ITU / BDT

Regional Seminar on Costs and Tariffs for TAL Group Member Countries

Rio de Janeiro, Brazil May 2006

NGN Services, Business planning and Regulation

Oscar González Soto
ITU Consultant Expert
Strategic Planning and Assessment

NGN Services, Business planning and Regulation Content

- NGN driving services
  - Services motivation and market issues
- Business planning and Convergence
  - Cost factors and economies of scale
  - Convergence
- Regulation issues and principles in NGN
  - Requirements and convergence
  - Trends for players

NGN Services, Business planning and Regulation
Driving Services for Residential

- **VoIP**
- **Content delivery**
- **Video on demand**

NGN → Enabler for multiservice Convergence

NGN Services, Business planning and Regulation 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 / home workers: based on IP Centrex
  - Residential: Secondary line
  - Residential: Primary line

NGN Services, Business planning and Regulation 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

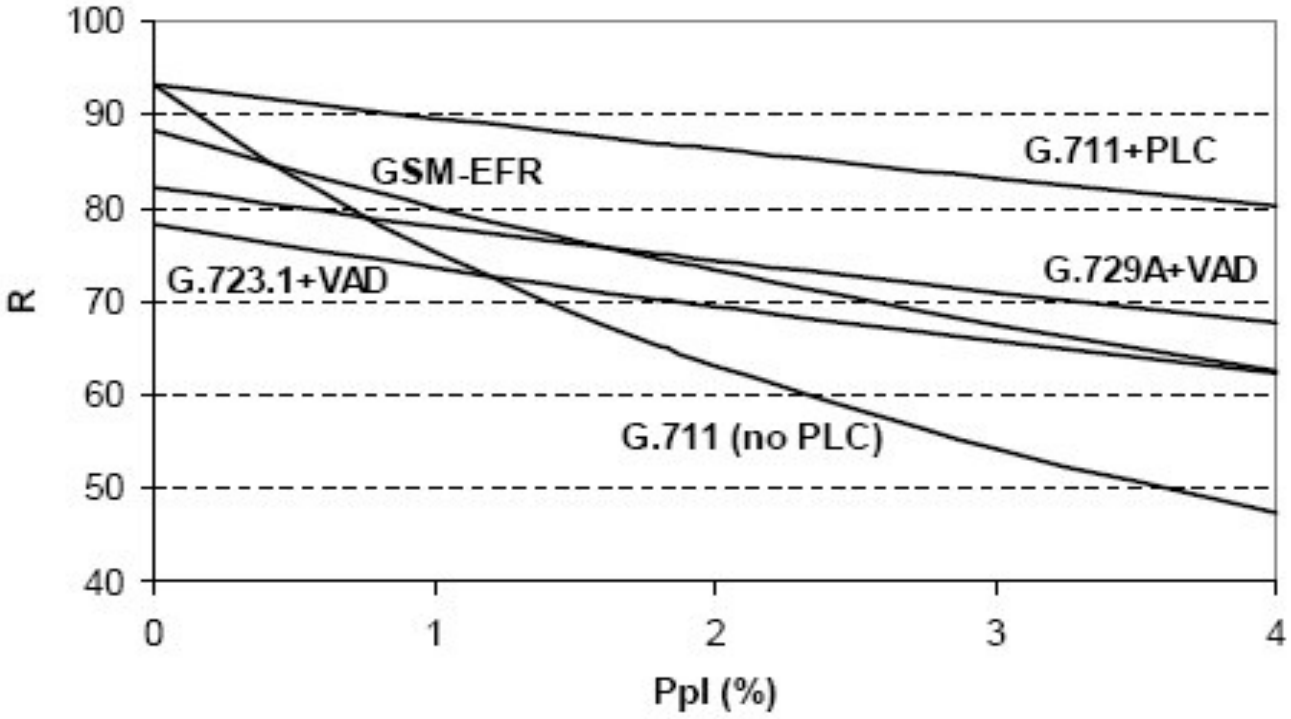
NGN Services, Business planning and Regulation
VoIP market and quality

- Strong influence of Quality of Service on the acceptance level by high end and medium customer segments
  - Multiple compression degrees
  - Acceptable qualities in compressions ip to 4:1

    (packet overhead aprox. 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

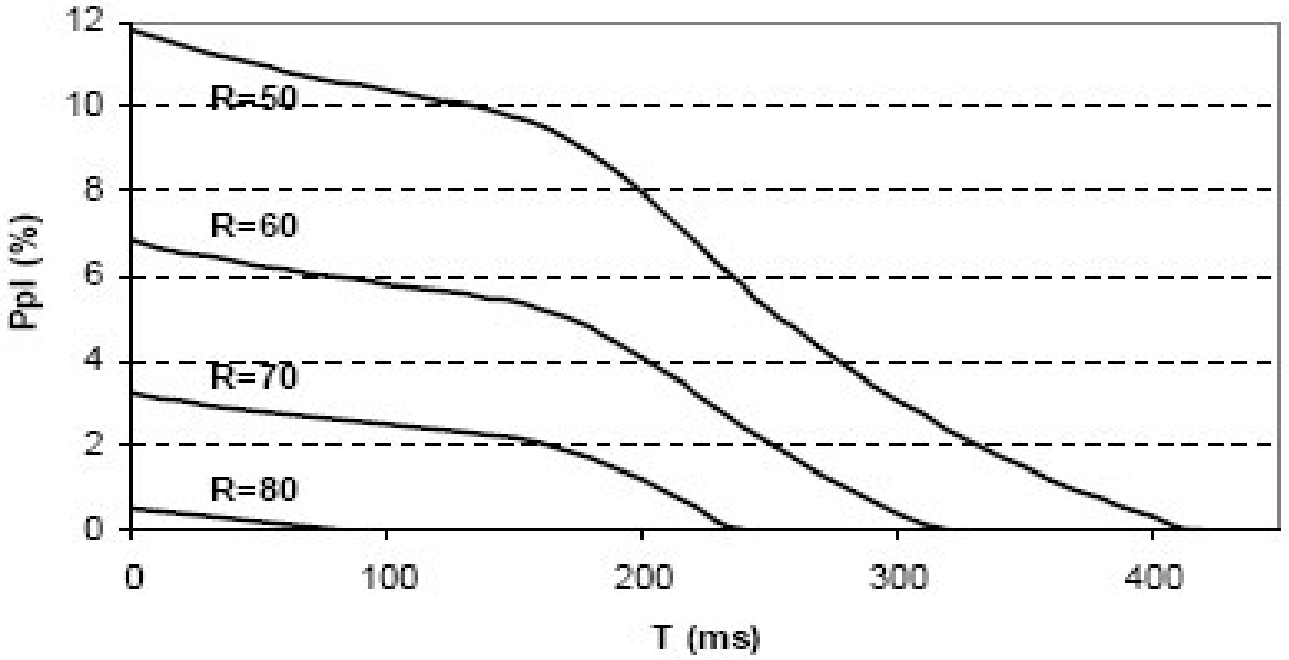
NGN Services, Business planning and Regulation Performance Issues: Application requirements

Perceived Quality of Service for different codecs as a function of packet loss probability (19th International Teletraffic Congress September 2005, Beijing)



