TYNDP 2024

The Hydrogen and Natural Gas TYNDP

HEAT
SUPPLY
INDUSTRY
NATURAL GAS
RETROFIT
BIOGAS
NETWORK
DECARBONISE

Executive Summary

Draft

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PRESIDENT'S AND **GENERAL DIRECTOR'S** JOINT FOREWORD

This is the second Hydrogen and Natural Gas Ten-Year Network Development Plan published since the entry into force of the revised TEN-E Regulation (EU) 2022/869. It is an important platform for European projects and their further assessment in the Cost Benefit Analysis (CBA), feeding into the European Commission's and Regional Groups' selection process of Projects of Common Interest (PCI) and Projects of Mutual Interest (PMI) of the hydrogen category. To complement to the projects database, the **TYNDP 2024 contains a network-level hydrogen infrastructure gaps identification report and a natural gas system assessment report, including a Supply Adequacy Outlook with a Biomethane Progress Report, as required by Regulation (EU) 2024/1789**.

The process for this edition included many updates, starting with the full application of the revised TEN-E Regulation. Consequently, ENTSOG adapted its Project Portal to facilitate the data collection for new project categories, with particular focus on the hydrogen-related infrastructures, their contribution to sustainability, as well as elements of the new hydrogen CBA methodology.

Another important development is the addition of a hydrogen-electricity interlinkage to the existing natural gas and hydrogen modelling. For the first time ENTSOG's system-level assessments are based on the Dual Hydrogen Electricity Model (DHEM) developed in addition to the Dual Gas Model (DGM). Therefore, **interactions between the hydrogen, natural gas and electricity sectors are better**

captured. Over 200 of the 326 investments in ENTSOG's TYNDP 2024 are hydrogen projects. Building on the 2022 edition, the focus on hydrogen continues to increase, presenting a wider range of project types, including hydrogen subcategories for transmission, reception facilities, storage, electrolysers, and mobility projects. Other categories, such as biomethane and CO_2 infrastructure, make up the remainder of TYNDP 2024.

For the first time, ENTSOG evaluated the specific role of hydrogen infrastructure in achieving EU climate and energy targets in a dedicated report – the hydrogen Infrastructure Gaps Identification (IGI) report. The other important milestones for TYNDP 2024 were the publication of the Infrastructure report, followed by the publication of the Natural Gas System Assessment report, supported by various annexes and maps.

We are proud that TYNDP 2024 achieves the most advanced TYNDP assessment from an Energy System Integration perspective to date. Besides the addition of the new interlinkage mentioned above, this is also reflected in the close working relationship between ENTSOG and ENTSO-E in the development of the TYNDP 2024 Scenarios, the first phase of the TYNDP cycle. Given the importance of integrating the interface with the hydrogen sector, this cooperation will extend to include ENNOH representatives in 2026 and onwards.

Within the framework of the Clean Industrial Deal, growth and competitiveness go hand-in-hand with climate neutrality and strategic energy sovereignty. **Molecules today offer affordable flexibility and reliable storage, even for the longer term, and the gas grids are an important part of an efficient, reliable and cost-efficient decarbonised energy system.** The TYNDP 2024 assessment reiterates the potential the gas infrastructure provides for a robust and integrated European energy system.

On behalf of ENTSOG, we would like to thank all parties involved in the TYNDP 2024 journey. We hope you enjoy the TYNDP 2024 reports and maps. We look forward to your further contributions!

