



Glass fiber projects in the Netherlands – lighting up the future for broadband

René Kramer

Eindhoven University of Technology, The Netherlands

BReATH workshop České Budějovice, Czech Republic, 15 May 2006

Outline



- Introduction
- Fiber projects
 - Kenniswijk
 - Almere Fiber Pilot/City
- Contact

Kenniswijk Origin



- Initiated by the DGTP in early 2000, in order to
 - Create a 'living testbed' of consumers
 - Spawn innovative products and services about computers, (mobile) communication, and the Internet
- Eindhoven-Helmond area won the selection phase in July 2000
- Official start on 1 October 2000

Kenniswijk Objectives (1...)



- Create an open consumer market of the future, with an innovative nature and an international flavour
- Create a unique combination of infrastructure and services that can break through the stalemate between both fields

Kenniswijk Objectives (...2)



- Strengthen the Netherlands' competitive position as a site for ICT companies
- Gain and share with other municipalities knowledge on effects of ICT on spatial, social and mobility patterns

Kenniswijk Approach (1....)



- Consumer plays a central role
- Public-private cooperation, open market
- Investments are done by private parties
- Kenniswijk is ahead of other comparable regions in the Netherlands
- Kenniswijk offers a testbed for ICT innovations

Kenniswijk Approach (...2...)

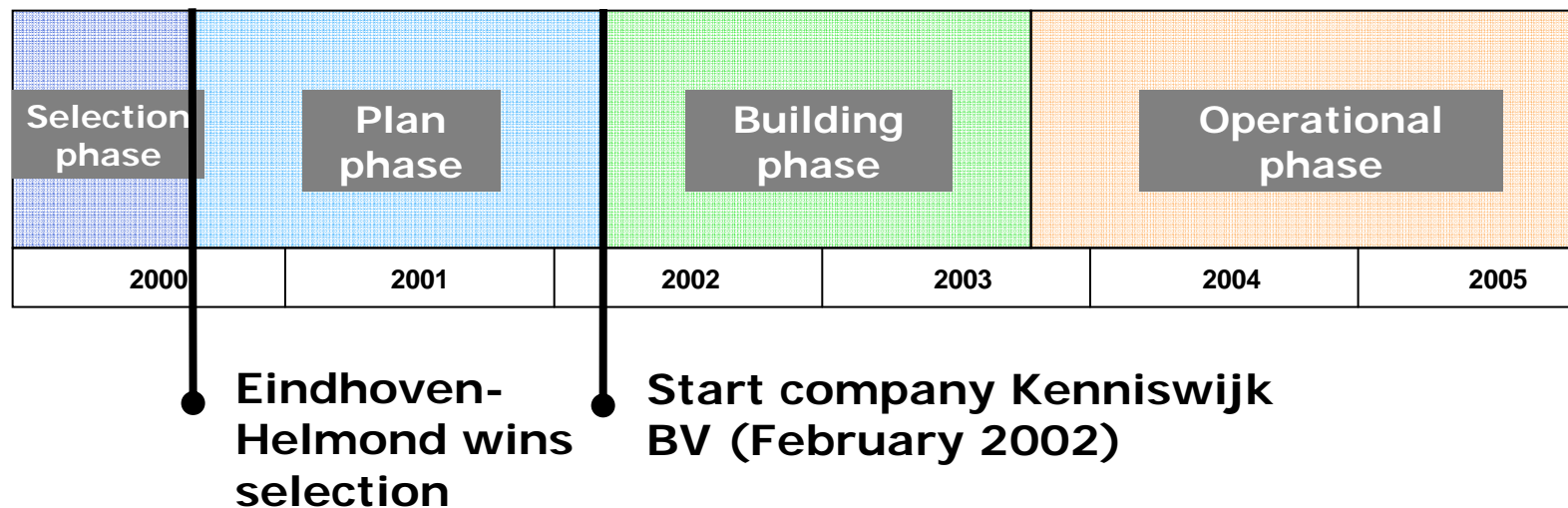


- Experiments done in Kenniswijk must aim to be implemented later on national level
- Kenniswijk is a national initiative with a regional format and an international image
- Stichting Kenniswijk.nl organized the project in the first period and brought together and supported partners

Kenniswijk Approach (...3...)



