Session 7

Regional Seminar on Costs and Tariffs for Member Countries of the Regional Group for Asia and Oceania (SG3RG-AO)

Broadband: regulation and pricing issues

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March 2011

Phuket, Thailandia

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3. Broadband Plans
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Introduction.

What is Broadband?

As It is described in the American Broadband Plan by FCC, Broadband is the **great infrastructure challenge** of the early 21st century. Its is difficult to **separate broadband services from next generation networks (NGN). According to the FCC:**

"broadband" refers to advanced communications systems capable of providing highspeed transmission of services such as data, voice, and video over the Internet and other networks. Transmission is provided by a wide range of technologies, including digital subscriber line and fiber optic cable, coaxial cable, wireless technology, and satellite. Broadband platforms make possible the convergence of voice, video, and data services onto a single network.

and according to the ***Recommendation I.113 of the ITU Standardization Sector*** **defines broadband as:**

Transmission capacity that is faster than primary rate Integrated Services Digital Network (ISDN) at 1.5 or 2.0
Megabits per second (Mbits)

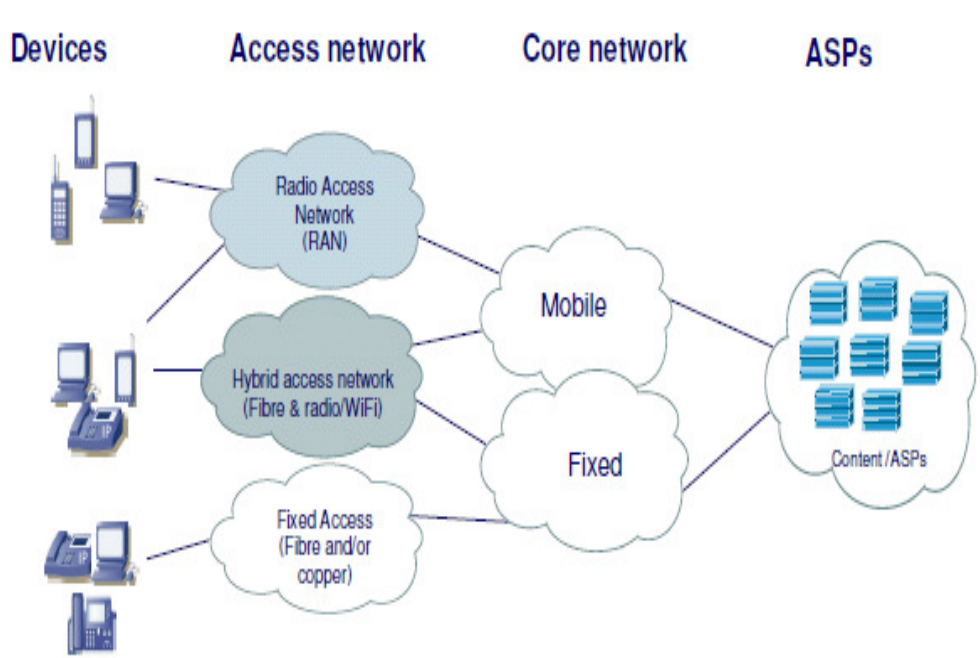
Broadband is really linked to NGN !!!!

Introduction.

What is NGN…..?

Next Generation Networks (NGN) can be developed **using a number of technologies, including fiber, cable, fixed, mobile wireless**, or further technology **upgrades to the existing copper based networks.**

- From traditional “one network-one service” approach to a “one network-many services”.
- Services and content maybe **delivered over a variety of devices**
- Provide **higher speed using different technologies**



Towards the convergence of networks, services and devices:

One of the most fundamental aspects that characterize **NGN is the convergence mobile/fixed networks.**

The term “**convergence**” is being used to refer to offer **voice, data, video, and other increasingly intermingled multimedia services** seamlessly over single or multiple infrastructures and platforms.

Converging NGNs, and the overall global NGN, are being driven by **digitization, packetization, high-speed transfer,** and **Internet Protocol (IP).**

From traditional networks to NGN

NGN's are distinguished **from traditional circuit switched networks in that all information is transmitted via packets**, which are then labeled according to their type (data, voice, etc) and handled differently by traffic management equipment.

So,

- NGNs will allow carriers' networks **to cost effectively support a new suite of sophisticated services** by building on core competencies related to traditional transport services

- **It will help reduce costs by eliminating the inefficiencies** of current service-specific, proprietary, and non-reusable solutions

- NGN approaches will **reduce the time to market and life-cycle costs** of offering new services.

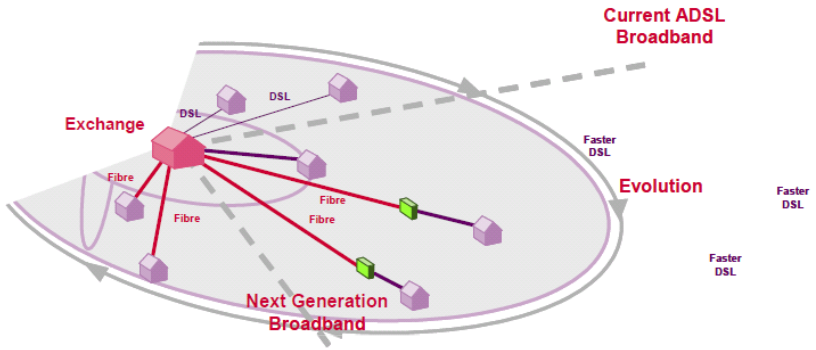
- It will enable carriers **to deploy advanced ser**vices, allowing them to remain competitive as well as expand their capabilities to enter new markets

Main architectural changes to be made:

- In core network, **migration of voice from a circuit-switched architecture to packets**
- In the wired access network, new mechanism **to process voice and data (xDSL).**
- In the cable access network, **upgrade of DOCSIS (towards DOCSIS 3.0) -> FTTH**

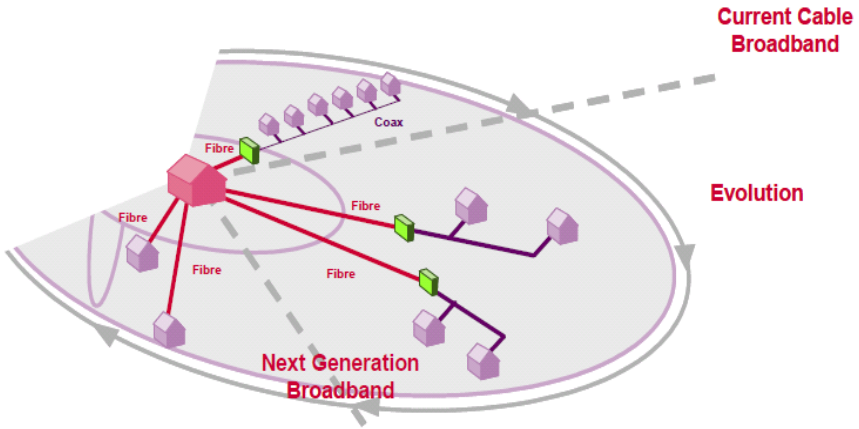
Network evolution

High Speed Broadband Access – ADSL Evolution



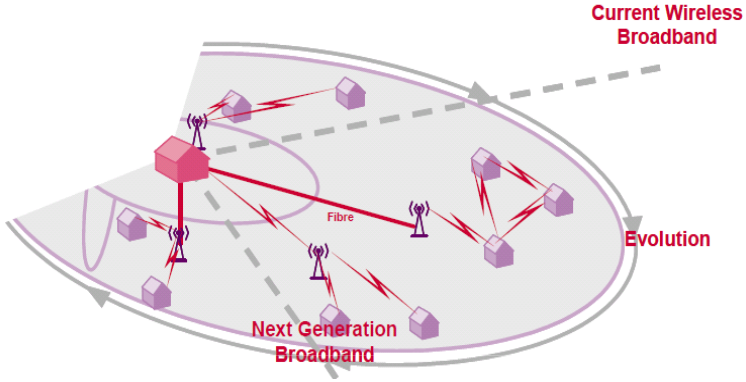
Source: OFCOM

High Speed Broadband Access – Cable Evolution



Source: OFCOM

High Speed Broadband Access – Wireless Evolution



Source: OFCOM

- **Demand is increasing very quickly** in most Member States – and it has produced an increase of required capacity and an upgraded network.

- **Rankings of broadband penetration** among Member States are very volatile, suggesting major disparities according to market conditions;

- **Price per unit of bandwidth is falling** very quickly, largely because an active competition based on infrastructure in some areas.

- **Operators offer a range of services**, presumably in the hope of encouraging upgrading;

Market description: offer vs demand

DEMAND

- **High growth** not only of **fixed but also mobile services**…..
- **Packet services**
- **Customer segmentation** (heavy internet users vs soft internet users) and fixed-mobile substitution effect.

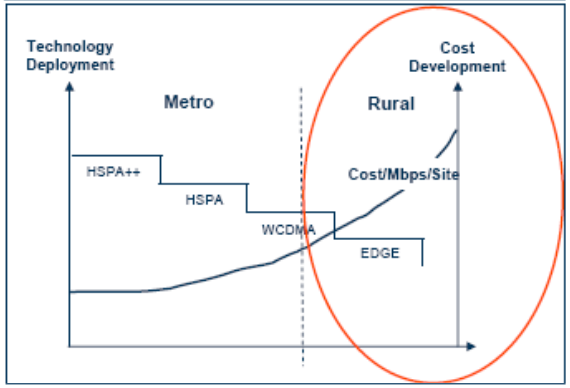
OFFER

- **Alternative technologies** like cable, fiber , ULL or mobile
- Focused on **most highly populated areas** and **better economic conditions**
- **Geographical regions characterized by infrastructure competence has more price competition**
- **Governments in Europe are convinced to extend broadband services to urban and rural areas –> Complementation by private initiatives**
- **Alternatively, areas with no network competence have competence based on services.**
- **Mobile broadband offer is increasing quickly.**
- **Network neutrality could change some business models (service providers, content providers, network operators, end users)**

Introduction.

Geographical model changes with NGN

Regional cost dynamics



Cost drivers

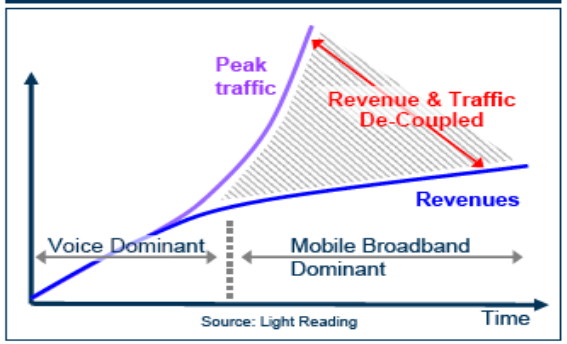
- Rural challenged by fewer users/site & relative higher Site costs
- Mobile broadband requires further sites also in low traffic areas to deliver wanted data speeds
- Mobile broadband model requires cost analysis on user/site

Higher costs for capacity in Rural areas lead to new infrastructure model for low traffic sites → Overall higher utilization leading to lower emissions

Market drivers

- "All-you-can-eat" pricing for mobile broadband drives backhaul demand
- Trend go from n*E1/site to 50+ Mbps/site (LTE ~100Mbps/site)
- Stepwise modernization to Ethernet
- Shift towards single backhaul for Mobile, Broadband, Fixed, IPTV etc.

