# Analysys STEM® case studies

### The business case for WiMAX vs DSL in rural areas

Robin Bailey – Head of Decision Systems Group
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# The economics of rural access

- Operators are considering BBFWA technologies such as WiMAX as a more cost-effective solution for delivering IP-based services in low-density subscriber areas

- 2000 homes are connected over conventional copper to a local exchange, but in this rural area, only 60% are within reach of the current available DSL technology

- WiMAX is suggested as an alternative broadband solution, and a network will be deployed during 2006, with the launch of commercial service scheduled for January 2007

- The model considers scenarios for each technology in isolation, and also running both in parallel.

# The big picture

2000 homes

60% DSL reach

WiMAX

Video content ——— Backhaul

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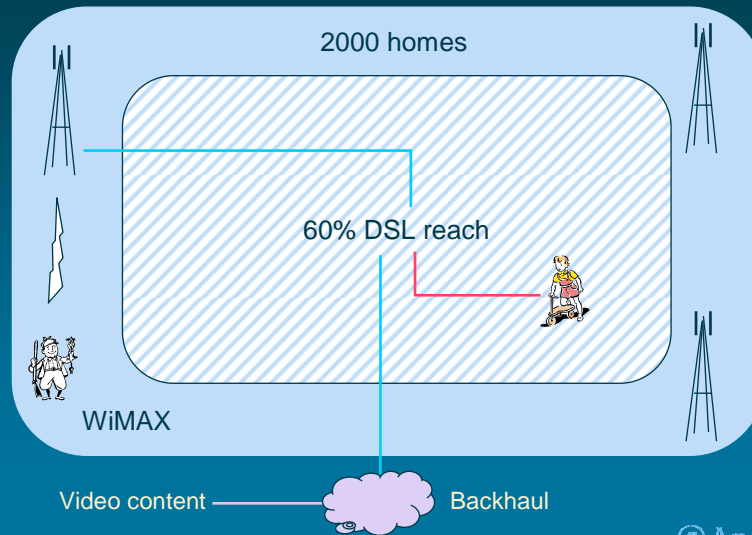
# Services

- WiMAX is offered as a total replacement technology for the outlying homes: voice and Internet services will both be carried over WiMAX for those subscribers

- Revenue arises from these separate access platforms, as well as from the individual services

- The model makes a high-level dimensioning of the relevant network elements according to the numbers of subscribers and associated traffic levels

- The model also considers the addition of an IPTV service, and its impact on service revenues and required network elements

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# Simplified network architecture

- DSL or WiMAX CPE

- DSLAM (and line rental, if this is an alternative operator)

- WiMAX access sectors and base stations

- Backhaul

- Core network

- Set-top box and video server

- Two different access technologies, but the same backhaul and core network are used by both systems

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# Quick and easy model

- The model is built on the STEM business-modelling software for networks

- Graphical user interface facilitates rapid and team-oriented editing of the model structure and assumptions

- STEM handles the structure and execution of the calculations





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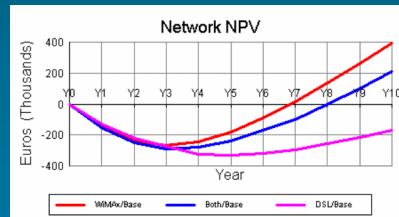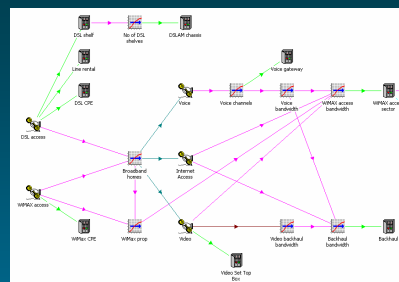
# Market and service structure

- Target market for broadband access (BBA)

- Estimated take-up rate



- Optional services and associated tariffs:
  - voice
  - Internet access
  - IPTV

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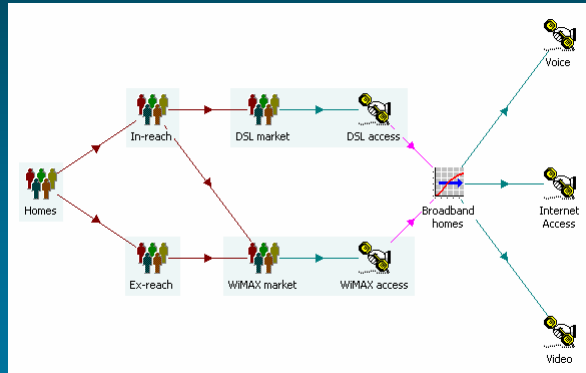
# Connections and bandwidth

