Brazilian experience on cost modeling project

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ITU

ANATEL
Agência Nacional de Telecomunicações

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AGENDA

1. Introduction
2. Cost modeling project – top down models
3. Cost modeling project – bottom up model
4. Main lessons learned

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MAIN MOTIVATIONS FOR THE COST MODELING PROJECT

What is a cost model? What is the use of it?

What are the impacts of the cost model in the telecom sector?

- ***Economic regulation***
- ***Competition***
- ***Settlement of disputes***
- ***Frequencies' bids***
- ***Continuity***
- ***Universalization***
- ***Regulatory framework review***

Source: Advisia

BACKGROUND AND MAIN MILESTONES

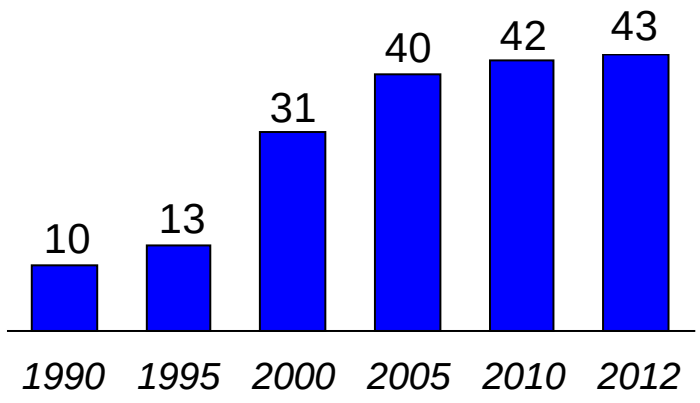
1995: Constitutional amendment	*2003: New PGMU*	*2011: Cost modeling project*
1997: LGT - Lei Geral de Telecomunicações	*2003: Telecom Public Policy (Regulation 4733/2003)*	
1998: Privatization	*2005: RSAC (Accounting Separation)*	
1998: PGMU – Universal Services	*2008: PGR – Plano Geral de Atualização da Regulamentação*	

Source: Advisia

DEVELOPMENT OF TELECOMUNICATIONS IN BRAZIL

Fixed lines

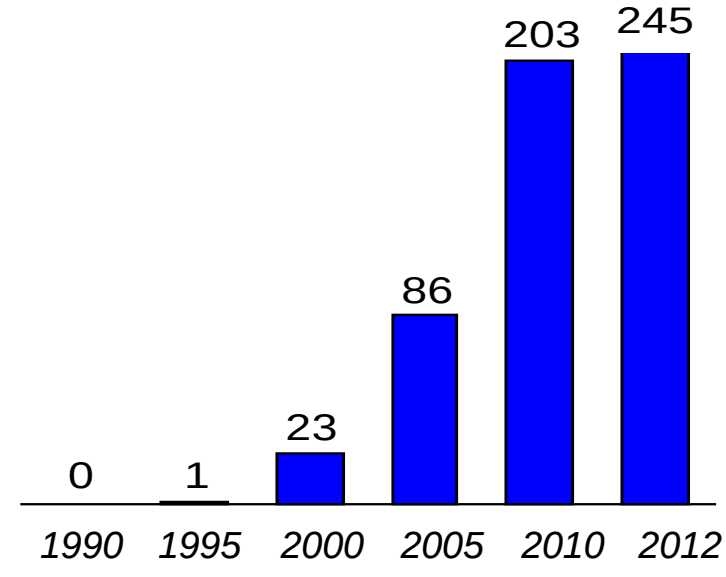
(Million)



Penetration (# fixed lines/ 100 households)	***29***	***34***	***68***	***75***	***73***	***74***

Mobile lines

(Million)

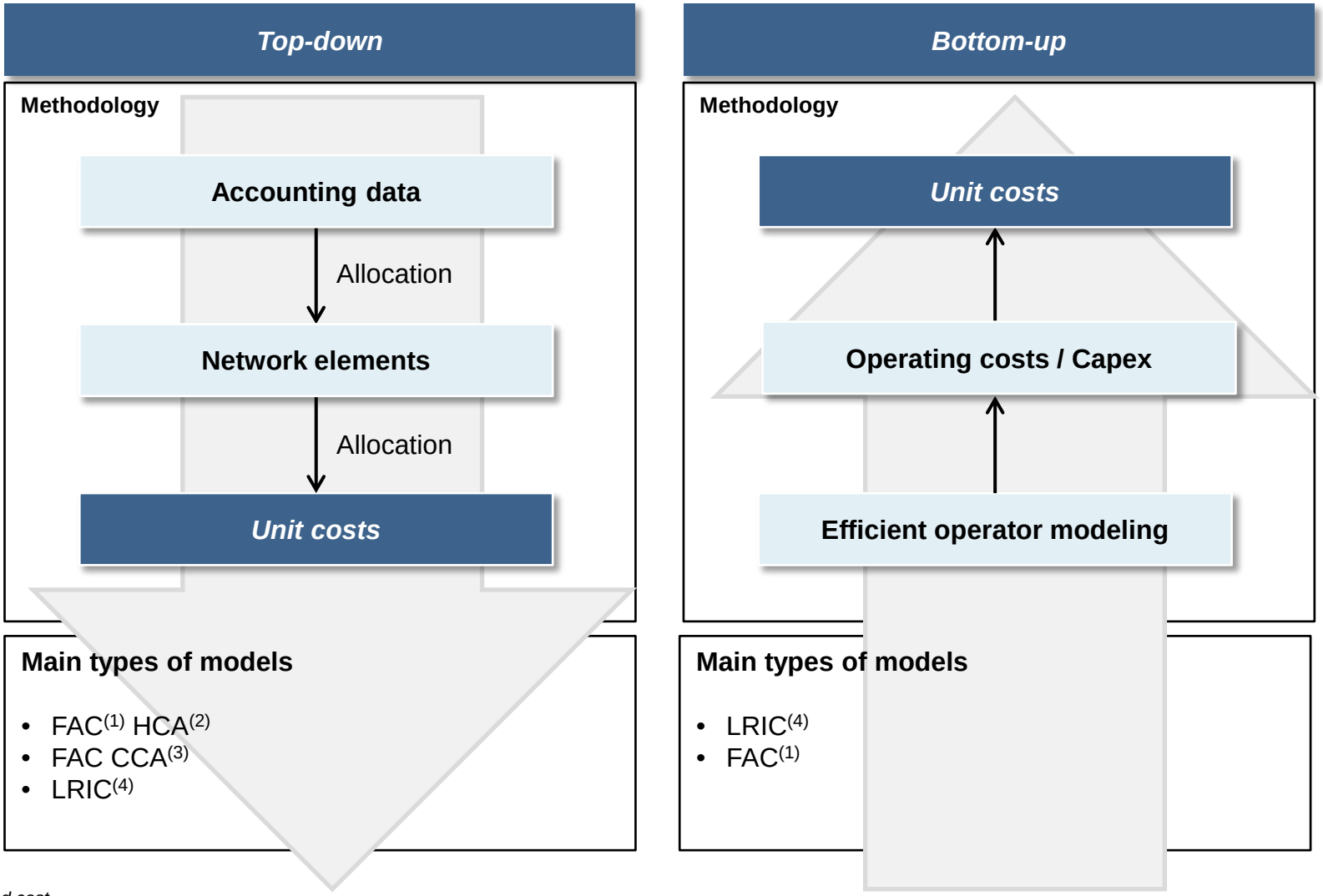


Penetration (# mobile lines/ 100 inhabitants)	***0***	***01***	***14***	***47***	***106***	***125***

Brazilian telecom regulation fomented a strong increase in number of lines and penetration – cost modeling should improve market conditions and enhance competition

Source: Advisia, Anatel, Teleco

COST MODELING METHODOLOGIES



(1) Fully allocated cost
(2) Historical cost accounting
(3) Current cost accounting
(4) Long run incremental cost

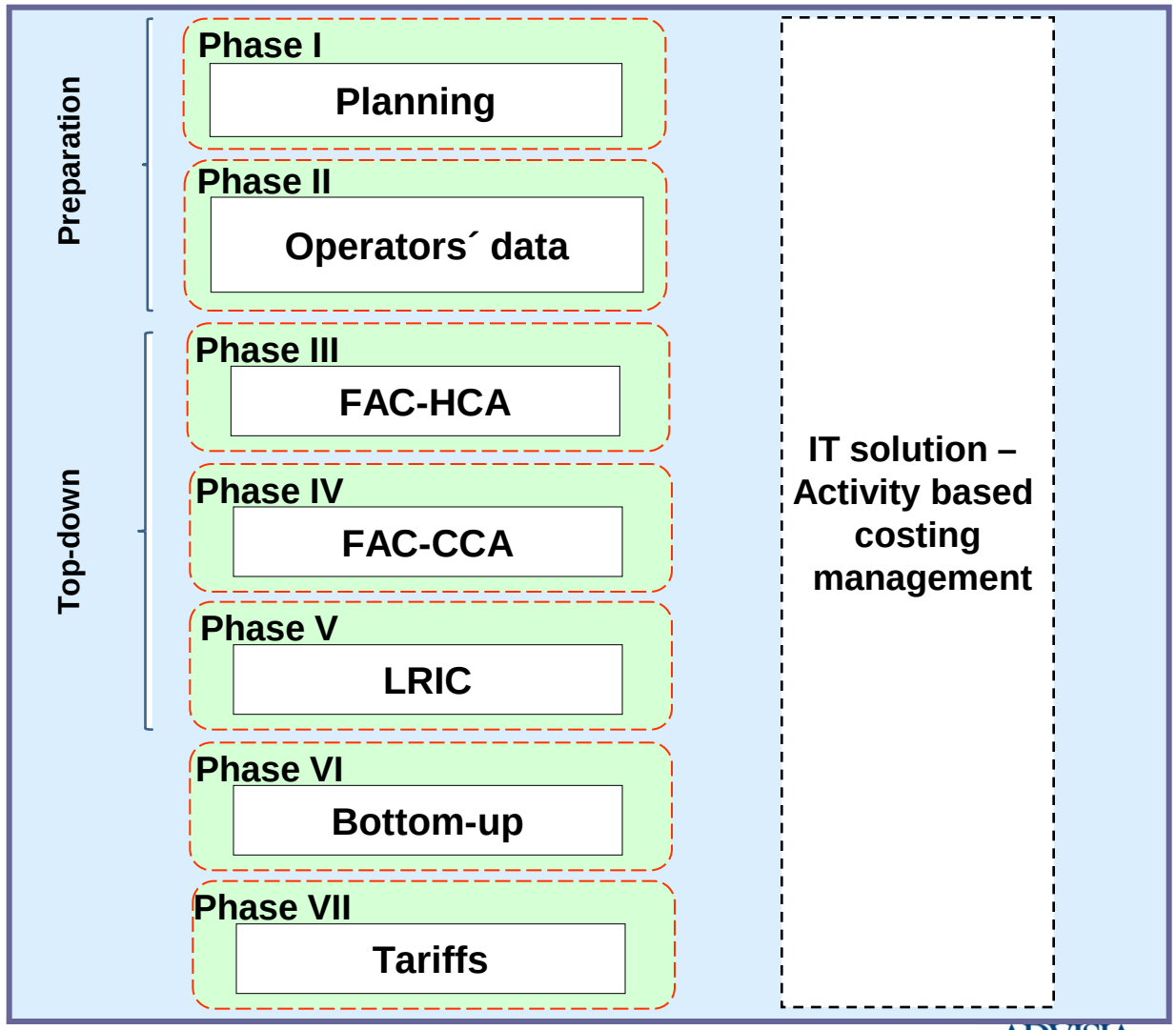
Source: Advisia

PROJECT SCOPE – PHASES

Elements

- All work fronts:
  - Top-Down FAC-HCA
  - Top-Down FAC-CCA
  - Top-Down LRIC
  - Bottom-Up
  - Methodology
- Granted:
  - STFC (fixed) operators
  - SMP (mobile) operators
  - Operators with Significant
  - Market Power in Leased Lines
- Activity-based-costing system (MyABCM).

