TYNDP 2013 - 2022

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Methodology

The backbone of ENTSOG TYNDP

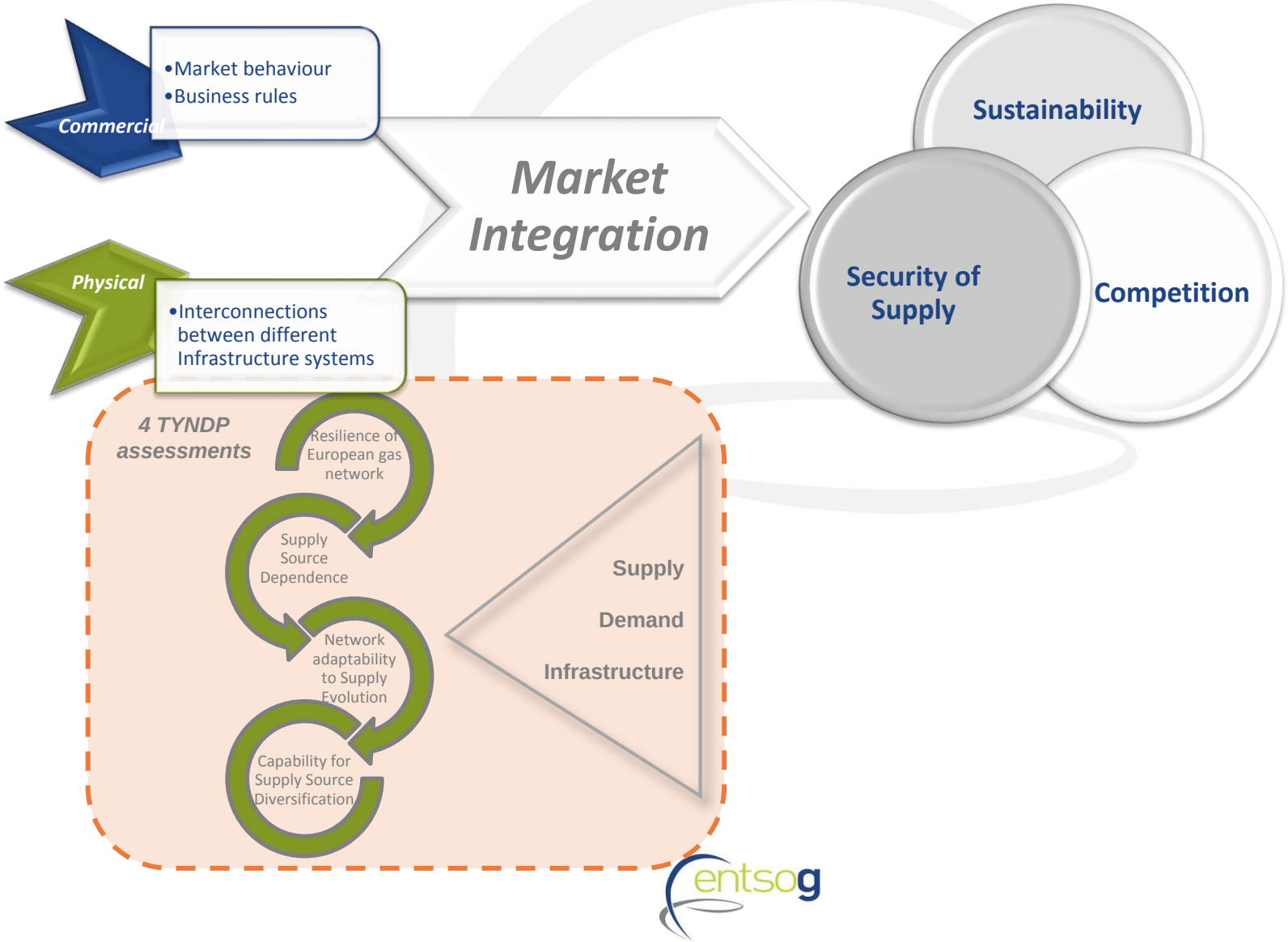
Methodology is the backbone of the TYNDP; it provides full transparency about the TYNDP's concept thus ensuring stakeholders' trust

- In order to face increasing expectations, TYNDP has developed in a complex report making crucial its good understanding
- The developed methodology derived from the concept defined with stakeholders during SJWSs

An updated structure describing the role of infrastructure

- The infrastructure component of Market Integration is defined as the role of the gas infrastructures in sustaining the pillars of the European energy policy, in particular Security of Supply and Competition
- Infrastructure-related Market Integration is defined as a physical situation of the interconnected network which, under optimum operation of the system, provides sufficient flexibility to accommodate variable flow patterns that result from varying market situations

Role of TYNDP in the assessment of the 3 pillars of the European Energy policy



Main elements

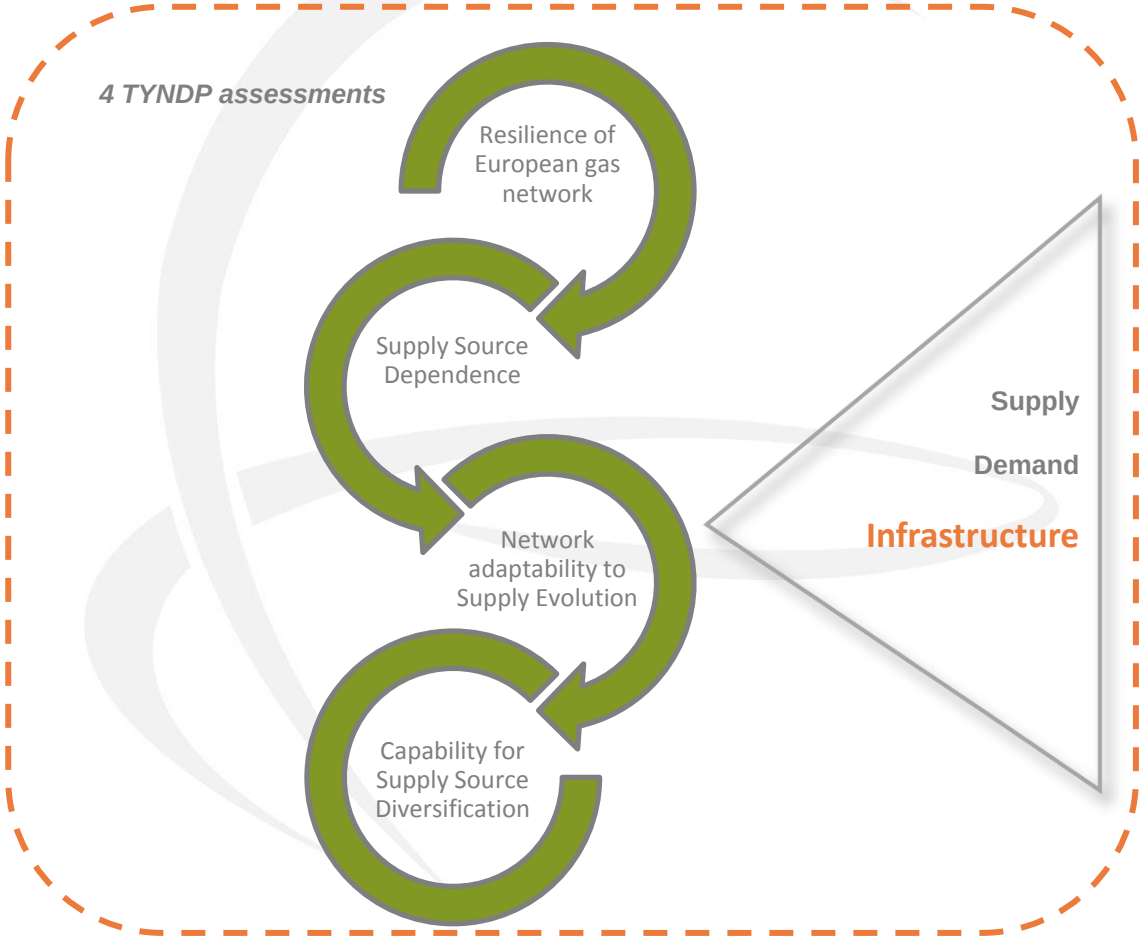
Description of the Network Modelling tool

