



VoIP and Broadband Technologies

Southern Africa Development Community
Luanda, Angola , October 2005

NGN services and VoIP

Oscar González Soto
ITU Consultant Expert
Strategic Planning and Assessment



NGN services and VoIP Content

- **NGN driving services**
 - **VoIP market and performance issues**
 - **Services motivation and market issues**
 - **Tariff structures and revenue trends**
- **Business modeling support**
 - **Modeling tools and evaluations**



NGN services and VoIP

Driving Services for Residential

- VoIP
- Content delivery
- Video on demand

NGN → Enabler for multiservice Convergence



NGN services and VoIP

VoIP

- **Context**
 - Access to plain telephone services with different levels of quality of service from a data line (e.g. DSL or Wireless) and reduced pricing
 - Computer to computer/ user to computer / user to user
- **Interested customer segments**
 - Corporate: based on VPN VoIP
 - SME / SOHO / homeworkers: based on IP Centrex
 - Residential: Secondary line
 - Residential: Primary line



NGN services and VoIP

VoIP

- **Motivation**

- End-user

- Access to different tariff schemes and cost saving
 - Enabler for IP services (CTI) => e.g. IP Centrex, Browse and Talk

- Operator

- Add value to BB delivery for emerging operators
 - Defensive position for incumbent operators

- Operator concerns

- Cannibalization (incumbent)
 - “Free services”
 - Interconnection
 - QoS and regulatory obligations (e.g. for primary line: power feeding, emergency service, localization,...)
 - End to end quality supervision



NGN services and VoIP : VoIP market and quality

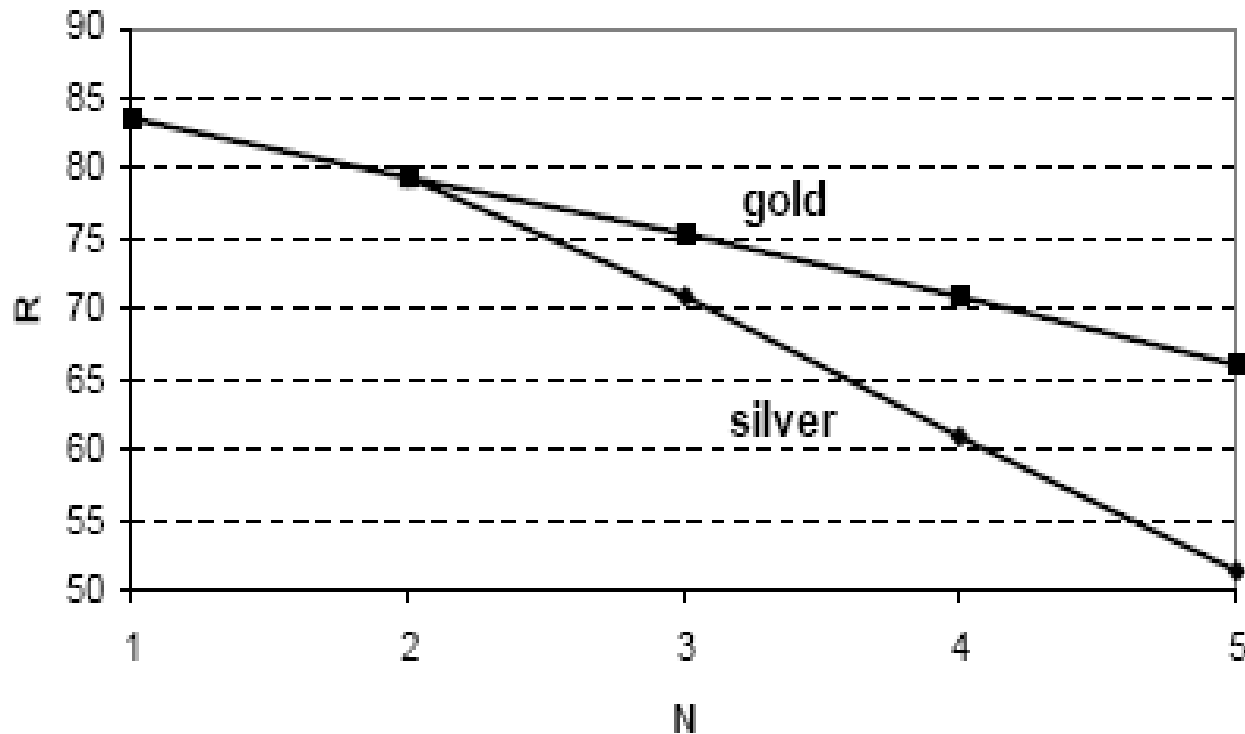
- Strong influence of Quality of Service on the acceptance level by high end and medium customer segments
 - Multiple compression degrees
 - Acceptable qualities in compressions up to 4:1
(packet overhead approx. 1.6)
 - Packet delay and jitter very critical
 - VoIP quality under analysis across multiple heterogeneous networks with different compression levels and transfer modes. Important influence by the number of crossed domains and not extensive agreements
- End to end quality supervision through different networks pending and needing SLA