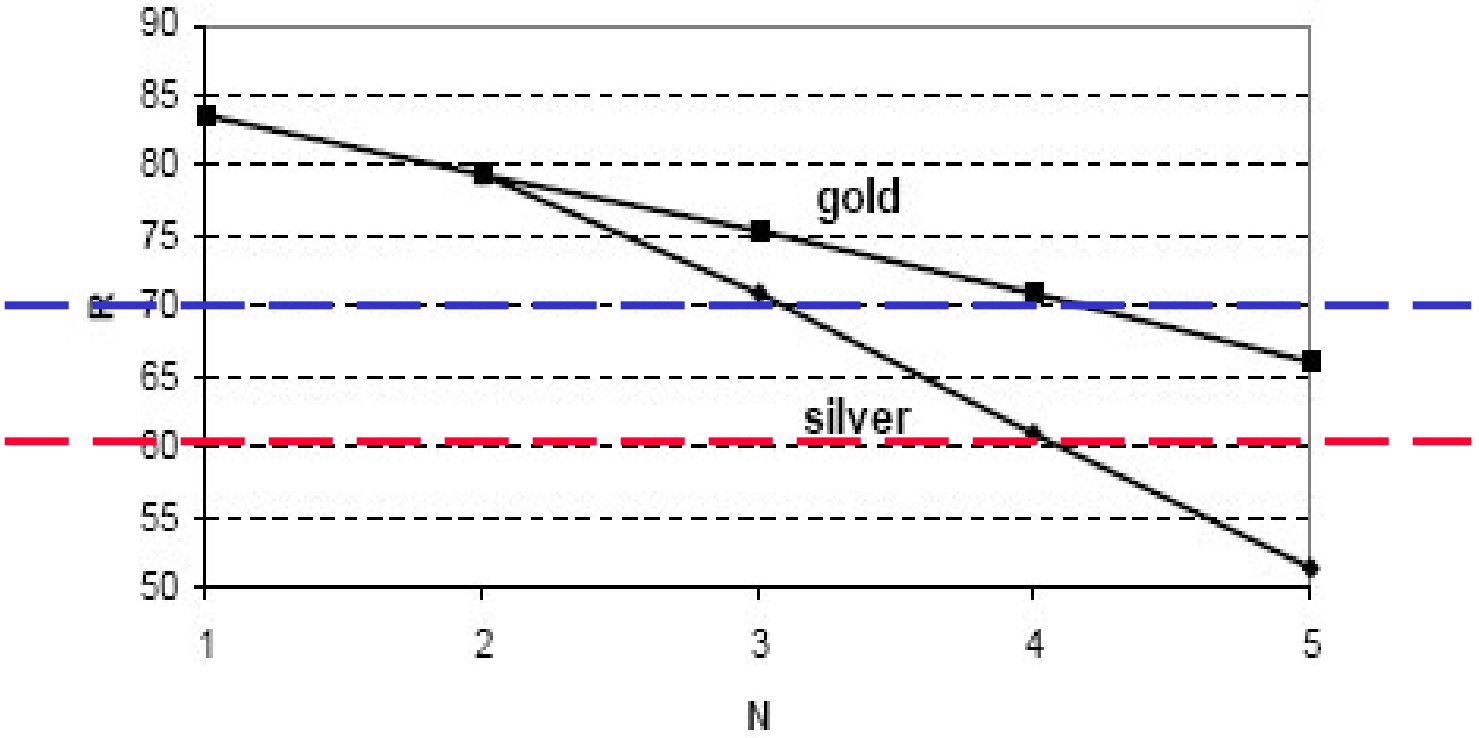
NGN Services, Business planning and Regulation Performance Issues: Application requirements

Iso-quality curves as a function of packet delay and packet loss probability for G.729 (19th International Teletraffic Congress September 2005, Beijing)

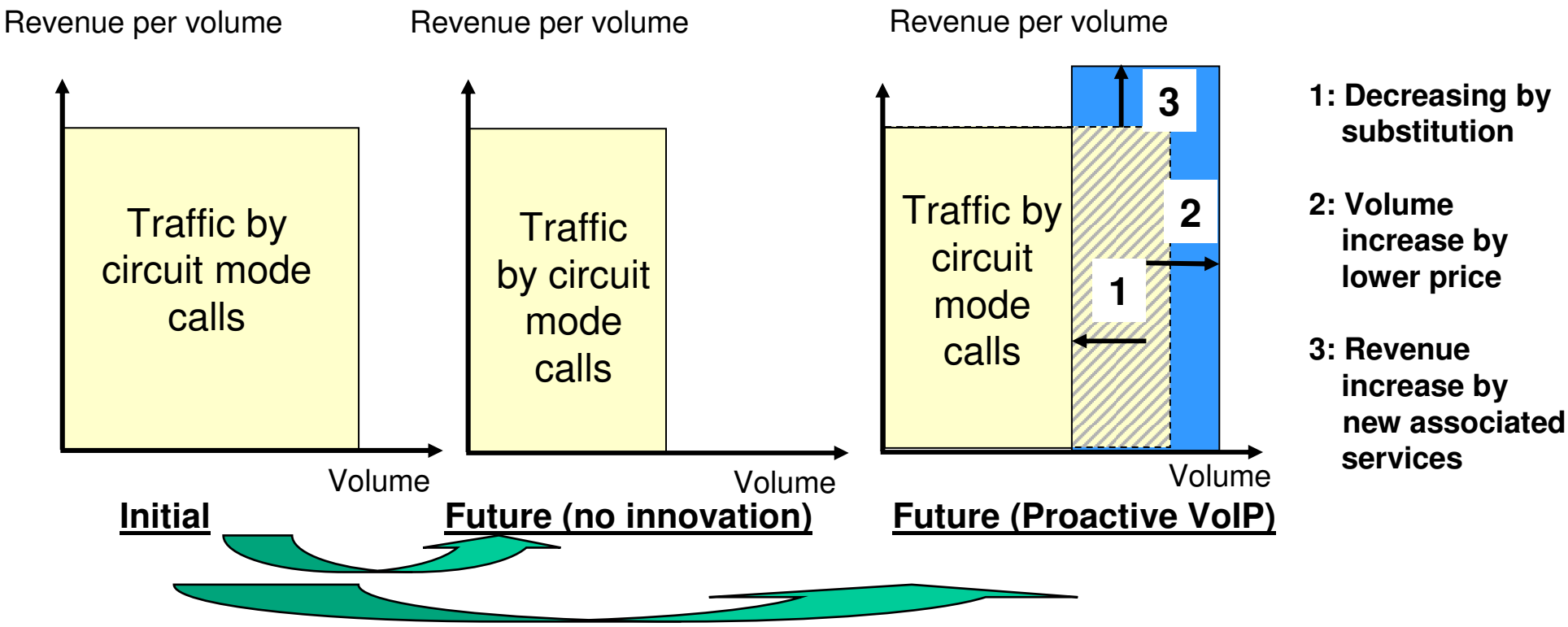


NGN Services, Business planning and Regulation Performance Issues: Application requirements

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, Business planning and Regulation Impact on revenues as a function of the established operator strategy



NGN Services, Business planning and Regulation 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, Business planning and Regulation
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, Business planning and Regulation
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, Business planning and Regulation Driving Services for Business

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

NGN → Enabler for Multiservice Convergence

NGN Services, Business planning and Regulation
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, Business planning and Regulation
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, Business planning and Regulation
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, Business planning and Regulation
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 bulding block for an SME bundle
  - Associate to Voice and Data VPN for full Virtual Company solution (Phones, PBX, Mobiles)

NGN Services, Business planning and Regulation
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, Business planning and Regulation
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, Business planning and Regulation
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, Business planning and Regulation
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, Business planning and Regulation 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

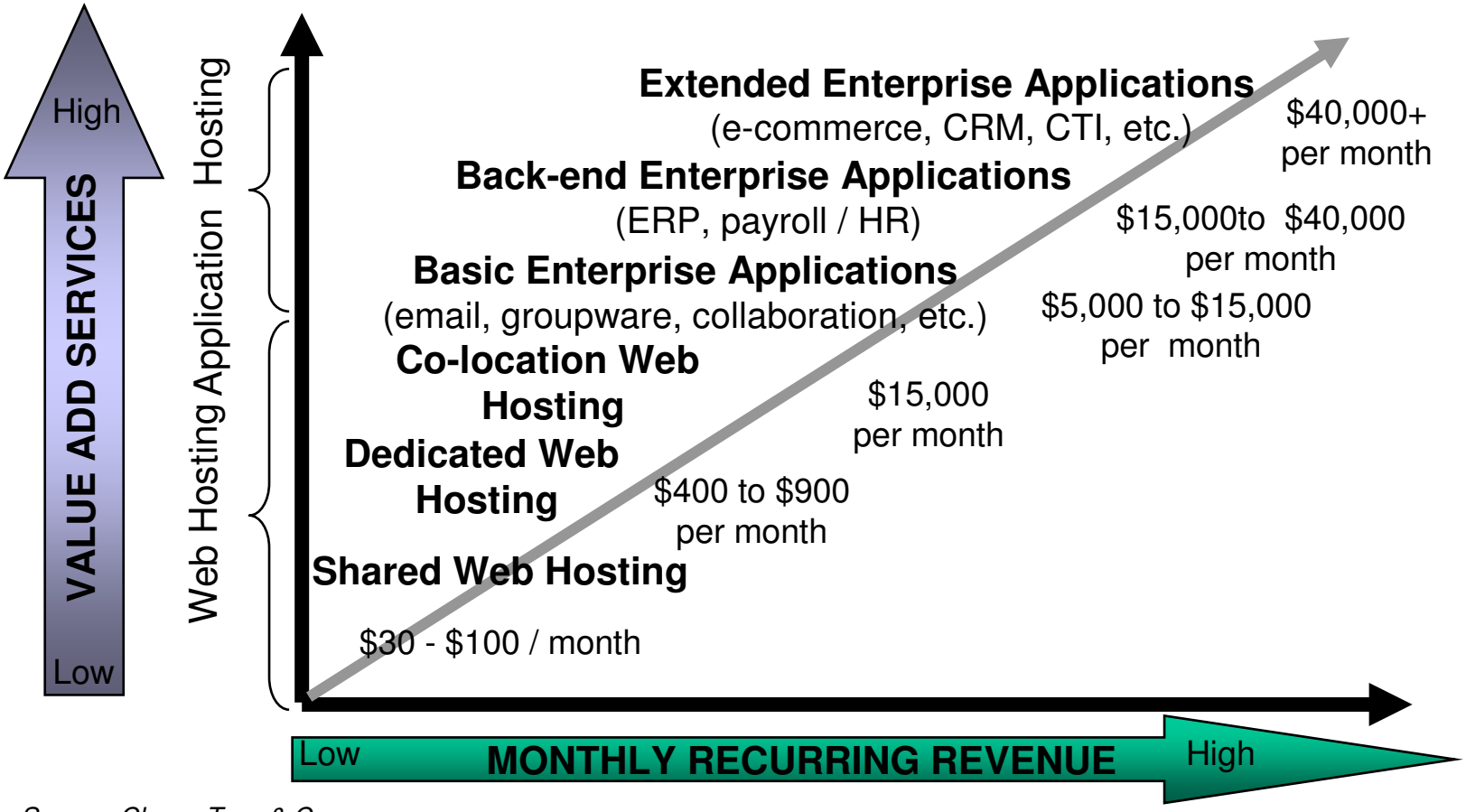
NGN Services, Business planning and Regulation ASP

