

ENTSOG CBA Methodology

European Network of Transmission System Operators for Gas

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Investment Subject Manager



ENTSOG Members



European Network of Transmission Operators for Gas was created December 2009 - and has 45 full members, 2 associated partners and 5 observers



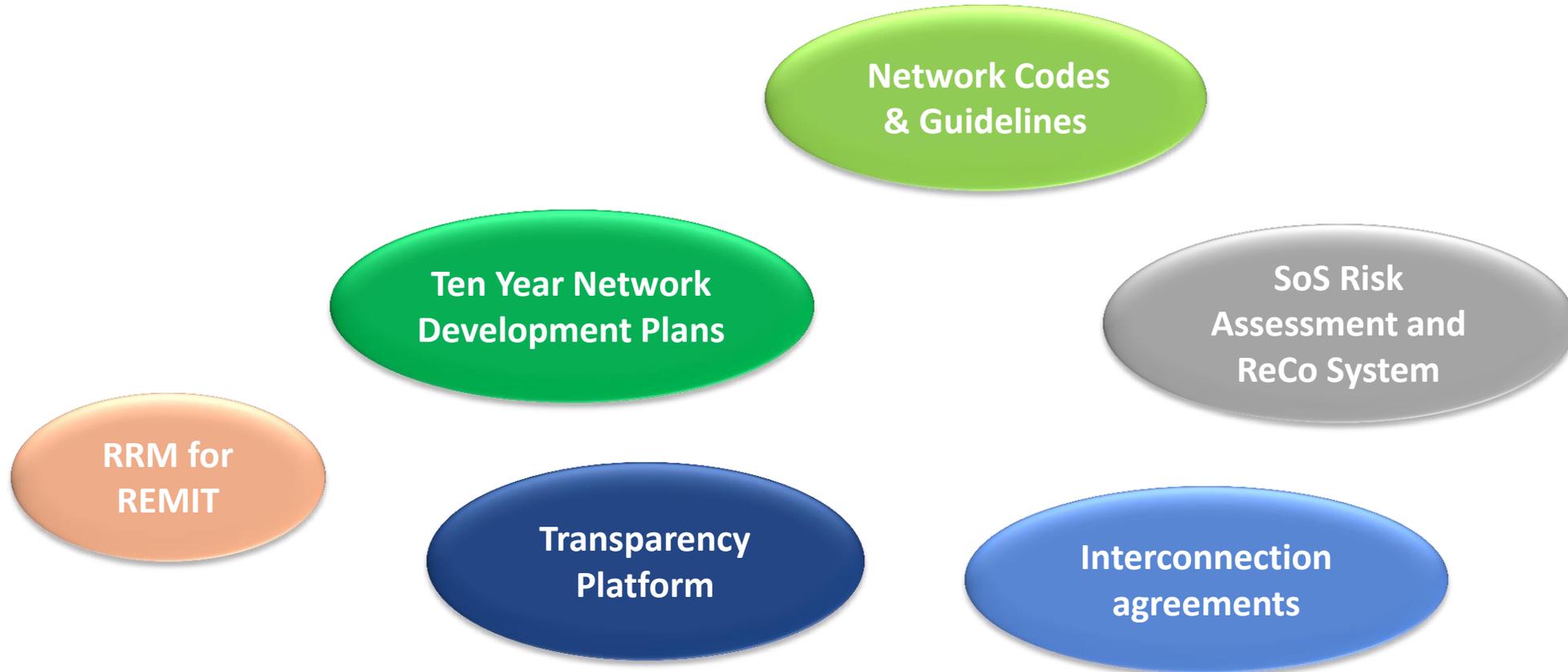
Italy



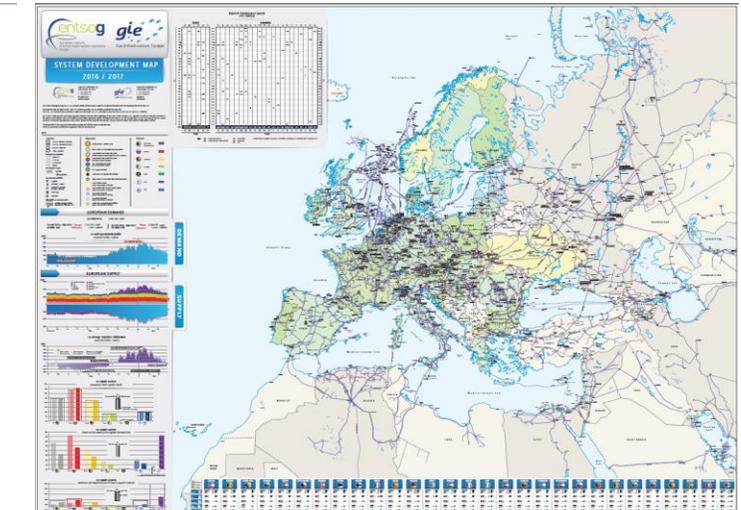
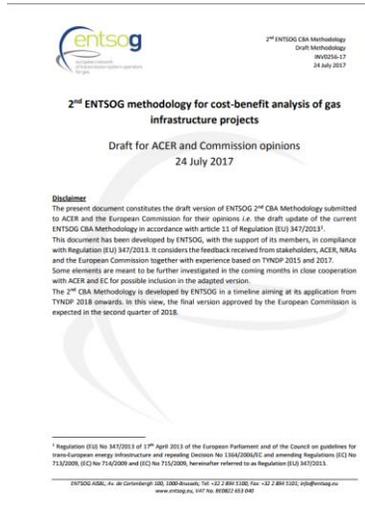
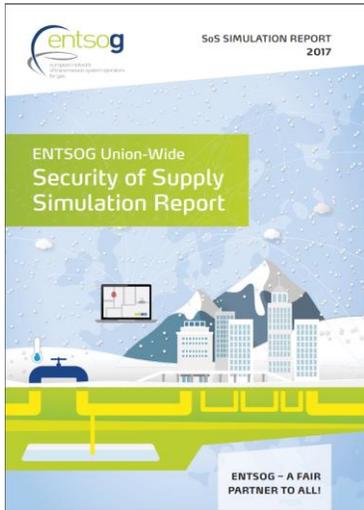
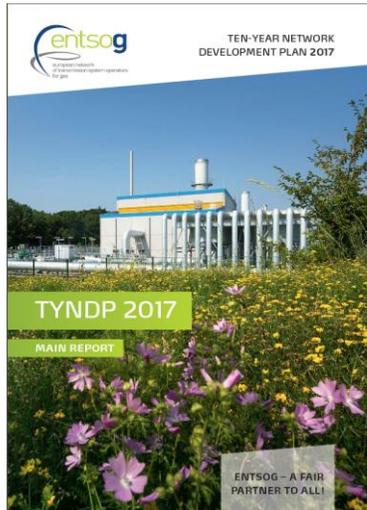
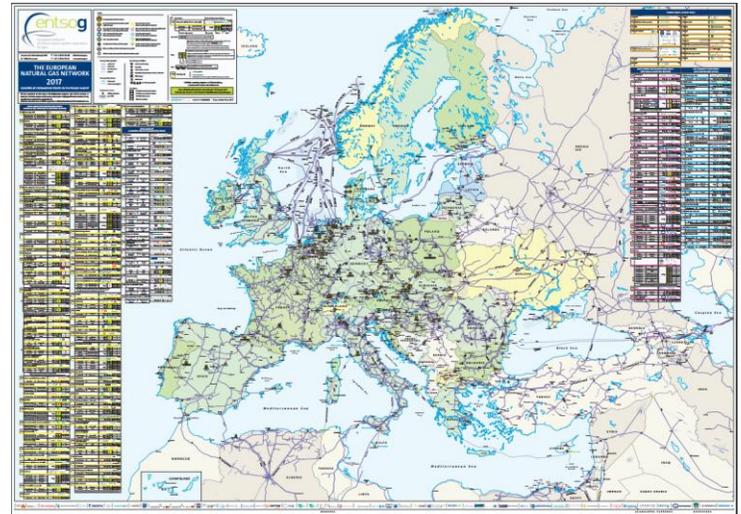
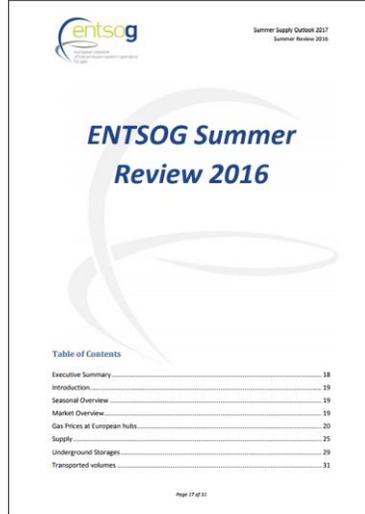
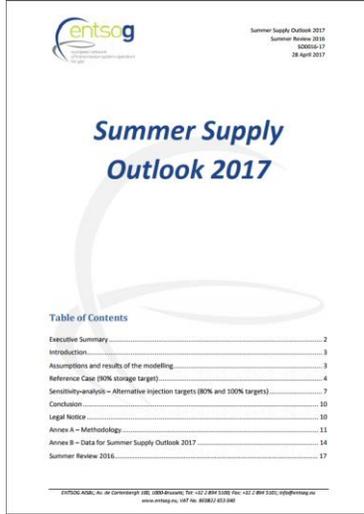
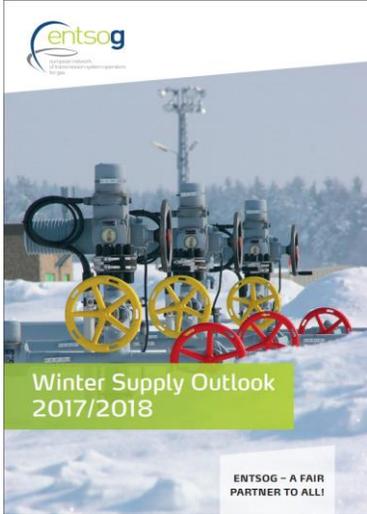
5 Observers from EU affiliate countries:
GA-MA AD (FYROM),
Gassco AS (Norway),
