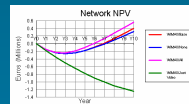
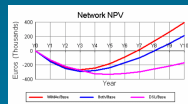


STEM modelling exercises

The business case for WiMAX vs DSL in rural areas



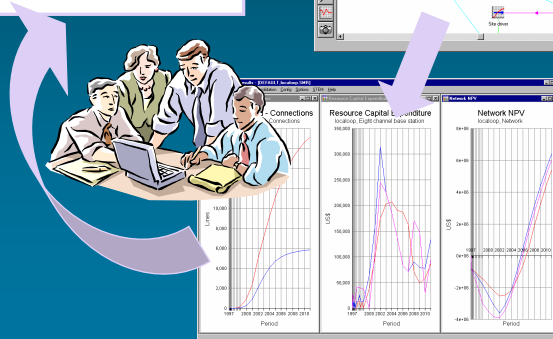
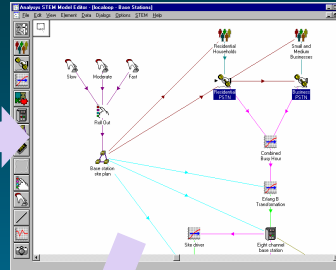
Robin Bailey – Head of Decision Systems Group
18-20 July 2006 – Cairo

WiMAX and DSL modelling with STEM

The economics of rural access

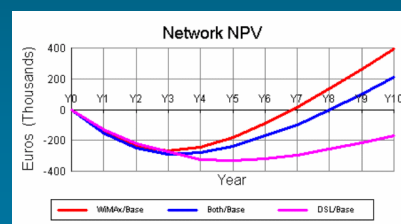
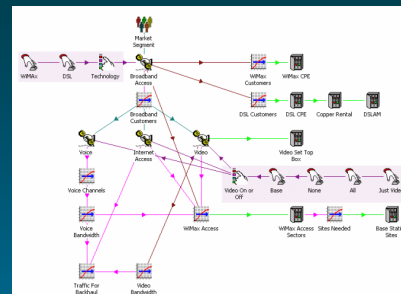
- Operators are considering BFWA technologies such as WiMAX as a more cost-effective solution for delivering IP-based services in low-density subscriber areas
- We present a quick and easy model which compares the economics of WiMAX and DSL for the provision of voice, Internet and video services in rural areas
- The model effects a basic WiMAX/DSL comparison and then measures the impact of possibly limited reach with DSL

Modelling exercises



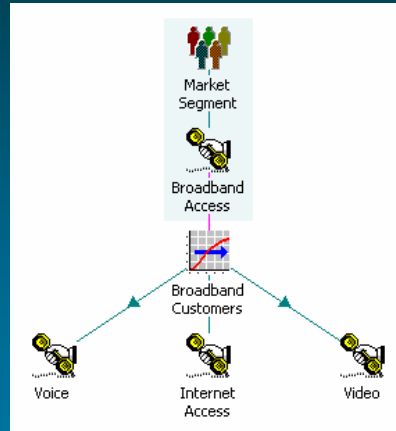
Quick and easy model

- 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



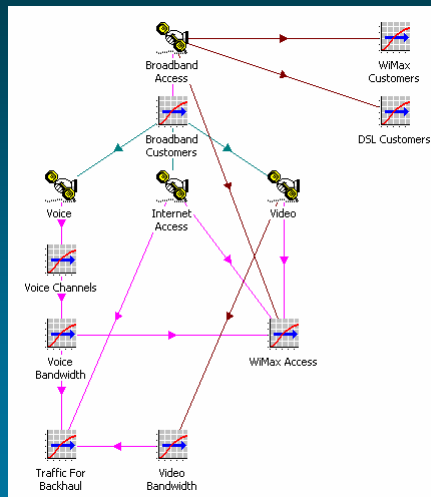
Market and service structure

- Target market for broadband access (BBA)
- Estimated take-up rate
- Optional services and associated tariffs:
 - voice
 - Internet access
 - IPTV



