

OIL & GAS

# Gas pricing and network access

Regional Gas Competence Seminar - Mozambique

22 September - 2015

**Bert Kiewiet**

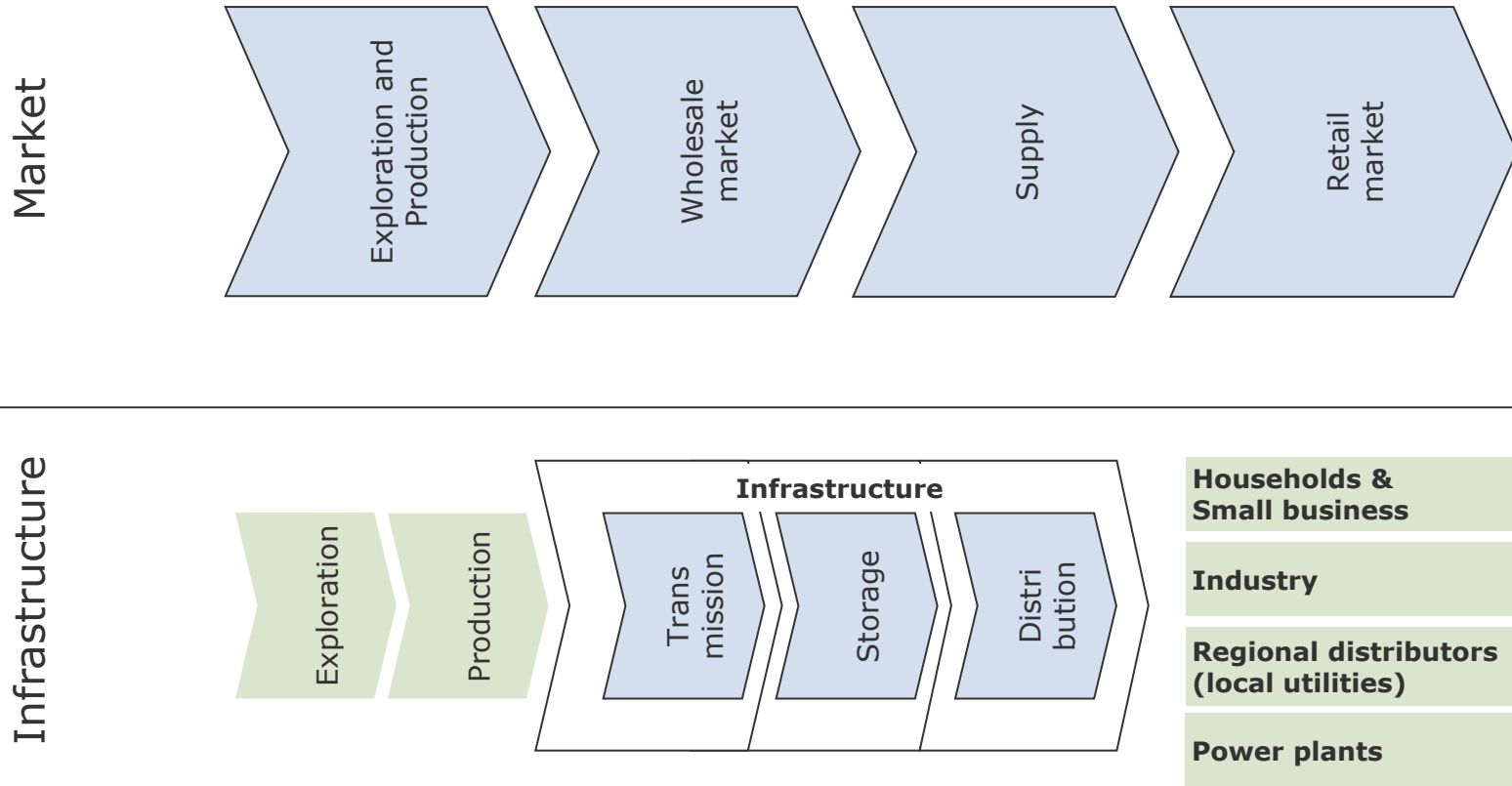
## About DNV GL



- DNV GL enables **safe, reliable and enhanced performance** in oil and gas projects and operations
- We provide **integrated services** in technical and marine assurance and advisory, risk management advisory and offshore classification
- Our **people** combine industry expertise, multi-disciplinary skills and innovation to solve complex technical issues in challenging environments
- We drive the industry forward by developing **best practice and standards** across the asset lifecycle.