Swissgas AS (Switzerland),
Ukrtransgas (Ukraine),
Moldovatransgaz (Moldova)



ENTSOG's Main Responsibilities and Deliverables



Overview publications by System Development





Introduction to the ENTSOG CBA Methodology



Why a CBA methodology



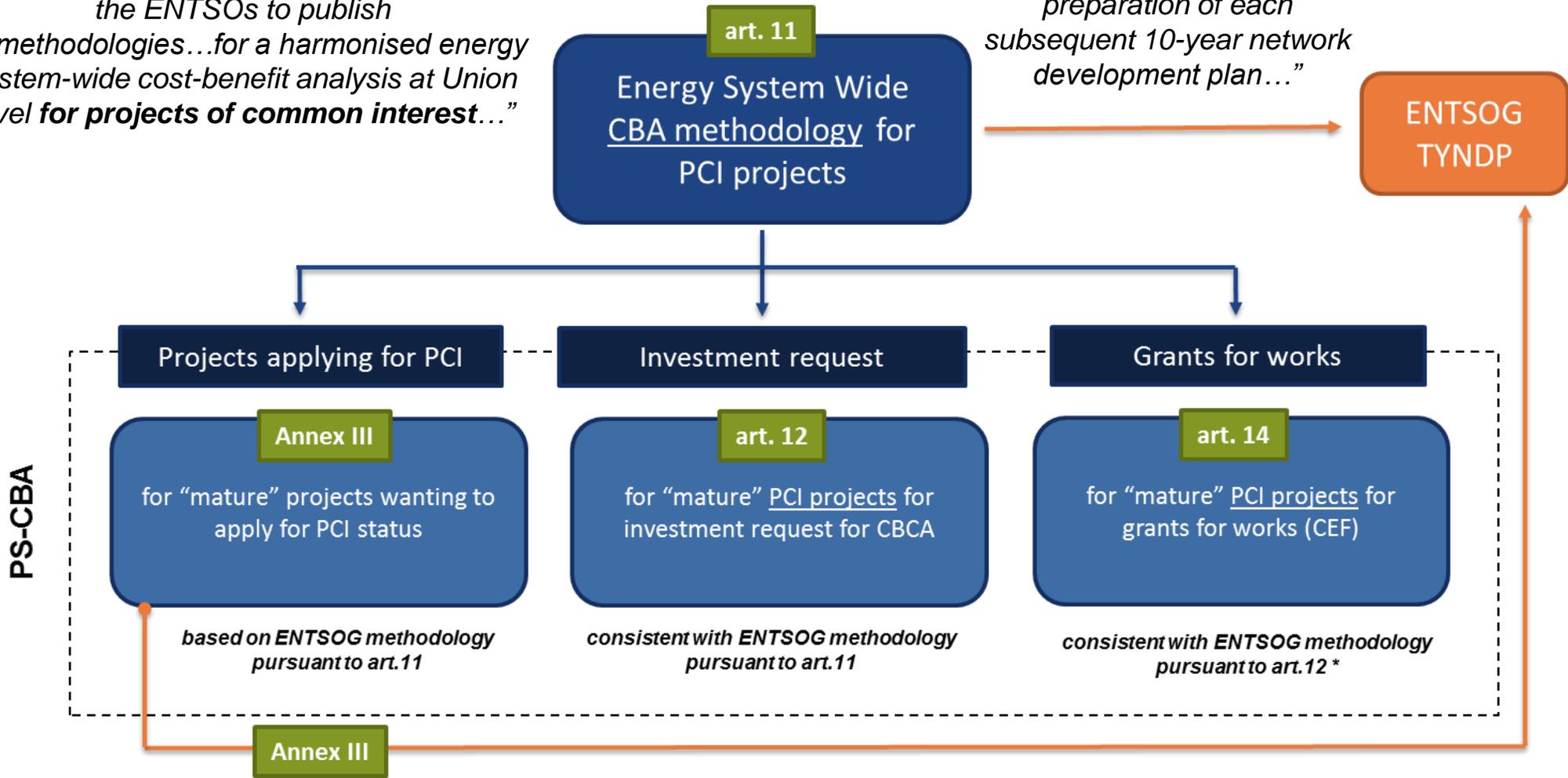
- > Regulation (EC) 347/2013 represents the regulatory reference for the Energy-System Wide CBA methodology
- > Regulation (EC) 347/2013 defines the use of CBA Methodology for
 - the development of TYNDP
 - as input for the selection of Projects of Common Interest (PCIs)
 - as basis to investment request (incl. Cross Border Cost Allocation)
 - as basis to allow promoters to request financial assistance (CEF)
- > CBA methodology is a **mandatory step** in the preparation of TYNDPs by ENTSOG