- Duration 5 years, until 1 October 2005

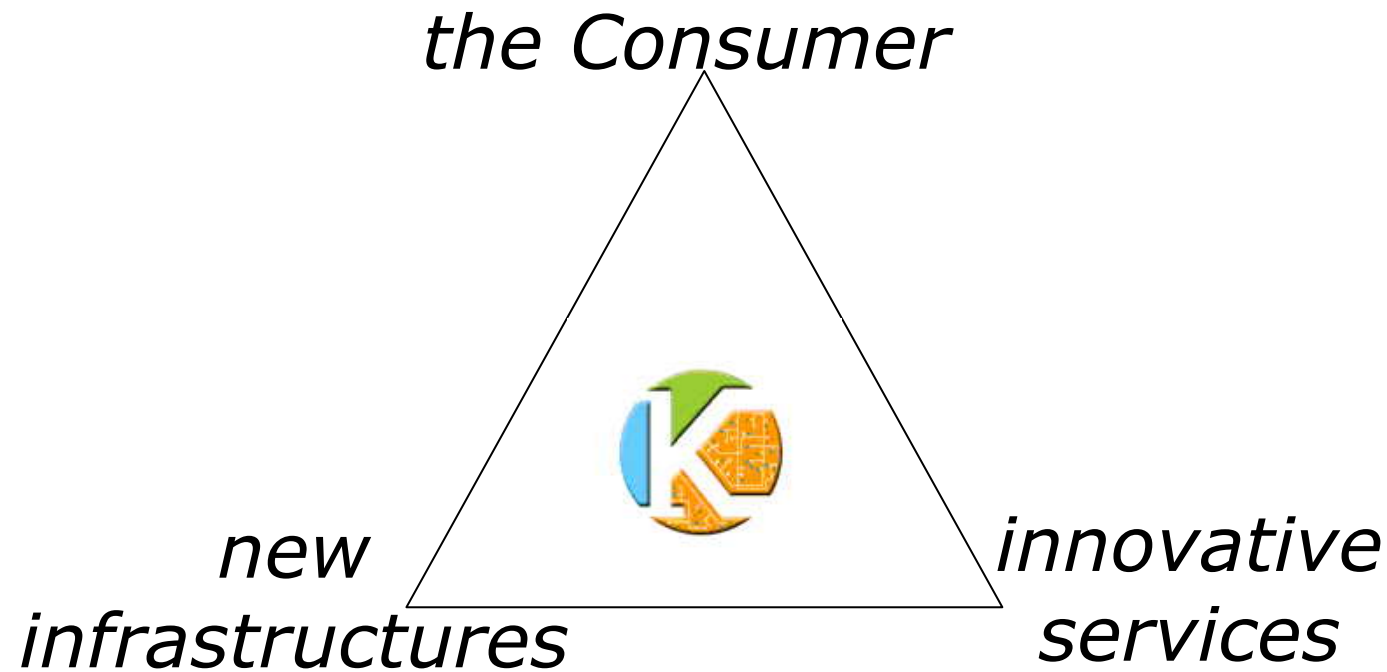


- Knowledge and outcomes of the Kenniswijk project are publicly and freely available and applicable
- Final report is available in print (Dutch) and electronically (English), see <http://www.kenniswijk.nl/>

