



ITU / BDT workshop

Ljubljana, Slovenia,

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IMT 2000

Lecture 3.3.2

Economical Evaluation of 2G to 3G Migration and Tool based case study

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Economical Evaluation for 2G to 3G Content

- **Factors in the 2G to 3G evolution**
 - Key economical issues
 - Migration steps and architectures
- **Techno-Economical and Business modeling**
 - Demand, services and revenues
 - Network Resources and sharing factors
- **Tool based case study**
 - STEM tool summary
 - Case study demo and results



Economical Evaluation for 2G to 3G Key Economical Factors

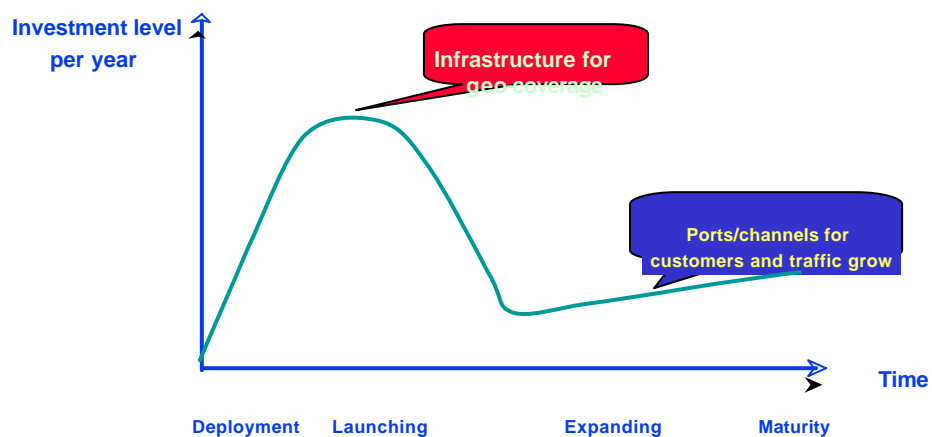
- Dominant dimensioning criteria evolving in 3 phases:
 - **Geo coverage** due to propagation and capacity at first phase
 - **Ports/users** as customers grow in a second phase
 - **Traffic** increase due to applications at latest phase
- High cost impact of network infrastructure
- Significant savings by resources and equipment sharing
- Business profitability as a function of Revenues for new services, Take-up rate and Cost of Ownership

Impact on business? → What-if analysis



Economical Evaluation for 2G to 3G Key Economical Factors

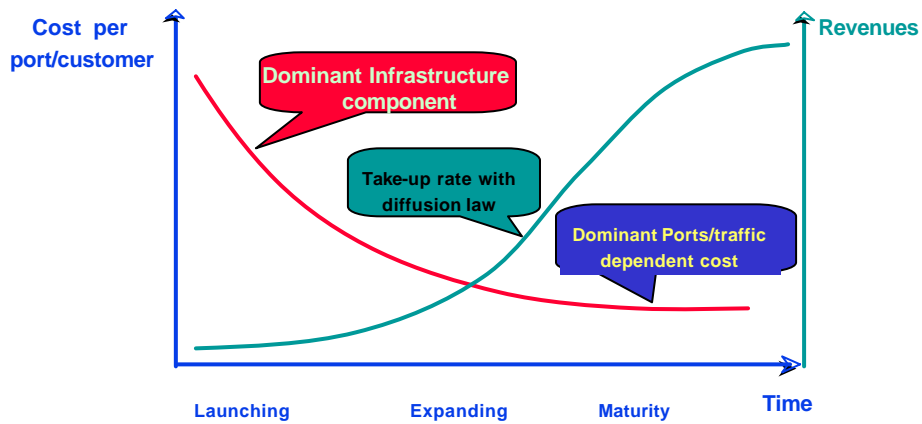
- Dimensioning and investment trough time





