Assessment of the cost of providing wholesale voice call termination services on fixed networks in the EU/EEA countries – SMART 2018/0014

Workshop 1

23 October 2018

Introduction

- **Engagement**: Axon Partners Group Consulting (hereinafter, 'Axon') has been commissioned the study "*Assessment of the cost of providing wholesale voice call termination services on fixed networks in the EU/EEA countries – SMART 2018/0014*" (the 'Project') by the European Commission (hereinafter, 'EC').

- **Objective of the study**: Assess the cost of providing wholesale voice call termination services on fixed networks in the EU/EEA countries, in the context of a potential implementation of an Euro Rate as defined in the draft EECC*.

- **Purpose of Workshop**: Discuss **objectives and timeline** of the Project along with the **data request process** to be launched shortly and **the proposed methodological approach** to be applied in the cost model that will be developed.

- **Written comments**: Comments on the topics discussed during this workshop can be provided to your National Regulatory Authority by 15 November 2018.

Note (*): European Electronic Communications Code (latest draft version from 29 June).

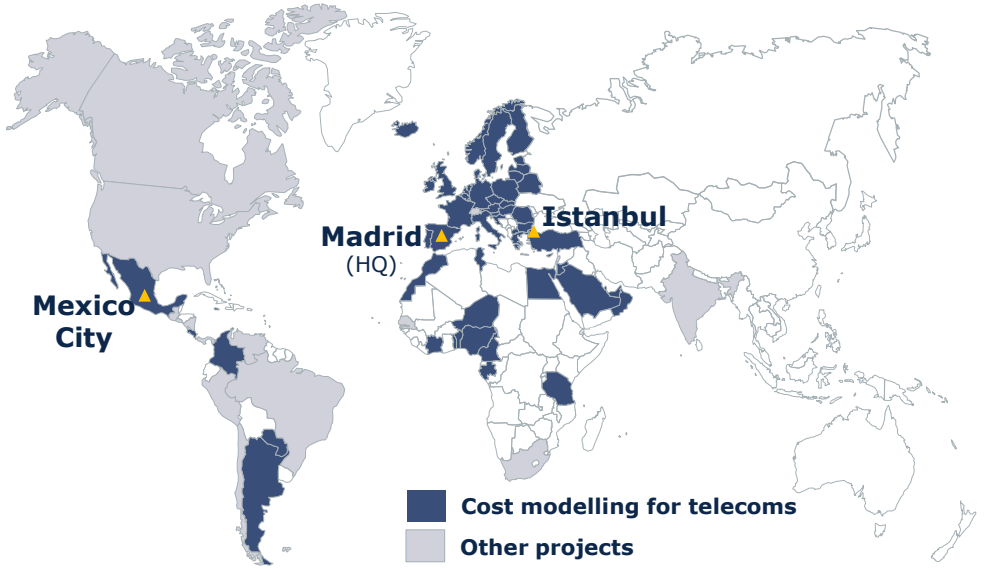
Agenda

Time	Session	Description
09:00 - 09:15	**Welcome by workshop chair**	▸ Presentation by the EC
09:15 - 10:45	**Session 1** Project objectives, timetable and overview of the data request process	▸ Presentation of objectives and timetable (Axon) ▸ Overview of the data request process (Axon) ▸ Q&A session
Coffee Break		
11:00 - 13:30	**Session 2** Methodological approach	▸ Presentation of the proposed approach (Axon) ▸ Q&A session
13:30	**Next Steps and closure**	▸ Presentation by the EC

About Axon Consulting

- International consulting firm that provides services to an international client base in the broad technology sector.
- Axon Consulting is the consulting arm of Axon Partners Group (www.axonpartnersgroup.com).
- Axon is also engaged with the EC in the development of a Bottom-Up model to calculate the cost of provision of mobile services.
- Over the last few years, Axon Consulting has developed cost models covering fixed & mobile operations in around 50 countries.

International footprint and reference clients



Examples of clients for costing projects:

- *Telecom operators:* Telefonica Group, Vodafone Group, Telecom Italia, STC Group, Etisalat Group, Turkcell Group, UNE, ETB.
- *Regulatory authorities:* European Commission, BEREC, AGCOM (Italy), ANACOM (Portugal), BIPT (Belgium), CNMC (Spain), EETT (Greece), OCECPR (Cyprus), CITC (KSA), TRC (Jordan), TRA (Oman), TRA (UAE), CRA (Qatar), IFETEL (Mexico), CRC (Colombia), SUTEL (Costa Rica), ENACOM (Argentina).

Questions

Please contact:

jordi.Casanova-tormo@ec.europa.eu

Workshop Session 1

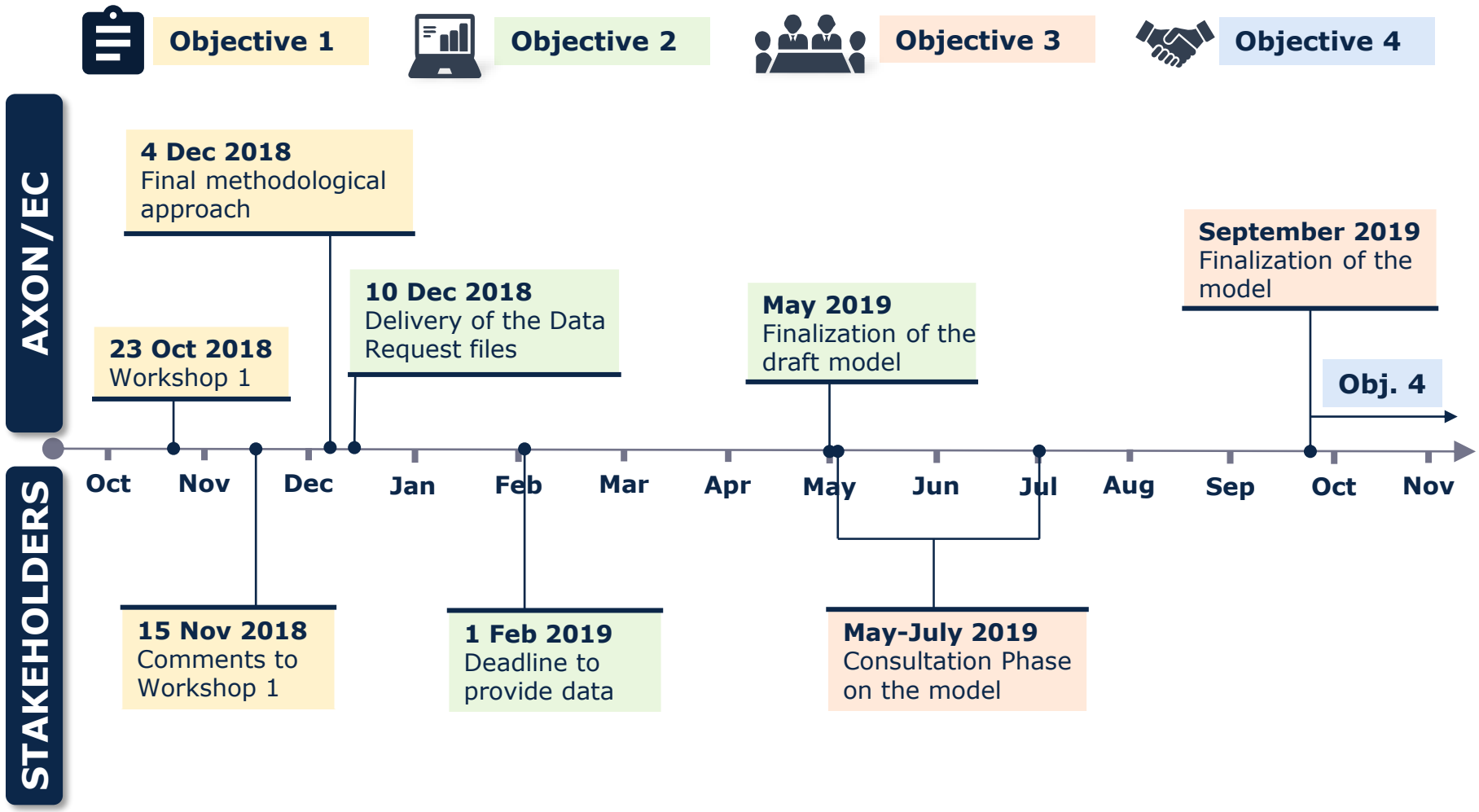
Project objectives, timetable and overview of the data request process

Contents

The Project aims at achieving 4 clear objectives identified by the EC

Main objectives	Key tasks involved
Objective 1: Determine the characteristics of the BULRIC model	▸ Suggest main methodological approaches to be adopted in the development of the BULRIC model ▸ Workshop to consult methodology with stakeholders
Objective 2: Build, populate and calibrate the BULRIC model	▸ Prepare information requests and collect data ▸ Build the cost model ▸ Populate and calibrate the model to deliver outputs
Objective 3: Validate the cost model and its outputs with NRAs and BEREC	▸ Consultation process on the model ▸ Model finalisation and Workshop to present results ▸ Publication of final report
Objective 4: Provide technical assistance on the cost model during the Commission's proposals	▸ Provide assistance to the EC in using the model and its outputs ▸ Answer questions/requests from the European Parliament and the Council

The cost model is expected to be finalised by September 2019, while the decision-making process will extend until Dec 2020



NRAs will play a major role in achieving these objectives by coordinating with their operators and communicating with the EC

- **EU/EEA NRAs will be fully involved in the development of the cost model.**

  Thanks to their knowledge of national fixed markets, NRAs will play a major role in validating that the data considered in the development of the model is representative of their national realities.

  NRAs will have an active role in the definition of the methodology, the collection of inputs and the review of the model.