Contracting structure



PROJECT SCOPE – ECONOMIC GROUPS WITH SIGNIFICANT MARKET POWER

	GROUPS	COMPOSITION (Resolução nº 101)
1	Telefônica	Telefônica (STFC); Vivo (SMP); Emergia (SCM), DTHi (DTH) …
2	oi	Telemar Norte Leste (STFC); TNL PCS (SMP); Brasil Telecom (STFC); 14 BrT Celular (SMP); BrT Com Multimídia (SCM), Vant (SCM)...
3	TELMEX	Embratel (STFC); Claro (SMP); Vésper (STFC);
4	CTBC	CTBC Telecom (STFC); CTBC Multimídia (SCM); Engeredes…
5	Sercomtel	Sercomtel (STFC); Sercomtel Celular (SMP) ...
6	TIM	TIM Nordeste (SMP); TIM Celular (SMP), TIM (STFC)…

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INTERNATIONAL CONSORTIUM PROFILE

Contracting partners

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Consortium

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Management consulting

- **Advisia** is a **strategy consulting firm** focused on supporting leading companies in identifying opportunities and solving complex problems
- **500 professionals in 14 offices with the OC&C partnership**

analysys mason

International specialists

- **Analysys Mason** is a consulting firm **specialized in telecom**, technology and media
- With nearly **250 professionals in 11 offices**, has supported several clients including national regulatory agencies in **100+ countries for 25 years**

Independent accountants

- **Grant Thornton** offers an extensive range of services including **audit**, tax, labor and corporate consulting, corporate finance and outsourcing to private and public companies headquartered in Brazil and worldwide

Grant Thornton

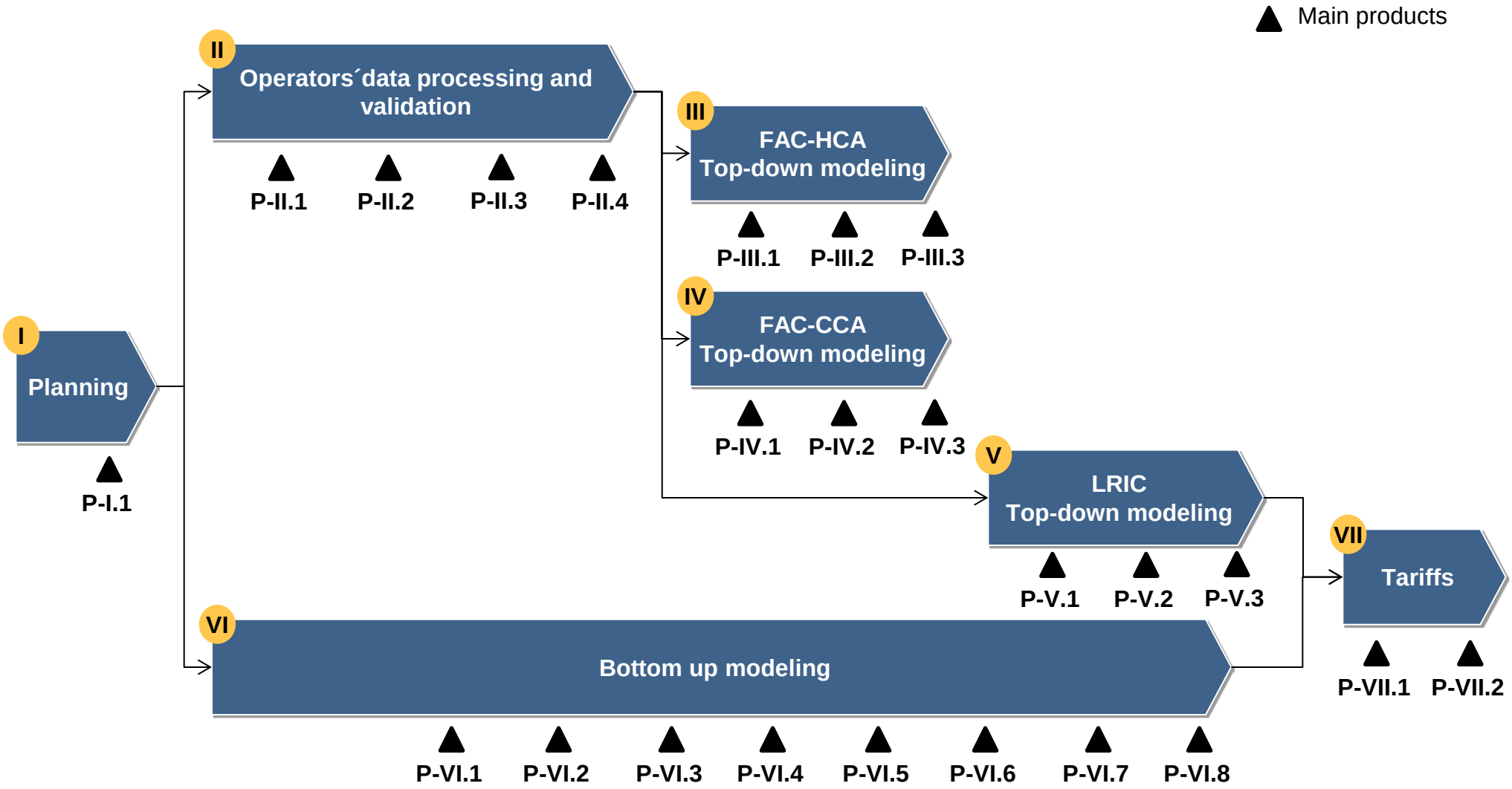
IT specialists

- **ETEG** develops customer demanded systems in several sectors
- Throughout **11 years** of operation, has become a reference in software development, and is one of the fastest growing SMEs according to Exame

eteg
Tecnologia adaptada à sua empresa

Source: Advisia

PROJECT PHASES AND MAIN PRODUCTS



Source: Advisia

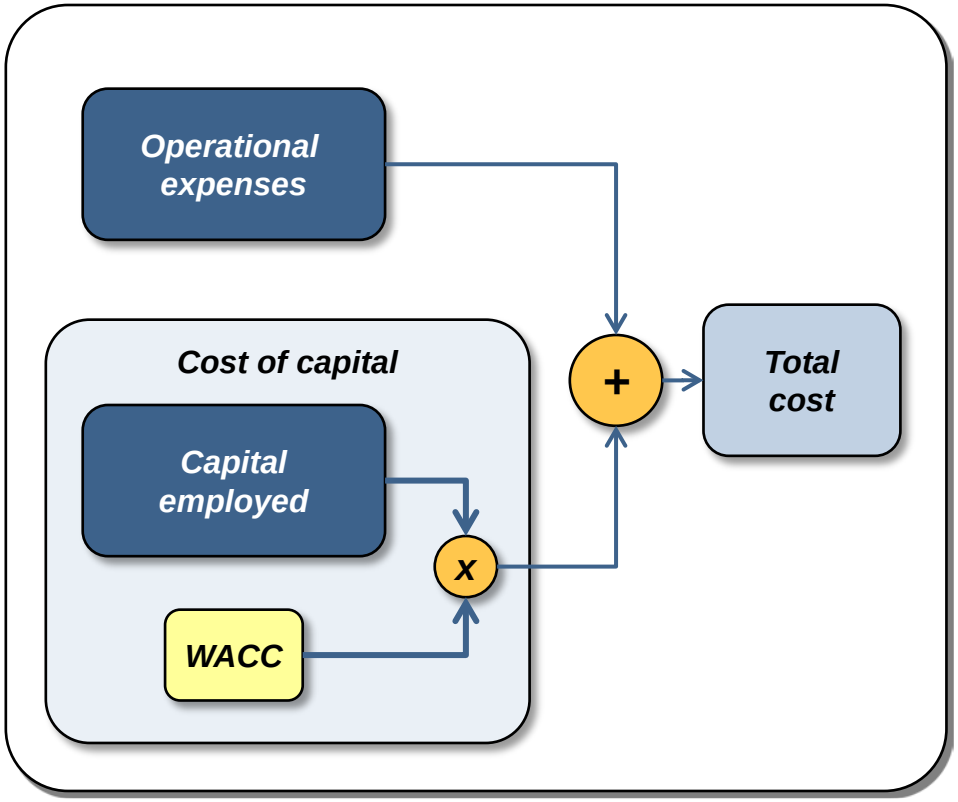
COMPARATIVE VIEW AMONG FAC-HCA, FAC-CCA AND LRIC

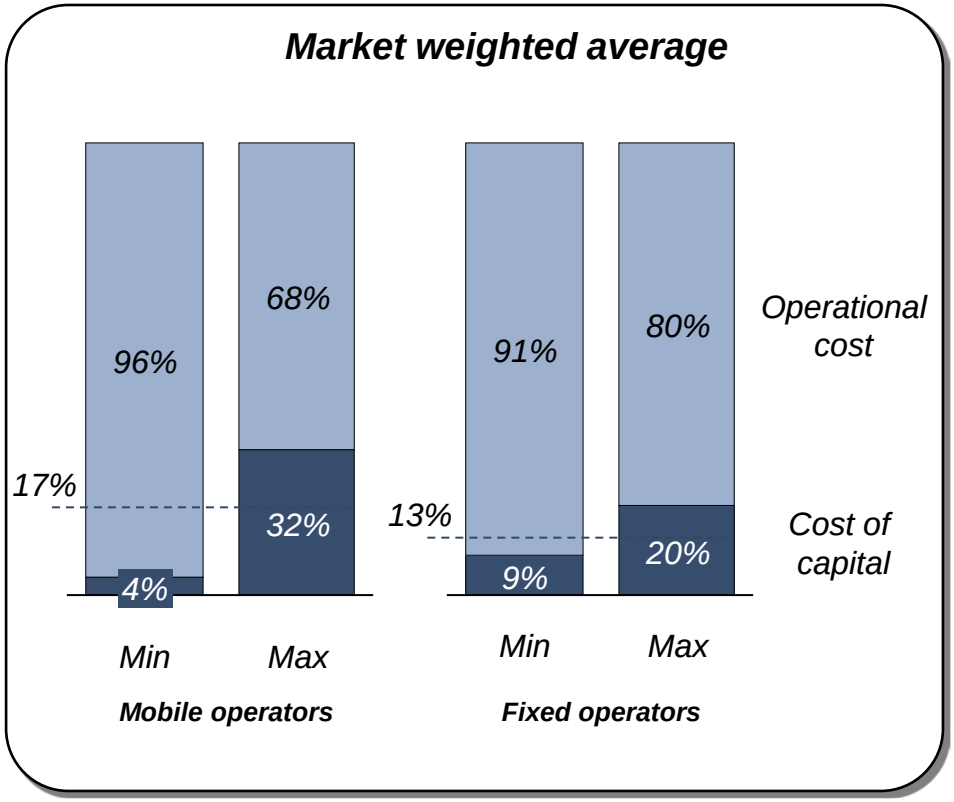
	FAC-HCA *Fully Allocated Costs* *Historical Cost Accounting*	FAC-CCA *Fully Allocated Costs* *Current Cost Accounting*	LRIC *Long Run* *Incremental Costs*
Characteristics	• Accounting costs allocated to products • Based on historical costs	• Transforms historical costs into current costs • May consider eliminating inefficiencies and replacing obsolete technologies	• Considers long run incremental costs allocated to products • Tries to reflect economies of scale and scope - array of cost-volume relationship
Time horizon	Past (*backward looking*)	Present	Future (*forward looking*)
Assets evaluation	Historical book value	Current value	Current / future replacement value
Network equip. / Topology	Existing	Existing and modern equivalent	New and modern equivalent
Efficiency adjustments	Not	Possible	Yes