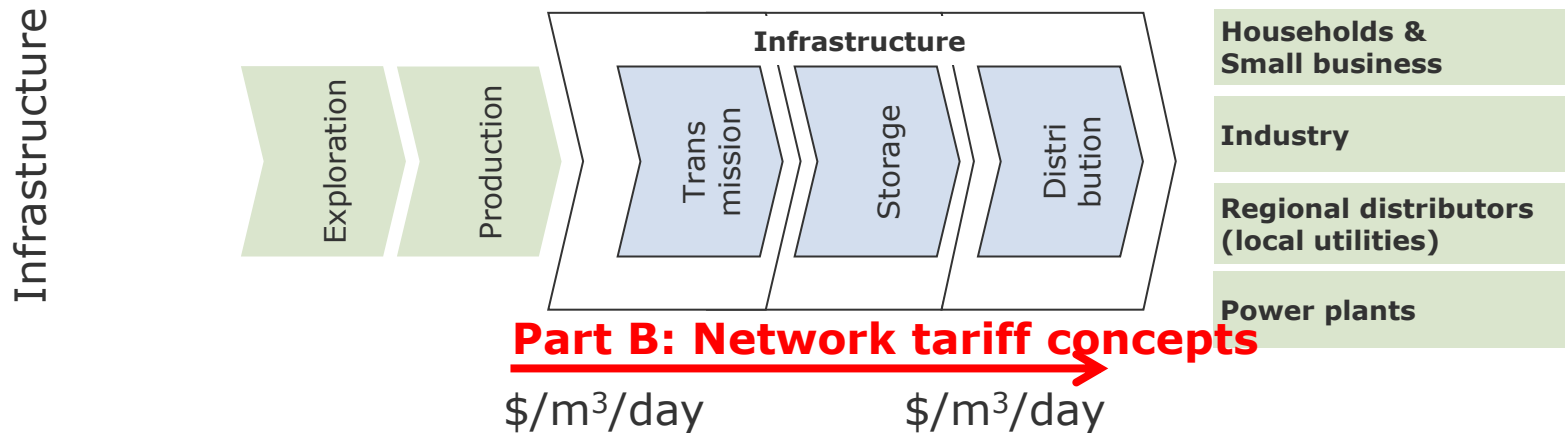
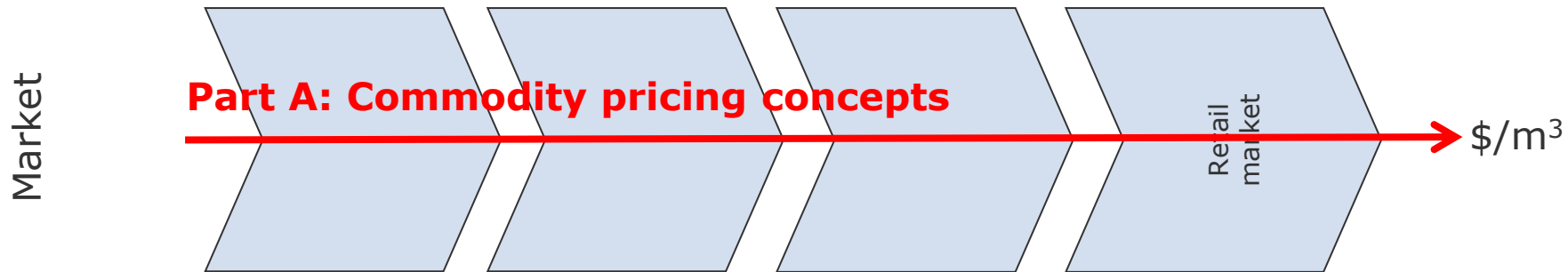
# Scope

This presentation aims to share concepts for gas pricing and network access.