Scope of CBA in Reg. 347/2013

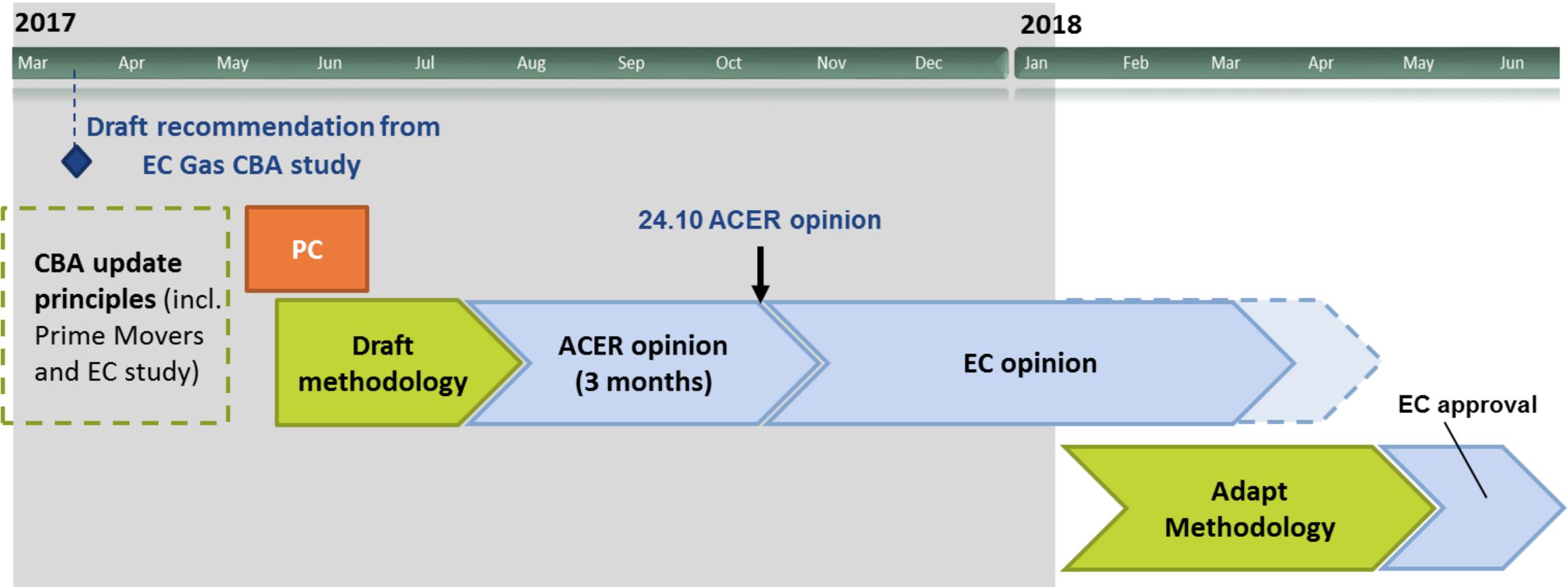
the ENTSOs to publish
“...methodologies...for a harmonised energy system-wide cost-benefit analysis at Union level for projects of common interest...”

“...applied for the preparation of each subsequent 10-year network development plan...”





CBA Methodology 2.0 overall timeline



> ENTSOG will develop TYNDP 2018 based on CBA 2.0



CBA Methodology in the framework of TYNDP



CBA methodology: guidelines for TYNDP assessments



TYNDP is a regulatory task for ENTSOG

- > Reg. (EU) 715/2009: deliver a supply adequacy outlook and **identify possible investment gaps**
- > Reg. (EU) 347/2013: **gather all possible PCI candidates, apply CBA methodology to TYNDP**



- Scenario
- Projects
- Existing infras
- external data



System assessment

PCI candidates – Project CBAs

New for TYNDP 2018

PCI process

CBCA & CEF

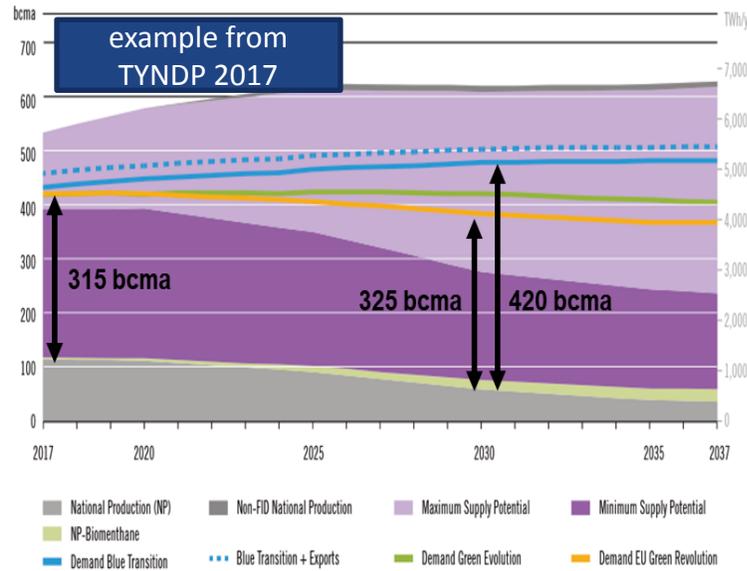
CBA methodology setting the frame



What do we use TYNDP for?