The 3 models are hierarchical, complementary and evolutionary

Source: RTR, ITU, Advisia

TOTAL COST CALCULATION INCORPORATES OPERATIONAL EXPENSES AND COST OF CAPITAL

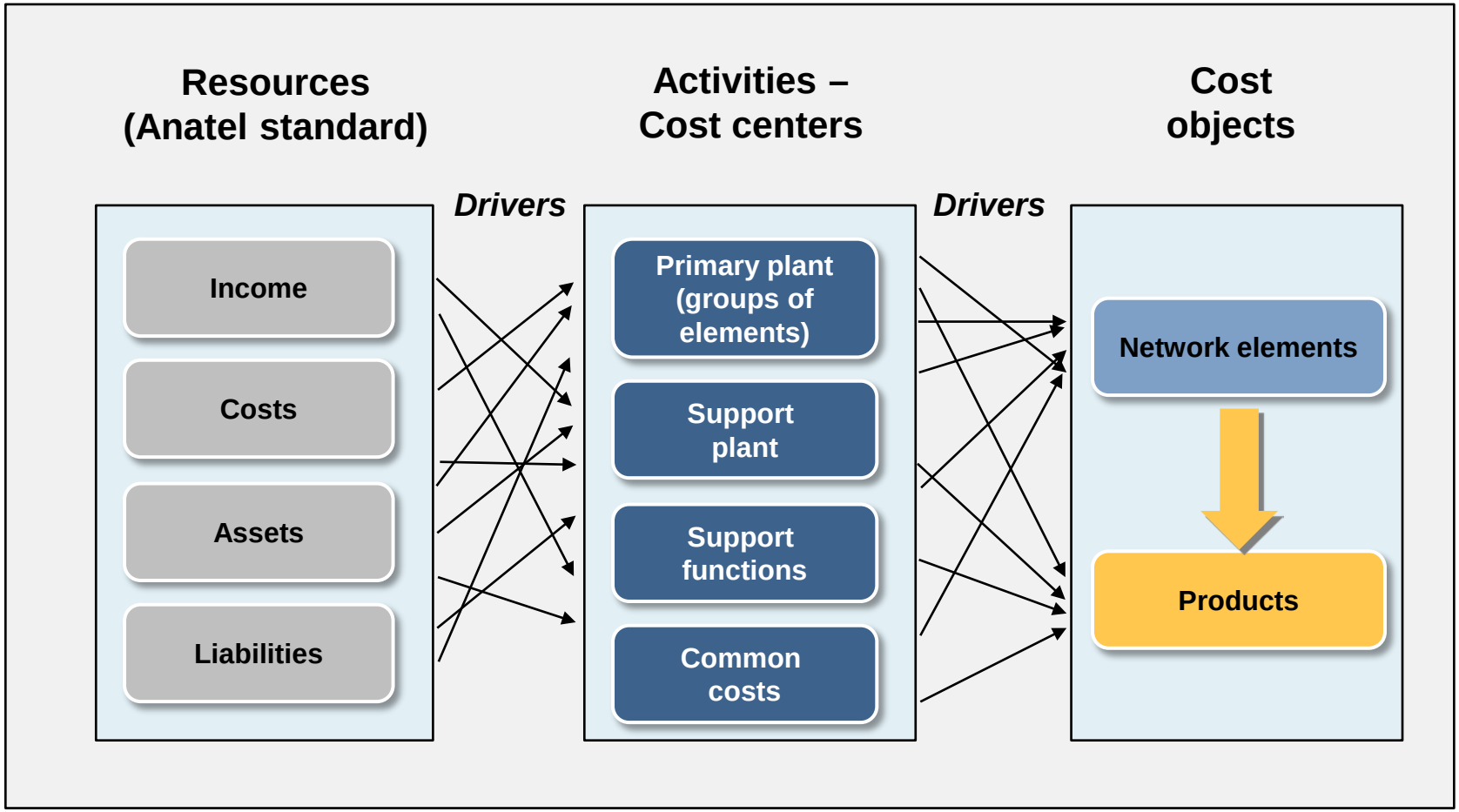




FAC-HCA total cost calculation considers, in addition to operational costs, also the capital employed for the telecommunication business