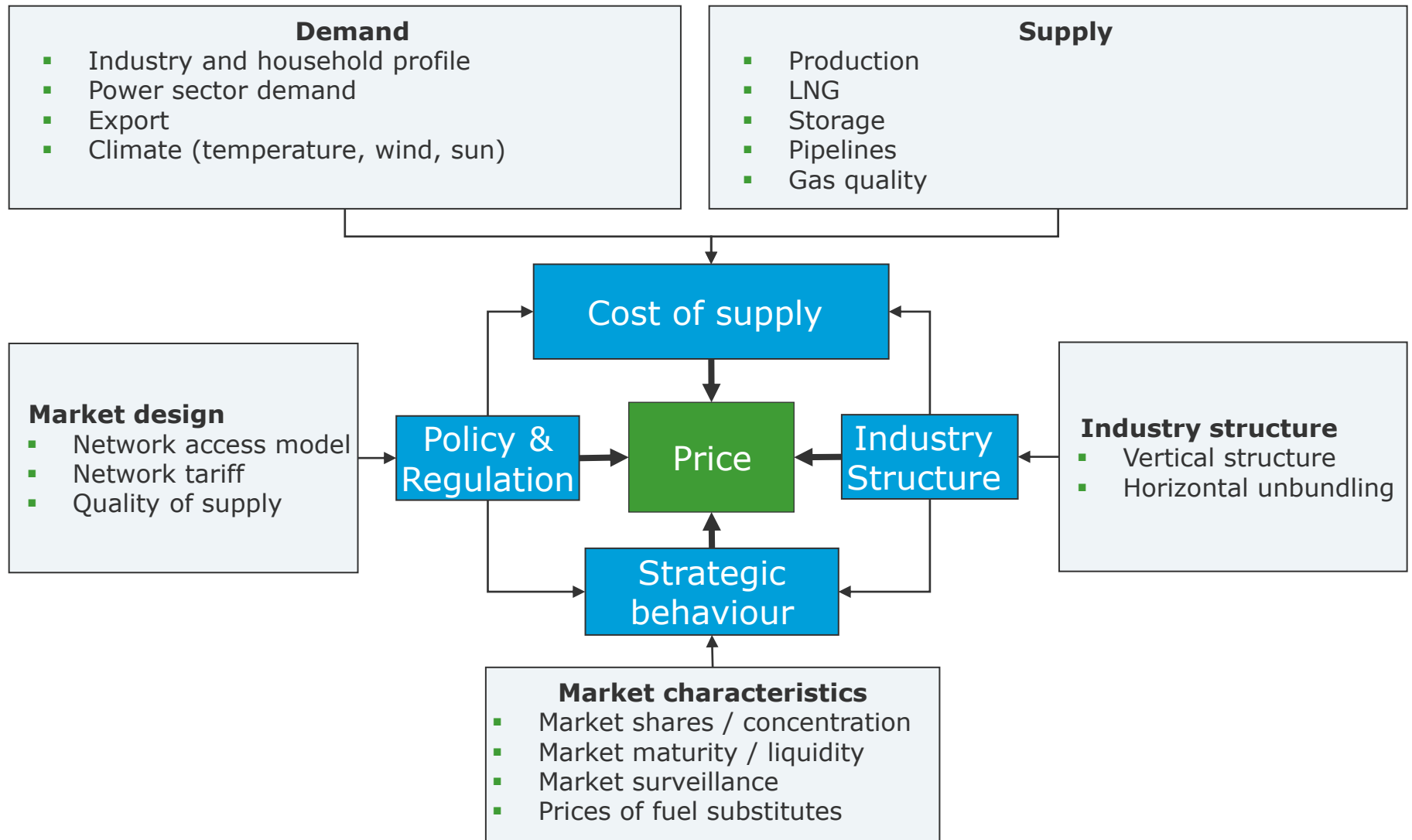


# Scope

This presentation aims to share concepts for gas pricing and network access.