- DSL access customers drive DSL ports

- Busy-hour Erlangs drive channel based voice bandwidth

- Voice, Internet and video bandwidth drive WiMAX capacity

- Voice and Internet plus video-feed bandwidth drives backhaul



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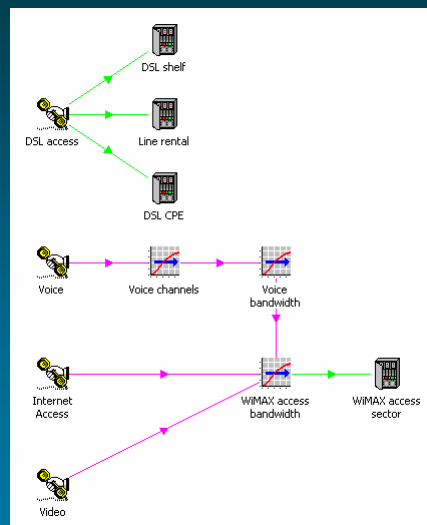
# WiMAX architecture

- WiMAX CPE per WiMAX customer
- Calculate WiMAX access sectors by 30 Mbit/s capacity

- Max 3 sectors per tower drives number of towers
- Independent site plan to allow for coverage constraints



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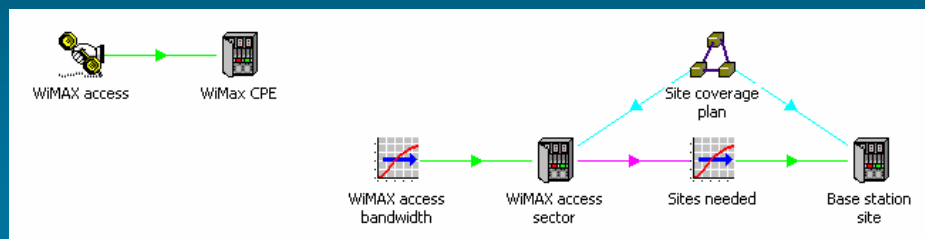
# Simplified DSL architecture

- Each DSL access customer requires a DSL modem
- Line-cards supplied in unit of packed shelves with 320 ports

- DSLAM chassis can accommodate up to five shelves
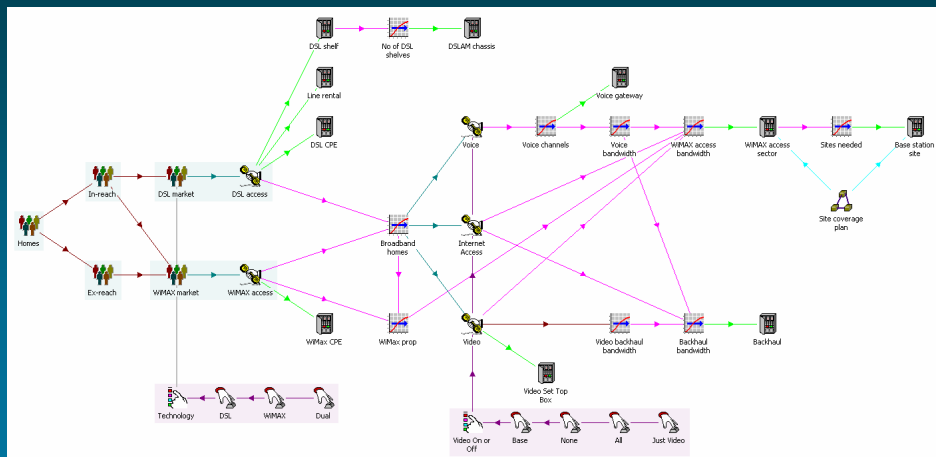- DSLAM backplane throughput capacity assumed to be 'enough'
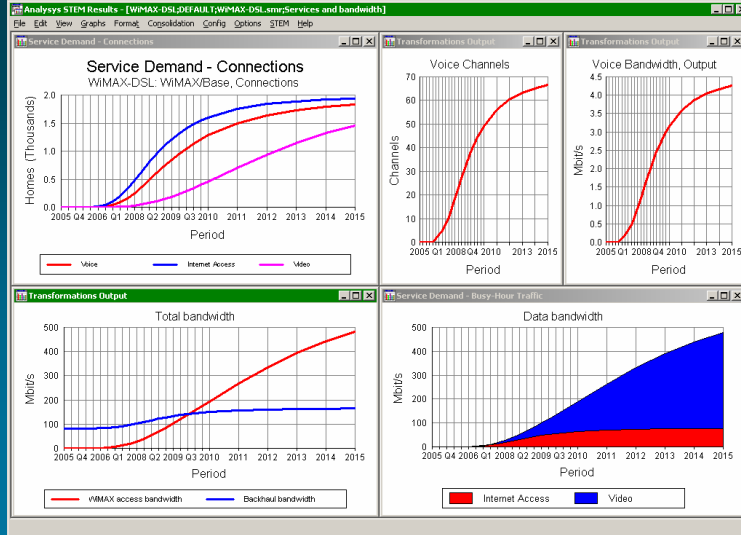