1. Assess the gas system: what are the remaining infrastructure needs?

Access to new supply sources: diversification and competition



Supply diversification

2017

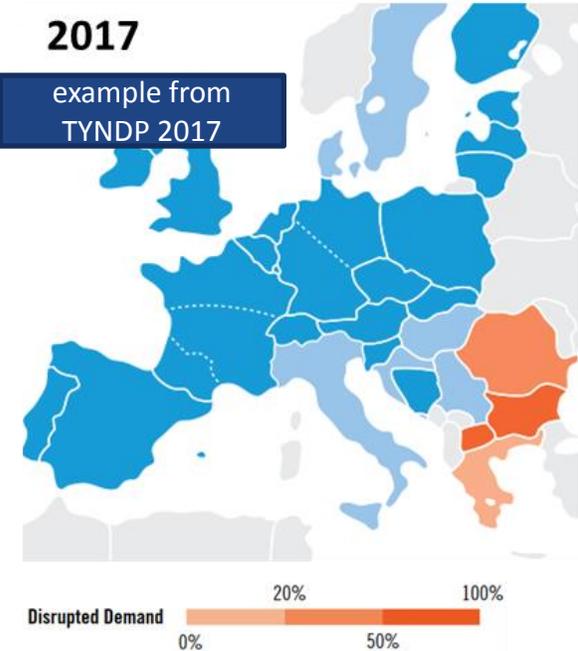
example from TYNDP 2017



Security of supply

2017

example from TYNDP 2017



2. Assess projects: how do projects address the infrastructure needs?

CBA Methodology as common metrics to system and project assessment



ENTSOG CBA Methodology main steps

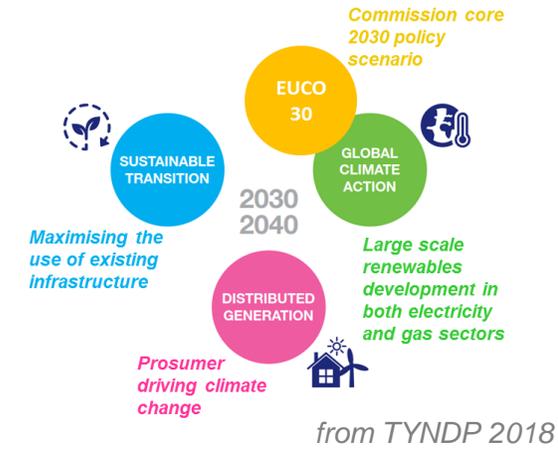
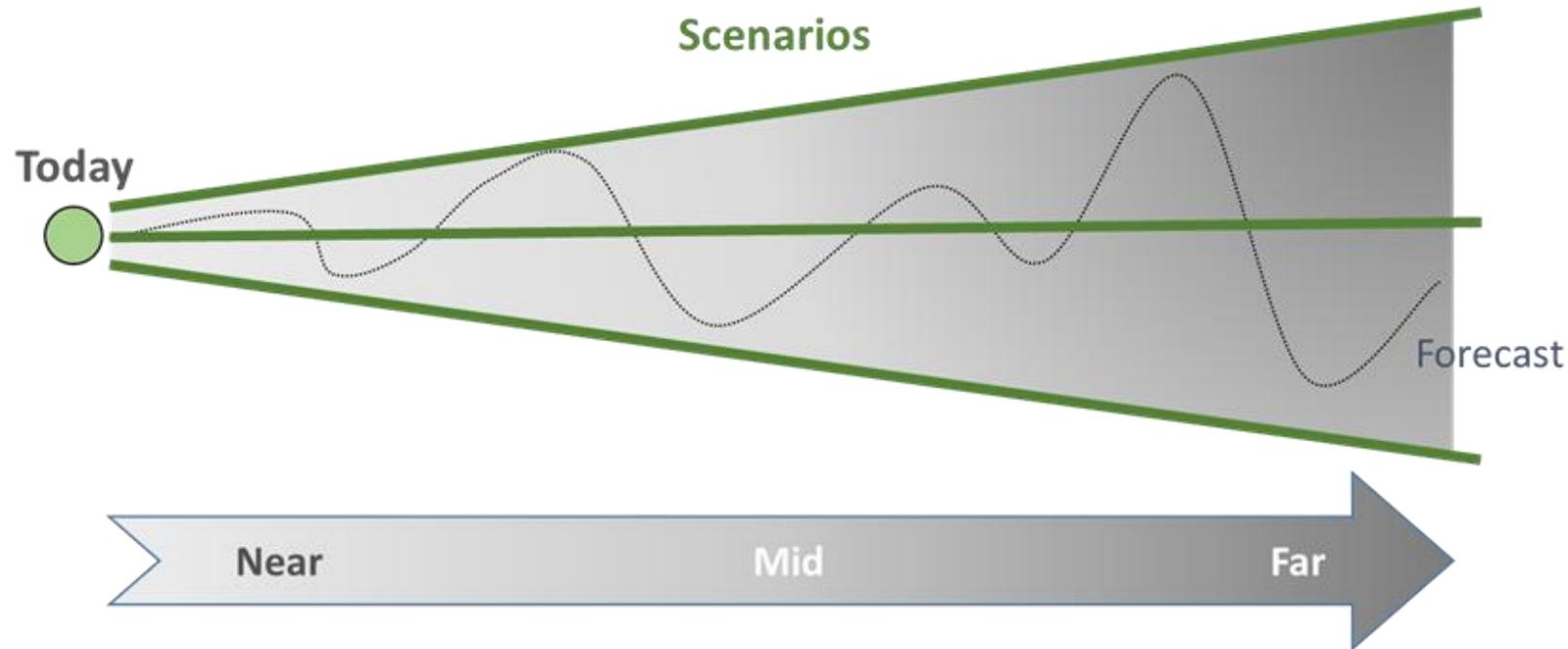


ENTSOG Cost-benefit analysis indicates to follow these steps:

- > Assessment framework
- > Projects
- > System assessment & infrastructure needs identification
- > Project assessment and incremental approach
- > Socio-Economic analysis