- **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, Business planning and Regulation
ASP

Main applications and projected value/revenue added



Source: Cherry Tree & Co

NGN Services, Business planning and Regulation Content

- NGN driving services
  - Services motivation and market issues
- Busines planning and Convergence
  - Cost factors and economies of scale
  - Convergence
- Regulation issues and principles in NGN
  - Requirements and convergence
  - Trends for players

NGN Services, Business planning and Regulation
Business planning requirements

- **Required functionality for Business analysis process**
  - 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, Business planning and Regulation Key Factors: Cost structure and savings

– High cost impact of network infrastructure layer: > 60% in Greenfield areas of which > 70% in access segment.

– Dimensioning and cost evolving in 3 phases through time:

  – A) Accessibility due to Geo coverage either physical or radio

  – B) Equipment in Ports/users as customers grow

  – C) Capacity in Traffic due to increase of multiservice applications

– Significant savings by resources and equipment sharing within an operator due to convergence at network layers : i.e.: 30%

– Additional savings inter-operators due to cost sharing of non-core equipment (buildings, towers, etc.) > 20%

NGN Services, Business planning and Regulation Key Factors: Economies of scale

Economies of scale are an inherent characteristic to the telecom technologies that impacts on solutions, evolution and also now survivability in competition

– **The five dimensions of the economy of scale:**

- **By Size of the systems → Larger systems cheaper per unit**
- **By Technology capabilities → New technologies with higher capacity**
- **By Traffic efficiency with the occupancy → Higher utilization for a given GoS when more servers**
- **By customers Density → Quadratic increase with coverage radio**
- **By Volume of purchasing → Discount per volume in log scale**

NGN Services, Business planning and Regulation Key Factors: Competition level

Different Levels of Competition

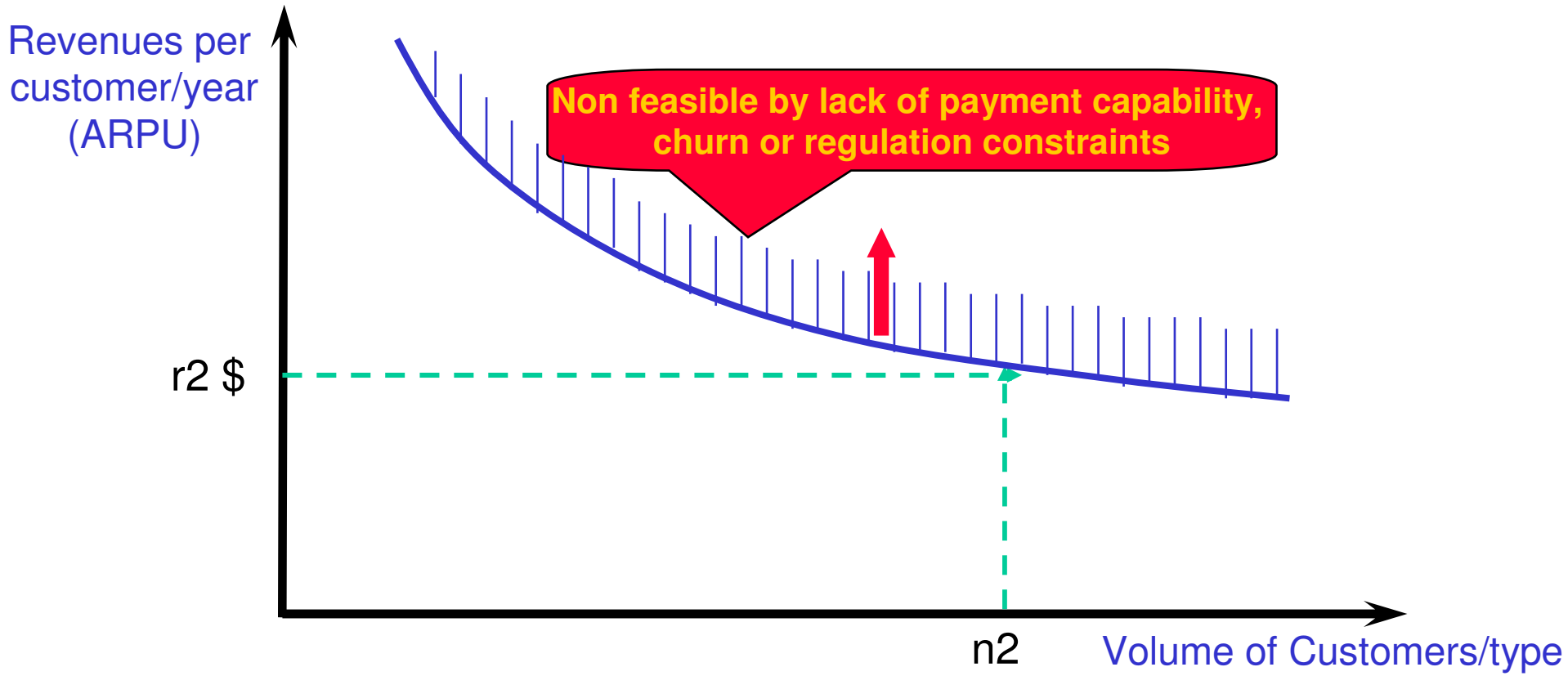
- L1) Monopoly for all geographical areas, customer classes and service types
- L2) Limited monopoly per area and/or service types while free operation for niche operators
- L3) Moderate competition for all network segments and services
- L4) High competition for high revenue customers and services
- L5) Aggressive competition for all areas, customers and services

"Efficient telecom implies different competition levels as a function of country size and development status"