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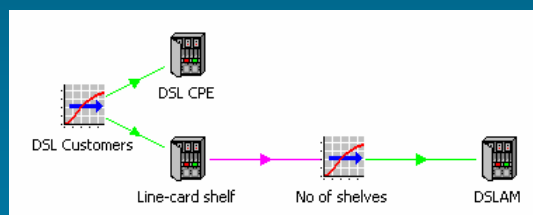
# Technology scenarios

- Technology choice drives relative markets:
  - less DSL subscribers if WiMAX is available
- Video on–off choice varies proportion of customers with video:
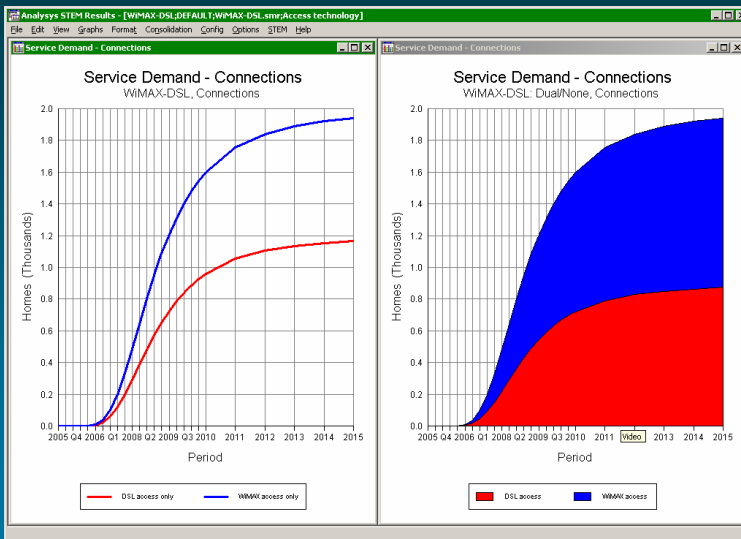  - sensitivity of WiMAX case to bandwidth saturation from video
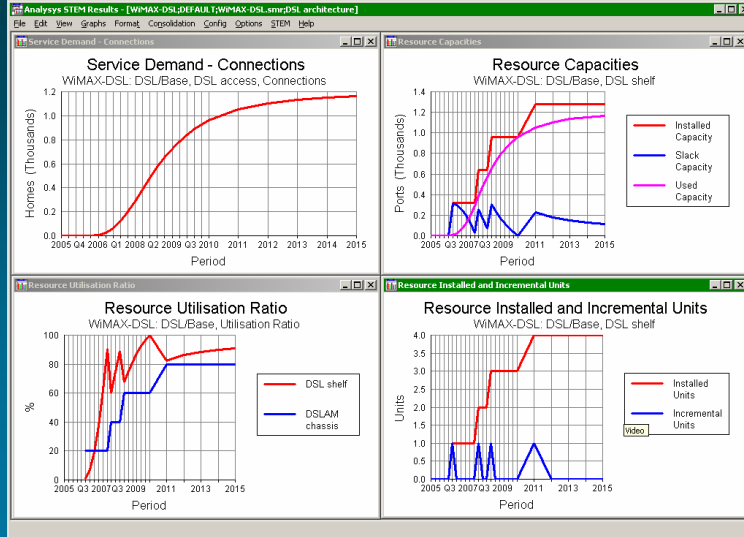


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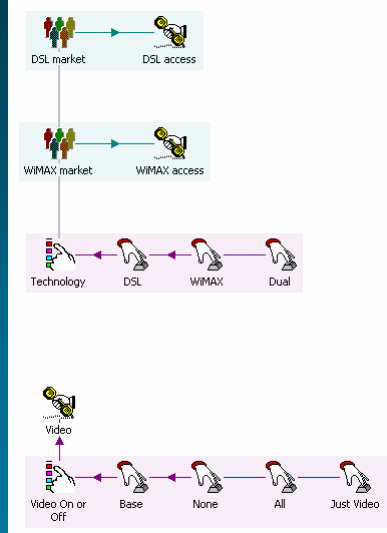
# Complete model structure

