

Advisory

*Entry-Exit methodological  
guidelines for gas TSO*  
Public meeting

25 June 2014

---

# *Agenda*

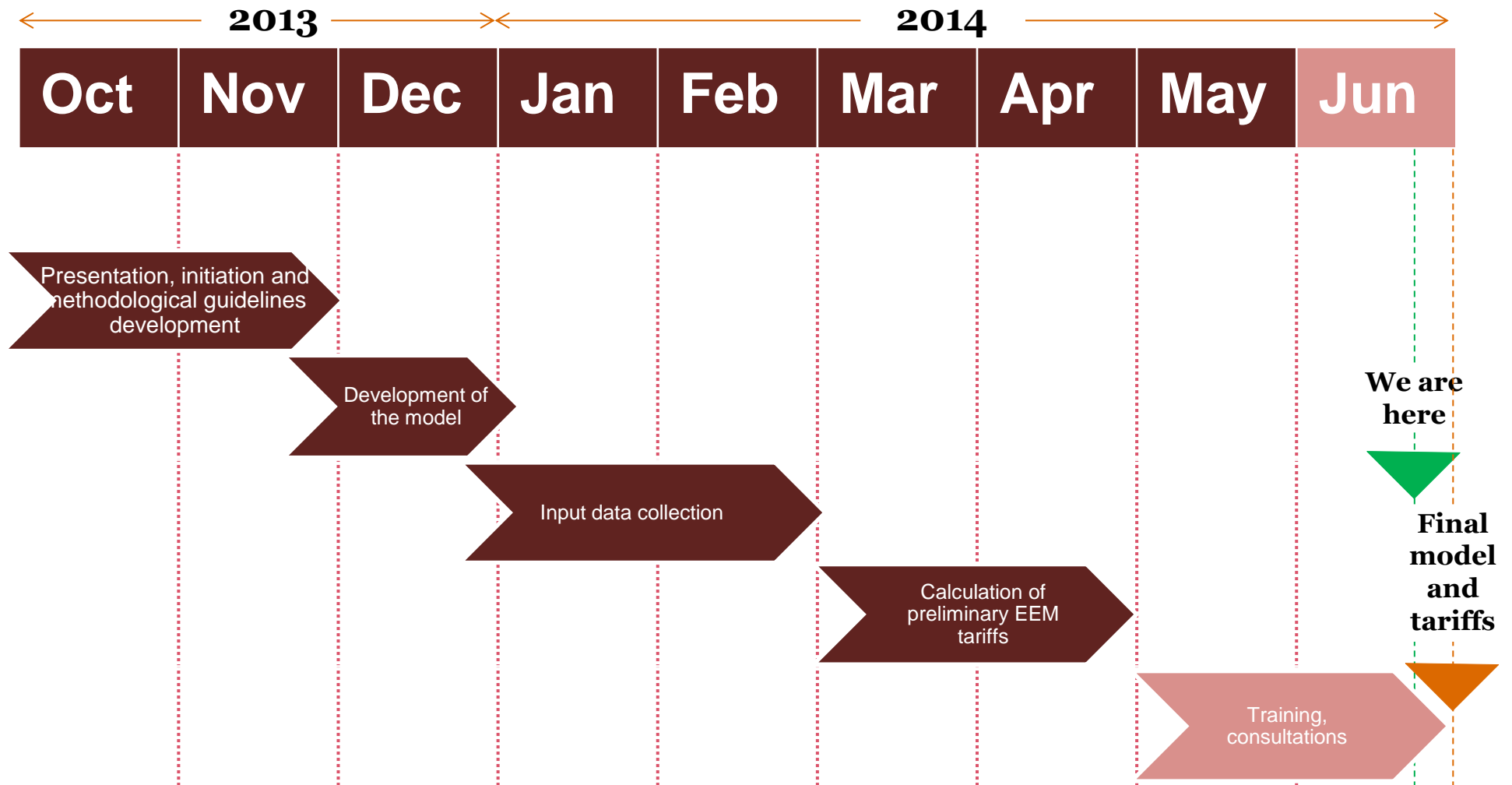
Project  
timeline

Methodology  
guidelines

Proposed  
model  
parameters

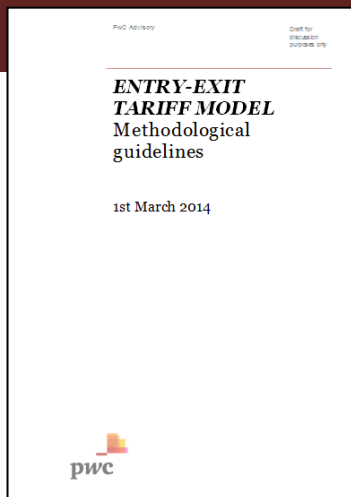
Model  
overview

# Entry-Exit model project timeline



# *Entry-Exit methodology guidelines overview*

*Methodology document analysing the gas market and regulation in Lithuania and proposing the approach for development of Entry-exit tariff model*



## *Key points:*

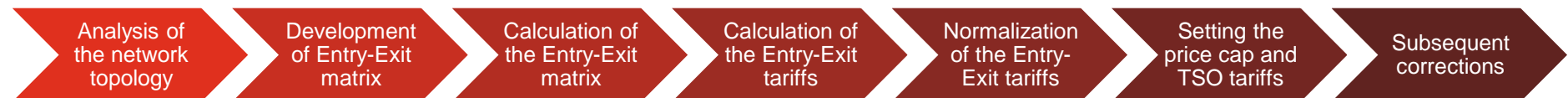
- Overview of the gas market in Lithuania
- Overview of main legislative acts for gas market regulation
- Overview of recent developments on the gas market
- Definition and models used in the development of the entry-exit model
- Selection of the model for Lithuanian entry-exit model
- Explanation of the modelling approach and overview of the steps and calculation logic for the entry-exit model

## ***Entry-Exit methodology guidelines – key points***

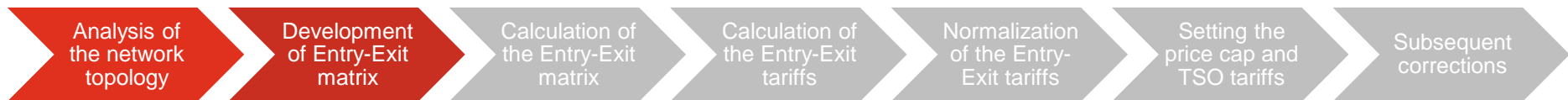
