TYNDP 2018 Modelling & CBA 2.0

Introduction to modelling assumptions
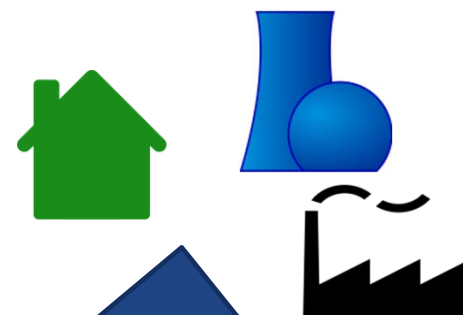
Image courtesy of Thyssengas
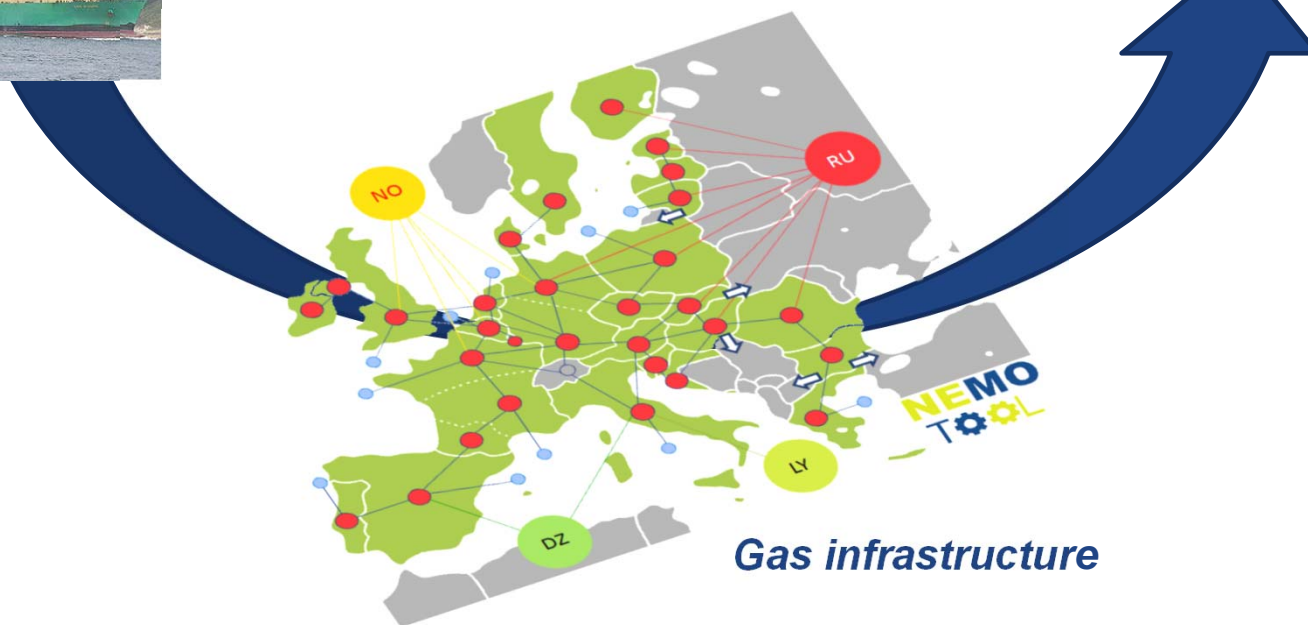
TYNDP 2018 modelling

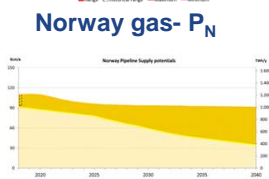# TYNDP modelling

Supplies

Demand

Gas infrastructure

TYNDP modelling

Supplies

Supply potentials

EU production - P_{NP}

Russian gas - P_R

Norway gas - P_N

....