- **NRAs are encouraged to set up internal deadlines with their operators to ensure EC's deadlines are met.**

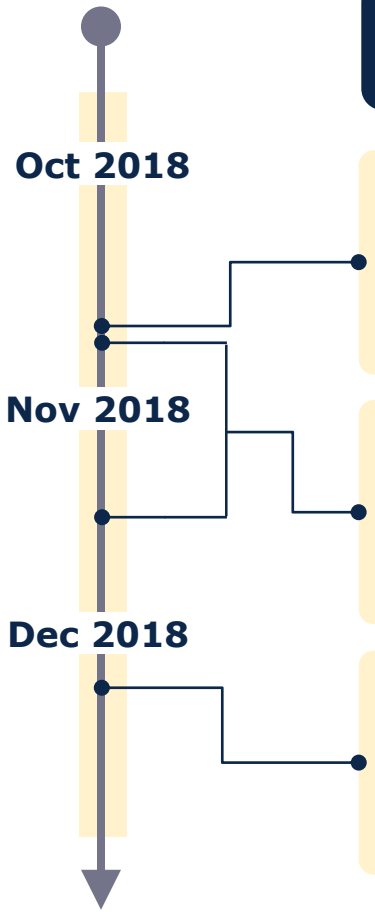
  NRAs should coordinate with their national operators to gather data/comments as well as to ensure their quality and completeness. NRAs are suggested to anticipate the main milestones of the project to their national operators based on the dates already shown in this presentation.

- **Interactions and discussions will take place with a dedicated Steering Committee (SC) including representatives from various NRAs in the key phases of the Project.**

  The SC will be in direct contact with the EC/Axon throughout the project to provide guidance on the course of work and ensure that the views of NRAs, BEREC and operators are duly taken into account.

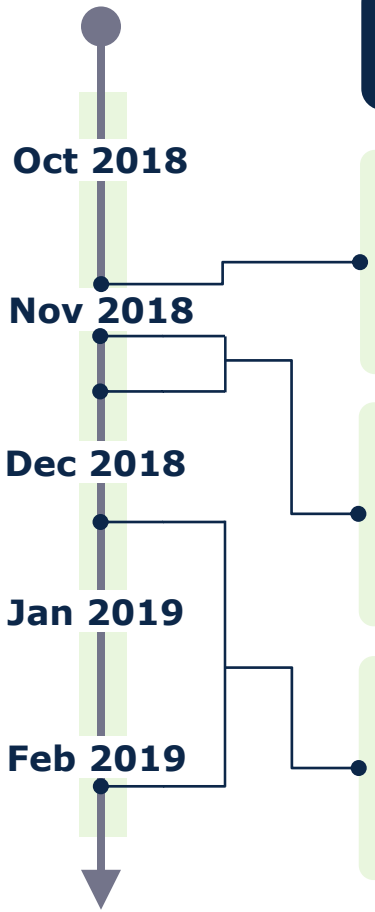
- **EC/Axon will only interact with NRAs, who will act as point of contact with national operators.**

Objective 1
Determine the characteristics of the BULRIC model



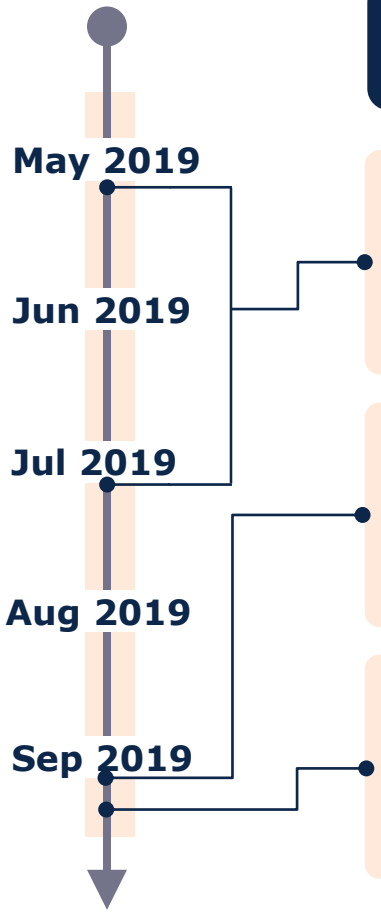
Topic	Description and parties' involvement	Timings
Workshop 1	▸ (All) Discussion of main methodological decisions to develop the model	23 October 2018 (today)
Comments on Workshop 1	▸ (Stakeholders) Provide comments on the contents of Workshop 1	24 October - 15 November 2018 (3,5 weeks)
Agree on final methodological approach	▸ (Axon/EC) Review of comments and definition of the final methodology	4 December 2018

Objective 2
Build, populate and calibrate the BULRIC model



Topic	Description and parties' involvement	Timings
Delivery of draft Data Requests for review	▸ (Axon/EC) Deliver the draft Data Requests	31 October 2018
Comments on draft Data Requests	▸ (Stakeholders) Provide comments on the draft Data Requests	1 - 15 November 2018 (2 weeks)
Population of Data Requests	▸ (Stakeholders) Fill in the data requests	10 December 2018 – 1 February 2019 (8 weeks)

Objective 3
Validate the cost model and its outputs with NRAs and BEREC



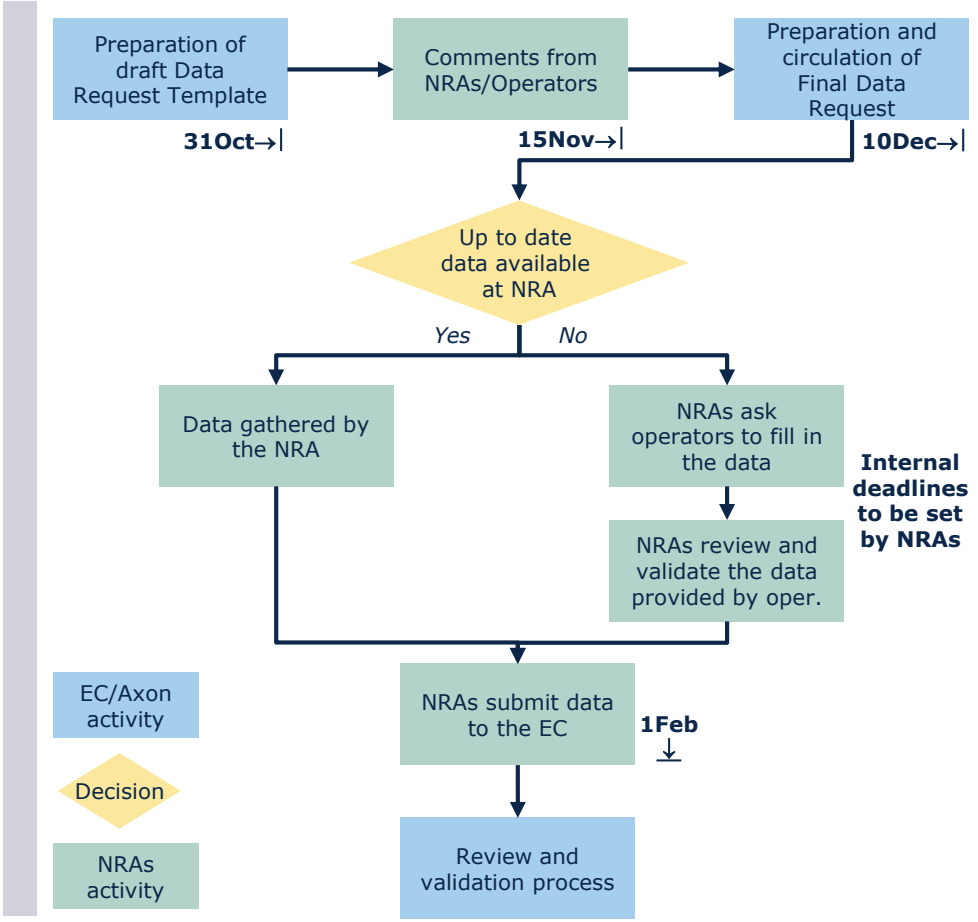
Topic	Description and parties' involvement	Timings
Consultation Phase on the Model	▸ (Stakeholders) Provide comments on the draft model	May – July 2019 (~2 months)
Finalisation of the Model	▸ (Axon/EC) Finalise the model based on comments received	July – September 2019 (2,5 months)
Workshop 2	▸ (All) Presentation of final results and outcomes of the project	September 2019 (1 day)

Contents

We will rely on NRAs' knowledge of national markets to ensure gathering of updated and representative data

- The data collection process is **one of the most critical activities of the project**.
- In order to gather information representative of each country, **Excel data request templates will be sent to NRAs**.
- NRAs should fill in the data request templates if they have up to date data and/or ask stakeholders for any additional information.
- The **national operators that will have to be involved** in the data gathering process will be defined based on the methodological approach adopted to develop the model.
- We foresee **potential additional interaction with NRAs to validate** our comprehension of the inputs received.