Economical Evaluation for 2G to 3G Key Economical Factors

- Evolution for unitary costs and revenues



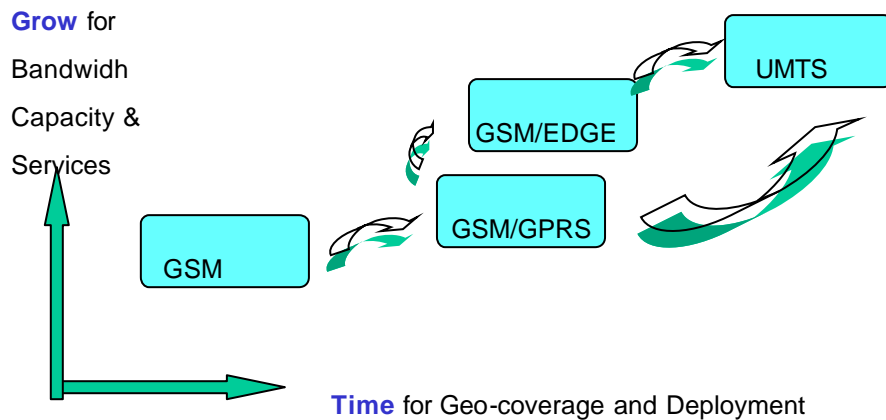
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Economical Evaluation for 2G to 3G Network Evolution steps



Migration strategy is strongly dependent on **country**
Geo-structure and has to be customized

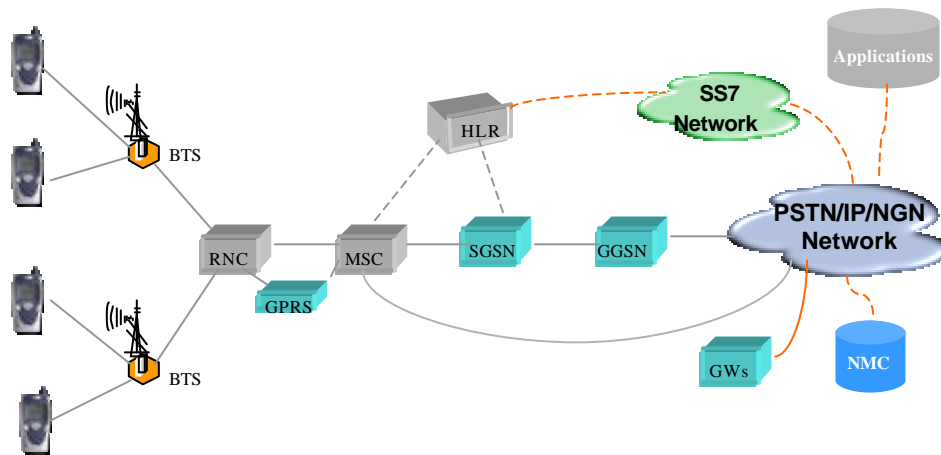
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Economical Evaluation for 2G to 3G Modeled architectures



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Economical Evaluation for 2G to 3G Considered Services

Technology	Services	Revenues
GSM	Voice	Time function
	Data/circuit 9.6Kbps	Subscription/Time function
GPRS/EDGE	Data/circuit up to 64Kbps	Subscription/Time function
	Data/packet up to 144Kbps	Subscription/Message/ Information volume function
UMTS	Voice	Time function
	Data/circuit up to 384Kbps	Subscription/Time function
	Data/packet up to 2Mbps	Subscription/Message/ Bandwidth/Information volume function

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Economical Evaluation for 2G to 3G Infrastructure Sharing Scenarios

Sharing Levels (new sites)

- A) No sharing
- B) Site and Tower
- C) Site, Tower and BST
- D) Full access segment

Leasing Levels (existing)

- Renting space/towers to others
- Leasing space to others
- Both Renting and Leasing
- None



Economical Evaluation for 2G to 3G Network Systems Modeling

- Customer Segments (business, residential) and Services (Voice and Data low/medium/high speed)
- Sites and Base Stations at Urban, Suburban, Rural and Hot spots
- Backhaul per geo-scenario
- Core Network with the specific network elements in the architecture
- Transport for voice, circuit mode data and packet mode data
- Interconnection for voice and data



Economical Evaluation for 2G to 3G STEM tool summary

Business
Planning



Objective : STEM by “Analysys”
(in Cambridge) is a business decision
making support tool that enables the
analysis of business models and cost
assignment for Telecommunication
Networks and services over a period
of time.