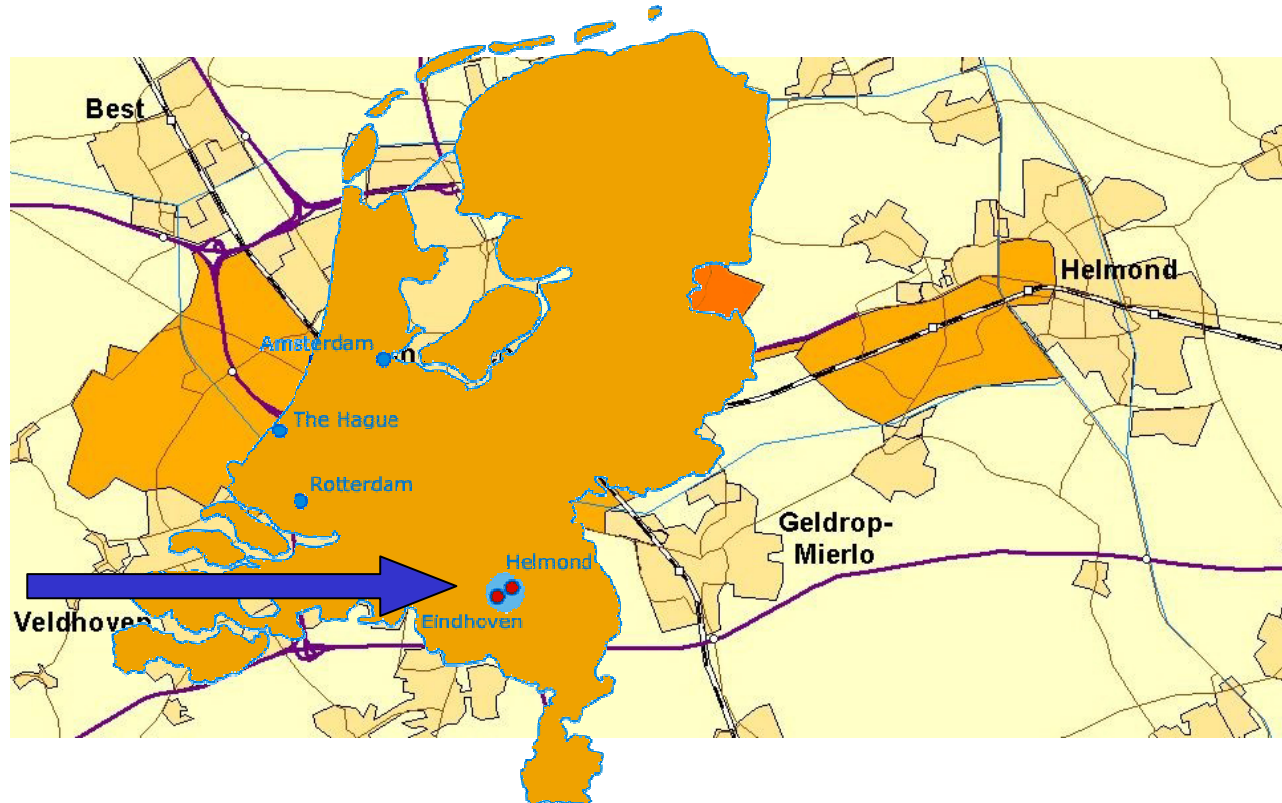
Kenniswijk – Approach (...4)



- Based on three aspects:



Kenniswijk Area



- 100,000 inhabitants in 47,500 hh
- Nuunen officially added in 2003
- Representation of total population

Monday 15 May 2006

BReATH workshop Czech Republic

Kenniswijk Business model (1...)



- Subsidy from Dutch government
 - € 45.5 M allocated at the start
 - 2/3 of this money used at the end
- Private financing had to be at least equal to this amount
 - Turned out to be considerably more

Kenniswijk Business model (...2...)



- Kenniswijk BV
 - Founded in February 2002
 - Replaces Stichting Kenniswijk.nl
 - Organizes Kenniswijk project
 - 10 employees
 - Proactively approaches companies and institutions to make use of Kenniswijk's subsidy schemes

Kenniswijk Business model (...3...)



- Has a facilitating role, motivates and supports companies and institutions
- Helps in building public-private partnerships
- Forces breakthroughs
- 27 public and private shareholders:

Kenniswijk Business model (...4...)



Monday 15 May 2006

BReATH workshop Czech Republic

Kenniswijk Business model (...5)



- Broadband infrastructure incentive scheme



Monday 15 May 2006

BReATH workshop Czech Republic

15

Kenniswijk Infrastructure (1...)



- Cederlaan and Tongelre
 - 2Gbps to SURFnet/AMSIX/ISP
 - Total ~350 connections
 - Broadband Benelux' network from 2000
- Cederlaan
 - Core: FttB Ethernet over SMF, converted to UTP outside buildings
 - Access: 100Mbps individual connection
 - CPE: SIP gateway

Kenniswijk Infrastructure (...2...)



- Tongelre
 - Core: FttH Ethernet over SMF
 - Access: Ethernet over MMF (SMF now), 100Mbps individual connection
 - CPE
 - Ericsson E \leftrightarrow O convertor
 - SIP gateway

Kenniswijk Infrastructure (...3...)



- Woenselse Molen and Vonderkwartier
 - ~900 FttH connections
- Lakerlopen
 - ~165 FttH connections

Kenniswijk Infrastructure (...4...)



- OnsNet Nuenen

- General

- Early 2004, a cooperative organisation consisting of the residents of Nuenen was launched, called OnsNet (OurNetwork)
 - Intensive local education, community building, and free installation & connectivity in the first year caused 97% of the residents to join the cooperation
 - All >7500 houses in Nuenen now have a fiber connection
 - After the first subsidized year has ended, 80% of the households still uses the fiber connection

Kenniswijk Infrastructure (...5...)