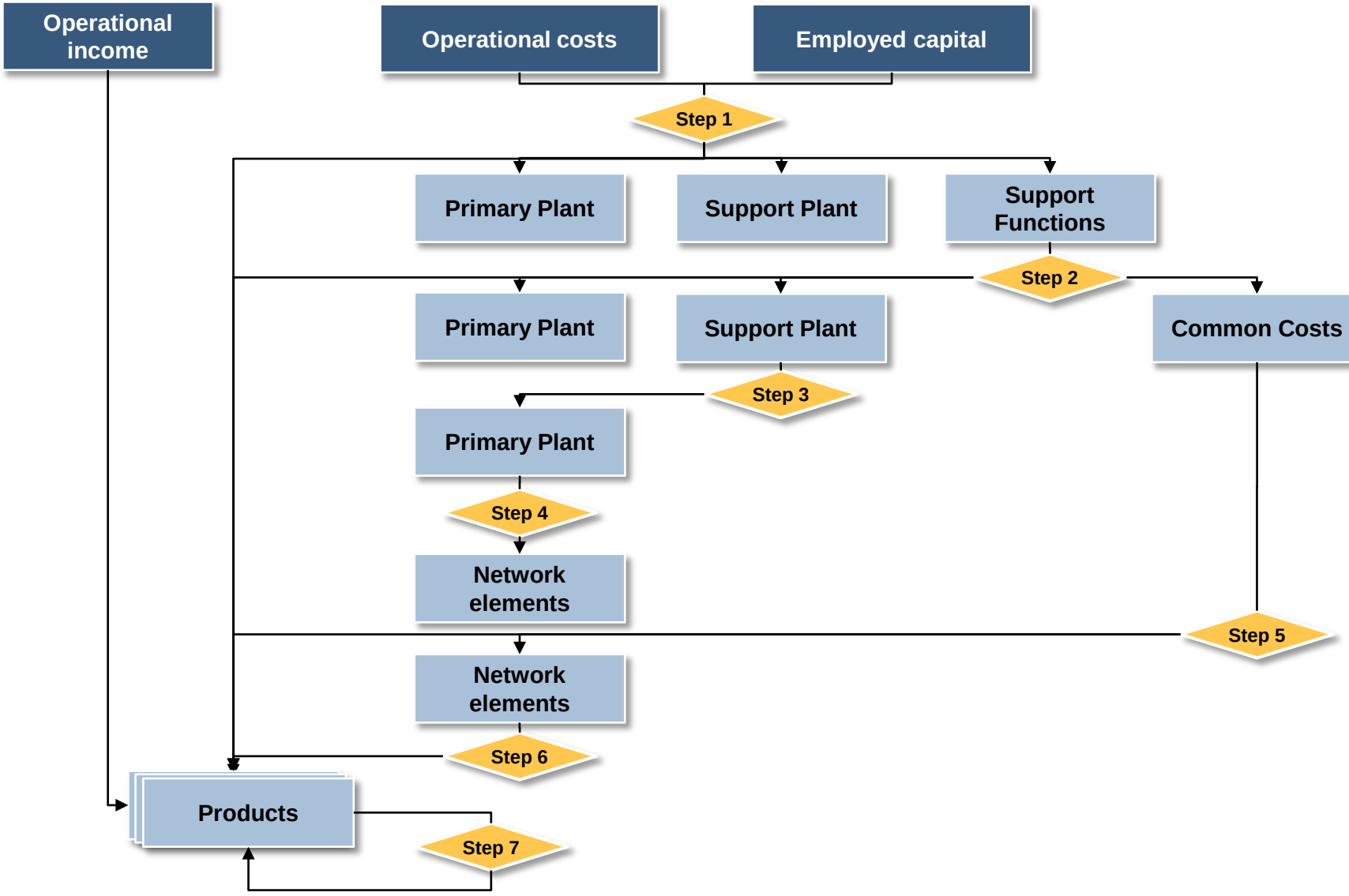
Source: Advisia

OVERVIEW OF *ABC-COSTING* METHODOLOGY



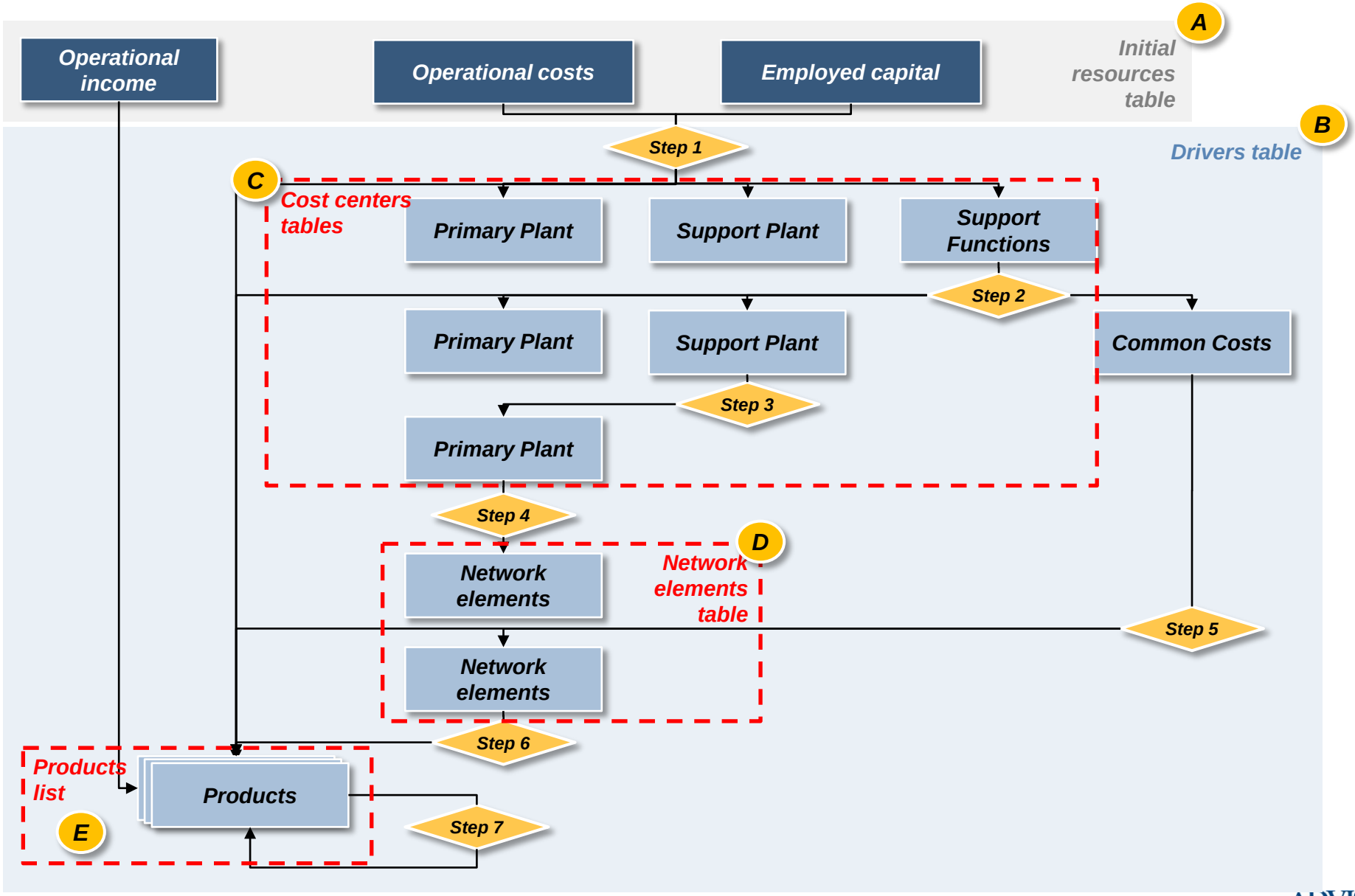
Source: Advisia

TOP-DOWN FAC-HCA MAIN ALLOCATION STEPS



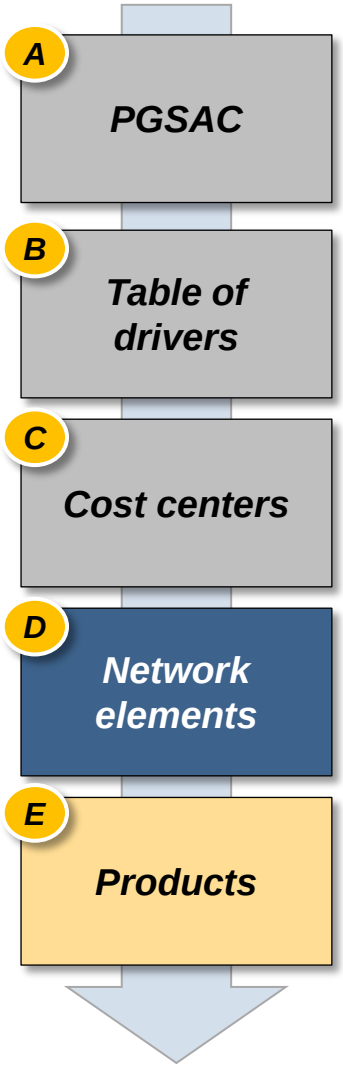
Source: Resolution 396, Advisia

MAIN RSAC TABLES COVER ALL SEVEN COST ALLOCATION STEPS



Source: Resolution 396/2005 Anatel, Advisia

THE FIVE MAIN TABLES FROM RSAC INCORPORATES OVER A THOUSAND ITENS



	Descrição	*Number of items*	*Variation among operators*
A	• *Standard chart of accounts for assets, liabilities, income and expenses, to be used as a starting point for allocations*	• *Aprox. 1000*	• *Low*
B	• *Table with drivers recommended to be used at each stage of allocation*	• *Aprox. 100*	• *High*
C	• *Structure of the items that compounds the intermediate allocations cost centers: Primary plant, support plant and support functions*	• *Aprox. 100*	• *Medium*
D	• *Table with the main elements that compounds the network (fixed or mobile), from which the costs are allocated to products in stage 6*	• *Aprox. 100*	• *Low*
E	• *List of products, divided by business area, for which costs are calculated*	• *Aprox. 300*	• *High*

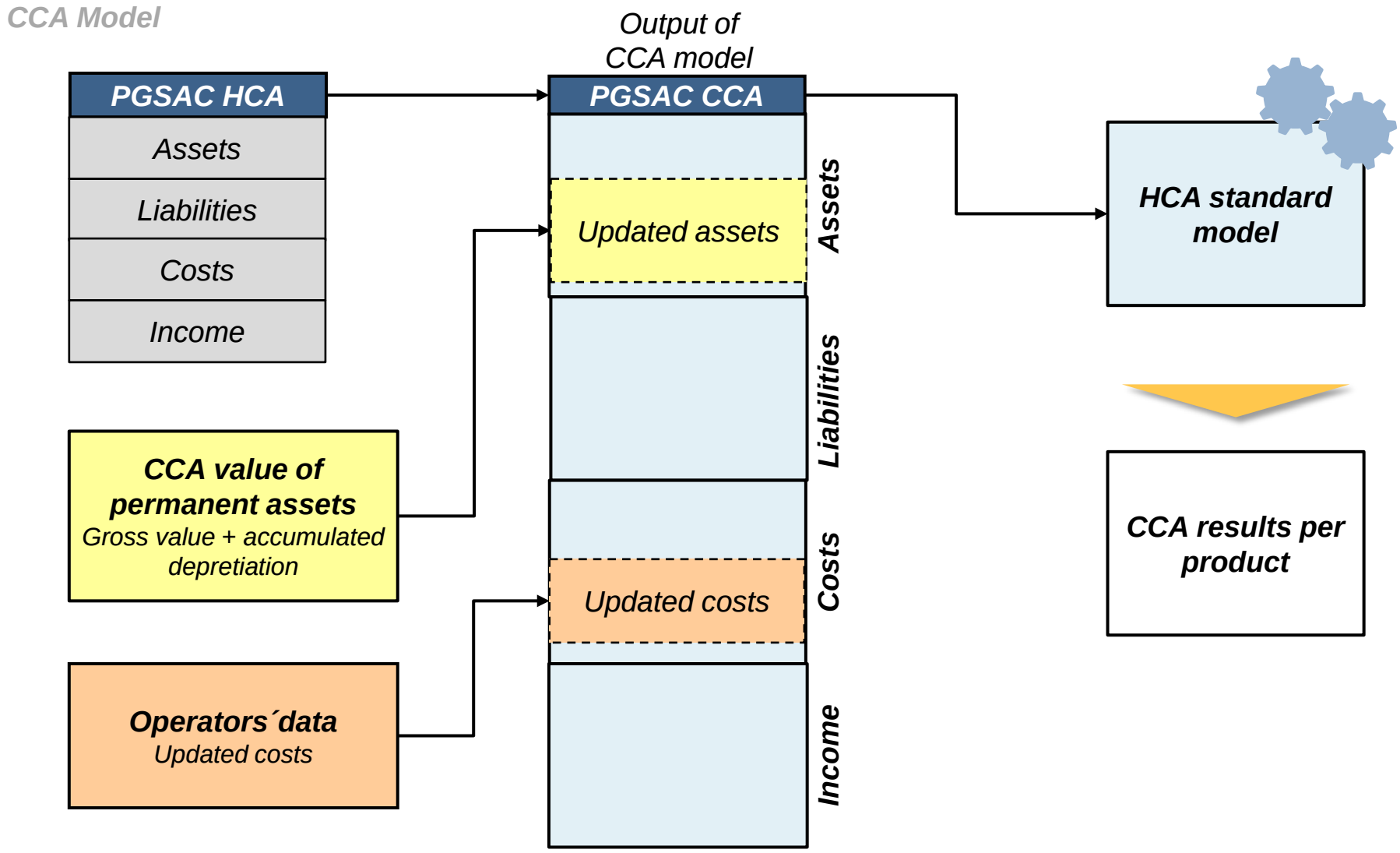
Source: Advisia

MAIN IMPLEMENTATION CHALLENGES: FAC-HCA

	Assessment of models from previous years	***Review of the methodology and main RSAC tables***	***Development of standard models***
Main Challenges	***Variation in the levels of detail between operators***	***Standardization of RSAC tables***	***Complementary data gathering from operators***
Approach	• *Separation of analysis in comparable **modules and groups** between operators* • *Ex: Network elem. – Switching, Transmition and Access*	• *Search for **alignment with guiding principles from RSAC** and regulatory demands from agency*	• ***Collaborative approach**, open for contributions about the process and proposed revisions*
Outcome	• ***Profound analysis**, with identification of attention points by module / group*	• *Achievement of tables attending **either the reality of the operators and the necessities of the agency***	• *Good quality level in the delivery of information and **essential contributions** for the revision of RSAC*