The Analysys STEM network investment modelling tool is a
product of Analysys Consulting Ltd, Cambridge, UK
contact: robin.bailey@analysys.com



Economical Evaluation for 2G to 3G STEM tool summary

Analysys

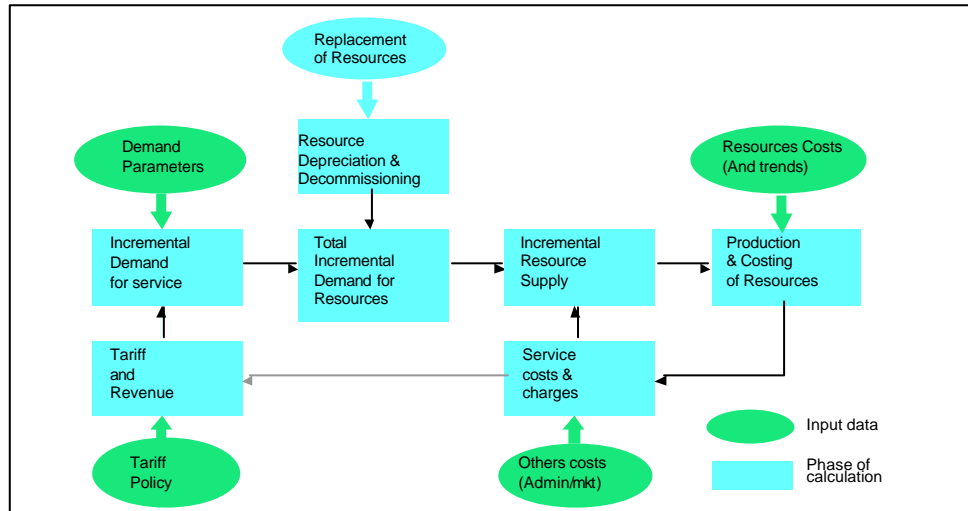
- **Capabilities**

- Service Demand Projection
- Evaluation of network resources and associated investment (CAPEX)
- Evaluation of revenues for given tariffs and installation rate
- Modeling multiple resource lifetimes
- Modeling multiple time periods
- Modeling of demand elasticity
- Interrelation between network growth and operational cost (OPEX)
- Cost assignment as a function of utilization rates
- Produces automatically the standard financial results like Cash Flow, Profit & Loss, Balance Sheet and many others
- Interfacing to other MS Windows applications like Excel, Word,....



Economical Evaluation for 2G to 3G Tool activity flow

Analysys



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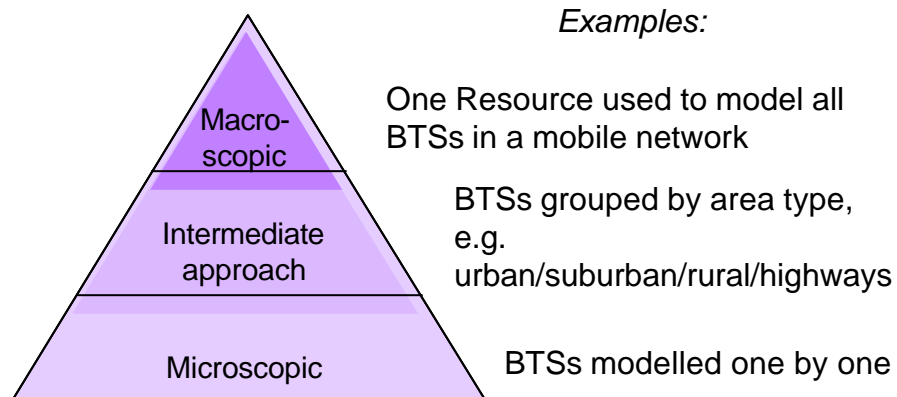
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Economical Evaluation for 2G to 3G Macroscopic and microscopic approach to modelling

