

BU – LRAIC

Kick – off meeting

22 February 2012

Agenda

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|---|----------------------|
| 1 | Project background |
| 2 | Project scope |
| 3 | BU-LRAIC methodology |
| 4 | Project management |

Assumptions

Legal background:

- ▶ European Union Electronic Communications Regulation System (directives);
- ▶ Law on Electronic Communications of Republic of Lithuania;
- ▶ Market analysis conducted by the Communications Regulatory Authority of Republic of Lithuania (further – RRT);
- ▶ Executive orders and decisions of the Director of the RRT.

In 2005 RRT initiated project to estimate call costs for Fixed-line networks and in 2008 another project was initiated to estimate call costs for mobile networks:

- ▶ EY created HY-LRAIC cost calculation model for fixed-line networks according to which call prices were started to be regulated by RRT from 2010;
- ▶ EY created BU-LRAIC cost calculation model for mobile networks according to which call prices were started to be regulated by RRT from 2010.

However in 2009 European Commission released new recommendation (2009/396/EC) regarding call price regulation and this project's aim is to update current cost estimation models accordingly.

EU recommendation 2009/396/EC

The aim of the project is to build a BU-LRAIC model to calculate costs of call termination in fixed-line and mobile operators networks in order to comply with requirements set out in all of the recommendations of the European Commission (EU recommendation 2009/396/EC), in particular the following:

- ▶ Model the costs of an efficient service provider
- ▶ Based on current costs
- ▶ Forward looking BU LRAIC model
- ▶ Comply with the requirements of "technological efficiency" – NGN
- ▶ Take into account 2G and 3G technology mix (mobile operator)
- ▶ May contain economic depreciation method
- ▶ Take into account the incremental costs of call termination in determining the per item cost

LRAIC cost models overview of Fixed-line

The table below presents change in calculation approach according to European Commission recommendation (2009/396/EC).

	Previous RRT approach	New Recommendation	
Model the costs of an efficient service provider			Included
Based on current costs			Not included
Forward looking BU LRAIC model*			
Comply with the requirements of "technological efficiency" - NGN			New topics
Take into account pure incremental costs of call termination in determining the per item cost			

*Previously applied RRT model was based on HY-LRAIC methodology

LRAIC cost models overview of Mobile

The table below presents change in calculation approach according to European Commission recommendation (2009/396/EC).

	Previous RRT approach	New Recommendation	
Model the costs of an efficient service provider			Included
Based on current costs			Not included
Forward looking BU LRAIC model			
Comply with the requirements of "technological efficiency" – NGN			
Take into account 2G and 3G technology			
Take into account pure incremental costs of call termination in determining the per item cost			New topic

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Project objectives and key deliverables

Project objectives



- ▶ Build a BU-LRAIC model to calculate costs of call termination in fixed-line and mobile operators networks in order to comply with requirements set out in all of the recommendations of the European Commission
- ▶ Estimate costs of other voice wholesale services

Key deliverables

- ▶ **Plan** for the carrying out the Project
- ▶ **Reference paper** for BU-LRAIC model
- ▶ **Questionnaire** for data collection
- ▶ **Report on estimation of WACC**
- ▶ **Intermediate BU-LRAIC model**
- ▶ **Final BU-LRAIC model** including user manual

Services included

	Fixed telecommunications	Mobile telecommunications
Economic model	<ul style="list-style-type: none"> ▶ Call origination* ▶ Call termination* ▶ Call transit services (5 types)* ▶ Point of interconnection services ▶ Providing capacity in point of interconnection services 	<ul style="list-style-type: none"> ▶ Call origination* ▶ Call termination* ▶ Call transit services (3 types)* ▶ Point of interconnection services ▶ Providing capacity in point of interconnection services
Technical-Technological Model	<ul style="list-style-type: none"> ▶ Data services ▶ IPTV services ▶ Providing access to network infrastructure ▶ Other services 	<ul style="list-style-type: none"> ▶ Sending and receiving SMS (4 types) ▶ Sending and receiving MMS (4 types) ▶ Data services (national and international) ▶ Other services