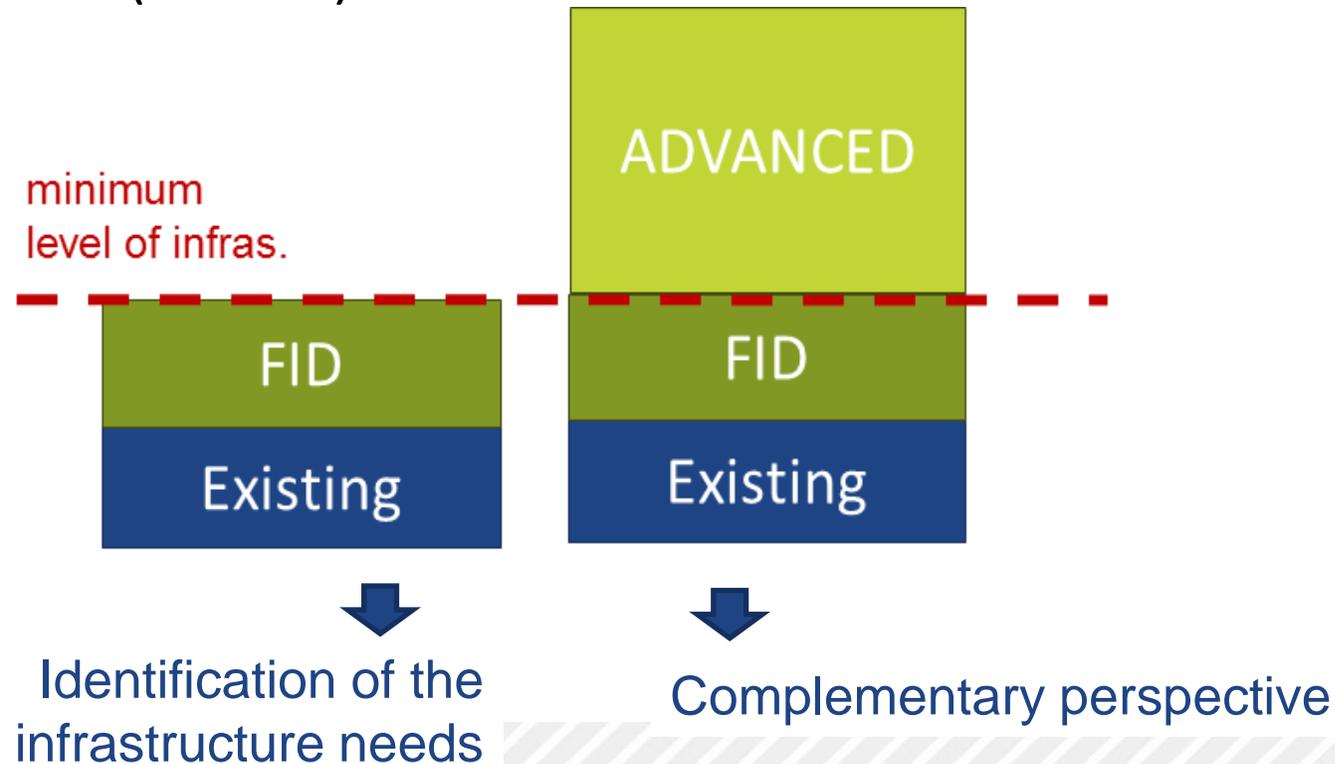
Assessment framework



- > **Scenarios set the range of possible contrasted futures needed to test the infrastructure**
- > **A meaningful assessment of the gas infrastructure and projects required that demand scenarios consider both yearly and peak demand situations**

Projects

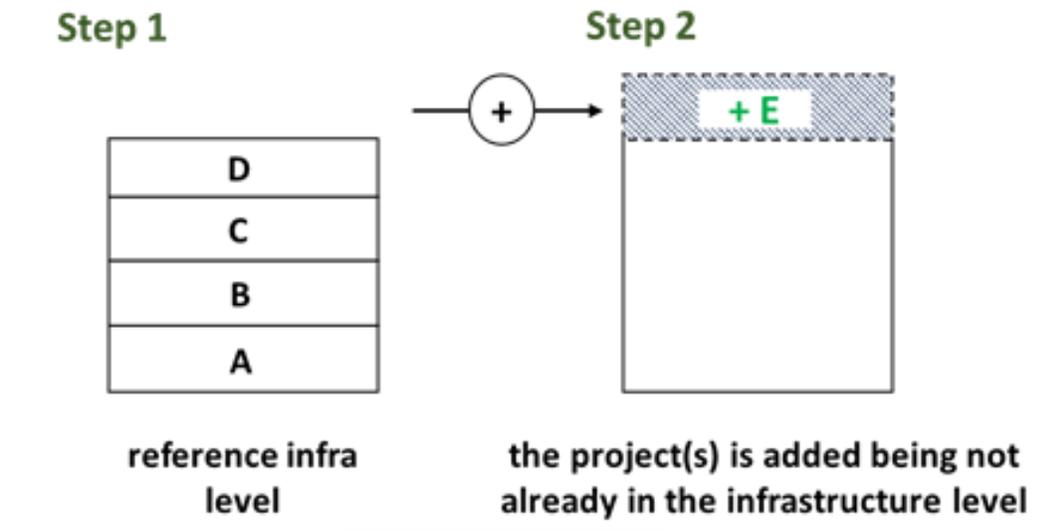
- > A proper description of existing infrastructure and projects is essential for
 - definition of reference grids
 - system assessment & infrastructure needs identification
 - project assessment (PS-CBA)



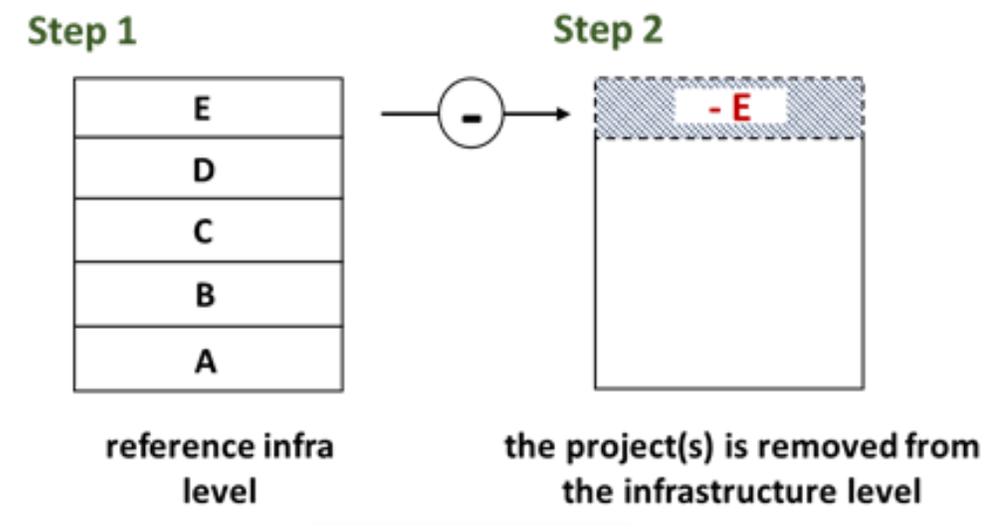


Project-specific assessment (PS-CBA)

- > Project-specific assessment is carried **with/without each project (or project group)** for both infra levels
- > It measures the **incremental impact in mitigating the identified infrastructure needs**



Put In one at a Time (PINT)



Take Out One at a Time (TOOT)



Socio-Economic benefit analysis



ENTSOG CBA Methodology combines monetary elements from the CBA approach as well as non monetary and/or qualitative elements referring to the Multi-Criteria Analysis (MCA)

Gas infrastructure projects potential benefits:

- > Reduction of the cost of gas supply (change in the Social Economic Welfare)
- > Contribution to security of supply
- > Price convergence
- > Fuel replacement
 - Substitution of more expensive fuels
 - Reduction in CO2 emissions
- > Increase of the number of supply sources
- > Decrease in country supply dependency

All the benefits are measured as the incremental project impact

Sensitivities



Sensitivity analysis enabling the identification of those elements affecting most the social economic performance of a project.