Gas infrastructure

NO

RU

LY

DZ

NEMO TOOL

Demand

Demand

2020   2025   2030   2040

1 Scenario   2 Scenarios (coal vs gas merit order switch)   3 Scenarios   3 Scenarios
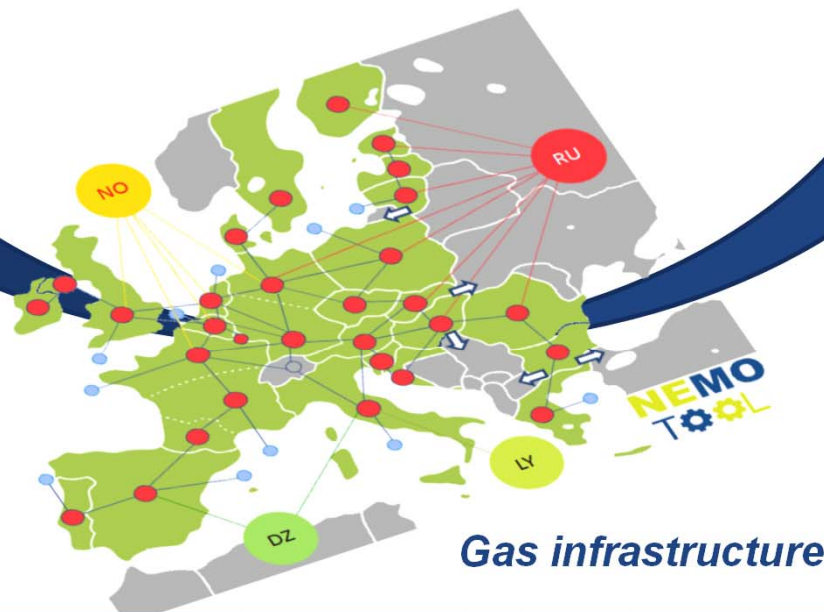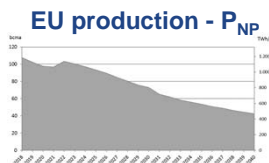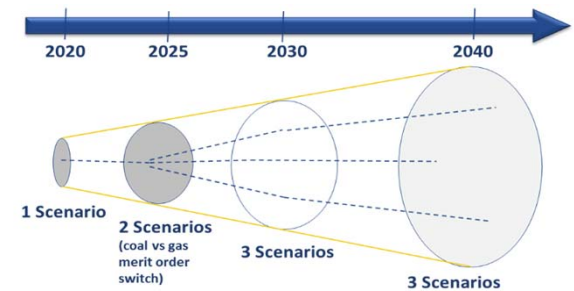
Flow modelling aimed at covering demand at the lowest supply costs