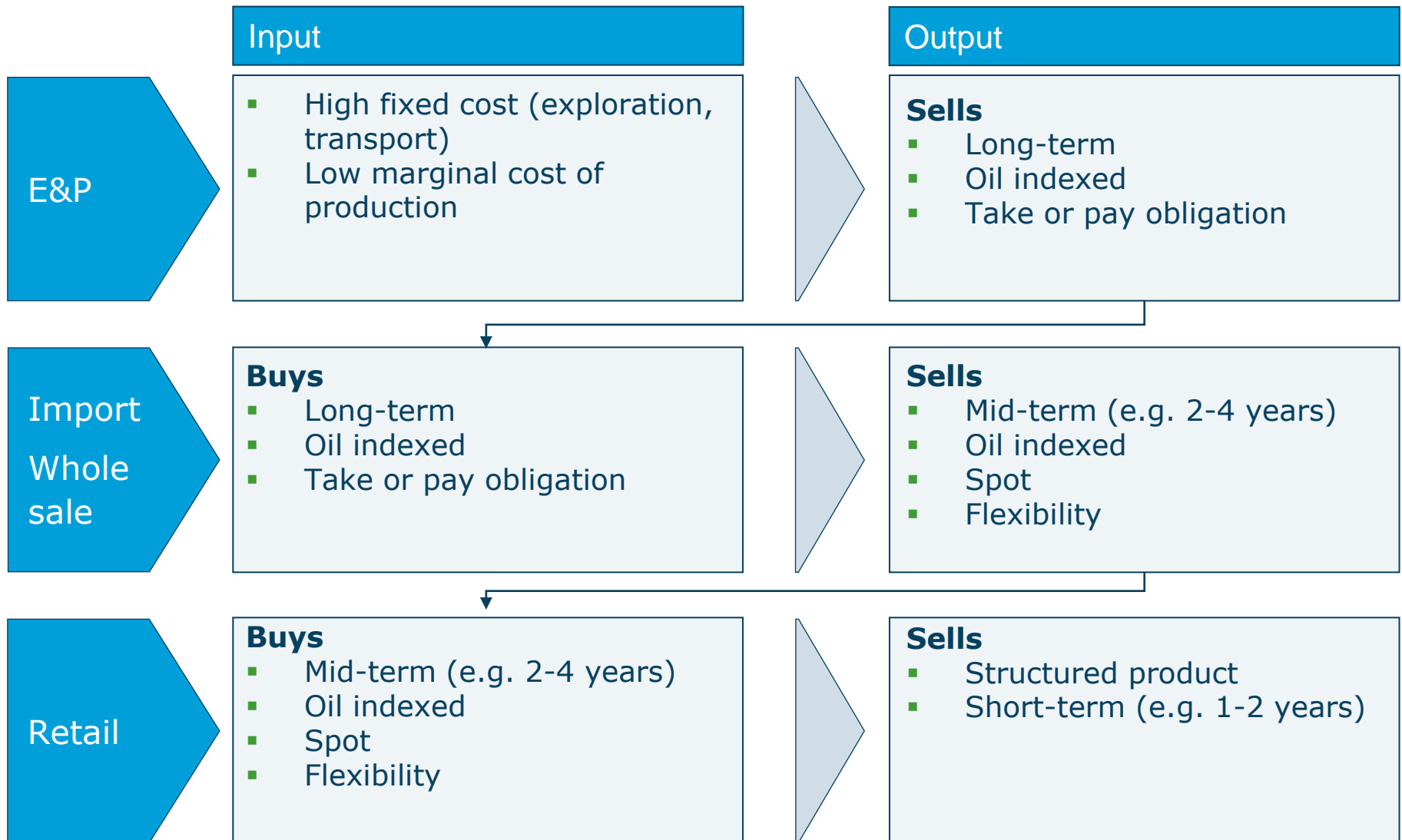


# The Arena: Fundamental Price Drivers



# Part B: Commodity pricing concepts

# Price Establishment for Competitive Activities



# Oil Indexation Prices

## Pro Arguments

- Gas and oil compete and customers can choose.
- Mitigate market power of producers to keep high prices when oil prices decrease.
- Protect customers from price shocks.
- Long term contracts strengthen security of supply. Long term contracts work typically with market based price adjustment schemes like oil indexation.
- Oil indexation ensures that gas supply remains competitive against oil at any time and encourages correct investment decisions in networks and exploration.

## Contra Arguments

- Oil indexation is not always transparent for final consumers.
- Oil indexation hinders establishment of free market prices for gas according to supply and demand.
- Gas supply companies do not convey timely and entirely oil price changes in gas retail prices.
- Strong opposition from customer protection organisations.



# Gas-to-Gas Competition

## Pro Arguments

- In case of multiple gas supply sources: making the alternative of oil less relevant.
- Development of Spot gas markets
- Industry will demand access to lower cost spot gas.
- Cost reduction programs due to economic crises.