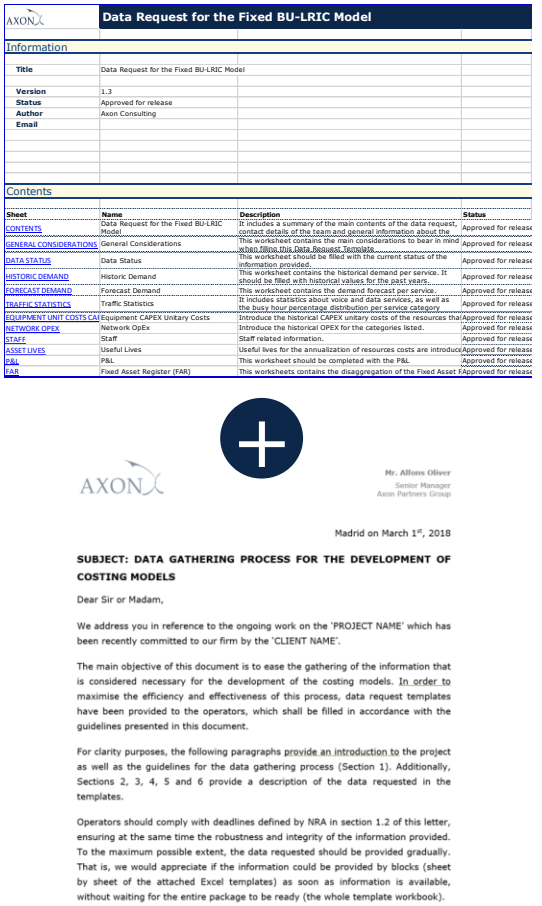
Illustrative overview of the data gathering process



Data requests will be handled through highly standardized files (Excel + Word) to ease the process on both sides (EC and NRAs)

- All information requested to the stakeholders will follow a standardized format, including:
  - An **Excel file,** where the information requested is to be filled in through different worksheets. Each item will have a self-explicative description within the worksheet where it is contained.
  - A **letter**, explaining what is needed and how it should be filled in the Excel data request file.
- Prior to the start of the data gathering process, NRAs will have the opportunity to submit comments on both documents (consultation from 31 October until 15 November), the excel template and the accompanying letter.

Data request templates



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Data Request for the Fixed BU-LRIC Model

Information

Title	Data Request for the Fixed BU-LRIC Model
Version	1.3
Status	Approved for release
Author	Axon Consulting
Email	

Contents

Sheet	Name	Description	Status
CONTENTS	Data Request for the Fixed BU-LRIC Model	It includes a summary of the main contents of the data request, contact details of the team and general information about the	Approved for release
GENERAL CONSIDERATIONS	General Considerations	This worksheet contains the main considerations to bear in mind when filling this Data Request Template.	Approved for release
DATA STATUS	Data Status	This worksheet should be filled with the current status of the information provided.	Approved for release
HISTORIC DEMAND	Historic Demand	This worksheet contains the historical demand per service. It should be filled with historical values for the past years.	Approved for release
FORECAST DEMAND	Forecast Demand	This worksheet contains the demand forecast per service.	Approved for release
TRAFFIC STATISTICS	Traffic Statistics	It includes statistics about voice and data services, as well as the busy hour percentage distribution per service category	Approved for release
EQUIPMENT UNIT COSTS CAI	Equipment CAPEX Unitary Costs	Introduce the historical CAPEX unitary costs of the resources tha	Approved for release
NETWORK OPEX	Network OpEx	Introduce the historical OPEX for the categories listed.	Approved for release
STAFF	Staff	Staff related information.	Approved for release
ASSET LIVES	Useful Lives	Useful lives for the annualization of resources costs are introduc	Approved for release
P&L	P&L	This worksheet should be completed with the P&L	Approved for release
FAR	Fixed Asset Register (FAR)	This worksheets contains the disaggregation of the Fixed Asset F	Approved for release

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Mr. Alfons Oliver
Senior Manager
Axon Partners Group

Madrid on March 1st, 2018

SUBJECT: DATA GATHERING PROCESS FOR THE DEVELOPMENT OF COSTING MODELS

Dear Sir or Madam,

We address you in reference to the ongoing work on the 'PROJECT NAME' which has been recently committed to our firm by the 'CLIENT NAME'.

The main objective of this document is to ease the gathering of the information that is considered necessary for the development of the costing models. In order to maximise the efficiency and effectiveness of this process, data request templates have been provided to the operators, which shall be filled in accordance with the guidelines presented in this document.

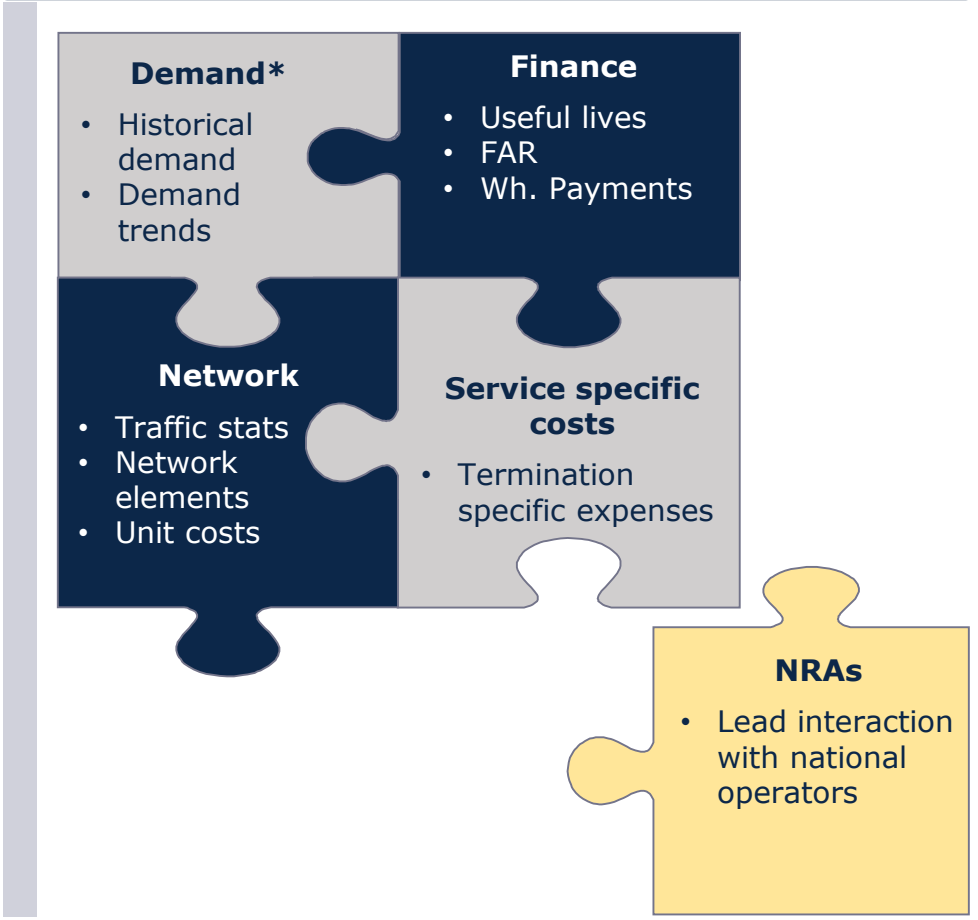
For clarity purposes, the following paragraphs provide an introduction to the project as well as the guidelines for the data gathering process (Section 1). Additionally, Sections 2, 3, 4, 5 and 6 provide a description of the data requested in the templates.

Operators should comply with deadlines defined by NRA in section 1.2 of this letter, ensuring at the same time the robustness and integrity of the information provided. To the maximum possible extent, the data requested should be provided gradually. That is, we would appreciate if the information could be provided by blocks (sheet by sheet of the attached Excel templates) as soon as information is available, without waiting for the entire package to be ready (the whole template workbook).

We expect the data collection process to involve NRAs and different teams within national operators

- The **information requested in the Excel template will be grouped into different categories** (e.g. Demand, Network, Finance, Staff).
- This classification is expected to help NRAs and national operators to organise internally, directing the requests to the relevant people.
- We also expect that this approach will help NRAs manage their relationship with the operators more easily.
- All the information provided will be subject to Axon's Non-Disclosure Agreement with the EC. Careful treatment will be given to all confidential information.

Preliminary list of data items to be requested



Note (*): Further details on the specific services for which demand is going to be requested will be provided in the upcoming slides.

Ensuring the protection of confidential information is critical for the Axon/EC team

- In order to ensure that confidential information is carefully protected, the Axon/EC team has an strategy based on three main pillars:

Non-Disclosure Agreement between Axon and EC. All information reported by stakeholders to the EC will be confined within the limits of this Project. This agreement covers data reported in the data gathering process as well as any other information handed out in any other activities under the framework of this Project.

Multi-level categorisation of confidential information. Stakeholders will be able to categorise all the information reported based on its level of confidentiality. This will ensure that each data submitted in any of the processes is treated with the due carefulness.

Preliminary review of the model by NRAs. In addition to Axon's treatment of confidential information according to the categorisation described above, NRAs will be able to review the draft model prior to the Consultation with stakeholders. This adds an additional layer of peer-review that ensures all confidential information is kept as such.

Workshop Session 2

Proposed methodological approach

Contents

The methodological approach is going to be defined in accordance with the EC's Recommendation on MTR/FTR and the EECC

- One of the most critical milestones of the Project is the definition of the methodological approach to be adopted in the development of the cost model.

- Most methodological aspects have already been addressed by the EC in the following documents:
  - **EC's 2009 Recommendation on MTR/FTR*,** defines the main principles to be adopted by Member States in the determination of fixed and mobile termination rates.
  - **European Electronic Communications Code (EECC)****, while still in draft version, it provides further indications on how termination rates should be calculated.

- The principles defined in these documents will be followed in the development of the cost model.

Note (*): EC's Recommendation of 7.5.2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU
Note (**): European Electronic Communications Code (draft version from 29 June).