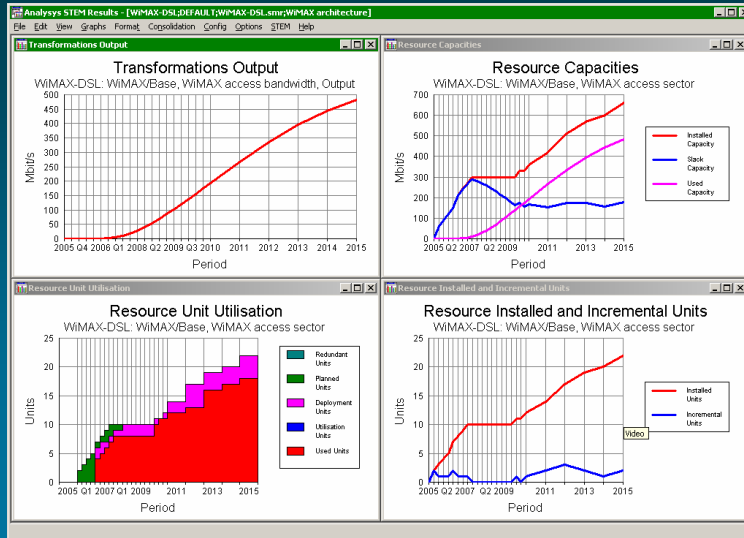

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Services and bandwidth
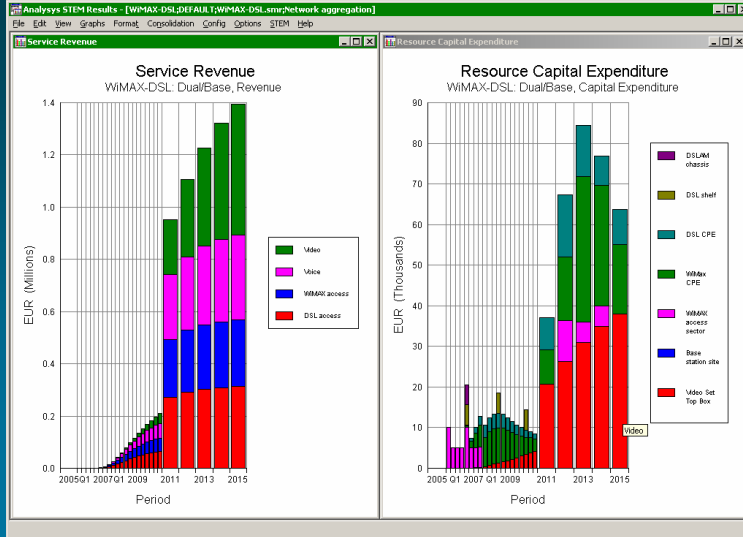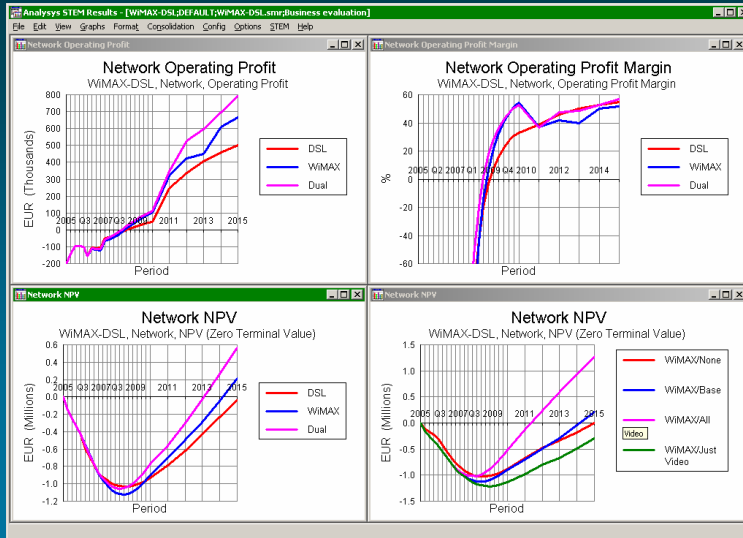


Access technology

# DSL architecture

# WiMAX architecture

# Network aggregation

# Business evaluation

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STEM® business-case modelling software for networks
www.analysys.com/stem/

**Robin Bailey** – Head of Decision Systems Group
robin.bailey@analysys.com
+44 1223 452773