- Topology of the network: nodes (e.g. E/E Zone) linked through arcs (e.g. cross-border capacity)
- Tool functioning: network flow programming applied on a linear modelling of the market
- Expected output per each case modelled (240+): identification of **a** flow pattern balancing each zone demand and facing all constraint set according the methodology

Infrastructure, demand and supply settings

- For each modelled situation, methodology describes:
  - The infrastructure cluster
  - The demand situation
  - The supply situation
  - The modelling approach
  - The investigated facet of infrastructure-related Market Integration
- The process which led to the definition of pilot indexes

Infrastructures



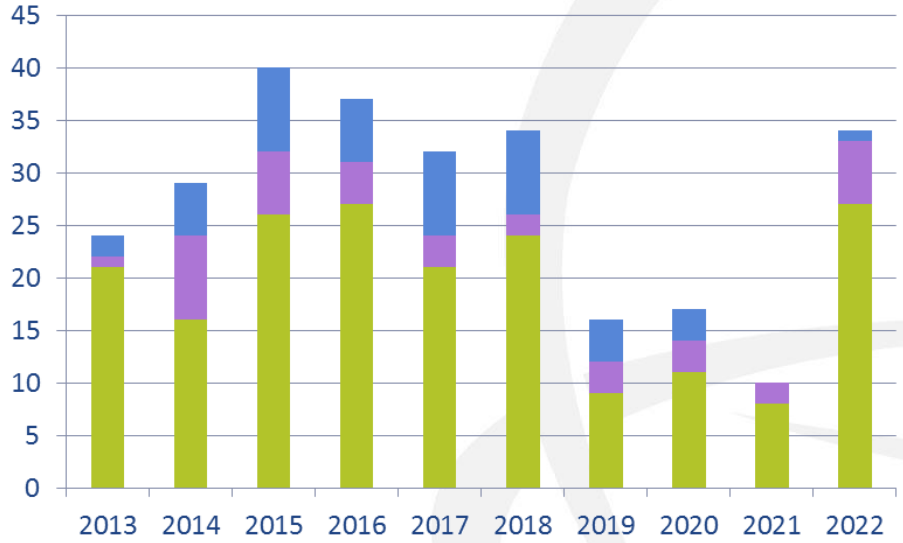
A reference document for infrastructure projects

ENTSOG TYNDP remains the most comprehensive project database

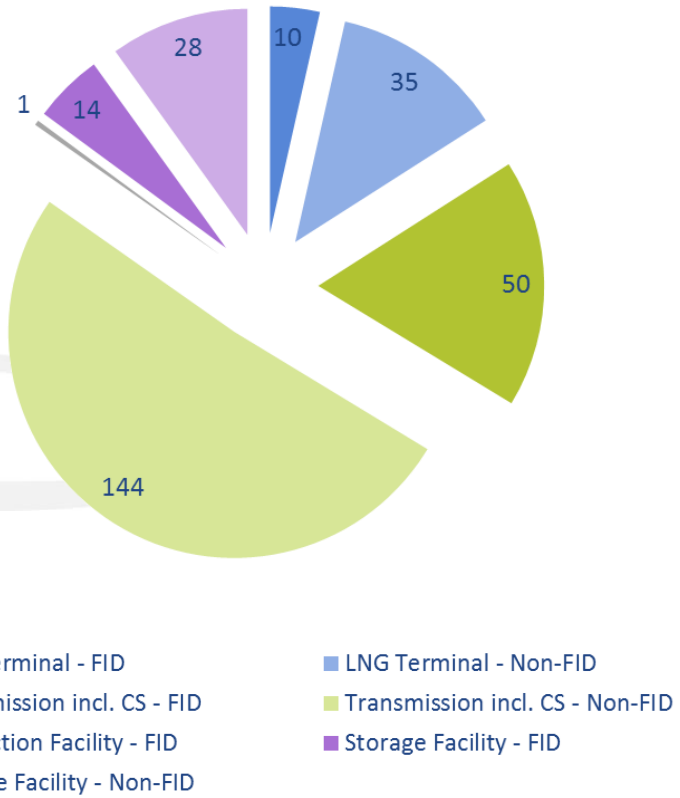
- Open to all types of gas infrastructure projects and promoters
- FID status remains the only clustering criterion (status as of 15 Sep 2012)
- Annex A provides detailed information on each project
  - Promoter/operators
  - Capacity increment
  - Time schedule
  - Promoter's assessment of the importance of the project
- Annex provides advanced querying/filtering features
- Due to the new PCI framework, TYNDP includes projects which
  - could be considered as not sufficiently mature for the purpose of the report
  - which do not have a counter project on the other side of the 'system'; these projects are modelled assuming that such counter projects will be realized in the future; all such projects are accompanied by an appropriate remark

Infrastructure projects

Projects by commissioning date



Projects by FID status



Infrastructure clusters

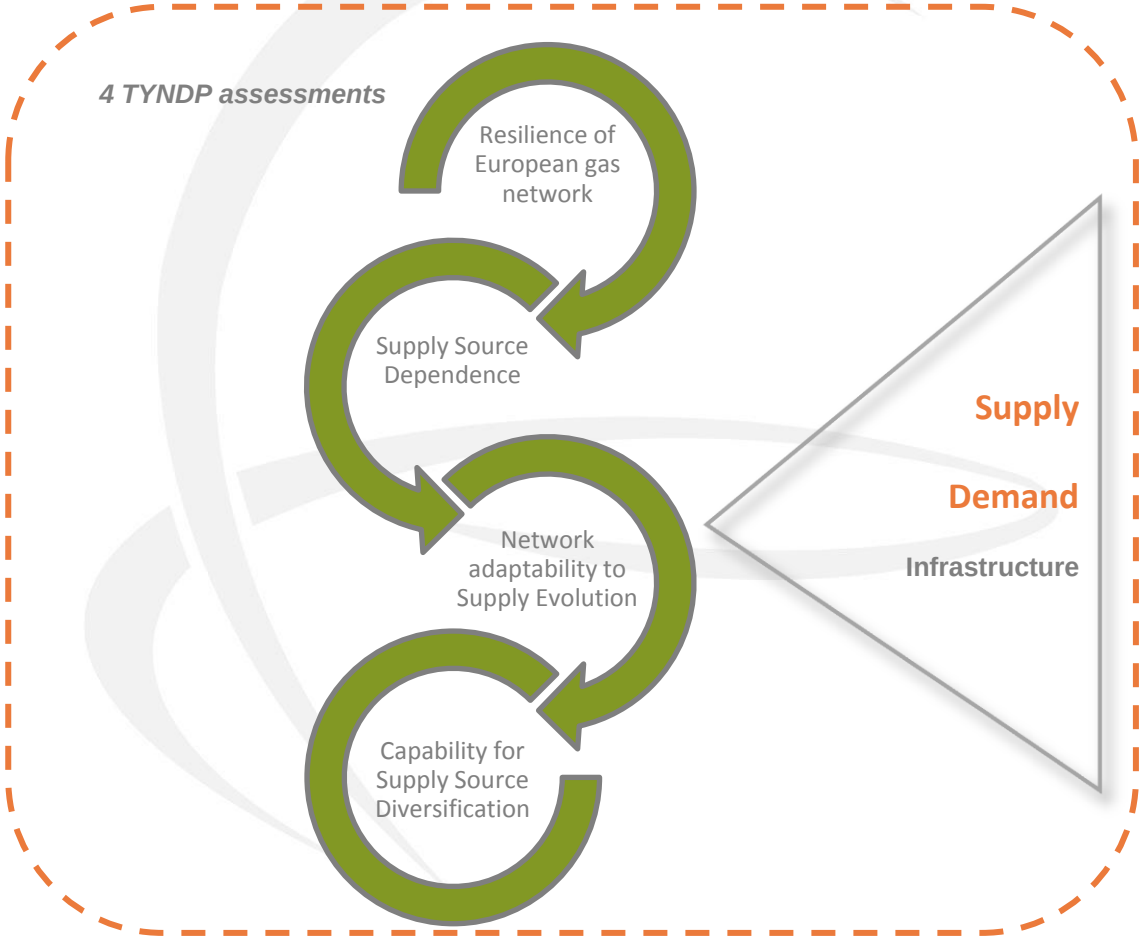
The infrastructure clusters

- The Final Investment Decision (FID) remains the only transparent and non-discriminatory criteria for clustering
- Difficulty faced by project promoters to define the steps of their project and their order clearly supports this choice
- The 2 considered infrastructure clusters:
  - FID: existing infrastructures + FID projects
  - Non-FID: existing infrastructures + FID projects + Non-FID projects