Mobile Broadband de-coupling of traffic to revenues



Source: Ericsson

Towards network sharing through several mechanisms:

- **SITE sharing**
- **RAN sharing**
- **Backhaul sharing**

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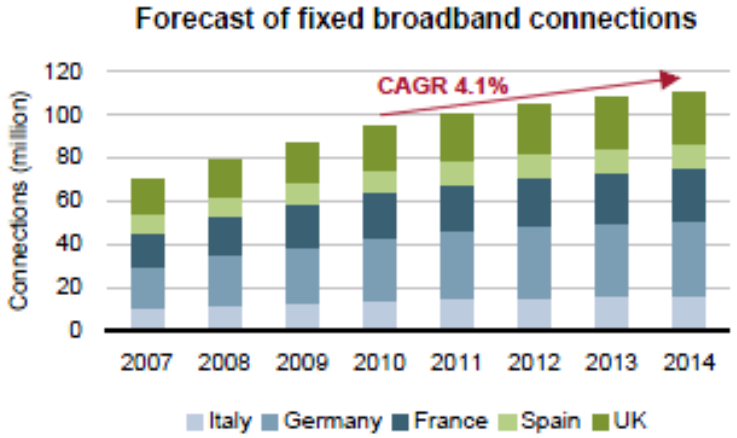
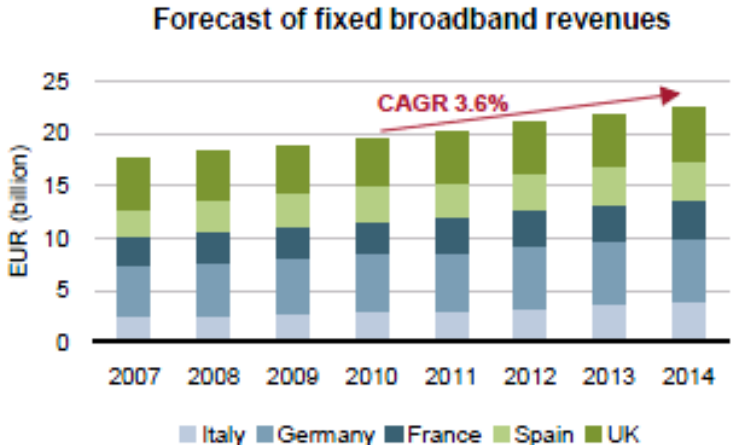
2. Main trends and challenges

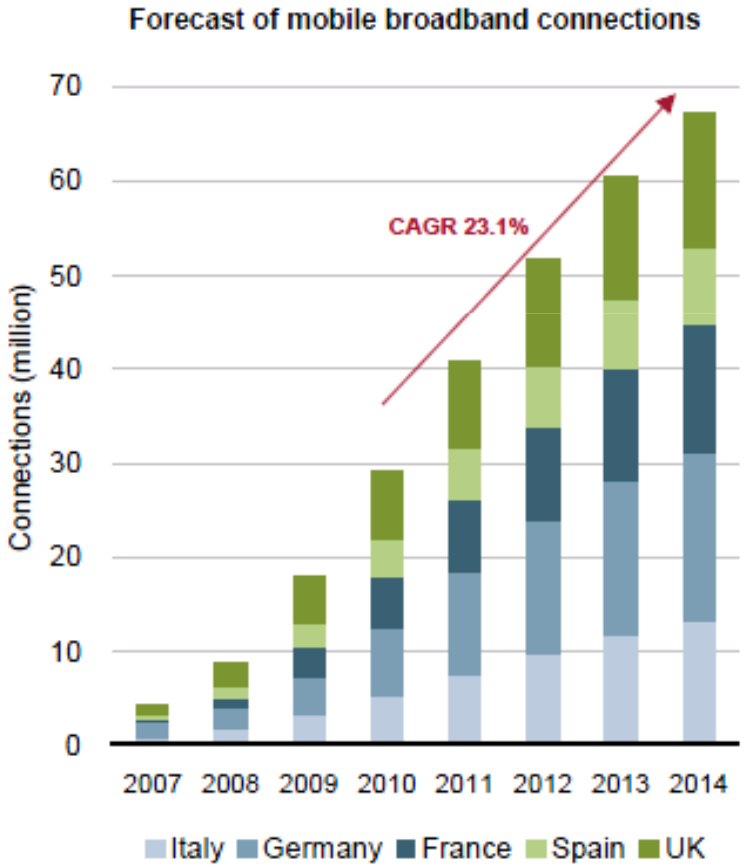
Fixed broadband and especially IPTV connections and revenues will continue to grow in Western Europe …





Source: Analysis Mason

Strong uptake of mobile broadband services



Source: Analysis Mason

2. Main trends and challenges

Main trends

- Growing **popularity of smartphones** with an **significant impact on the traffic**
- **Mobile broadband substitution** for several clients and geographical areas.
- **Economical crisis impacts on demand evolution** and decision taken about network rollout or sharing networks
- **Impact of network neutrality** on strategy of different operators (value chain)
- **Price strategy must be changed**
- **Spectrum regulation**
- **Digital Agenda** (rural broadband, universal broadband, etc,,,,)

Challenges

- **Definition of spectrum policy** implying more efficient spectrum use as well as a higher telecom services penetration. (refarming, digital dividend,…)
- **Definition of regulatory policy** that incentive investments and shareholders return (risk remuneration depending on the risk assumed)
- **Access network transformation** substituting traditional networks for broadband networks.
- **Geographical segmentation consideration** in the market analysis, network deployment and SMP operators.
- New **commercial and pricing policies,** based on capacity and different kinds of user devices

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3. Broadband Plans: USA

In early 2009, Congress directed the Federal Communications Commission (FCC) to develop a National Broadband Plan to ensure every American has “access to broadband capability.”

Long Term Goals

Goal No. 1: At least 100 million U.S. homes should have affordable access to actual download speeds of at least 100

megabits per second and actual upload speeds of at least 50 megabits per second.
Goal No. 2: The United States should lead the world in mobile innovation, with the fastest and most extensive wireless networks of any nation.

Goal No. 3: Every American should have affordable access to robust broadband service, and the means and skills to subscribe if they so choose.

Goal No. 4: Every American community should have affordable access to at least 1 gigabit per second broadband service to anchor institutions such as schools, hospitals and government buildings.

Goal No. 5: To ensure the safety of the American people, every first responder should have access to a nationwide, wireless, interoperable broadband public safety network.

Goal No. 6: To ensure that America leads in the clean energy economy, every American should be able to use broadband to track and manage their real-time energy consumption**.**

100Mb download in 2020

Mobile Broadband is a key item

To achieve 500Mhz for 4G providers from current 50Mhz

Each community having access to 1Gbps to connect schools,….

But is it the solution to real lack of competence?

Fundings

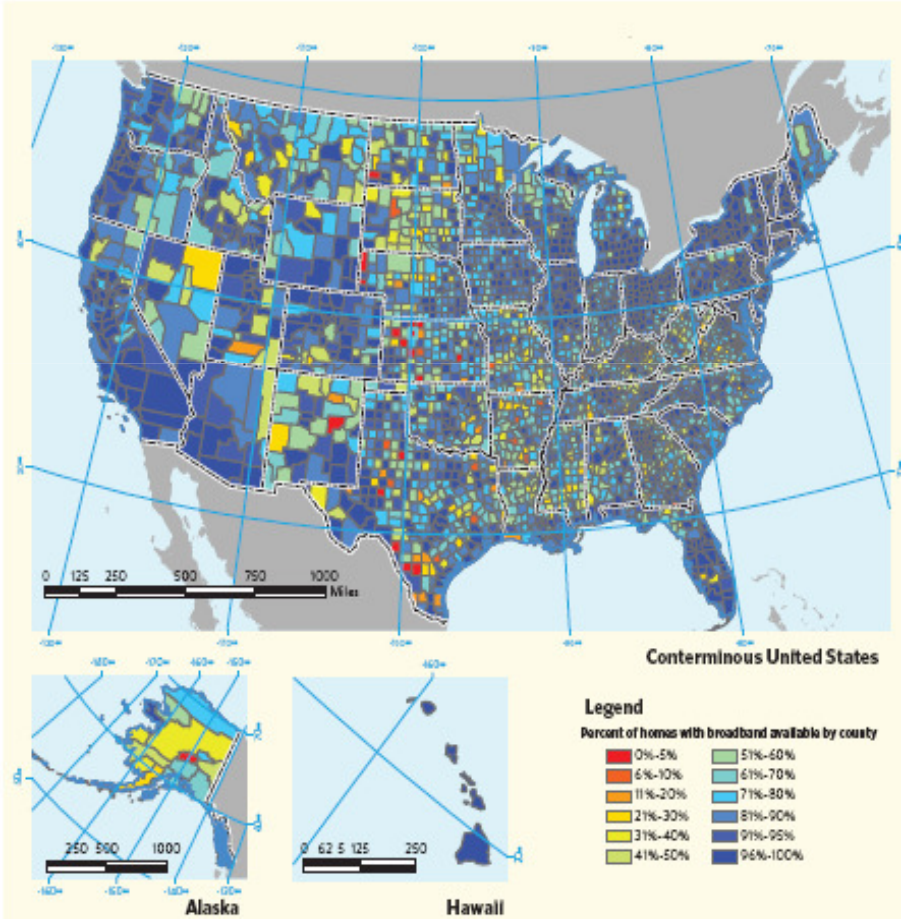
In 2010, the federal USF (Universal Service Fund) is projected to make **total outlays of $8.7 billion** through several programs The High-Cost program, which subsidizes telecommunications services in areas where costs would otherwise be prohibitively high, will spend $4.6 billion. Additionally to USF**, FCC wants Government to approve US$9bn in 3 years to deploy broadband**

Total cost of the **Broadband Plan is estimated around €US$15bn-US$ 35bn**

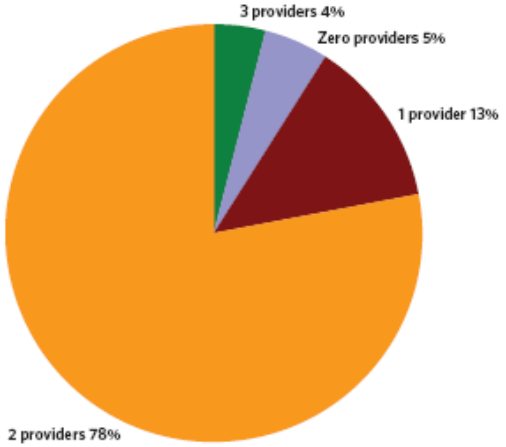
3. Broadband Plans: USA

International Telecommunication Union

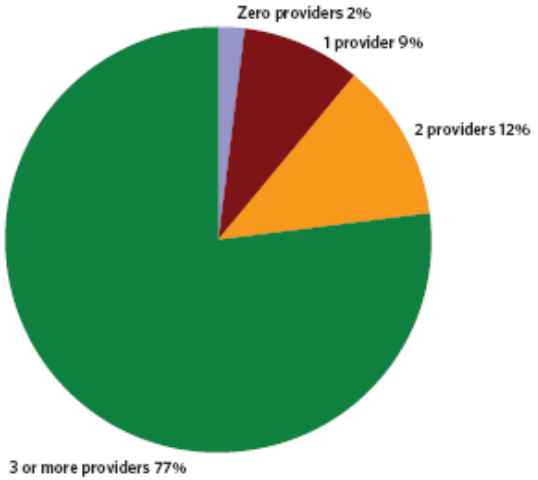
Availability of 4Mbps-Capable Broadband Networks in USA by country



Share of housing units with 0,1,2, and 3 wireline providers



Share of population with 0,1,2,,3 or more 3G Mobile Providers



3. Broadband Plans: Europe - Digital Agenda

Key Performance Targets from the Benchmarking framework 2011-2015 endorsed by the EU Member States in November 2009.