ENTSOG modelling tool

Consolidation and EU-wide modelling: ENTSOG expertise

National hydraulic modelling: TSO expertise
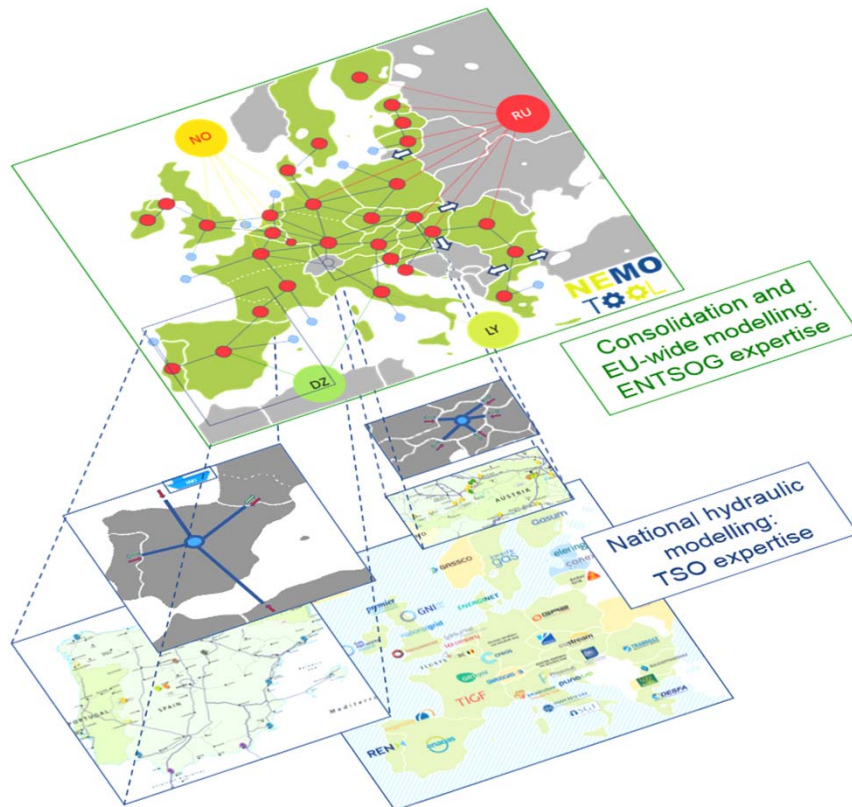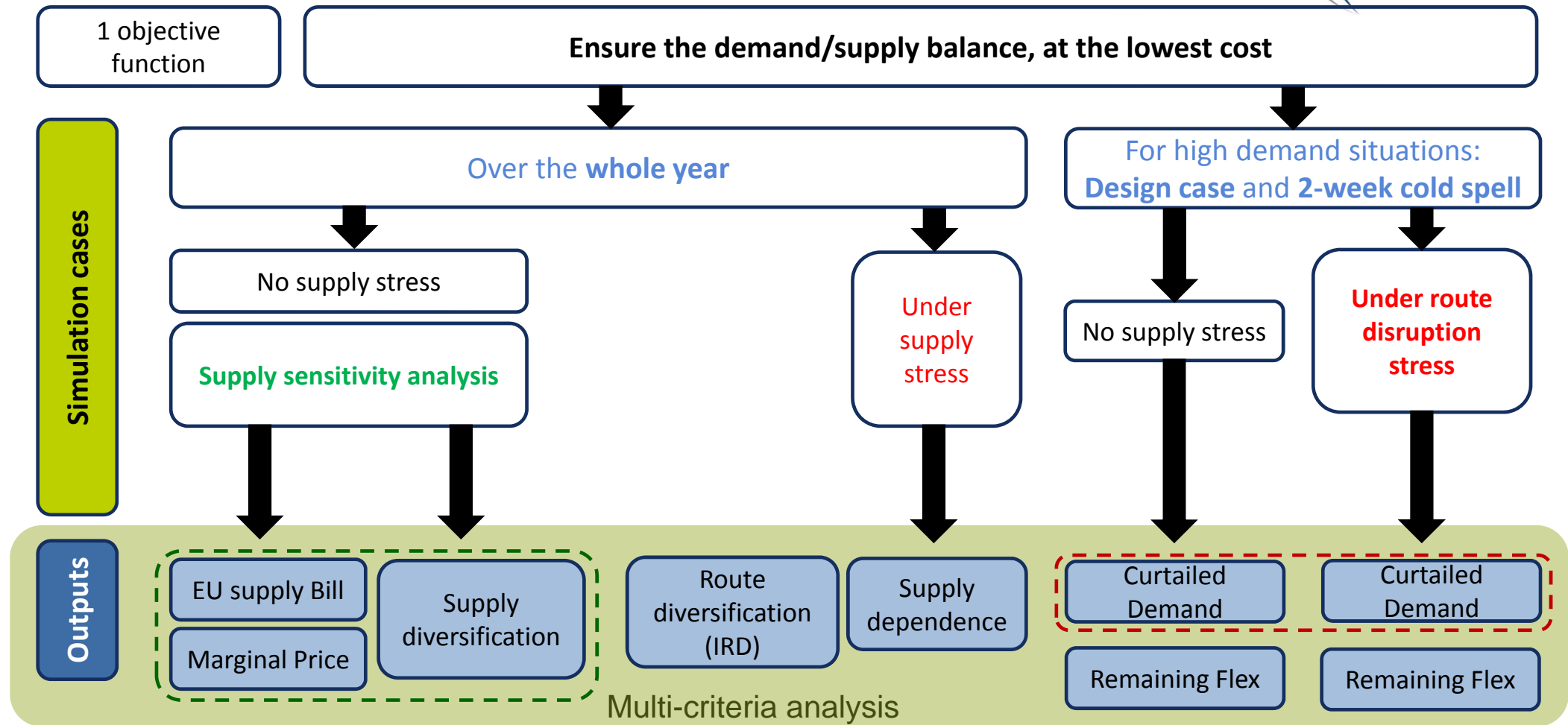
EU-wide Modelling tool

