Ten-Year Network Development Plan 2020

Picture courtesy: GRTgaz

Public presentation

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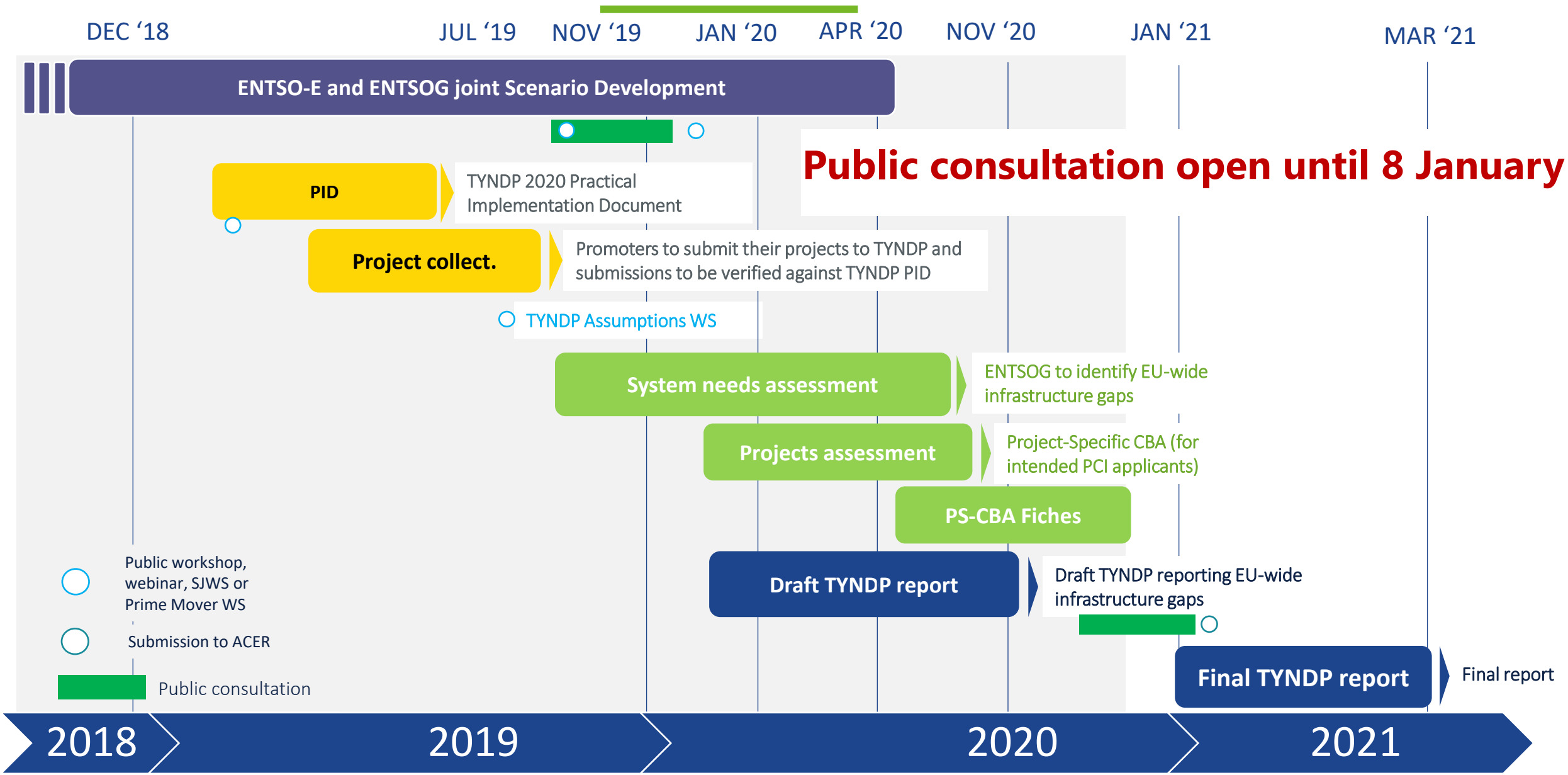
online

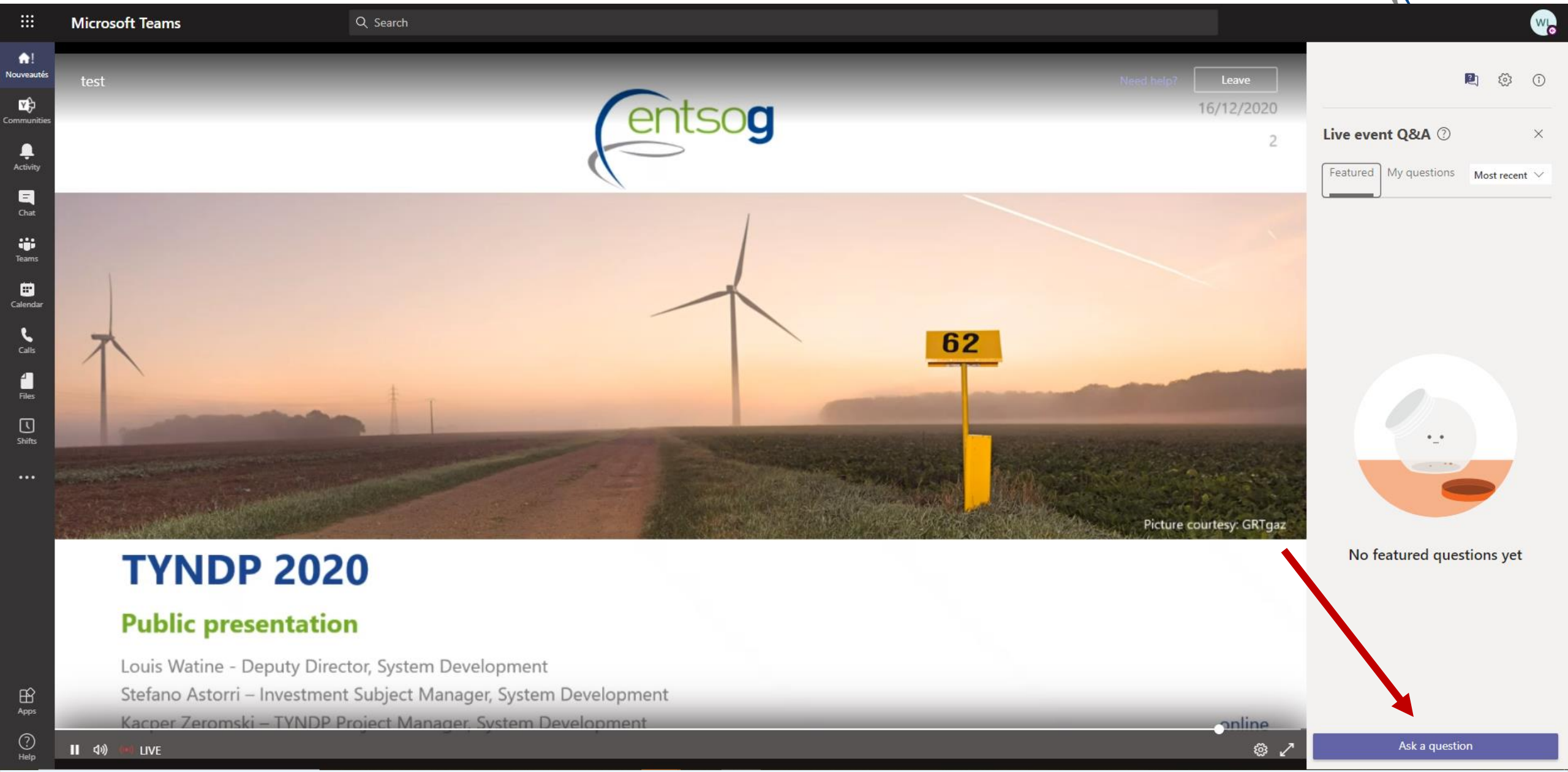
Agenda

- 13:00 – 13:15 Welcome and Introduction
- 13:15 – 14:00 TYNDP 2020 Scenarios
- 14:10 – 14:35 Presentation of the EU gas infrastructure and TYNDP assessment methodology
- 14:35 – 14:45 Coffee break 
- 14:45 – 15:35 TYNDP assessment results
- 15:35 – 15:50 Next steps

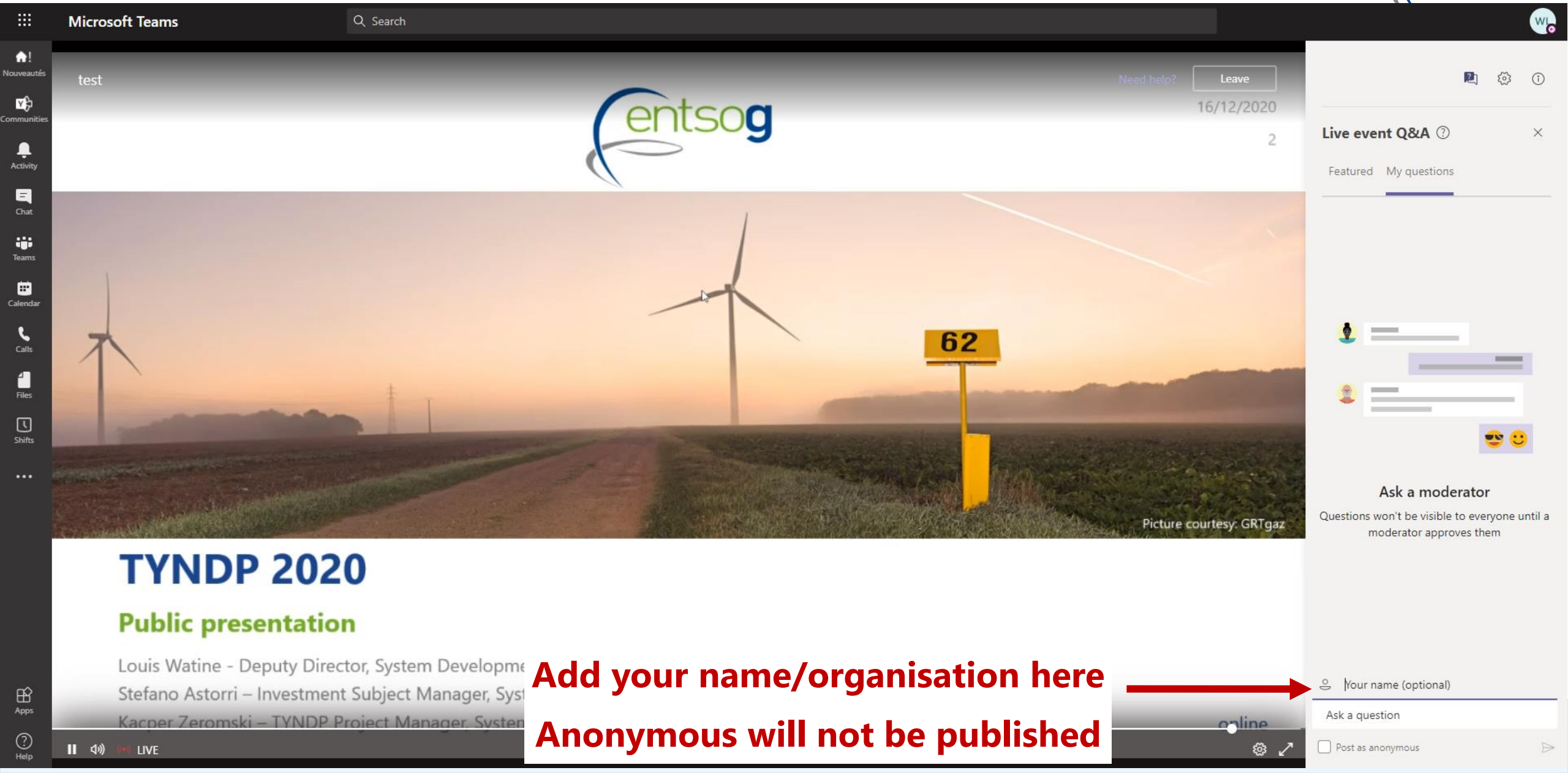
TYNDP 2020 timeline



Interacting with Teams



Interacting with Teams



Interacting with Teams

TYNDP 2020 Scenarios

Needs Assessment Methodology

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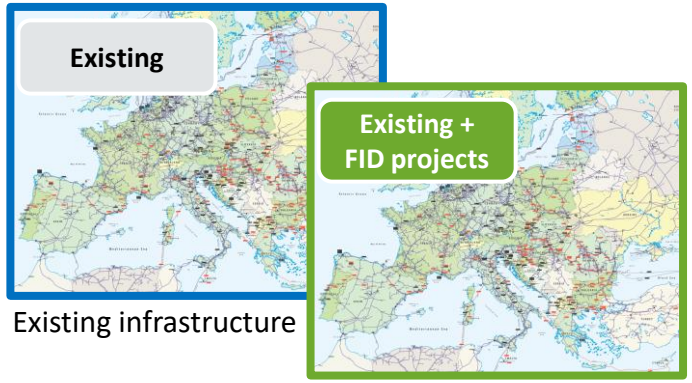
Is further infrastructure needed?

– TYNDP assesses the gas infrastructure against the Union energy policies

Sustainability | Security of Supply | Competition | Market Integration

Are they achieved with the existing infrastructure and FID projects?



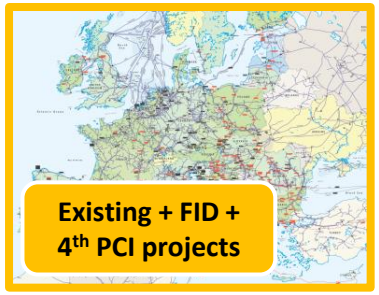
Existing infrastructure

Low infrastructure level

No

Advanced infra. level

+



PCI infra. level

Yes

No further infrastructure needs

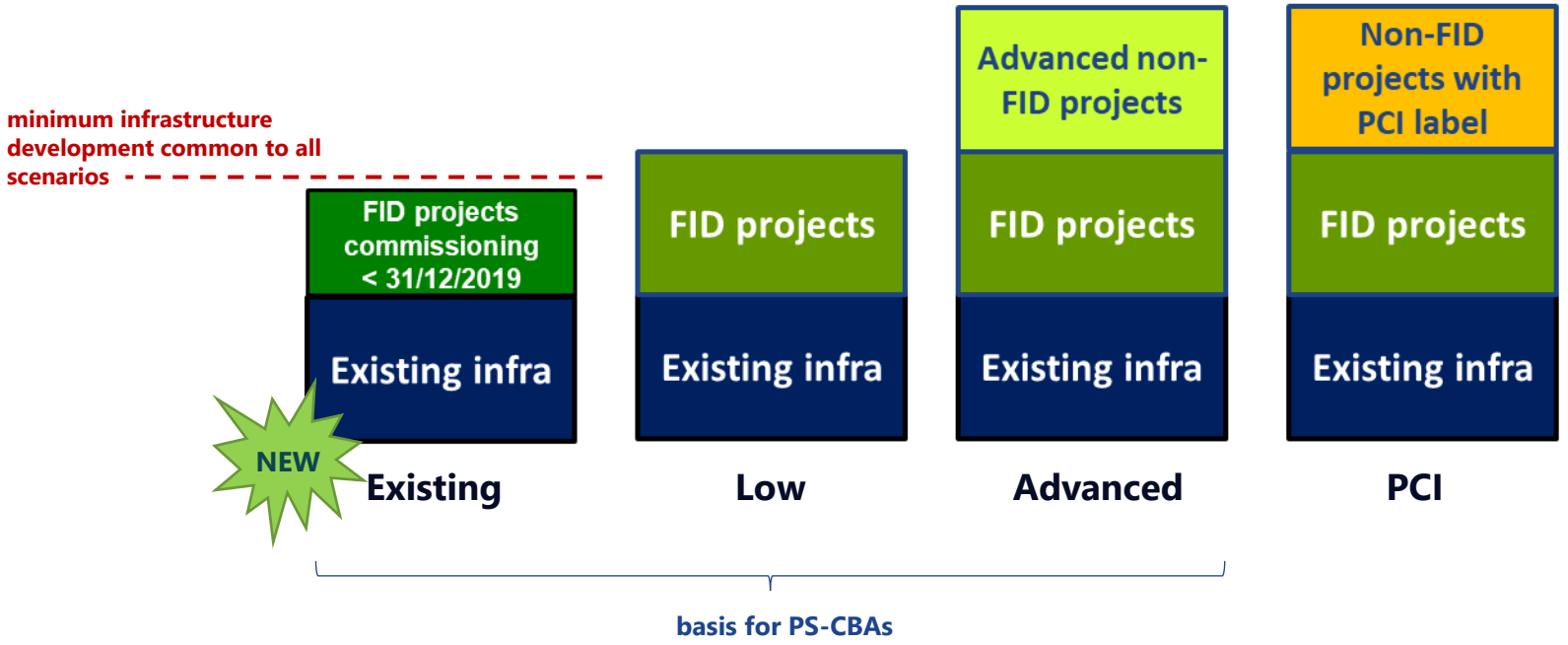
TYNDP assesses further infrastructure development