Broadband targets

• **Basic broadband** for all by 2013: basic broadband coverage for 100% of EU citizens. (Baseline: Total DSL coverage (as % of the total EU population) was at 93% in December 2008.)

• **Fast broadband by 2020**: broadband coverage at 30 Mbps or more for 100% of EU citizens. (Baseline: 23% of broadband subscriptions were with at least 10 Mbps in January 2010.)

• **Ultra-fast broadband by 2020:** 50% of European households should have subscriptions above 100Mbps.

Digital single market

• **Promoting eCommerce**: 50% of the population should be buying online by 2015. (Baseline: In 2009, 37 % of the individuals aged 16-74 ordered goods or services for private use in the last 12 months.)

• **Cross-border eCommerce:** 20% of the population should buy cross border online by 2015. (Baseline: In 2009, 8 % of the individuals aged 16-74 ordered goods or services from sellers from other EU countries in the last 12 months.)

• **eCommerce for business:** 33% of SMEs should conduct online purchases/sales by 2015. (Baseline: During 2008, 24% and 12% of enterprises was, respectively, purchasing/selling electronically, for an amount equal to or greater than 1% of the turnover/total purchases.

• **Single market for telecoms services:** the difference between roaming and national tariffs should approach zero by 2015. (Baseline: In 2009, the roaming average price per minute was 0.38 cents (call made) and the average price per minute for all calls in the EU was 0.13 cents (roaming included).

3. Broadband Plans: Spain – Plan PEBA

PEBA (National Program for Broadband Deployment In Rural And Isolated Areas) was a national funding program promoted by The Ministry of Industry, Tourism and Commerce of Spain **between 2005 and 2008** in order to stimulate operators" investments in broadband infrastructures at rural and isolated areas

This program was part of **"Avanza", the Spanish government strategy to develop the Information Society in Spain**. **PEBA goal was to provide broadband access to the population of countryside and isolated areas** with similar conditions to those available in urban areas

Collaboration with Autonomous Regions and Local Administrations was key to define the target population centres, to assess proposals for projects and to monitor infrastructures deployment and quality of commercial service.

From the program kick-off in 2.005, 13 meetings were organized by a Monitoring Committee composed of all the stakeholders (local administrations, the ministry and the two beneficiary operators). This allowed successful execution of the program and consolidation of relationships between the agents.

Principles	Technologies	Investments & achivements
• **Minimum bandwidth: 256Kbps/128Kbps** • Technical features similar to those offered by broadband commercial services at urban areas • Technological neutrality so that any type of broadband technology could be deployed and to avoid technology obsolescence, • The duty of the beneficiaries to open up the financed networks to competition. • Infrastructure investments in well-defined and not serviced areas in order to avoid duplicative investments	PEBA projects were not limited to a single technology. At present, several technological solutions (ADSL, WiMAX, Satellite and HFC) are being used to provide broadband access to the PEBA population centers, depending on their geographic features, roll–out dates and available technology. PEBA broadband technologies have been improved: • ADSL: 1Mbps minimum. The possibility of offering higher speeds depends of specific conditions such us distance to the office switch, cable features, etc. •HFC: 4Mbps	PEBA investments through 29 projects **and two beneficiary operators**, amounted to nearly **85 million€ which have allowed access to broadband services to 8 million people from 58.442 population centres of our country**. The Spanish Ministry of Industry, Tourism and Trade contributed more than 17 million € zero interest reimbursable loans and 8 million € non-recoverable subsidies to support these investments

3. Broadband Plans: Spain – Plan Avanza

The objective of "**Avanza Infraestructures“ (2008-2011) funding program** is to facilitate investments to extend telecommunication services" coverage to isolated and rural areas.

•The objective is to continue PEBA program successes by increasing broadband coverage in very small population centers and not only to improve bandwidth and network capacity provided by telecommunication operators at rural areas but also to improve the service quality.

Main goals of phase I

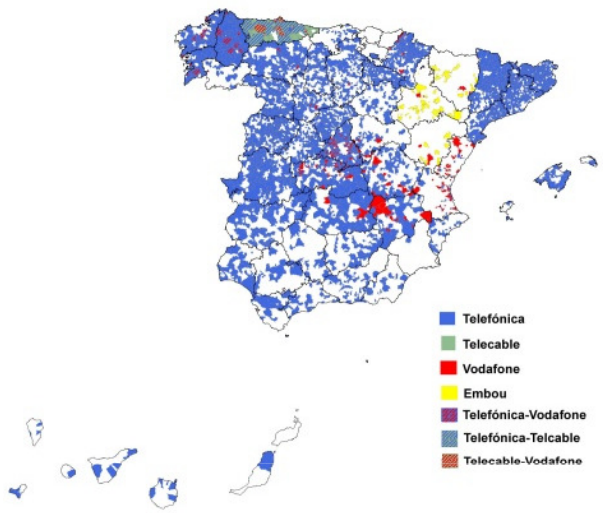
- **Broadband and other telecommunication services development in rural and isolated areas** : projects intended to develop access infrastructures in order to satisfy the demand for broadband connection from population in isolated and rural areas.
- **High-capacity rural networks** : projects intended to develop rural backbone networks.
- **Pilot projects for advanced telecommunication services** : projects intended to test in rural areas those innovative broadband technologies that are being spreaded in urban areas.
- **Access networks for local public services** : projects intended to develop public networks so that citizens can access to Public Administration services.
- **Actions for conscience raising** : projects intended to disseminate broadband advantages and opportunities so that digital divide can be narrowed.

Action Plan

- **F1 action line projects:** 13 projects from 4 telcos are being developed in order to provide broadband access to 10.034 population centrs. Both cabled and wireless broadband access technologies are being used: ADSL, 3G/HSDPA, WIMAX and Satellite. Envisaged investments amount to nearly 9 million € with a contribution by the Government of 2.1 million € non-recoverable subsidies and nearly 4.7 million € zero interest loans.
- **F2 action line projects:** 16 projects from 3 telcos are being developed in order to improve backbone networks of 721 town councils. Envisaged investments amount to nearly 46 million € with a contribution by the Government of 10.1 million € non-recoverable subsidies and nearly 21 million € zero interest loans.
- **F3 action line projects:** one pilot project is being developed within this action line by Innovamar tecnological foundation . The project objective is to develop ICTs at sea related industries in order to update the fishing sector.
- **F4 action line projects:** taken into account the importance of training and advertising in order to increase Internet usage rates and literacy at rural areas, this action line objective is to disseminate advantages of broadband and telecommunication advanced services as well as available opportunities by accessing to the information society.

3. Broadband Plans: Spain – Plan Avanza

Action F1



Comunidad Autónoma	Nº núcleos	Nº proyectos	Operadores beneficiarios
Andalucía	316	1	Telefónica
Aragón	87	2	Embou, Vodafone
Asturias	1549	3	Telefónica, Telecable, Vodafone
Baleares	83	1	Telefónica
Canarias	40	1	Telefónica
Cantabria	61	1	Telefónica
Castilla La Mancha	429	2	Telefónica, Vodafone
Castilla y León	1890	2	Telefónica, Vodafone
Cataluña	1989	1	Telefónica
Ceuta	3	1	Telefónica
Comunidad Valenciana	98	2	Telefónica, Vodafone
Extremadura	399	1	Telefónica
Galicia	1910	2	Telefónica, Vodafone
La Rioja	147	1	Telefónica
Madrid	427	2	Telefónica, Vodafone
Melilla	2	1	Telefónica
Murcia	2	1	Telefónica
Navarra	602	2	Telefónica, Vodafone
TOTAL	10034		

Action F2

Comunidad Autónoma	Nº municipios	Nº proyectos	Operadores beneficiarios
Andalucía	84	3	Red Banda Ancha de Andalucía, Nostracom, Telefónica
Aragón	123	1	Telefónica
Asturias	3	1	Telefónica
Canarias	3	1	Telefónica
Cantabria	8	1	Telefónica
Castilla La Mancha	44	1	Telefónica
Castilla y León	258	1	Telefónica
Cataluña	12	1	Telefónica
Comunidad Valenciana	6	1	Telefónica
Extremadura	34	1	Telefónica
Galicia	72	1	Telefónica
La Rioja	11	1	Telefónica
Madrid	2	1	Telefónica
Murcia	1	1	Telefónica
Navarra	47	1	Telefónica
País Vasco	13	1	Telefónica
TOTAL	721		

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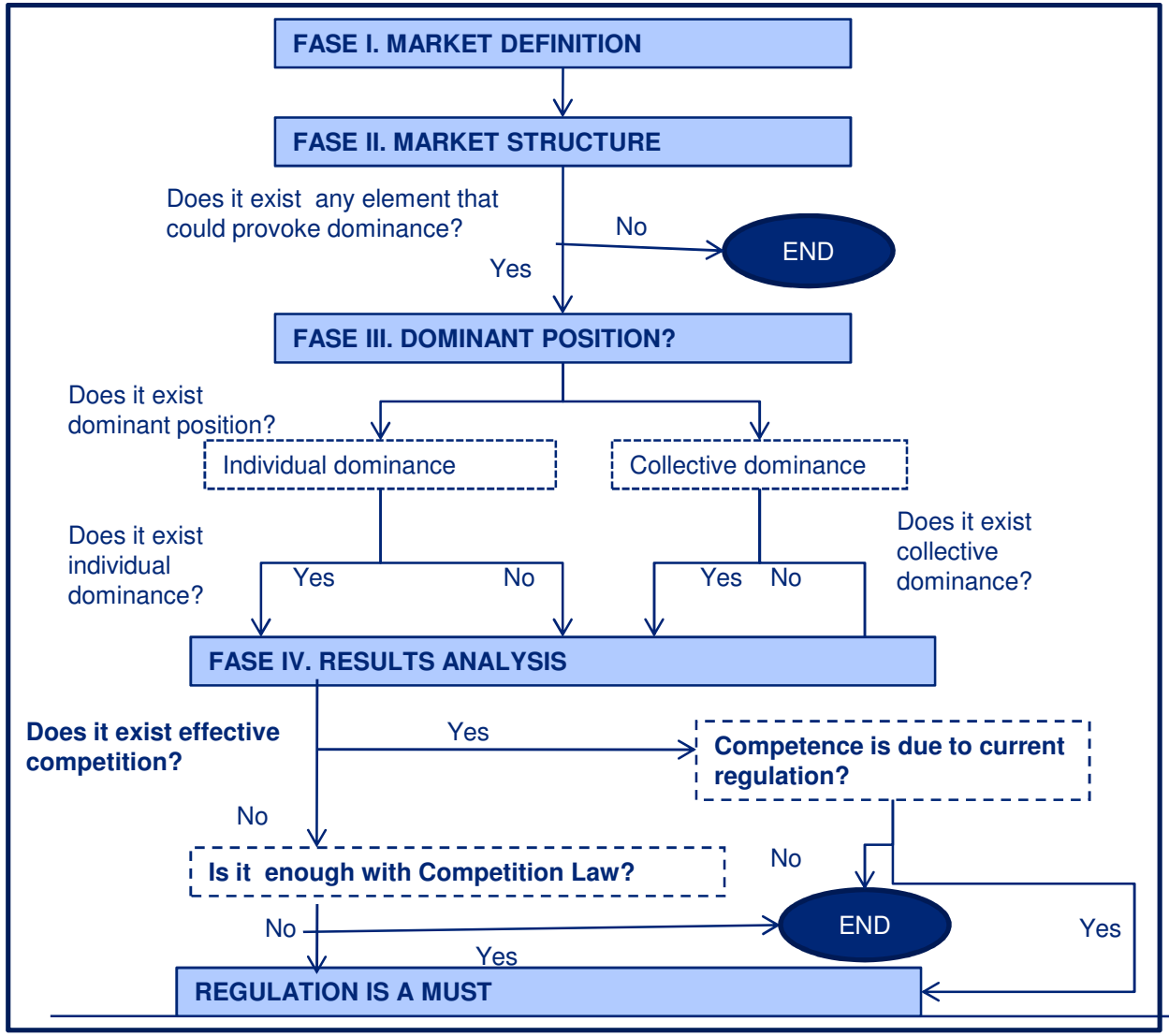
4. When to regulate?.