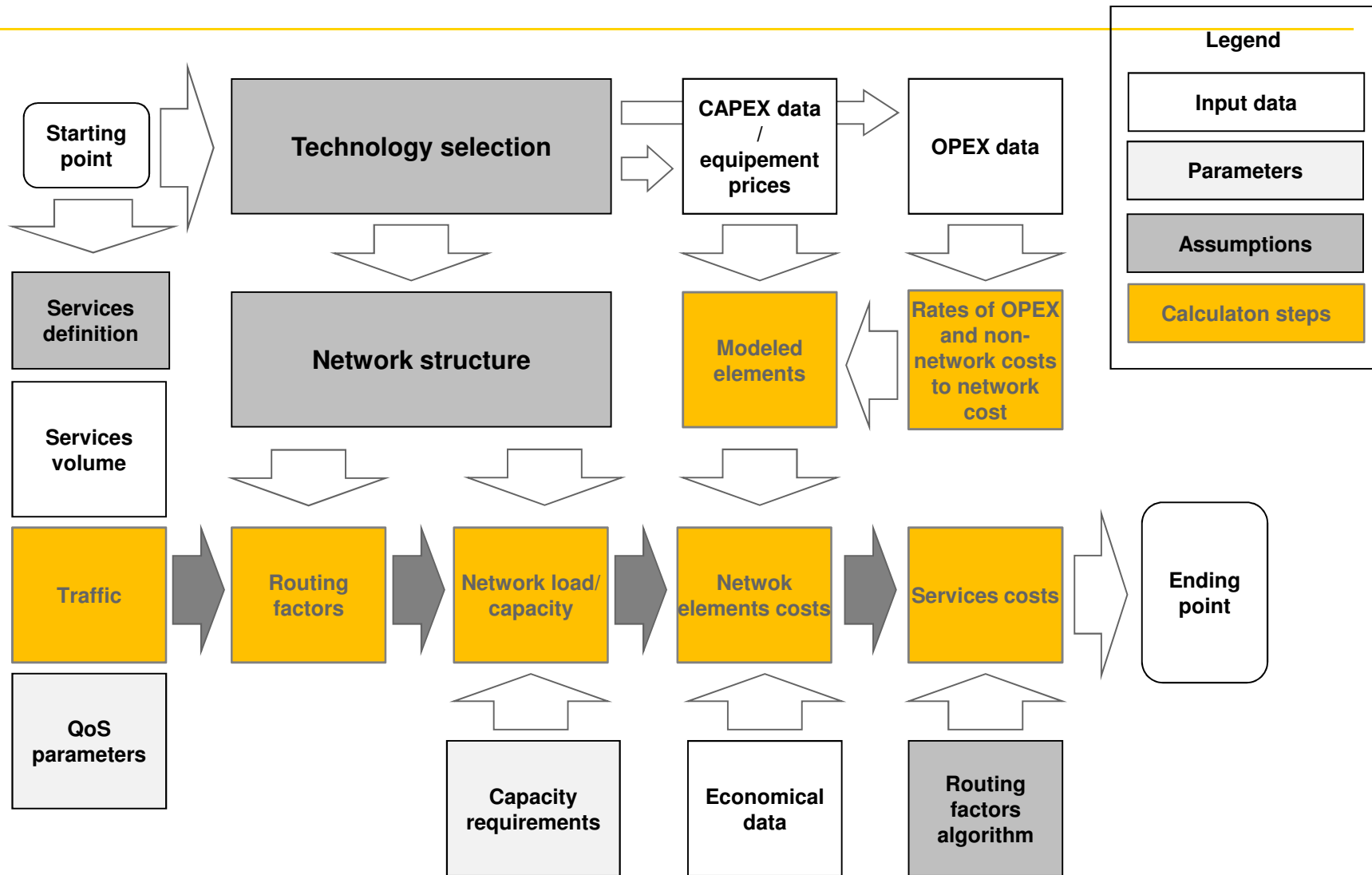
* Call origination, termination and transit services have **peak-hours, not peak-hours** and **general perspectives** (Fixed and Mobile)

Technical – Technological model will **only model these infrastructure components** that are required for the delivery of **wholesale services**, calculated in Economic model. However the capacity of these components will be set according all relevant services. Costs of other services, using same infrastructure, will not be calculated.