Data collection

Scenarios
- Demand
- Supply potentials

Network
- Operator expertise of capacity computation
- Existing network
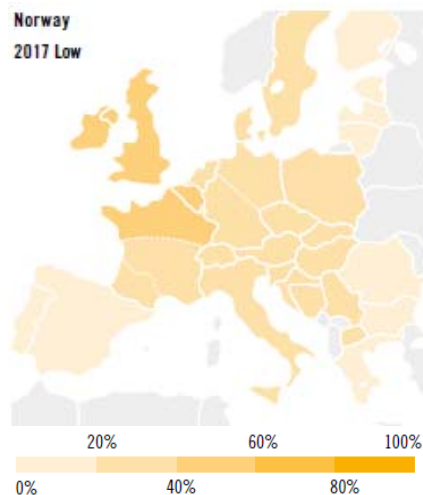- projects

TYNDP assessment is multi-criteria

1 objective function	Ensure the demand/supply balance, at the lowest cost

Simulation cases

Over the **whole year**

For high demand situations:
Design case and **2-week cold spell**

No supply stress

Supply sensitivity analysis

Under supply stress

No supply stress

Under route disruption stress

Outputs

Multi-criteria analysis

- EU supply Bill
- Marginal Price
- Supply diversification
- Route diversification (IRD)
- Supply dependence
- Curtailed Demand
- Remaining Flex
- Curtailed Demand
- Remaining Flex

TYNDP assessment

Competition

> Access to Supply Sources

2017 Low

Access to supply sources, Green Evolution, Low infrastructure level, whole year

| 1 | 2 | 3 | 4 | 5 |

How many sources a can a country access?

> Supply source dependence

Norway
2017 Low

0%   20%   40%   60%   80%   100%

Which specific source?

2020 Low

0%   2%   15%   25%   50%   100%
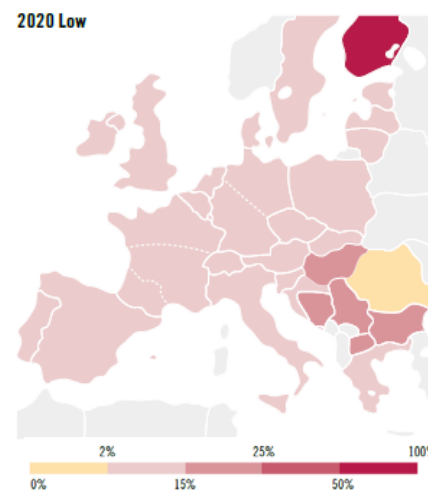
How dependent is a country?

> diversification

2017 Low

0   0.50   1.00   2.00   3.00   5.00

Figure 6.21: Price effects from a low price for Russian gas, Green Evolution, Low infrastructure level
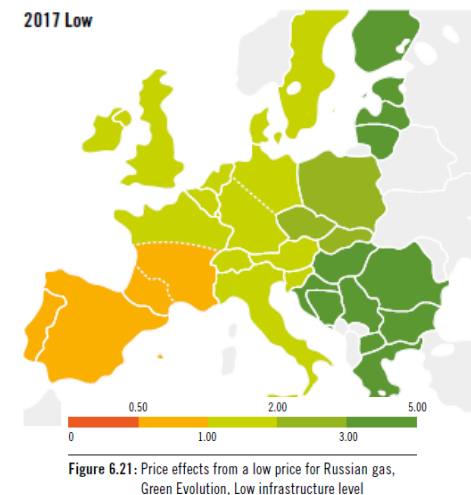
Can a country benefit from a lower price?