Analysys



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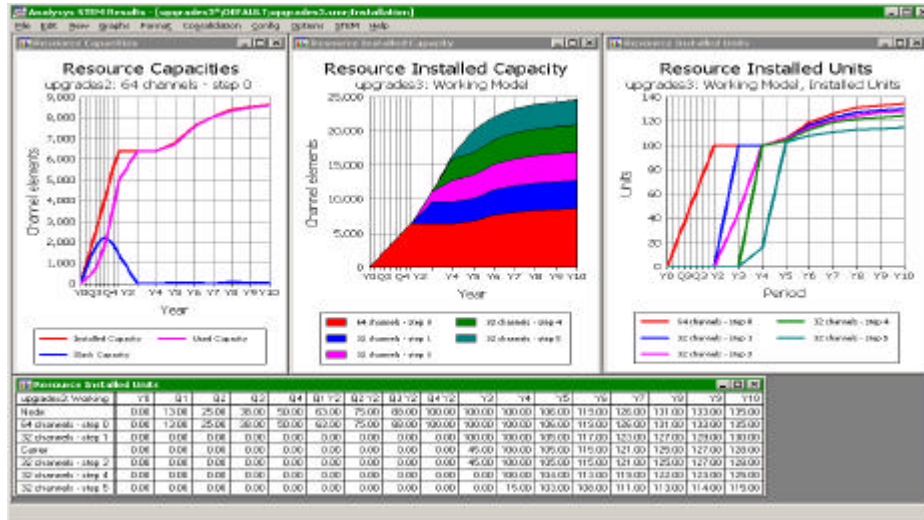
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Economical Evaluation for 2G to 3G

Analysisys

Example of tool results for business analysis



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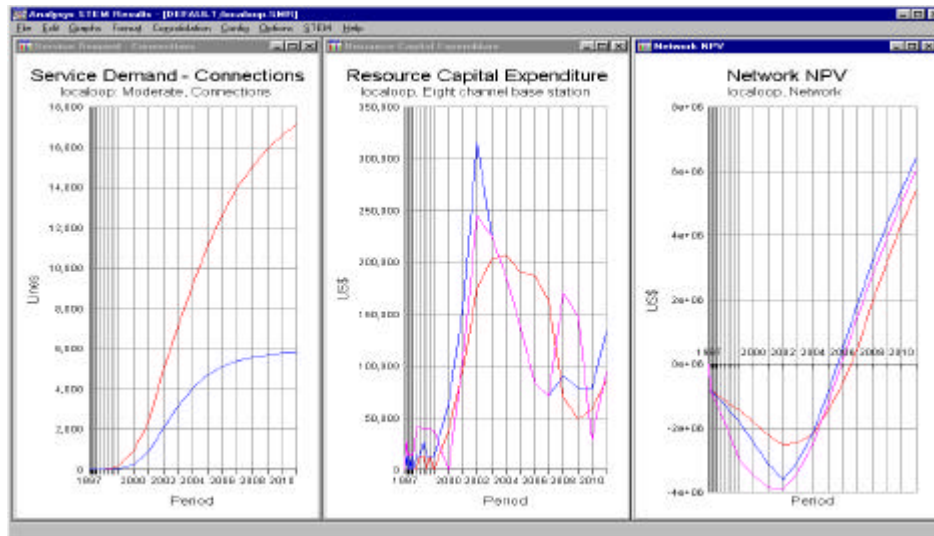
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Economical Evaluation for 2G to 3G

Analysisys

Example of tool results for business analysis



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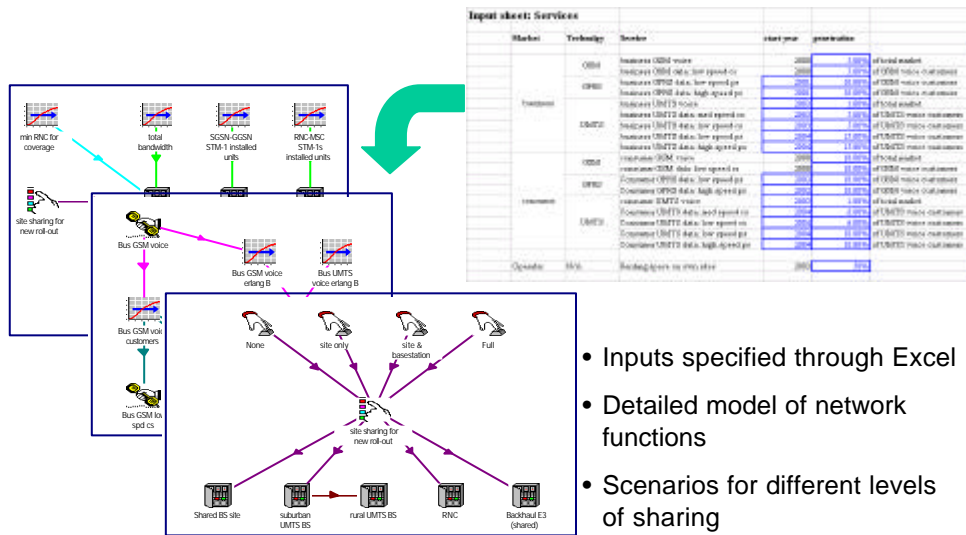
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Economical Evaluation for 2G to 3G Case study: Scenario Modeling