> FID projects + advanced projects

> FID projects + 4th PCI list projects

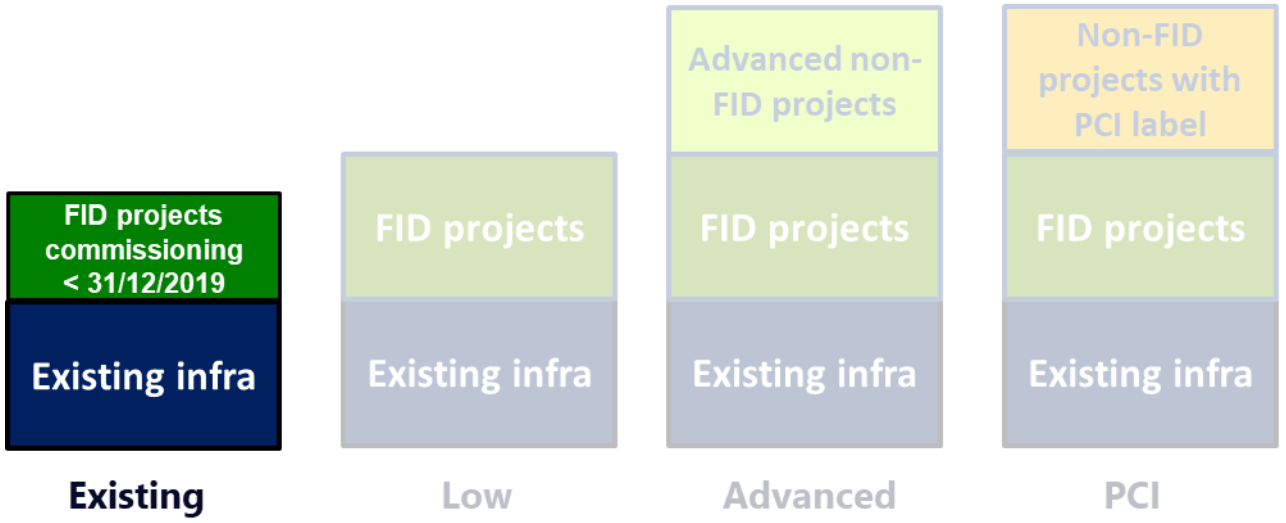
The infrastructure levels

- Different infrastructure levels allow to
  - assess different possible infrastructure evolutions
  - verify projects benefits under different infrastructure configurations



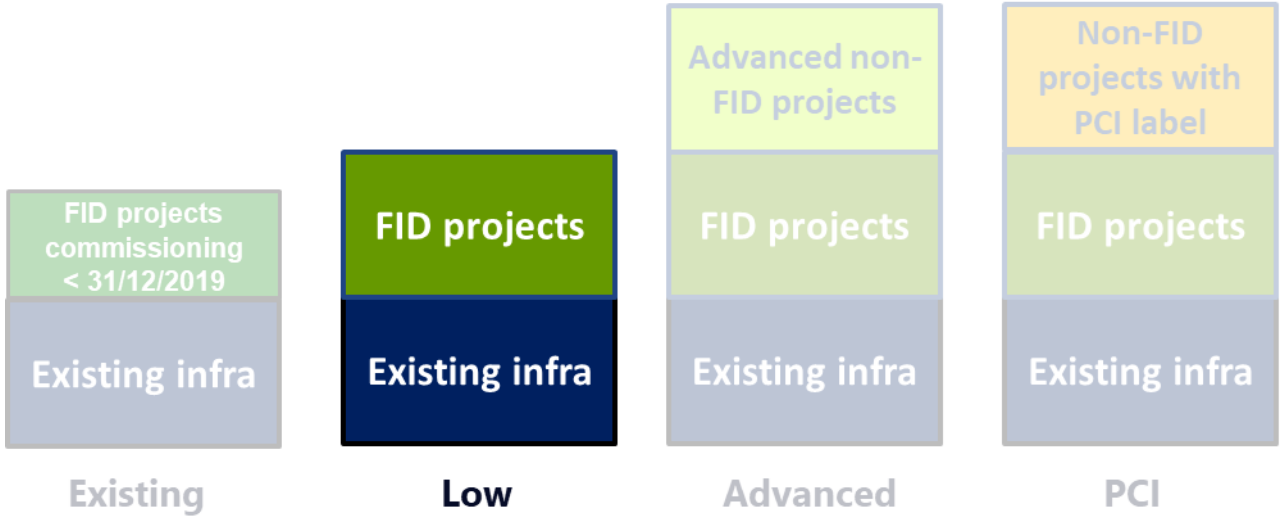
Existing infrastructure level

– A new infrastructure level to better reflect today infrastructure gaps and FID projects contribution



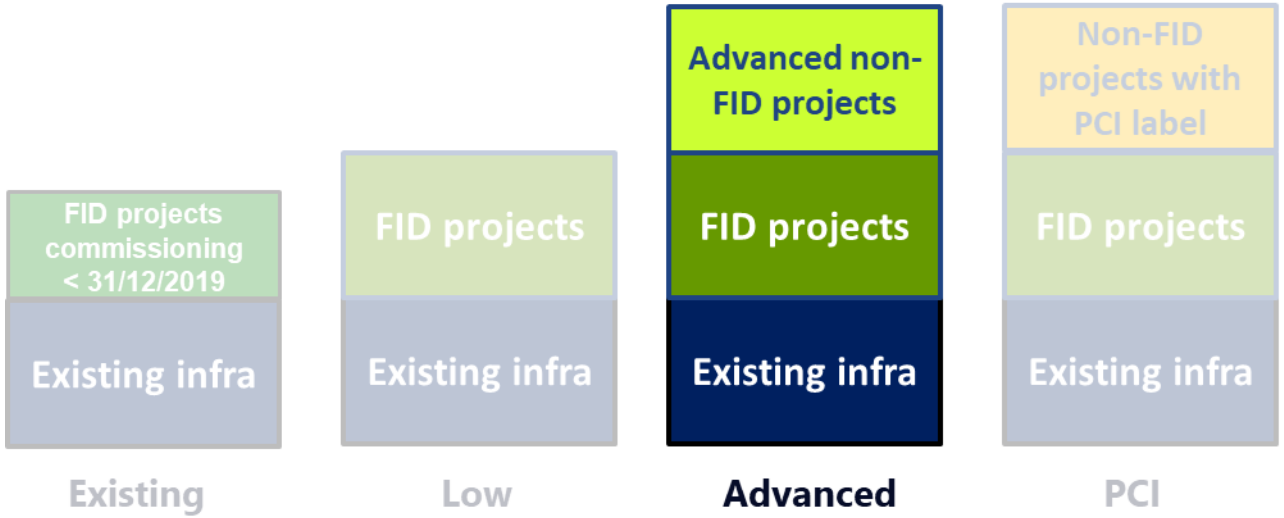
Low infrastructure level

- Additional reference infrastructure development for identification of infrastructure gaps:
  - Existing infrastructure + Projects having made their Final Investment Decision (FID projects)



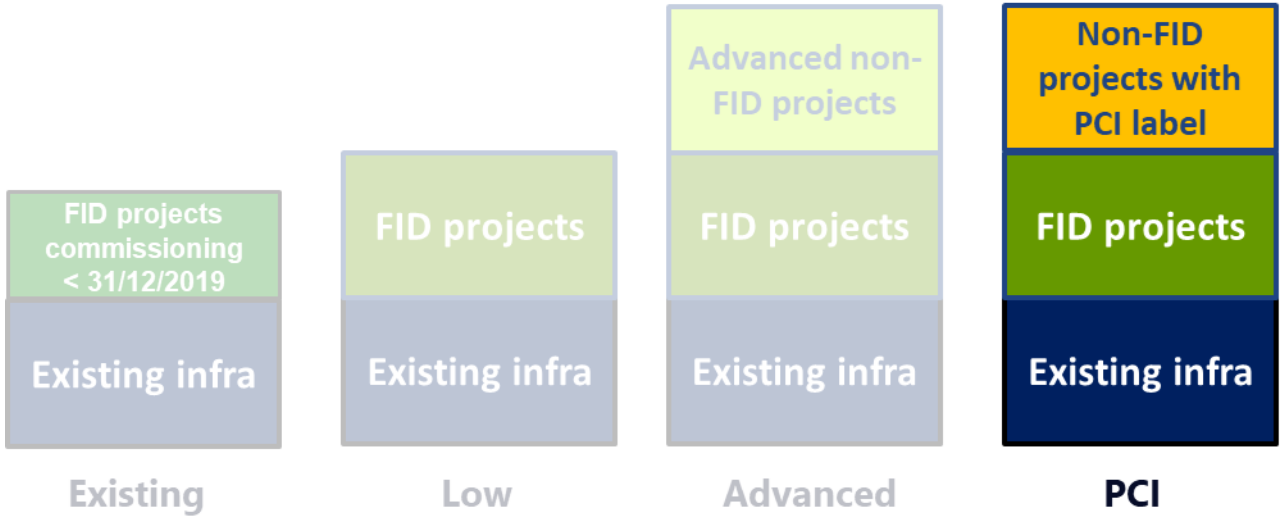
Advanced infrastructure level

- Advanced infrastructure level is considered to assess the impact of
  - Existing infrastructure +
  - Projects having made their Final Investment Decision (FID projects)+
  - Projects to be commissioned by 2025 having initiated their permitting process or FEED studies (or having been granted CEF funding for FEED)

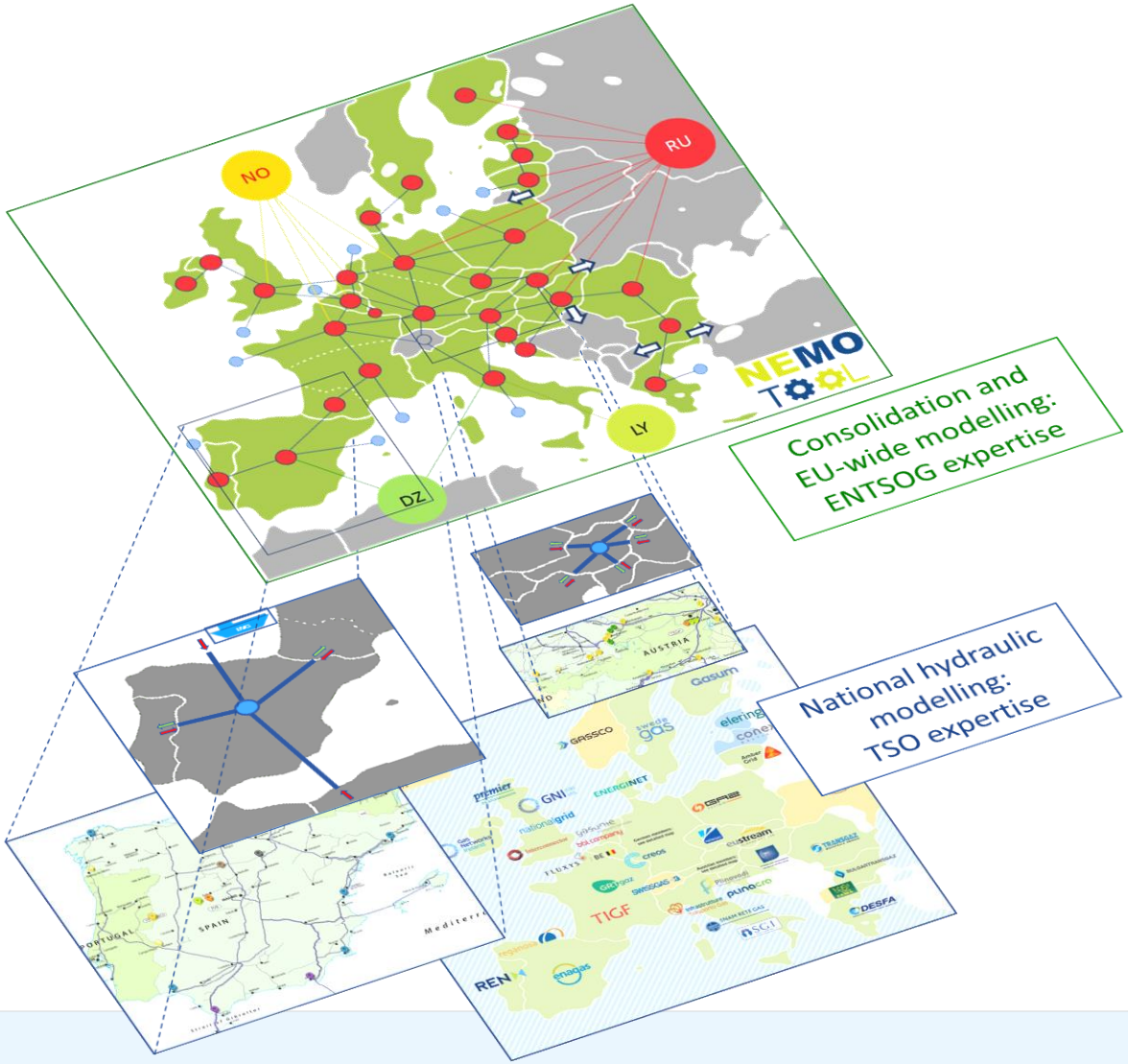


PCI infrastructure level

- PCI infrastructure level is considered to assess the impact of
  - Existing infrastructure +
  - Projects having made their Final Investment Decision (FID projects)+
  - Additional projects of the 4th PCI list not having made their FID yet