EU BILL RESULTS IN THE GREEN EVOLUTION SCENARIO (MILLION €/d)			
	2017	2020	2030
BALANCED (REFERENCE CASE)	257.9	228.8	302.7
AZ MAXIMISATION	–*	–	-1.5
LNG MAXIMISATION	-10.3	-13.7	-21.3
LNG MINIMISATION	+5.8	+5.4	+6.2
RU MAXIMISATION	-23.4	-26.4	-28.9
RU MINIMISATION	+17.8	+18.2	+12.9

*Not relevant since there is no Azeri supply in 2017 and only low volumes during the ramp-up in 2020

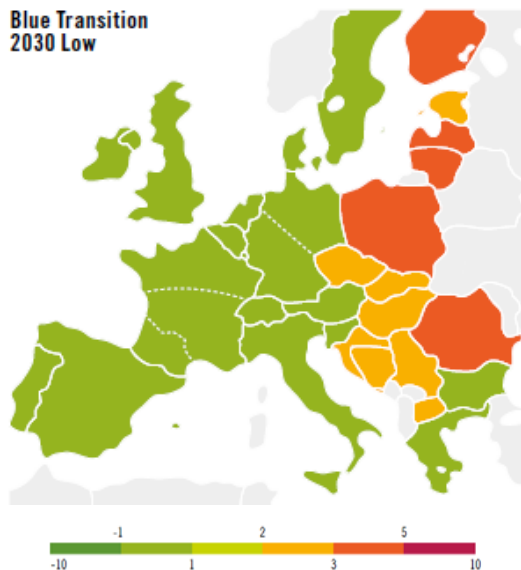Table 6.3: EU Bill results in the Green Evolution scenario (million €/d)

TYNDP 2017
entsog

TYNDP assessment

Market integration

> Marginal prices

Security of supply

> Demand curtailment

> Single-Largest Infrastructure disruption
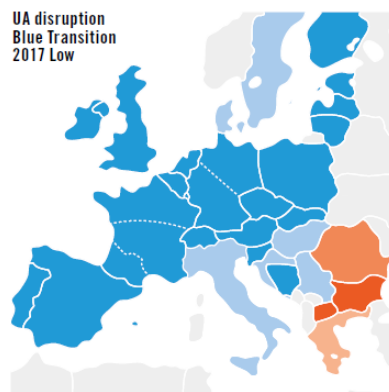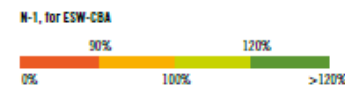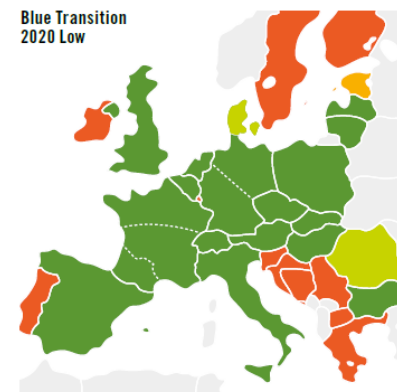
What's new for TYNDP 2018
Addressing stakeholders recommendations

Modelling evolution for TYNDP 2018

Supply modelling

TYNDP 2017

> LNG considered as one supply source

> For a given supply source, same price whatever the import point

> A reference supply configuration

> + 12 supply configurations to

- Minimise use of a specific source (by setting a high source price)
- Maximise use of a specific source (by setting a low source price)

> Specific configuration to differentiate the Russian supply price by import point

TYNDP 2018

> **LNG diversification**

- LNG considered as a multiple source supply

> **Different pipe import prices**

- One price per source

> most relevant configurations to be considered

> **Different Russian import prices** « embedded » in all configurations

LNG diversification

> LNG supply considered as multi-source from different basins

What price assumptions for LNG at basins should be made?