NGN services and VoIP

VoIP market and quality

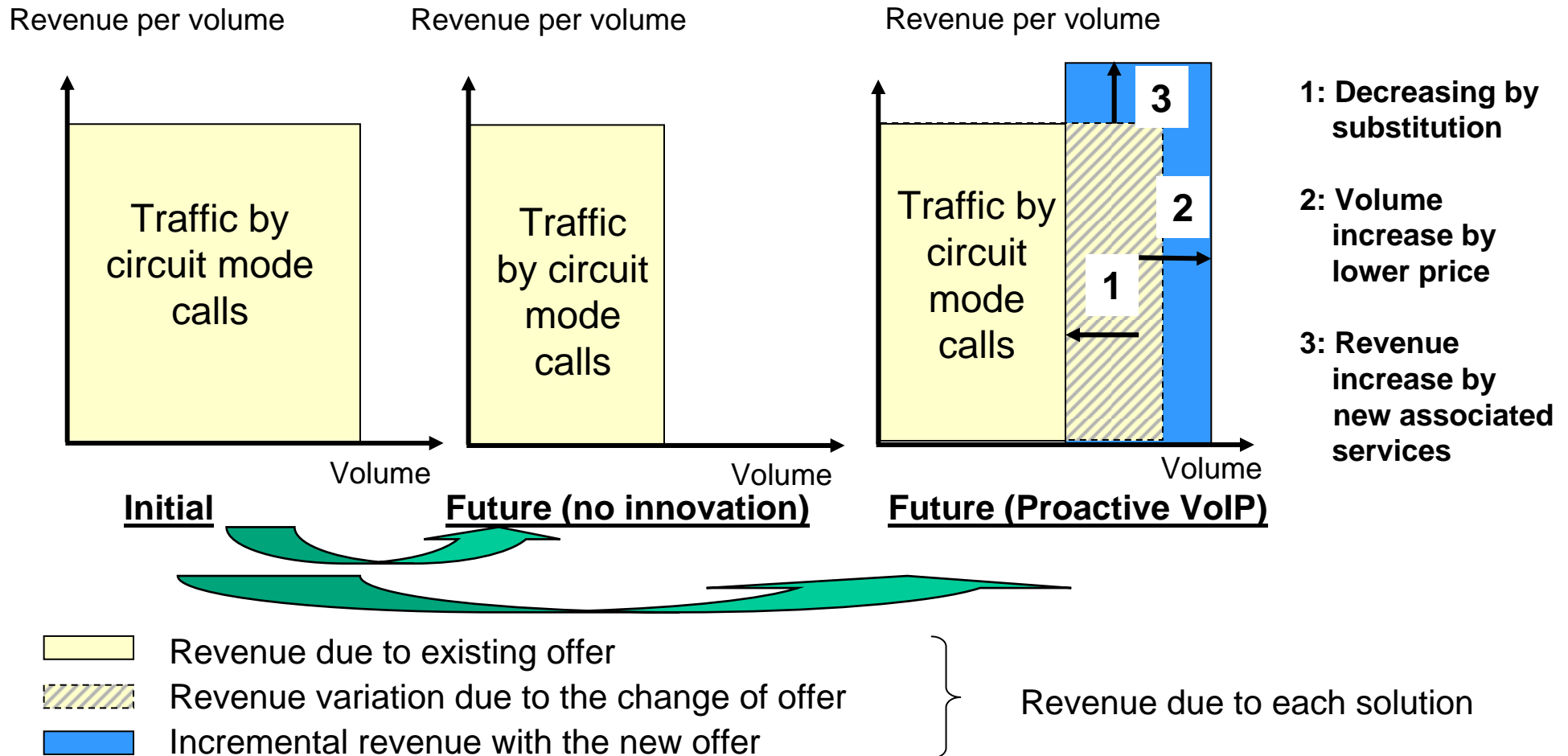
Perceived Quality of Service as a function of the number of crossed domains for the G.711+PLC coding with ppp = .01 and gold /silver SLA
(19th International Teletraffic Congress September 2005, Beijing)





NGN services and VoIP

Impact on revenues as a function of the established operator strategy





NGN services and VoIP Content Delivery

- **Context**

- Access to paid content with different quality levels
 - Music: (> 25% of total market) → Exploit Win-Win legal solutions
 - Games: (> 50 million users) → Need for BB and quick reaction time
 - Gambling: → Need for BB and short delay

- **Motivation**

- End-users
 - Trusted relation with operators
 - Integrated contract
- Operators
 - Capitalize on their access to users with increase of revenues through marginal investments
 - Get share of e-commerce and increase business chain
- Content providers
 - Ease of use for distribution channel;
 - Operators as trusted party



NGN services and VoIP

Video on demand

- **Context**
 - Access to movies on a per-demand basis (from DSL line or Wireless) (VoD, NVOD, iTV)
- **Motivation**
 - End-users
 - Accessibility/Control / personalization of video content
 - Operators
 - Capture a part of entertainment value chain
 - Uplifts DSL demand



NGN services and VoIP

Video on Demand drivers and issues

- **Revenue Drivers**

- Share of revenue depending on value chain
- Possible payment intermediation

- **Market**

- Fundamental service for the triple play operation
- High interest and fastest growing market
- Candidate for convergence in broadband
- Willingness to pay per movie, per subscription and per time unit



NGN services and VoIP Driving Services for Business

- VPN
- IP Centrex
- Multimedia Conferencing
- Unified messaging
- ASP

NGN → Enabler for Multiservice Convergence



NGN services and VoIP

Virtual Private Network - VPN

- **Context**
 - Set of communication capabilities provided over a private network using a common telecom infrastructure shared by several companies
- **Motivation**
 - More efficient and customized operation
 - Homogeneous solutions for all company
 - Private numbering plan
 - Services integration
 - Security management



NGN services and VoIP

Virtual Private Network - VPN

- **Market issues**
 - Cost benefits: Balance between tariff levels for competing services (PSTN & leased line services)
 - CAPEX versus OPEX expenses over a period of time
 - Need for skilled telecom staff
 - Provision of VPN features
 - Billing and Management
 - Service Delivery Process Planning



NGN services and VoIP IP Centrex

- **Context**

- Provides PBX-like voice / CTI services to enterprises
- Main targets: SOHO/SME and teleworkers

- **Motivation to users**

- No CAPEX investment from non-core business (telecom)
- No operation staff to be trained and employed
- Deployment follows company's pace (growth or reduction)
- Easier cost management (against move, obsolescence, traffic patterns)
- Multi-site converged service (e.g. for homeworkers)
- Willingness to pay: 8-15 Euros per month



NGN services and VoIP IP Centrex

- **Motivation to Operators**

- Offer voice services on top of (deployed) data-VPN,
- Move up the value chain providing core-business (voice) services
- Reduce churn to in-house solutions and competitors
- Possible building block for an SME bundle
- Associate to Voice and Data VPN for full Virtual Company solution (Phones, PBX, Mobiles)



NGN services and VoIP Multimedia Conferencing

- **Context**

- Multi-party room-based or PC-based multiservice conference (with document sharing, Instant Messaging facilities,...)
- Non-IP users allowed in voice
- Room-based quality with "NetMeeting - like" ease of use and services

- **Market Issues**

- Threat of "free" web conference?
- Cannibalization of ISDN visioconf (leased lines; BRA)?
- Willingness to pay: 0.5 to 0.7 \$ /min per user



NGN services and VoIP Multimedia Conferencing

- **Motivation**

- For End User

- Teleconf. shares time and costs and improves efficiency.
 - Intermediate step between phone call and face to face visit
 - Lower cost / better user friendliness than ISDN room-based visioconf.