The EC's Recommendation and the EECC are clear and consistent on the approach to be adopted on key methodological aspects

Methodological Aspect	EC's Recommendation on MTR/FTR	Draft EECC
Cost Standard	▸ Pure LRIC (Long Run Incremental Costs)	▸ Aligned with Rec 2009
Dimensioning approach	▸ Bottom-up	▸ Aligned with Rec 2009
Operator Type	▸ Efficient operator	▸ Aligned with Rec 2009
Assets valuation method	▸ Current Cost Accounting (CCA)	▸ Aligned with Rec 2009
Depreciation method	▸ Economic Depreciation*	▸ Aligned with Rec 2009
Core technologies adopted	▸ NGN Core (packet switched)	▸ Aligned with Rec 2009
Costs to be considered	▸ Traffic-related costs ▸ Directly related wholesale commercial costs	▸ Aligned with Rec 2009
Time period	▸ No specification	▸ Review period of 5 years**

Note(*): Based on the practices typically adopted by NRAs, a volume-based approach will be adopted to implement economic depreciation.
Note(**): In line with entry into force of the Eurorate (2020), a modelling period going until the year 2025 will be included in the model.

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A number of issues should be further developed in the design of the model's specifications

Network assets

- Should active transmission equipment be included in the cost model?
- What core elements should be dimensioned?
- How should incremental costs of core platforms be assessed?

Wholesale commercial costs

- What wholesale commercial costs should be considered?
- How should these costs be allocated to fixed termination?

Reference Operator

- How should the reference operator be defined?
- What should be its market share?

Methodological aspect 1: Network assets

Network assets

- Should active transmission equipment be included in the cost model?
- What core elements should be dimensioned?
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Wholesale commercial costs

- What wholesale commercial costs should be considered?
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Reference Operator

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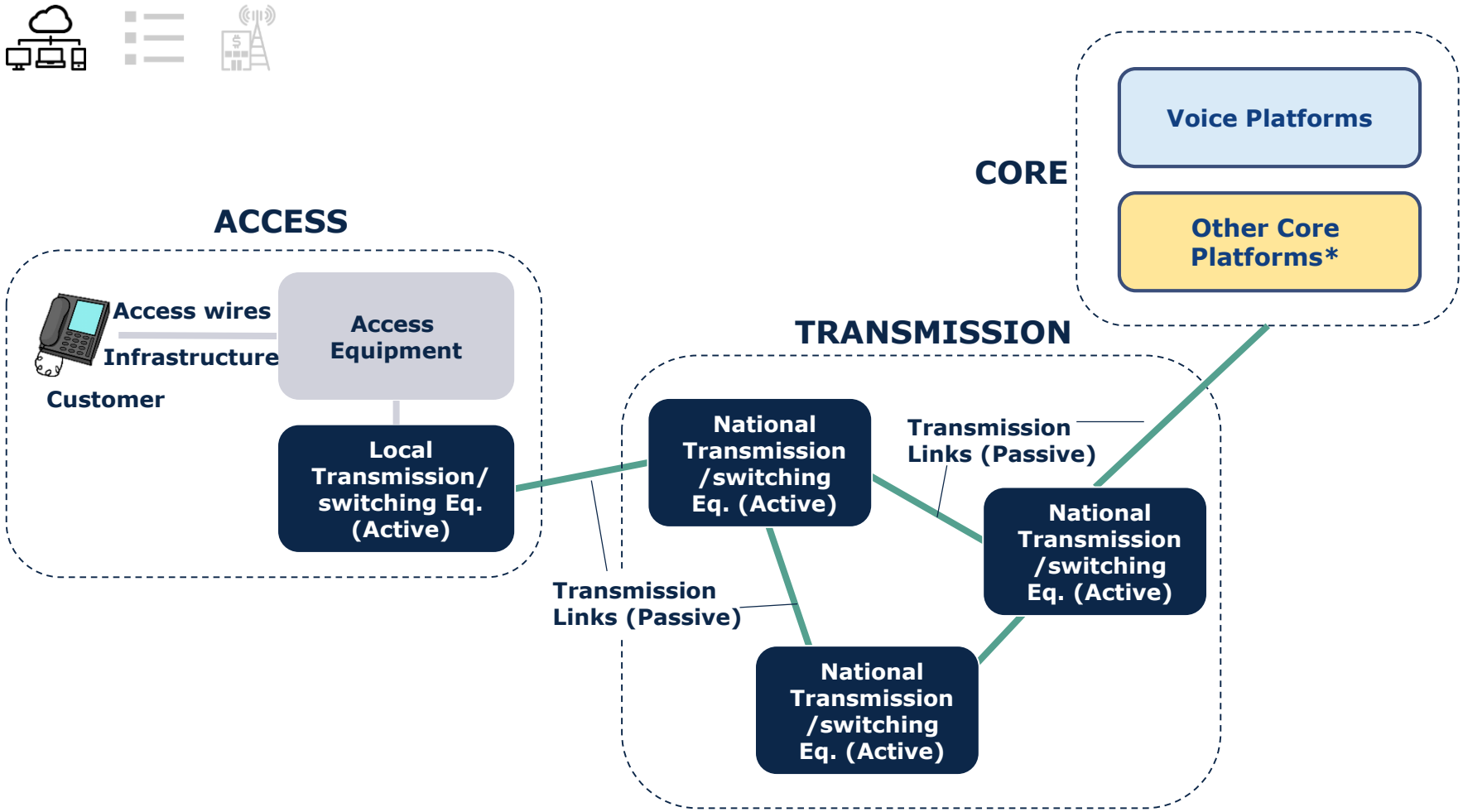
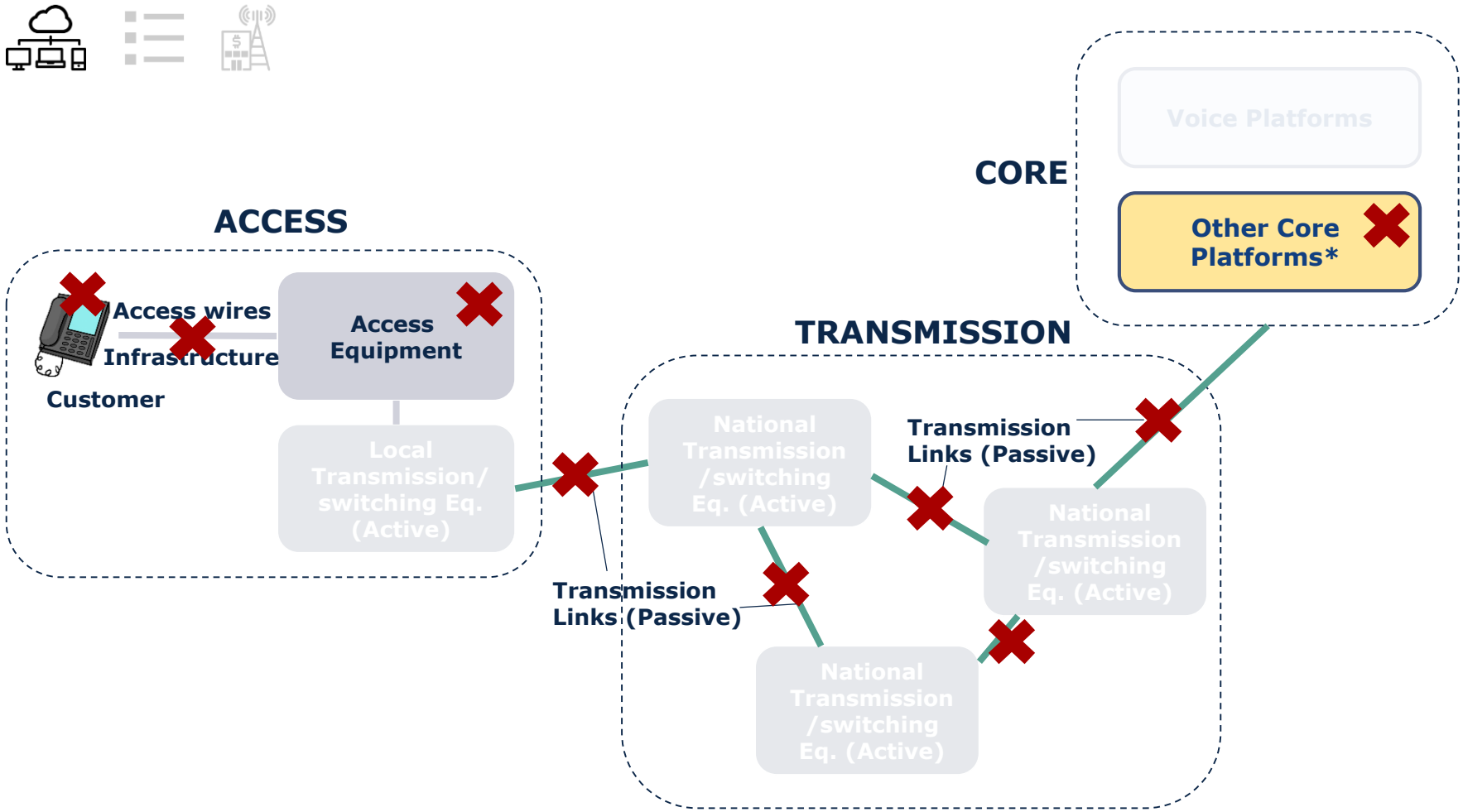
Network assets: A fixed telecom network is composed by a large number of elements, divided in three main sections



Note(*): Such as the DNS, BRAS, RADIUS, IPTV platforms, etc.

Network assets: The costs of some network elements are not driven by or incremental to the voice termination service



Note(*): Such as the DNS, BRAS, RADIUS, IPTV platforms, etc.