In order to justify the imposition of regulatory obligations on a given market, **the three criteria test** is applied.



The three Criteria test

1. Presence of high and non-transitory entry barriers whether of structural, legal or regulatory nature
2. It admits only those markets, the structure of which does not tend towards effective competition within the relevant time horizon
3. Application of competition law alone would not adequately address the market failure(s) concerned

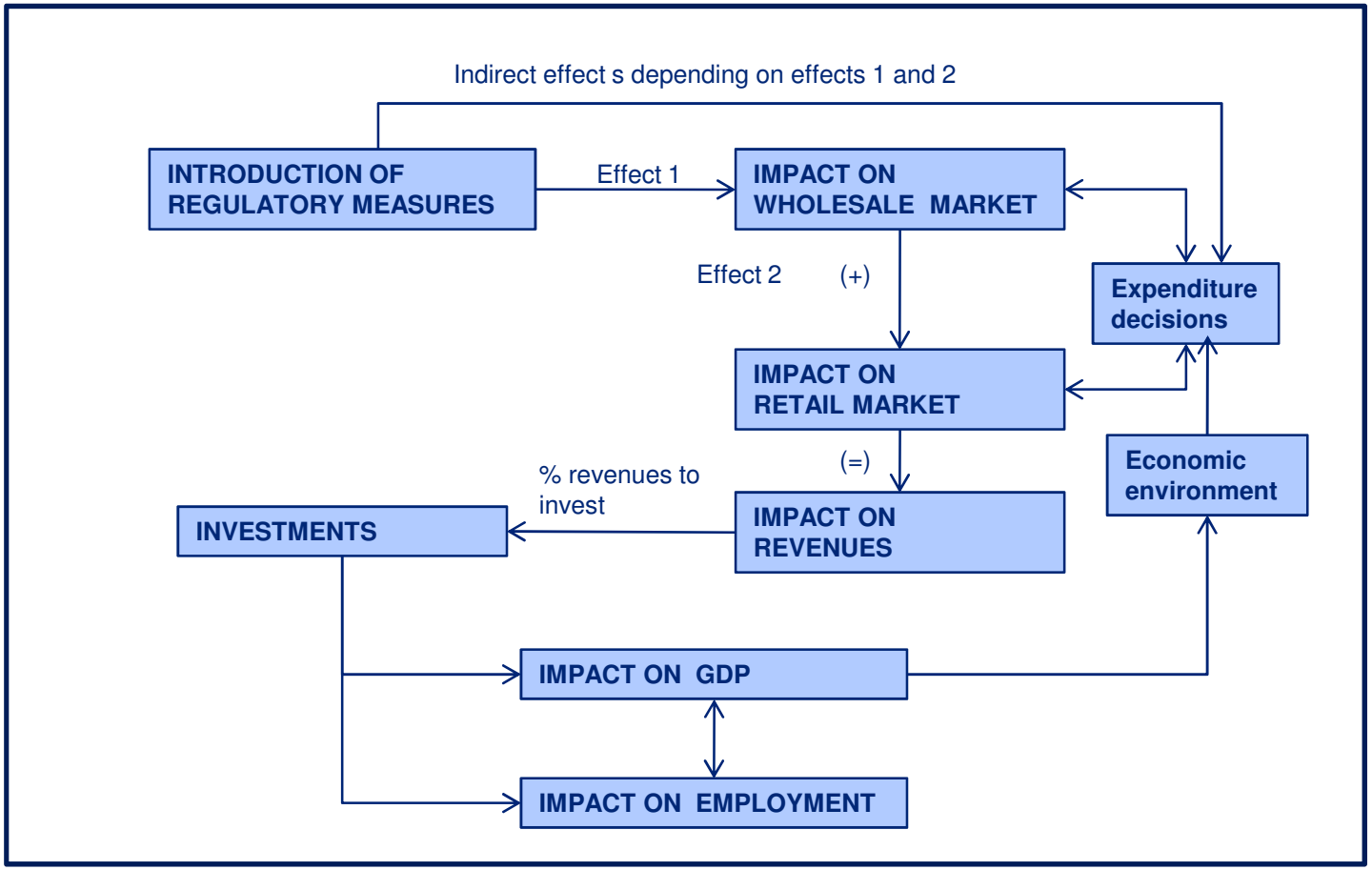
Obligations/Remedies:

- **Price control**: cost oriented/ reasonable "prices"
- **Separated accounting**
- **Access obligation**
- **Non discrimination and transparency**
- **Functional separation**

4. When to regulate?.

Telecom sector impacts directly on several economic variables:

1. GDP
2. Employment
3. Inflation (traditional deflation effect on the economy)
4. Investment in the country



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5.Broadband/ NGN regulation.

Some ideas to be considered:

• In reality, **competition is focusing on some areas** in every country !!

• Geographic markets should not be considered exceptions in fixed telecommunications

• **narrowband access** markets as well as **broadband access markets** are likely to show very often the features of geographic markets.

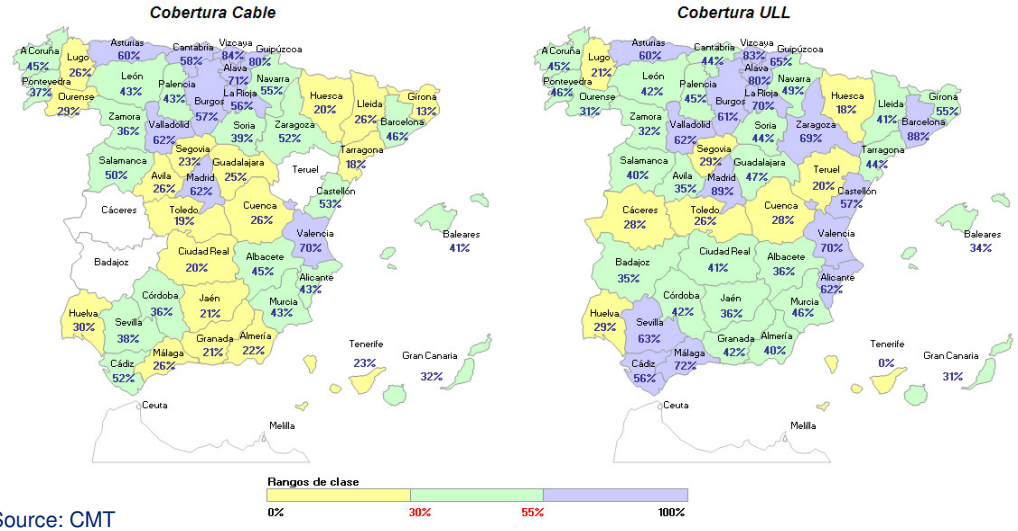
Regarding NGA (Next Generation Access), **geography does matter:**

• **state and age of existing network infrastructure,**

• length of local loop,

• population density and structure of the housing market,

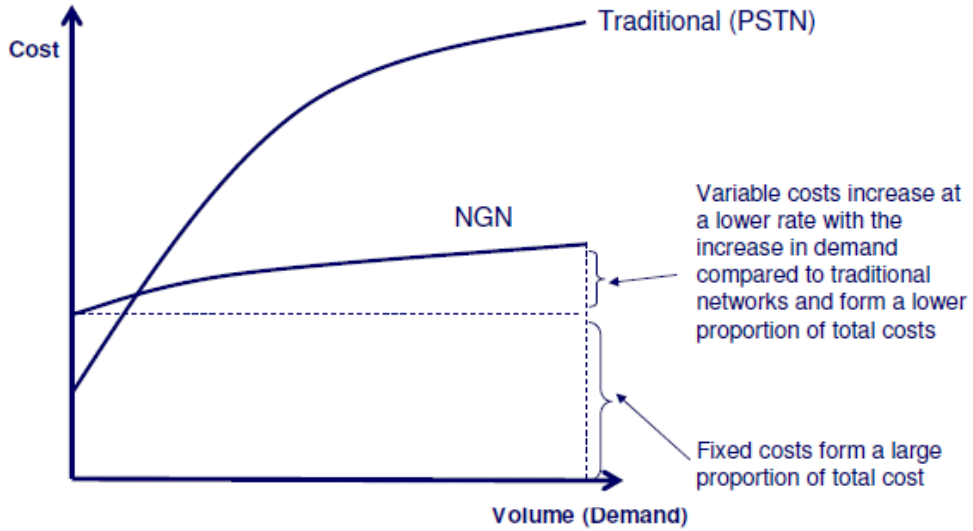
• Others (distribution of number if users,…)



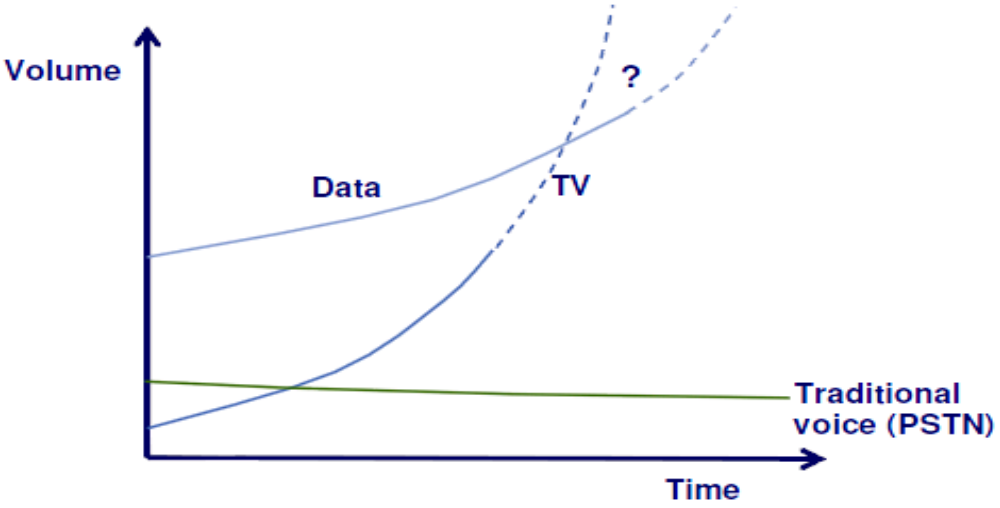
Source: CMT

In Spain, broadband market shows very heterogeneous competitive conditions, existing higher competition in areas where several types of infrastructures provide several broadband services: socio-demographic and economic conditions in different regions.