Gas Market Factors

- *demand evolutions*
- *renewables penetration*
- *commodity and CO2 prices*
- *supply potentials*

Project-specific data

- *commissioning year*
- *investment and operating expenditures costs*

Financial Data

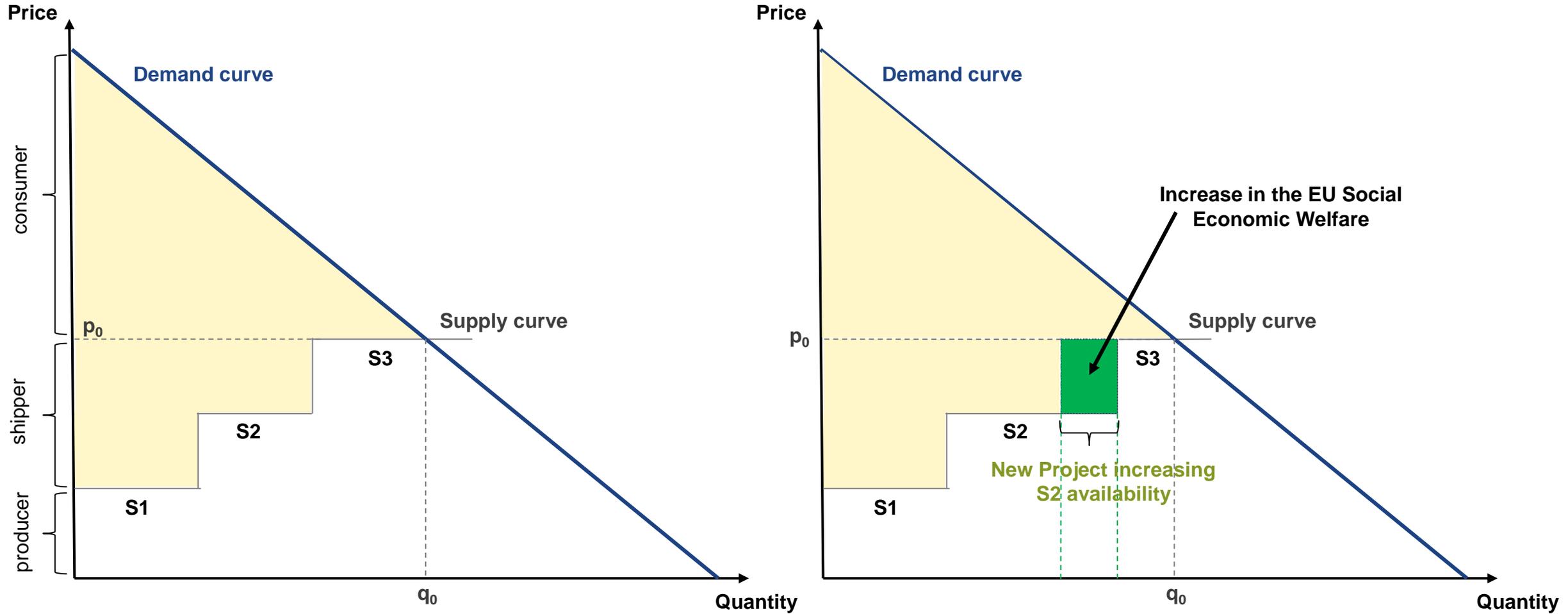
- *social discount rate*
- *sensitivity on price supply*



Benefit from gas infrastructure (examples)