Pipeline imports prices

> Consequently to the LNG diversification modelling, pipeline and LNG price assumptions should be consistent

What price assumptions for pipeline supplies should be made?

Modelling evolution under investigation

Infrastructure cost
investigating new market related assumptions

### *General principle for TYNDP 2018*

> More market oriented use of the infrastructure in the modelling

> More market oriented marginal price differentiation

Assumptions

> Infrastructure use
- Towards more tariff driven use

> Infrastructure tariffs assumptions needed for:
- Transmission/Storage/LNG
- existing infrastructure and projects
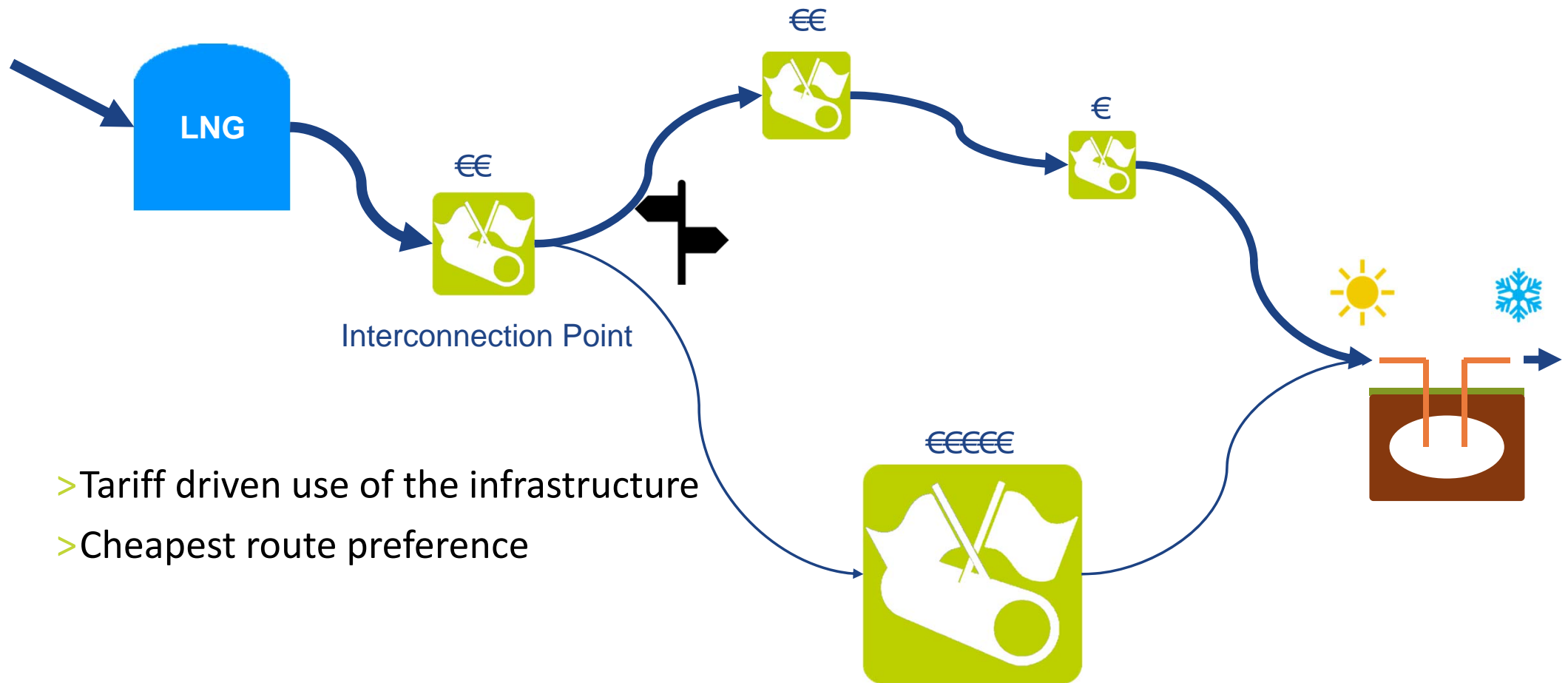
Infrastructure cost – until now