5.Broadband/ NGN regulation.



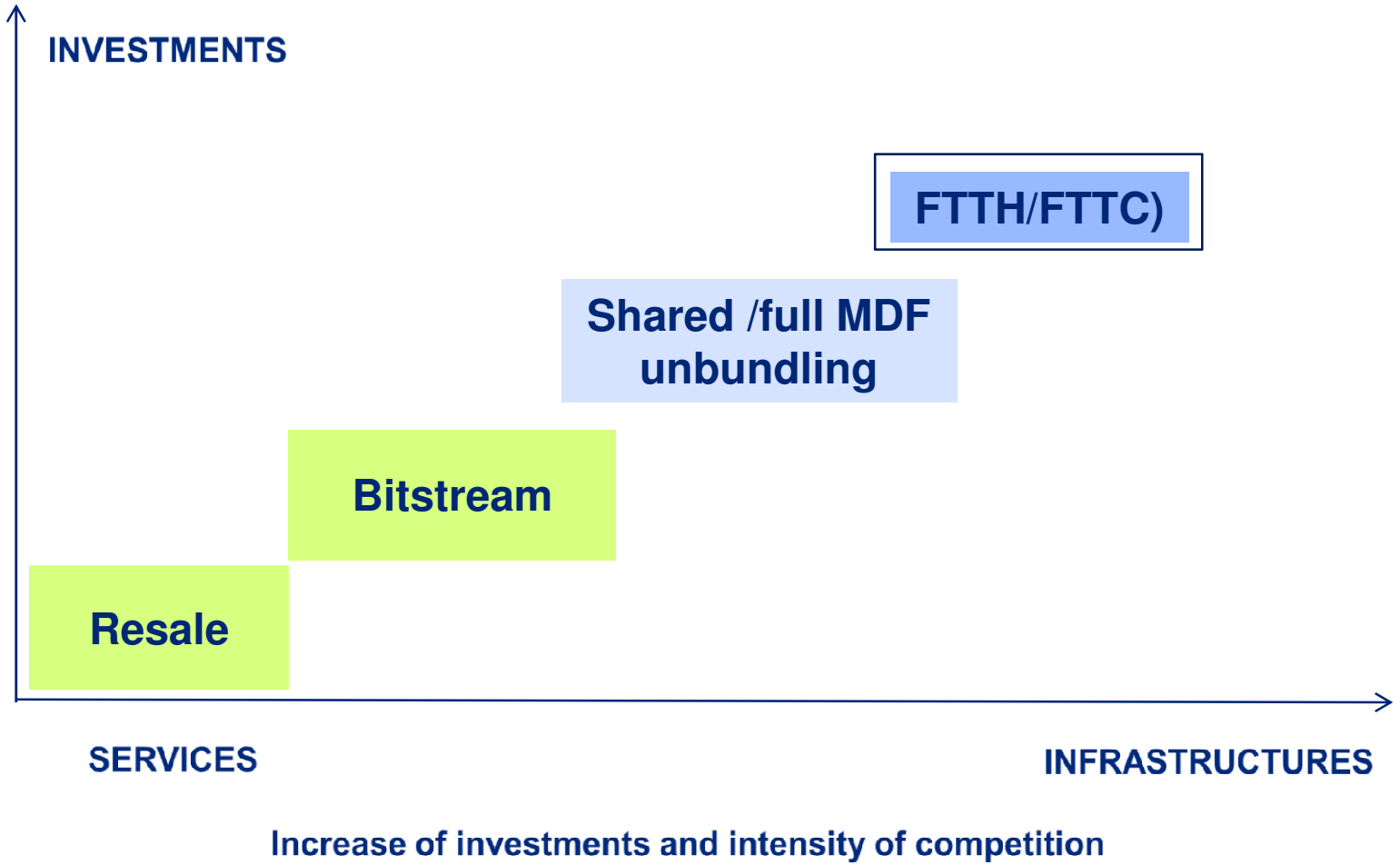
- **NGN costs should be lower** and less dependent on traffic volumes.
- NGN features create fundamental problems if we wish to cost an **individual service for "cost-based wholesale price" remedies**



- **Data services dominate voice traffic volumes contributing to an increase of data revenues in the operators accountings.**

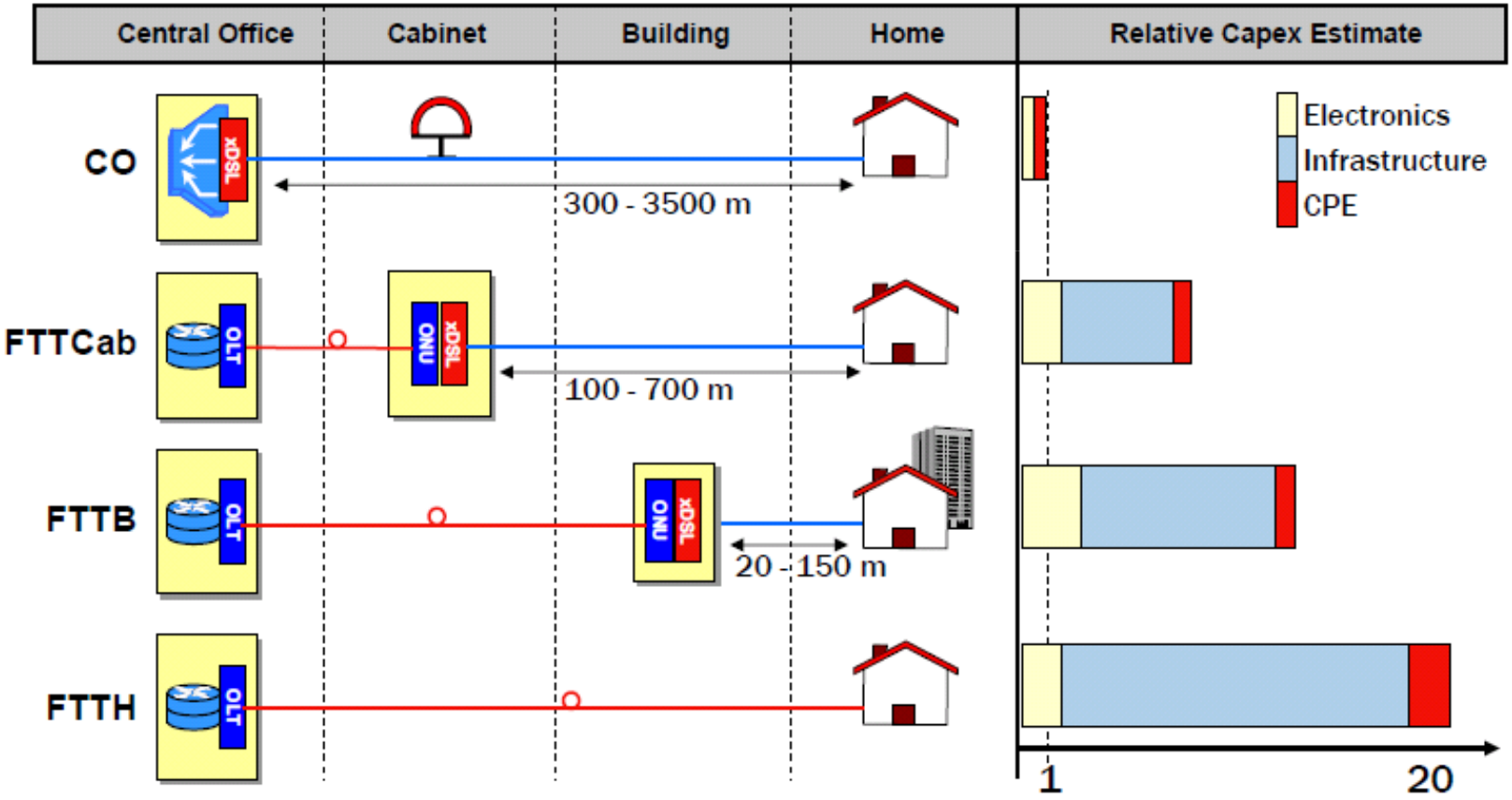
5.Broadband/ NGN regulation.

• The **main barriers of FTTC /FTTB and FTTH** are civil engineering cost (horizontal barrier), in-house wiring (vertical barrier), co-location at the street cabinet, and backhaul between the Street Cabinet and the operators' networks.



5.Broadband / NGN regulation.

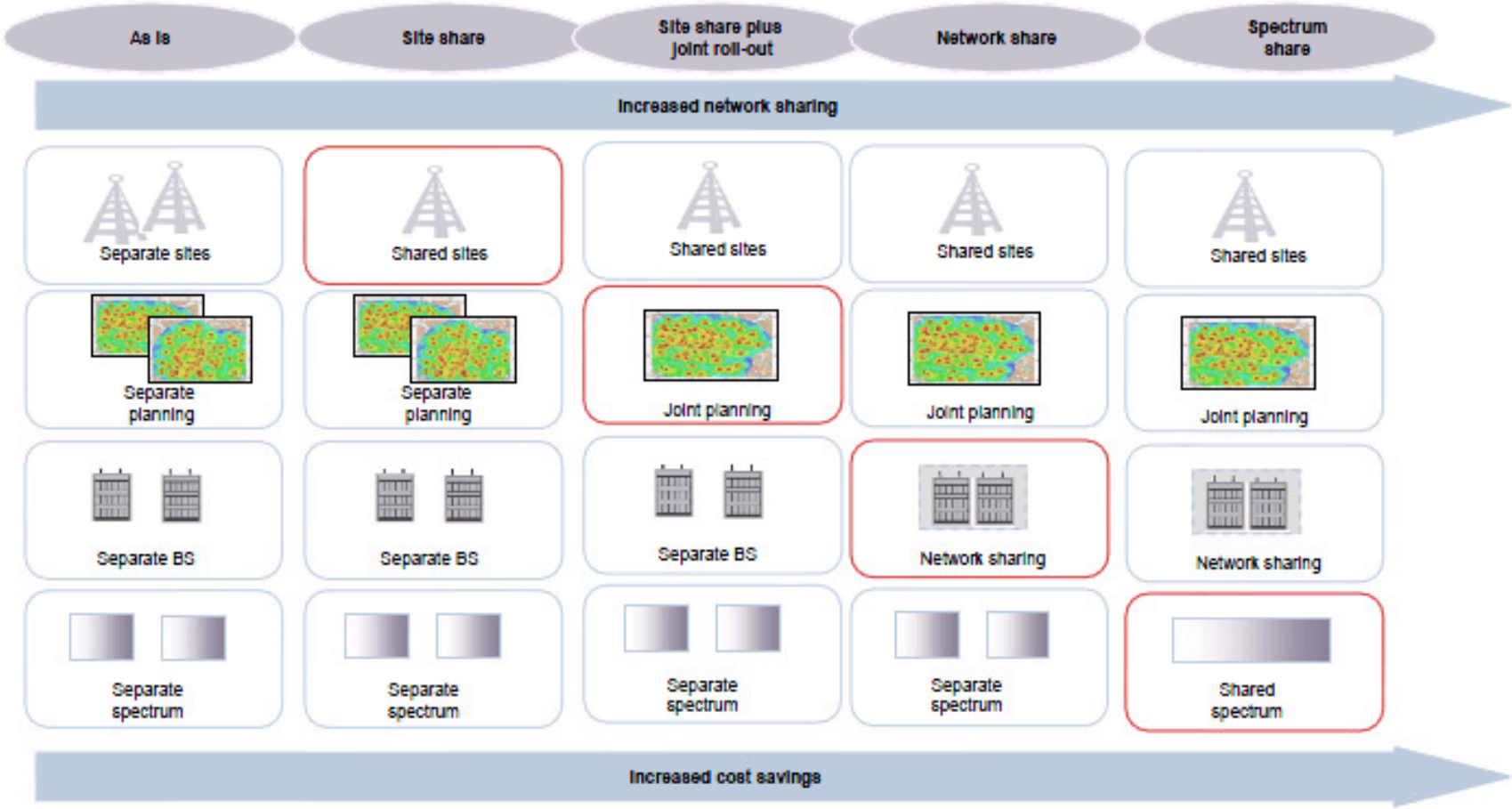
Due to the high investment in Fiber, **only where alternative operators have sufficient market share** and access to infrastructure (ducts from the municipalities) it is possible to achieve a reasonable payback



Source: Telecom Italia

5.Broadband/ NGN regulation.