Demand and supply may depend on infrastructure projects

- Some demand and national production figures will only be part of the assessment under Non-FID cluster (e.g. Malta and Cyprus)
- Commissioning of LNG terminals will impact the level of the Minimum and Intermediate LNG Potential scenarios leading to one scenario per infrastructure cluster

Supply & Demand



Demand scenarios

Enhanced analysis

> Underlying assumptions

> Demand disaggregation: DOM & COM & IND vs. Power generation

One single (ENTSOG) demand scenario for modelling

> Following situations covered

- Yearly demand (Average daily demand)
- High daily demand
  - 1-day Design Conditions -- strictly bottom-up (national plans)
  - 1-day Uniform Risk
  - 14-day Uniform Risk

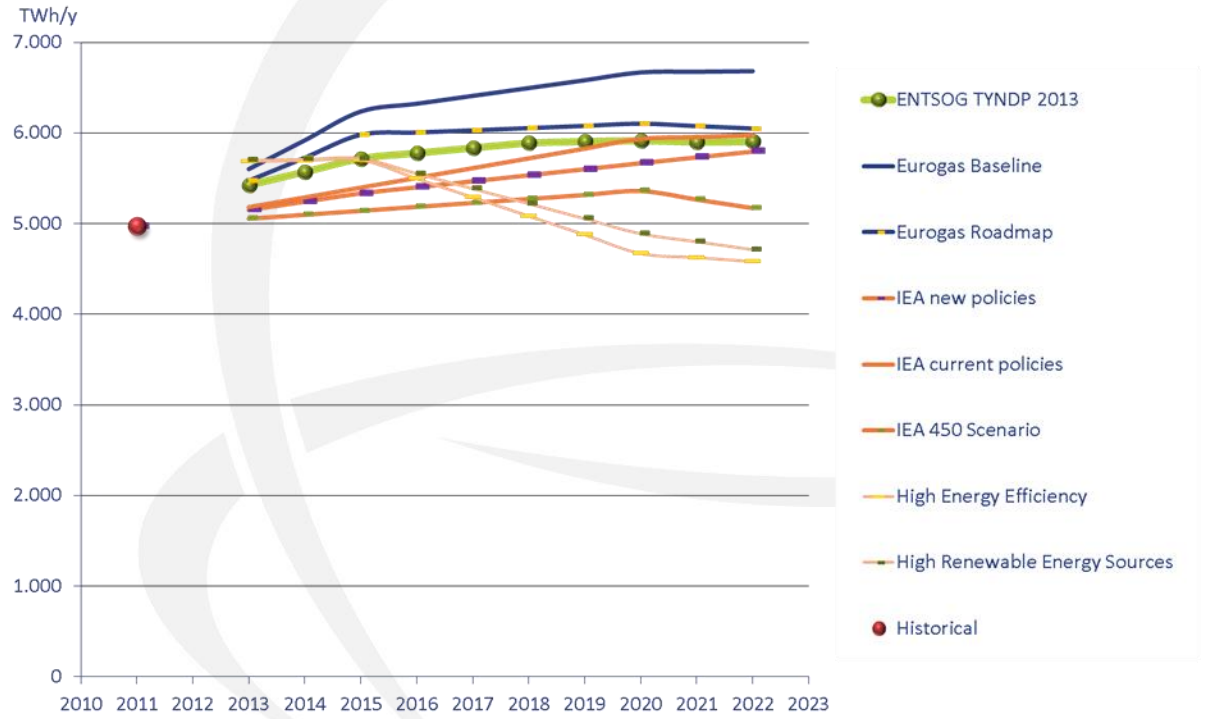
Cooperation with ENTSO-E

> Comparison of the scenarios in Electricity and Gas TYNDPs – gas in the electricity mix

> Ongoing cooperation

Comparison of demand scenarios

Comparison with demand scenarios from other institutions possible only at the European level and on yearly basis due to the data available



The ENTSOG scenario is towards the middle part of the range. Significant differences appear between scenarios driven by environmental targets (Eurogas Roadmap, IEA 450 Scenario, Roadmap 2050) towards the end of the period. The Eurogas Roadmap shows a demand scenario that achieves the environmental targets while also converging with ENTSOG's scenario for the last years of the horizon.