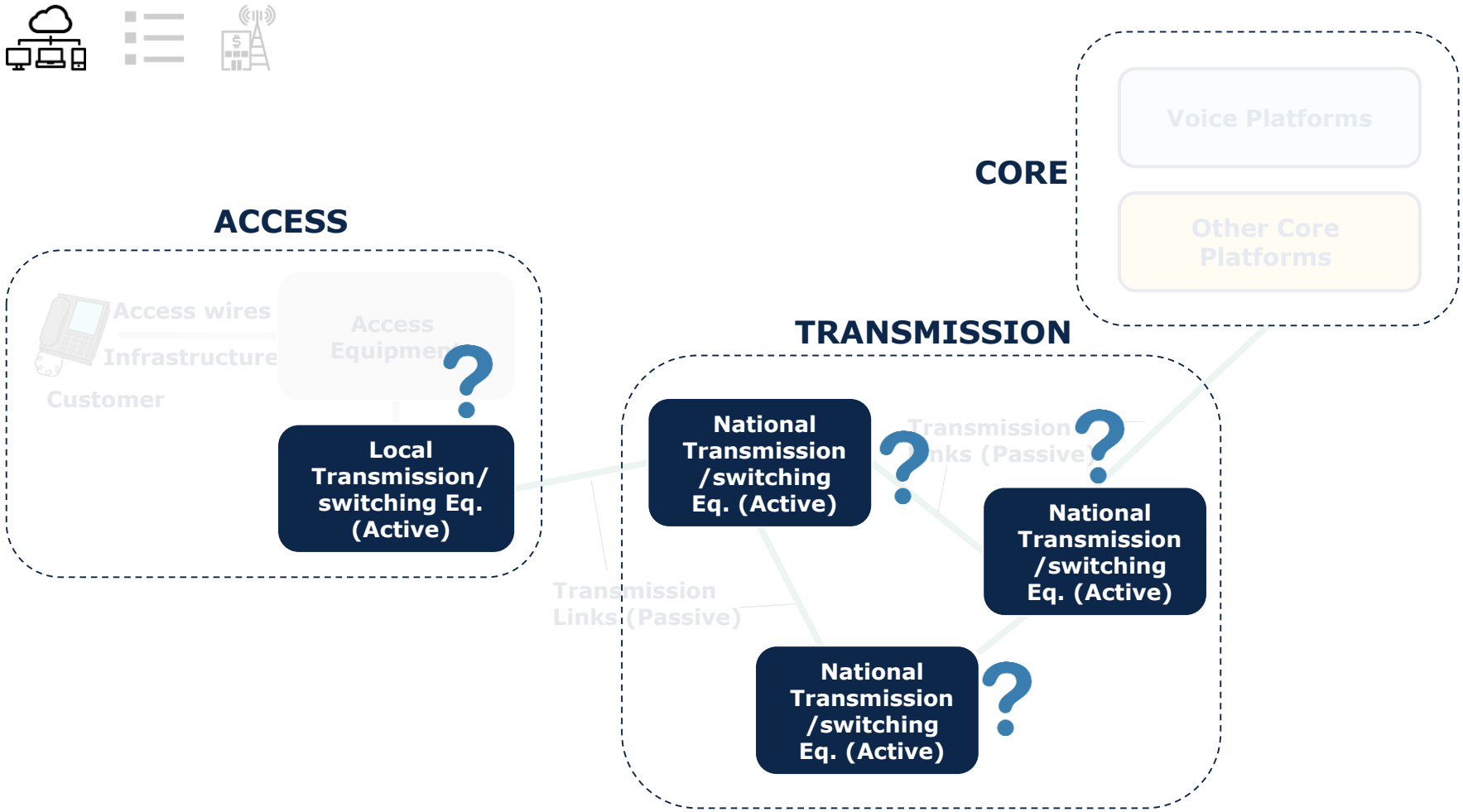
Network assets: Network elements with no impact for termination rates will not be modelled

Network components that will not be considered in the modelling exercise

Access network elements (cable, civil infrastructure, access ports and most of access equipment) are driven only by the number of users served - not traffic -. Therefore, costs associated with these assets are not incremental to voice termination traffic.

Fibre transmission links (cable) and civil infrastructure elements. The deployment of fibre wires for transmission is mainly required to comply with the coverage needs along the national territory. Given that they are not driven by voice termination traffic, their costs are neither avoidable nor incremental to voice termination traffic.

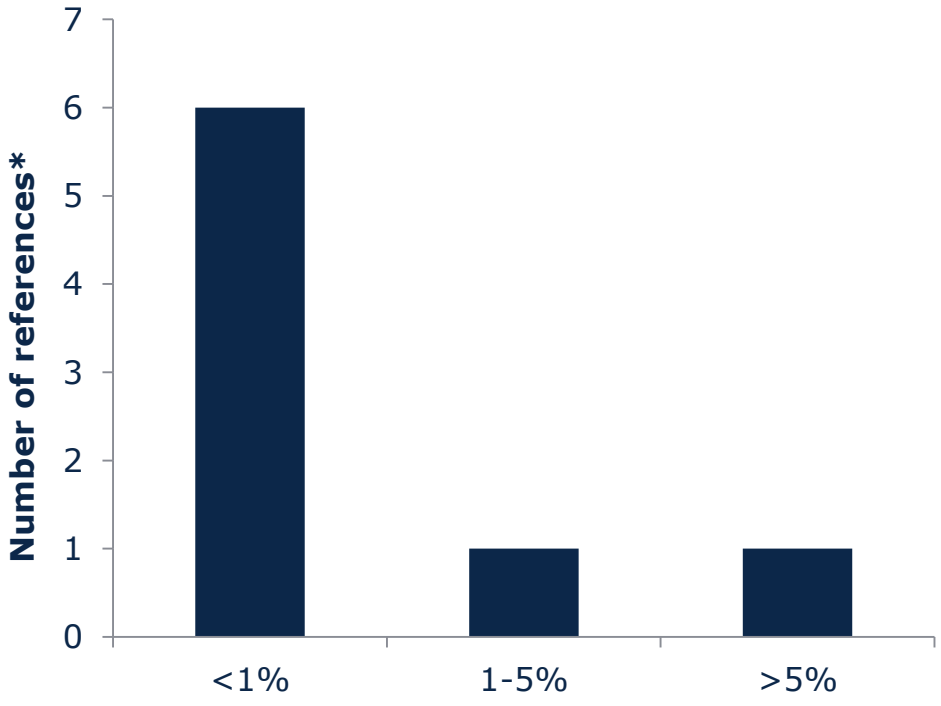
Network assets: Active transmission/switching equipment is mostly driven by non-voice services. Their relevance could be negligible for FTR



Network assets: NRAs' models typically show low relevance of active transmission/switching equipment in the Pure LRIC cost of the FTR

- Active transmission and switching equipment is mostly driven by the demand of non-voice services (broadband, TV, leased lines, etc.).
- Therefore, the relevance of such assets is typically negligible in the calculation of the pure LRIC cost for the voice termination service.
- This situation is confirmed by most NRAs' models as well as Axon's own models. These costs hardly ever represent more than 1% of the service's cost.

Weight of active transmission/switching in Pure LRIC



* References include: France, Spain, United Kingdom, Netherlands, Austria, Denmark, Norway and Sweden.

Note: As an additional reference, in models developed by Axon's for other NRAs the materiality of these assets in Pure LRIC FTR is typically below 1%.

Network assets: The consideration of these elements would have implications on the cost model and on stakeholders' involvement

Implications for the cost model

- New inputs would have to be fed into the model to dimension these additional network elements, including, inter alia, demand for non-voice services, unit prices of active transmission elements, traffic per access/distribution node, geo information.
- The model's complexity would be increased to account for the transmission and active transmission elements of the network.

Implications for the stakeholders

- Recognising that the timings of the project described in section 1 are not subject to change, stakeholders could face time limitations in:
  - *The review of the model.* The higher complexity of the model could require more time to understand the calculations adopted.
  - *The provision of data.* As indicated above, additional requirements would be issued if these elements are to be included in the cost model.

Network assets: The most relevant implication of considering active transmission/switching equipment would be additional data requirements

Input 1: Demand of non-voice fixed services

IPTV SERVICES

Services	Units	2016	2017	2018
IPTV lines	lines	-	-	-

BROADBAND SERVICES

Services	Units	2016	2017	2018
Yearly average 50Mbps xDSL Retail lines	lines	-	-	-
Yearly average 100Mbps xDSL Retail lines	lines	-	-	-
...				
Yearly average 50Mbps FTTH Retail lines	lines	-	-	-
Yearly average 100Mbps FTTH Retail lines	lines	-	-	-
...				
Yearly average 50Mbps bitstream Wholesale line	lines	-	-	-
Yearly average 100Mbps bitstream Wholesale lin	lines	-	-	-
...	lines	-	-	-

LEASED LINES SERVICES

Services	Units	2016	2017	2018
Yearly average E1	lines	-	-	-
Yearly average E3	lines	-	-	-
Yearly average STM1	lines	-	-	-
Yearly average STM4	lines	-	-	-
Yearly average STM16	lines	-	-	-
Yearly average Fast Ethernet	lines	-	-	-
Yearly average Gigabit Ethernet	lines	-	-	-
...		-	-	-

Dimensioning of switching and active transmission equipment requires demand of all services using them (broadband, TV, LL, mobile services, etc.).

Input 2: Prices of active transmission equipment

Resource	Unit CAPEX (EUR)	Unit OPEX (EUR)
Cost of a Switch 100Mbps port	-	-
Cost of a Switch 500Mbps port	-	-
Cost of a Switch 1Gbps port	-	-
Cost of a Switch 10Gbps port	-	-
Cost of a Switch 40Gbps port	-	-
Cost of a Switch 100Gbps port	-	-
Cost of a Switch chassis (small)	-	-
Cost of a Switch chassis (medium)	-	-
Cost of a Switch chassis (large)	-	-
Cost of other common elements of a Switch	-	-
...		

Unit prices (CapEx and OpEx) of all the network elements to be included in the model will be requested in order to calculate the costs they generate.