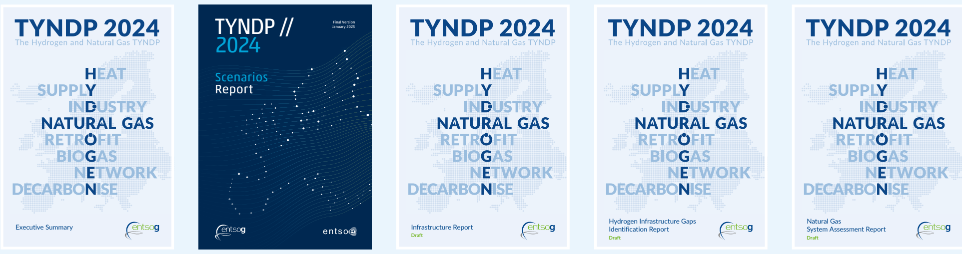
BART JAN HOEVERS
President*, ENTSOG

PIOTR KUŚ
General Director, ENTSOG

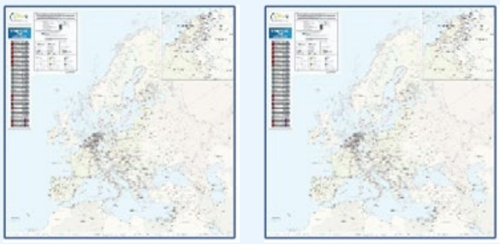
* since October 1st 2025 and hence at the time of publication, Pierre Duvieusart is interim President of ENTSOG.

1 ENTSOG'S TYNDP 2024 PACKAGE

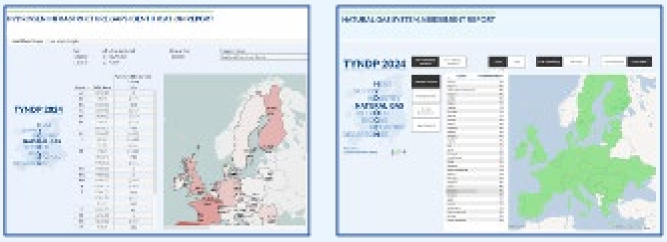
Main TYNDP reports



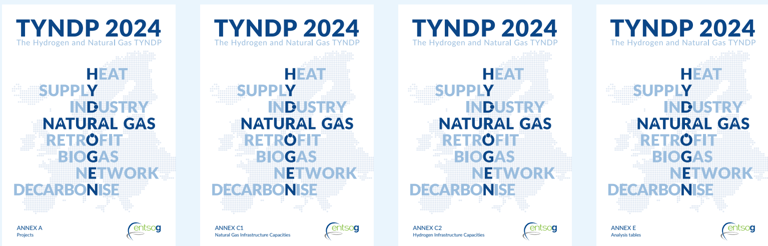
TYNDP 2024 Infrastructure maps



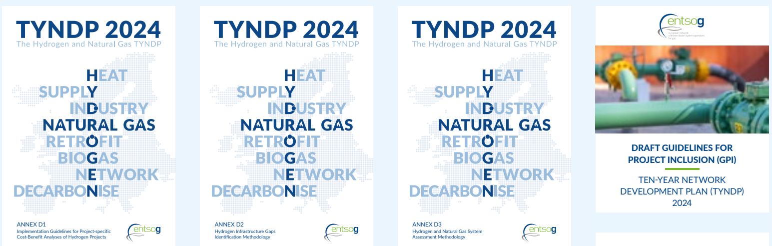
TYNDP 2024 Online visualisation platforms



Data Annexes



TYNDP 2024 Guidance documents



2 KEY MESSAGES OF THE HYDROGEN AND NATURAL GAS TYNDP 2024

The European gas system continues to play a significant role in the achievement of European energy and climate targets. Methane and hydrogen flows support the electricity sector, increasing the flexibility of the energy system and facilitating the integration of renewables, in a cost-effective, secure, and efficient way.

ENTSOG's TYNDP 2024 presents many hydrogen and methane infrastructure projects updated according to recent market and regulatory conditions. It highlights that even if all the projects materialise, gaps still remain to reach European energy and climate goals for 2030 and 2050.