ENTSOG EU network modelling

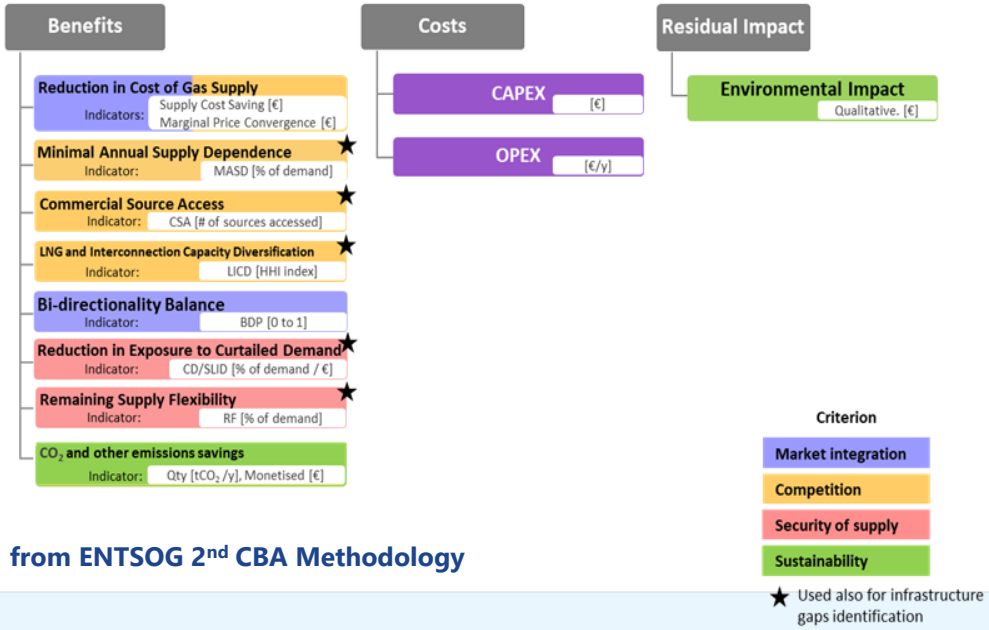


ENTSOG European model builds on TSOs national expertise

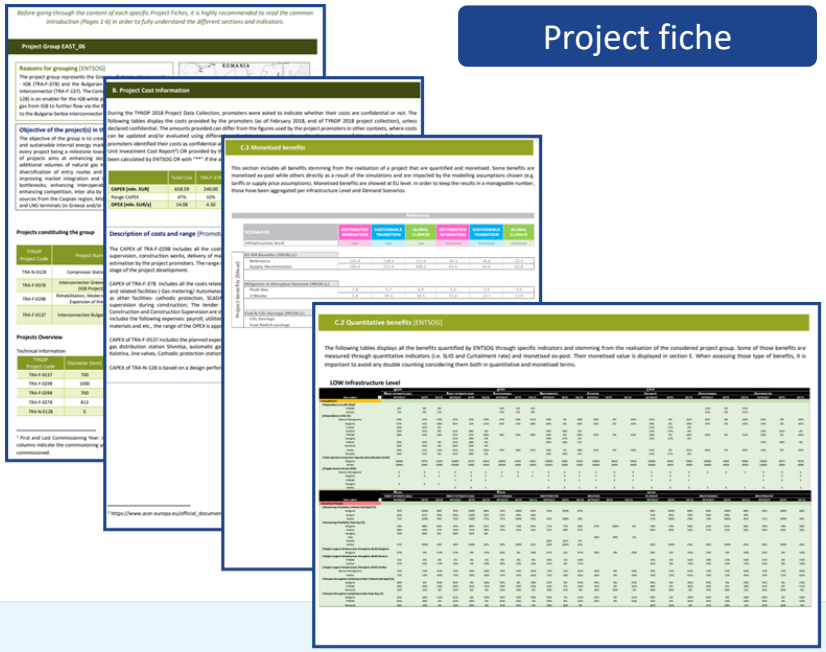
ENTSOG Topology is constantly updated

Indicators for the assessment needs

- 5 indicators to measure infrastructure needs under SOS and Market integration / Competition
- Separate analysis for sustainability in TYNDP 2020
- Contribution of projects to gaps mitigation assessed with the same indicators (+ additional indicators) and results published in the format of Project Fiches



from ENTSOG 2nd CBA Methodology



Infrastructure Projects

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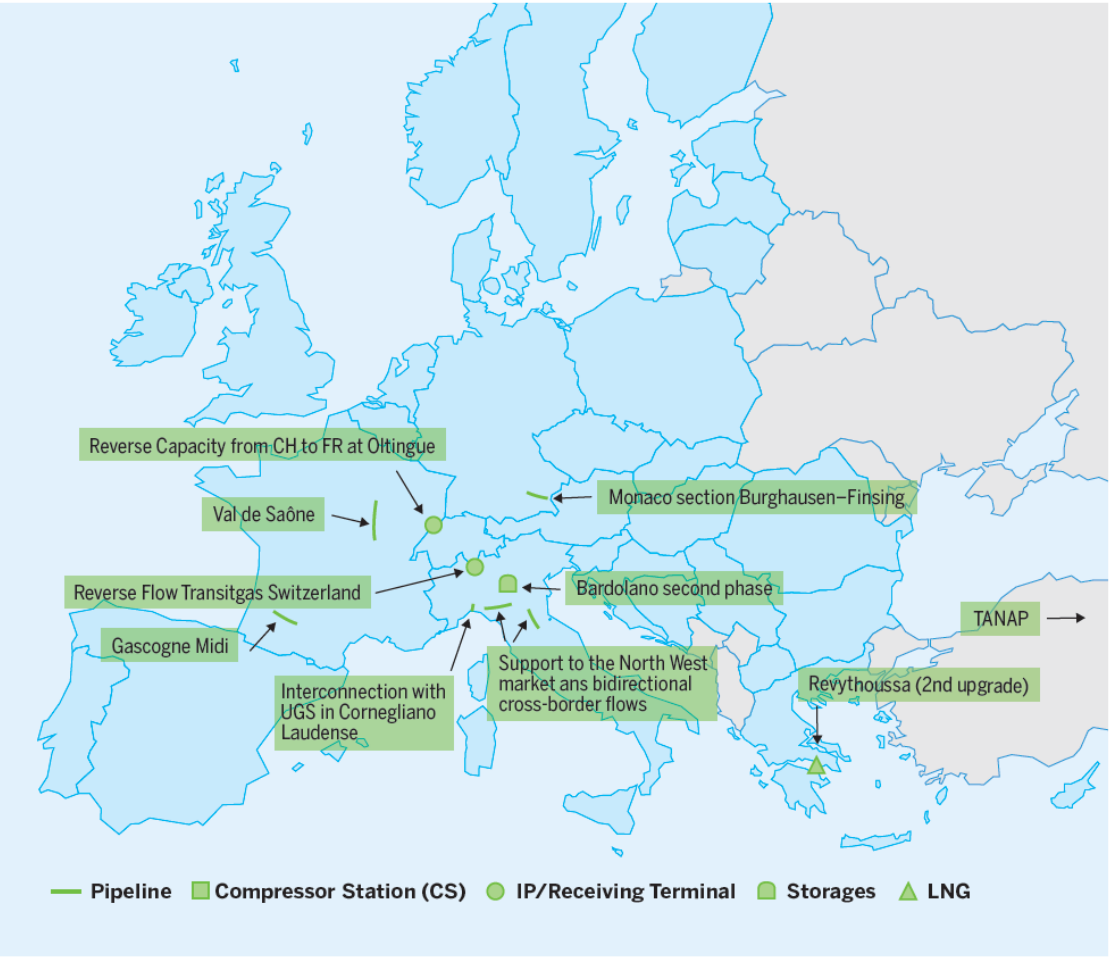
TYNDP 2020 submitted projects

10 projects commissioned since TYNDP 2018
+21 projects expected to be commissioned by 31 December 2020

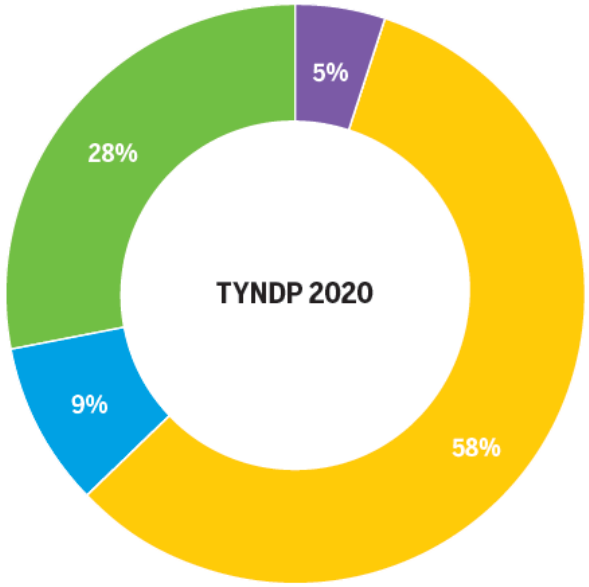


31 investments cancelled or not resubmitted

19 new investments submitted to TYNDP 2020

75 Energy Transition (ETR) projects submitted

Energy Transition projects

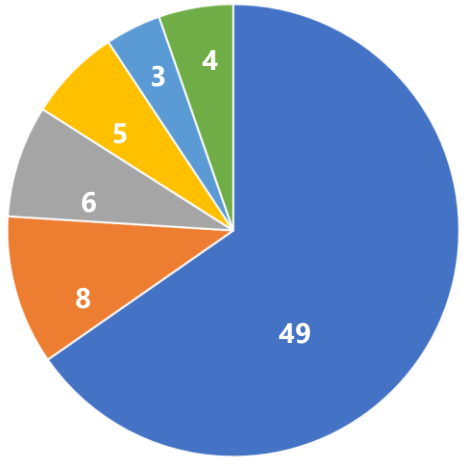


ETR
LNG
Transmission
Storage

28%

Infrastructure projects in TYNDP 2020 directly related to the Energy Transition

Projects submitted to TYNDP 2020

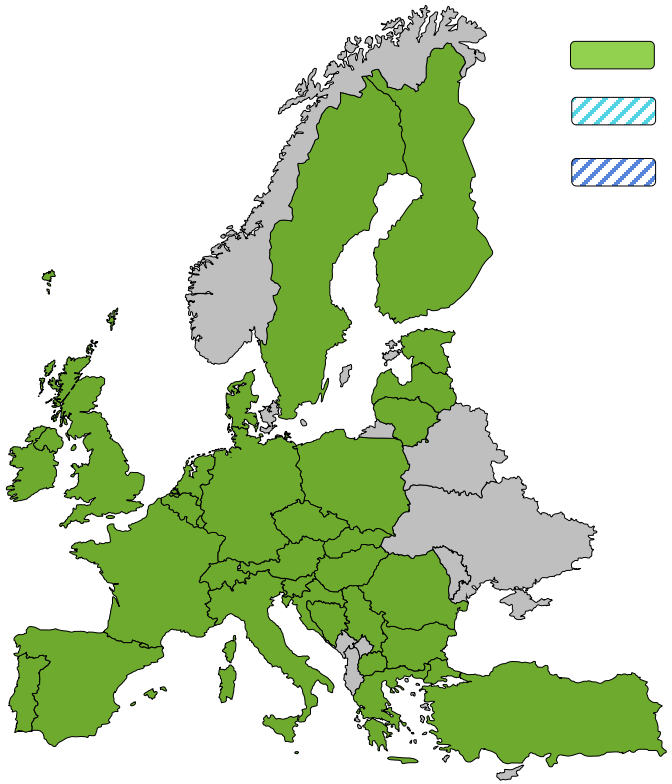


Hydrogen and synthetic methane
Biomethane developments
CCS/CCU
CNG/LNG for transport
Reverse flow DSO-TSO
Others

Hydrogen projects account for **+55%** of Energy Transition (ETR) projects, including P2G and repurposing of existing infrastructure