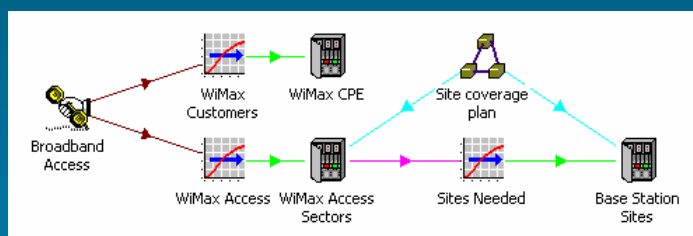
Connections and bandwidth

- BBA 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



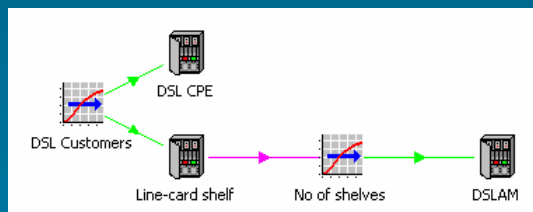
WiMAX architecture

- WiMAX CPE per BBA 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



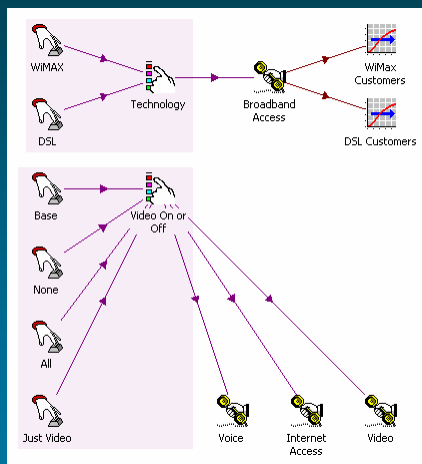
Simplified DSL architecture

- Each BBA customer requires a DSL modem and splitter
- 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'

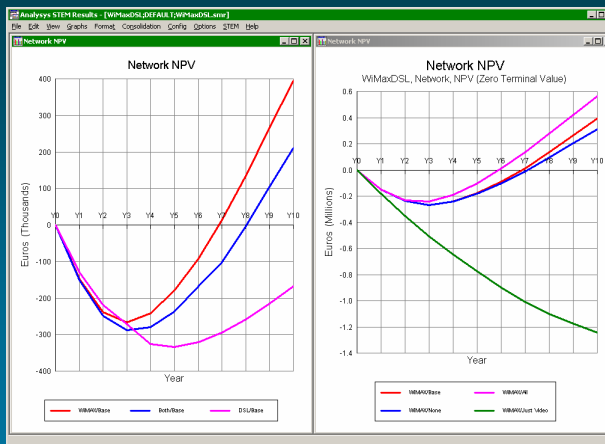
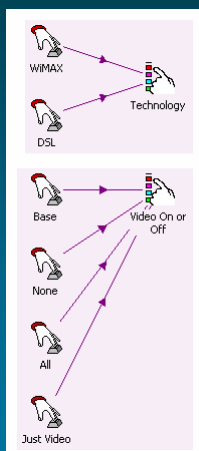


Technology scenarios

- WiMAX–DSL choice factors demand carried by each technology
 - increased market reach with WiMAX
- Video on–off choice varies proportion of customers with video:
 - sensitivity of WiMAX case to bandwidth saturation from video