– Core/access:

- Point-to-point PON with >7500 SMF (9 μ m) pairs
- 2 fibers per house: general Ethernet and analog CATV
- Concentration, resilient switching and routing to SURFnet/ISP
- 1550nm down on both fibers; 1310nm up for general fiber
- Non-tunable lasers in CO/CPE

Kenniswijk Infrastructure (...6...)



– CPE

- Genexis FiberXport™: convertor fiber↔4-port UTP and fiber↔CATV
- Separate or built-in SIP gateway for telephony, for two lines & telephone numbers
- Transparent service delivery: one Ethernet port per Service Provider
- Manageability per port, including 8 levels of QoS

Kenniswijk Infrastructure (...7...)



- OnsNet East Eindhoven (was never part of Kenniswijk)
 - Similar setup as in Nuenen
 - CPE of different vendor, with less manageability
 - Took over the old Kenniswijk networks in Eindhoven

Kenniswijk Infrastructure (...8)



- Infrastructure lessons learned
 - It is essential to have an open network, where the conditions for access are the same for any service provider
 - The fiber projects in Kenniswijk have been a breakthrough in the Netherlands; more and more organizations are investing in fiber, also attracted by the decreasing prices for fiber connections

Kenniswijk Services



- Kenniswijk's unique features
 - Incentive schemes \geq 400,000 euro
 - Own market development team
 - Dedicated market & consumer research
 - PR and communication facilities
 - IT and network facilities

Kenniswijk Consumers



- Facilitate and involve consumers
- Kenniswijk consumer council
- Newsletters
- Testpanels