- For Operator

- Incremental value on data/voice
 - Brick for package to business segment or vertical service (distance learning; home working...)
 - Lower cost to operate Visioconf. helpdesk



NGN services and VoIP Unified Messaging

- **Context**

Retrieve from anywhere any message from any device: e-mail, voice mail, SMS, MMS, Fax

- **Motivation**

- To End-User

- Main target: Businesses, Teleworkers
- Productivity gain, ease of use, time-critical information management

- To Operator

- Move up value chain in Business segment (competes with enterprise-related EVS/Messaging)
- Leverage Mobile services



NGN services and VoIP Unified Messaging

- **Market Issues**

- Service partly offered by advanced IP-PBX systems
- Benchmark with Mobile penetration
- Check competitive positioning vs. Mobile operator
- Interest to be a component for a bundle in the business segment
- Willingness to pay around 1 to 3 \$/employee/month



NGN services and VoIP ASP

- **Context**

- ASPs provide a contractual service offering to deploy, host, and manage access to an application residing in a facility other than the customer's site.

- **Motivation**

- To en user

- Solution to lack of internal IT resources
 - Potential cost savings and better cost control
 - Easier and faster software implementation
 - Gives access to otherwise unaffordable applications (SMEs)
 - Access to latest technology and superior connectivity

- To operator

- Enlarge value chain business to the applications and
 - Empower attractive bundling for business customers
 - Increases participation in e-business



NGN services and VoIP ASP

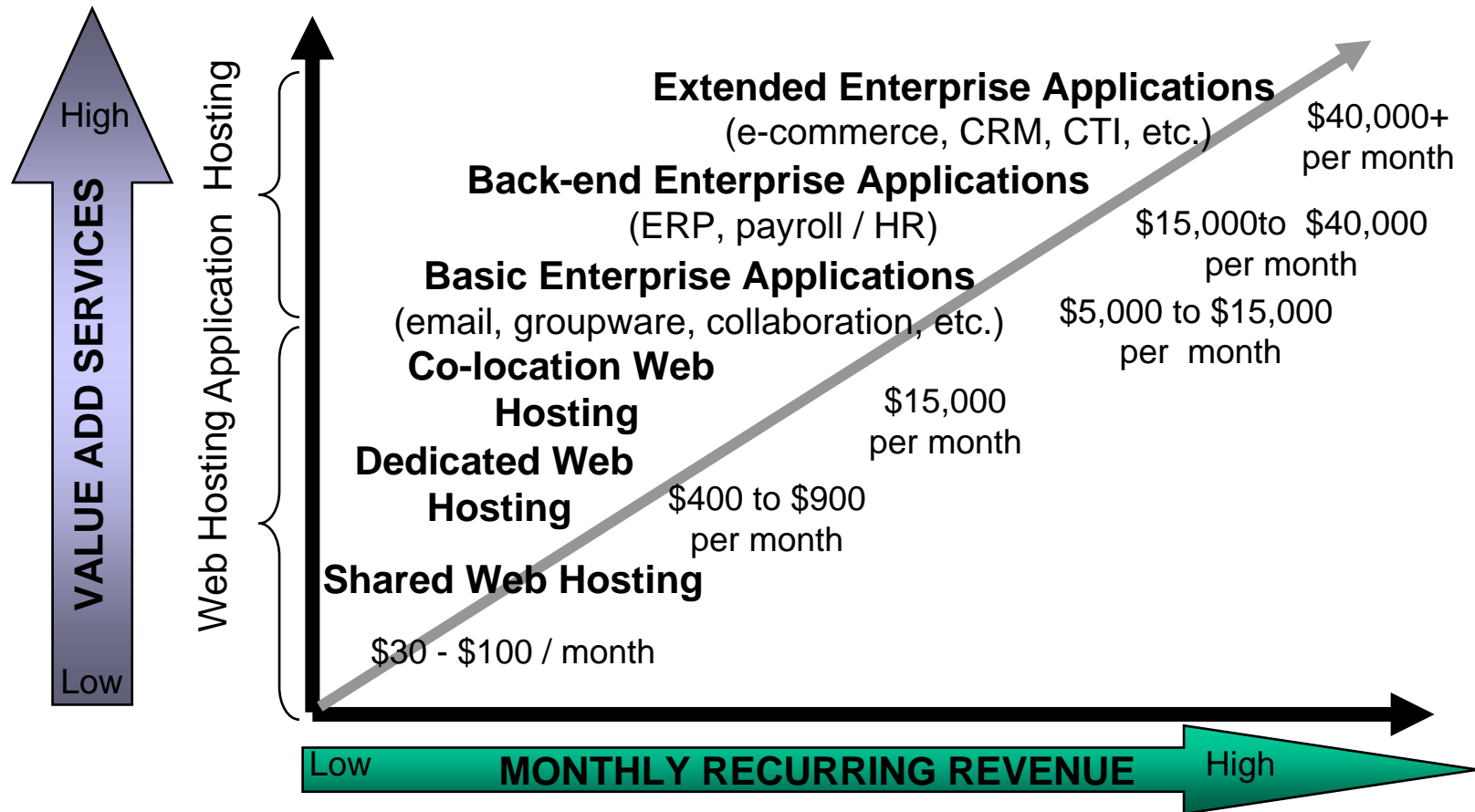
- **Market Issues**

- Customer acceptance culture due to external control
- Availability of network performance, reliability and robustness
- Enhancement of applications towards web-enabling capabilities
- Some Services partly offered by advanced IP-PBX systems



NGN services and VoIP ASP

Main applications and projected value/revenue added



Source: Cherry Tree & Co



NGN services and VoIP

Cost drivers in NGN

- Volume of customers per category
- Bandwidth demand per origin/destination
- Packet processing rates for control related functions
- Variety of applications/services and related platforms
- Content storage and location within the network
- Leasing of physical or communication resources

Backward evaluation of contribution to services cost is essential to calculate cost dependent tariffs, cash-flows and IRR