NGN Services, Business planning and Regulation

Key Factors: Competition level

Business feasibility space as a function of volume and ARPU

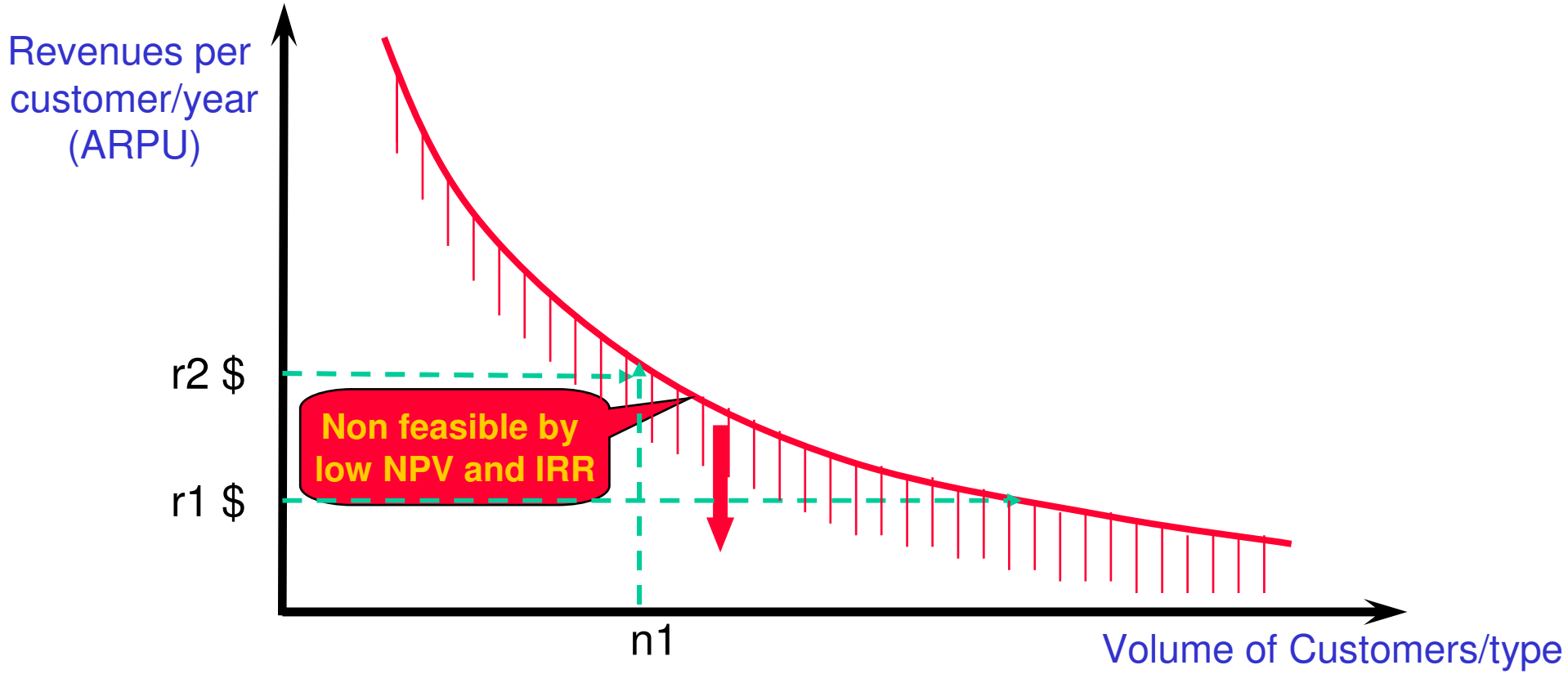


ARPU is limited by the economical development level and fixed costs

NGN Services, Business planning and Regulation

Key Factors: Competition level

Business feasibility space as a function of volume and ARPU

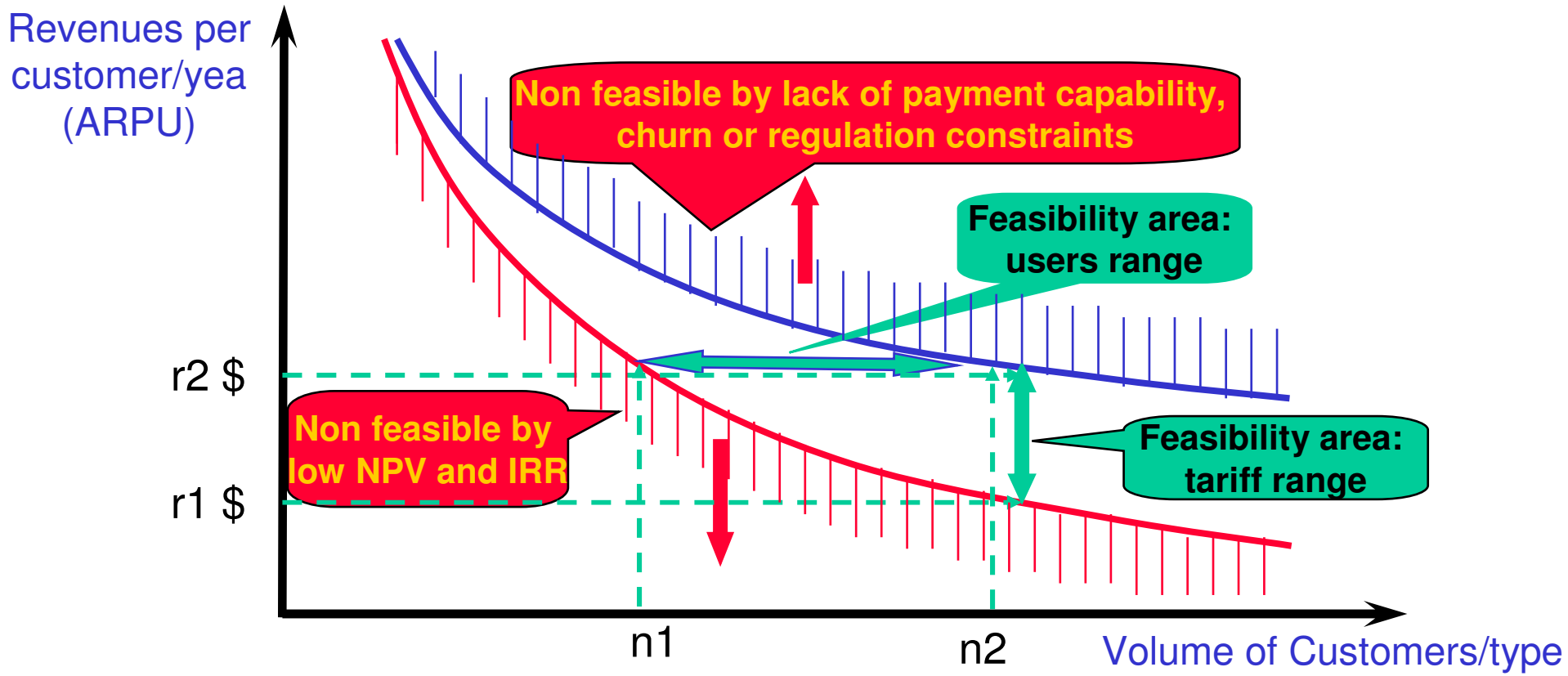


Business feasibility limitted by positive NPV

NGN Services, Business planning and Regulation

Key Factors: Competition level

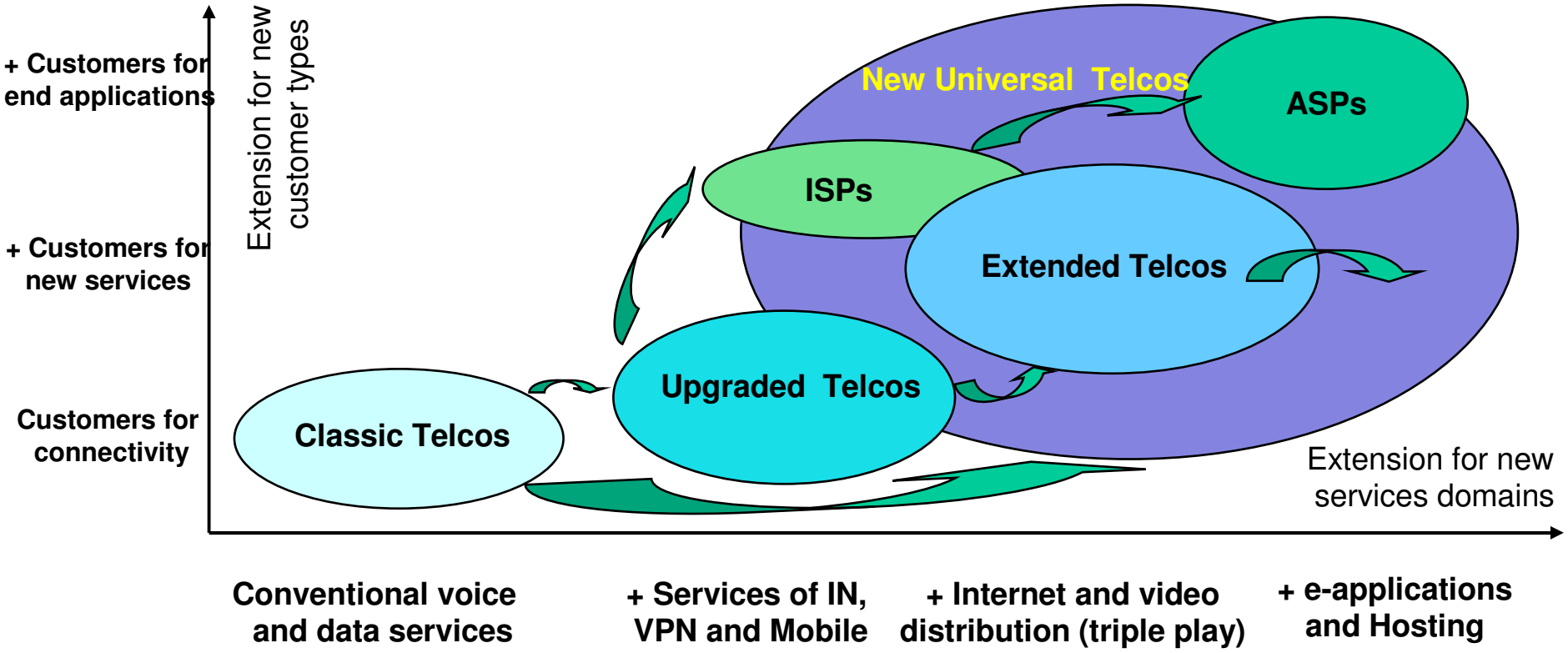
Business feasibility space as a function of volume and ARPU