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Our approach – process flow

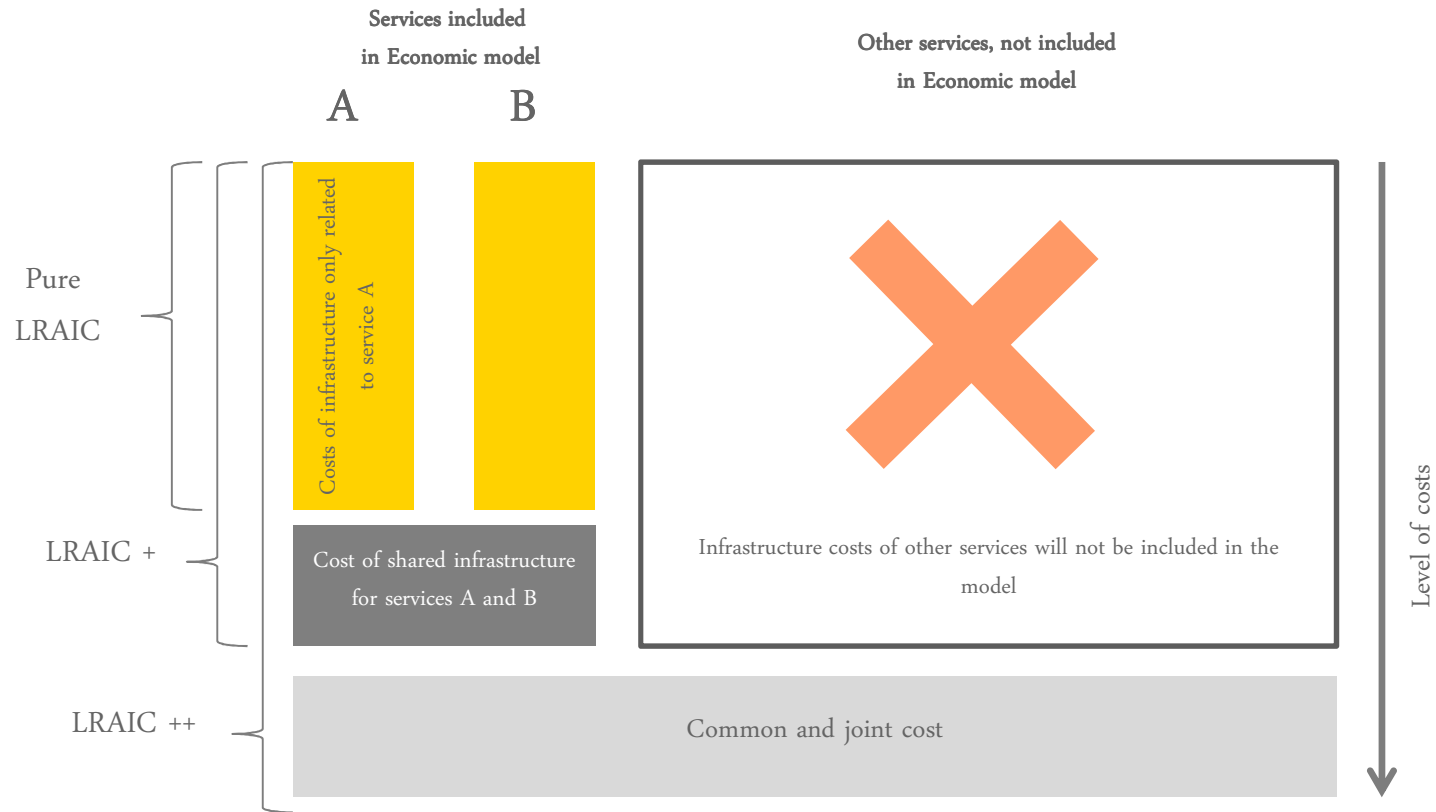


Pure LRAIC methodology

- ▶ Taking account of the particular characteristics of call termination markets, the costs of termination services should be calculated on the basis of forward-looking long-run incremental costs (LRAIC).
- ▶ In a LRAIC model, all costs become variable, and since it is assumed that all assets are replaced in the long run, setting charges based on LRAIC allows efficient recovery of costs.
- ▶ LRAIC models include only those costs which are caused by the provision of a defined increment. An incremental cost approach which allocates only efficiently incurred costs that would not be sustained if the service included in the increment was no longer produced (i.e. avoidable costs).