*The Entry-exit model proposed in methodology guidelines is in line with the ACER's recommendations summarised in Framework Guidelines on rules regarding harmonized transmission tariff structures for gas*

**Selected modelling approach** – Matrix model, based on optimal routes and least square statistical calculation

The methodology guidelines, model and tariff setting process can be summarized in the following steps:



# Entry-Exit methodology guidelines – main steps



## Main steps:

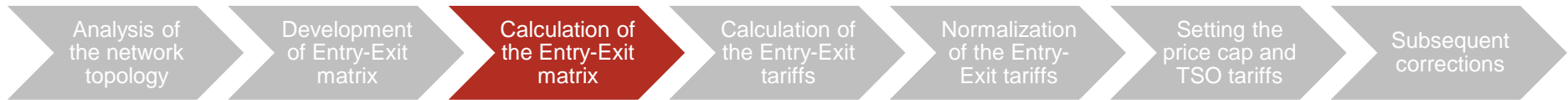
- Current situation is analyzed
- Data on the network topology collected
- Entry and exit points and pipeline segments defined
- Cost and technical data on the gas pipeline segments collected



## Result:

- Gas network for the model is defined

# Entry-Exit methodology guidelines – main steps



## Main steps:

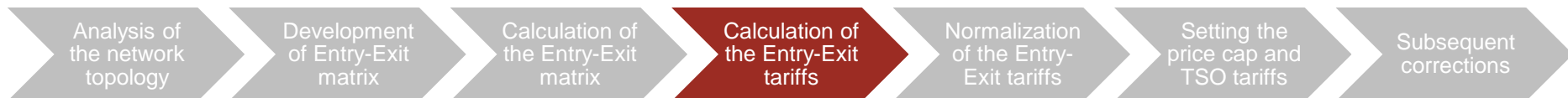
- Calculation of unit costs of pipeline segments
- Modelling the optimal routes
- Calculation of E/X matrix