Analysys



- Inputs specified through Excel
- Detailed model of network functions
- Scenarios for different levels of sharing

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Economical Evaluation for 2G to 3G Case study: Resources modeling

Analysys

- **Network resources** are associated to Network elements per type
- Resources modeled by **capacity, utilization, physical lifetime and depreciation policy**
- Capital cost structure modeled with **trends over time**
- Operational costs modeled for: **Maintenance, Churn, Decommissioning, Connection, Rental, Usage and Operation costs**
- Models **keeps track and history** for all these capital and operational costs components for later reverse cost allocation

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Economical Evaluation for 2G to 3G Case study: Economical modeling

Analysys

- Tariffs for connection, rental and usage
- Modeled demand elasticity to the three tariffs
- Differentiated physical and economical lifetimes
- Cost allocation per service and customer segment as a function of consumed resources
- Models and calculates all standard economical and financial values with more than 100 pre-programmed functions including:
 - service revenues and costs, service cash-flows, market segment revenues and costs, resource incremental units, resource operating costs, network revenue and expenditure, network operating profit, network NPV, network IRR, network depreciation and amortization, network assets, network balance sheet, etc.

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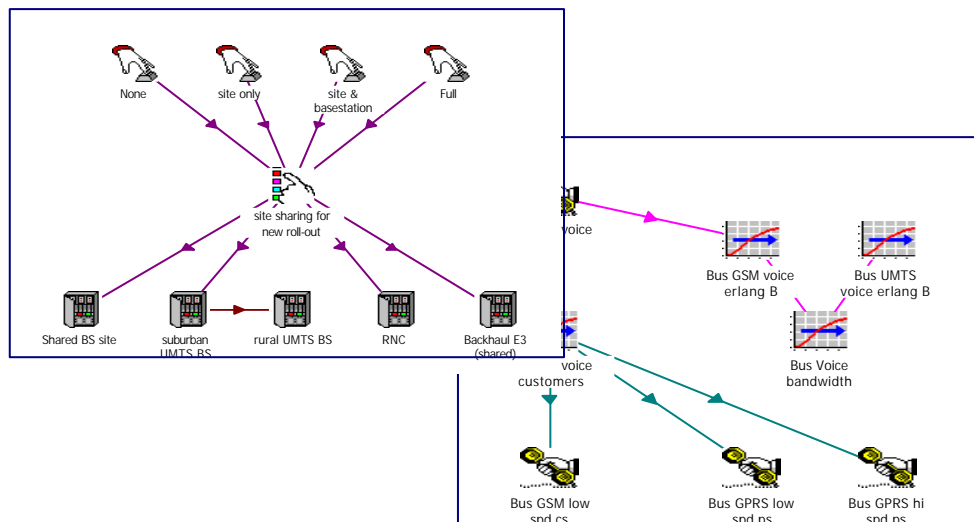
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Economical Evaluation for 2G to 3G Case study: Life-Demo and results