Business evaluation

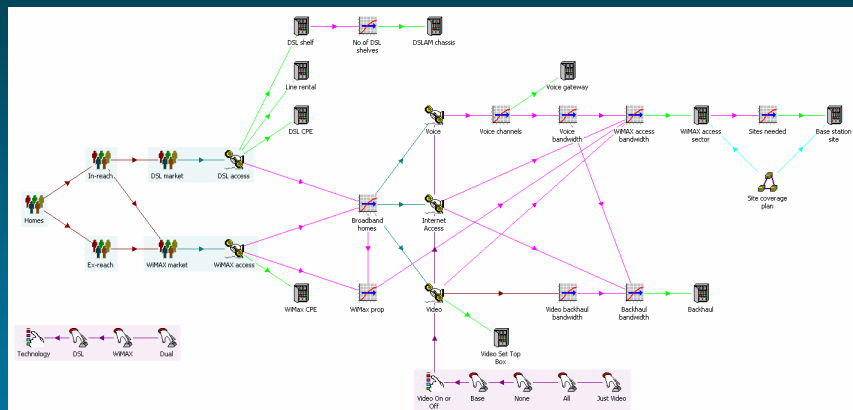


- NPV comparison is very sensitive to DSL reach

Views from the training model

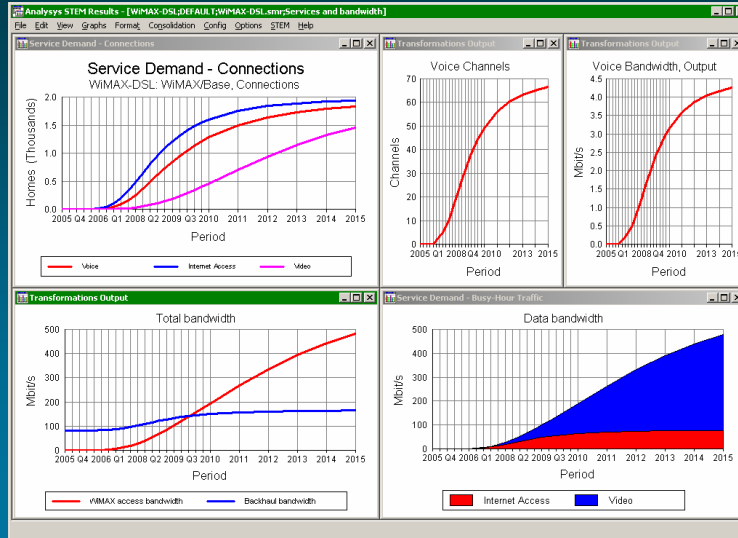
Analysys

WiMAX-DSL model structure



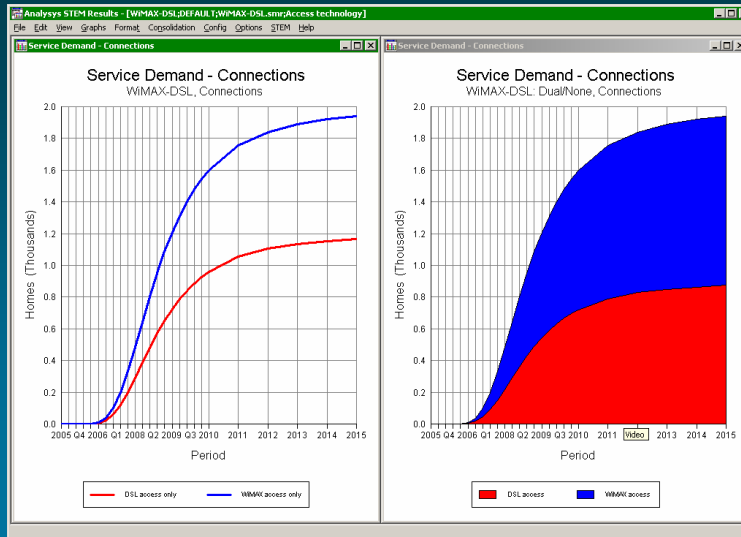
Analysys

Results: Services and bandwidth



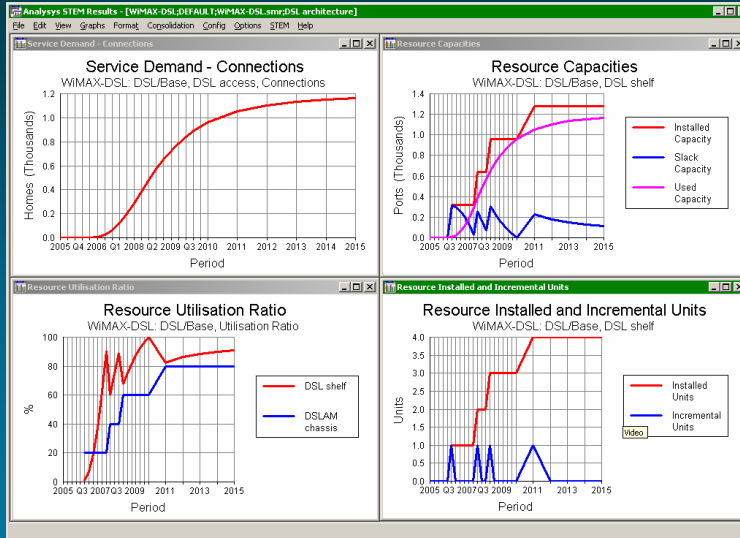
Analysys

Results: Access technology



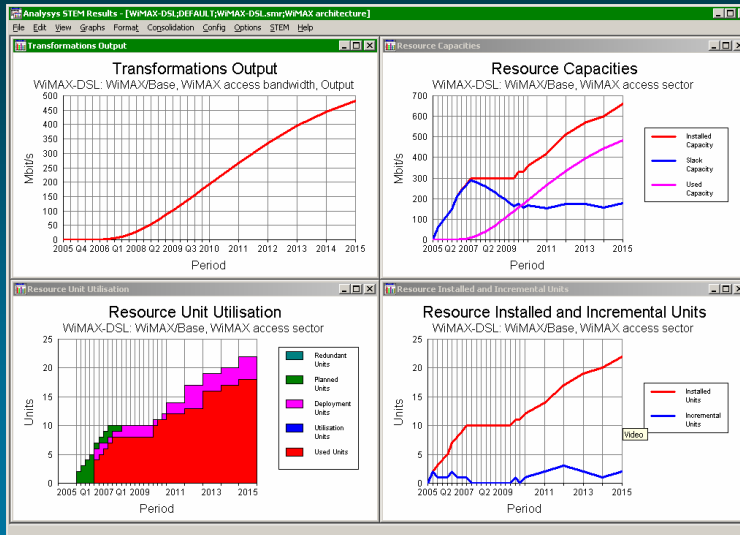
Analysys

Results: DSL architecture



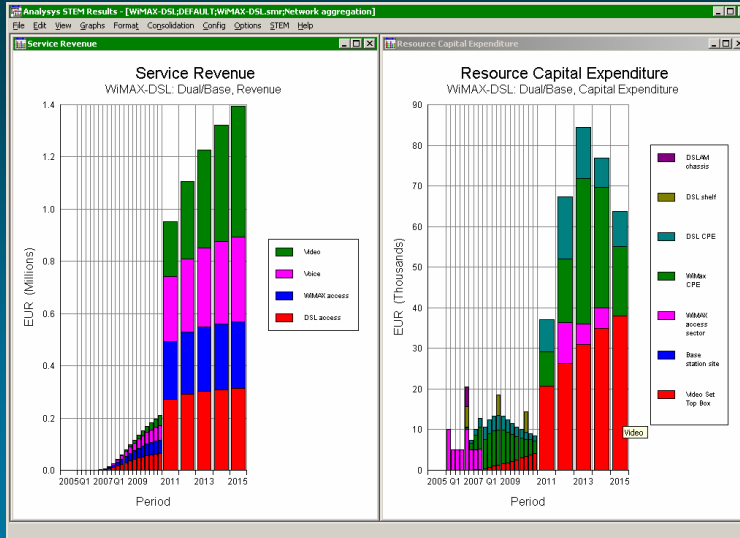
Analysys

Results: WiMAX architecture



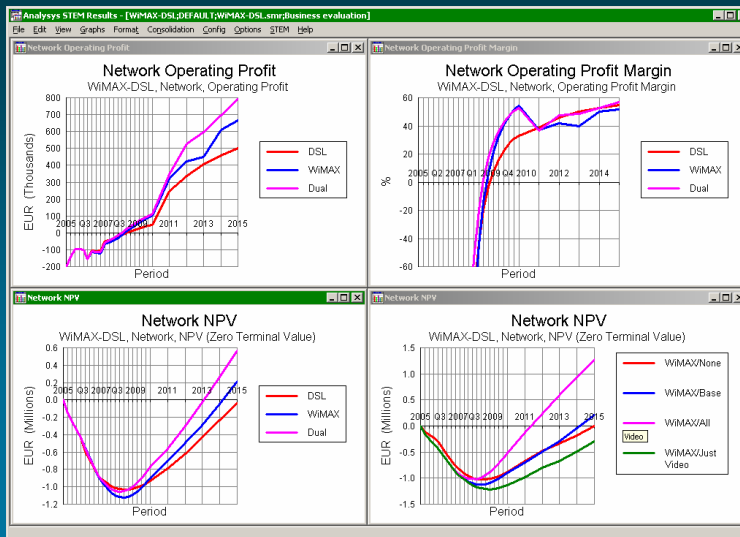
Analysys

Results: Network aggregation



Analysys

Results: Business evaluation



Analysys

Working smarter with the STEM business-case modelling software for networks



STEM business-modelling software for networks

Analysys STEM®

- Strategic Telecoms Evaluation Model*
- A consistent language and flexible framework for evaluating investments in telecoms business
- A high-level communication tool which uses icons to represent the key drivers in a business plan
- A time-based revenue, capex and opex calculator which supports network roll-out and investment decisions
- A tailored package of software, training, consultancy and support services

* developed over 20 years with the emerging telecoms economy



Operators and vendors using STEM

- BT Global Services
- Cable and Wireless
- China Telecom
- Korea Telecom
- Mobifon (Connex)
- Mobitel
- Swisscom Mobile
- Telecom New Zealand
- Telkom Indonesia
- Telkom SA
- Alcatel
- Ericsson
- Fujitsu
- Huawei Technologies
- Iskratel
- Juniper
- Marconi
- Motorola
- Nokia
- Siemens