Feasibility space highly dependent on country size and economical level

NGN Services, Business planning and Regulation

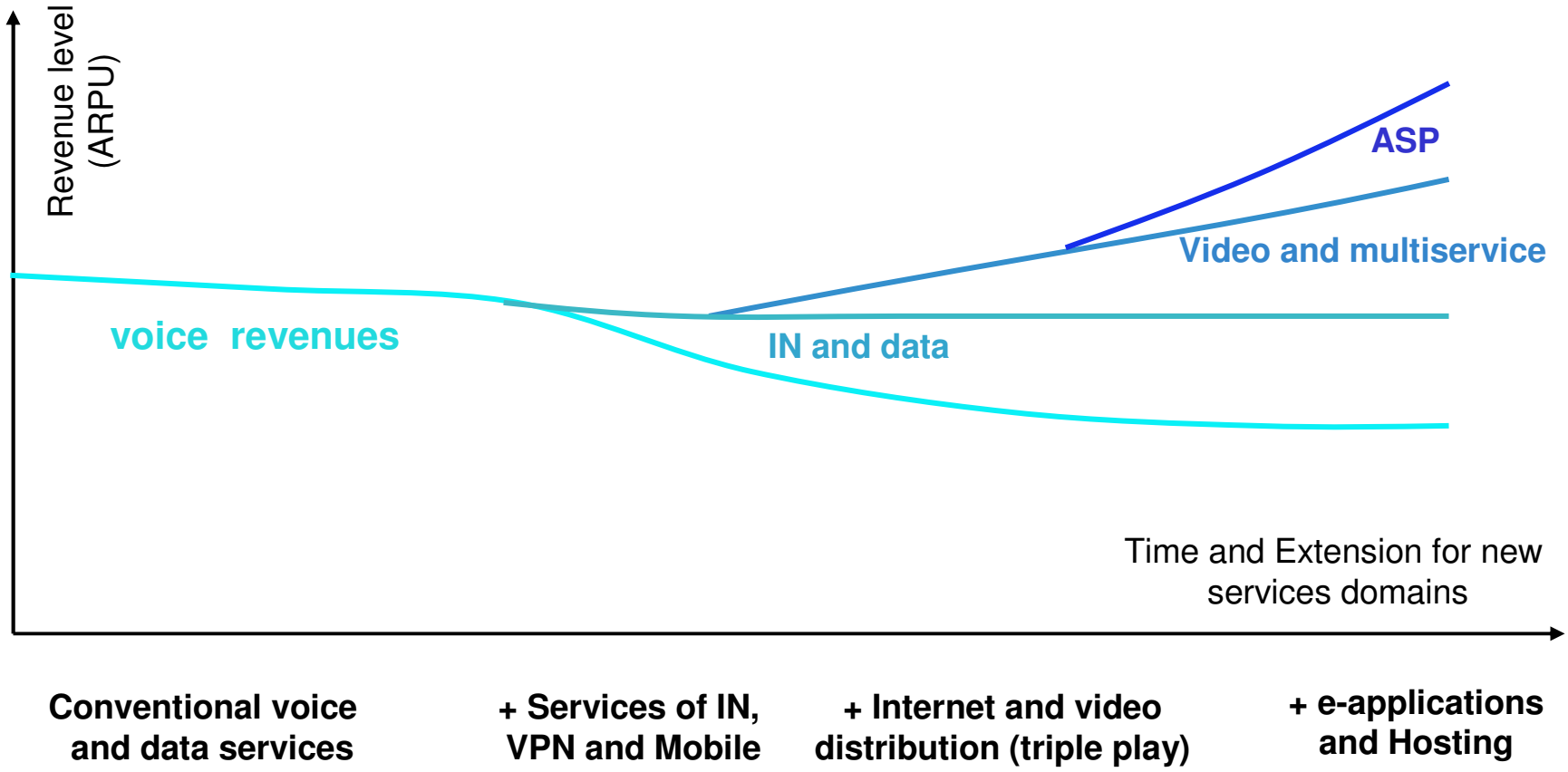
Universal Telcos converge in order to increase value chain



Specific migration and timeframe to be optimized for the country context and regulatory conditions

NGN Services, Business planning and Regulation
Migration steps

Evolution of revenues with major service domains



Convergence strategy is fundamental to ensure business feasibility

NGN Services, Business planning and Regulation
Case of Business Planning

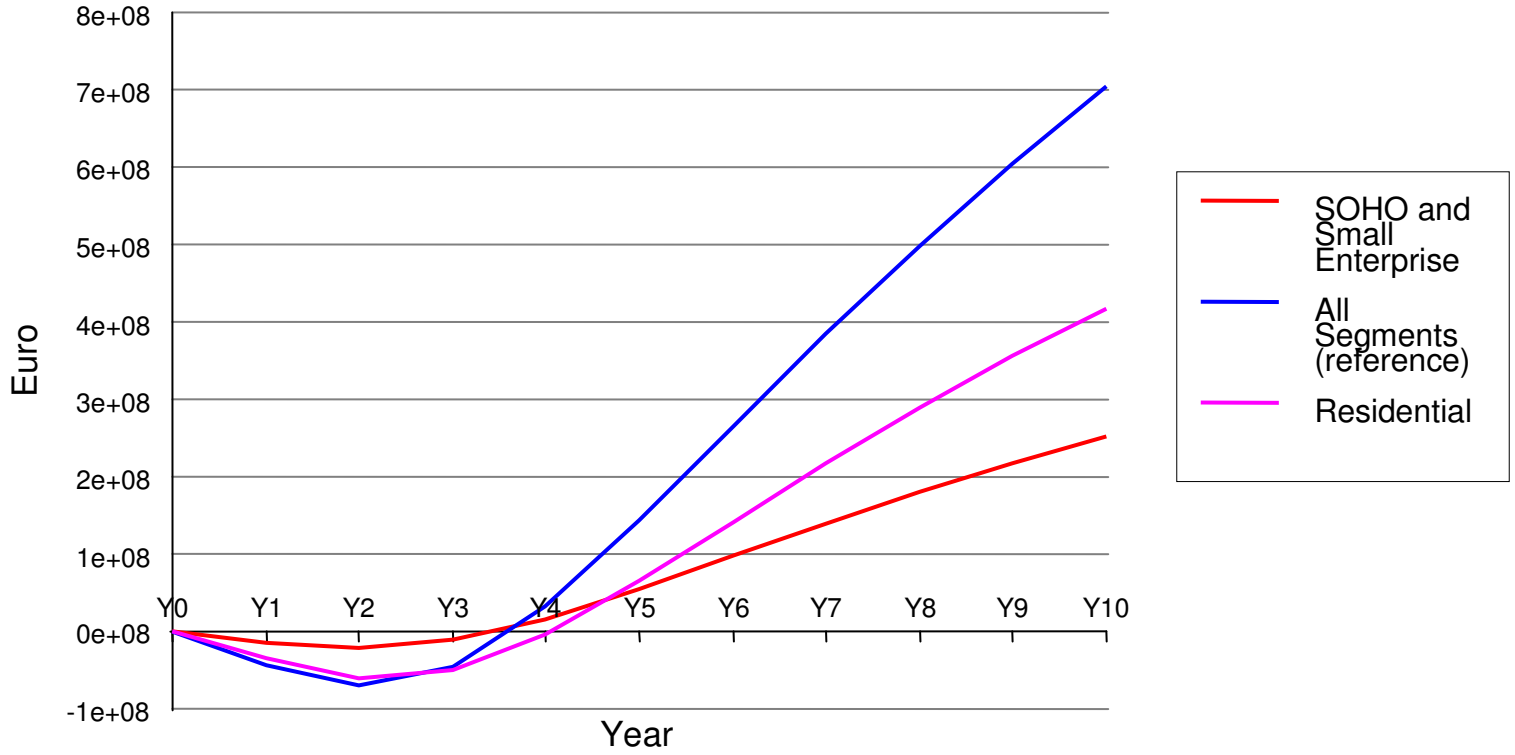
Evaluations to be based on robust techno-economical tools due to high number of alternatives and complexity