KEY POINTS OF NOTE FROM THE TYNDP 2024

- The adoption of Regulation (EU) 2024/1789 and the revised Regulation (EU) 2022/869 ('TEN-E' Regulation) have fundamentally changed the eligibility criteria for Projects of Common Interest (PCI) and Projects of Mutual Interest (PMI), placing hydrogen and renewable gases at the centre of EU infrastructure policy. **The focus for the natural the gas sector is repurposing infrastructure to transport hydrogen and broader decarbonisation while maintaining security of gas supply, market integration, competitiveness and sustainability.**
- Scenario analysis confirms that **reaching 55% GHG emissions reduction by 2030 with at least 42.5% share of renewables – and net-zero by 2050[1] – is technically achievable but challenging in the short term**. The importance of gas molecules as energy carriers is foreseen in all scenarios, where methane remains predominant in 2030 and hydrogen becomes more prominent in the long-term. The role of gas molecules, particularly methane and hydrogen, is crucial in the energy transition scenarios.
- Building on a selected target-compliant scenario, ENTSOG's TYNDP 2024 assesses hydrogen infrastructure requirements. It concludes that, **even with the most ambitious projects built, not all indicated demand in Europe can be satisfied, with infrastructure gaps still existing in both 2030 and 2040**. This is the case during winter and in regions with reduced or no connections to the future European hydrogen backbone, such as South-Eastern Europe and islands.
- Importantly, reaching European energy and climate goals is only possible in practice provided that **more ambitious progress on energy sector transformation would be observed compared to the current evolution**, achieved by energy efficiency increase, accelerated deployment of renewables, and better energy system integration across the electricity, gas, and hydrogen markets. Should such progress not materialise in practice and in case the construction of projects is not finalised on time, this would pose serious risks to achieving the assumed targets.

1 Compared to 1990 levels

KEY MESSAGE #1
ENTSOG'S TYNDP 2024 MARKS A STEP-CHANGE IN INTEGRATED ENERGY SYSTEM MODELLING

- For the first time under the revised TEN-E Regulation, ENTSOG's system-level assessments are based on the Dual Hydrogen Electricity Model (DHEM) developed in addition to the Dual Gas Model (DGM) – a hydrogen and methane network model, introduced in TYNDP 2022.
- On the basis of the integrated modelling approach referred to above, assessment of infrastructure needs at cross-sectoral level can now be measured. The degree of market integration can now be monitored with more precision, as well as the impact of increasing network interconnections and sector coupling. Detailed information is available in the TYNDP 2024 guidance documents[2].
- Cost-benefit assessments of individual infrastructure projects are now also for the overall energy system including their associated CO_2 emissions reduction. The TYNDP 2024 guidance documents[3] provide additional information about project-specific modelling.

KEY MESSAGE #2
THE AMBITION TO DEVELOP HYDROGEN INFRASTRUCTURE ACCELERATES

- Of 326 investments that make up ENTSOG's TYNDP 2024, over 200 are hydrogen projects. Moreover, 33% of hydrogen projects are now included in National Development Plans (NDPs), up from 17% in TYNDP 2022. Around 80% of the 110 new investments in the 2024 cycle are hydrogen-related, double the number in TYNDP 2022.
- This evolution reflects the EU's commitment to building a hydrogen backbone and a strong focus on connecting regions and integrating renewable energy supply.
- Hydrogen projects span transmission, storage, import terminals, electrolysers and mobility. They are grouped into two 'infrastructure levels', representing stages of network development. These serve as the basis for identifying infrastructure gaps and for individual project assessments.

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2 Annex D2 – Hydrogen Infrastructure Gaps Identification Methodology and Annex D3 - Hydrogen and Natural Gas System Assessment Methodology, available on https://tyndp2024.entsog.eu/downloads/

3 Annex D1 – Implementation Guidelines for Project-specific Cost-Benefit Analyses of Hydrogen Projects, available on https://tyndp2024.entsog.eu/downloads/

