden | Portaal | GNEM | 8,500 | 8,500 |
| Naarden | Portaal | GNEM | 3,000 | 3,000 |
| Nijmegen | Portaal | GNEM | 13,000 | 13,000 |
| Soest | Portaal | GNEM | 3,500 | 3,500 |
| Utrecht | Portaal | GNEM | 19,000 | 19,000 |
| Lijbrandt | | | 64,500 | 224,500 |
| Hillegom | Lijbrandt | Lijbrandt | 7,500 | 7,500 |
| Lisse | Lijbrandt | Lijbrandt | 10,000 | 10,000 |
| Haarlem | Pré Wonen/Lijbrandt | Lijbrandt | 40,000 | 80,000 |
| Bollenstreek region | Lijbrandt | Lijbrandt | | 120,000 |
| Various towns | Housing/Care corps. | Lijbrandt | 7,000 | 7,000 |
| Student dormitories | | | 43,803 | 43,803 |
| Amstelveen | Duwo | Casema | 3,000 | 3,000 |
| Amsterdam | De Key | PinkRoccade | 5,000 | 5,000 |
| Amsterdam | Duwo | Lijbrandt | 1,000 | 1,000 |
| Breukelen | Nijenrode | Nijenrode | 200 | 200 |
| Delft | Duwo | TU Delft | 6,500 | 6,500 |
| Den Haag | Duwo | Lijbrandt | 350 | 350 |
| Eindhoven | Vestide | NEM | 1,500 | 1,500 |
| Enschede | U Twente Campus | U Twente - ITBE | 2,000 | 2,000 |
| Groningen | IN-Groningen | RuG RC | 1,013 | 1,013 |
| Leiden | SLS | Lijbrandt | 3,000 | 3,000 |
| Nijmegen | SSHN | UCI-KUN | 4,000 | 4,000 |
| Oegstgeest | Duwo | Lijbrandt | 540 | 540 |
| Rotterdam | Stadswonen | BBned | 5,500 | 5,500 |
| Tilburg | Breburg Wonen | Breburg | 400 | 400 |
| Utrecht | SSHU | CapGemini | 5,600 | 5,600 |
| Wageningen | SSHW | WU FB/ICT | 4,200 | 4,200 |
| Total Netherlands | | | 377,297 | 579,297 |

Two main trends emerge from the data presented above. First, there is a shift from piecemeal projects in co-operation with housing corporations to city-wide projects. Secondly, a considerable ramp up in new installations is slated for 2007. The first hundred thousand lines have been constructed in ten years, although most of these have been installed in the last five

years. The first initiators were student housing corporations outfitting their first large apartment and dormitory buildings around towns with Fibre-to-the-Building as early as 1994. They proved a market and business model and were prime investors. Then private companies started to serve housing corporations and began to co-invest with them. Today, private network constructors are taking over and private equity is funding new initiatives in Haarlem/Bollenstreek, Deventer and Arnhem. In the Amsterdam GNA initiative, financing is jointly provided by the municipality, housing corporations and private equity.

Upgrade initiatives by copper and coax incumbents

Dutch fixed telephony incumbent KPN and major cable operators today have very limited Fibre-to-the-Home deployments. These are either by acquisition or technology pilot projects. They have announced different strategies and are conducting trials with electronics upgrades of current DSL and cable technology like VDSL(2), Teleste's Ethernet-to-the-Home and EuroDOCSIS 3.0 that is slated to supersede current ADSL2+ and Euro-DOCSIS 2.0 deployments. Below is the list of the current status of the various copper upgrade projects that do not require an entire overhaul of the local loop, where the expensive last 300 meters will remain in place with old technology.