Case study for medium size country with mixes of customer classes and services domains:

- Multiservice IP Network with integrated operation
- Three service categories: Voice, Data/Internet, Video distribution
- Modeling demands, multiservice traffic flows, dimensioning, network resources, CAPEX, OPEX and financial results for different levels of competition
- Evaluate future Cash-flows, NPV, IRR, etc. for a 10 years period

NGN Services, Business planning and Regulation
Case of Business Planning

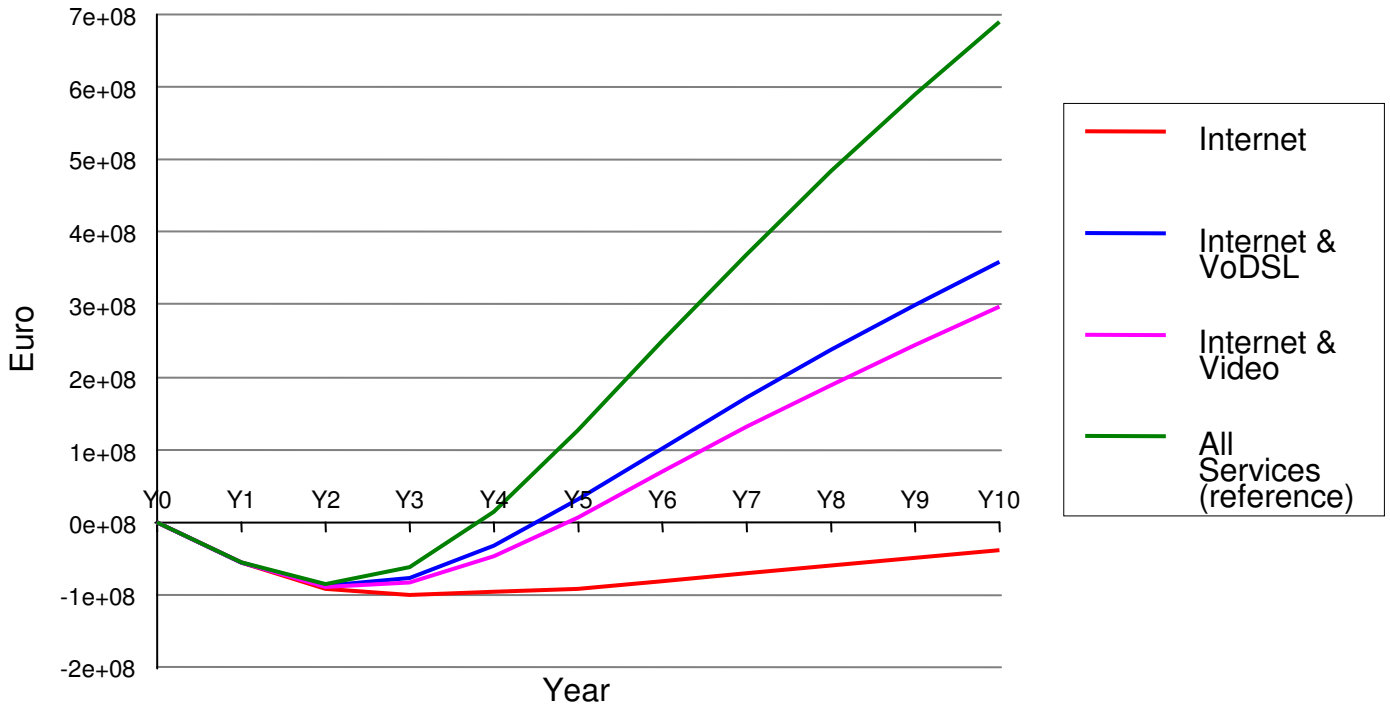
Effects of the mix of customers on Reference Scenario: Low competition level
Network NPV



- SME and SOHO with quicker recovery but less NPV and company value at medium term
- "All customer segments" case with much better behavior

NGN Services, Business planning and Regulation
Case of Business Planning

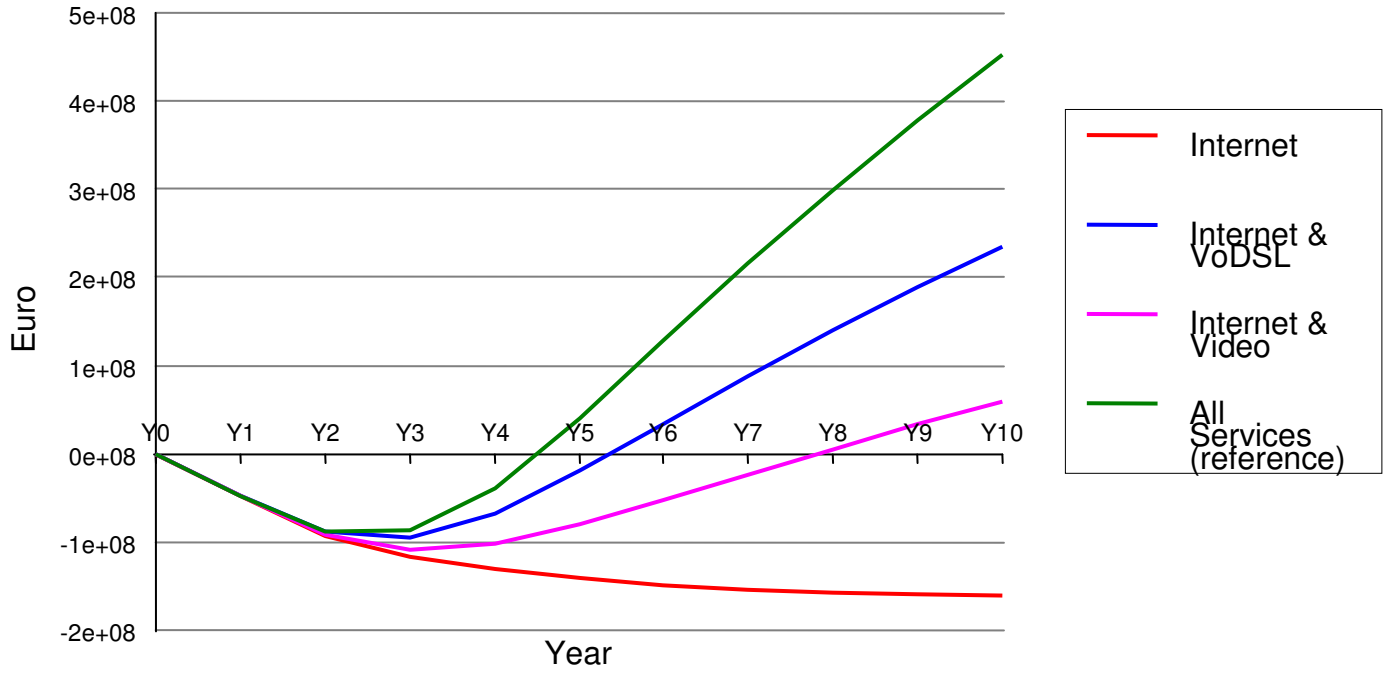
Effects of the mix of services on Reference Scenario: Low competition level
Network NPV



- Major impact of service classes on NPV and company survivability
  - Single service classes without future
  - High benefit of “all services” case