Analysys



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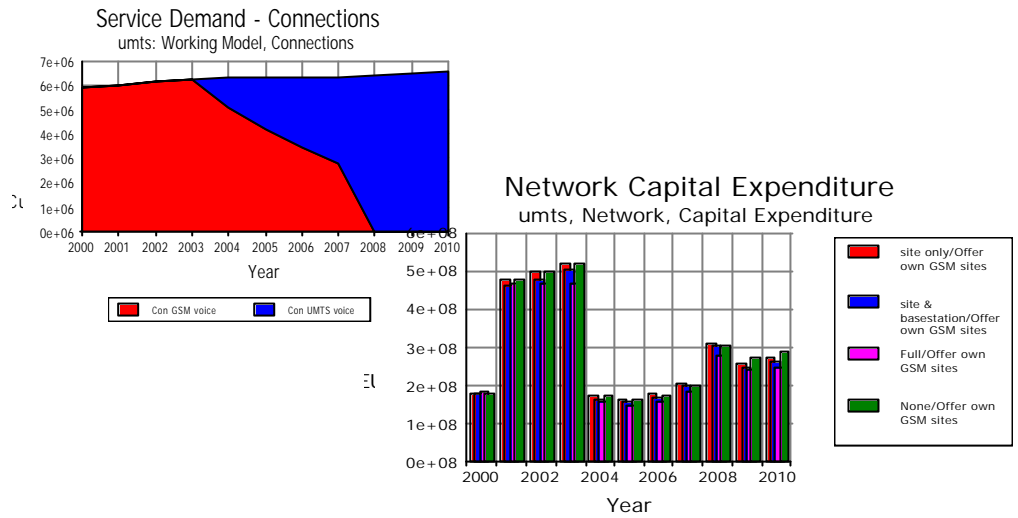
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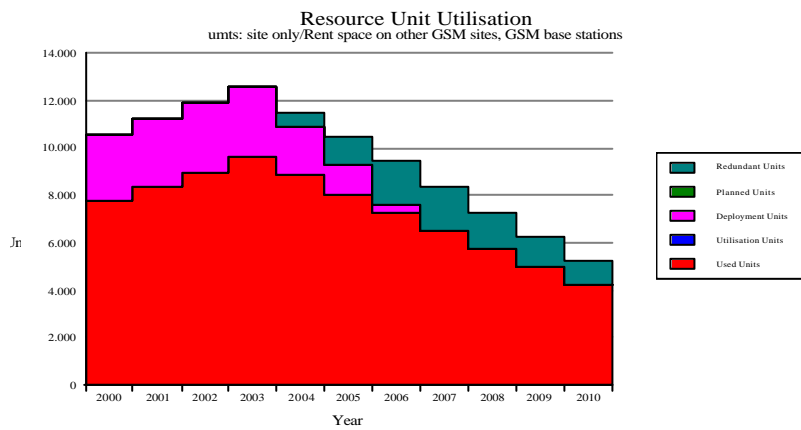
Economical Evaluation for 2G to 3G Analysis

Case study: Life-Demo and results



Economical Evaluation for 2G to 3G Analysis

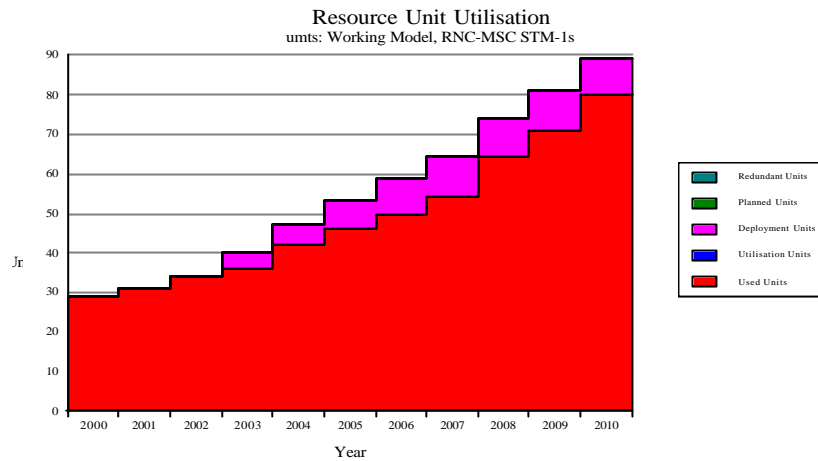
Case study: Life-Demo and results





Economical Evaluation for 2G to 3G Analysys

Case study: Life-Demo and results



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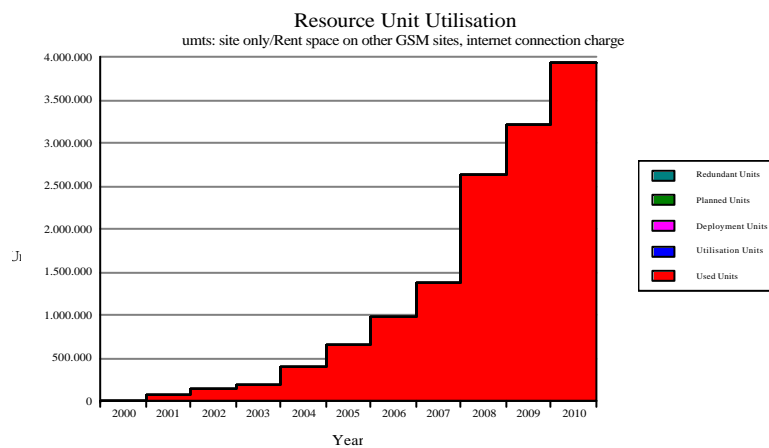
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Economical Evaluation for 2G to 3G Analysys