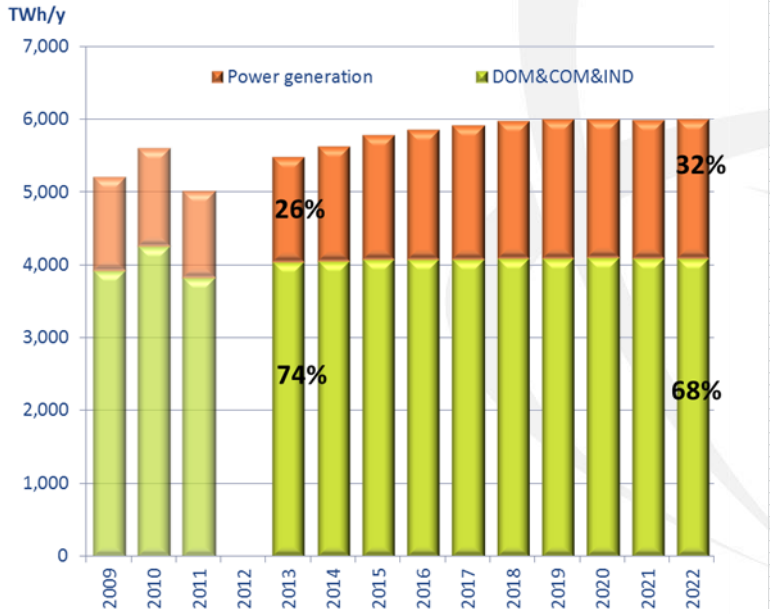
Average demand situation

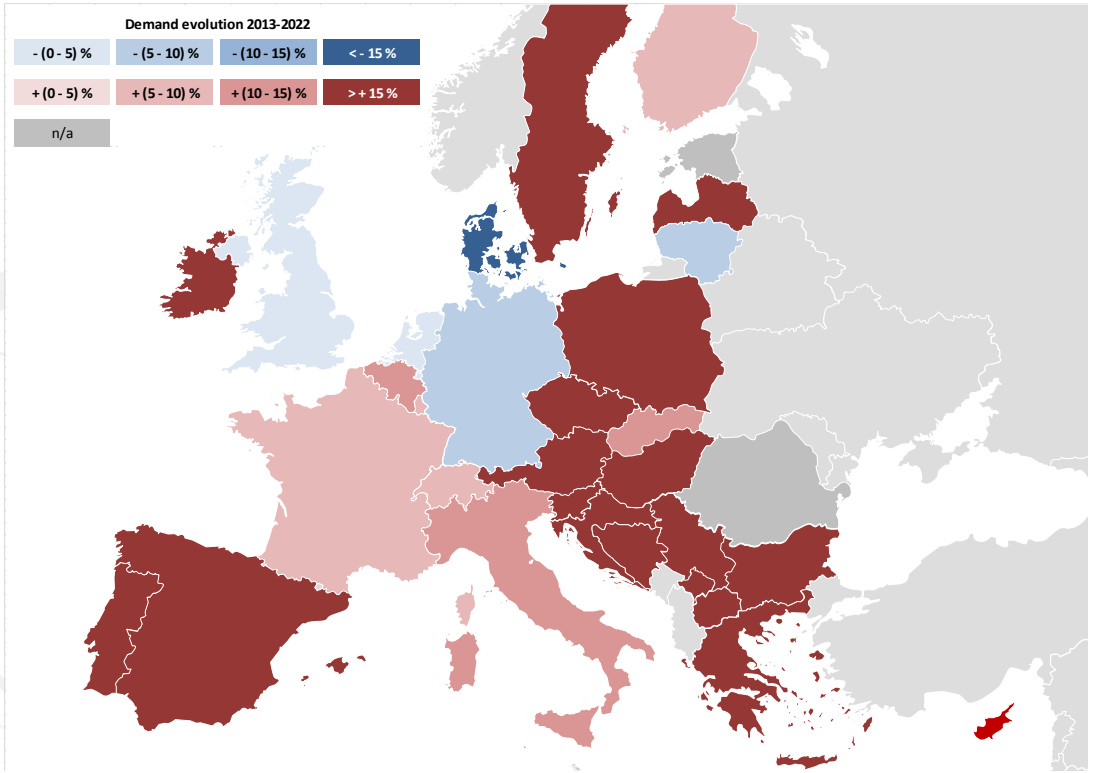
Yearly demand

> Average yearly growth 1% - coming from power generation sector

> Total growth (2013-2022): 9%

- Power generation: +33%
- DOM&COM&IND: +1%

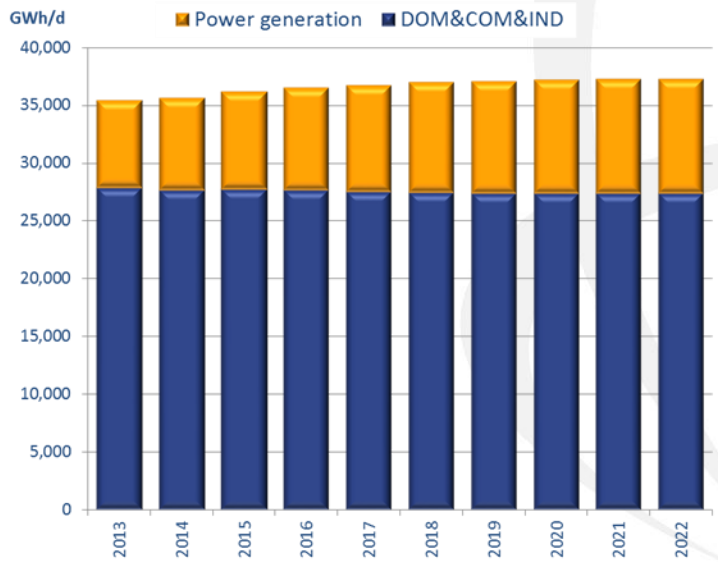


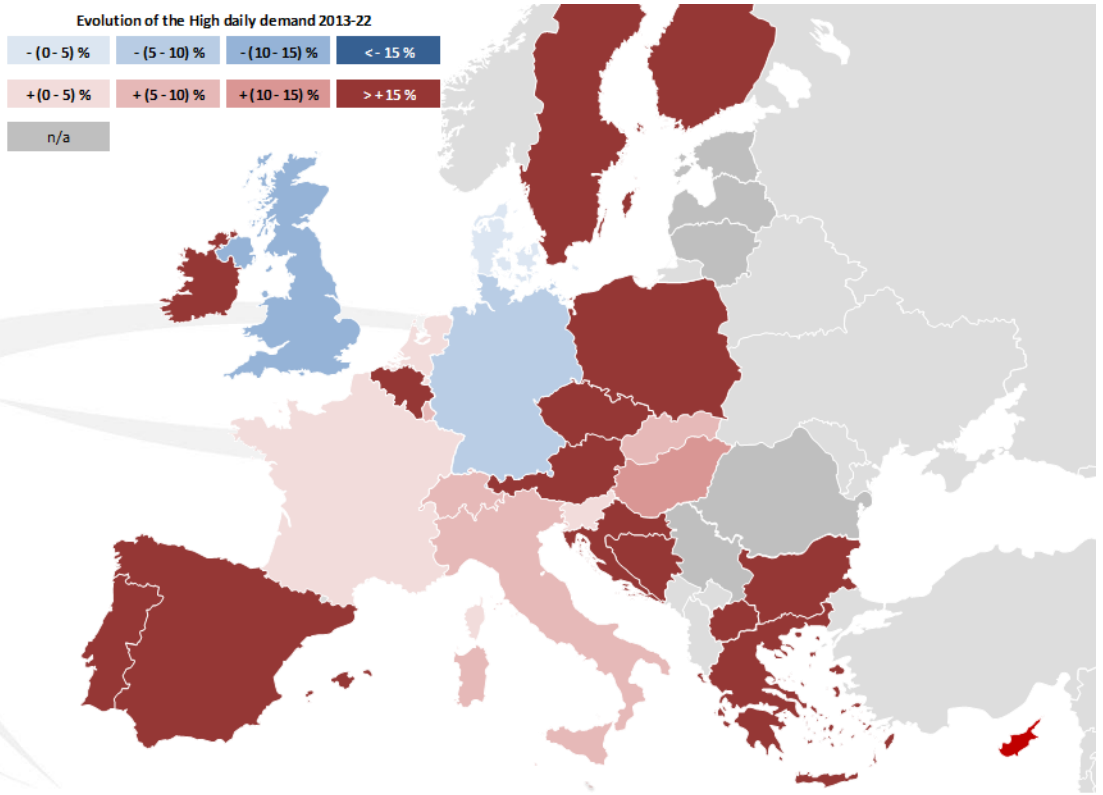


High daily demand situations

Design Case

> Total growth (2013-2022): 5%
  - Power generation: +31%
  - DOM&COM&IND: -2%





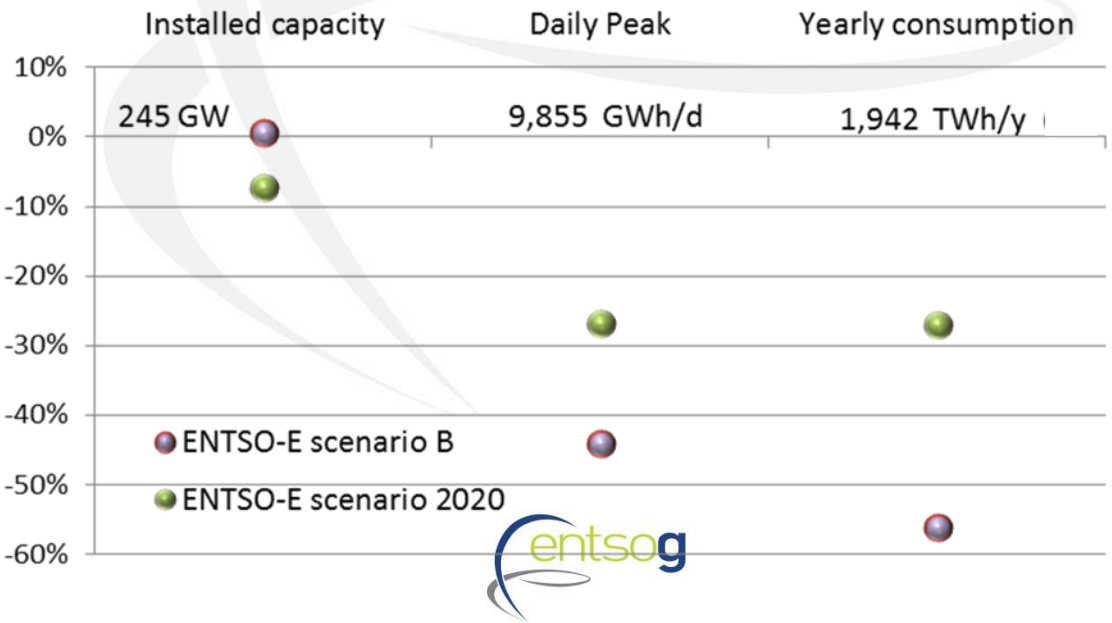
Power generation

Cooperation with ENTSO-E

> Comparison of the TYNDP scenarios between ENTSOG and ENTSO-E
  - ENTSO-E Scenario 20-20 (top-down, based on the European 20-20-20 objectives and the NREAPs)
  - ENTSO-E Scenario B (bottom-up , extrapolates information from market players' present investments perspectives)

> Consistency in the installed capacities, significant differences in the demand scenarios