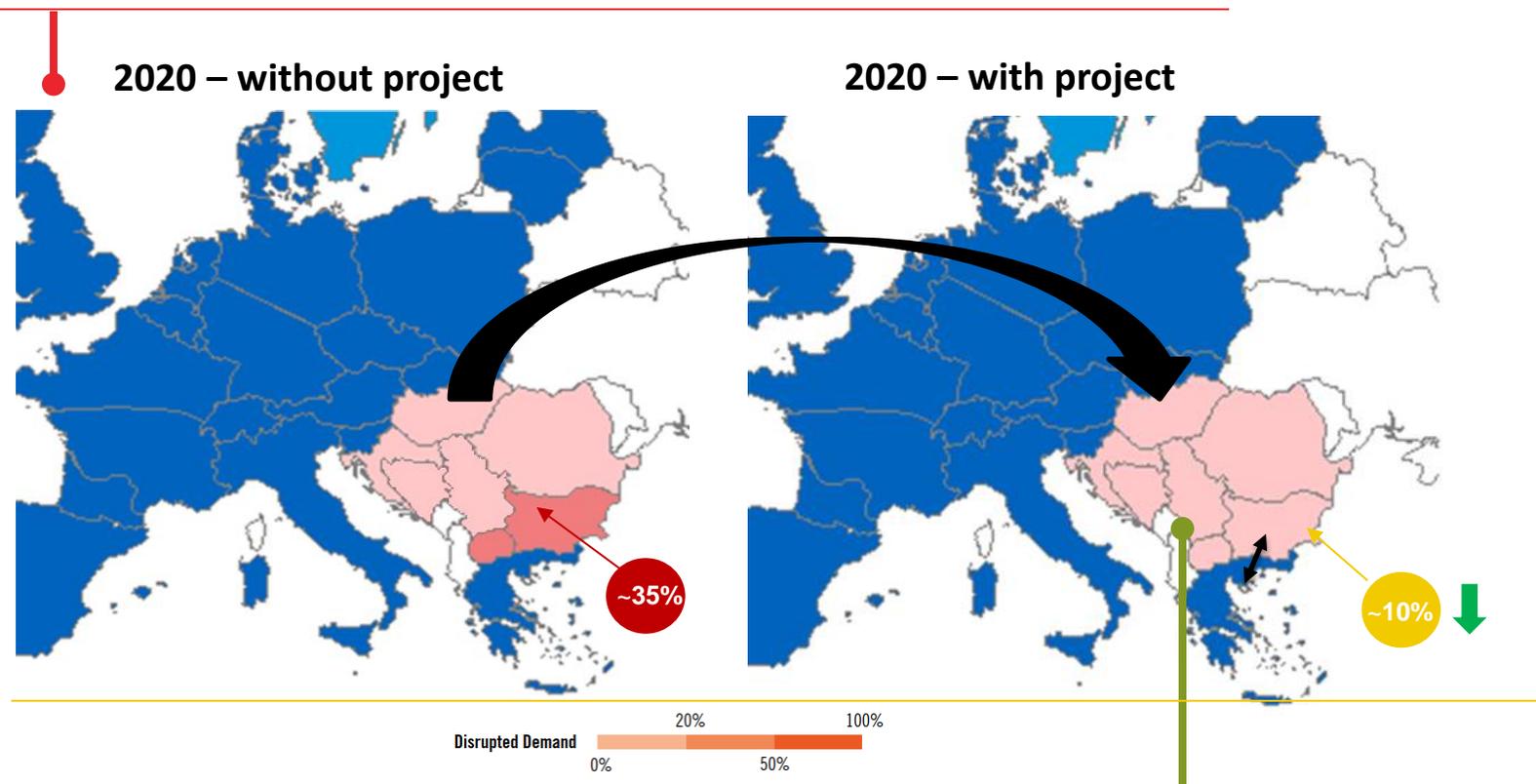


Reduction of the cost of gas supply



Avoided demand curtailment

South-East Europe would face demand curtailment in case of UA disruption



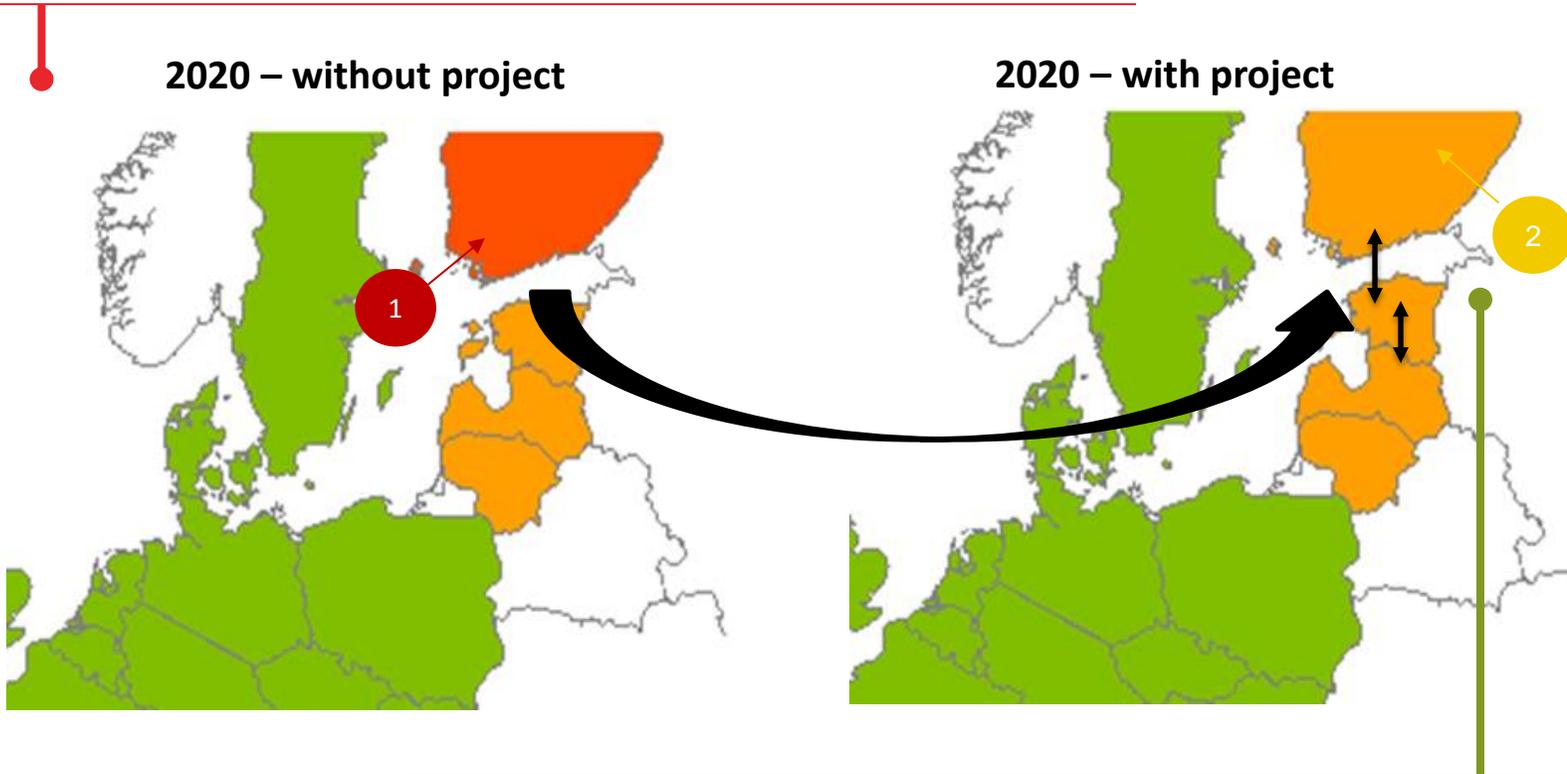
The avoided curtailed demand can be monetised ex-post

Realisation of the project group reduces BG and MK demand curtailment by 25%



Supply diversification

Finland has access to only one supply source (RU)



FI-EE and EE-LV allow FI to access the same 2 sources (RU and LNG) as other Baltic states



Project Fiche



Project fiche principles



Offering an overview of project information and assessment

- > technical project information
- > benefits from the incremental assessment
- > cost information
- > qualitative elements

... simplifying the assessment/valuation of projects



Project fiche – Results overview example



Indicators & Impacted countries	Infrastructure level, Year and Demand Scenarios							
	LOW 2020		2025		Green Evolution		EU Green Revolution	
	Green Evolution		Blue Transition		Green Evolution		EU Green Revolution	
	Value	Delta	Value	Delta	Value	Delta	Value	Delta
Access to supply sources (nb of sources)								
FI	2	1						
Dependence to LNG (%)								
-								
Dependence to Russia (%)								
EE	31	6	97	2	96	6	96	7
FI	31	-66	96	4	96	8	96	8
LT			97	-3	97	-3	97	-3
LV	31	6	97	-3	96	-4	96	-4
Disruption Rate (%) - Ukraine route disruption								
-								
Disruption Rate (%) - Belarus route disruption								
EE			0	-6				
LV			0	-5	0	-4	0	-4
Disruption Rate (%) - Without any supply disruption								
-								
IRD								
FI	6,343	-3,657	6,343	-3,657	6,343	-3,657	6,343	-3,657
LV	4,330	-1,230	4,330	-1,230	4,330	-1,230	4,330	-1,230
N-1 for ESW CBA (%)								
EE			222	9				
FI	97	95	77	73	112	94	112	94