Input 3: Traffic per node

	COORDINATES				ANNUAL TRAFFIC	
ACCESS NODE CODE/NAME	LATITUDE	LONGITUDE	CITY	REGION	VOICE (MINUTES)	BROADBAND DATA (GB)
-	-	-	-	-	-	
-	-	-	-	-	-	
-	-	-	-	-	-	
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-	-	-	-	-	-	

The dimensioning of the active transmission equipment also requires characterisation of traffic (minutes, GB, etc.) per node tier.

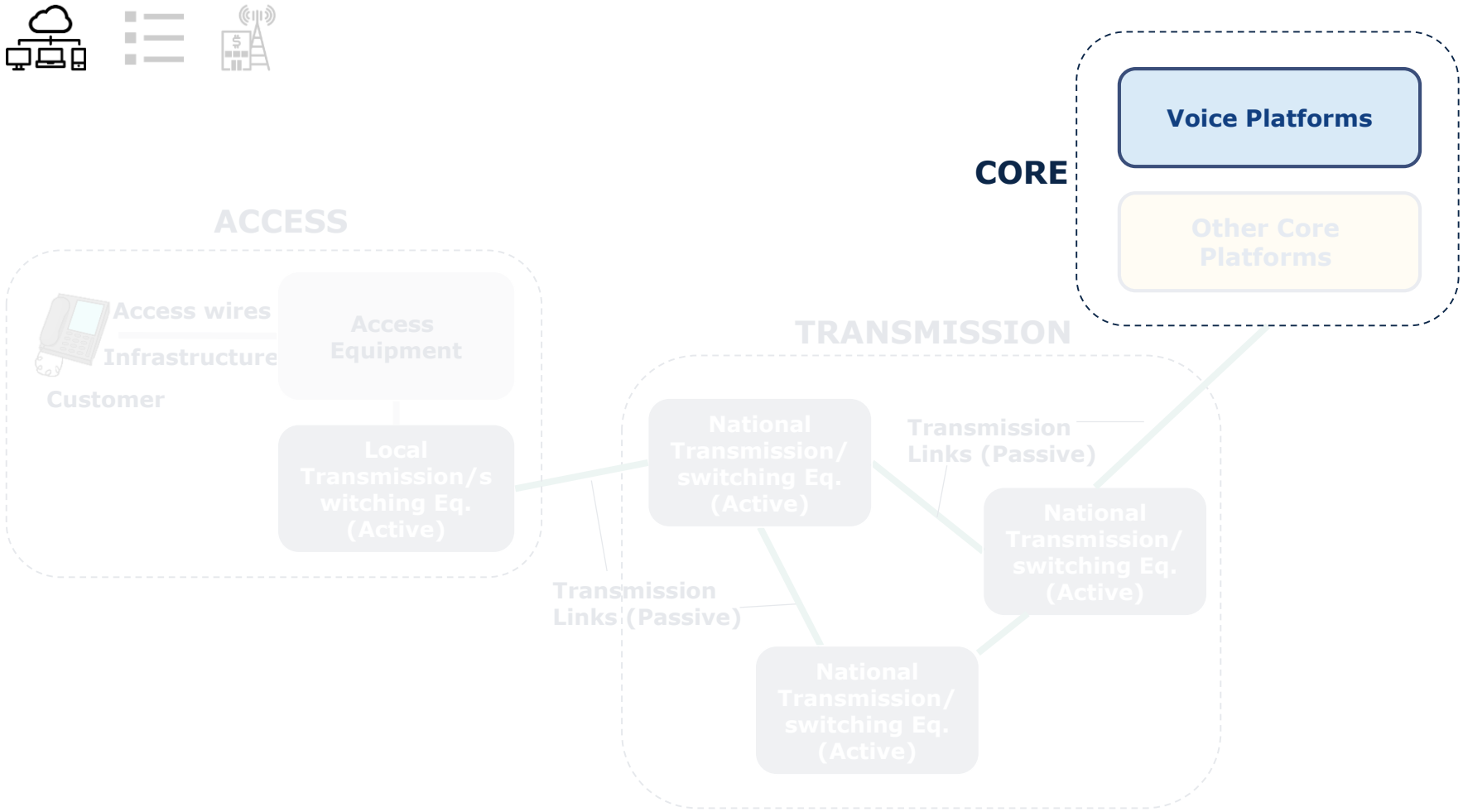
Note: Illustrative overview of information that could be requested for modelling active transmission elements. Non-exhaustive list.

Network assets: There are three main approaches with regards to how the model should deal with active transmission equipment

Order of preference Axon/EC

Description	Pros	Cons
Alternative 1 Active transmission equipment is not considered	+ Lower work-load for stakeholders in the data request and model review + Lower model complexity	- Marginally lower accuracy of the cost model
Alternative 2 Active transmission equipment is considered through a mark-up	+ Lower work-load for stakeholders in the data request + Lower model complexity	- Public models will be requested to calculate the mark-up - Stakeholders mark-up review - May not improve accuracy
Alternative 3 Active transmission equipment is included in the model	+ Relatively higher accuracy of the model	- Additional work-load for stakeholders in data request and model review - Increased model complexity

Network assets: The platforms used to provide voice services will be the focus of the network modelling exercise



Network assets: Given its relevance, we expect stakeholders' feedback on the specifications of their core voice networks

Network structure

- Core network structure adopted (e.g. IMS, MGW-based, etc.)
- Main core platforms deployed for the provision of voice services

Virtualization of network elements

- Current status of virtualization and expected situation towards 2025.
- Current cost/specs availability for the implementation of these solutions.

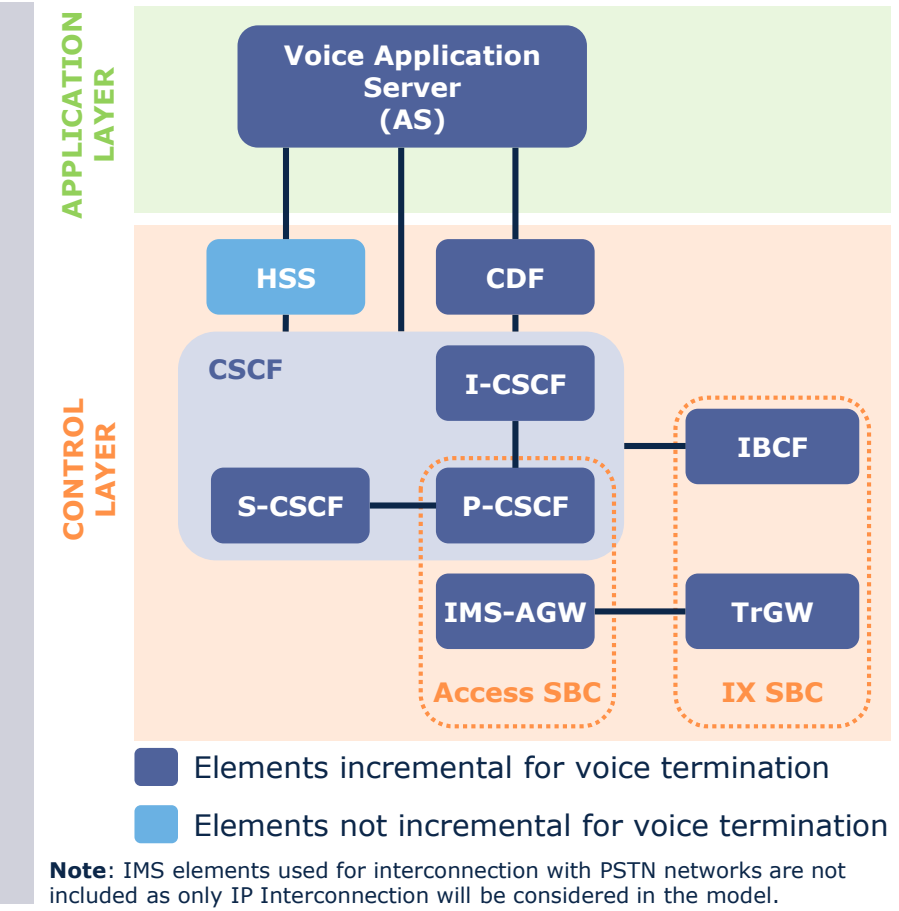
Synergies with mobile traffic

- Platforms that are shared between mobile and fixed voice traffic.
- Percentage of relevance of mobile voice traffic in the shared platforms.

Network assets: We propose to model an IMS network architecture for the provision of fixed voice services

- It is our understanding that the most modern platforms currently employed by fixed operators in Europe to provide voice services are:
  - Voice Application Server (AS)
  - Call Service Control Function (CSCF), split into the P-CSCF, I-CSCF and S-CSCF.
  - Charging Data Function (CDF)
  - Interconnect Border Control Function (IBCF)
  - IMS Access GateWay (IMS-AGW)
  - Transition GateWay (TrGW)
- Other IMS platforms (e.g. HSS), will not be considered if they are not incremental to voice.

Network elements to be modelled



Note: IMS elements used for interconnection with PSTN networks are not included as only IP Interconnection will be considered in the model.

Network assets: A detailed and granular cost-analysis of the IMS network should be performed to capture its specific behaviour

- A thorough assessment of the cost-incrementality of the core platforms will be performed.
- A detailed data request will be issued, to understand the cost-demand relationship of these platforms. The final approach to be adopted will strongly depend on the amount and quality of the information received.
- EC and Axon have already identified three potential alternatives to perform this assessment. Below we present these alternatives by order of our initial preference. However, the approach finally adopted will depend on the level/granularity of information received from stakeholders:
  - **Option A**. Use catalogues of modular equipment based on the information provided by stakeholders.
  - **Option B**. Use Cost-Volume Relationships (CVRs) provided by stakeholders.
  - **Option C**. Build our own Cost-Volume Relationships (CVRs) based on the information received, the information publicly available and Axon's internal database.
- Data requests will be designed with the purpose of gathering information for all alternatives.