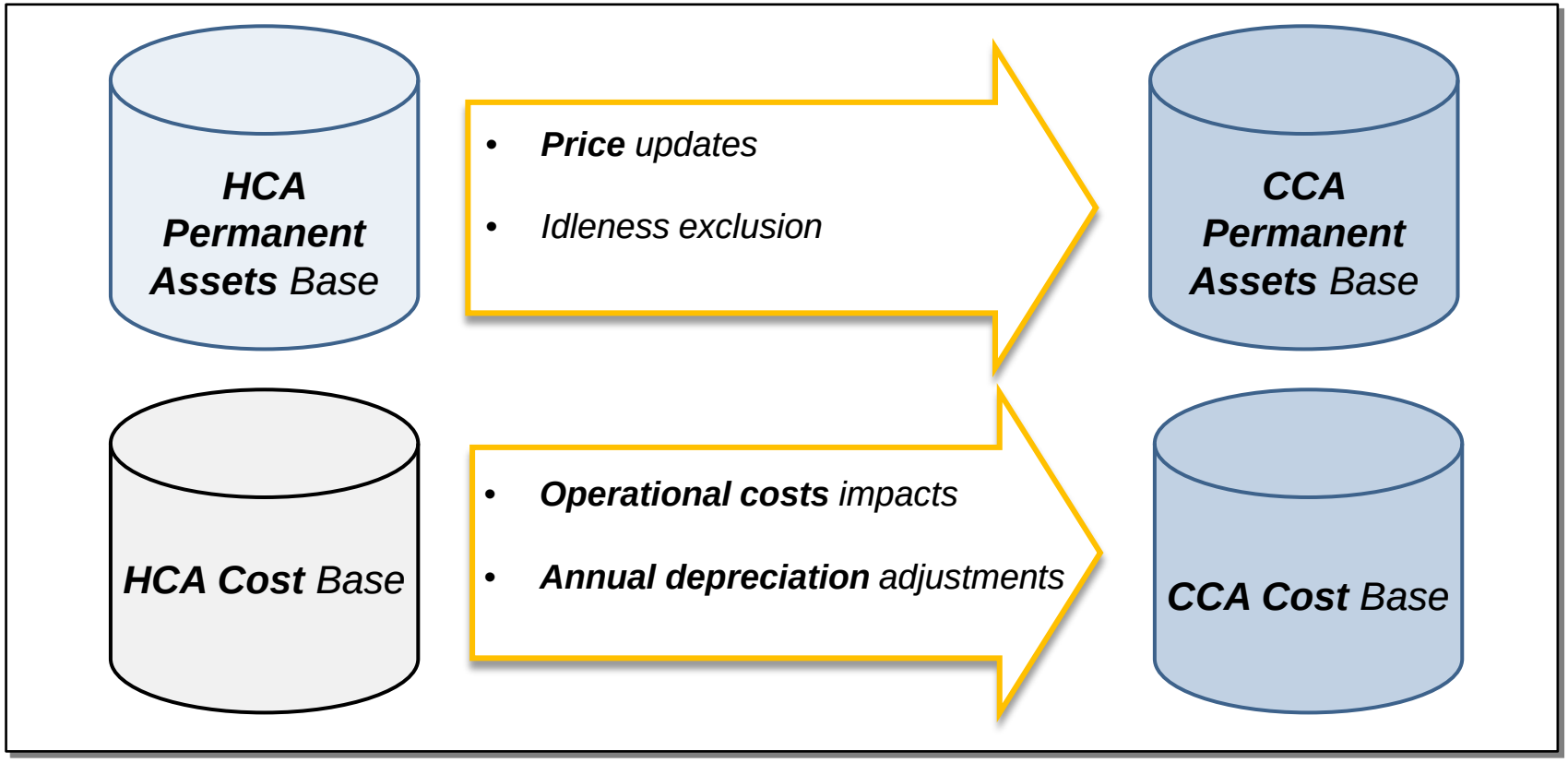
Source: Advisia

STANDARD CCA MODEL LEVERAGES THE SAME DEFINITIONS OF THE STANDARD HCA MODEL



Source: Advisia

MAIN CCA CHANGES REFER TO ASSETS AND COSTS BASE



*HCA changes to CCA base is basically updating the **historical values** for **current prices**, in order to get closer to the actual cost of an entrant, keeping the existing structure*

Source: Advisia

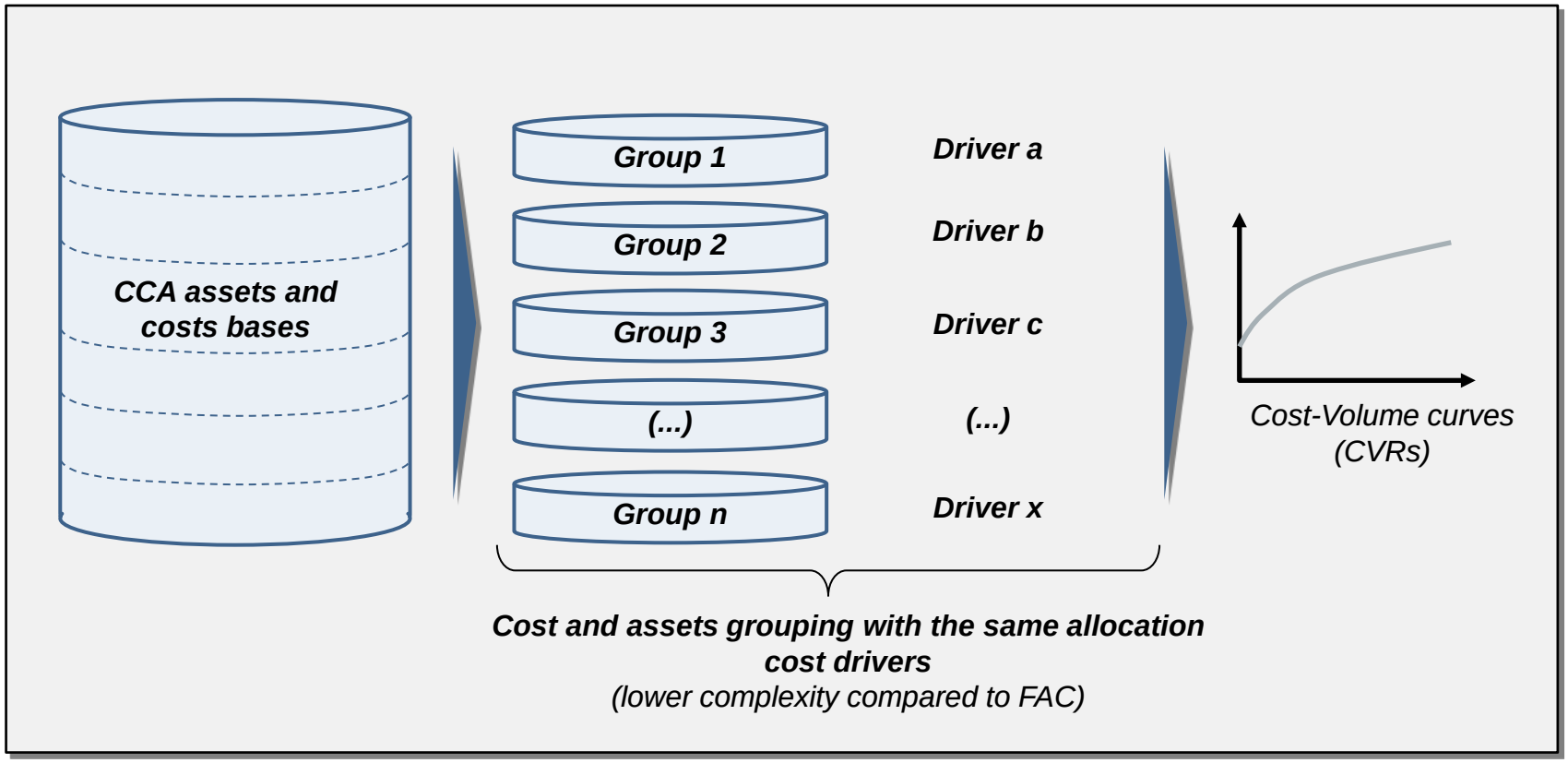
MAIN IMPLEMENTATION CHALLENGES: FAC-CCA

	Comparable models analysis	***Review of the RSAC methodology and main elements***	***Development of standard models***
Main Challenges	*Utilization of **different technical criteria** for asset classification and valuation*	***Standardization** of files and detailing of the assumptions*	***Adaptation** to the changes in regard to the FAC-HCA*
Approach	• *Discussion with technical specialists and identification of **common classification practices and trends** in other countries*	• *Translation of the RSAC into applicable equations in an **integrated model***	• ***Constant alignment** between the project phases and communication to operators*
Outcome	• ***Classification standards identification** and trend forecasts for discussion*	• *Proposition of a detailed and standardized delivery model, **reducing the complexity** for the next years*	• *Possibility of **utilization of the same structure** of the HCA models, with little adjustments*

*The FAC-CCA challenges are mainly due to **criteria standardization, definitions and formats***

Source: Advisia

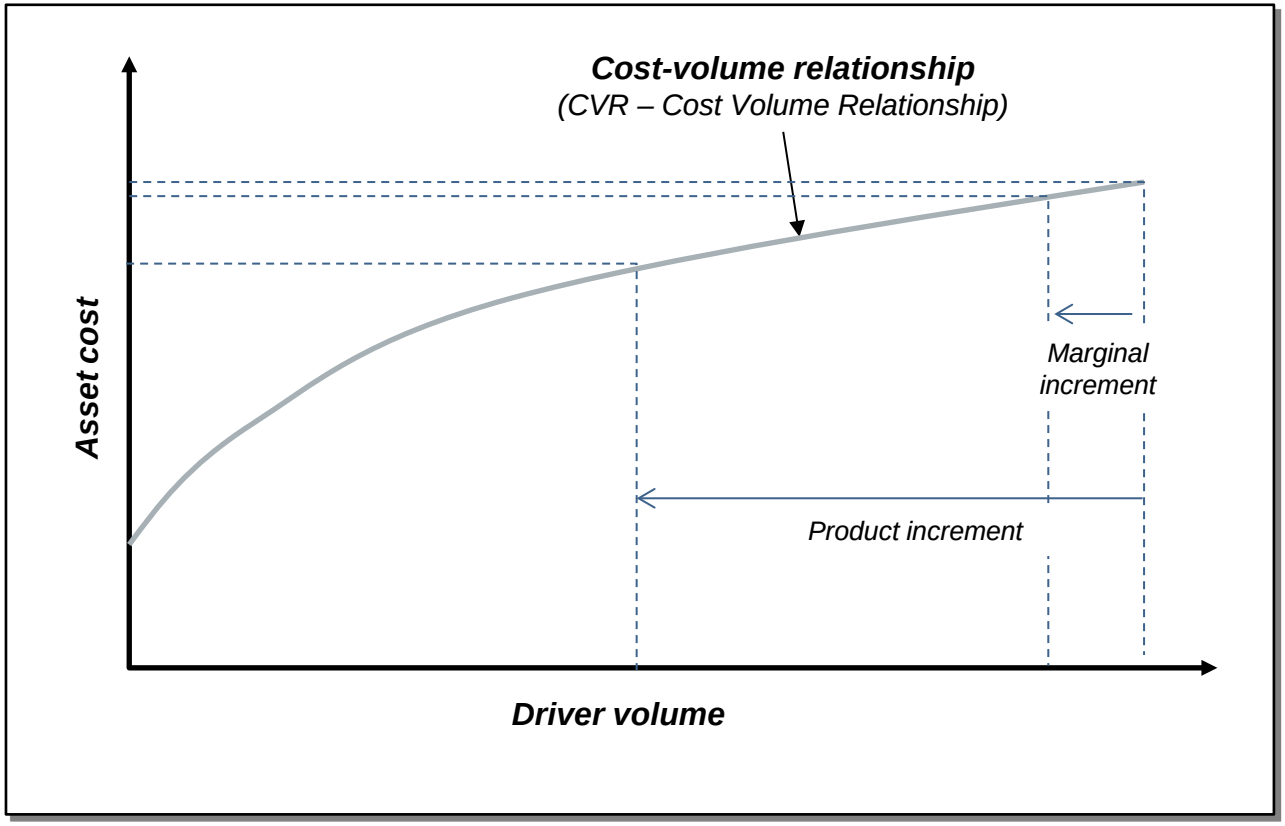
LRIC FIRST STEP IS COST AND ASSETS GROUPS DEFINITION ACCORDING TO COMMON DRIVERS



*LRIC cost allocation methodology is distinct from HCA and CCA FAC, using own **drivers** and specific relationships of **cost-volume***