NGN Services, Business planning and Regulation
Case of Business Planning

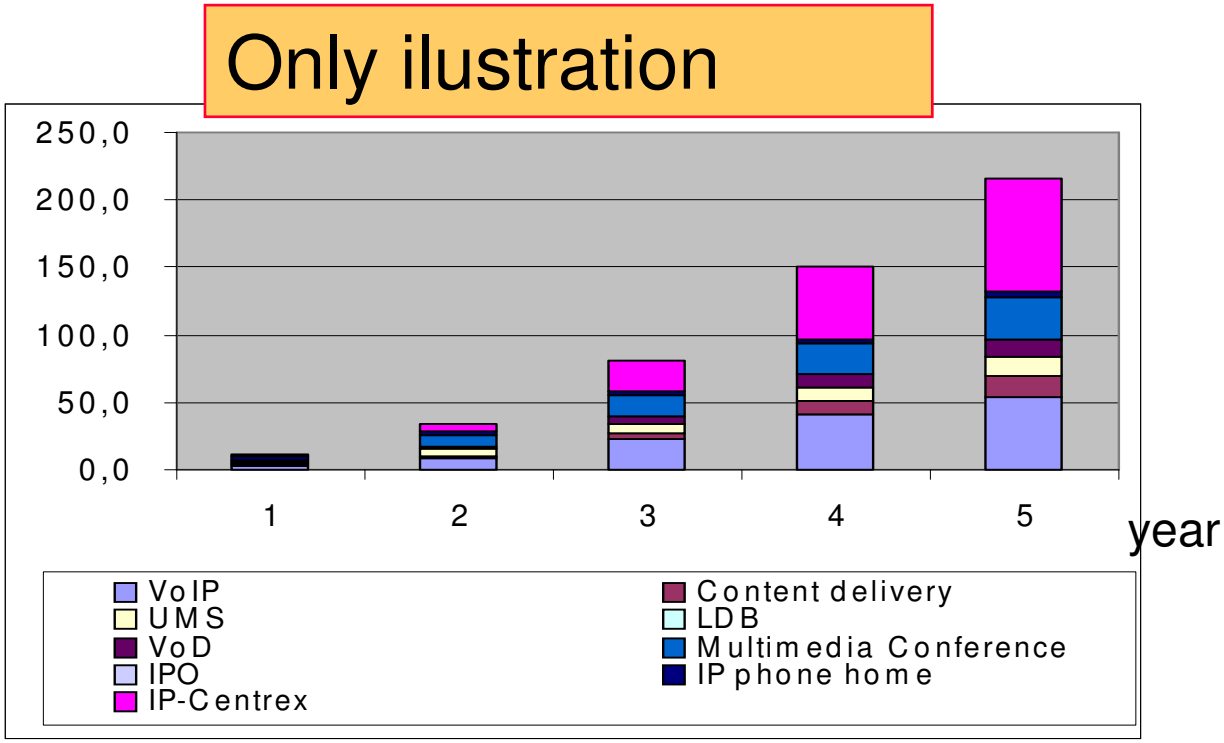
Effects of the mix of services on typical scenario: Medium competition level
Network NPV



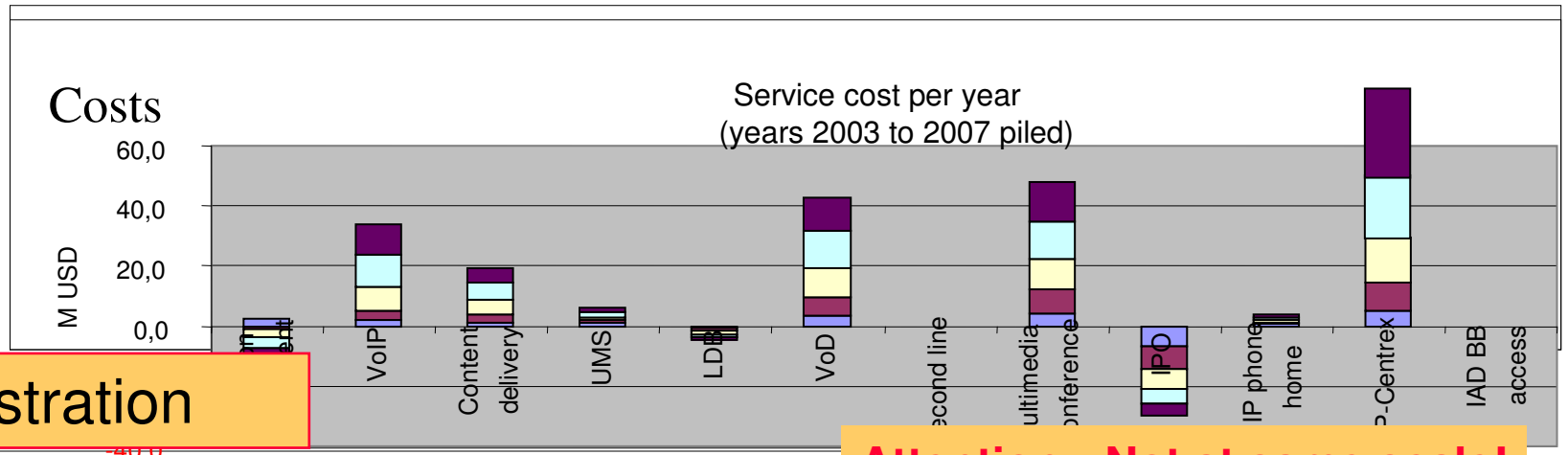
- Increase of competition level amplifies the previous effects on feasibility: big differences between service mixes
- Data only or single service classes without feasibility at medium term
- Very robust behavior for the “all services” case

NGN Services, Business planning and Regulation
Example of revenues per service type

- Revenue per service is related to the service description with a tariff policy and the customers scenario (market assumptions)

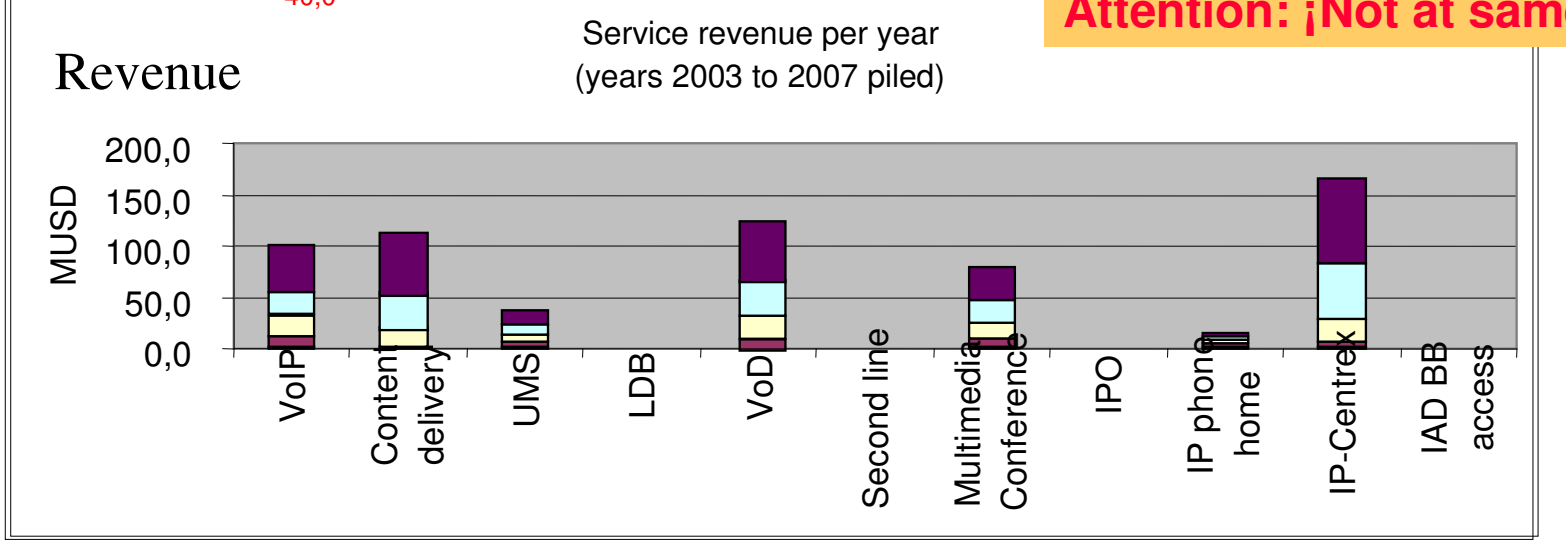


NGN Services, Business planning and Regulation
Example of revenues per service type