https://tyndp2020.entsog.eu/

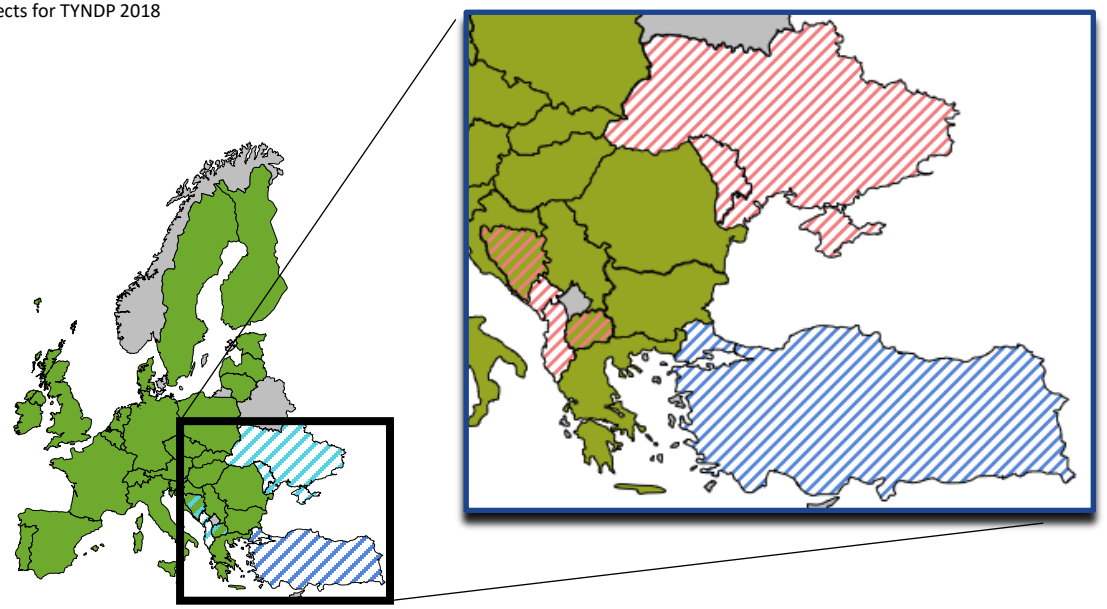
TYNDP 2020 project perimeter



TYNDP perimiter countries

Energy Community Contracting Parties submitting projects for TYNDP 2018

Energy Community Observers submitting projects for TYNDP 2018



TYNDP perimeter countries

Submitted projects in extra-EU

Market Modelling Assumptions

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Infrastructure tariffs

Interconnections

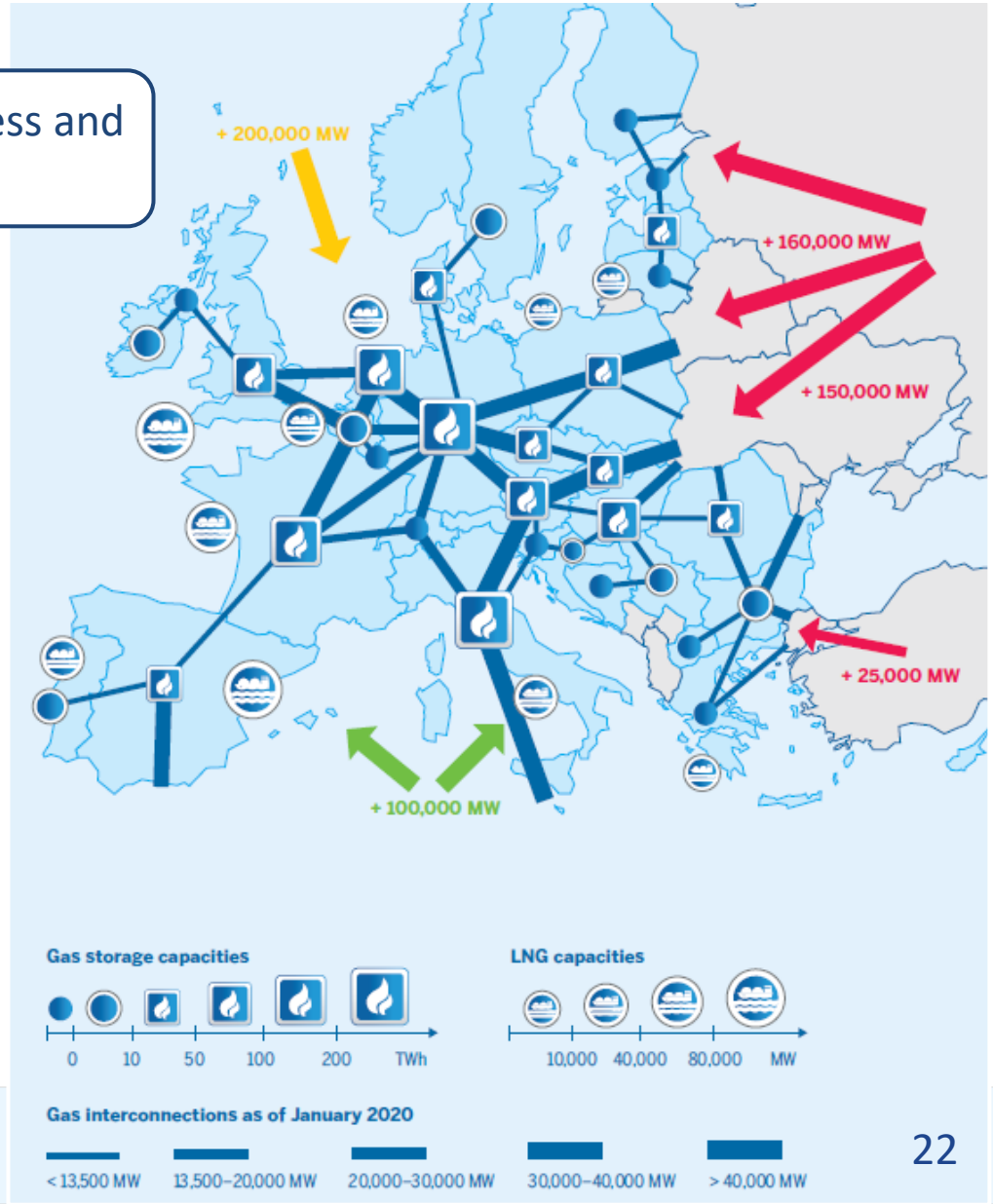
LNG Terminals

Storages

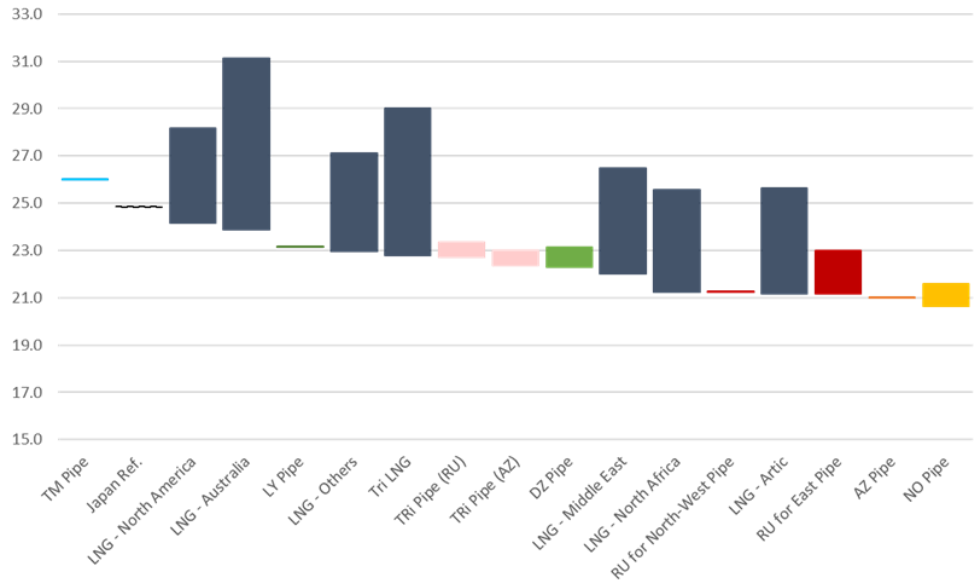
Commercial Supply Access and Marginal Prices

Marginal Prices consider infrastructure costs

Benefits from tariff arbitrage also measured in Project CBAs



Supply prices diversification



Example of the merit order of the supply sources in the Reference case (Japan reference price purely indicative)

- The range of each supply is depending on the entry costs to EU and shipping cost for LNG
- Differentiated supply prices embedded in the reference price configuration
- Based on
  - literature
  - exchanges with suppliers
  - stakeholders feedback

6 price configurations to assess the sensitivity to each supply source

> Russia maximisation	Low price
> Russia minimisation	High price
> LNG maximisation	Low price
> LNG minimisation	High price
> South gas supply maximisation	Low price
> South gas supply minimisation	High price

Infrastructure Assessment

What is in TYNDP 2020

Scenarios

- Distributed Energy
- National Trends
- Global Ambition

Infrastructure levels

Existing	FID + Existing	Advanced* + FID + Existing	PCI + FID + Existing
Existing	Low	Advanced	PCI
		*commissioned by 2025	

Time horizons

2020 → 2025 → 2030 → 2040

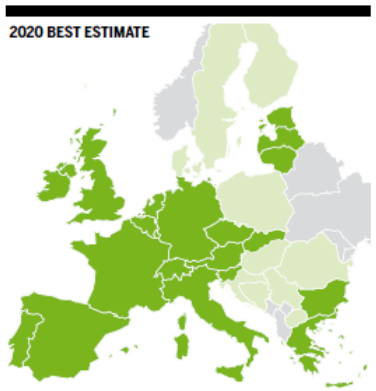
Climatic cases

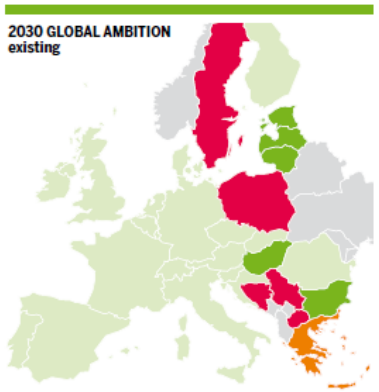
- Peak Day — 1-in-20 years
- 2-week cold spell — 1-in-20 years
- 2-week Dunkelflaute — 1-in-20 years

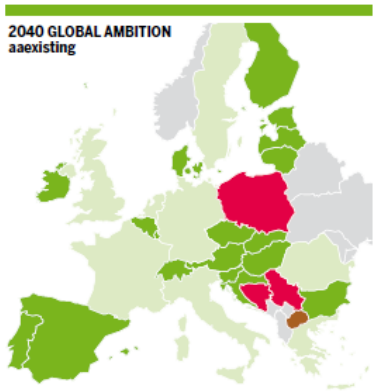
Supply disruptions

- Ukraine route
- Belarus route
- Baltics and Finland
- Algeria

Delay and Acceleration in TYNDP





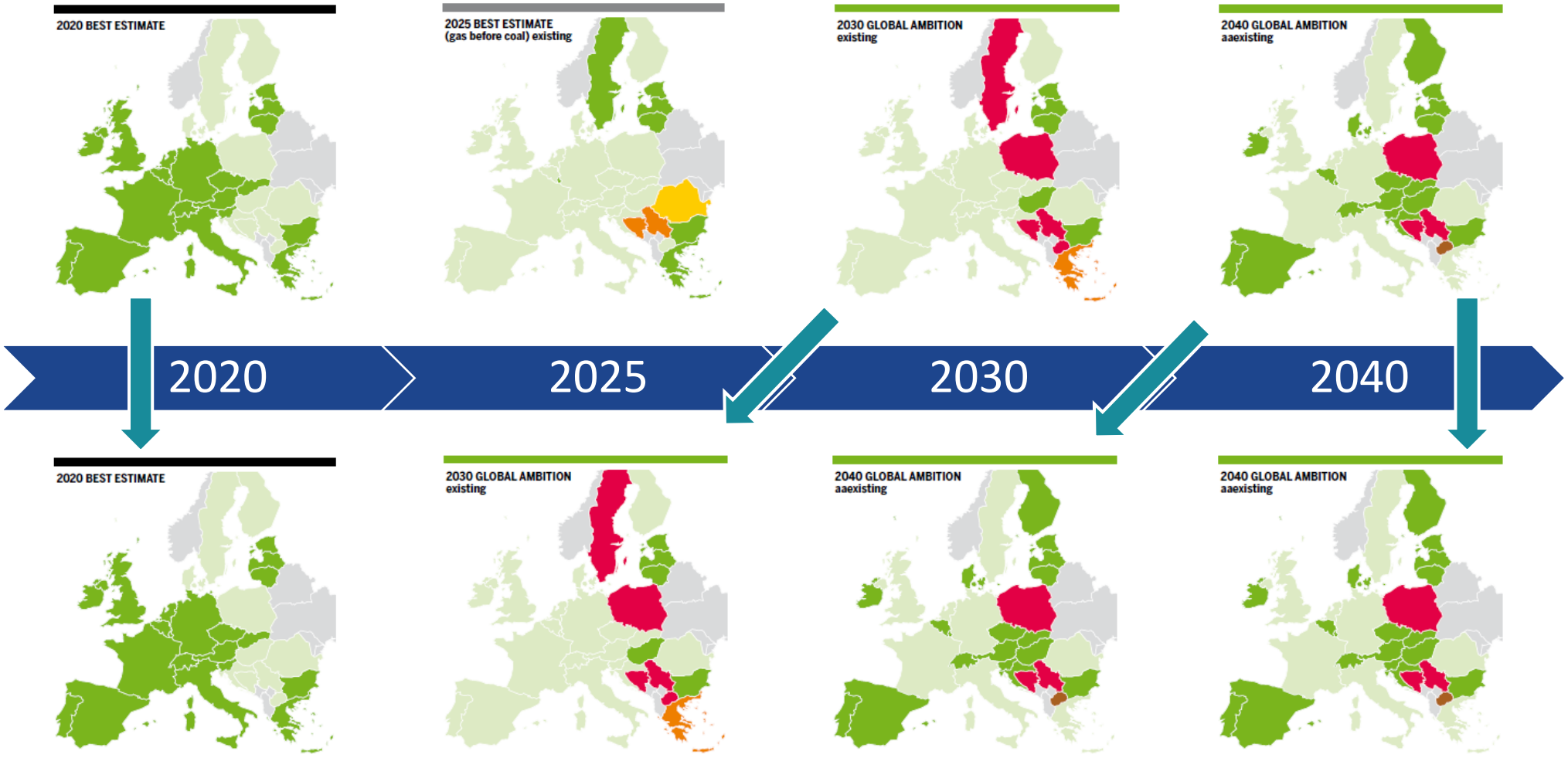


2020 → 2025 → 2030 → 2040

ENTSOG assesses infrastructure needs and projects over the whole time-horizon of TYNDP to allow for the assessment of delays and anticipation of the **scenarios** and **project** commissioning dates

Delay and Acceleration in TYNDP

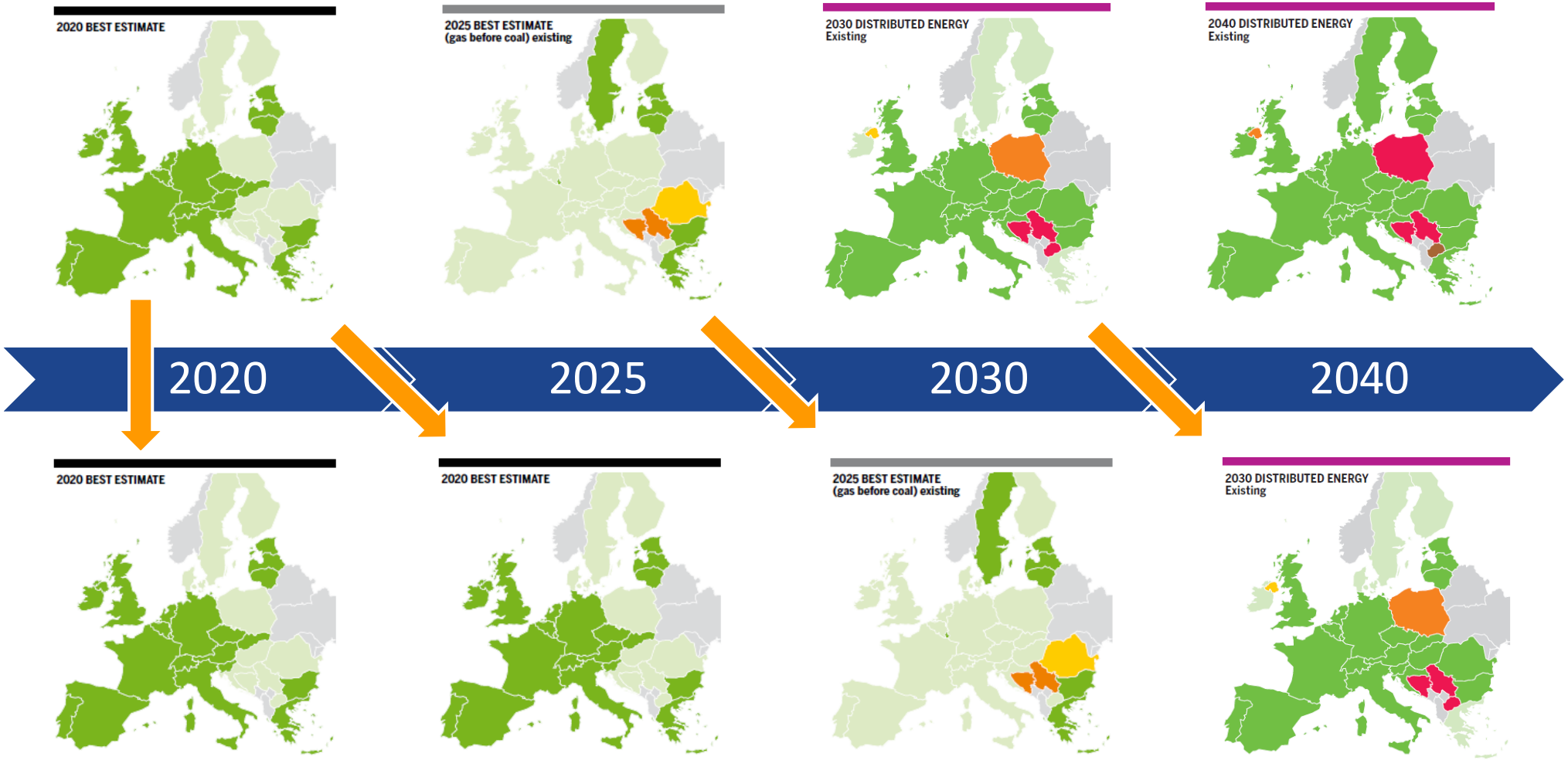
Global Ambition scenario



5/10-year anticipation in GA scenario

Delay and Acceleration in TYNDP

Distributed Energy scenario



5/10-year delay in DE scenario

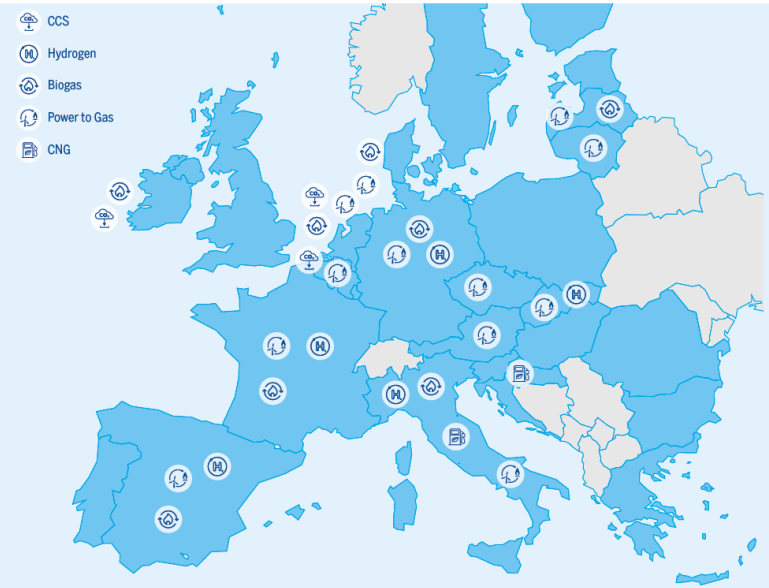
TYNDP assessment categories

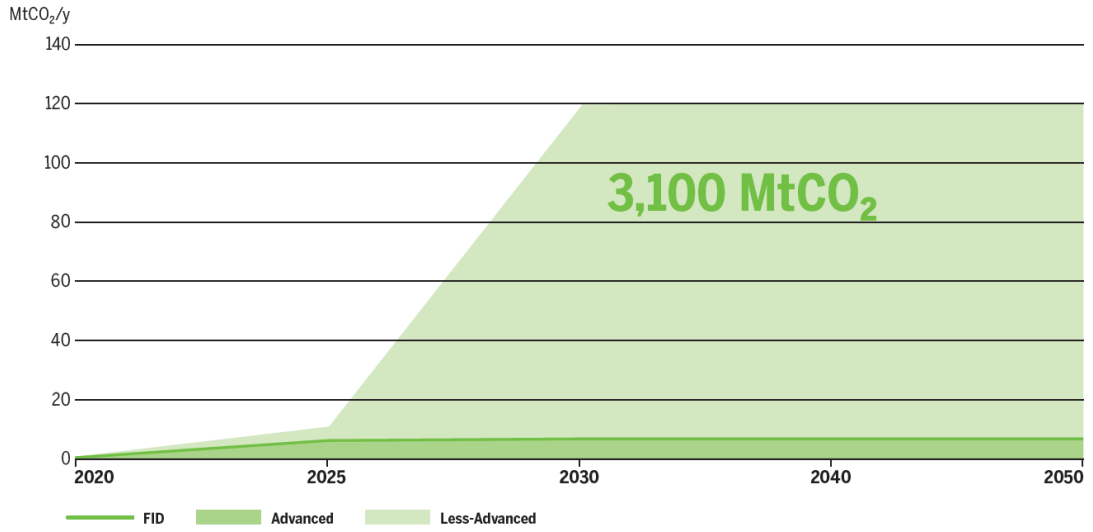
- Sustainability
- Security of Supply
- Competition and Market Integration