Source: Advisia

THE SECOND STEP IS THE BUILD UP OF CRV (COST-VOLUME RELATIONSHIPS) CURVES



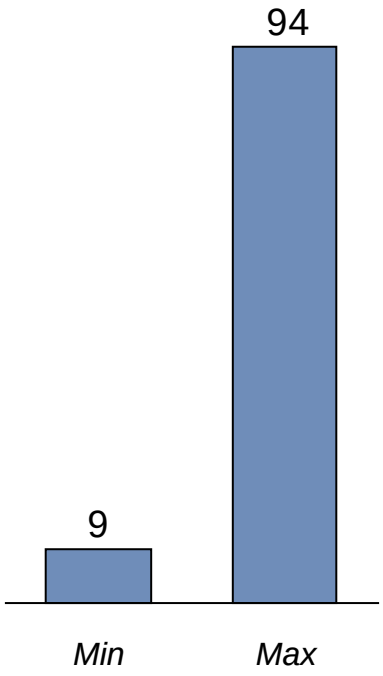
CVRs examples		
Cost/asset groups		**Drivers**
Equipment installation in clients	*X*	*Number of installation services*
Commutation	*X*	*Number of terminals*
Public phone	*X*	*Inhabitants*
Support structures	*X*	*Number of antennas*
DSLAM	*X*	*Number of access*

*CVRs are built up using statistical methods, field research or simulations, and identify the **cost specific impact** of a **product increment increase***

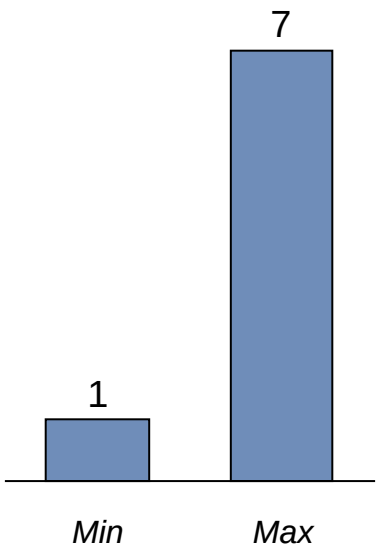
Source: Advisia

DIFFERENCES IN GRANULARITY AND CRV AMONG OPERATORS PRESENT AN ADDITIONAL CHALLENGE FOR THE STANDARD MODEL DEFINITION

Number of CVRs per operator



Number of CVRs hierarchy



- Great **variability** in the implementation of the LRIC models among operators
- **Number of CVRs** and **hierarchy levels** indicate granularity dispersion among models
- This great variability difficults direct comparison among LRIC results – need of **standardization**

Source: Advisia

MAIN IMPLEMENTATION CHALLENGES: LRIC

	Comparable models analysis	***Review of the RSAC methodology and main elements***	***Development of standard models***
Main Challenges	• *Comparison of results of **curves and increments*** • *Analysis of **comparable CVRs***	• *Need of **additional information** to the RSAC* • *Alignment with **CCA standard model***	• *Clear definition of product **increment*** • *Proposition of future **evolutionary** standardization*
Proposed approach	• *Grouping of **similar curves and products** among operators* • *Understanding of CVR curves development **criteria***	• *Request in advance of **data request** for the operators* • *Continuity of discussions with operators with regard to **CCA standard model***	• *Arrangement of discussions and meetings with operators to **discuss best practices*** • *Discussions with operators for **criteria** and **definitions** alignment*

*The challenges expected for LRIC implementation are related to the **comparability of results** created by different CVRs*

Source: Advisia

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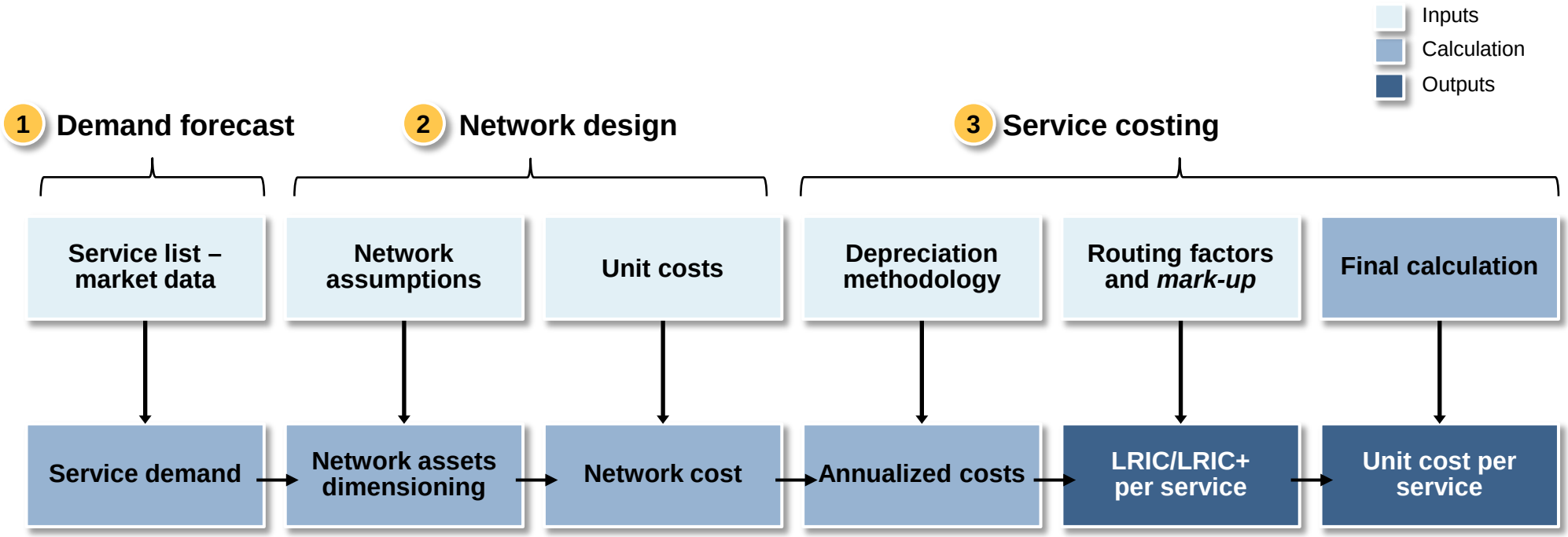
BOTTOM-UP MODEL FLOW



- Demand for each service, divided geographically (sector – Fixed; SMC – Mobile)

- Traffic dimensioning per asset (per sector – Fixed; per SMC – Mobile)
- Final dimensioning of network assets

- Calculation of capital cost per asset per region
- Calculation of total operating costs per asset per region

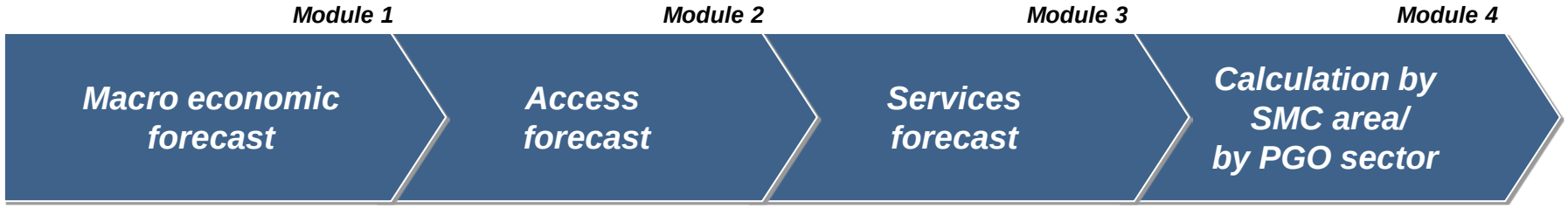
- Annualized total capital cost per asset per region
- Annualized total operating costs per asset per region

- LRIC per unit of traffic of each service, per region
- LRIC+ per unit of traffic of each service, per region

- Final unit cost of TU-RL, TU-RIU1, TU-RIU2, VU-M e EILD

Source: Advisia

STRUCTURE OF THE DEMAND FORECAST MODEL



- *Total population forecast*
- *GDP forecast*
- *Number of households forecast*
- *Number of companies forecast*
- *Population by income ranges forecast*

- *Forecast of the number of access of several services:*
  - *Mobile access*
  - *M2M*
  - *Active fixed access*
  - *Broad band access*
  - *Access of IPTV*
  - *EILD*

- *Forecast of the total amount of services for the Brazilian market*
- *List of services:*
  - *VC1 on-net/Off-net*
  - *Data traffic 2G*
  - *SMS on-net/off-net*
  - *Others*

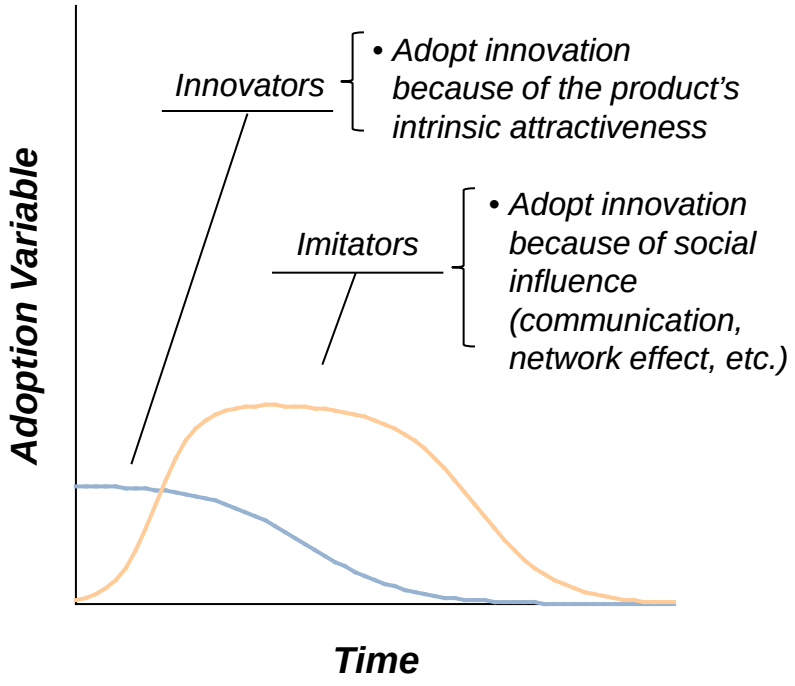
- *Calculation of demand forecast to input in the bottom-up model:*
  - *By SMC area*
  - *By PGO sector*

This structure to demand projection follows the international best practices and is adapted and adequate to the specific context of the Brazilian market