Key elements are volume and liquidity

## Contra Arguments

- Fragmentation of markets.
- Not able to function without access to transport capacity to spot markets.

Key elements are access and market formation/stimulation

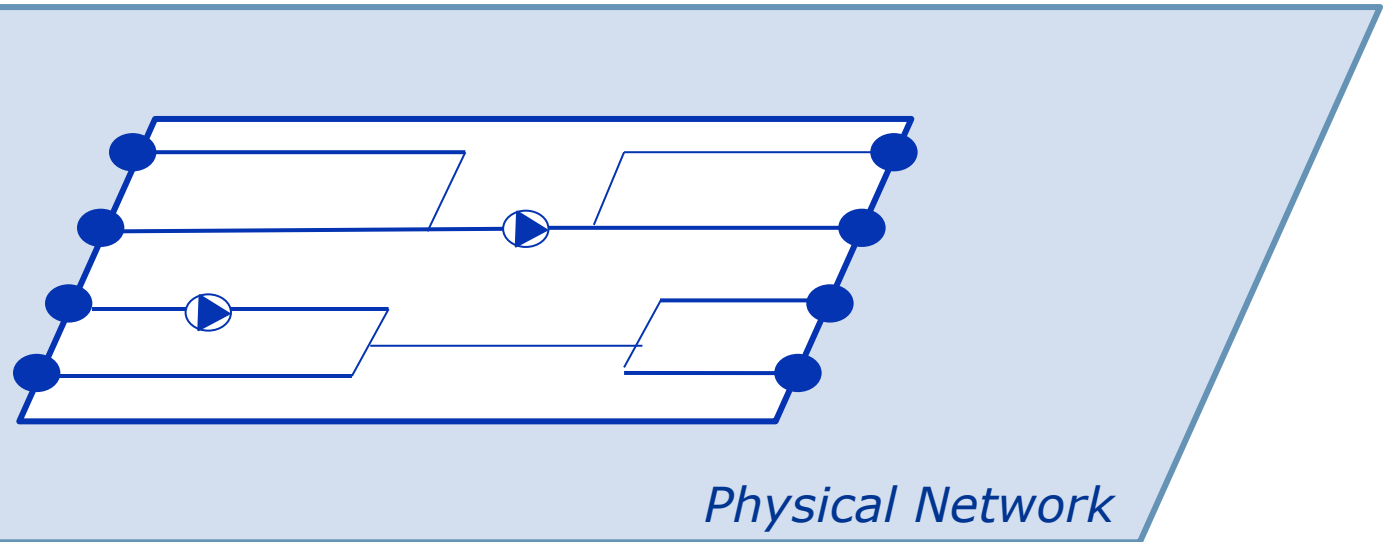
# Short History of Gas Pricing (Europe)

- **Mid / end 60s (Beginning of Gas Era)**
  - Gas prices based on production costs
- **Beginning / mid 70s**
  - Competitive pricing
  - Gas market value established in comparison with other competitive energy sources
  - Oil indexation (oil most important competitive source / take or pay contracts)
- **Beginning / mid 80s**
  - Coal indexation after the oil price shocks (in particular for power stations and large industrial customers)
  - Return to oil indexation after the drop of oil price
- **Mid / end 90s**
  - Restoration of coal indexation and extension of oil indexation towards gas-to-gas competition and net-back pricing using competitive energy substitutes at final consumer level
- **End 90s / Beginning of new millennium**
  - Organised gas markets, gas exchanges, standardised products