NGN services and VoIP

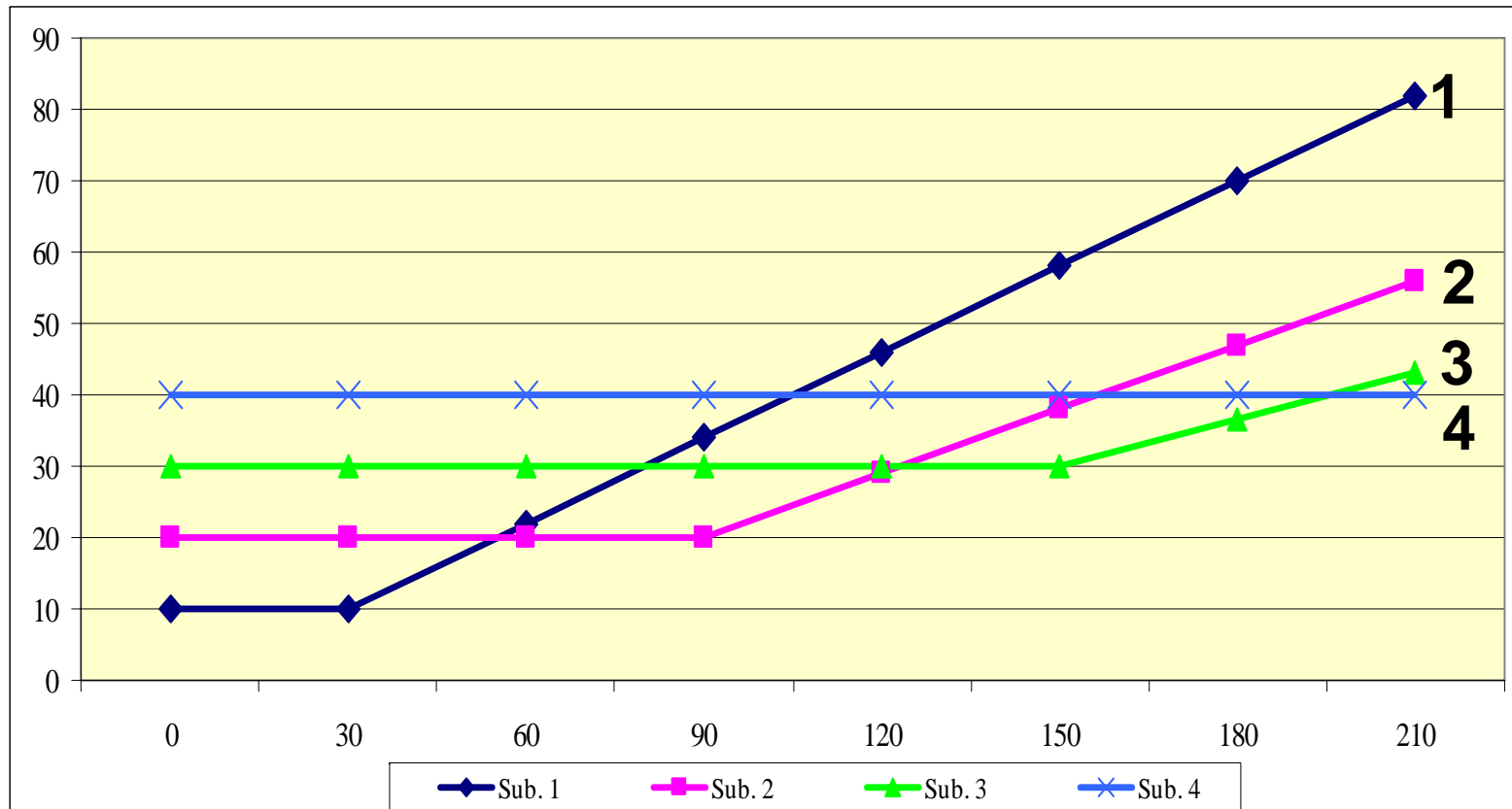
Impact of service mix on business

- Due to the cost and revenue drivers for different services , the mix of services on an NGN has a fundamental influence on the project profitability.
- Costs are distributed and assigned among services as follows:
 - Common cost to all network
 - Common costs to the BB and multiservice platforms
 - Specific costs for each service introduction and operation
- Higher number of NGN services (and not only VoIP) will increase overall profitability and each service profitability by the common cost sharing among them.