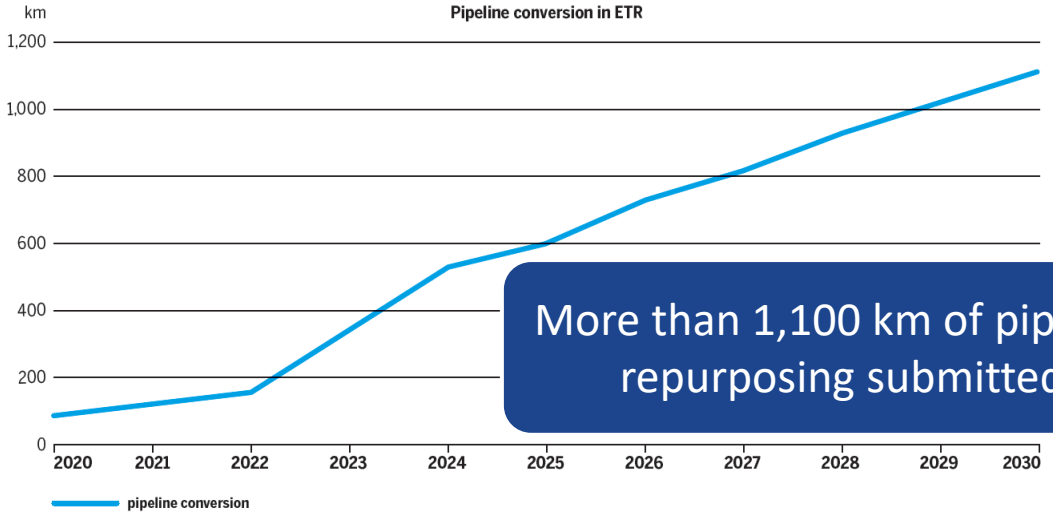
Sustainability

Coal-to-gas switch in the power sector can already save more than 85 $MtCO_2$/y

Energy Transition (ETR) projects can save additional 3,1 $GtCO_2$ by 2050







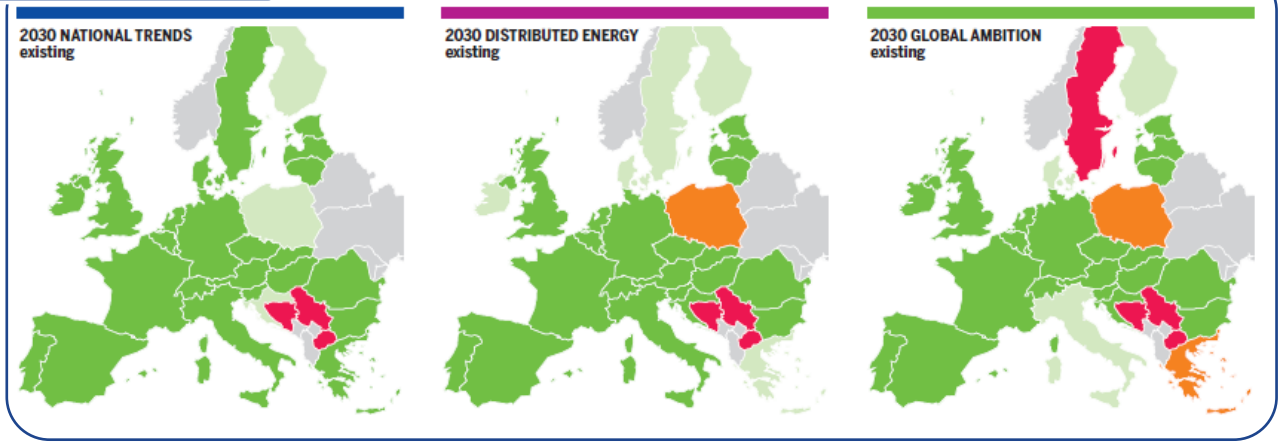
More than 1,100 km of pipeline repurposing submitted

1st non-mandatory collection of ETR projects shows diversified categories spread all over the EU

Security of Supply

Security of Supply – Climatic Stress

Existing

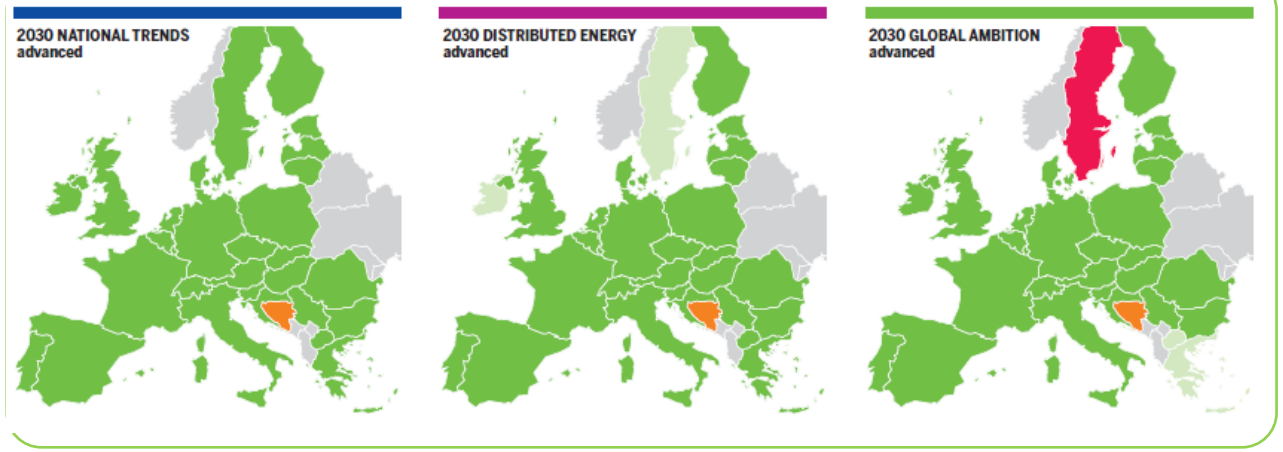


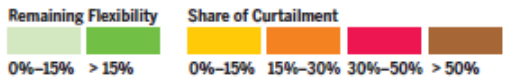
Peak day
1-in-20 years

FID and Advanced projects to be commissioned in the next 5 years almost fully mitigate the remaining gaps

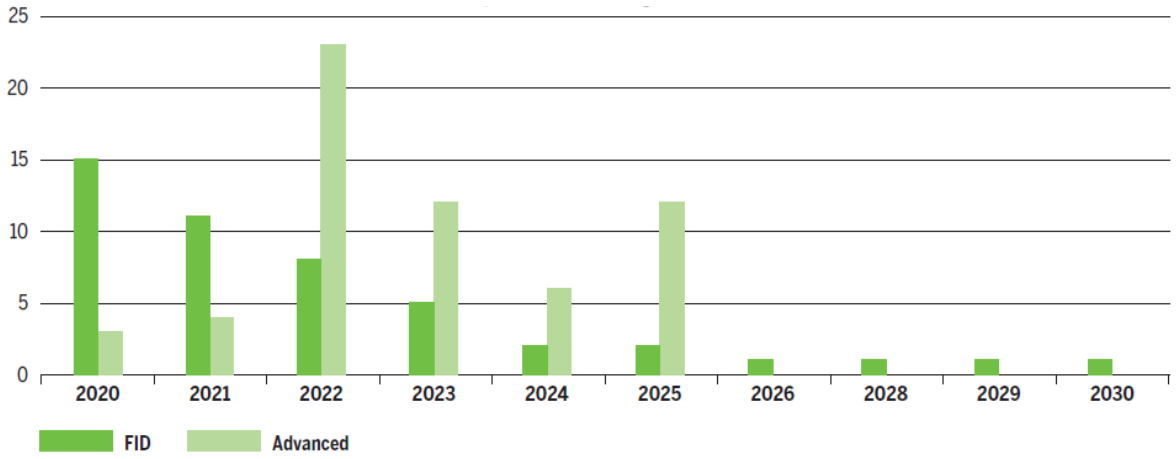
Advanced

FID + advanced projects commissioned by 2025





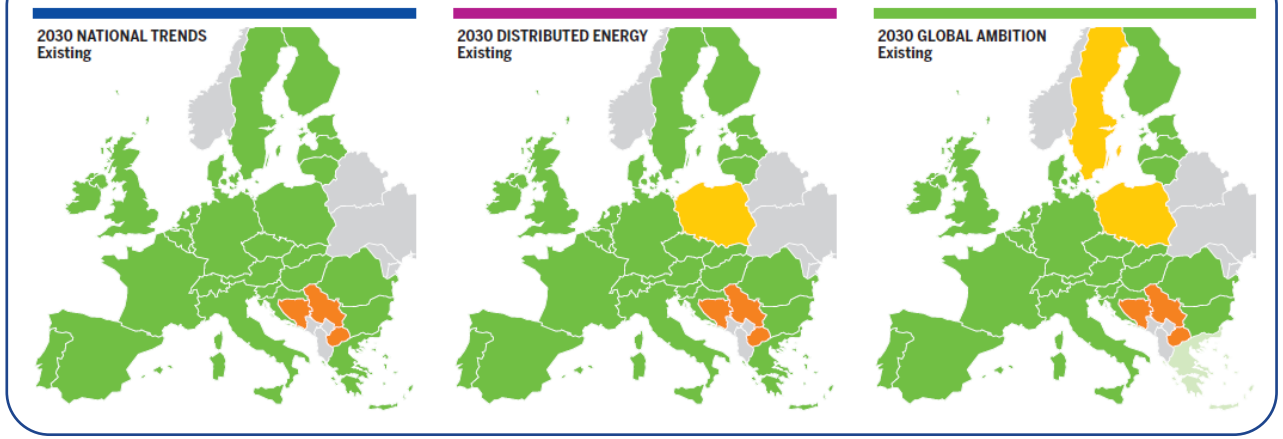
Projects* commissioning dates



*1 interconnector = 2 projects (1 each side of a border)

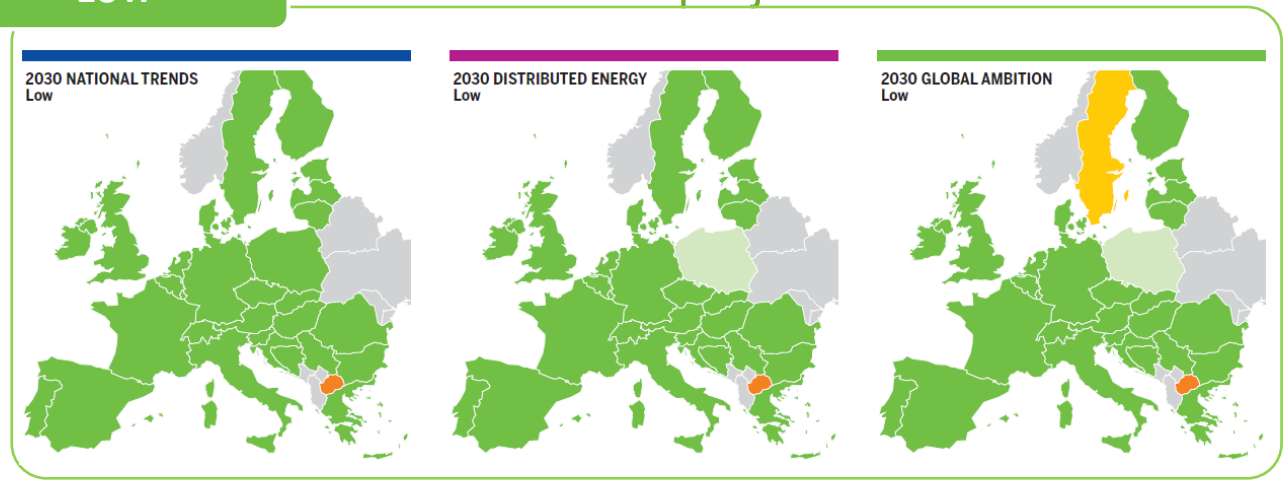
Security of Supply – Climatic Stress

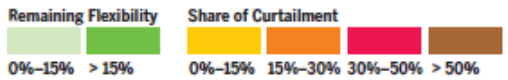
Existing



Low

FID projects

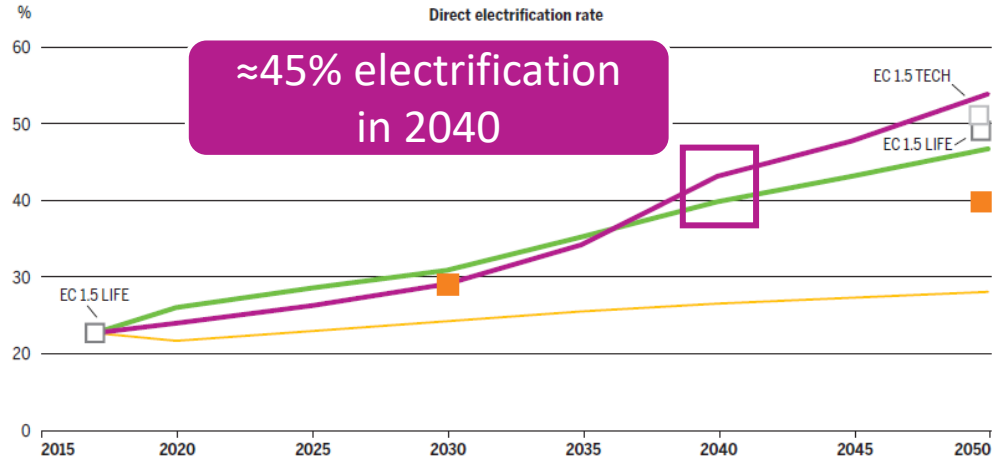




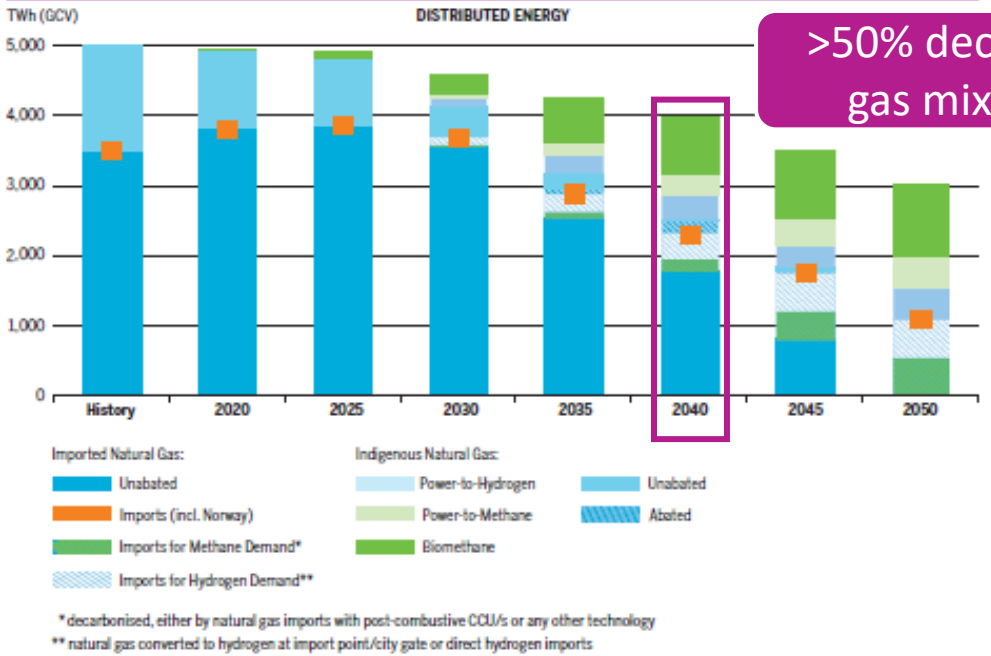
2-week cold spell
1-in-20 years

FID projects to be commissioned in the next 5 years almost fully mitigate the remaining gaps