Table 3 *Advanced network upgrades of copper and coax incumbents*

| Municipality/Region | Operator | Technology | Max. Bitrate | Dec. 2006 |
|----------------------------|----------|------------|---------------|-----------|
| Deployment location | | | | |
| Zoetermeer-Noordhove | KPN | VDSL | 30/13 Mbps | Trial |
| Boxmeer | Essent | ETTH | 50/50 Mbps | 3,000 |
| Naaldwijk | CAIW | Narad | 100/100/ Mbps | ? |
| Almere | UPC | DOCSIS 3.0 | 30/30 Mbps | ? |

Table 4 provides an overview of the announced incumbent upgrade strategies. KPN's strategy is described in OPTA's 2006 All-IP consultation paper. We have quantified the phases mentioned in this paper. We will provide an explanatory note here. KPN has announced that it is dismantling its local exchanges and moving to a new network with 28,000 street cabinets containing VDSL2 start with upgrades first in the rural areas, where no competitors have installed DSLAMs in local exchanges. Secondly it will upgrade the most remote street cabinets behind the longest feeder cables. Only in the final stage will KPN upgrade the large local exchange service areas. Upon completion, KPN will have retrofitted cabinets for their entire installed base of local loops servicing PSTN, ISDN2 and ISDN30 over twisted pair, their datacommunications services, ADSL-only and leased line portfolio. Estimated on current KPN Facts and Figures, VDSL2 nodes will serve near 8 million extensions upon completion in 2010.

There are three key reasons for this uncommon deployment strategy of retrofitting in rural areas:

1. KPN is considered to be lacking in ADSL wholesale market power and is therefore allowed to charge higher rates for its services in the rural areas, where no competitor has asked for local loop access.

2. KPN and DSLAM-competitors installed ADSL2+ in the major exchanges and on the shorter local loops. This strategy therefore extends the economic life cycle of the most recent equipment investments.
3. By upgrading the remote cabinets early on, KPN boosts service for consumers who are currently experiencing the most performance limited DSL-service. Lastly, in greenfield areas/housing development projects, KPN is installing Fibre-to-the-Home from the start.

Amongst Cable operators, only UPC has already announced that it will deploy DOCSIS 3.0 in the future as its upgrade strategy. DOCSIS 3.0 allows for shared bandwidth of up to 120 Mbit/s downstream. Essent Kabelcom, recently acquired by Warburg Pincus and Cinven, is in trial with a different technology, Ethernet to the Home (ETTH), requiring upgrades of the multi-taps at the kerbside, and initially offers 10 Mbit/s symmetric access. In 2006, Essent announced that it was extending its trial from 3,000 homes to 10,000 and was going to offer higher bandwidths (up to 50 Mbit/s symmetric), however no further announcements on its rollout strategy has been made since Essent was sold. Multikabel and Casema, two other companies owned by Warburg and Cinven, have not yet announced an upgrade strategy. The same applies to Delta/Zelandnet. Lastly, cable operator CAIW has deployed Narad Networks technology, hooked up local WiFi hotspots in Naaldwijk and connected some businesses. The current use and future deployment of this technology is however unclear, CAIW also decided to install FTTH in a new housing area.

Table 4 Network upgrade plans for 2007 and announcements for Year End 2009 and 2010

| Municipality/Region | Operator | Technology | Planned 2007 | Announced for YE 2009 | Announced for YE 2010 |
|----------------------------|-----------------|------------|-----------------|--------------------------|--------------------------|
| Deployment location | | | | | |
| Zoetermeer-Noordhove | KPN | VDSL2 | trial | | |
| Rural areas | KPN | VDSL2 | 300,000 | 1,200,000 | 1,200,000 |
| Remote street cabinets | KPN | VDSL2 | | 1,000,000 | 2,500,000 |
| Major local exchanges | KPN | VDSL2 | | | 4,300,000 |
| Greenfield areas | KPN | FTTH | 75,000 | 225,000 | 225,000 |
| Boxmeer | Essent Kabelcom | ETTH | 10,000 | 10,000 | 10,000 |
| | CAIW | Narad | ? | ? | ? |
| | UPC | DOCSIS 3.0 | ? | ? | ? |

Acknowledgements and copyright Notice: Original data was compiled for a Netkwesties publication by Peter Olsthoorn: <http://www.netkwesties.nl/editie145/artikel5d.html>. This table was released with some small errors on project initiators and had gaps. In this publication, we provide an improved and updated list on the project initiators and active layer operators of the local loop networks and their number of connections. It represents our best knowledge of the current status of FTTH deployment in The Netherlands. Stratix Consulting plans for regularly published updates in the future. This document can be distributed and contents cited only with proper reference to Stratix Consulting, Hilversum, the Netherlands or a referral to our English website: <http://www.stratix.com/>