- ▶ The further termination rates move away from incremental cost, the greater the competitive distortions between fixed and mobile markets and/or between operators with asymmetric market shares and traffic flows.
- ▶ Therefore, it is justified to apply a pure LRAIC approach whereby the relevant increment is the wholesale call termination service and which includes only avoidable costs.

LRAIC+ and LRAIC++ calculations are included in model creation, however the type of method to estimate cost will be chosen by the RRT

Network infrastructure modeled



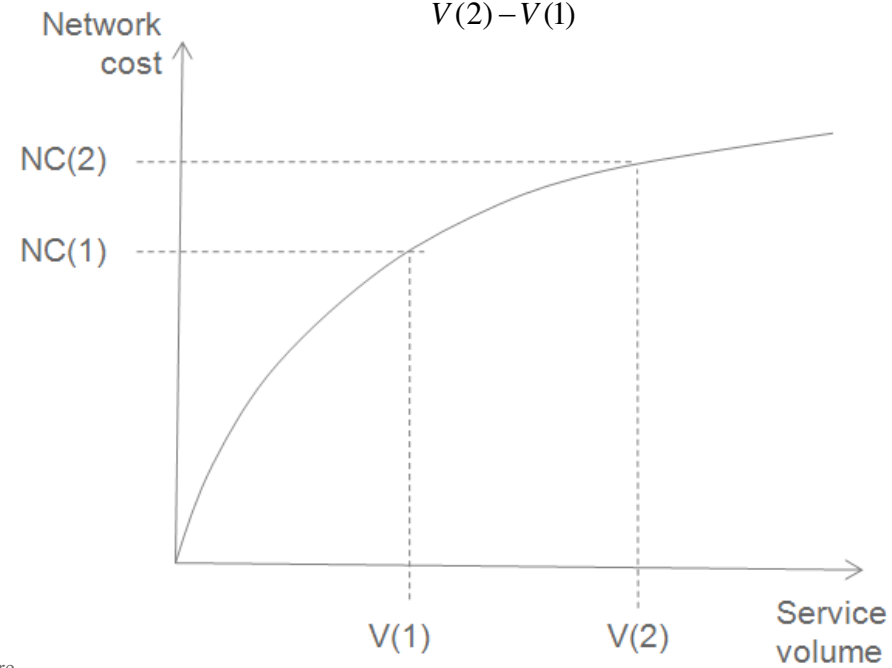
- ▶ Pure LRAIC: pure incremental costs (MTR/ FTR volume increment);
- ▶ LRAIC+: incremental costs and costs of shared elements and activities (Total voice increment);
- ▶ LRAIC++: incremental costs and costs of shared and common elements and activities.