Case study: Life-Demo and results



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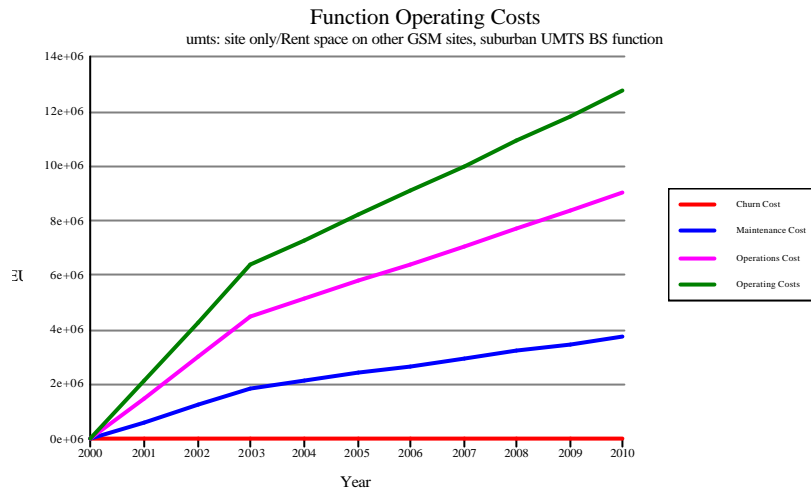
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Economical Evaluation for 2G to 3G Analysis

Case study: Life-Demo and results



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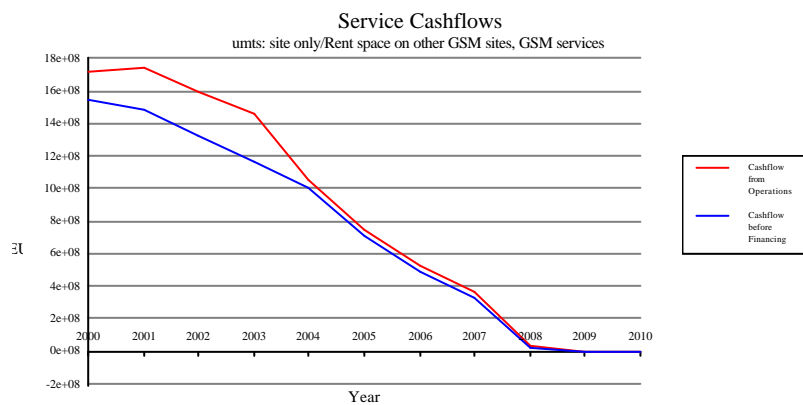
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Economical Evaluation for 2G to 3G Analysis

Case study: Life-Demo and results



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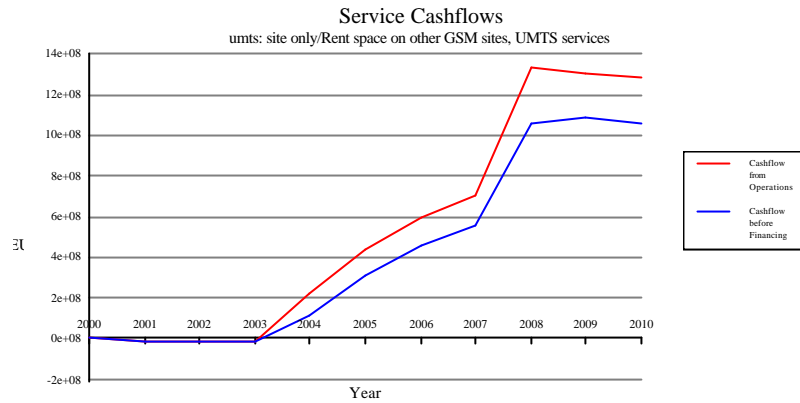
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Economical Evaluation for 2G to 3G Analysis