## Result:

- Calculated E/X matrix provides the unit costs to deliver 1 unit of gas from each entry point to each exit point

		Unit costs				
		Entry points				
Exit points	A	B	C	D	E	
	LTL/m3	LTL/m3	LTL/m3	LTL/m3	LTL/m3	
F	-	0.470	0.130	0.280	0.190	
G	0.078	-	0.320	0.600	0.260	
H	0.075	0.080	-	0.500	0.310	
I	0.077	0.240	0.110	-	0.290	
J	0.183	0.280	0.680	0.260	-	
K	0.373	0.160	0.560	0.500	0.460	
L	0.039	0.040	0.180	0.230	0.340	
M	0.120	0.370	0.590	0.580	0.650	
N	0.537	0.160	0.130	0.400	0.590	
O	0.066	0.350	0.150	0.020	0.420	
P	0.174	0.050	0.070	0.050	0.140	
Q	0.213	0.500	0.430	0.650	0.150	
R	0.451	0.550	0.370	0.360	0.420	
S	0.268	0.470	0.650	0.420	0.630	
T	0.074	0.640	0.020	0.700	0.160	
U	0.216	0.610	0.420	0.600	0.020	

# Entry-Exit methodology guidelines – main steps



## Main steps:

- Application of least square modelling to calculate cost-reflective tariffs
- Various modelling options available in the model

## Result:

- Preliminary tariffs calculated based on the E/X modelling

1.d.1 Entry tariffs

Entry point	Preliminary tariff (PT <sub>ENX</sub> )	Annual booked capacity (PF <sub>ENX</sub> )	Preliminary annual allowed revenues (PAAR <sub>EN</sub> )	Normalized entry tariff (ANT <sub>ENX</sub> )	CHECK - Recovered annual allowed revenues
[#]	[LTL/000 m3 /day]	[000 m3/day]	[LTL]	[LTL/000 m3 /day]	[LTL]
A	2.62	1,486	1,421,714	4.33	2,349,352
B	10.91	587	2,338,066	18.03	3,863,605
C	2.51	20,998	19,258,485	4.15	31,824,243

1.d.2 Exit tariffs

Exit point	Preliminary tariff (PT <sub>EXY</sub> )	Annual booked capacity (PF <sub>EXY</sub> )	Preliminary annual allowed revenues (PAAR <sub>EX</sub> )	Normalized exit tariff (ANT <sub>EXY</sub> )	CHECK - Recovered annual allowed revenues
[#]	[LTL/000 m3 /day]	[000 m3/day]	[LTL]	[LTL/000 m3 /day]	[LTL]
A	-	-	-	-	-
B	6.58	587	1,409,424	10.87	2,329,043.22
C	-	-	-	-	-
D	4.71	823	1,414,634	7.78	2,337,653.27
E	5.93	506	1,095,850	9.80	1,810,869.76
F	3.74	793	1,082,632	6.18	1,789,026.84
G	0.63	3,912	898,609	1.04	1,484,931.90
H	0.80	4,210	1,231,494	1.32	2,035,018.75
I	1.02	2,328	865,012	1.68	1,429,414.13
J	3.92	10,500	15,020,609	6.48	24,821,242.15



# Entry-Exit methodology guidelines – main steps



## Main steps:

- Rescale the preliminary tariffs to ensure the full recovery of allowed revenues
- Various options available – multipliers, adders, manual tariffs adjustments

## Result:

- Normalized tariffs are calculated – used to set the price caps

1.d.1 Entry tariffs

Entry point	Preliminary tariff (PT <sub>ENX</sub> )	Annual booked capacity (PF <sub>ENX</sub> )	Preliminary annual allowed revenues (PAAR <sub>EN</sub> )	Normalized entry tariff (ANT <sub>ENX</sub> )	CHECK - Recovered annual allowed revenues
[#]	[LTL/'000 m3 /day]	[’000 m3/day]	[LTL]	[LTL/'000 m3 /day]	[LTL]
A	2.62	1,486	1,421,714	4.33	2,349,352
B	10.91	587	2,338,066	18.03	3,863,605
C	2.51	20,998	19,258,485	4.15	31,824,243