Pure incremental cost

The final results are calculated in this calculation page – unit cost

- ▶ According to EU Recommendation the avoidable costs of the wholesale call termination increment should be calculated by identifying the total long-run cost of an operator providing its full range of services and then identifying the long-run costs of the same operator in the absence of the wholesale call termination service being provided to third parties (see figure on the right).
- ▶ Other words, this is an increment only of the call termination service and not whole voice traffic

$$U = \frac{NC(2) - NC(1)}{V(2) - V(1)}$$



Where,

U – incremental termination rate

NC(1) – cost of network planned to utilize demand for V(1) service volume

NC(2) – cost of network planned to utilize demand for V(2) service volume

NC(2) – NC(1) – incremental cost of network (avoidable cost)

V(2) – total service volume

V(1) – total service volume less wholesale call termination volume

V(2) – V(1) – wholesale call termination volume

Technology selection – EU Recommendation

The table below presents expected change in modeled network architecture according to European Commission Recommendation (2009/396/EC).

	Mobile network	Fixed network
Previous network architecture	<p>The diagram illustrates a traditional mobile network architecture. It features a mix of circuit-switched and packet-switched networks. Key components include a Base Transceiver Station (BT S), Base Station (BS), Mobile Switching Center (MSC), Visitor Location Register (VLR), Home Location Register (HLR), Equipment Identity Register (EIR), Authentication Center (AUC), Gateway MSC (GMS C), Packet Control Unit (PCU), Serving GPRS Support Node (SGS N), and Gateway GPRS Support Node (GGSN). The network is connected to both PSTN and Internet clouds.</p>	<p>The diagram shows a traditional fixed network architecture. It starts with a Modem connected to a Cabinet, which leads to a Main Distribution Frame (MDF). From the MDF, the network branches into DSLAM (Digital Subscriber Line Access Multiplexer) and Concentrator. The DSLAM path goes through ATM/IP-edge to an IP-core cloud. The Concentrator path goes through Local exchange and Inter exchange to a PSTN cloud.</p>
Network architecture according to new Recommendation	<p>The diagram illustrates the recommended mobile network architecture. It features a central IP NGN network core. Key components include Node B, Radio Network Controller (RNC), Base Station Controller (BSC), Media Gateway (MG), MSC Server, Media Gateway (MGW), Packet Control Unit (PCU), Serving GPRS Support Node (SGSN), and Gateway GPRS Support Node (GGSN). The network is connected to both PSTN and Internet clouds.</p>	<p>The diagram shows the recommended fixed network architecture. It starts with a Modem connected to a Cabinet, which leads to a Main Distribution Frame / Optical Distribution Frame (MDF / ODF). From there, the network goes through a Multi-Service Access Node (MSAN) and Metro-Ethernet to an IP-core cloud.</p>

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Project timeline



Stage	Objective	Starting date	Ending date	Duration (weeks)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
Project	BU-LRAIC model	2012 02 15	2012 09 26	33								

Stages of the project

1	Preparation of BU-LRAIC reference papers	2012 02 22	2012 05 30	15									
2	Estimation of WACC	2012 03 07	2012 05 30	13									
3	Collection of questionnaires data	2012 05 24	2012 08 01	9									
4	Development of final BU-LRAIC model	2012 08 02	2012 09 26	8									

Key deliverables

1	BU-LRAIC reference papers and WACC estimates			2012 05 30	▲ 1
2	Collected data from market participants of Mobile and Fixed networks			2012 08 01	▲ 2
3	Final BU-LRAIC model			2012 09 26	▲ 3

Public consultations/
data collection

1	Public consultation regarding reference papers and WACC calculation	2012 04 19	1 month
2	Public consultation regarding questionnaires for 4 SMP operators	2012 06 14	5 working days
3	Public consultation regarding the results of model calculation	2012 08 16	1 month
4	Collection of data from 4 SMP operators (filling the questionnaires)	2012 06 28	1 month

Questions to the market players

Please provide us with the following information:

1. Current network structure, presenting physical network elements;
2. NGN roll-out plans for 2 and 5 years perspective;
3. Target of fully implemented NGN network structure, presenting physical network elements;
4. List of access technologies with split of subscribers share (current and in 2 and 5 years perspective);
5. Assumptions of voice traffic split between IP NGN and PSTN in coming years.

We kindly ask you to provide data by 7th of March