Security of Supply – Climatic Stress

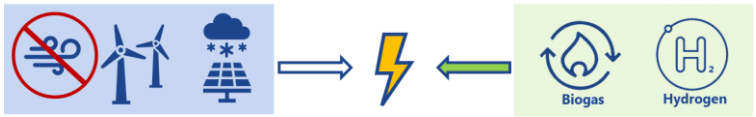


≈45% electrification in 2040

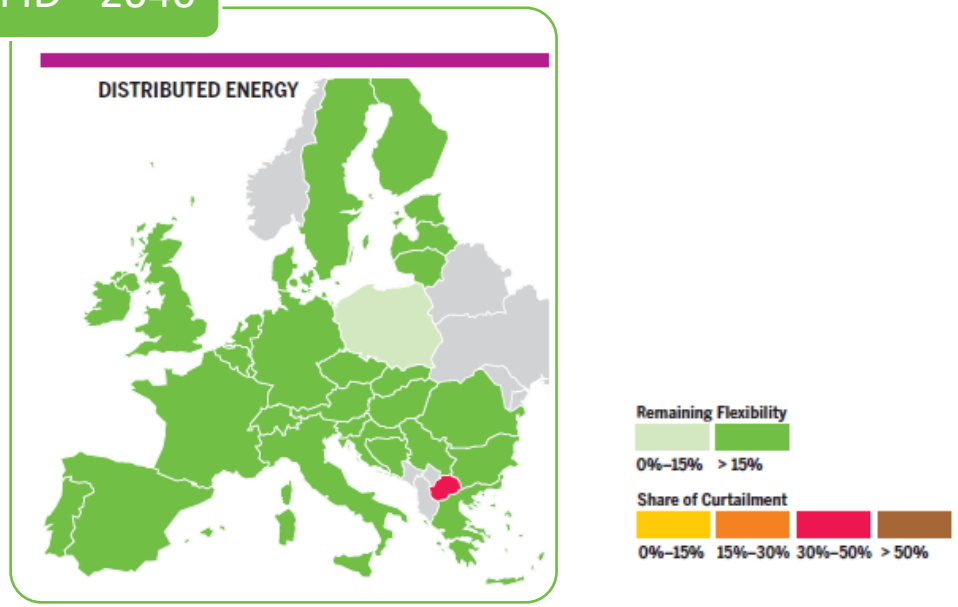


>50% decarbonised gas mix in 2040

2-week cold spell and Dunkelflaute



FID - 2040

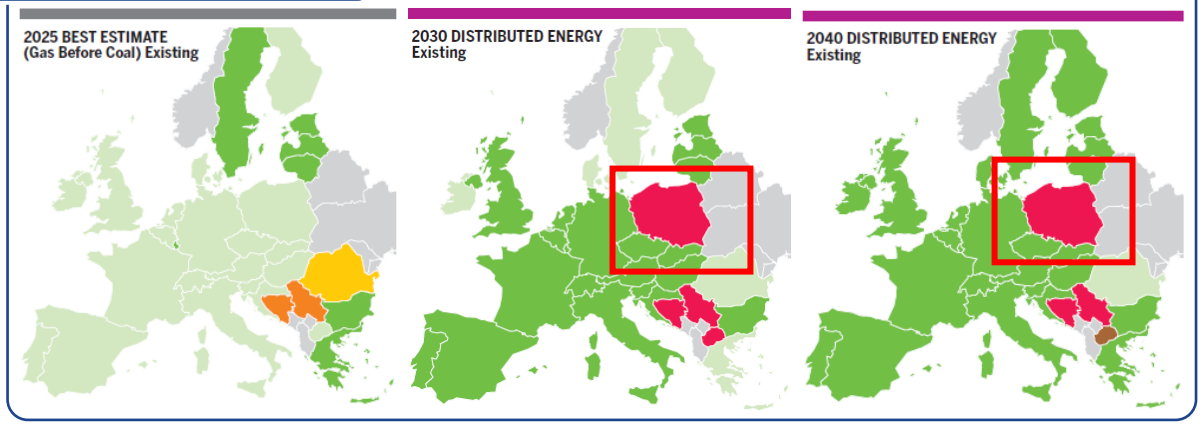


Existing infrastructure with FID projects can support the development of intermittent renewables while ensuring resilient backup with decarbonised gases

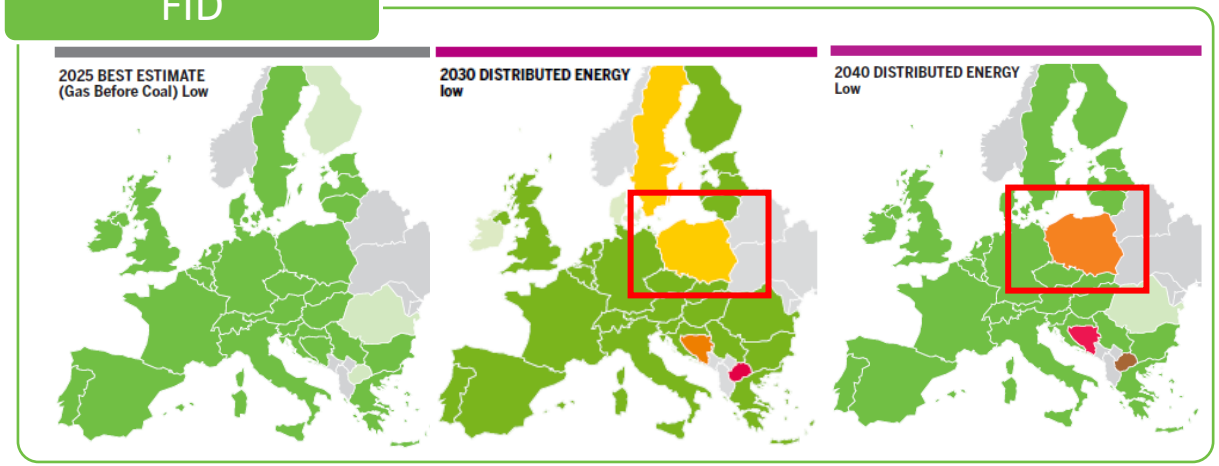
Security of Supply – Supply route disruptions

Ukraine route disruption Peak day

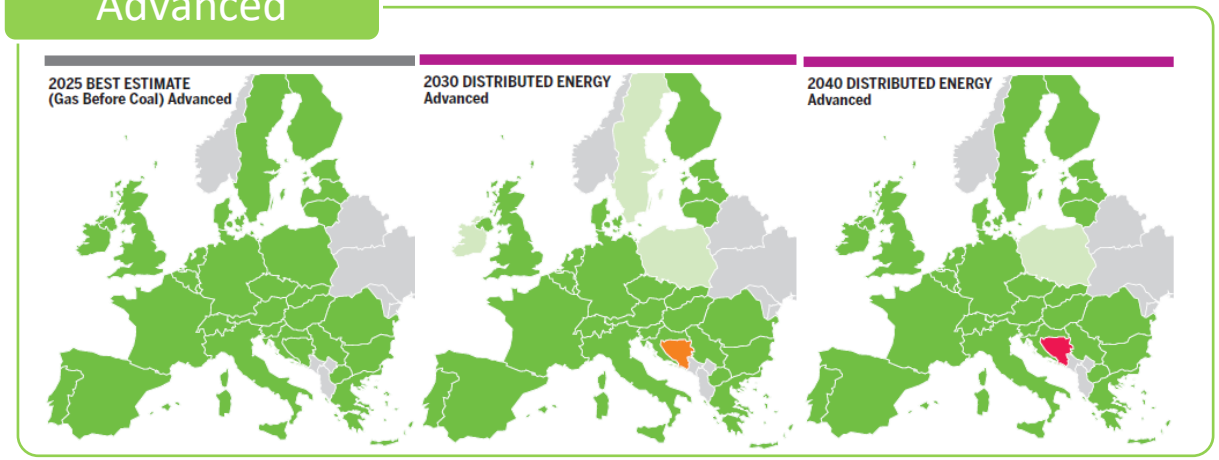
Existing



FID



Advanced



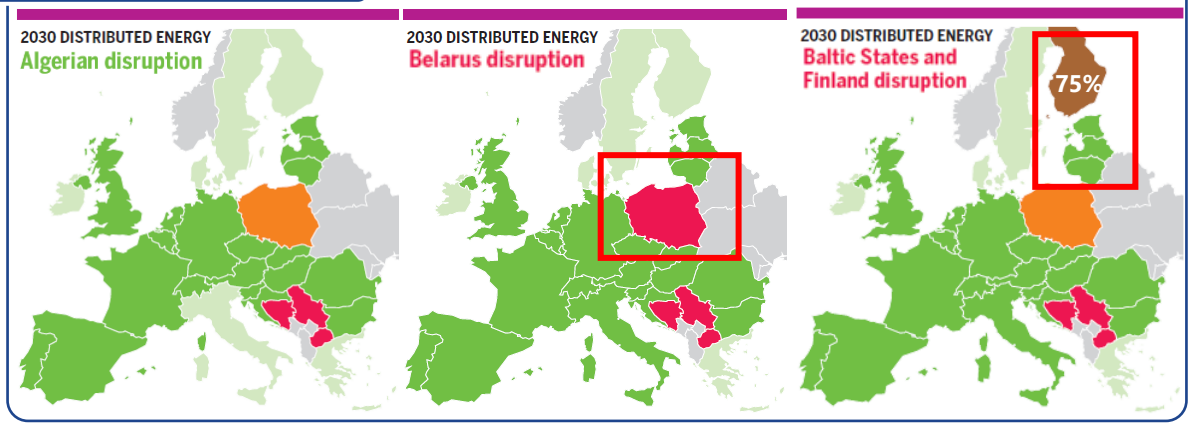
FID and Advanced projects can achieve the resilience of the gas system to future supply route disruptions by 2025

Countries further impacted by the supply route disruption compared to a peak day situation without disruption

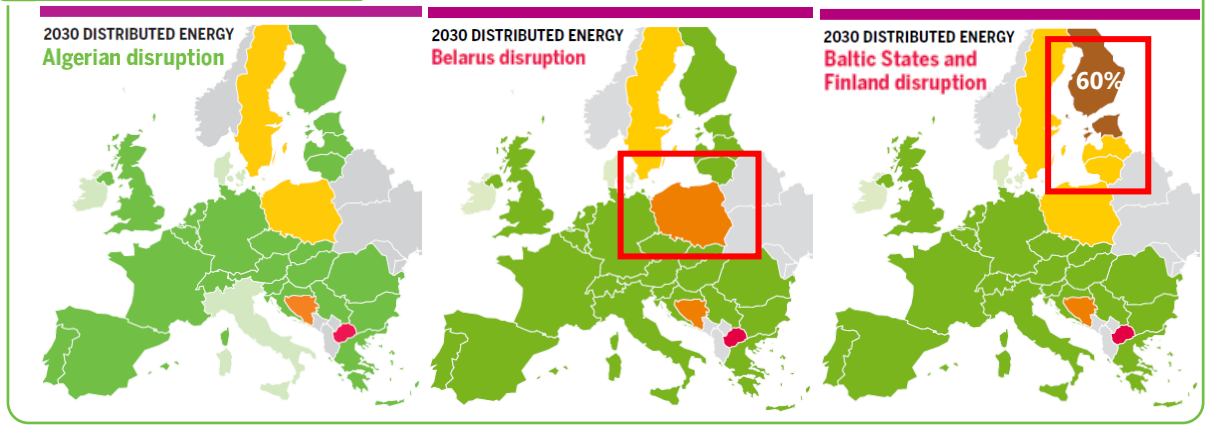
Security of Supply – Supply route disruptions