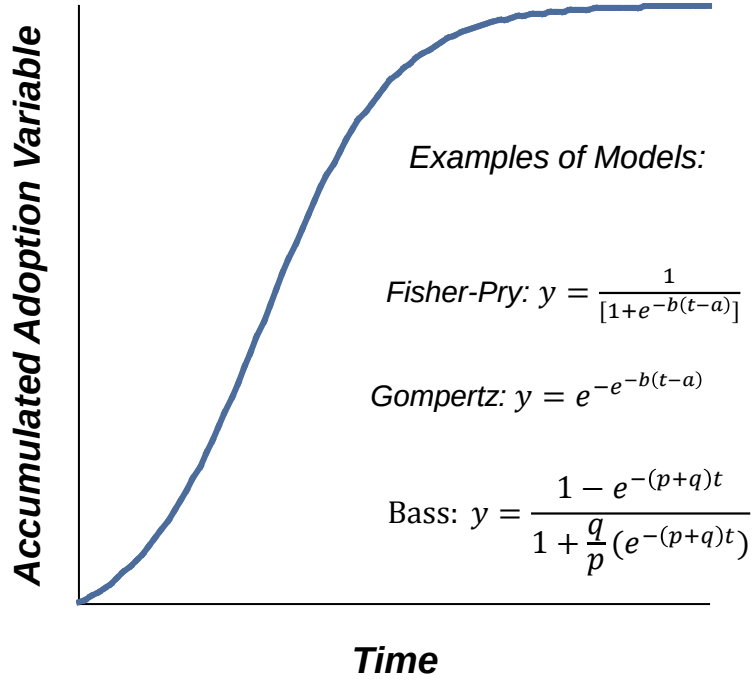
Source: Advisia

EXAMPLE OF FORECAST TECHNIQUE – OVERVIEW OF THE DIFFUSION TECHNIQUE

Diffusion Curves



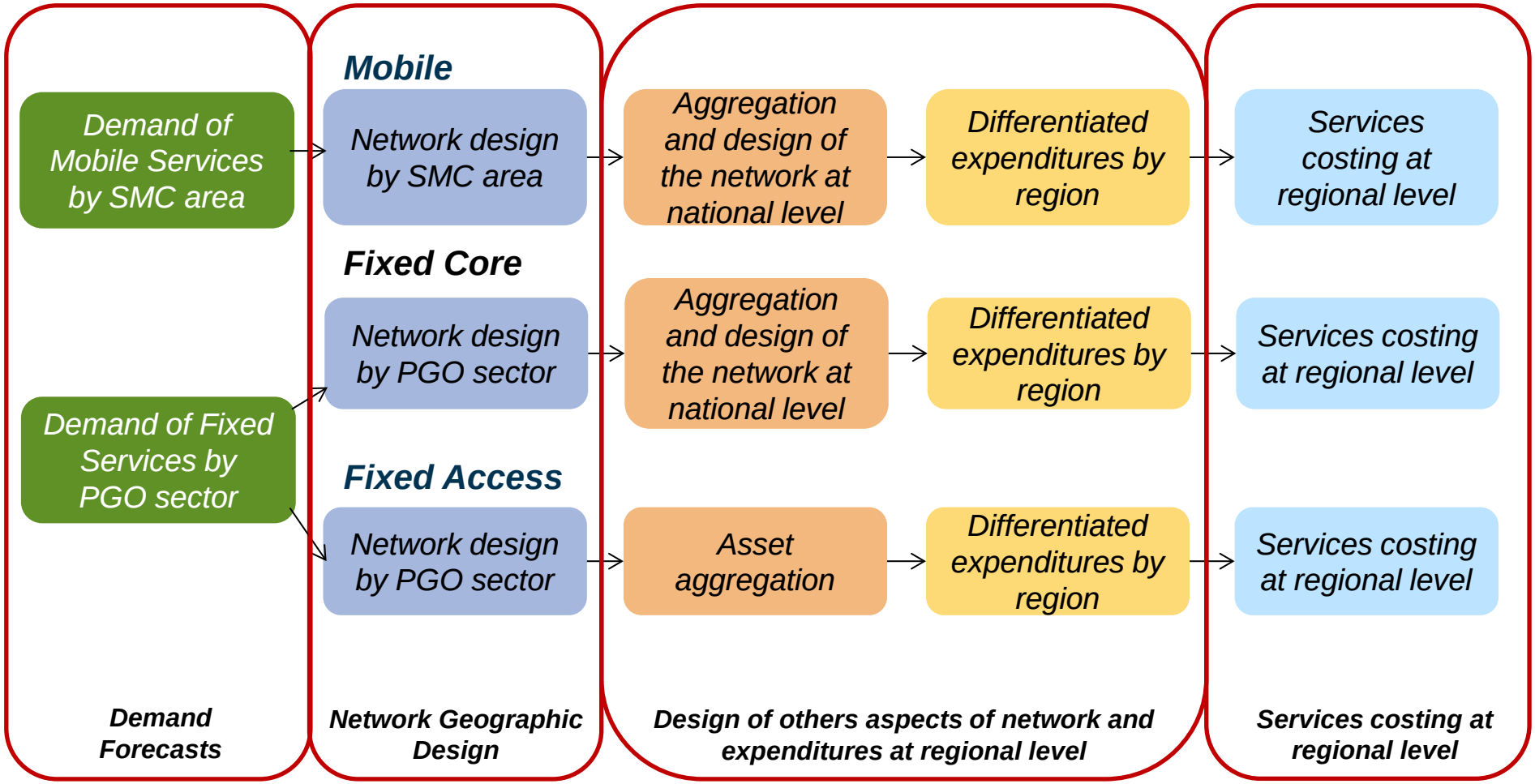
Diffusion model



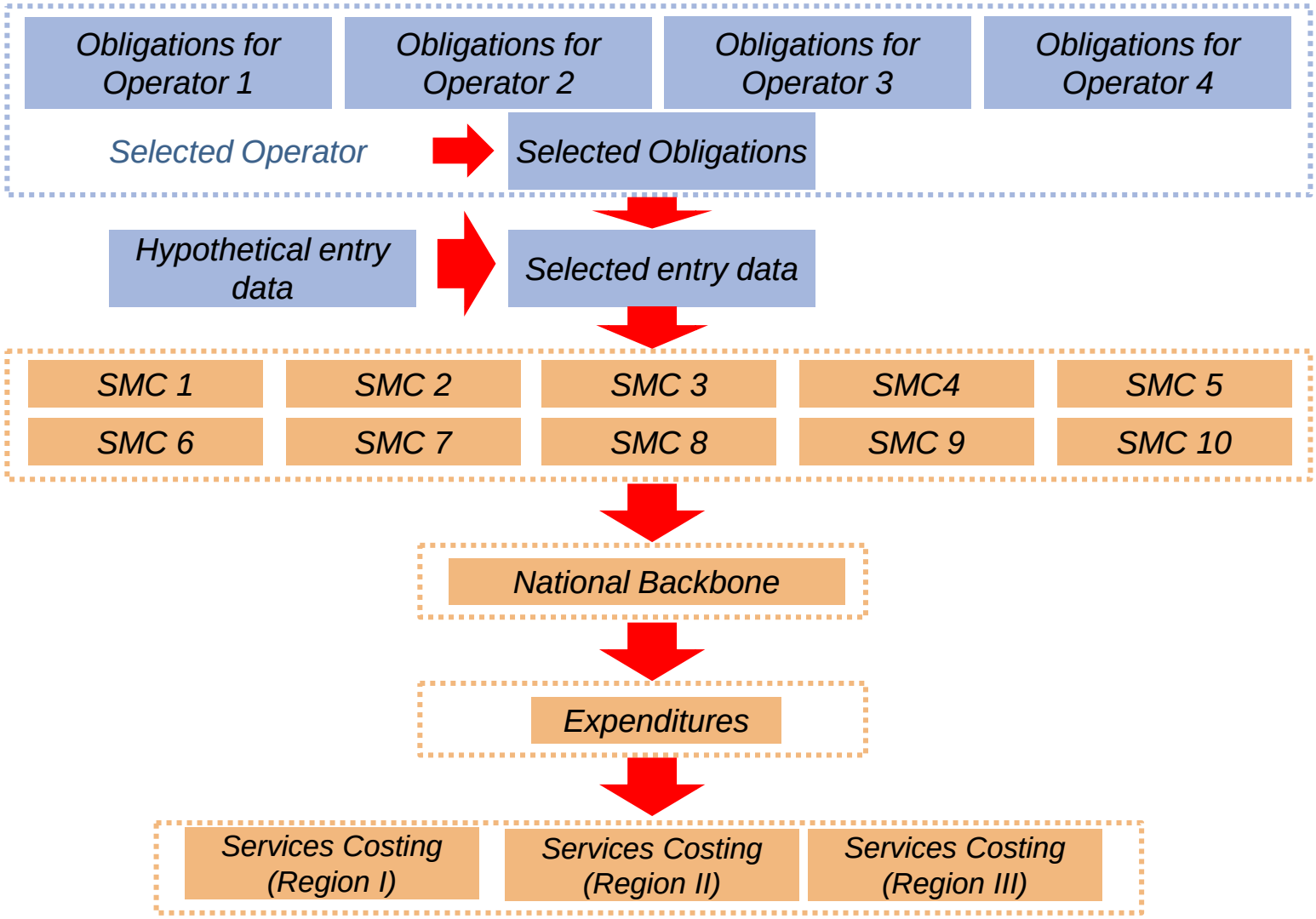
***Diffusion is the process of penetration of new products**, that is determined by intrinsic factors and social influences – diffusion modeling is applied in several fields such as product development and epidemics propagation*

Source: Advisia

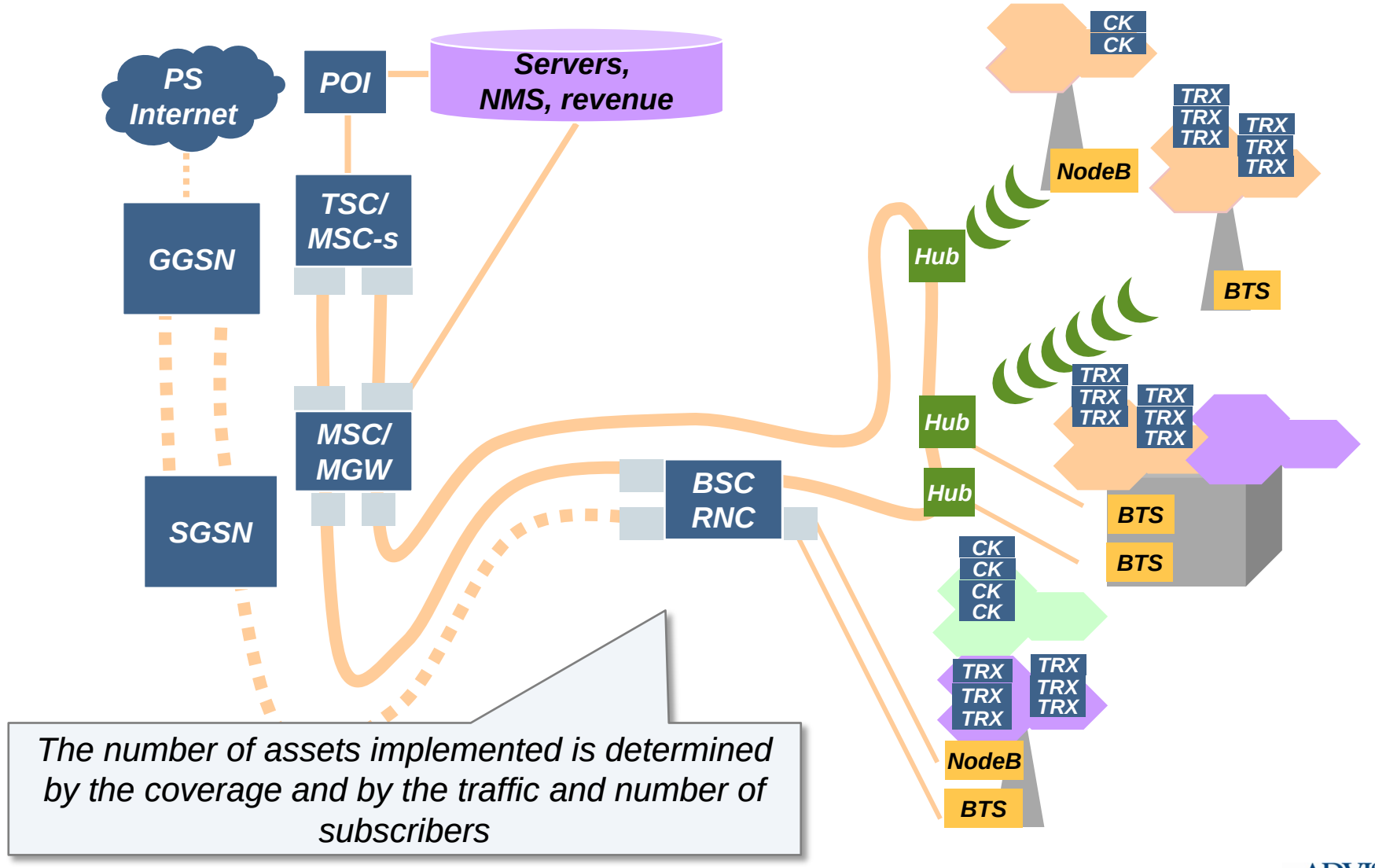
THE MODELING WAS DEVELOPED CONSIDERING THE COMPLEXITY OF THE BRAZILIAN MARKET...