Established modelling process

- In a constantly developing technology environment, there is a real business imperative to perform rapid and reliable evaluations of new service concepts
- Business cases must be readily adapted to changing market conditions and emerging vendor solutions
- STEM manages a complex structure of calculations to help focus on the financial impact of strategic choices
- CANTV (Venezuela), Telkom SA, and leading vendors, including Siemens and Alcatel, are performing detailed NGN studies with STEM
- T-Mobile is using STEM to evaluate the financial impact of technology choices for national and international networks
- BT Global Services uses STEM to calculate direct and fully-allocated unit costs for all the services provided on its regional networks in Europe

Professional modelling tool

Create business elements from a toolbar Access instant technical and financial results

Drag and drop to link elements

Follow prompts for inputs from menus:

Service 1

Resource 1

- Capacity and Lifetime
- Unit Costs
- Requirements
- Capital Cost Structure
- Cost Trends
- Deployment
- Cost Allocation
- Other Details
- User Data

Service Demand - Connections

Resource Utilisation Ratio

Revenue, Capex and Opex

Net Present Value

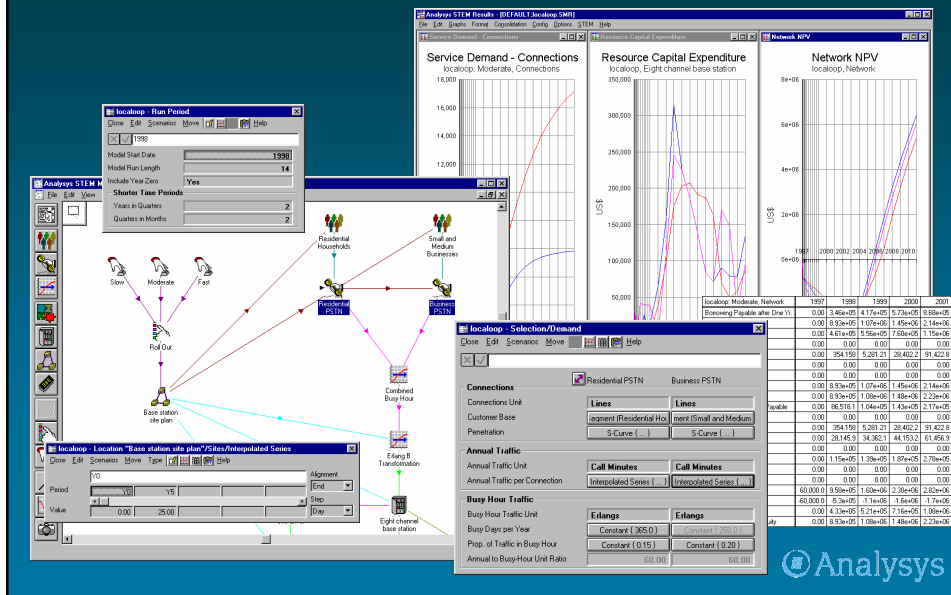
Analysys

Consistent financial framework

- Service elements capture demand and tariff assumptions → REVENUE
- Resource elements represent unit costs and build constraints for hardware, software, licences, buildings and human resources → CAPEX, DEPRECIATION and OPEX
- Connection, traffic and location-based dimensioning rules are shown as graphical links → PROFITABILITY and BALANCE SHEET

Analysys

Intuitive graphical interface



STEM integrates communication with calculation

- Provides a brainstorming and presentational tool for rapidly developing network business models
- Automatically generates demand / cost-allocation formulae, geographical variants and scenarios
- Calculates annual, quarterly and monthly service connections, traffic and revenues, equipment installation and replacement, capex and opex
- Delivers hundreds of built-in results through an integrated charting interface which can drill-down into individual elements, revenues and costs



Business cases by design

- Business-case models are typically built from the bottom-up each time in Excel:
 - laborious re-working of basic calculations
 - scope for copy errors; slow handover
- STEM wraps up core elements of telecoms business planning, enabling rapid and reliable, same-day development of business cases
- Consistent structure and graphics act provide a common language across business groups

STEM User Group Meeting

- 20-21 September 2006, Clare College, Cambridge, UK
- Interactive sessions on business planning for convergent services and product-profitability analysis
- Master classes for established users in parallel with fast-track training for newcomers
- Guest presentations from operator and vendor clients





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

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