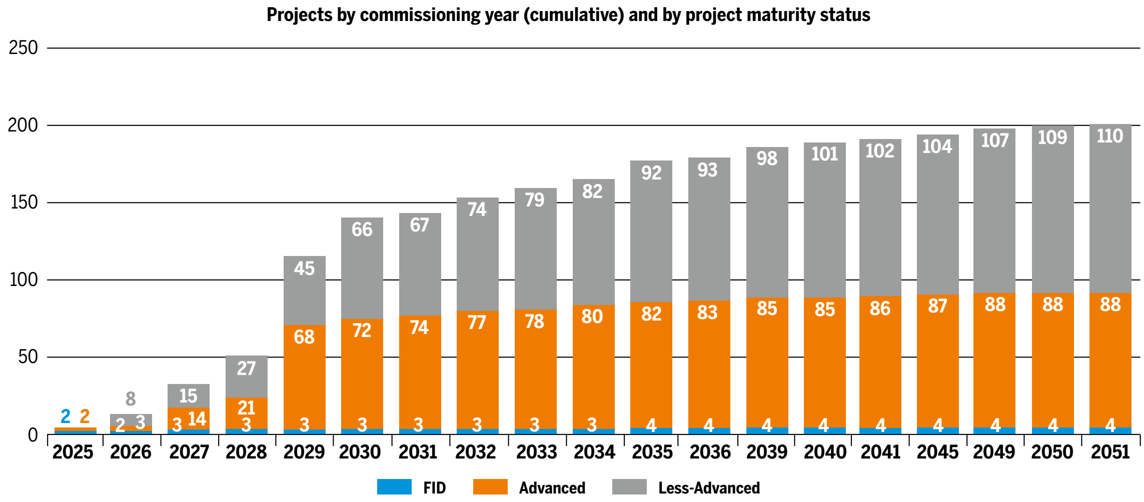

Figure 1: Projects by commissioning year (cumulative) and by project maturity status – H2T, H2L, H2S, H2E and H2M.[4]