1.d.2 Exit tariffs

Exit point	Preliminary tariff (PT <sub>EXY</sub> )	Annual booked capacity (PF <sub>EXY</sub> )	Preliminary annual allowed revenues (PAAR <sub>EX</sub> )	Normalized exit tariff (ANT <sub>EXY</sub> )	CHECK - Recovered annual allowed revenues
[#]	[LTL/'000 m3 /day]	[’000 m3/day]	[LTL]	[LTL/'000 m3 /day]	[LTL]
A	-	-	-	-	-
B	6.58	587	1,409,424	10.87	2,329,043.22
C	-	-	-	-	-
D	4.71	823	1,414,634	7.78	2,337,653.27
E	5.93	506	1,095,850	9.80	1,810,869.76
F	3.74	793	1,082,632	6.18	1,789,026.84
G	0.63	3,912	898,609	1.04	1,484,931.90
H	0.80	4,210	1,231,494	1.32	2,035,018.75
I	1.02	2,328	865,012	1.68	1,429,414.13
J	3.92	10,500	15,020,609	6.48	24,821,242.15

# Entry-Exit methodology guidelines – main steps



## Main steps:

- VKEKK sets the price caps
- TSO calculates the individual tariffs for different products (long-term, short-term, by tariff groups, capacity vs. commodity component, etc.)
- VKEKK approves the tariffs

## Result:

- E/X tariffs valid for the first year of the regulatory period

## Key message:

- *Implementation of E/X methodology should have no impact on the process of price cap setting and tariff calculation by TSO*
- *The only difference is that more price caps may be published by VKEKK and more tariffs calculated by TSO (for each entry and exit point)*

# *Entry-Exit methodology guidelines – main steps*



## **Main steps:**

- Application of the correction coefficients to calculate the price caps/tariffs for subsequent years within the regulatory period

## ***Key message:***

- *Implementation of E/X methodology should have no impact on the process of application of currently used correction coefficients*

## **Result:**

- E/X tariffs valid for the subsequent years

# Proposed model for Lithuania – model options

*The model provides flexibility in terms of selection of various model parameters.*

*It allows to incorporate various changes of the tariff setting in the future*

Main menu

Modelling options

Language	ENG
Entry-exit revenue recovery proportion	50:50 split
Tariff conditions	Nonnegative
Backhaul factor	5.0%
Weighted average cost of capital	7.1%
Uniform part of tariffs	Specific proportion
Normalization option	Normalization factor
Tariff equalization	No equalization

*The model allows:*

- E/X split** *Select different proportions of revenues to be collected from entry points and exit points*
- Equalization** *Set either equal entry or equal exit tariffs*
- Capacity/Commodity** *Select different proportion of revenues to be collected through capacity and commodity tariffs*
- Minimum tariff** *Set minimum tariff or uniform part of the tariff*
- Changes of points** *Add or remove entry and exit points in the future*

## *Proposed model for Lithuania – proposed parameters*

<b>Parameter</b>	<b>Current situation</b>	<b>After E/X implementation</b>
<b>Tariff composition</b>	Capacity + commodity component	Same approach or alternatively: capacity for entry, capacity + commodity for exit
<b>Capacity/ Commodity split</b>	Approx. 70:30 split, not formally set by legislation	Only costs directly associated with gas volume should be recovered through commodity tariff
<b>Entry/ Exit split</b>	Approx. 20:80 split, not formally set by legislation	General rule 50:50, alternatively the model can determine optimal split
<b>No. of points</b>	N/A	3 border entry points, 2 border exit points, 1 or 2 domestic exit points
<b>Tariff calculation</b>	Price cap set by VKEKK, tariffs calculated by TSO	Same approach, but more price caps/tariffs set
<b>Tariff corrections</b>	Tariff set for initial year and corrected by correction factors in subsequent years	Same approach

---

## ***Proposed model for Lithuania – number of exit points***

**Question:** How many domestic exit points and tariffs should be set?

**Options:**

- 1 domestic exit zone
- 2 domestic exit zones (distribution exit zone and Jonava Exit zone)
- 3 – 6 domestic exit zones

**Implications:** The more domestic exit zones the higher the cost reflectivity, but also higher differences between domestic tariffs.