# Part B: Network tariff concepts

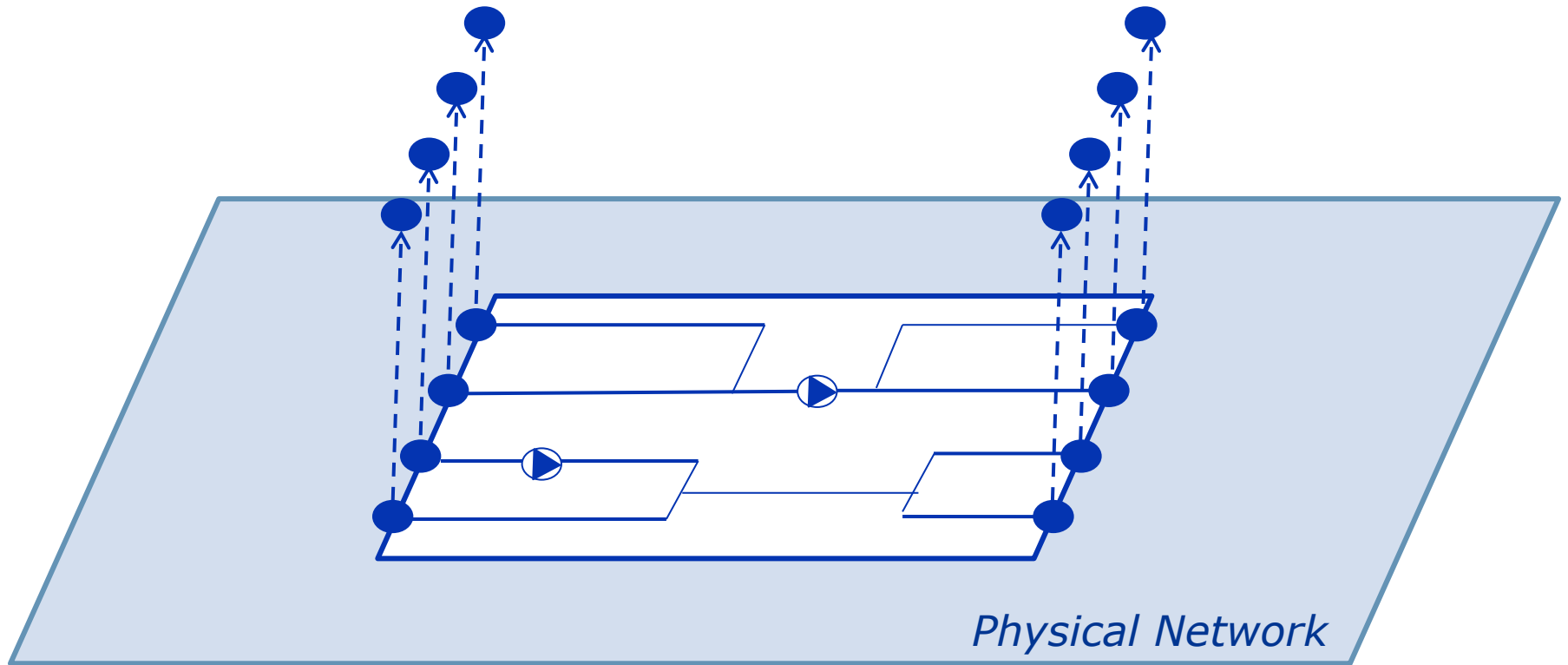
## Network access model: Introduction

A network access model defines the rules to the game of contracting gas transmission services