Supply route disruptions
Peak day

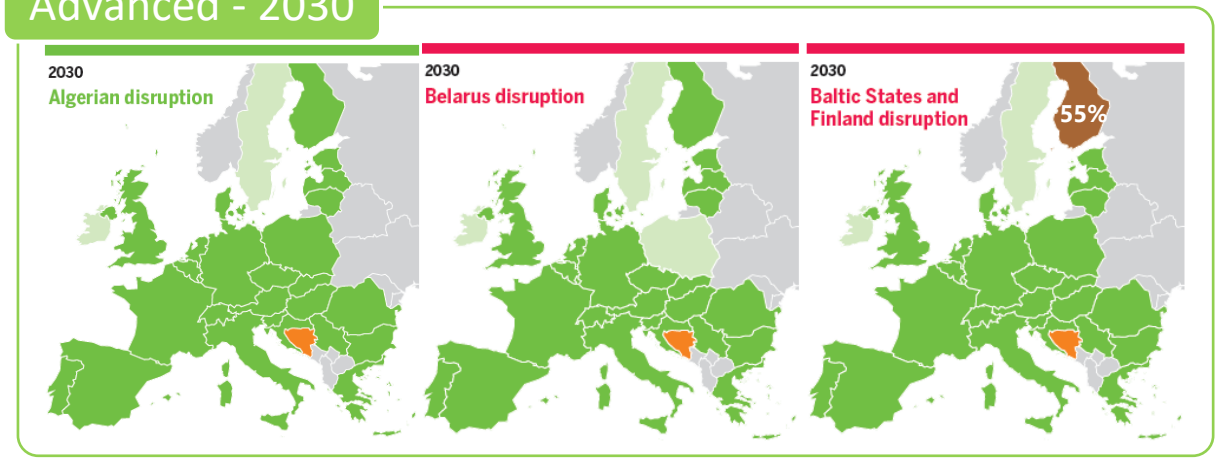
Existing - 2030



FID - 2030



Advanced - 2030

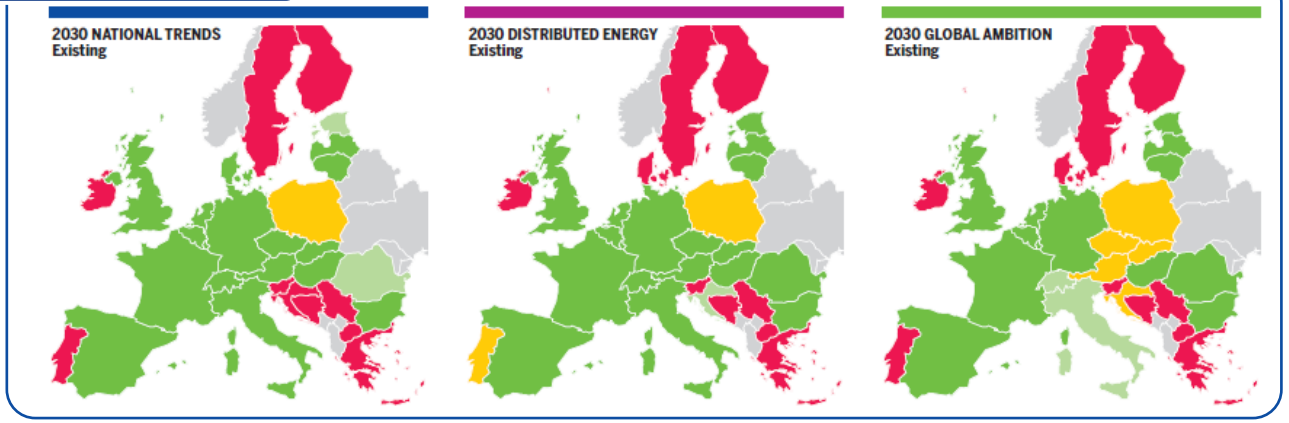


FID and Advanced projects can achieve the resilience of the gas system to future supply route disruptions by 2025

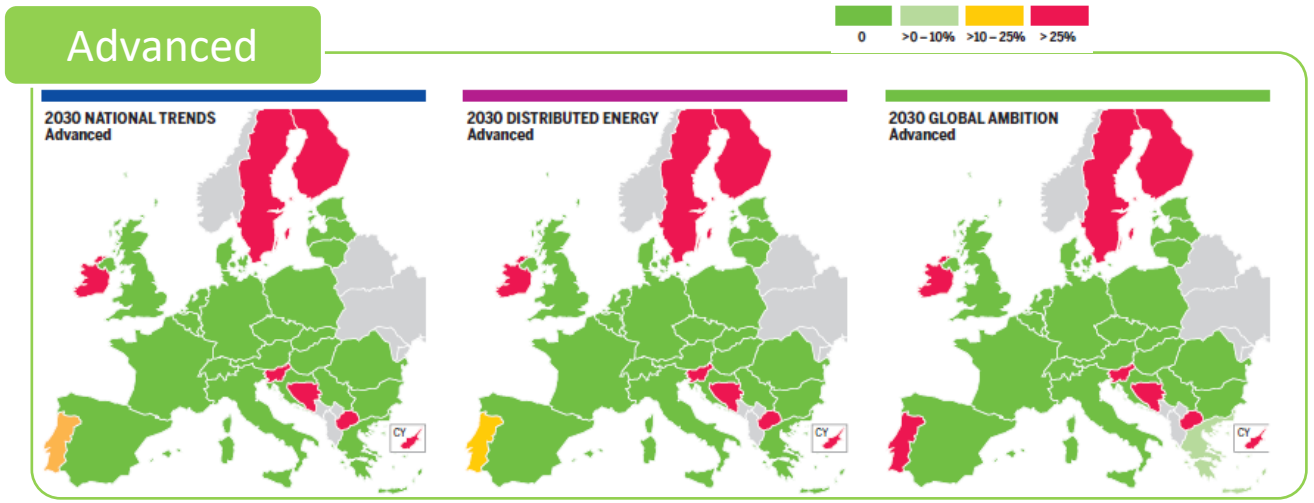
Countries further impacted by the supply route disruption compared to a peak day situation without disruption

Security of Supply – Single Largest infrastructure disruption

Existing



Advanced

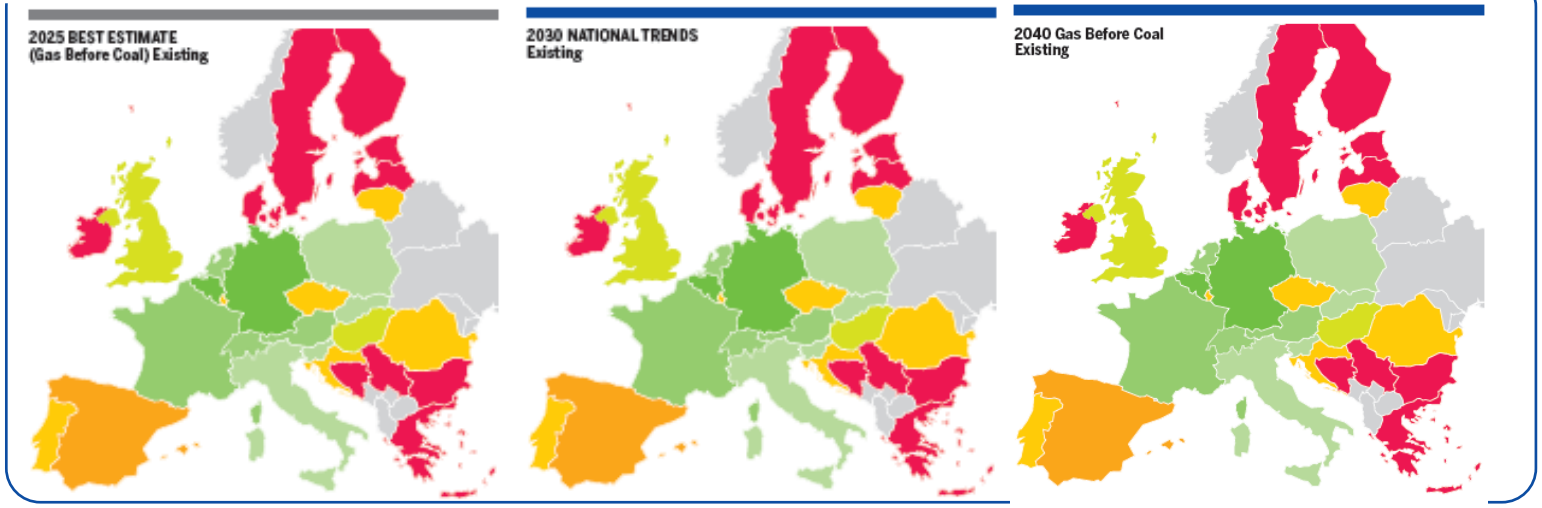


FID and Advanced projects improve significantly the situation
Results reflect the geographical specificities between countries with a central or peripheral location

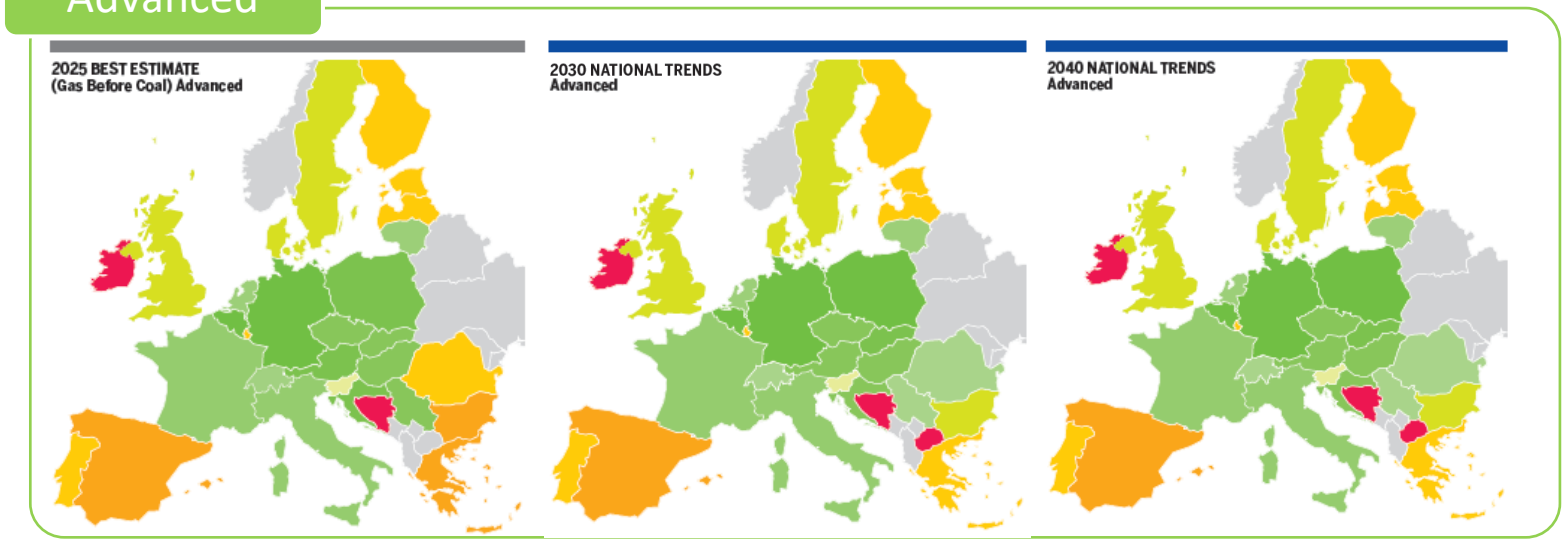
Market Integration & Competition

Competition – Market Integration

Existing



Advanced



LNG and Interconnection Capacity Diversification

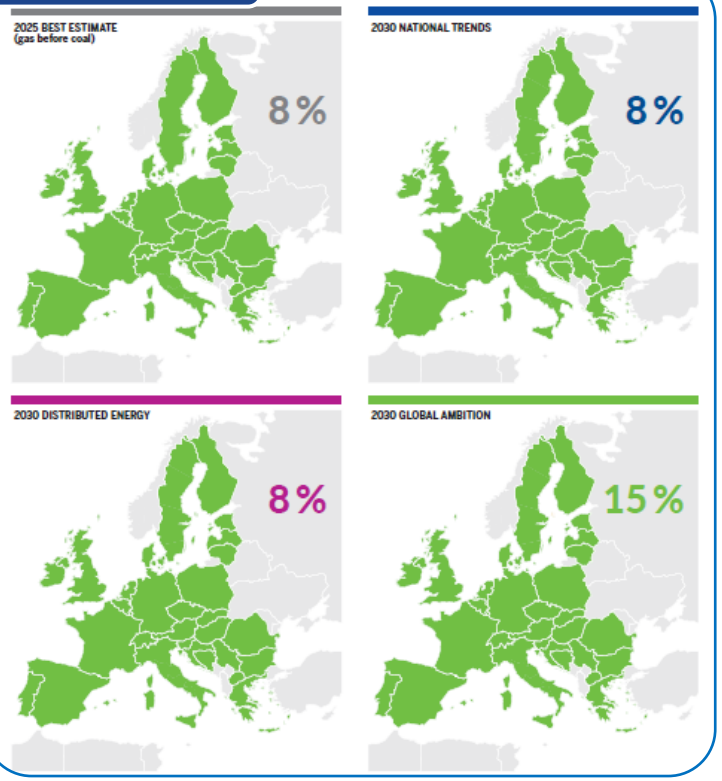
FID and Advanced projects improve significantly the situation
Results reflect the geographical specificities between countries with a central or peripheral location

Competition – Market Integration

Supply Dependence MASD indicator

Infrastructure limitation preventing from cooperation can be alleviated by FID and Advanced projects commissioned before 2025

Existing



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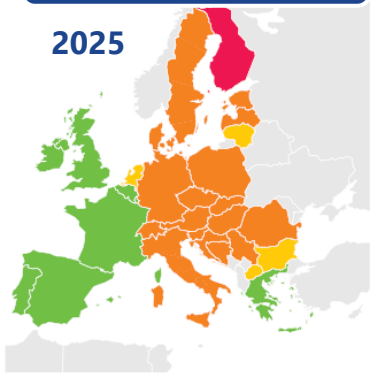

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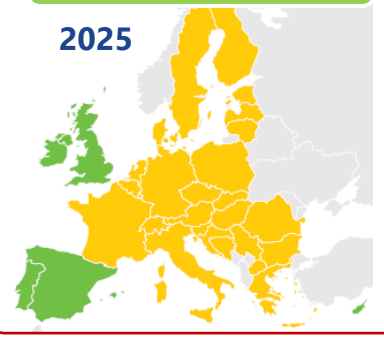
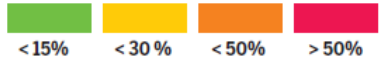
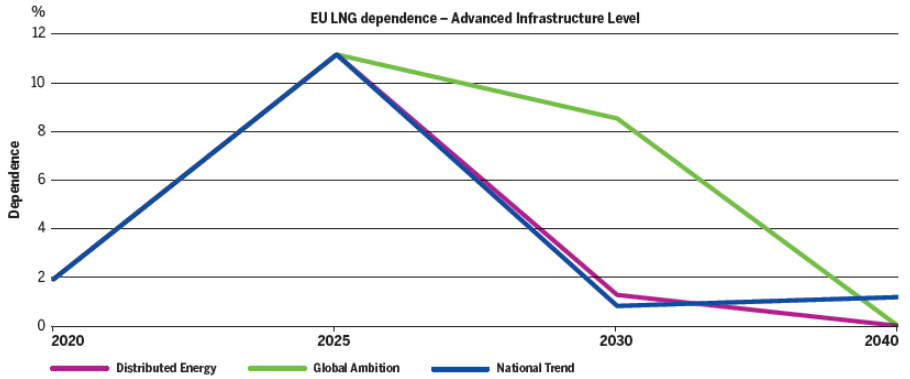
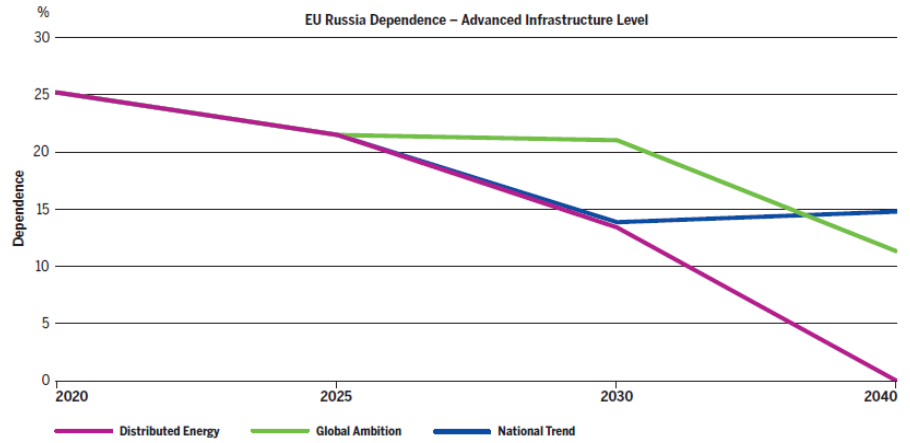