Relative dispersion of ENTSO-E scenarios from ENTSOG scenario



Supply scenarios

Development of supply scenarios

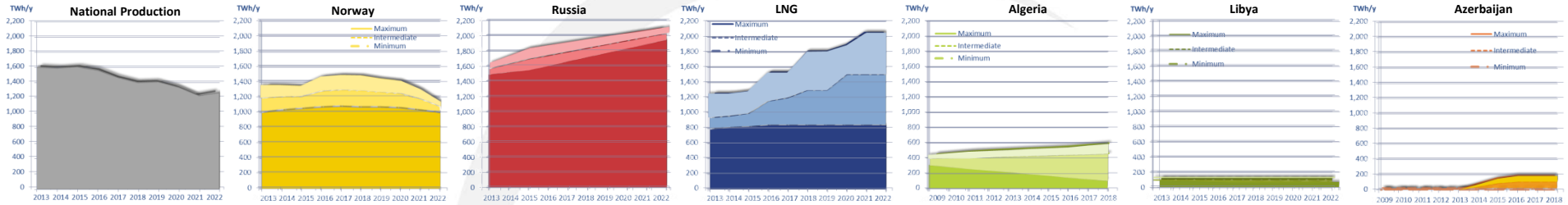
- The uncertainty in the future supply mix has been addressed through a multi-scenario approach

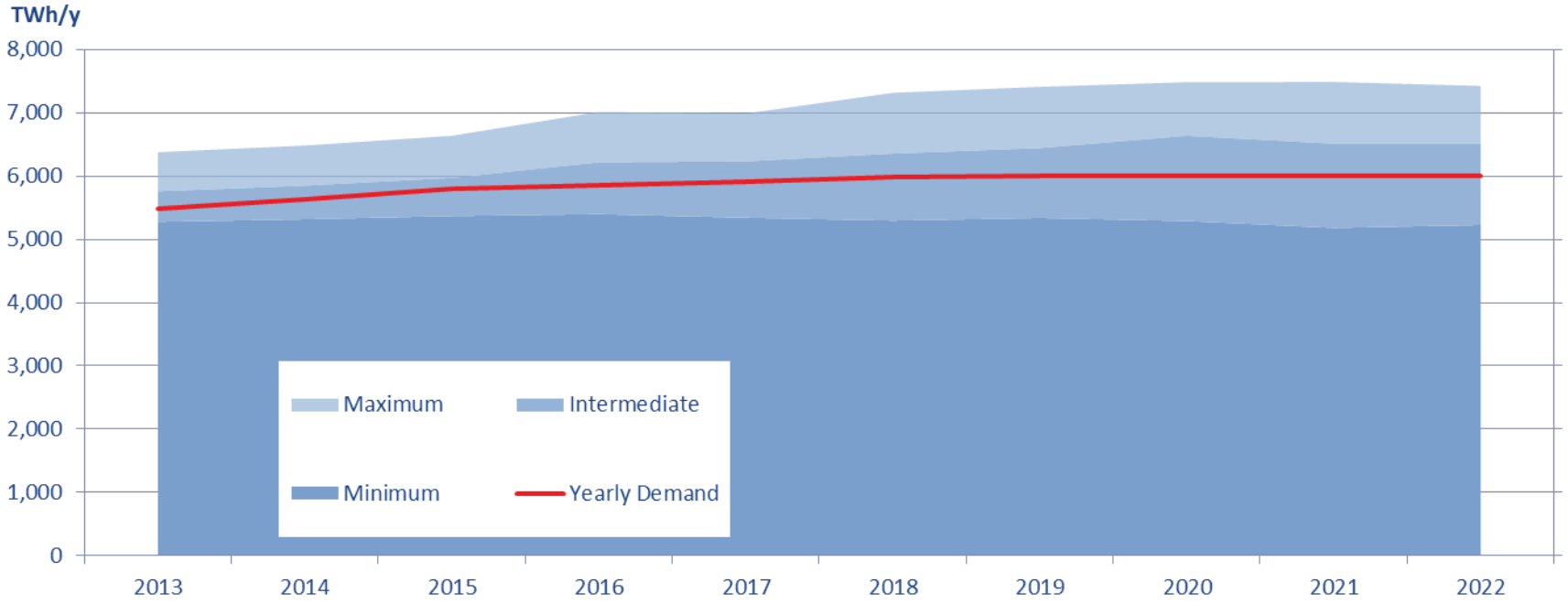
- A robust range of supply scenarios has been defined for each of the import sources by the combination of:
  - Minimum potential supply
  - Intermediate potential supply
  - Maximum potential supply

- These ranges have been carefully defined on the basis of public information targeting reasonable extremes