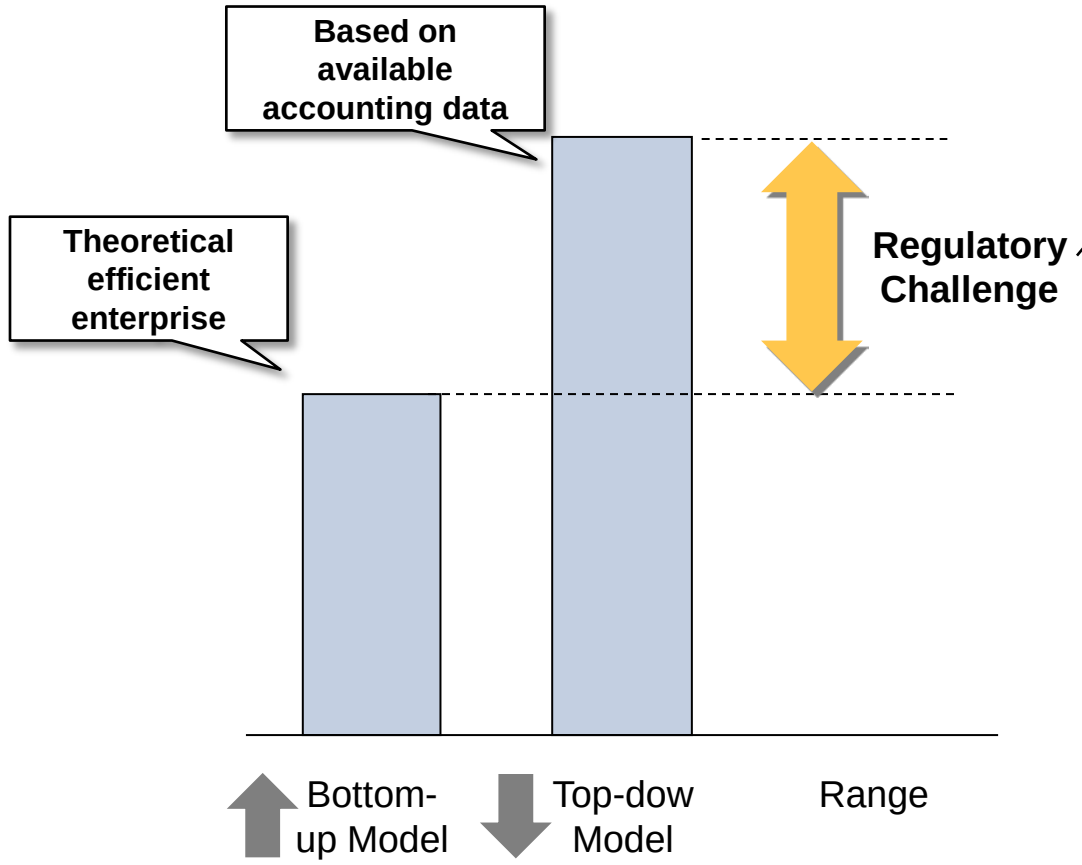
… RESULTING IN A DETAILED STRUCTURE



THE NETWORK ALGORITHMS ALLOW FOR THE CALCULATION OF ASSOCIATED COST OF THE MOBILE NETWORK



PHASE VII DISCUSSES THE RECONCILIATION OF TOP-DOWN AND BOTTOM-UP MODELS

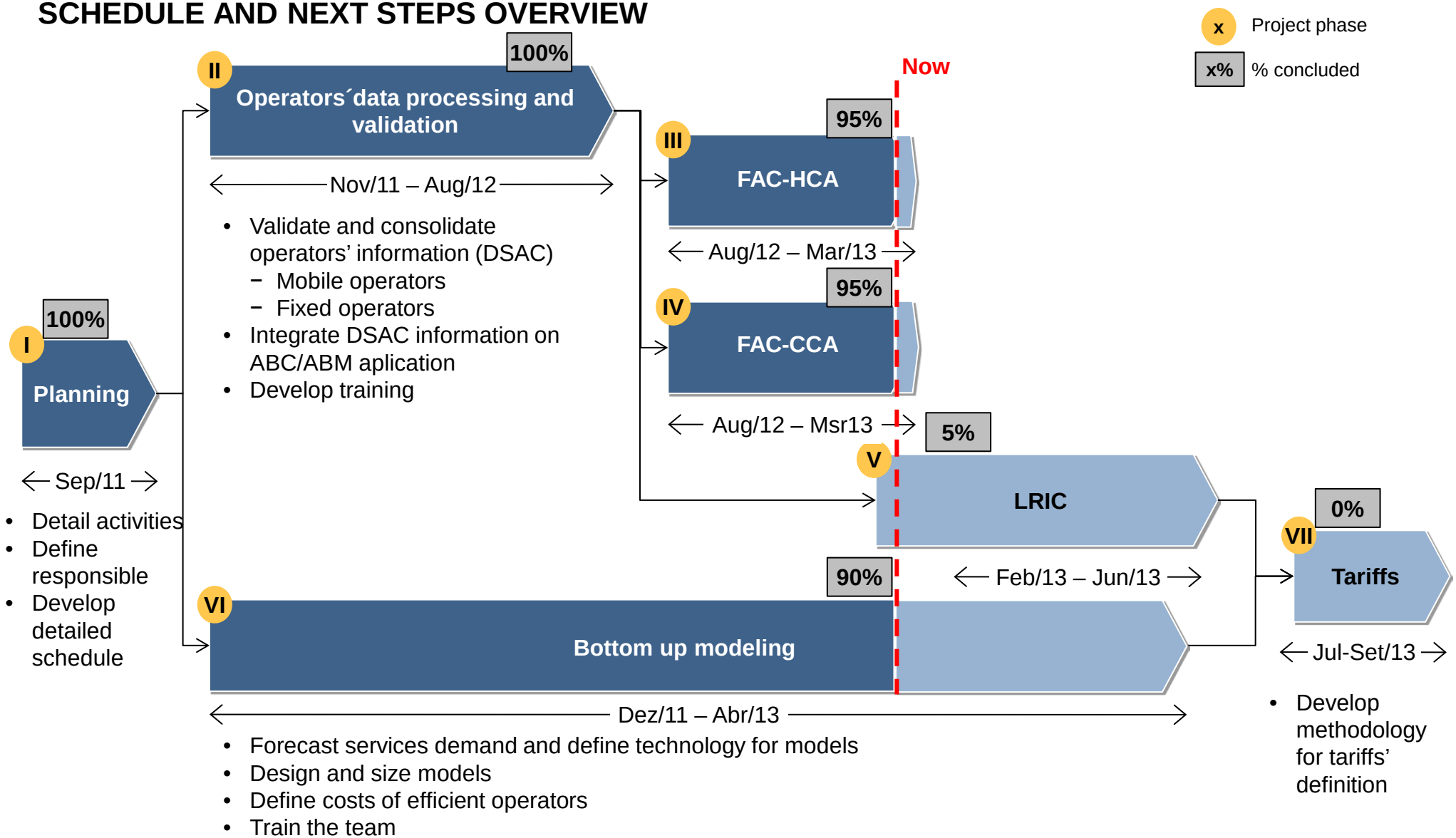


Possible adjustments:

- *Top-down*:
  - Exclusion of irrelevant costs
  - Inclusion of efficiency adjustments
- *Bottom-up*:
  - Opex adjustments based on accounting data
  - Inclusion of scorched node assumptions

Source: RTR, ITU, IRG 2005, Advisia

SCHEDULE AND NEXT STEPS OVERVIEW



Source: Advisia

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SUMMARY– MAIN OPERATIONAL CHALLENGES OF THE PROJECT

Main Challenges	Detailing	Project Approach
Profile differences among operators	• **Distinct realities** among operators – field , product portfolio scope, business strategy, etc. • How to reflect these differences in a **standard model**?	• **Constant dialogue** with operators – via public consultation of documents, conjoin and bilateral meetings • Composition of a team with significant experience in the industry
Data and Info gathering within required deadlines	• **Difficulty** by operators to gather data within required deadlines • How to consider **parameters** that some operators are not able to provide within the project's deadline?	• **Constant dialogue** with operators – Adjustments in the model or consideration of alternative parameters • Utilization of **several sources** of information: Operators data, Anatel data, international benchmarks, consortium experiences
Telecom sector evolutionary dynamics	• Sector characterized by **rapid evolution** in technology and development of new products • How the cost model will **reflect** this technological evolution / products?	• Development of the project with a **dedicated team** from Anatel • Continuous **formal training** of Anatel throughout the project – training to conduct adjustments and evolution of the model, after the finalization of the project

Source: Advisia

IMPORTANCE OF INTERFACE WITH OPERATORS

- **Participation** of telecom sector through:
  - Obtainment of information and data
  - Multilateral meetings
  - Bilateral meeting to clarify
  - Society Consultation
    - Delphi questionnaire
    - Conceptual Paper
- Confidentiality assurance of data and process transparency (trade-off);
- **Adequacy** to operators' reality

Source: Advisia

MAIN CHALLENGES OF THE PROJECT AND CONTINUITY

Main challenges	Project approach
Management of several stakeholders	• Structuring of a dedicated team at Anatel • Support to other areas of Anatel • Support to ITU • Operating model with the consortium: In presence meetings, conference calls, video conference • Participation of agents from telecommunication sector
Interaction with telecommunication sector and society	• Bilateral meetings: in presence, conference calls, video conference • Multilateral meetings • Consultation to operators: Data, information and clarifications • Consultation to society: including Public Consultation and questionnaires to sector's specialist (Agency, Operators, Governmental bodies, associations, suppliers, academic institutions, research centers).
Continuity and applicability	• Training of Anatel team during project execution • Continuous follow-up and meeting with the Consortium • Anatel's internal structuring for applicability of the cost models • Review and update of the models after project finalization (Area/Structured team)

Source: Advisia

Thanks!
Questions?

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