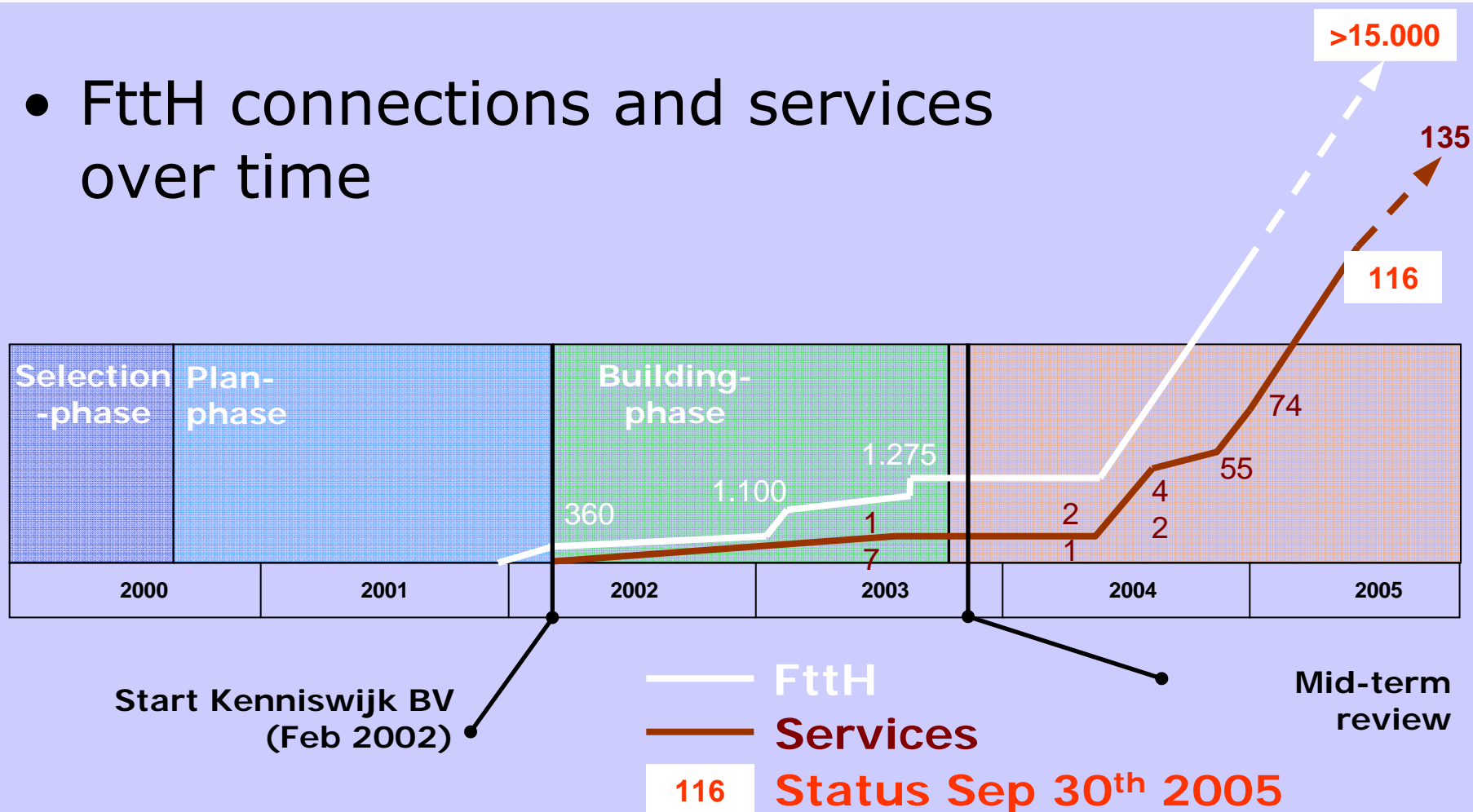
Monday 15 May 2006

BReATH workshop Czech Republic

Kenniswijk Outcomes



- FttH connections and services over time



Almere Fiber Pilot/City Origin



- From 2002-2004, eight Dutch towns got total of > € 7 M funding from Ministry of Economic Affairs to deploy and operate broadband networks and services
- Almere started in May 2002 with open FttH infrastructure for home users and businesses
- Almere Fiber Pilot built Almere Fiber Net and broadband services
- Almere Fiber City bundles BB demand

Almere Fiber Pilot/City Objectives



- Almere Fiber City initially aims to build a city-wide fiber network, connecting 150 municipal and social organizations

Almere Fiber Pilot/City Approach (1....)



- Almere Fiber City
 - Cooperation of municipality with housing agencies, investing parties and market organizations
 - Phase one: connecting municipal and social organizations, by April 2006
 - Phase two: connecting all company sites in Almere with data rates starting at 100Mbps

Almere Fiber Pilot/City Approach (...2)



- Center for Broadband Services
 - Opened in September 2004
 - Demo house showing possibilities
 - Stimulates local sales of services
 - Leverages international contacts

Almere Fiber Pilot/City Area



- Almere: rather new town
- Almere Fiber Pilot in one neighbourhood
- Almere Fiber City should become city-wide

Almere Fiber Pilot/City Business model (1...)



- Ownership and exploitation of network are split
 - Competition at service level
 - Prevents monopoly positions
- Almere Fiber Company owns the passive infrastructure
 - In future more than only municipality shall be involved

Almere Fiber Pilot/City Business model (...2)



- Home users pay € 59 a month for 10Mbps, or €79 a month for a 30Mbps connection in combination with Triple Play services
- Business users can now enter at € 59 a month instead of having to pay € 250 for all services
- Selling glass fiber services is difficult
 - Unfamiliarity with the possibilities
 - High threshold for consumers to make the switch

Almere Fiber Pilot/City Infrastructure



- Almere Fiber Net
 - Glass fiber pair to each consumer
 - Star-shaped network
 - Backbone network connects all public organizations incl. hospital, fire brigade, police and library
 - Passive infrastructure ready in February 2004
- Companies can connect other parts of town to this backbone, benefiting from bundled demand
- Dedicated Network Management System

Almere Fiber Pilot/City Services



- UNET develops and implements the services
- As of Spring 2004, subscribers use the Digital Service Package on the Almere Fiber Net
- In the beginning there were problems with telephony and the quality of digital TV
- Digital interactive encyclopedia
- Remote Backup for businesses : € 2 per month to backup 1GB of data
- VPN
- Camera surveillance from anywhere
- Flevo Hospital: Selfcare project to make an appointment electronically

Almere Fiber Pilot/City Consumer



- 1700 households and 500 businesses

Almere Fiber Pilot/City Outcomes



- Organizing the deployment of fiber networks proved costly and difficult
- Nevertheless, Almere Fiber Net is a very successful broadband solution

Contact information



- René Kramer (TUE/BReATH)
 - Email: r.d.j.kramer@tue.nl
 - Telephone: +31 40 247 3344
 - Web: www.ist-breath.net