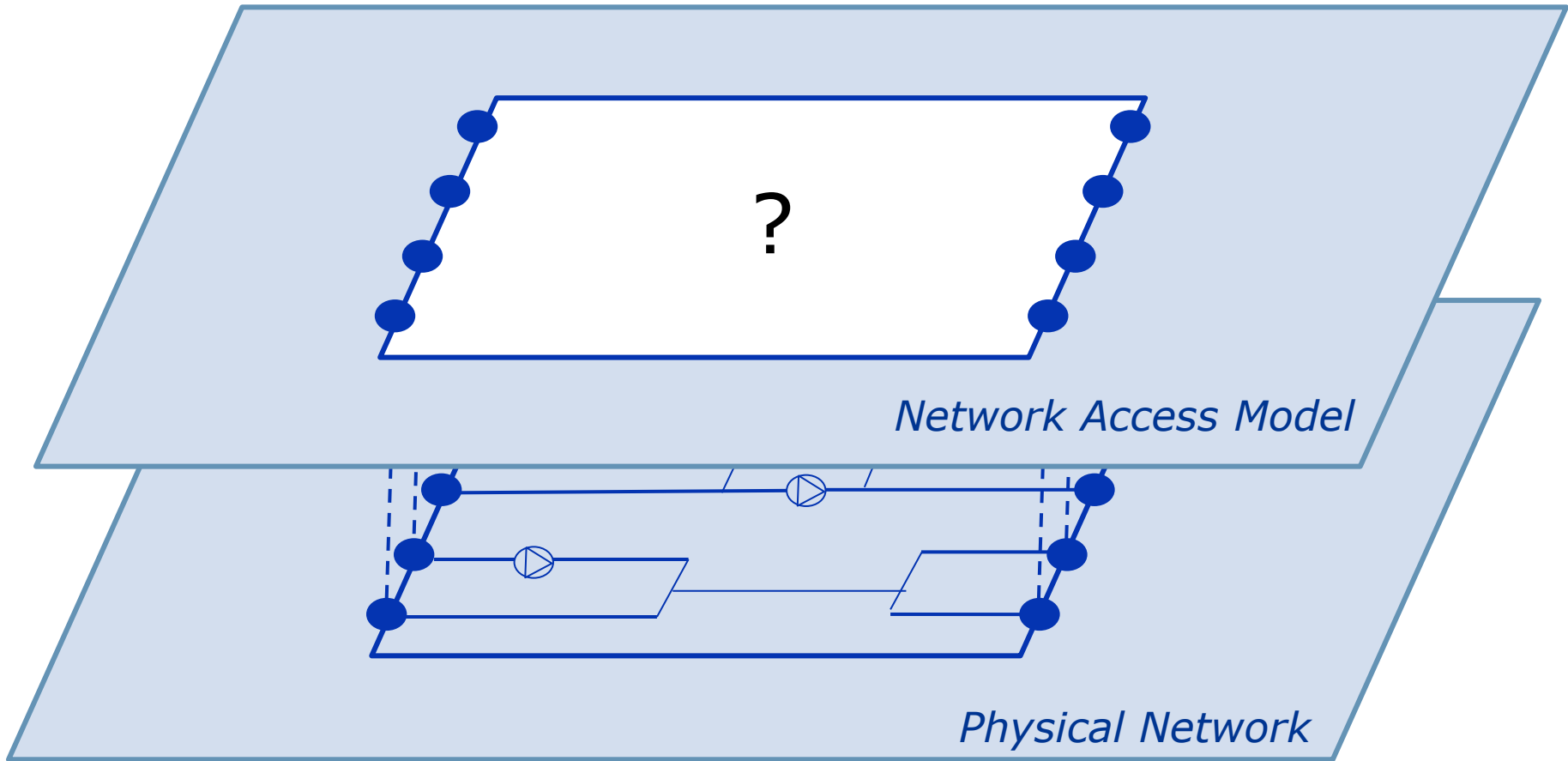
## Network access model: Introduction

A network access model defines the rules to the game of contracting gas transmission services



# Network access model: Introduction

A network access model defines the rules to the game of contracting gas transmission services



## Network access model: Introduction

A network access model determines the way network users contract access to and use of the gas transmission network. Three main models exist.

- Network Access Model constitutes of three components:
  - 1. Capacity contracting:** the way in which a network user contracts transmission capacity
  - 2. Transmission pricing:** derivation of the tariff a network user pays for access and use
  - 3. Network balancing:** specifying the flexibility a network user has in balancing

## Network access model: Introduction

A network access model determines the way network users contract access to and use of the gas transmission network.

- Network Access Model constitutes of three components:

- 1. Capacity contracting:** the way in which a network user contracts transmission capacity

- 2. Transmission pricing:** derivation of the tariff a network user pays for access and use

- 3. Network balancing:** specifying the flexibility a network user has in balancing



## Tariff setting: Main questions

The major questions in tariff setting give an outline of the different aspects that need to be addressed when designing gas transmission tariffs.

- Question 1: What should be priced?
- Question 2: How should costs for tariff setting be allocated?
- Question 3: What is the tariff structure?

## Tariff setting: Objectives

Various requirements can be set in designing gas transmission prices. In practice it is a challenge to ensure a trade-off between these objectives.

Objective	Explanation
① Revenue Recovery	Ensure that the TSO can recover the revenue required for the transmission service.
② Economic Efficiency	Pricing design should provide both short and long-term signal to the TSO to operate, maintain and expand the network optimally (allocative efficiency).
③ Efficient Regulation	The pricing methodology should encourage efficient operation, while keeping a manageable regulatory burden.
④ Complexity & Transparency	Sophisticated approaches might promote efficiency at first sight, but user may not respond adequately to the corresponding economic signals.
⑤ Non-Discrimination	Level playing field should be created for all users. Users are treated equally irrespective of size, ownership or other factors (e.g. transit vs. domestic).
⑥ Stability & Stakeholder Acceptance	Price changes may result when changing the design. This will have an impact on all stakeholders. Transition arrangements may be required.
⑦ Macroeconomic Constraints	Policy objectives like inflation control and regional development policy may present additional challenges for the tariff design.