Some operators have decided to share their networks under several options in order to reduce their opex and capex: site sharing, RAN sharing and backhaul sharing

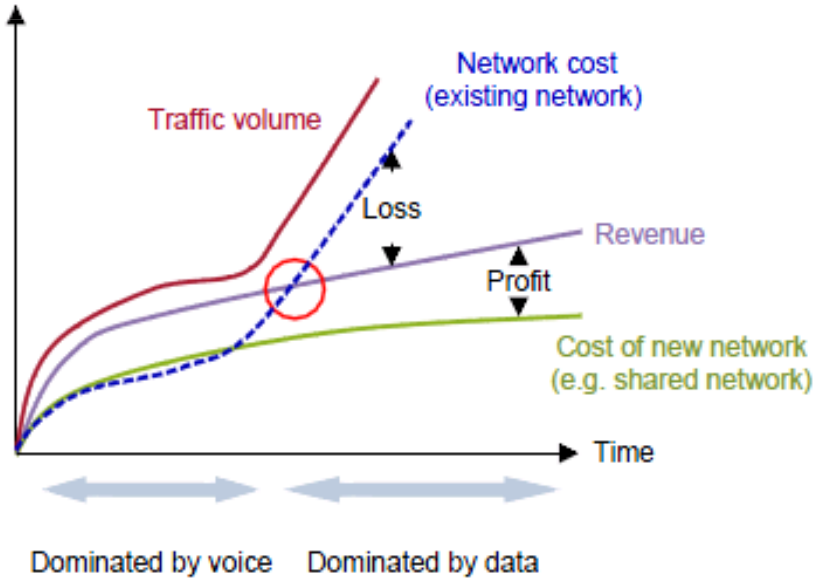


5.Broadband/ NGN regulation.

The main driver **to share networks is reducing network costs** that represents **one-third of total expenditure**.

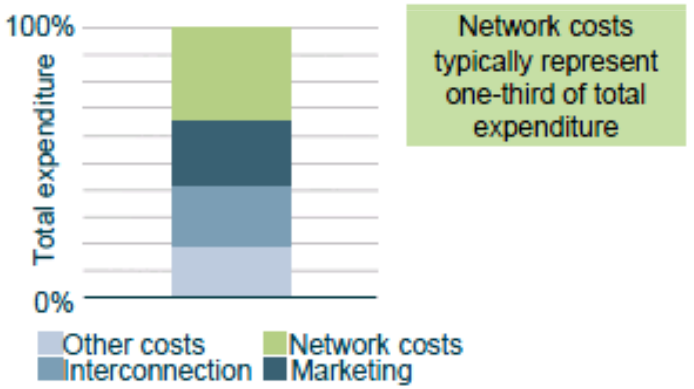
- **Capex**: 37% buildings and materials, 31% power, 15% BTS or Node B, 6% backhaul, 11% other
- **Opex**: 20% electricity, 20% hw and sw, 15% land rent, 14% backhaul, 31% other
- Another driver could be to **extent coverage into rural areas**,

Comparison of the network economics of legacy and LTE networks



Source: Analysis Mason

Typical expenditure by an European MNO



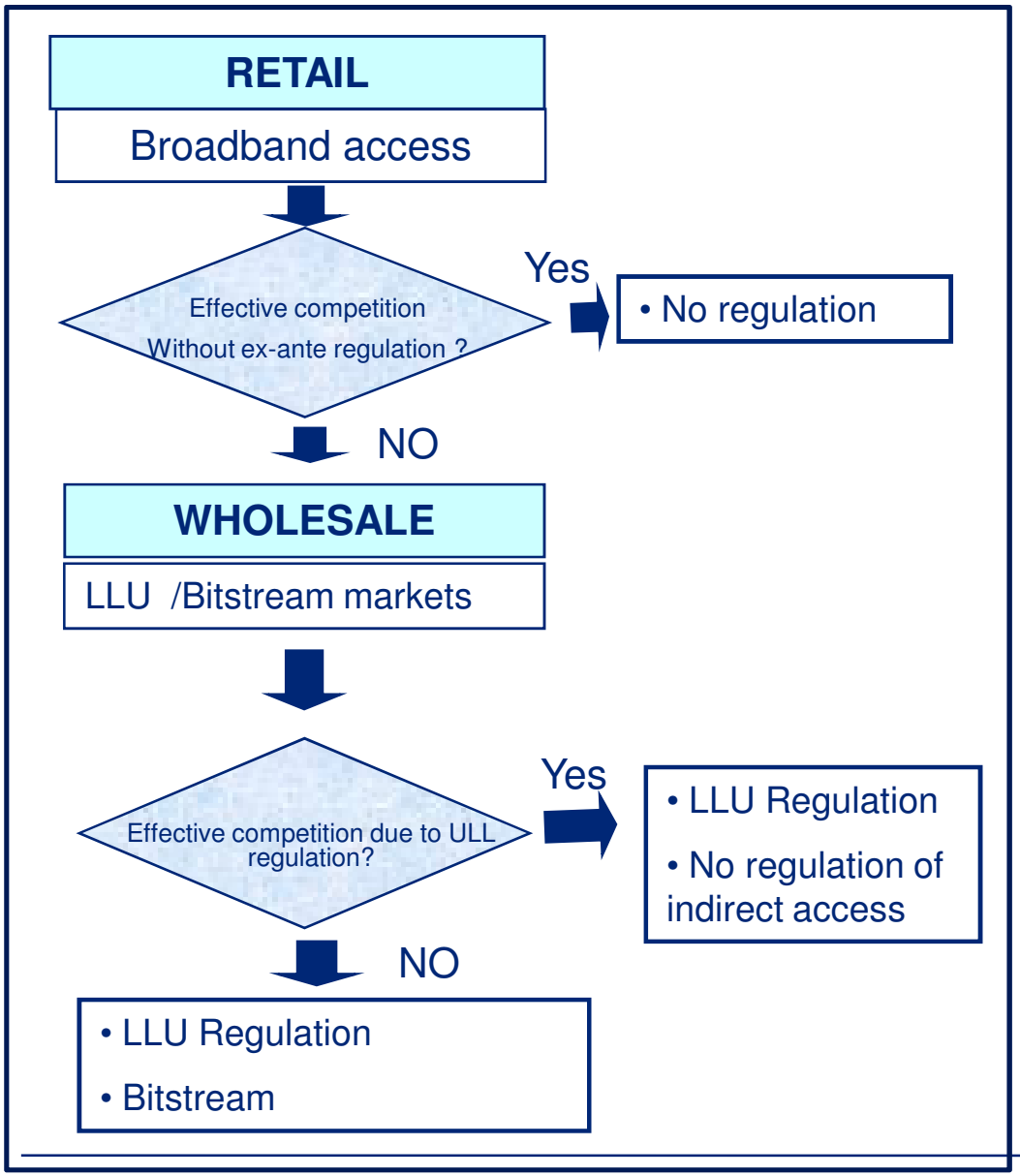
Source: Analysis Mason

5.Broadband/ NGN regulation.

NGN are facing different assessments to traditional remedies or regulatory strategies, taking into account the relationship between services and networks.

ACCESS NETWORK	• Already shared **access costs cannot be sensibly/easily split into services** • **"Customer dependent costs" are mixed with traffic dependent costs** and co- exist in the access network or even at customer premises • **Copper local loop is no longer a clear demarcation:** – Even in traditional networks, the definitions have been a problem with some "arbitrary" allocations of nodes from access to core • **Traditional definitions** (often in directives or law) **cannot be easily applied** • NGN access seems to be the **enduring bottleneck**
CORE NETWORK	• **Services share the same network** – in the past each had their own dedicated network (and costs). A large amount of costs are fixed/common to many services • In the past **shared systems' cost could be split based on technical and economic factors** that were generally agreed on and based on good cost driver logic • **NGN services are delivered by application severs** - more separate from the networks • **Service providers should be able to configure the network** (say QoS – speed, priority) to suit the service

5.Broadband /NGN regulation.



- A **Minimal intervention** principle
- **Wholesale regulation**
- To incentive **investment** and **innovation**
- Regulation applied to **emerging markets**
- Regulation must **no disturb competition**
- **ex-ante policies** proportional to the market situation

5.Broadband/ NGN regulation.

How can we regulate these networks/services?

• **Costing methods** for traditional networks show some difficulties:

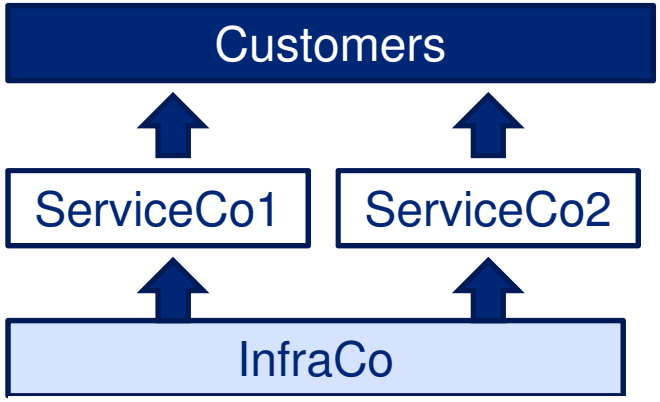
  • NGN services share the same network components. **The cost driver to each service is not as clear as PSTN** (Service routing table more difficult)

  • The problem is ***not how to make an NGN cost model*** *but also how to get a service-costing allocation scheme with a rationale economic and following technical and commercial reality :*

    • *M*odels based **on traditional "cost drivers" are difficult** because costs for some services will be too low and others too high and not aligned with current market revenue trends

• **Different pricing alternatives** (Cost based prices, reasonable prices, others…) ????