As result of the incremental approach



Thank You for Your Attention

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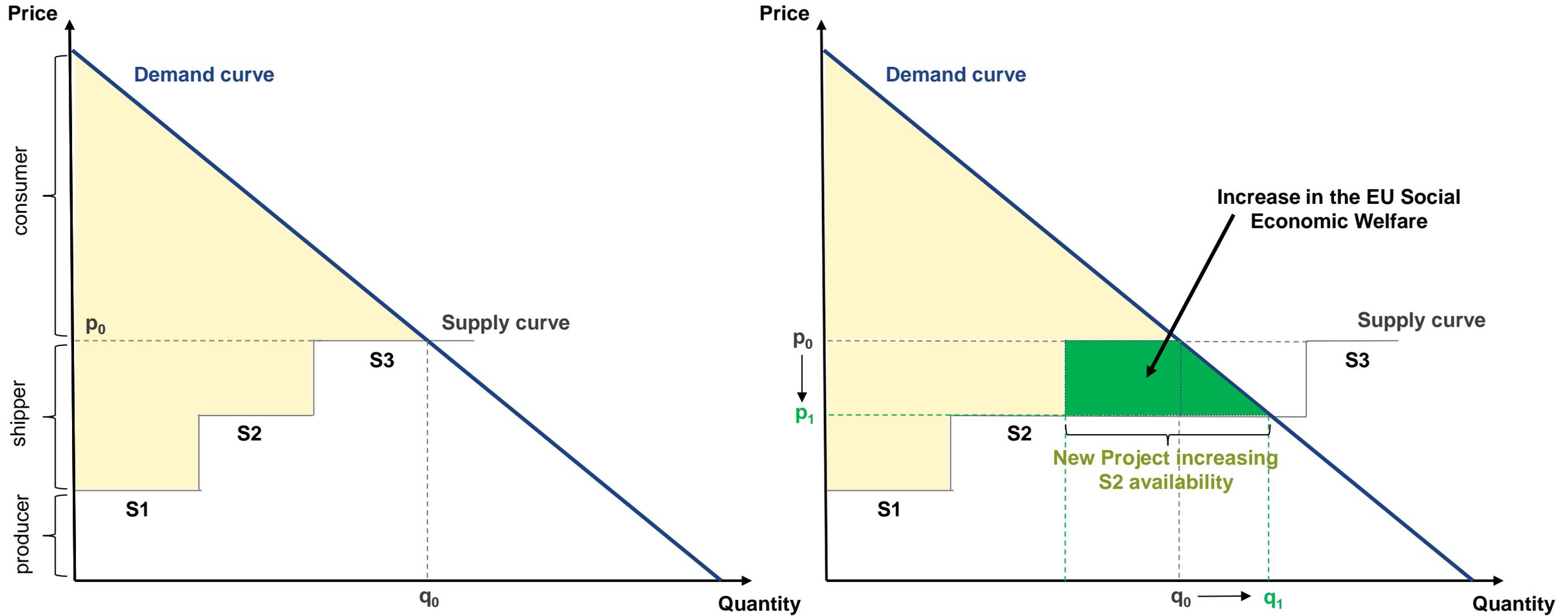
WWW: www.entsog.eu



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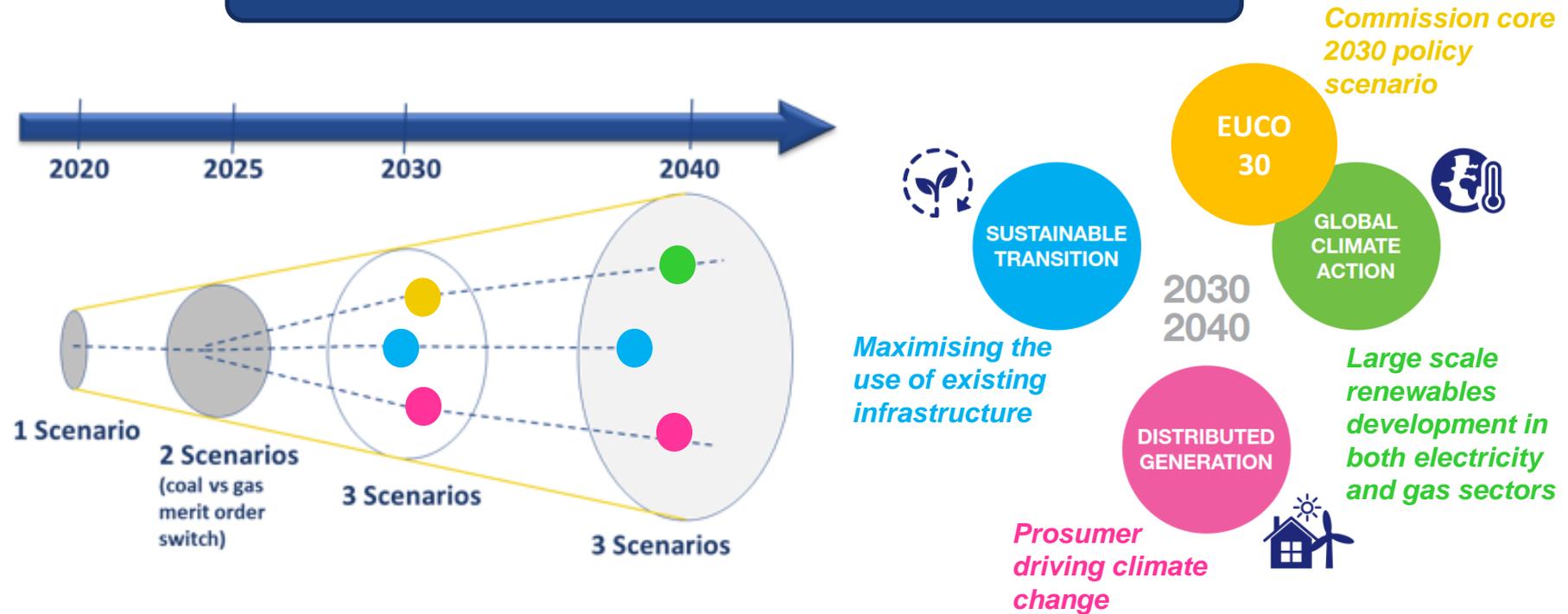


Reduction of the cost of gas supply



TYNDP 2018: ENTSOs Scenario Framework

3 scenarios to capture the possible future paths.



A common goal:
EU 2030 and 2050 targets