Network assets: Price catalogues will be preferentially used if this information is provided by stakeholders

OPTION A. Price catalogues of modular equipment

- The equipment employed in telecommunications networks is typically modular. This means that only a set of configurations/capacities is commonly available and, if the capacity required falls between two configurations, the higher one must be purchased.
- Option A consists in reflecting this behaviour in the model by defining a catalogue with a number of options together with their capacity and cost. When the demand for the voice termination service is removed, the model can select a lower capacity configuration and calculate the savings.

Illustrative example of a price catalogue

Equipment	Capacity (Gbps)	Cost ('000 EUR)
Core equipment Cat. 0	1	100
Core equipment Cat. 1	2	150
Core equipment Cat. 2	4	200
Core equipment Cat. 3	8	250
Core equipment Cat. 4	16	300
Core equipment Cat. 5	32	350

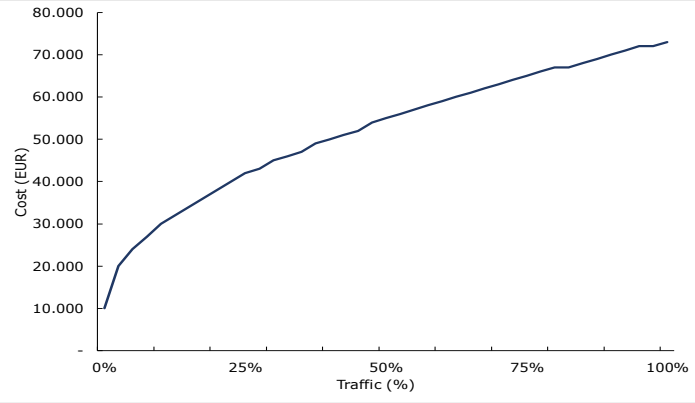
Pros	Cons
+ Information on equipment capacities and costs could be known by operators + More representative of the reality in the short-term	- Step modularity could lead to large jumps in the calculated FTRs - Since few units of each core element are owned by operators, price catalogues may not be as extensive as required

Network assets: The second alternative would rely on Cost-Volume Relationships (CVRs) received from stakeholders

OPTION B: Cost-Volume Relationships (CVRs)

- CVRs describe how costs are affected by demand and are commonly implemented in LRIC top-down cost models.
- Therefore, if price catalogues are not available, CVRs could constitute a reliable reference to calculate the savings in the core network when the provision of the fixed termination service is ceased.
- While this approach is appropriate to calculate the costs of the fixed termination service in the long run, we do recognise that only a minority of operators may have this information available off-the-shelf (and we are not suggesting that stakeholders should calculate CVRs for the purpose of this project).

Illustrative examples of cost-demand relationships



Pros	Cons
+ Produces stable results + More representative of the reality in the medium and long term	- Unless operators have recently implemented LRIC top-down systems, CVRs could be difficult to obtain

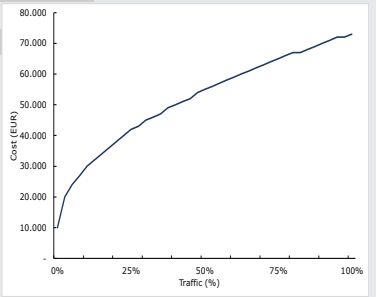
Network assets: If options A/B are not feasible with the data received, we would calculate and define our own CVRs with available data

OPTION C: Definition of our own CVRs

- If insufficient information is collected from stakeholders for the implementation of alternatives A or B, we would design our own Cost-Volume Relationship (CVR).
- CVRs would be defined based on:
  - Available information from stakeholders with regards to alternatives A and B.
  - CVRs published by NRAs of EU/EEA countries.
  - Axon's internal database.

Sources for definition of our own CVRs

Equipment	Capacity (Gbps)	Cost ('000 EUR)
Core equipment Cat. 0	1	100
Core equipment Cat. 1	2	150
Core equipment Cat. 2	4	200
Core equipment Cat. 3	8	
Core equipment Cat. 4	16	
Core equipment Cat. 5	32	



Pros	Cons
+ CVR's are more better to assess the incrementality of the network. + Increased robustness from multiple sources of information.	- Values reported by different stakeholders may not be consistent

Methodological aspect 2: Wholesale commercial costs

Network assets

- Should active transmission equipment be included in the cost model?
- What core elements should be dimensioned?
- How should incremental costs of core platforms be assessed?

Wholesale commercial costs

- What wholesale commercial costs should be considered?
- How should these costs be allocated to fixed termination?

Reference Operator

- How should the reference operator be defined?
- What should be its market share?

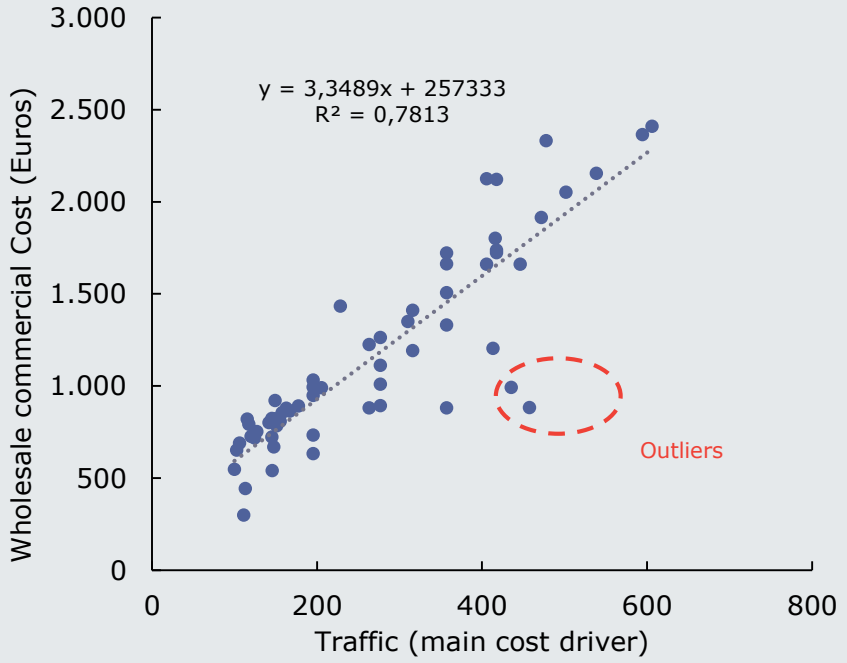
Wholesale commercial costs: Wholesale commercial costs associated to fixed termination should be included in the study

- The EC's Recommendation on MTR/FTR states that *"Wholesale commercial costs directly related to the provision of the wholesale termination service to third parties would also be taken into account"*
- The data request will include specific questions to achieve a clear view of the wholesale costs.
- The following categories are expected to be considered, consistently with EC's model for mobile networks:
  - Route testing/monitoring costs
  - Operation and management (O&M) costs
  - Data clearing costs
  - Financial clearing costs
- Nevertheless, alternative approaches/categories may be considered based on stakeholders' feedback to workshop 1 (e.g. hardware, software and staff).

Wholesale commercial costs: Regression analyses for each cost category will be employed to identify correlation between traffic and costs

- Regression analyses will be employed to assess the portions of costs that are fixed and variable to the demand.
- This process will be used to determine the total wholesale commercial costs of the operator. Our experience in the EC's mobile project has shown that this is a complex task.
- Drivers will be defined based on the reasonability of the regressions obtained and feedback from stakeholders is welcomed.

Illustrative regression analysis for calculating wholesale commercial costs



Wholesale commercial costs: A key task will consist in identifying the portion of wholesale commercial costs attributable to FTR

- A key challenge in the treatment of wholesale commercial costs will consist in identifying the costs attributable to fixed voice termination. We expect this allocation to be provided by operators.
- In the case that information received is insufficient or inconclusive, alternative method will be implemented by the EC/Axon (e.g. Wholesale payments*)

Possible allocation drivers for wholesale commercial costs

	Set by operators	Set by the EC/Axon	
	Driver 1	**Driver 2**	**Driver 3**
Route testing/monitoring	Internal alloc.	Wholesale Payments	*Others?*
Operation and maintenance (O&M)	Internal alloc.	Wholesale Payments	*Others?*
Data clearing	Internal alloc.	Wholesale Payments	*Others?*
Financial clearing	Internal alloc.	Wholesale Payments	*Others?*

Note(*): Payments may refer to revenues received by the operator providing a wholesale service (payment coming from the seeker operator) or costs of wholesale services paid by the operator seeking a wholesale service (paid to the provider operator).

Methodological aspect 3: Reference Operator

Network assets

- Should active transmission equipment be included in the cost model?
- What core elements should be dimensioned?
- How should incremental costs of core platforms be assessed?

Wholesale commercial costs

- What wholesale commercial costs should be considered?
- How should these costs be allocated to fixed termination?