NGN services and VoIP

Combined fixed and traffic dependent rates

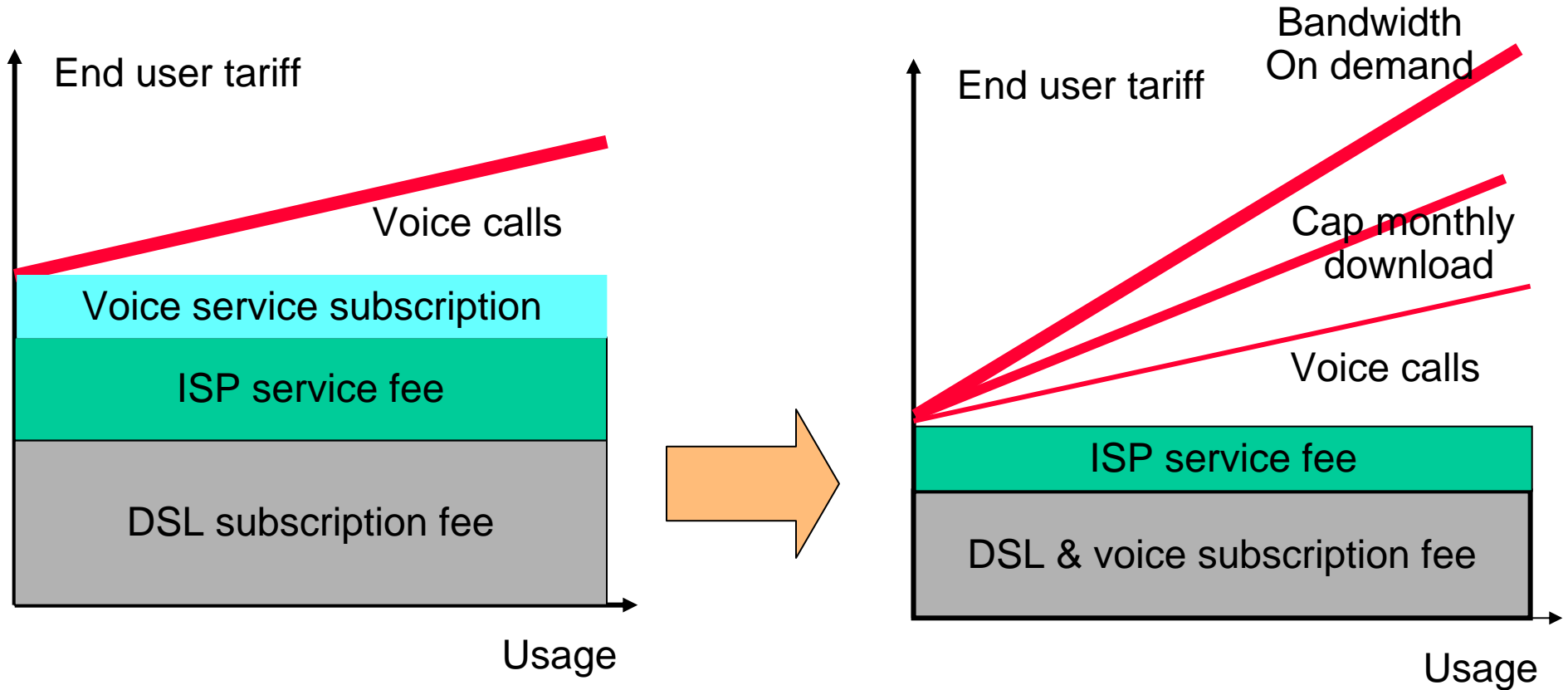


Combined fixed and variable tariffs has best flexibility for customers, operators and business



NGN services and VoIP

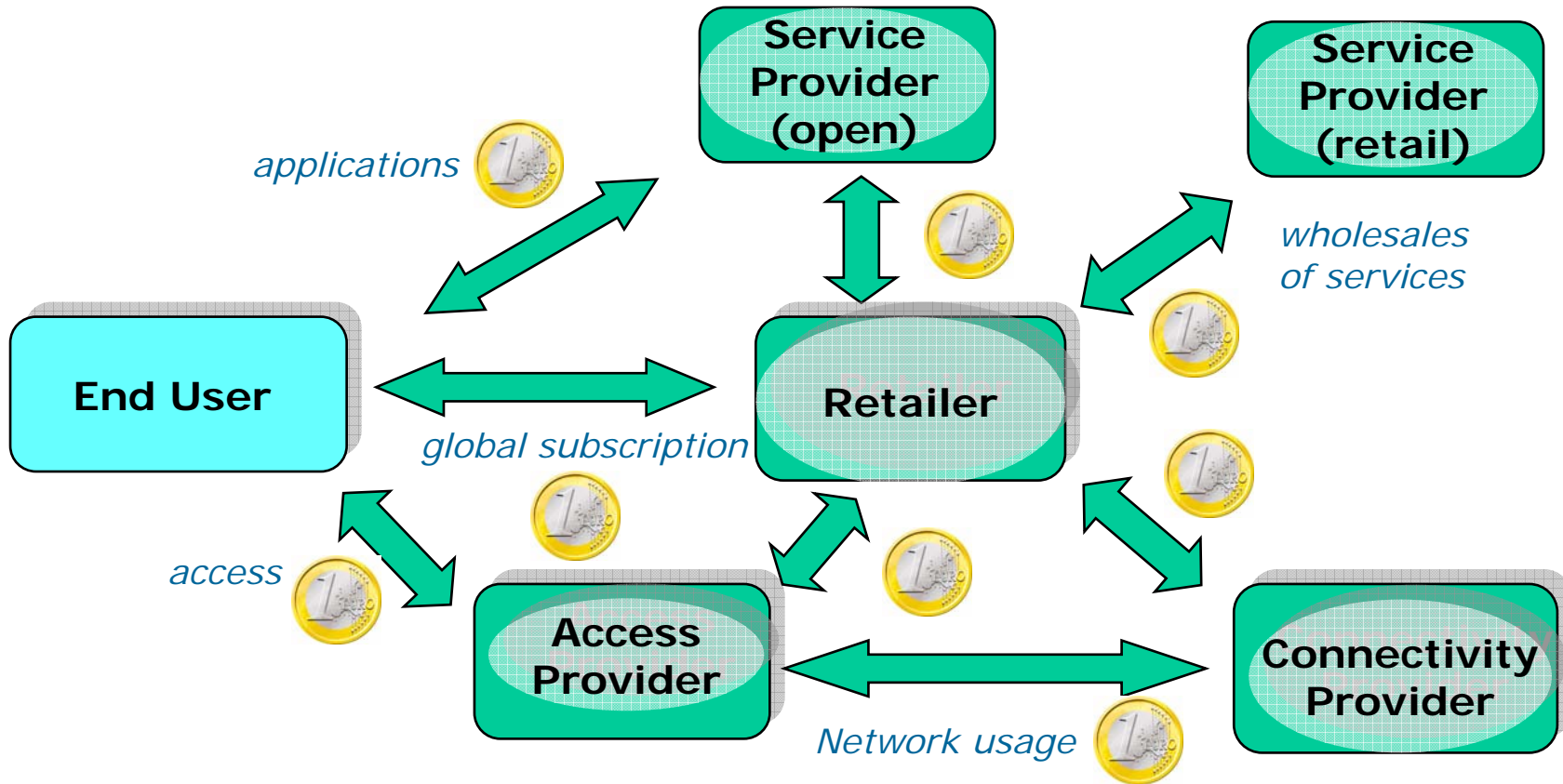
Illustration for tariffs strategy in DSL





NGN services and VoIP

Revenue chain with multiple business players



Increase of players for multiservice business specialization



NGN services and VoIP Content

- **NGN driving services**
 - **VoIP market and performance issues**
 - **Services motivation and market issues**
 - **Tariff structures and revenue trends**
- **Business modeling support**
 - **Modeling tools and evaluations**