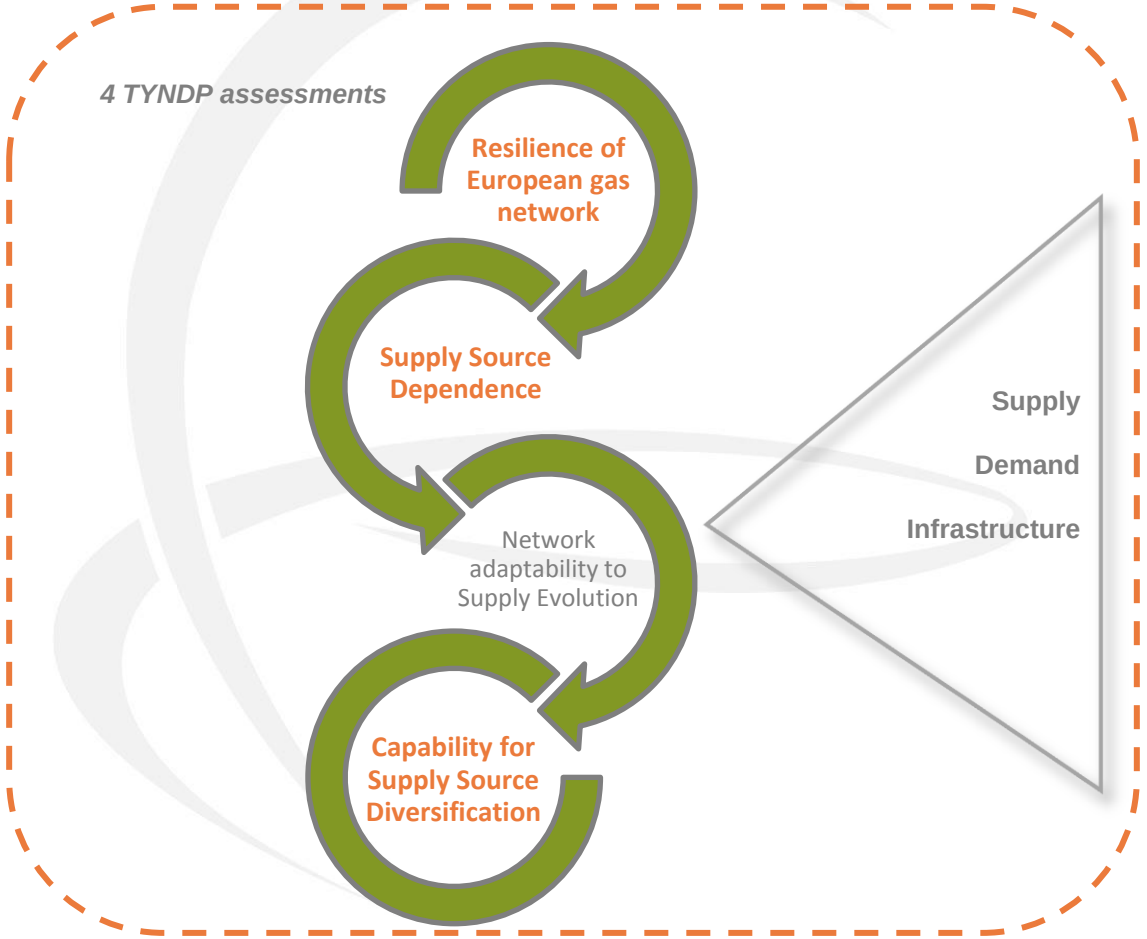
Supply Adequacy Outlook

Supply potential scenarios



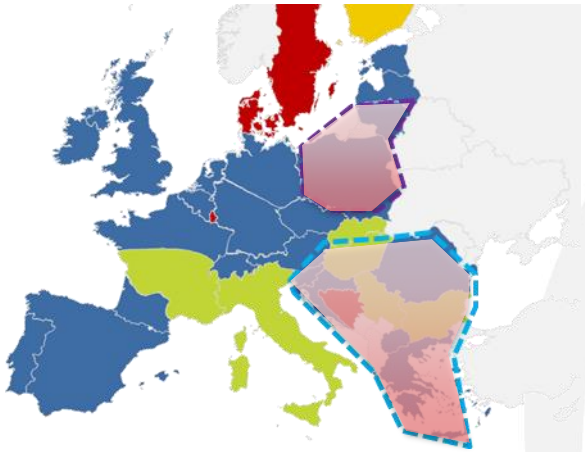


Assessment Results

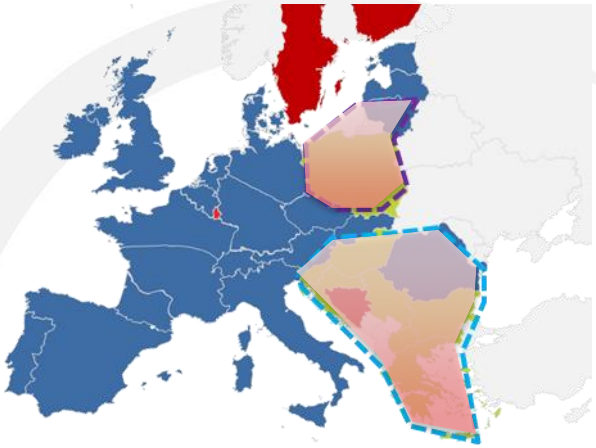


Infrastructure resilience - Results

2013



2017 FID



2022 FID

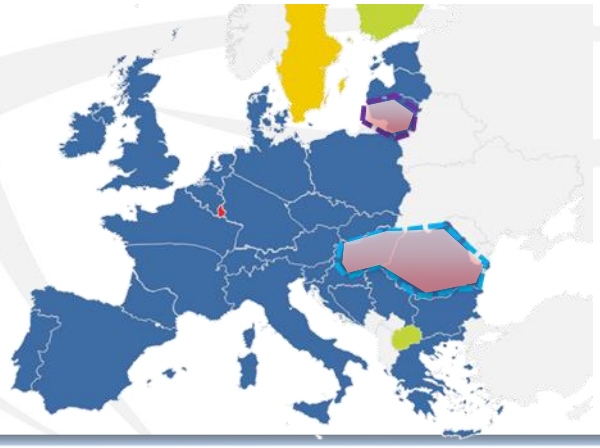
Remaining Flexibility under Reference Case – Design situation

< 1%	1 - 5%	5 - 20%	> 20%

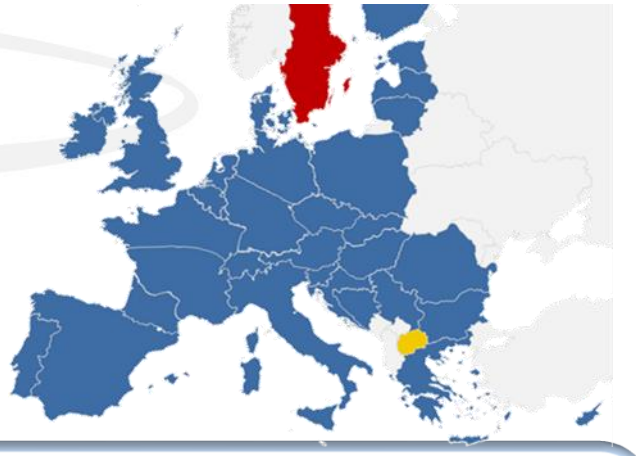
Areas lacking of Remaining Flexibility

- Under disruption of Belarus transit
- Under disruption of Ukraine transit

2017 Non-FID



2022 Non-FID



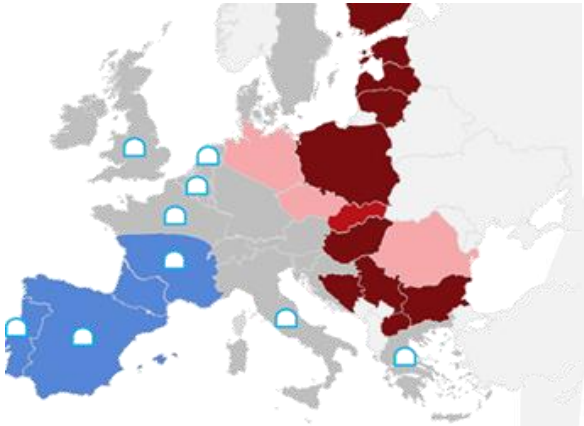
Gaps have been identified under Reference Case (BH, DK, FI, LU, MK & SE), Belarus disruption (+PL& LT) and Ukraine disruption (+BG, GR, HR, HU, RO, RS & SI)

Results are consistent with TYNDP 2011-2020

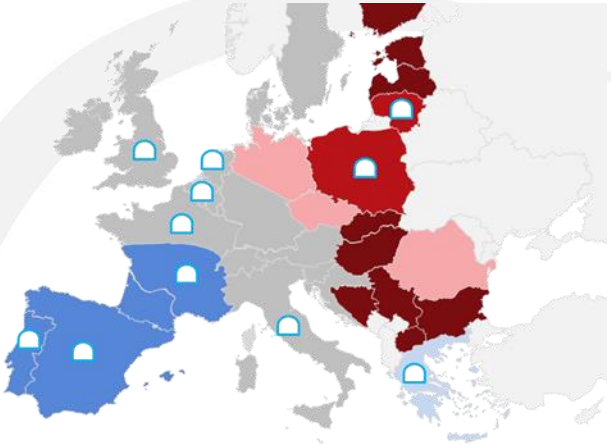
14-day Uniform Risk situation identified additional gaps in Poland.