## Tariff setting: Design options

Different parameters in the tariff setting can be chosen. Each design parameter will influence the score on the defined objectives.

Within the basic overall design options, different parameters can be set. An overview is given in the table below.

Design option	Explanation
① Cost Allocation	Varies between Average Cost Pricing and Marginal Cost Pricing (LRMC). Several cost allocation schemes may be used.
② Capacity/Commodity Split	Basis for charging can either be the allocated gas volumes or the reserved capacity. Combination of both might be additionally applied.
③ Short vs. Long-Term Products	Transmission prices might be differentiated for short-term and long-term products.
④ Interruptible/Non-Physical Backhaul	Transmission products other than firm capacity are made available to the market in order maximize the (short) term utilisation of the network

## Network access model: Tariff Models

A network access model determines the way network users contract access to and use of the gas transmission network. Three main models exist.

Characteristics of three main network access models summarized:

	<b>Capacity Contracting</b>	<b>Transmission/distribution Pricing</b>
<b>Point-to-point</b>	Along a pre-specified contractual path	Mainly based on the distance along the contractual path
<b>Postage stamp</b>	At exit points within the zone	Independent of the distance, uniform for all exit points (entry tariff is zero)
<b>Entry-exit</b>	Separately for entry and an exit points within the zone	Independent of the distance, defined independently for each entry and exit point

## Concluding remarks

- Gas transmission and distribution is a natural monopoly: a form of regulated third party access is usually required.
- A sound and stable regulatory framework is a prerequisite for making new investments in gas infrastructure bankable.
- Designing a good tariff system is vital for effective long-term decision making:
  - Incentivising development of the network
  - Support the functioning of the future gas market
- The most advanced tariff system is not always the best tariff system.
- The models are just different mathematical ways to describe reality and largely aim to achieve the same.

## Concluding remarks

- The design of the tariff system should take into account
  - Number of suppliers and consumers
  - Maturity of the gas market
  - Topology of the network
  - Market organization (shippers, regulator, contractual landscape)
- Designing and calculating tariffs strives to find a trade-off of between major pricing principles.
- A tariff system should seek trade-offs between the complexity of the model and its outcome:
  - More complex networks may require more detailed modelling
  - Unilateral networks could be represented by less sophisticated modelling efforts

## Further reading

DNV GL performed an extensive study on implementation of network access models for natural gas in all Member States of the European Union.

**The report and country factsheets on EU network access model are publically available online:**

[http://ec.europa.eu/energy/gas\\_electricity/studies/doc/gas/201307-entry-exit-regimes-in-gas-parta.pdf](http://ec.europa.eu/energy/gas_electricity/studies/doc/gas/201307-entry-exit-regimes-in-gas-parta.pdf)

[http://ec.europa.eu/energy/gas\\_electricity/studies/doc/gas/201307-entry-exit-regimes-in-gas-parta-appendix.pdf](http://ec.europa.eu/energy/gas_electricity/studies/doc/gas/201307-entry-exit-regimes-in-gas-parta-appendix.pdf)

[http://ec.europa.eu/energy/gas\\_electricity/studies/doc/gas/201307-entry-exit-regimes-in-gas-partb.pdf](http://ec.europa.eu/energy/gas_electricity/studies/doc/gas/201307-entry-exit-regimes-in-gas-partb.pdf)

**Paper on 'Gas transmission pricing models'**

<http://crninet.com/2013/2b.%20Kiewiet-Paper.pdf>

# Contact us.



**DNV·GL**

Bert KIEWIET, BSc MSc MTD  
Head of Section Gas System Management

Bert.Kiewiet@dnvgl.com  
Tel: +31 50 700 98 69  
Fax: +31 50 700 98 59

Energieweg 17, 9743 AN Groningen  
P.O. Box 2029, 9704 CA Groningen  
The Netherlands  
www.dnvgl.com

**SAFER, SMARTER, GREENER**