Dependence on LNG

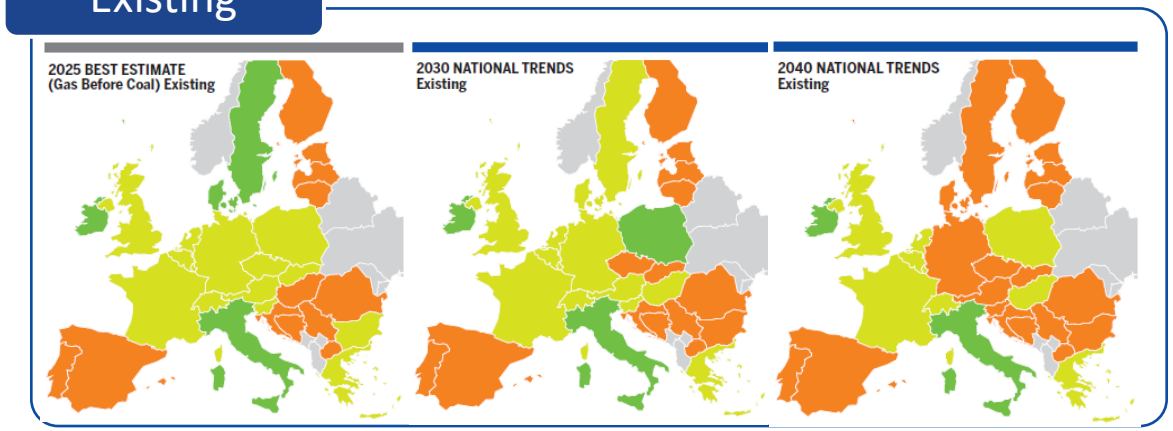
Dependence on Russia



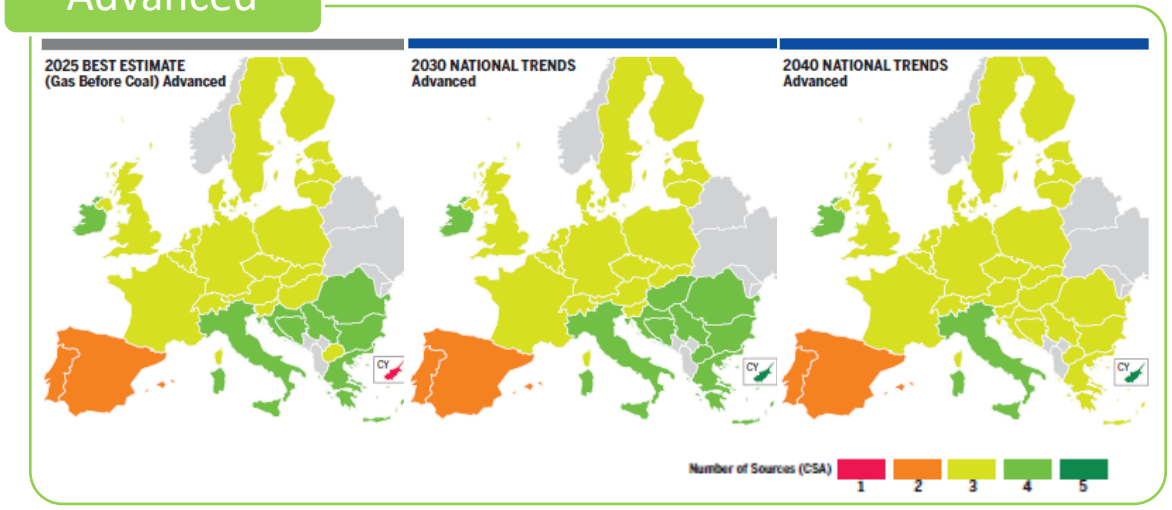


Competition – Market Integration

Existing



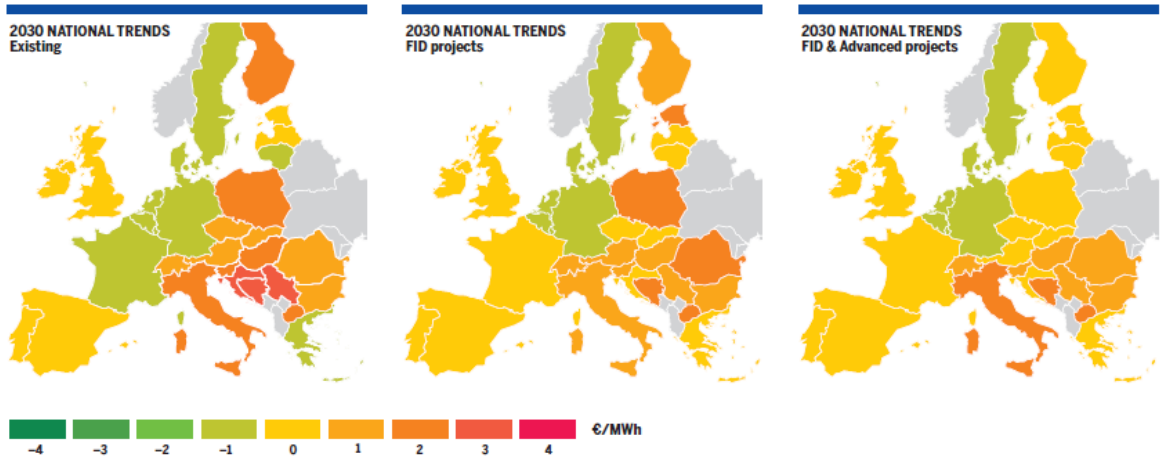
Advanced

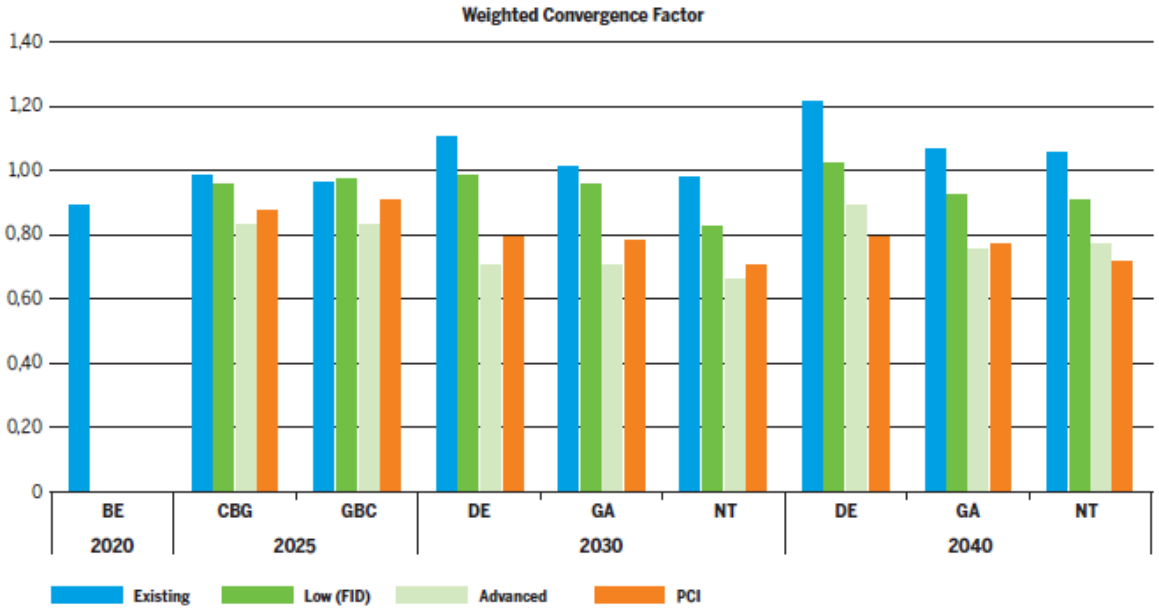


Commercial Supply Access CSA indicator

Most countries can access at least 3 different supply sources with FID and advanced projects commissioned by 2025

Competition – Market Integration





Marginal Price Convergence

Gas price convergence is generally efficient and depends on interconnection tariffs

Projects further improve price convergence

Conclusion

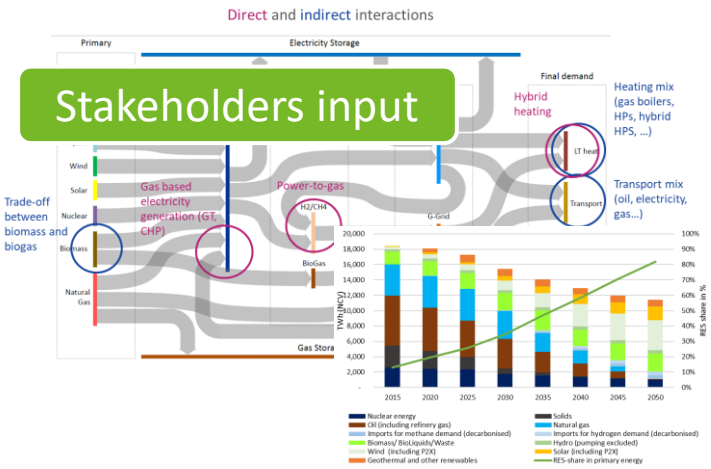
Interlinked Model by ENTSO-E and ENTSOG, a the fundament for infrastructure assessment

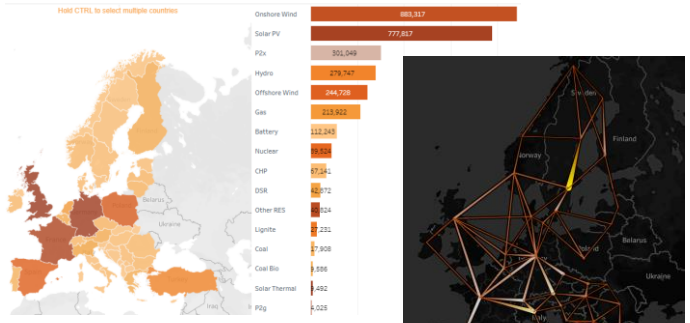
TYNDP scenarios for supply and demand

Comprehensive and consistent consideration of all sectors

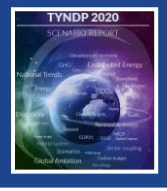
RES distribution to optimise the energy system and limit infra needs

Stakeholders input





Adapted time granularity (1h)



2 common modelling tools (Plexos + Ambition Tool)

TYNDP system needs and project assessment

Consistent assessment of infra needs and projects

e-Infra needs

g-Infra needs

Project e-CBA

Project g-CBA

Electricity & gas project dual CBA

ILM 2.0

1 common tool (Plexos)
2 fit-for-purpose TYNDPs
2 dedicated CBAs + 1 dual CBA

Conclusions – Scenarios

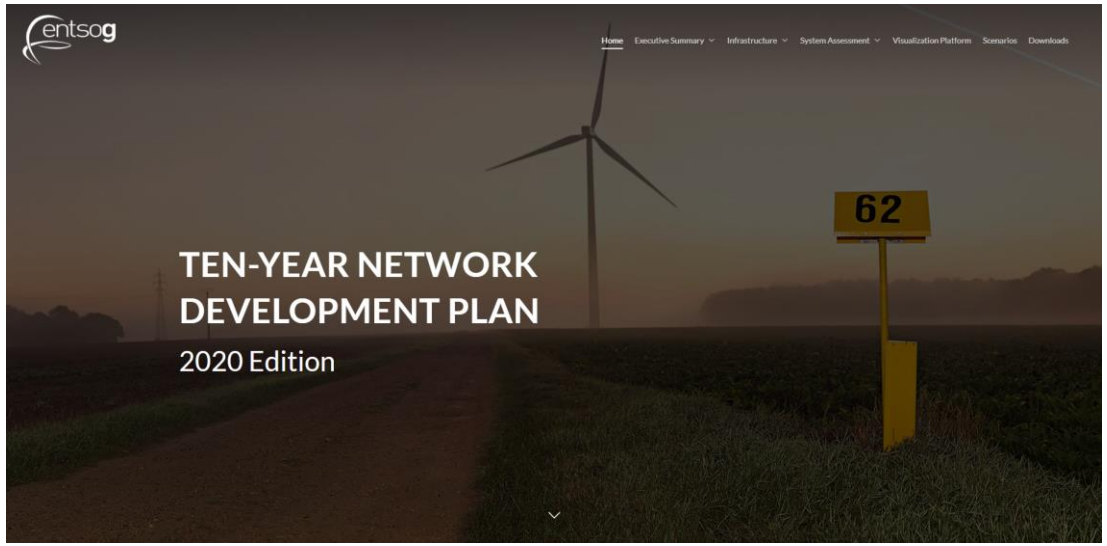
- Europe can reach net-zero 2050
- Quick wins are no regret options
- Depending on the energy transition at global level, the energy system may need to go carbon negative post-2050
- All technologies are needed to reach net-zero 2050
- Electricity and gas systems need one another to decarbonise and increase the flexibility of the European energy system

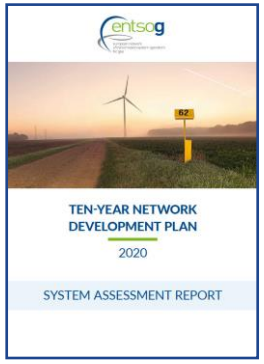
Conclusions - Infrastructure assessment

- Almost all infrastructure gaps can be addressed in the next 5 years by projects already initiated, including supply route disruptions
- Existing European infrastructure can support most of the fuel switch to gas and integrate renewable and decarbonised gases necessary to reach net-zero 2050. Remaining gaps are addressed by FID or advanced projects by 2025
- The gas infrastructure is resilient enough to support further development of intermittent renewables: it can integrate otherwise curtailed RES and offers sufficient back up for power generation
- ETR projects, including hydrogen projects, have significant potential to reduce GHG emissions in the EU

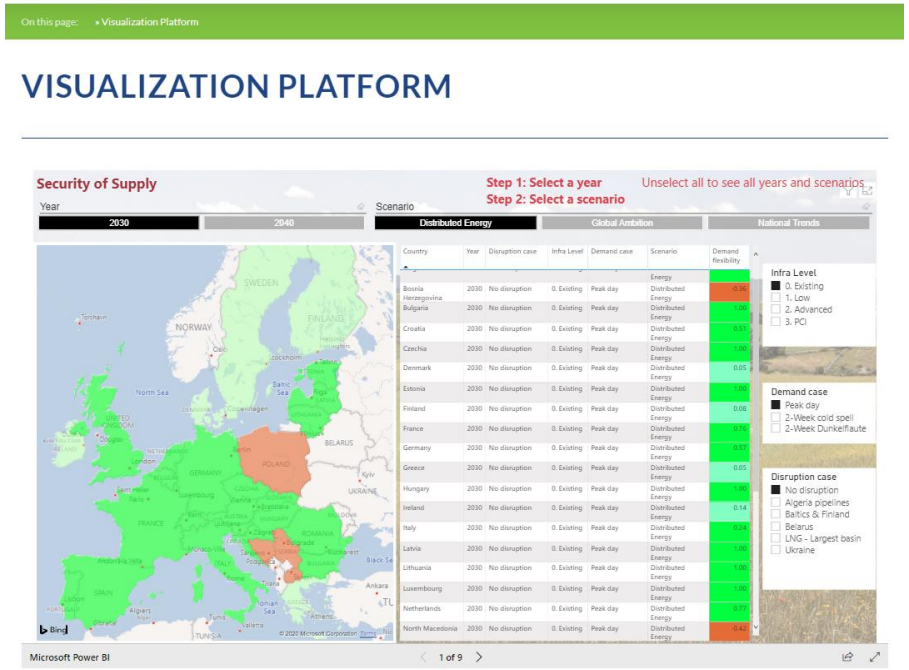
TYNDP 2020 publication

All information available at tyndp2020.entsog.eu





All results published on the visualization platform



Next steps

Next steps

- TYNDP 2020 Public consultation until 8 January 2021

https://www.entsog.eu/tyndp-2020-public-consultation-until-8-january-2021-and-presentation-day-16-december-2020

- Final TYNDP 2020 publication in March 2021

Thank you for your attention

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