• **Functional separation** ????



Regulated company

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6.Cost modeling: main issues

Bottom up models - LRIC	Top down models

Assets, working capital and operational costs

- A functioning network incurs operational costs. Both capital and operational costs must be recovered. In addition to the fixed assets, some working capital is required – net assets less net liabilities. This requires an additional investment that should be allowed for.

Annualisation methodologies

- Annualisation charges are calculated on capital investment as the sum of the cost of capital, and depreciation. The effective annual cost of the investment is required to define the revenue needed to provide for the replacement of the investment (asset) and to allow a fair return on the investment (profit).

Cost of capital (WACC)

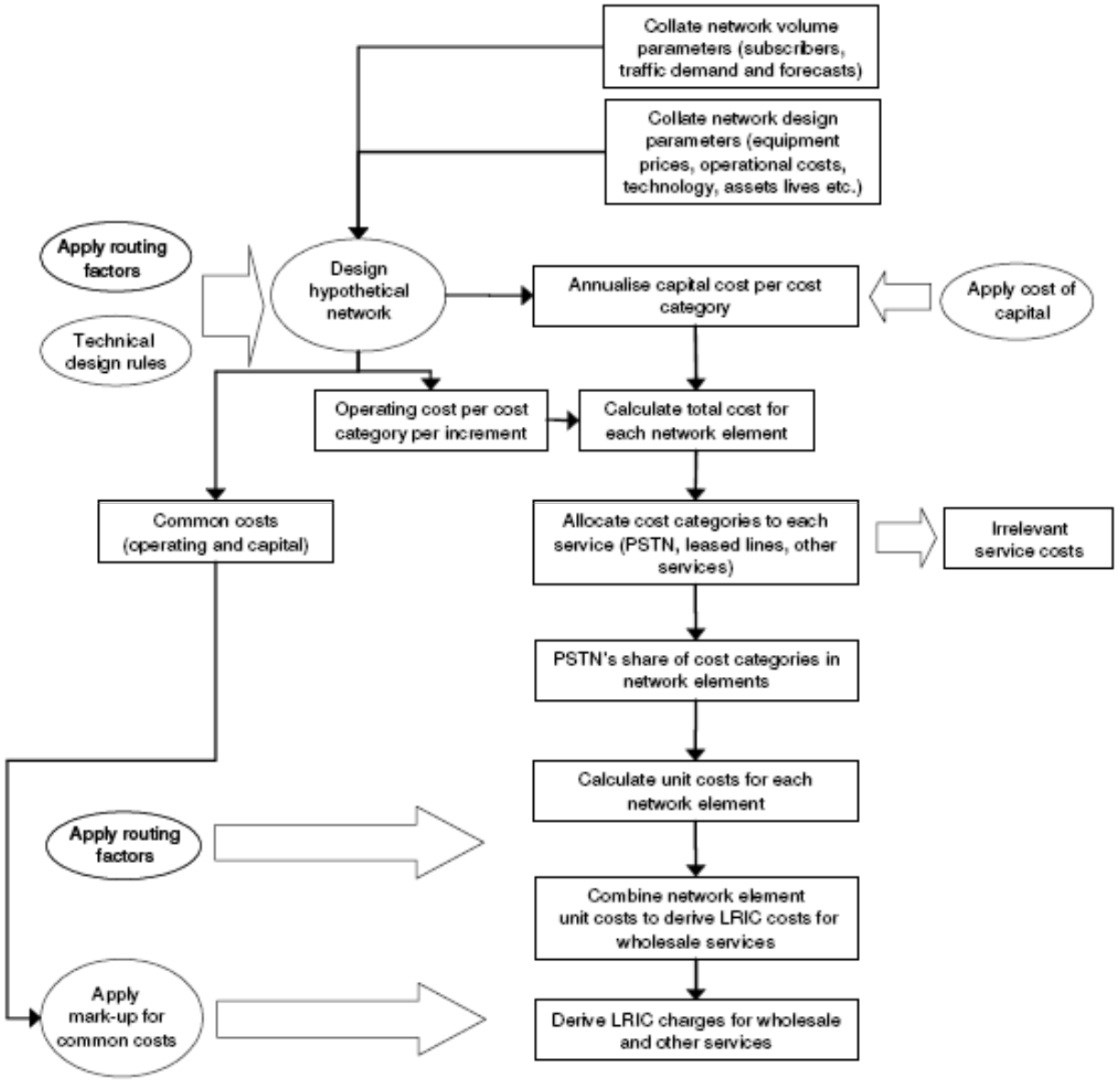
- It provides a fair return on the asset investment. If it is correctly defined, it allows sufficient return to account for the risks of the associated telecoms market

Routing factors:

- Specify, for each type of service, the average use made of each type of network element

Others

6.Cost modeling: bottom up - LRIC

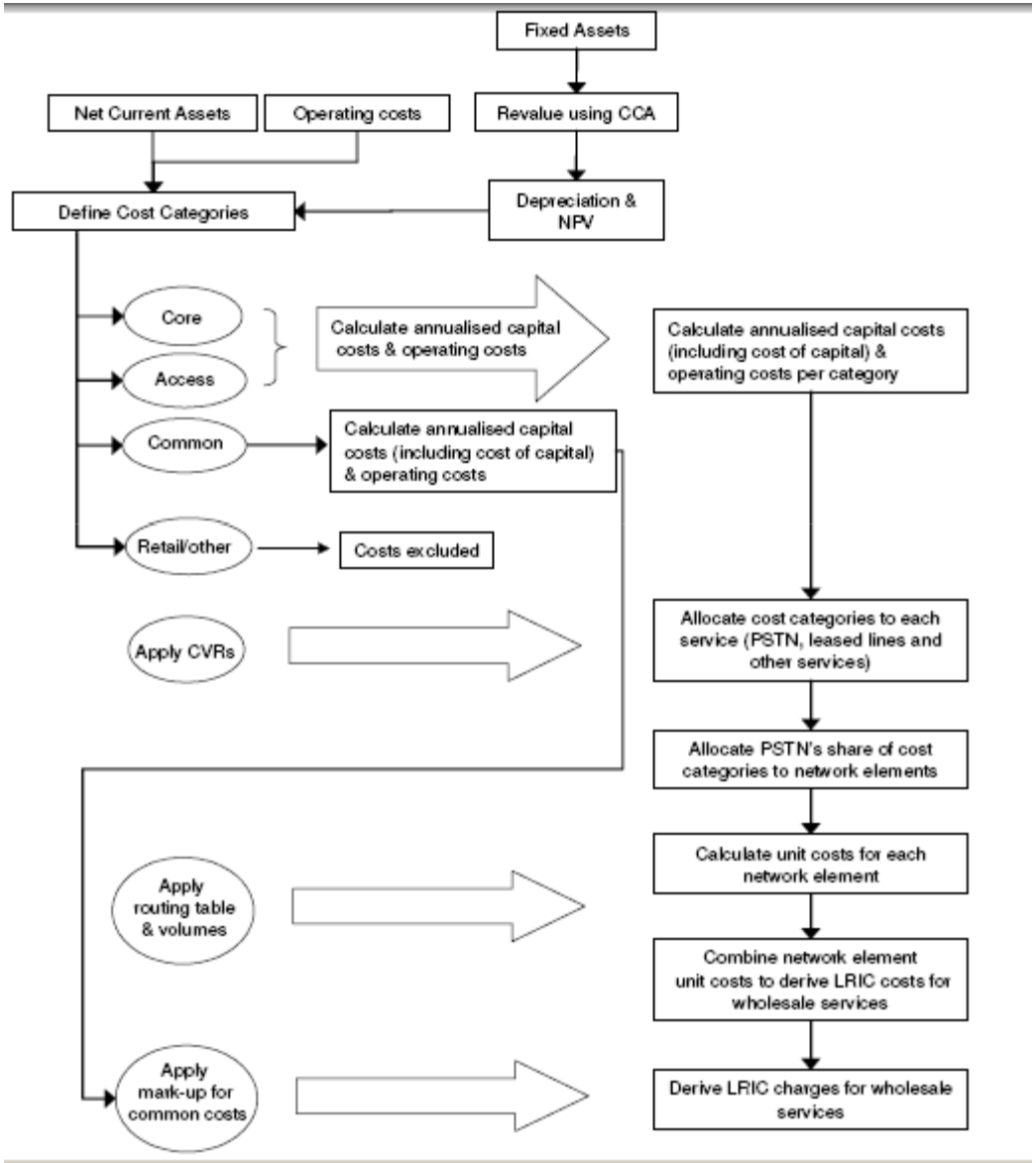


- The main parts of the model are:
  - Estimating demand and determining input unit costs
  - Building an hypothetical network
  - Calculating network elements
  - Determining the cost of network elements
  - Costing services

- The Bottom-Up model shall be used as part of a process to validate and reconcile results obtained from the Top-Down model to achieve fairly determined LRIC estimates for key wholesale services

- The Bottom-Up models may be updated periodically and used to compare with updated versions of the Top-Down models.

6.Cost modeling: Top down



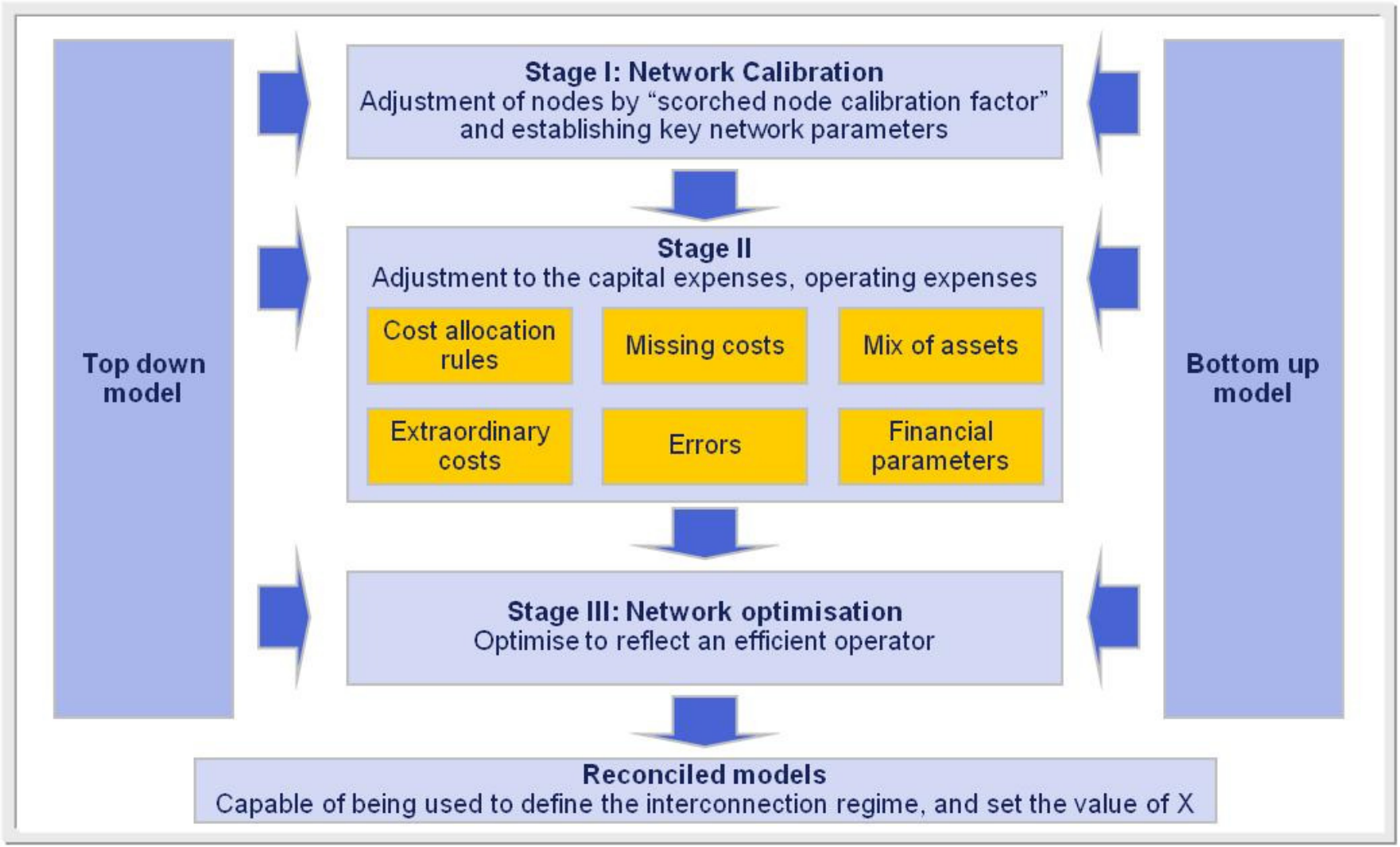
• Since **LRIC is a forward-looking concept, current cost accounting (CCA**) principles have to be used to estimate the appropriate Gross value of assets (an annualisation method has to be defined) . This involves re-valuing assets on the basis of the replacement cost of the modern equivalent asset (MEA).