LNG

Interconnection Point
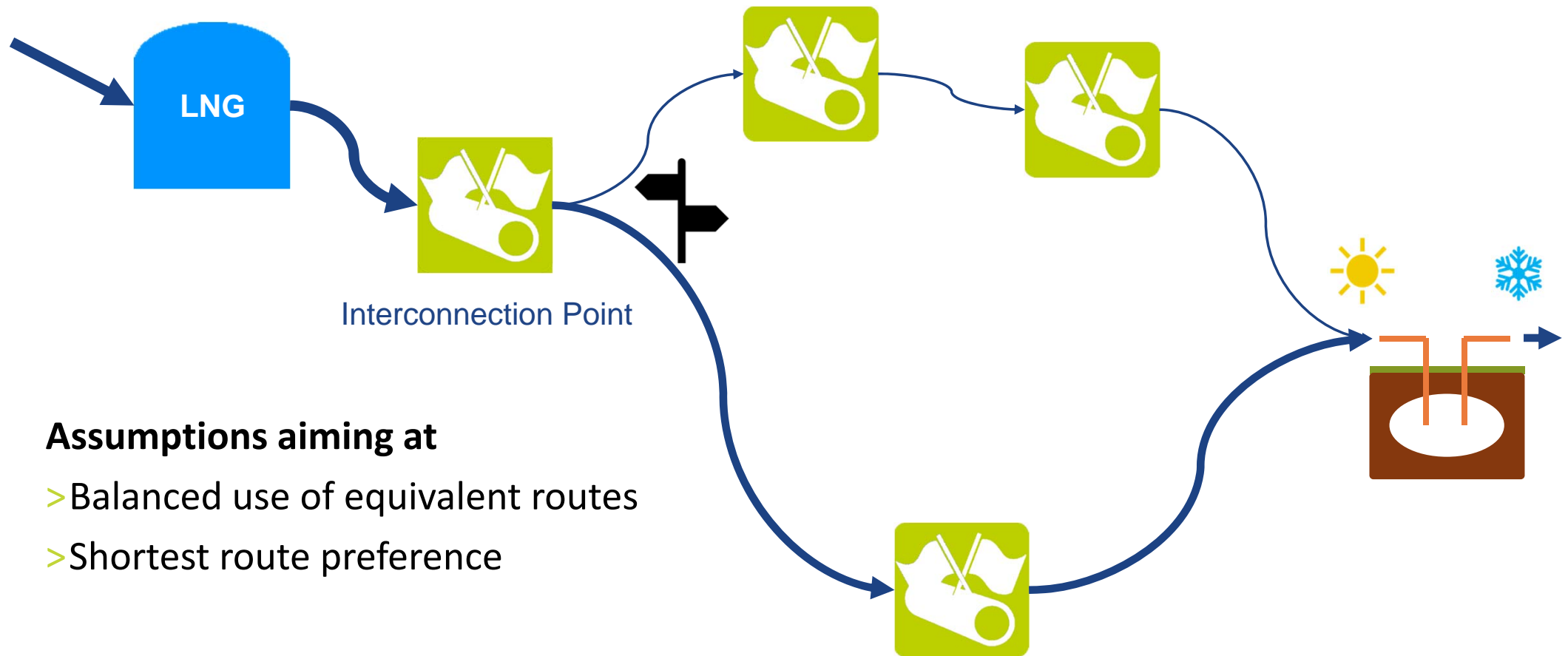
Assumptions aiming at

> Balanced use of equivalent routes

> Shortest route preference

> Use of the infrastructure driven by marginal costs rather than full cost

Infrastructure cost – tariff driven

> Tariff driven use of the infrastructure

> Cheapest route preference

Thank You for Your Attention

ENTSOG -- European Network of Transmission System Operators for Gas
Avenue de Cortenbergh 100, B-1000 Brussels

EML:

WWW: www.entsog.eu