NGN services and VoIP

Support tools: Business

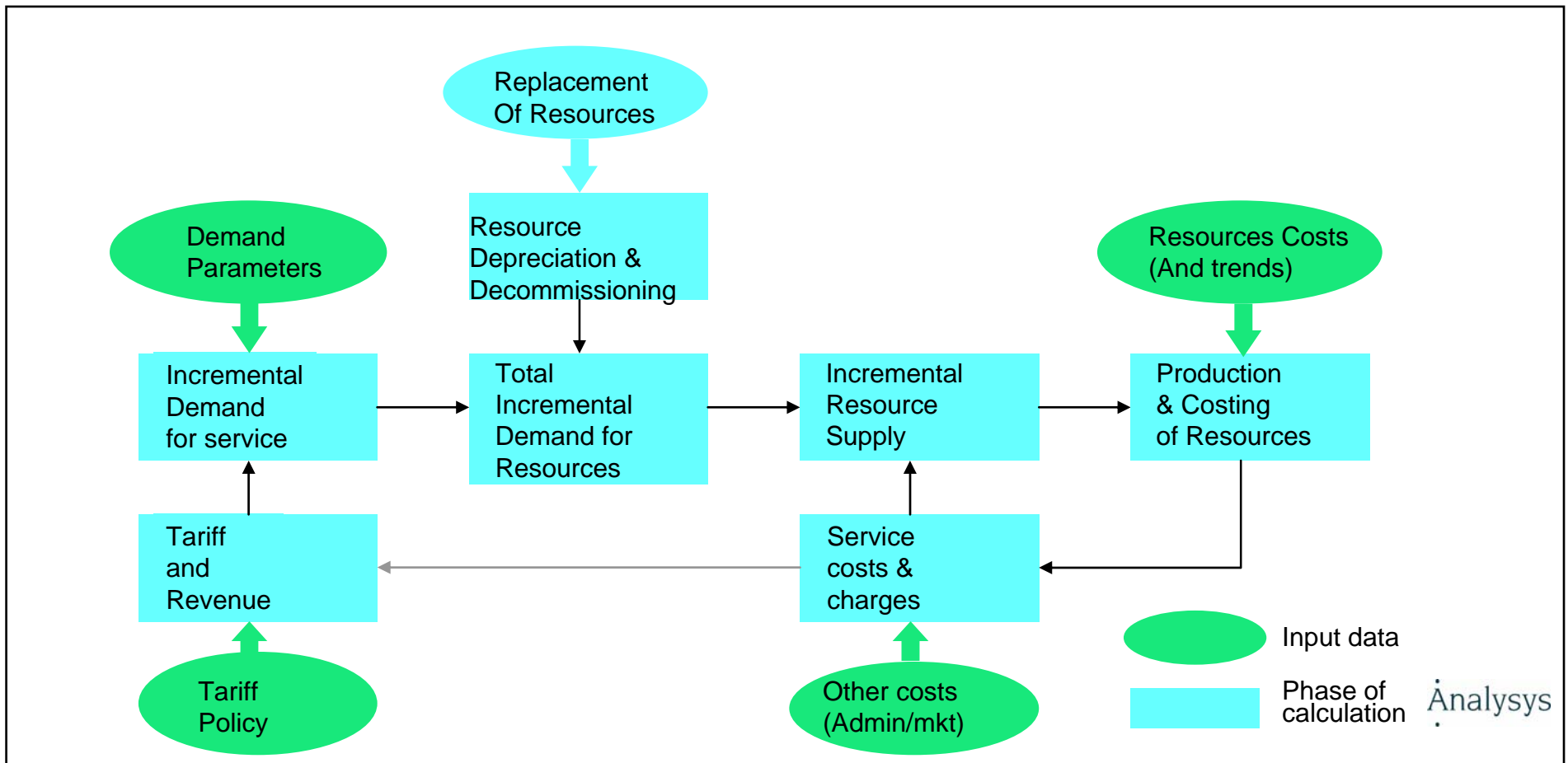
- **Required functionality for Business tools**
 - Service Demand Projection
 - Dynamic modeling for technology **substitution and migration rates**
 - Dimensioning **multiple flows** (circuit and packet modes)
 - Evaluation of network resources and associated investment (CAPEX)
 - Evaluation of revenues for given tariffs and installation rate
 - Modeling **multiple resource lifetimes**
 - Modeling of demand elasticity to tariffs
 - Interrelation between network growth and operational cost (OPEX)
 - **Cost assignment** as a function of utilization rates
 - Generation of standard financial results like Cash Flow, Profit & Loss, Balance Sheet, NPV, IRR, etc.



NGN services and VoIP

Support tools: Business

Activity Flow in STEM to evaluate migration alternatives:

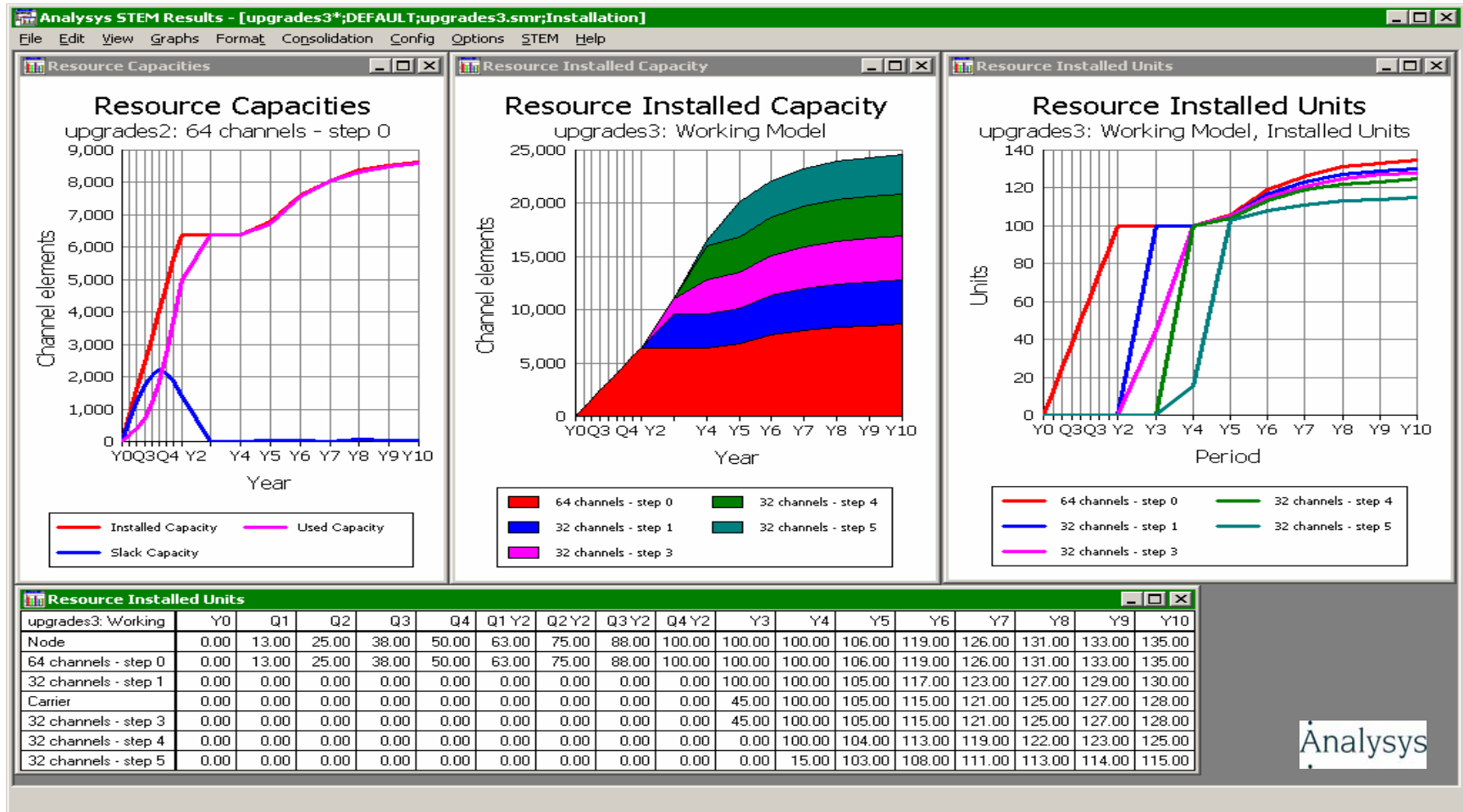




NGN services and VoIP

Support tools: Business

Type of STEM tool results

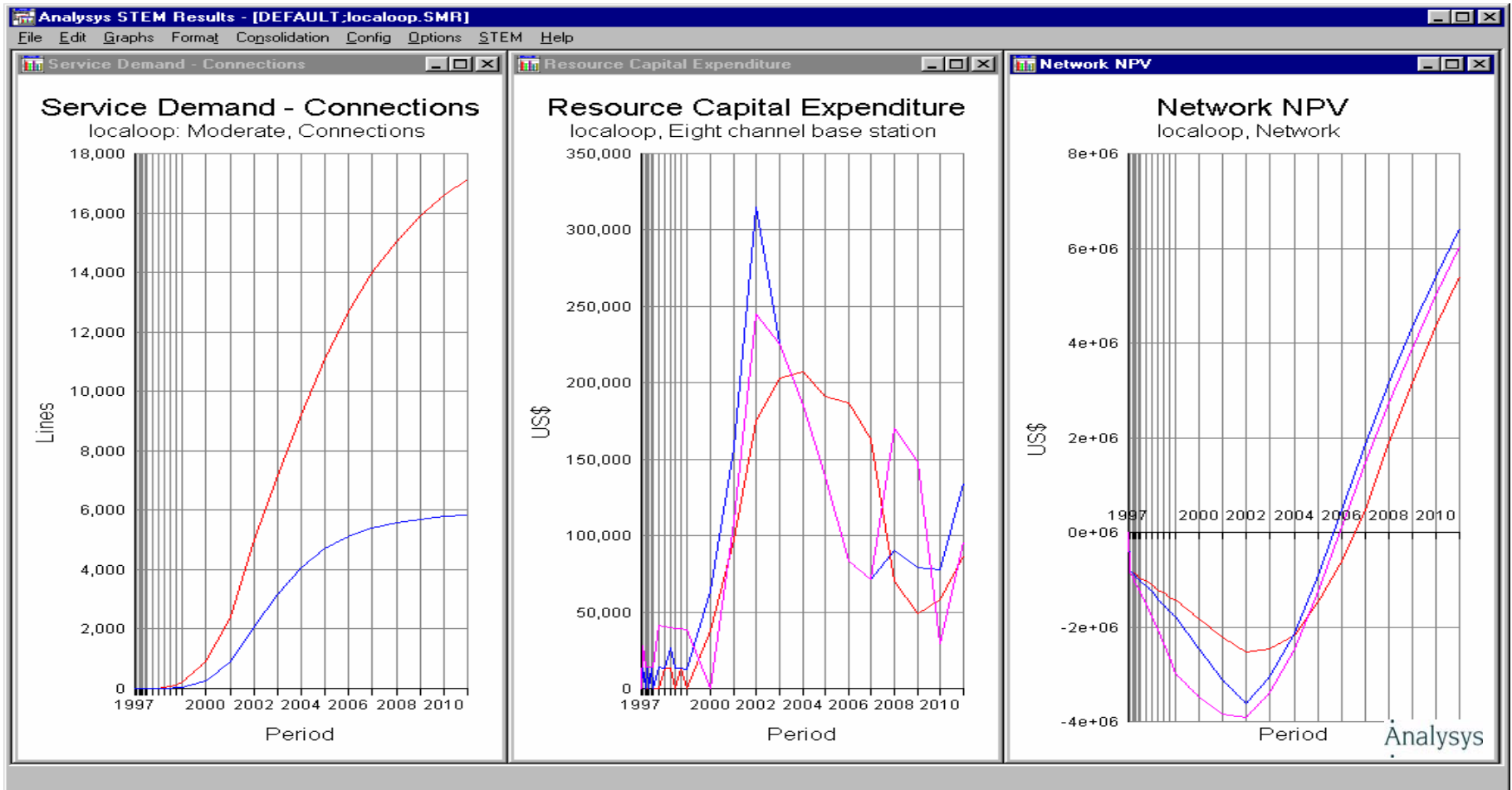




NGN services and VoIP

Support tools: Business

Type of STEM tool results

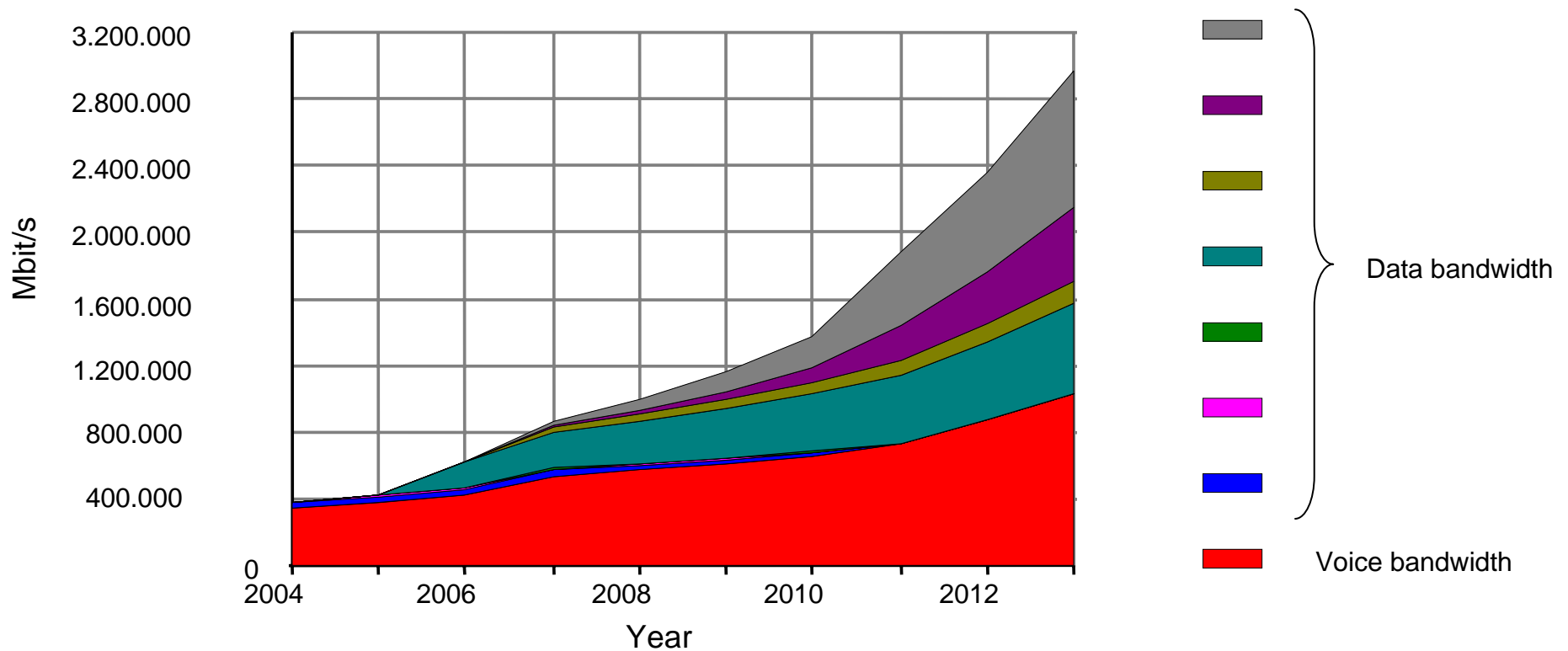




NGN services and VoIP Support tools: Business

Example of multi-service bandwidth evolution in 3G

Bandwidth per service class of business customers



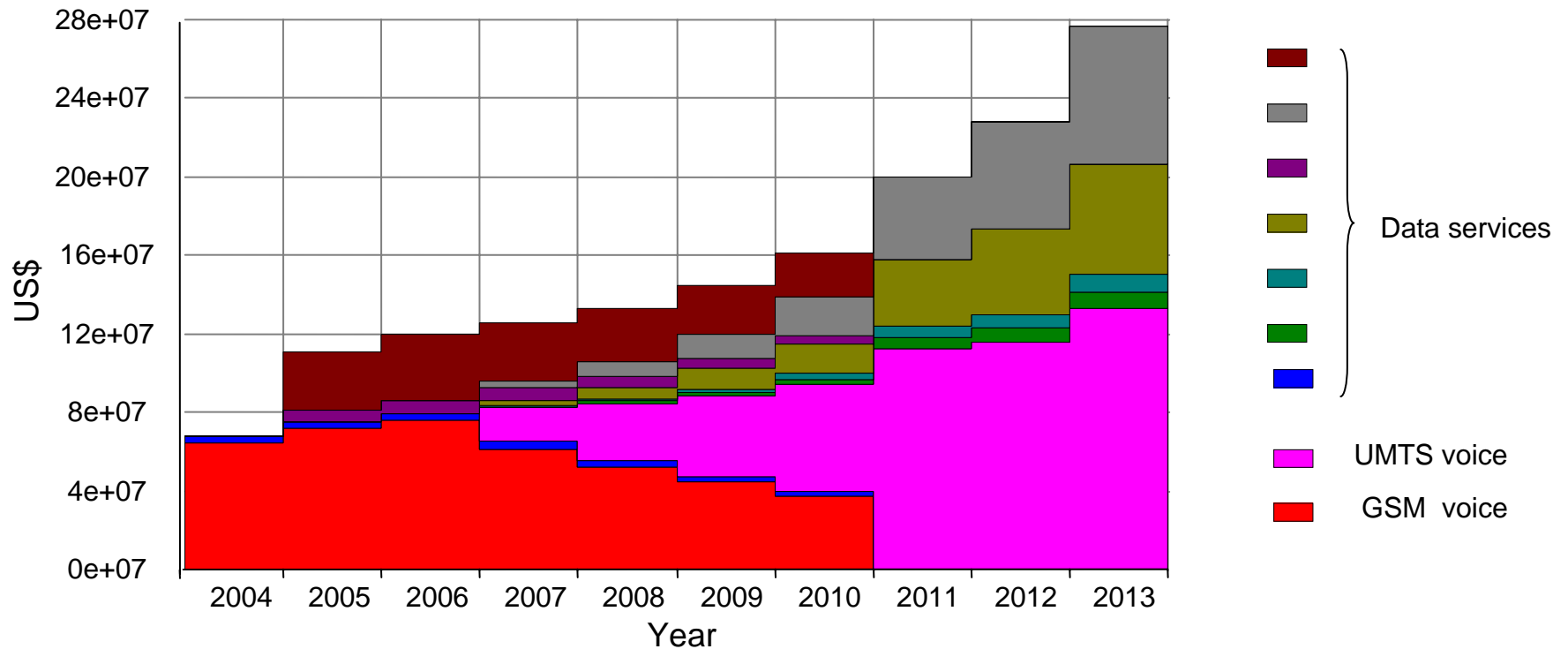


NGN services and VoIP

Support tools: Business

Example of multi-service revenue evolution in 3G

Revenue per service type for consumer customers





NGN services and VoIP

Summary of Key Factors

- **High potential** for new NGN services drives the interest in the network modernization.
- Analyze **new business chain** from content to delivery
- Provide attention to **Quality of Service on VoIP** and related agreements with other operators
- Design financial performance with best business practices and **services bundles**.