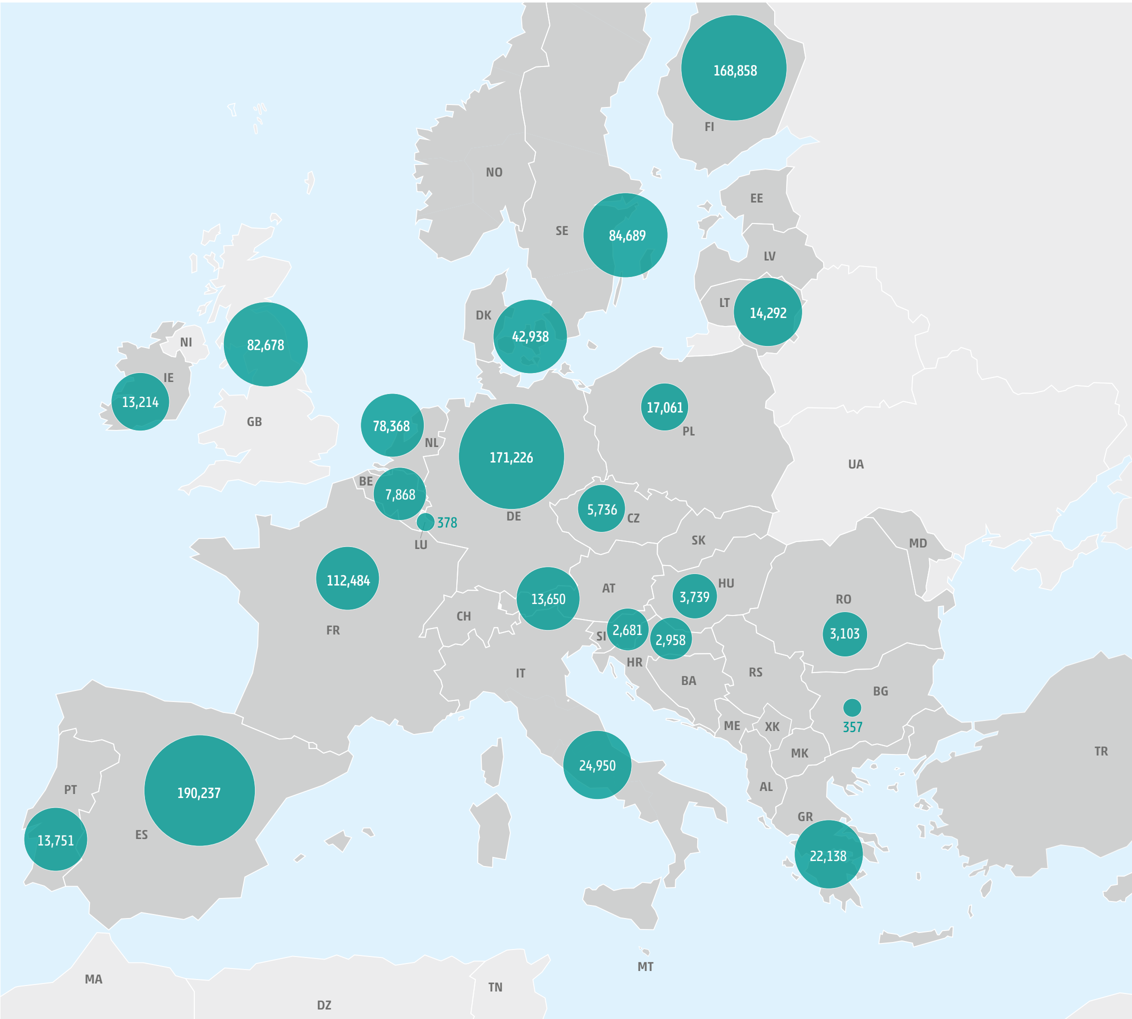

Figure 2: Distribution of electrolytic hydrogen production per country in the PCI/PMI hydrogen infrastructure level in 2040 for reference weather year (unit: GWh/y).[5]

4 Hydrogen project sub-categories: H2T (transmission), H2L (reception facilities), H2S (storage), H2E (electrolysers) and H2M (mobility). See the TYNDP 2024 Infrastructure Report for further details, available at https://tyndp2024.entsog.eu/downloads/.

5 See the TYNDP 2024 Infrastructure Gaps Identification report for further details, available at https://tyndp2024.entsog.eu/downloads/.

KEY MESSAGE #3
NATURAL GAS INFRASTRUCTURE CONTINUES AS KEY-ENABLER OF SECURITY OF SUPPLY, FLEXIBILITY AND ADEQUACY AT THE LEVEL OF THE INTERCONNECTED ENERGY SYSTEM

- While the hydrogen sector develops, natural gas project submissions have been progressively decreasing in recent TYNDP cycles. This is also a consequence of natural gas projects no longer being eligible for PCI/PMI status, a change brought by the revised TEN-E Regulation.
- Natural gas infrastructure focus is shifting towards the repurposing of assets to hydrogen, while further supporting the transition to renewable gases and maintaining a secure energy supply. In addition, its contribution in form of flexibility for the electricity system – at peak-times or periods of low RES infeed – is projected to increase, *inter alia* in line with findings of the European Resource Adequacy Assessment (ERAA) 2024, recently published by ENTSO-E[6]. The report states that between 50 and 60 GW of new flexible gas capacity could be required by 2035, as periods of scarcity prices are expected, according to the development of new investments or life extensions of existing ones closer to this date.
- The natural gas infrastructure with methane supply can and is still expected to ensure system flexibility and supply security while renewable gas volumes continue to increase. This implies a continued, albeit evolving, role for natural gas infrastructure during the transition.
- The invasion of Ukraine by Russia in 2022 led to a major overhaul of energy policy objectives in terms of energy security and diversification of supply. The future development of gas infrastructure must consider the ongoing decarbonisation trend and a need to phase out Russian gas by 2027, in line with the European Commission communication, Roadmap towards ending Russian energy imports, published in May 2025. Figure 3, below, shows an updated view of the European natural gas system, including external supply capacities.