• Under top down models and using FDC (Full Distributed costs) you have a first draft to calculate asset revaluation by using historical cost accounting

• **Cost-volume relationships** (CVRs) show the way in which costs change in relation to a change in the volumes of the service provided.

• **Average cost of capital** (WACC) is a key element of this model

6.Cost modeling: Reconciliation process



6.Cost modeling: real options

Cost models based on **real options theory** could fit with this capital intensive markets

• **Traditional regulatory practice** evaluates investments according to the well-established **net present value theory**

• In economy, "**real option**" is the term given to the possibility to **modify a project,** and it is really **useful with** investment decisions made under **uncertainty:**

- The investment is partially or completely irreversible.
- There **is uncertainty over the future re**wards from investment.
- Investors usually have some leeway about the **timing of their investments**

Traditional models based on **the net present value** rule assume that investment is **either reversible or is a "now or never proposition",** so it **does not model the value** that might be associated with the choice **of using different timing strategies**.

From a financial point of view, pricing cost oriented implies that Net Present Value (NPV) is equal to zero.

6.Cost modeling: real options

Value of "waiting" option

- Investment at t=0: NPV = 0 estimated access value price" p0"
- Investment at t=1: NPV(p0)>0. In this case, when sunk costs exists, there is some uncertainty regarding future cash flows and you can have the possibility to wait, and unlike rational investor that invest at t=0, the "wait price" is different from NPV =0

Distortion generated without including "waiting" value

- Competitor , that taking into account uncertainty and the access price p0 (NPV =0) wants to rent infrastructure from incumbent at t t=0,and enter into the market at t=1.
- Investment at t=1: NPV(p1)>0 and p1<p0, could fix a lower price (p1) than p0, whereas that using p1 incumbent would have NPV<0. In this case, regulation would provoke some advantage to the entrant disturbing the competence.

- The rule to fix prices should be the one that do not create "waiting value". Prices which do not disturb competence are not sensible to invest at the moment t=0 or at t=1;

Investing at t=0?

1. T=4: NPV(p4)=0, estimation of "p4"
1. T=3: NPV (p3)=0, estimation of "p3"
1. T=2: NPV (p2)=0, estimation of "p2"
1. T=1: NPV (p1)=0, estimation of "p1"

} p4>p3>p2>p1>p0

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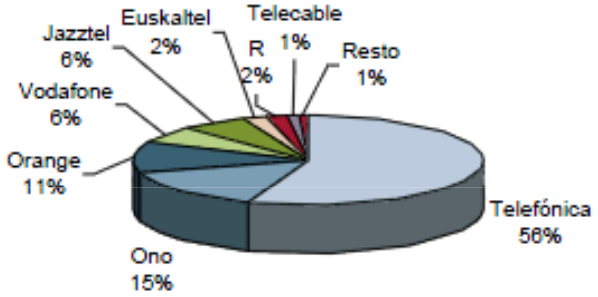
7.Case: Spain

Several fixed and mobile operators (Telefónica, Vodafone, Orange, Jazztel and ONO) are leading the deployment of fiber network in Spain

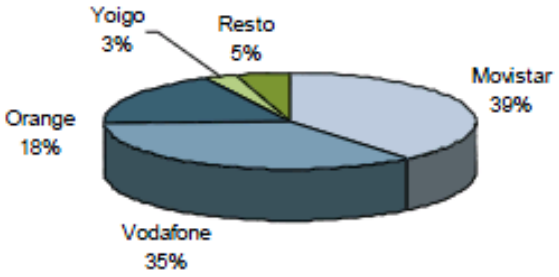
Share of the fixed broadband market (Q4 2009)

Telefonica still has a dominant position, but OLOs (including ONO) are now winning the battle for new additions



Share of the mobile broadband market (Q4 2009)

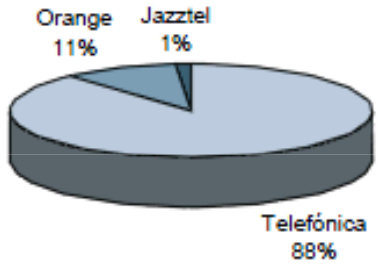
Due to their strong position in the mobile market, Vodafone and Movistar dominate the mobile broadband market



Source: Analysis Mason

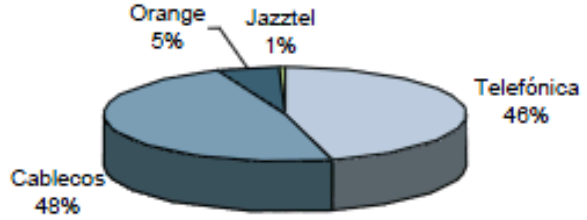
Share of the IPTV market (Q4 2009)

Telefonica's Imagenio is the most successful offer in the market; OLOs are increasingly focusing on IPTV



Share of the triple-play market (Q4 2009)

Telefonica's Trio package is the most successful. Orange and Jazztel are investing heavily to expand in this market



Source: Analysis Mason

7.Case: Spain

• In general terms, **OLOS have decided to base theirs business models on Local Loop Unbundling** (LLU) as a mechanism to be different from other operators. But, growing presence of some operators in exchandes where only traditional SMP operator was, has created an **aggressive competence** and a **large variety of services .**

• Differenciation through LLU has helped **packet services** appearance

• **LLU**, like cable technology, is focused on certain areas with special social and economic conditions . SMP operators **are losing market power** in that regions

Competence based on Infrastructures	Competence based on services

7.Case: Spain

Market, competition and regulatory conditions could make fibre an opportunity for new entrant with manageable risks

Growing demand	• **B2C* demand is increasing due to the growing penetration of high-bandwidth services (non-linear TV, fixed and** mobile broadband) as well as growing capacity requirements for these services • **B2B** demand is also experiencing significant growth, with increasing needs for more mobile backhaul capacity and** FTTx deployments in urban areas
Limited competition	**Backbone and aggregation – the majority is under the control of several electric companies, which provide** services directly to retail operators • **Access – Telefonica is the only operator with enough funds to deploy an FTTx network; cable operators will deploy** DOCSYS 3.0 in selected areas; whereas the high investments required would make it difficult for LLU operators toenter this market
Positive regulation	**Remedies in Market 4, including access to Telefonica's ducts, provide a workable environment. Proactive** lobbying with the CMT would improve the investment case • The European Commission and the Spanish authorities view the deployment of high-speed fibre as a **strategic objective, which could entail the allocation of public funding**
Value proposition	• **Backbone and aggregation – opportunistic approach on a route-by-route basis or national network with key points** • **Access – there is an opportunity for Abertis to jointly deploy fibre with broadband operators, as well as deploying fibre** to the mobile operators' base stations
Geographic scope	• The business case is clearly **more attractive in the most densely populated areas where key potential clients are** already present through LLU • At a later stage, the potential in other areas could be examined on a case-by case basis depending on the economics
Manageable risks	• The business case is clearly **more attractive in the most densely populated areas where key potential clients are** already present through LLU • At a later stage, the potential in other areas could be examined on a case-by case basis depending on the economics

7. Case Spain.

A favourable regulatory environment benefits the deployment of fibre networks, potentially with public funding

Spanish regulation

The CMT has imposed useful regulation in Markets 4 and 5 with the aim to create a favourable regulatory environment for investment in FTTH by:

- mandating open access to fibre networks in buildings: the operator which first cables a building needs to provide access to competitors
- mandating access to Telefonica's ducts for the deployment of FTTH and HFC-based NGA networks, as well as for mobile backhaul

Assessment of Spanish regulation

According to the CMT apporach, it makes a workable framework:

- the same Telefonica's local exchanges specified in the OBA are also open for the use by other operators of Telefónica's ducts
- the prices have been set at levels that may allow a business case to be successful
- Some lobbying could be beneficial to clarify some grey areas left in the MARCo such as actual available duct capacity, SLAs, simultaneous deployment of several fibre cables, etc.

Public funding

- The objective of state-aid control is to ensure that these measures will lead to higher broadband coverage and penetration, or in a more timely manner than would otherwise occur without the aid

- The European Commission recently announced its endorsement of almost EUR300 million of public funding to support the deployment of broadband networks from September 2010. It also announced its intention to award up to EUR1 billion to improve broadband coverage in rural areas

Assessment of regulation for public funding

- It is key to identify the three different types of area: white (no NGA network in three years), grey (one single NGA network in three years) and black (two or more NGA networks in three years):
- currently it is difficult to envisage that more than 25% of the population will live in black areas by 2012 (limited deployment by Telefonica)
- The safest bet is to target white areas, although a new operator could try and build a case by arguing that it could build a more open NGA network, with effective wholesale products (including fibre unbundling) in grey areas

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8. Summary and conclusions.

1. **No homogeneous competence conditions**. Depending on the geography and economic conditions , **competence based on infrastructures** or on **services** is applied.

2. **Different access alternatives**, like LLU or mobile broadband, must be taken into account in order to analyze markets and define ex-ante obligations.

3. **Next Generation Networks (NGN) investments** open the discussion related to the remuneration of the risk assumed by operators to deploy the networks.
   Traditional weighted average cost of capital (wacc) vs **real options**

4. **Calculating NGN pricing** face some difficulties compared with traditional networks and services: LRIC models - bottom up vs top down

5. **A new investment cycle** bring us new models to be considered: **real options**

6. **Take into consideration geographical areas** is crucial, from a regulatory point of view, in order to provide proportionate obligations.

Regional Seminar on Costs and Tariffs for Member Countries of the Regional Group for Asia and Oceania (SG3RG-AO)

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