Entry-Exit Model for gas TSO
The basic principles
21st October 2013
Agenda

Why is the E/X model introduced
What should be achieved with E/X model
What is E/X model
How to create E/X model
Next step
Why to implement Entry-Exit tariff system?

**EC Regulation 715/2009** introduces new principles to gas TSOs

**Regulation 715/2009** of the European parliament and of the Council of 13 July 2009 on conditions for access to the natural gas transmission networks introduces following principles:

1. Gas should be **traded independently** of its location in the system, i.e. give network users the freedom to book entry and exit capacity independently

2. Ensure **optimal management** of the gas transmission network in the Community

3. Tariffs should be **cost-reflective**, non-discriminatory and provide efficient (scarcity) signals

**As a result:**

- Entry-exit tariff should replace tariffs calculated on the basis of contract paths
- Costs should correspond to those of an efficient and structurally comparable network operator and are transparent, whilst including an appropriate return on investments

How Entry-Exit tariffs helps to achieve EC’s objectives?

Promote competition and efficient gas trade

In Entry-Exit model, the input and off-take of gas is separated and the transport of the gas between these entry and exit points is not bound to the physical contracted path.

- It promotes competition since it decreases the entry barriers for new players on the market.

- The separation of entry and exit points for capacity allocation results into improved gas tradability – gas is traded independently of its physical flow or location.

- Entry-exit tariffs are cost reflective in the meshed and complex gas transit networks.

- Entry-exit tariffs are capable of accommodating the local characteristics of different networks.
## Issues with complex mesh networks

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<td>Systems where only long pipelines with unidirectional flows exist.</td>
<td>Complex and meshed networks</td>
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In case physical flows deviate from contractual, distance based tariff system does not provide cost reflective charges and may be potentially discriminatory.
**Key definitions in Entry-Exit model**

- **Entry points**
  Points where the gas enters the gas transmission network, such as border points, underground gas storages, LNG terminals

- **Exit points**
  Points where the gas leaves the gas transmission network, such as border points, underground gas storages, big consumers or distribution grids

- **Virtual point/virtual hub**
  A virtual marketplace where gas can be bought and sold irrespective of the physical flows in the network
**Entry-Exit tariff model overview**

**Current Point-to-Point model**
- Capacities are booked bound to a particular transportation path
- Costs for the gas transportation depend on the length of the transportation path

**New Entry-Exit model**
- Separation of the input and off-take of gas
- No defined contract path
- Virtual trading point – purchase and sell gas without booking transportation capacity
The tariff setting process consists of 2 main steps:

1. Setting the **total allowed revenues**
2. **Allocation** of the total allowed revenues to the users of the network

The current tariff setting process is analyzed, including the calculation of the revenue requirement, but the focus is on the allocation of the revenues to user charges:

1. Total allowed revenues – possible approaches
   - Historical cost
   - Current cost
   - Benchmarking

2. Allocation to user charges – possible approaches
   - Point-to-point
   - Postage stamp
   - Entry-Exit

**Entry-Exit model in context of wider regulation**
We will calculate the cost of gas flow through various paths

The objective is to calculate the optimal paths through the network

Proposed approach:
• Develop matrix of all entry and exit points in the network
• Collect detailed cost information for each pipeline section
• Calculate the cost of optimal paths between all entry and exit points
• Derive entry exit tariffs
# Process of Entry-Exit model development

## Analysis of the network topology
- Collection of the data on the network topology, points in the network, segments of the pipelines and the respective technical and cost data
- Analysis of the existing tariff methodology and gas sector regulation
- Analysis of the overall gas market in Lithuania

## Development of Entry-Exit matrix
- Creation and costing of the gas pipeline segments, definition of the entry and exit points in the network and mapping the paths between entry and exit points
- Calculation of the unit marginal costs for each gas pipeline segment

## Calculation of the Entry-Exit paths
- Calculation of the unit marginal costs to deliver the unit of gas from each entry point to each exit point considering the best available path in the network from the cost perspective

## Calculation of the Entry-Exit tariffs
- Calculation of the tariffs for all entry and exit points such as to minimize the overall costs of the gas flow between each of the entry and exit points
- Application of the calculated entry and exit tariffs to the allowed revenue requirement

## Normalization of the Entry-Exit tariffs
- Since the calculated entry and exit tariffs do not precisely recover the revenue requirement, the tariffs need to be normalised to calculate the final tariffs that will recover all the allowed revenues
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