Case study: Life-Demo and results



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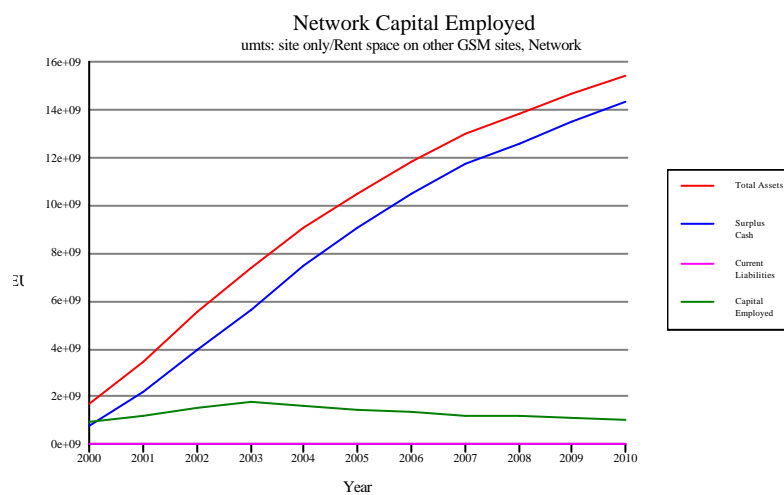
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Economical Evaluation for 2G to 3G Analysis

Case study: Life-Demo and results



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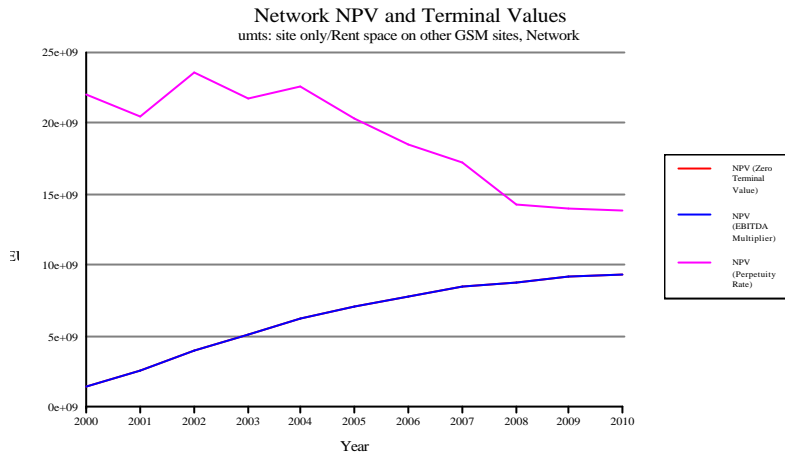
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Economical Evaluation for 2G to 3G Analysis

Case study: Life-Demo and results



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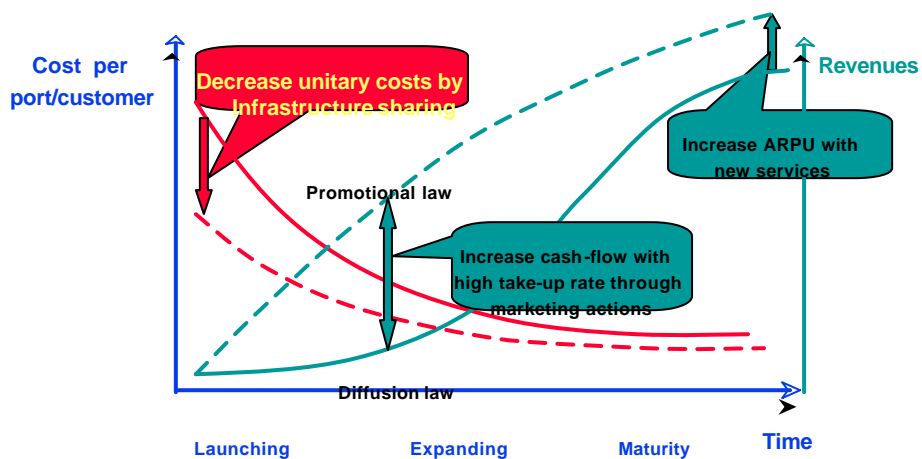
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Economical Evaluation for 2G to 3G

Actions for profitability

!! Joint Techno-economical evaluation at all phases !!



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Economical Evaluation for 2G to 3G Conclusions

**Key economical factors have to be considered with
dynamic models and validated**

**High impact of sharing factors and take-up rate in the
profitability**

**High number of country and technology scenarios to be
analyzed**

Powerful support tools needed