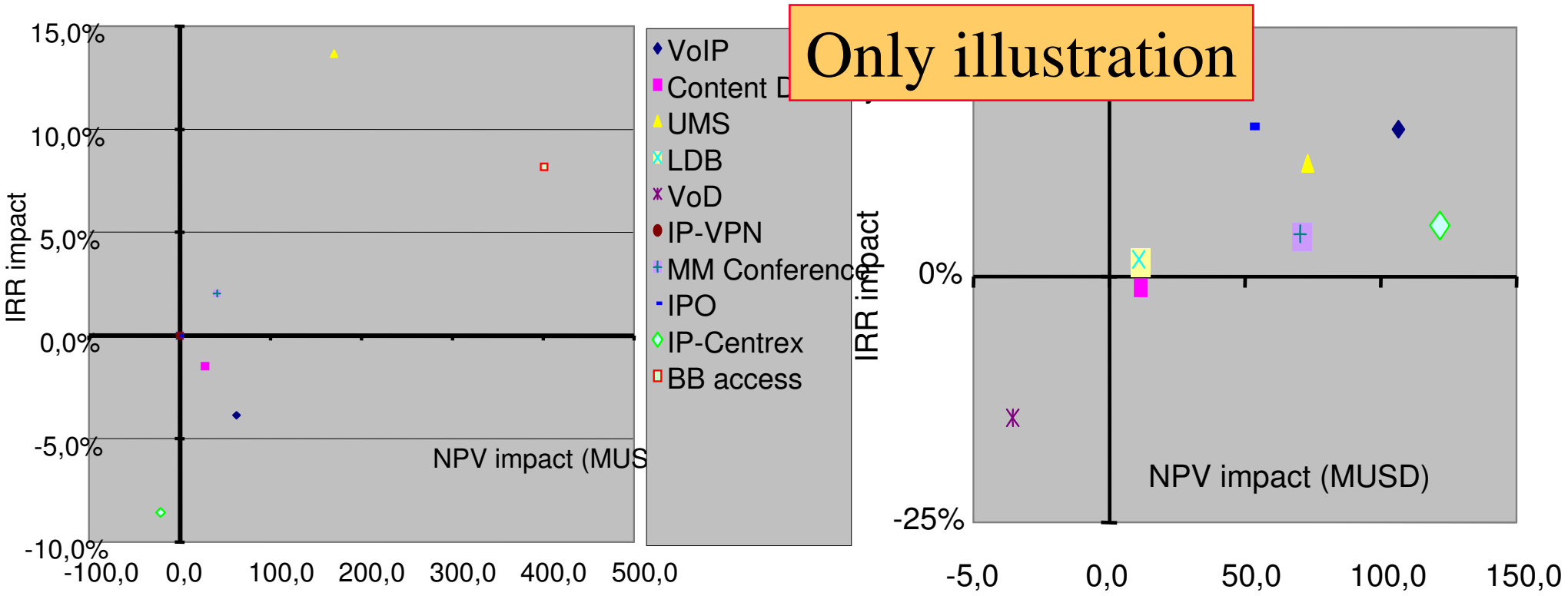
Only illustration

Attention: ¡Not at same scale!



NGN Services, Business planning and Regulation
Example of profitability per service type

- Strong impact of the service grouping on the overall profitability (NPV and IRR)
- Different scenarios as a function of the services mix and tariff strategy



NGN Services, Business planning and Regulation Content

- NGN driving services
  - Services motivation and market issues
- Busines planning and Convergence
  - Cost factors and economies of scale
  - Convergence
- Regulation issues and principles in NGN
  - Requirements and convergence
  - Trends for players

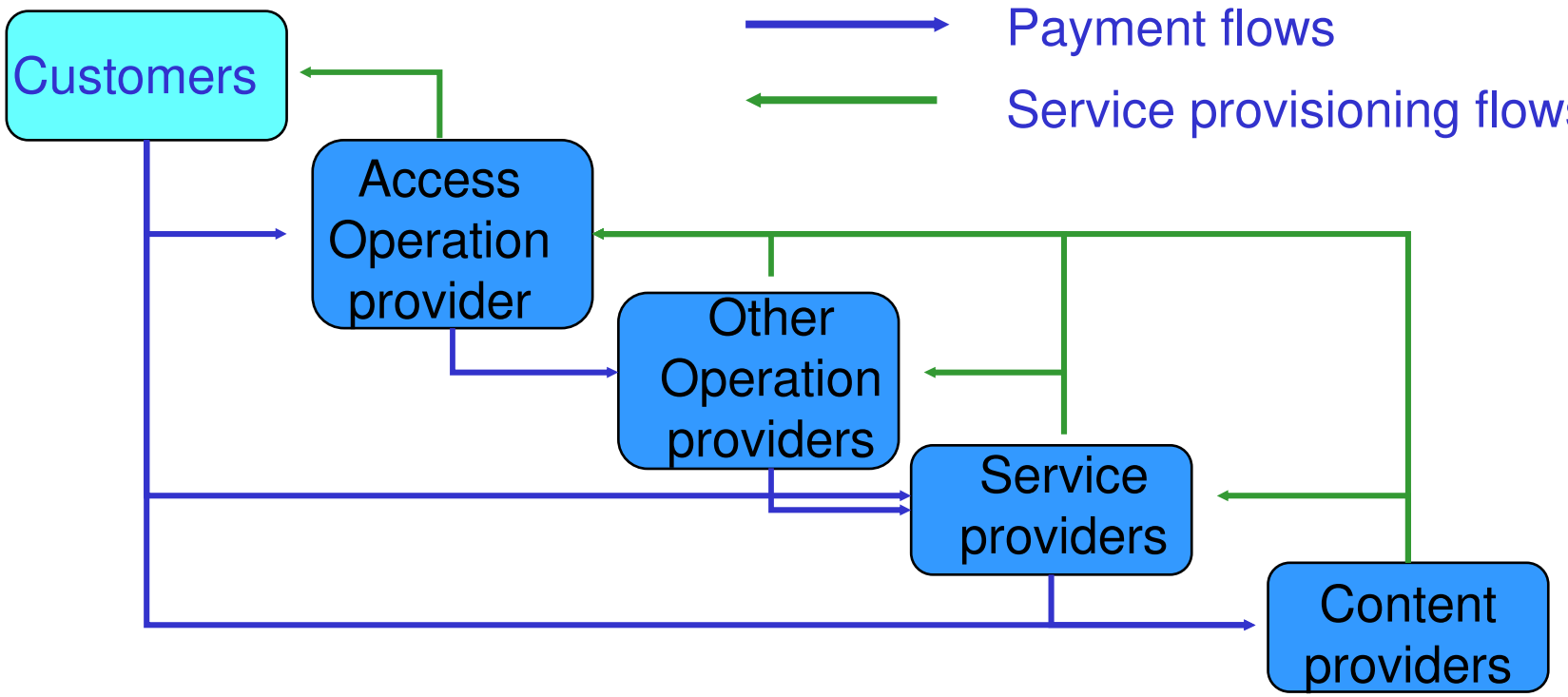
NGN Services, Business planning and Regulation
NGN regulation issues

- How to follow quick evolution of technology and services ?
- How to regulate multiservices including simultaneously voice/data/video ?
- How to define new reference networks, architectures and interfaces to new players?
- How to define and quantify dimensioning and costing units for interconnection ?
- How to ensure consistency for regulation principles when different network types coexist in the migration phases ?
- How to regulate different network players in the value chain at physical, equipment and services layers ?

NGN Services, Business planning and Regulation
NGN regulation principles

- **Fairness**: The regulatory rules should be neutral and fair so that all players will be treated equally.
- **Transparency**: the regulatory rules, decisions making process and results should be made public and open to all.
- **Independence**: the regulatory bodies should be independent of any business interests as well as protected from any political influences.
- **Quality and consistency**: Quality evaluations with experts in market, laws, economics, engineering etc. to maintain valid rules and consistent among players and solutions.
- **Effectiveness**: the regulatory bodies should be able to implement rules by penalizing those who break the rules thus help to create the expectation that all rules will be observed.
- **Accountability**: the regulatory bodies should be made accountable for their decisions by the regulatory procedures and through appeal clauses.

NGN Services, Business planning and Regulation
NGN regulation trends. Players interrelation



Regulation will affect all players involved in the value chain

NGN Services, Business planning and Regulation
NGN regulation trends

- Maintain fundamental principles for regulation objectives and decrease degree of detail for services
- Simplify application procees at “macroscopic” level
- Converge regulation for the different service categories
- Ensure solid, consistent and proved techno-economical modeling with cost/revenue drivers
- Maintain technological neutrality
- Have a vision of market evolution and overall services and business development

NGN Services, Business planning and Regulation How to define dimensioning and costing units for interconnection ?

- Which units to be used for dimensioning ?
- Which units to be used for billing ?
- Which units to be used for interconection and termination taxes ?
  - Usage time?
  - Bandwidth?
  - Information Volume?
  - Interface or link capacity?

NGN Services, Business planning and Regulation How to define dimensioning and costing units for interconnection ?

- Requirements for service flow units:
  - Quantifiable with defined engineering rules
  - Useful for interrelation between demand/dimensioning/costing for a given QoS and SLA
  - Reflecting service provisioning and market value across multiple networks
  - Applicable to multiservice/multimedia flows

NGN Services, Business planning and Regulation How to define dimensioning and costing units for interconnection ?

Common units for dimensioning and costing applicable at different network interfaces and interconnection points

Proposal for NGN multiservice networks:

Equivalent Sustained Bit Rate (ESBR) effectively carried at the network interface or interconnection point for a given Quality level or Service Level Agreement (SLA)

NGN Services, Business planning and Regulation
Summary of Key Factors

- Plan **business and services first**, later the network with proven solutions.

- Analyze **new business chain** from content to delivery

- New **reference networks**, units and processes needed for the regulatory activities

- A new multiservice **reference traffic unit proposed** for NGN dimensioning and interconnection