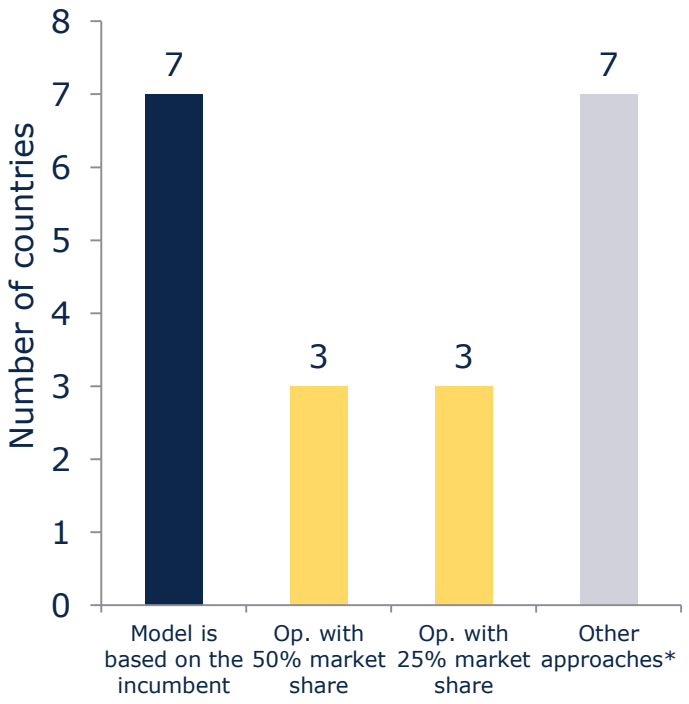
Reference Operator

- How should the reference operator be defined?
- What should be its market share?

Reference Operator: We seek stakeholders' feedback to define the market share of the reference operator to be modelled

- Unlike the case of the MTR, no clear indications are provided in the EC's 2009 Recommendation or the EECC with regards to the size of the reference operator.
- The market share of the reference operator could be defined as:
  - Market share of the incumbent operator in each country.
  - Fixed share (25% or 50%).
- We expect to receive stakeholders' feedback about their preferred approach for the size of the reference operator.
- The same approach (fixed share or incumbent's share) will be adopted to define the reference operator considered in each Member State.
- This decision will impact on the data requirements and it may require the participation of smaller operators for filling in the data requests.

Benchmark of approaches for ref. op.



Note (*): Includes other scenarios such as the consideration of different market shares per network section, the refusal to set a market share in advance but deciding it based on the results of the model or the definition of market shares based on geographical areas.

Contents

Next Steps

Key upcoming milestones (1/2): Comments to the Workshop 1

Oct 2018

24 October

The EC/Axon will circulate Workshop 1 materials to NRAs

Nov 2018

15 November

NRAs to submit comments to the EC/Axon

Dec 2018

Workshop 1 presentation

AXON

European Commission

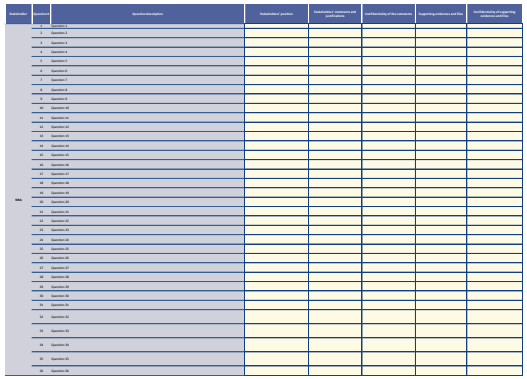
Assessment of the cost of providing wholesale voice call termination services on fixed networks in the EU/EEA countries – SMART 2018/0014

Workshop 1

23 October 2018

This document was prepared by Axon Consulting for the use of the client to whom it is addressed. No part of it may be copied or made available in any way to third parties without our prior written consent.

Workshop 1 template to comment



Stakeholder	Question	Question description	Stakeholders' position	Stakeholders' comments and justifications	Confidentiality of the comments	Supporting evidences and links	Confidentiality of supporting evidences and links
NRAs	1	Question 1					
	2	Question 2					
	3	Question 3					
	4	Question 4					
	5	Question 5					
	6	Question 6					
	7	Question 7					
	8	Question 8					
	9	Question 9					
	10	Question 10					
	11	Question 11					
	12	Question 12					
	13	Question 13					
	14	Question 14					
	15	Question 15					
	16	Question 16					
	17	Question 17					
	18	Question 18					
	19	Question 19					
	20	Question 20					
	21	Question 21					
	22	Question 22					
	23	Question 23					
	24	Question 24					
	25	Question 25					
	26	Question 26					
	27	Question 27					
	28	Question 28					
	29	Question 29					
	30	Question 30					
	31	Question 31					
	32	Question 32					
	33	Question 33					
	34	Question 34					
	35	Question 35					
	36	Question 36					

Next Steps

Key upcoming milestones (2/2): Comments to draft data requests

Oct 2018

31 October

The EC/Axon will circulate draft data requests to NRAs

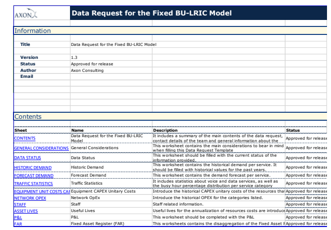
Nov 2018

15 November

NRAs to submit comments to the EC/Axon

Dec 2018

Draft data requests



Data Request for the Fixed BU-LRIC Model

Information

Title	Data Request for the Fixed BU-LRIC Model
Version	1.3
Status	Approved for release
Author	Axon Consulting
Email	

Contents

Sheet	Name	Description	Status
CONTENTS	Data Request for the Fixed BU-LRIC Model	It includes a summary of the main contents of the data request, contact details of the team and general information about the	Approved for release
GENERAL CONSIDERATIONS	General Considerations	This worksheet contains the main considerations to bear in mind when filling this Data Request Template	Approved for release
DATA STATUS	Data Status	This worksheet should be filled with the current status of the information provided.	Approved for release
HISTORIC DEMAND	Historic Demand	This worksheet contains the historical demand per service. It should be filled with historical values for the past years.	Approved for release
FORECAST DEMAND	Forecast Demand	This worksheet contains the demand forecast per service.	Approved for release
TRAFFIC STATISTICS	Traffic Statistics	It includes statistics about voice and data services, as well as the busy hour percentage distribution per service category	Approved for release
EQUIPMENT UNIT COSTS CAP	Equipment CAPEX Unitary Costs	Introduce the historical CAPEX unitary costs of the resources tha	Approved for release
NETWORK OPEX	Network OpEx	Introduce the historical OPEX for the categories listed.	Approved for release
STAFF	Staff	Staff related information.	Approved for release
ASSET LIVES	Useful Lives	Useful lives for the annualization of resources costs are introduce	Approved for release
P&L	P&L	This worksheet should be completed with the P&L	Approved for release
FAR	Fixed Asset Register (FAR)	This worksheets contains the disaggregation of the Fixed Asset F	Approved for release

Mr. Alfons Oliver
Senior Manager
Axon Partners Group

Madrid on March 1st, 2018

SUBJECT: DATA GATHERING PROCESS FOR THE DEVELOPMENT OF COSTING MODELS

Dear Sir or Madam,

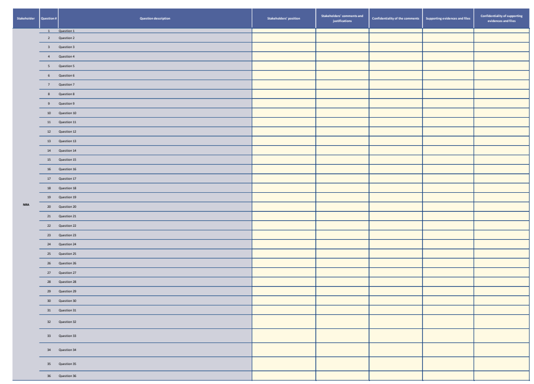
We address you in reference to the ongoing work on the 'PROJECT NAME' which has been recently committed to our firm by the 'CLIENT NAME'.

The main objective of this document is to ease the gathering of the information that is considered necessary for the development of the costing models. In order to maximise the efficiency and effectiveness of this process, data request templates have been provided to the operators, which shall be filled in accordance with the guidelines presented in this document.

For clarity purposes, the following paragraphs provide an introduction to the project as well as the guidelines for the data gathering process (Section 1). Additionally, Sections 2, 3, 4, 5 and 6 provide a description of the data requested in the templates.

Operators should comply with deadlines defined by NRA in section 1.2 of this letter, ensuring at the same time the robustness and integrity of the information provided. To the maximum possible extent, the data requested should be provided gradually. That is, we would appreciate if the information could be provided by blocks (sheet by sheet of the attached Excel templates) as soon as information is available, without waiting for the entire package to be ready (the whole template workbook).

Template to comment



Stakeholder	Question #	Question description	Stakeholders' position	Stakeholders' comments and justifications	Confidentiality of the comments	Supporting evidences and files	Confidentiality of supporting evidences and files
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	30	Question 30					
	31	Question 31					
	32	Question 32					
	33	Question 33					
	34	Question 34					
	35	Question 35					
	36	Question 36					

Next Steps
General considerations for the consultation processes with stakeholders

- <u>EC/Axon-NRAs-Operators interactions:</u>
  - Both NRAs and Operators' feedback is welcomed.
  - A single filled-in template with comments is expected per country. This implies that:
    - NRAs should set an internal deadline to operators to collect their feedback (which should be before the deadline set by the EC/Axon team).
    - NRAs should collect the feedback generated by their national operators and integrate it with their own feedback into a single filled-in template.
    - NRAs should upload their filled in template to the CIRCABC workspace*.
  - Any questions from operators should be addressed to their NRA (not to the EC or Axon).

- <u>Indications about the consultation processes:</u>
  - Stakeholders should only comment on the specific questions raised by the EC/Axon team in the template for providing comments.
  - Comments should be as precise and brief as possible, while making sure they are properly justified.
  - Comments provided beyond the agreed deadline may be dismissed by the EC/Axon team.

* Instructions on how to manage the CIRCABC workspace will be provided.

Axon Partners Group

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28004 Madrid (Spain)

Tel: +34 91 310 28 94

Any questions? Please, contact:

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Senior Manager

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