Supply Source Dependence - Results

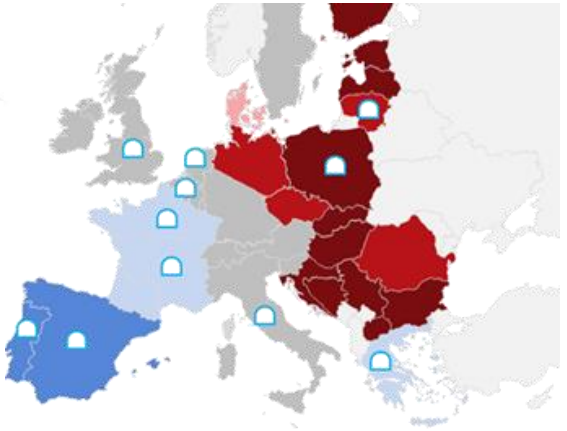
2013



2017 FID



2022 FID

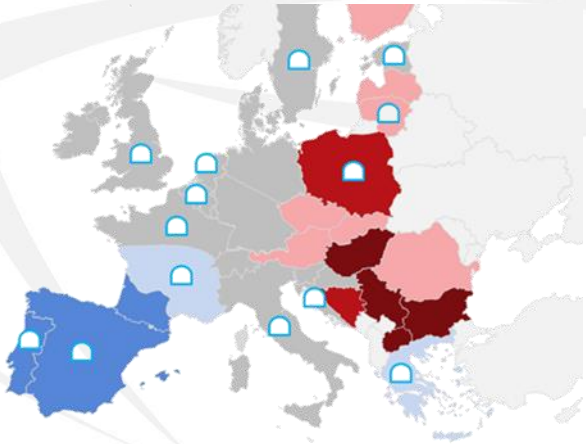


Minimum share in total supply

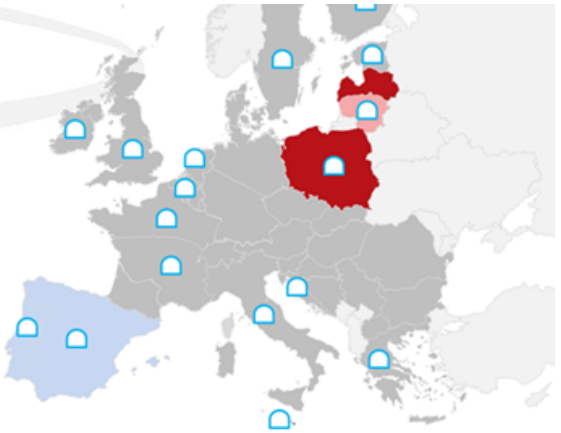
	LNG	RU
< 20%		
20-40%		
40-60%		
>60%		

Zone connected to a LNG terminal

2017 Non-FID



2022 Non-FID



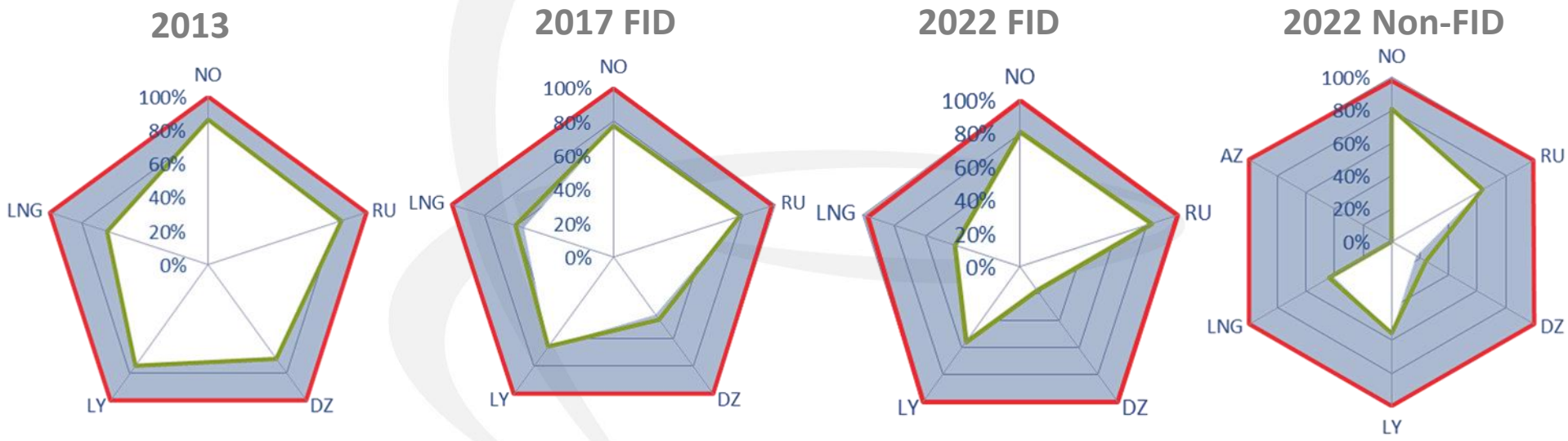
Strong dependence has been identified only to Russian gas and LNG

Whereas the dependence on LNG stays relatively low, the evolution of dependence on Russian gas is strongly linked to the implementation of Non-FID projects

Adaptability to Supply Evolution - Results

Results

- The **blue area** represents the range between the Minimum and Maximum Potential Supply scenarios
- The **red** and **green** lines represent the highest and lowest levels reached through Even Maximization and Minimization modelling



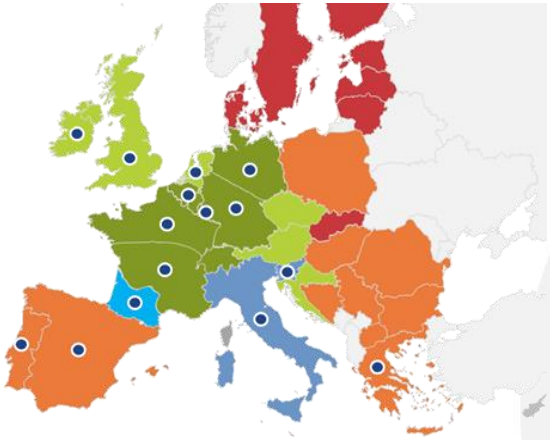
Potential for change in supply mix will increase with time

European system can easily face such changes in supply mix, still Russian gas cannot drop too low as RO and HU are strongly dependent on it

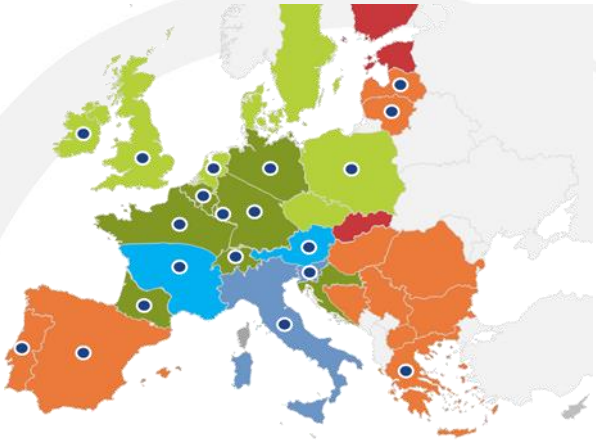
The same goes for Algerian gas for the Iberian Peninsula and LNG for the Iberian Peninsula and South of France

Supply Source Diversification - Results

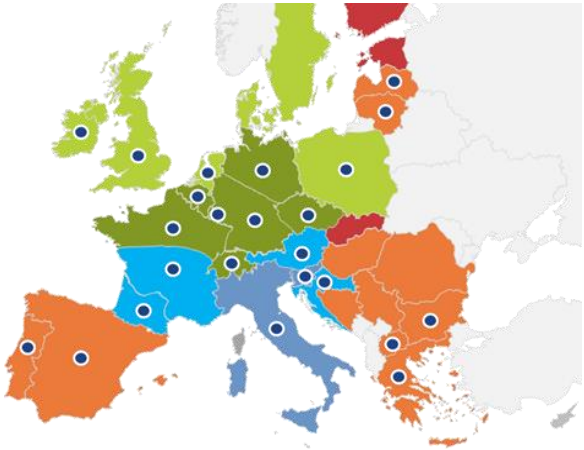
2013



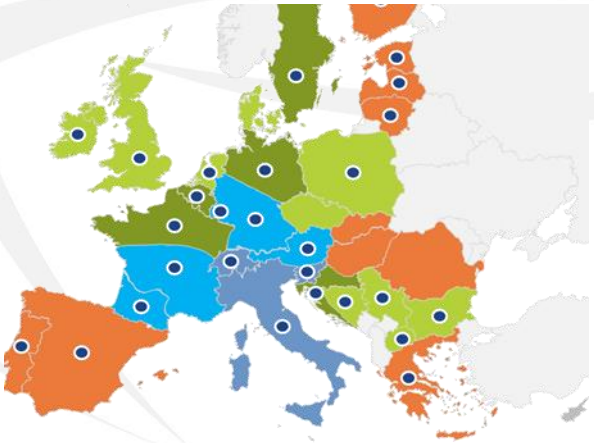
2017 FID



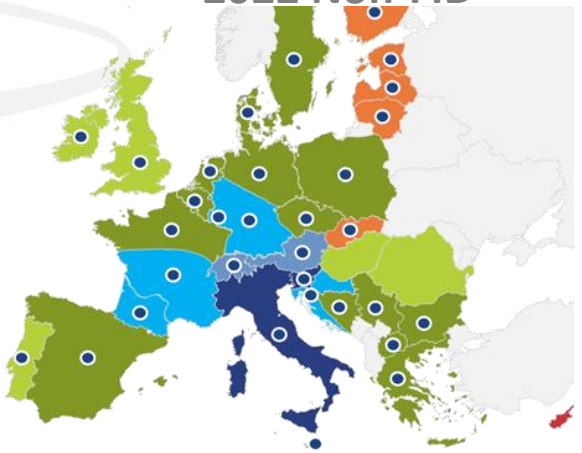
2022 FID



2017 Non-FID



2022 Non-FID



1
2
3
4
5
6
7

Number of accessible sources with at least a 5% share (simultaneity not considered)