**Conclusion:** Various countries use 1 domestic exit zone for DSO plus domestic exit zones for directly connected big consumers or gas storages.

Therefore option with 2 domestic exit zones (and tariffs) can be suitable in Lithuania, but is subject to further discussion.

---

## ***Proposed model for Lithuania – entry/exit split***

**Question:** What proportion of allowed revenues should be collected from entry and exit points respectively?

**Options:**

- 50:50 split – general recommendation of ACER
- Other split
- Split determined by the model

**Implications:** The split affects the value of entry and exit tariffs and the relative difference between them.

The split can also affect the cross-border competition.

**Conclusion:** Most of the EU countries where E/X models are implemented apply 50:50 rule. We recommend it as a general guidance.

---

## ***Proposed model for Lithuania – capacity/commodity split***

**Question:** What proportion of allowed revenues should be collected from capacity and commodity tariffs respectively?

**Options:**

- 100% capacity
- Capacity + commodity to recover costs mainly driven by gas volume
- No changes to capacity/commodity split

**Conclusion:** We recommend to follow ACER's Framework guidelines – i.e. commodity tariffs should only be used to recover the costs mainly driven by volume. Almost all of the countries with implemented E/X models follow this rule or use 100% capacity tariff.

The split should however not be predetermined in the E/X calculation model, but rather determined by TSO and approved by VKEKK.

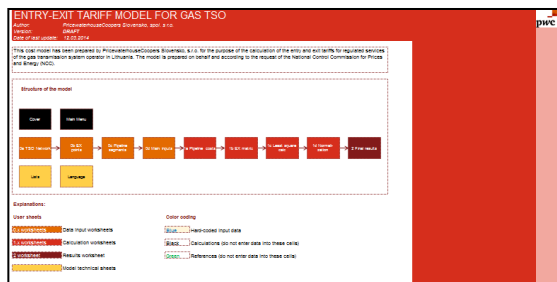


# Entry-exit tariff model (MS Excel)

*The Entry-exit tariff model is prepared in MS Excel and consist of several parts – data collection, calculation and presentation of results*

## *Key points:*

- The model is prepared in MS Excel
- It has separate worksheets for selection of modelling options, data collection, model calculation and results presentation
- The model uses programmed formulae in VBA and Solver add-in for the least-square calculation
- The model options allows to model various scenarios depending on:
  - Entry-exit % split
  - Setting the minimal tariff
  - Setting the fixed uniform part of the tariff



# Entry-exit tariff model (MS Excel) – model options

## Main menu

### Modelling options

Language	ENG
Entry-exit revenue recovery proportion	50:50 split
Tariff conditions	No fix proportion 50:50 split Other proportion
Backhaul factor	5.0%
Weighted average cost of capital	7.1%
Uniform part of tariffs	Specific proportion
Normalization option	Normalization factor
Tariff equalization	Equal entry tariff

Post stamp: 20% Entry-exit 80%

---

# *Thank you for your attention*

This publication has been prepared for general guidance on matters of interest only, and does not constitute professional advice. You should not act upon the information contained in this publication without obtaining specific professional advice. No representation or warranty (express or implied) is given as to the accuracy or completeness of the information contained in this publication, and, to the extent permitted by law, PricewaterhouseCoopers Slovensko, s.r.o., its members, employees and agents do not accept or assume any liability, responsibility or duty of care for any consequences of you or anyone else acting, or refraining to act, in reliance on the information contained in this publication or for any decision based on it.

© 2014 PricewaterhouseCoopers Slovensko, s.r.o.. All rights reserved. In this document, "PwC" refers to PricewaterhouseCoopers Slovensko, s.r.o. which is a member firm of PricewaterhouseCoopers International Limited, each member firm of which is a separate legal entity.