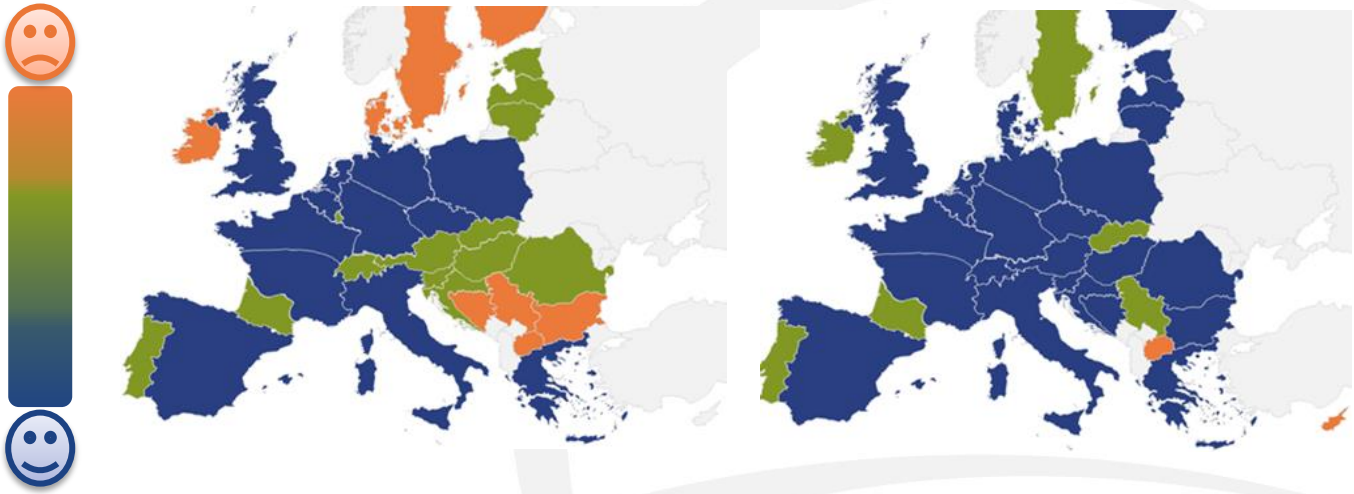
Including access to LNG

Diversification will improve but the extent will depend on the commissioning of Non-FID projects especially in South-East Europe

Results would differ if concerning the 20% targeted supply share

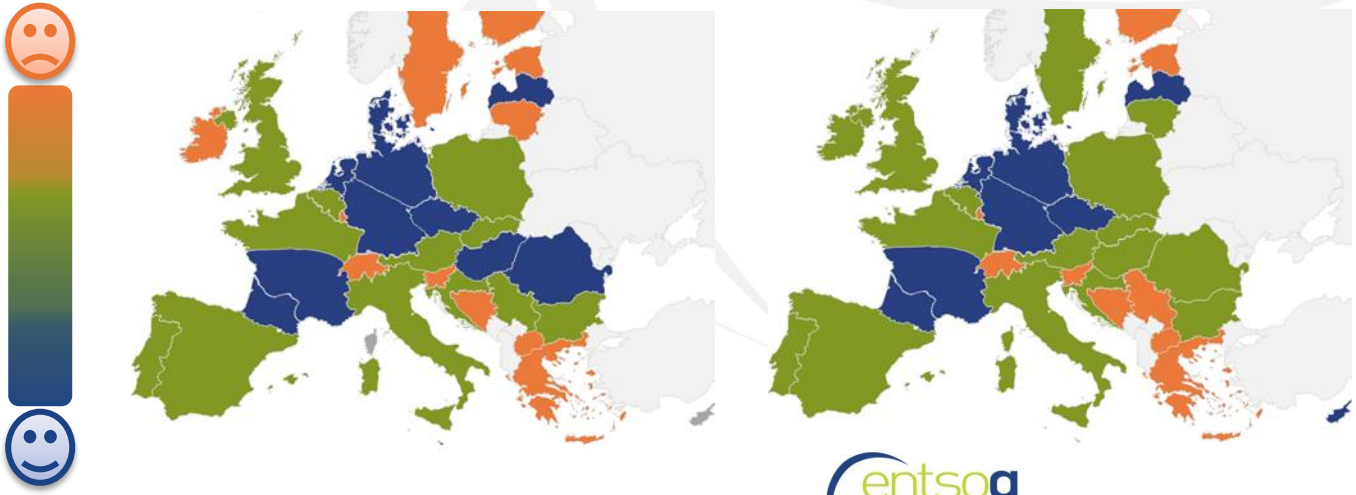
Capacity-based indexes - Results

Import Route Diversification index (2022 FID vs. Non-FID)



Positive evolution of diversification in Baltic and SEE regions will rely on Non-FID projects

Import Dependency index (2013 vs. 2022 Non-FID)



Dependency should remain stable through the 10-year range due to new UGS substituting NP and limited growth of gas demand

Assessment conclusions

Consistence with ENTSOG TYNDP 2011-2020

> The new report confirms the resilience assessment results of the previous edition while adding further sensitivity to the analysis

Things to keep in mind when reading TYNDP

> Results derive both from methodology and input data

> Results should be considered along a comparative approach (e.g. 2017 vs. 2022, FID vs. Non-FID) rather than as an absolute assessment

> In Non-FID cluster, all projects are considered together, incl. those in competition

> A perfect market perspective has been considered

According to TYNDP assessment, all facets of infrastructure-related market integration will benefit from the commissioning of Non-FID projects

Thank You for Your Attention

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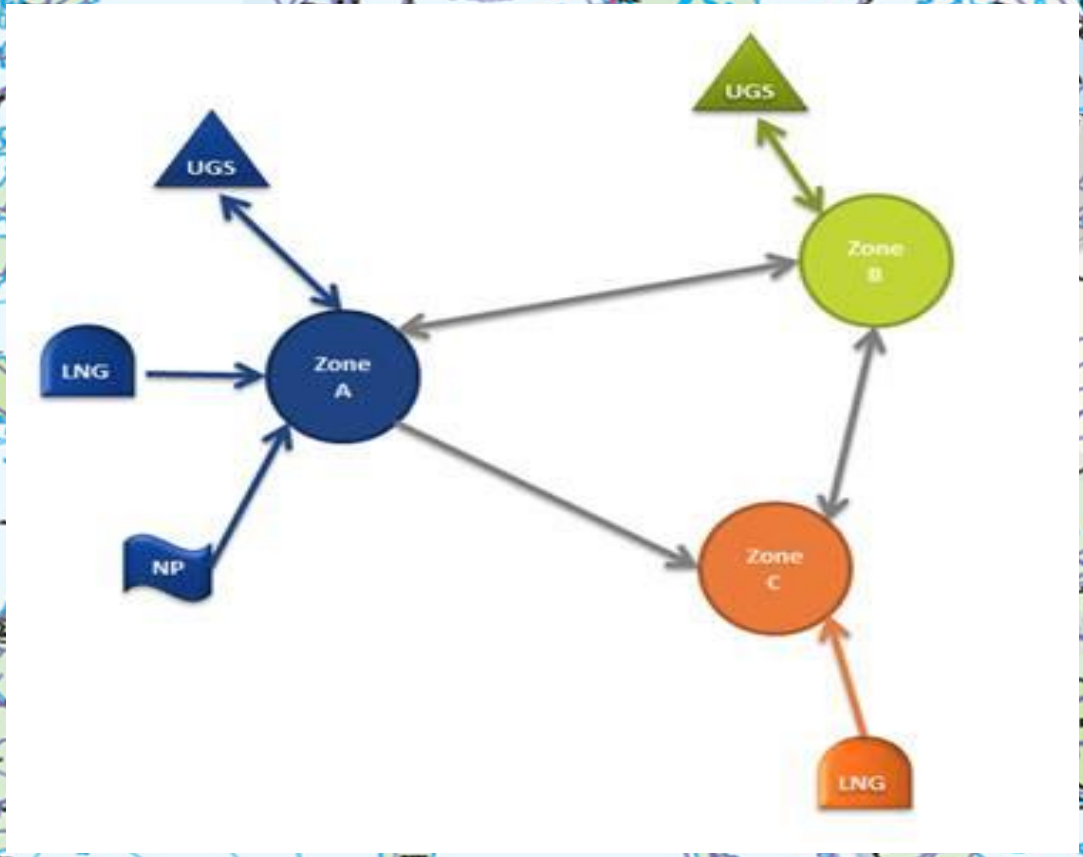
The European gas spider web



Enhanced topology better considers complex situations such as forks (e.g. Emden) and transit system (e.g. Yamal pipeline)