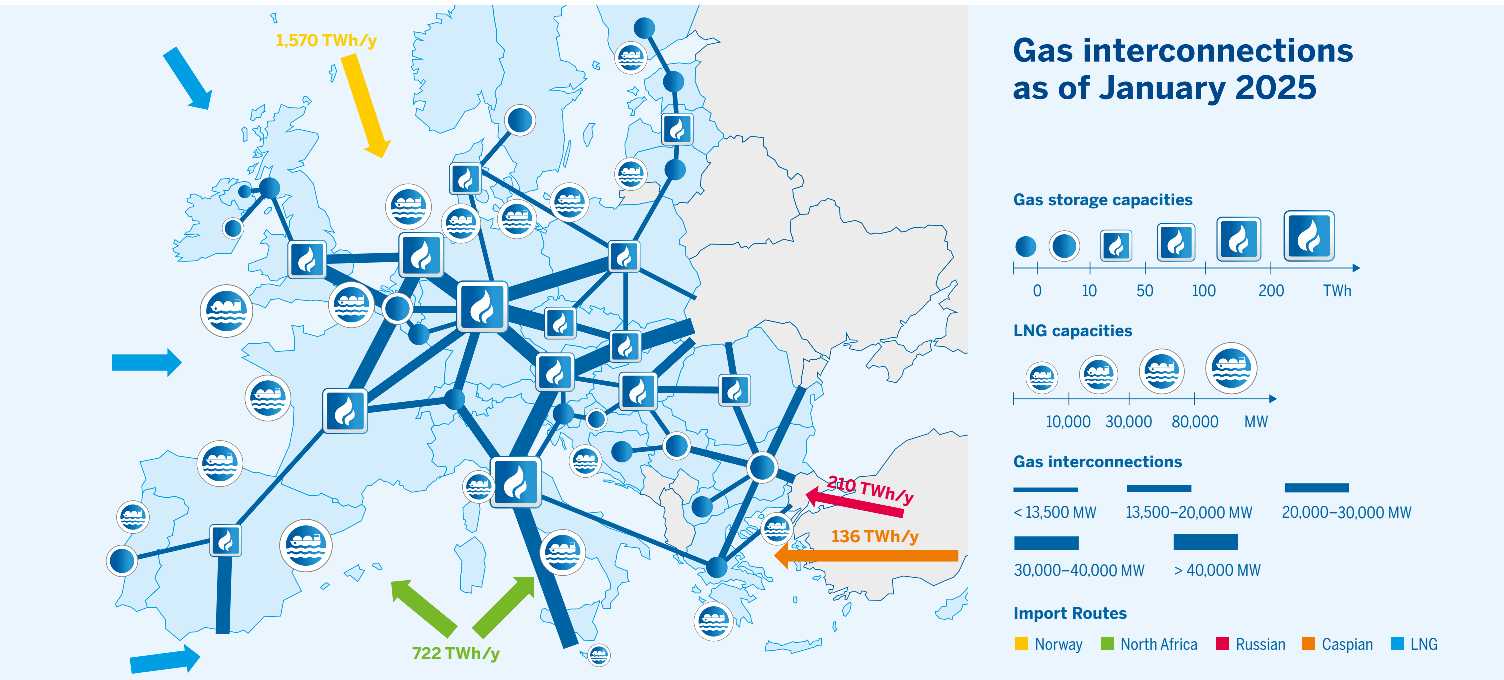

Figure 3: The natural gas system at a glance in January 2025

6 See chapter 2.2 of European Resource Adequacy Assessment 2024/Executive Report

KEY MESSAGE #4
SIGNIFICANT INFRASTRUCTURE GAPS FOR HYDROGEN WERE FOUND IN 2030 AND 2040

- The approach adopted in TYNDP 2024 is to assess hydrogen infrastructure gaps by the relative degree of demand curtailment, as well as by looking at price spreads between regions.
- Many regions are projected to face hydrogen demand curtailment of 4–8% by 2030 and 12–15% by 2040, even under ambitious infrastructure assumptions. Such gaps are most visible in Central and Eastern Europe, the Balkans and insular systems, as further detailed in Section 7.
- The message is clear: current investment ambitions are not sufficient on a European level to meet the projected hydrogen demand, with anticipatory planning required to reach energy and climate commitments. While they may not be fully used in 2030, anticipatory investments show high utilisation by 2040, unlocking economies of scale for hydrogen infrastructure.

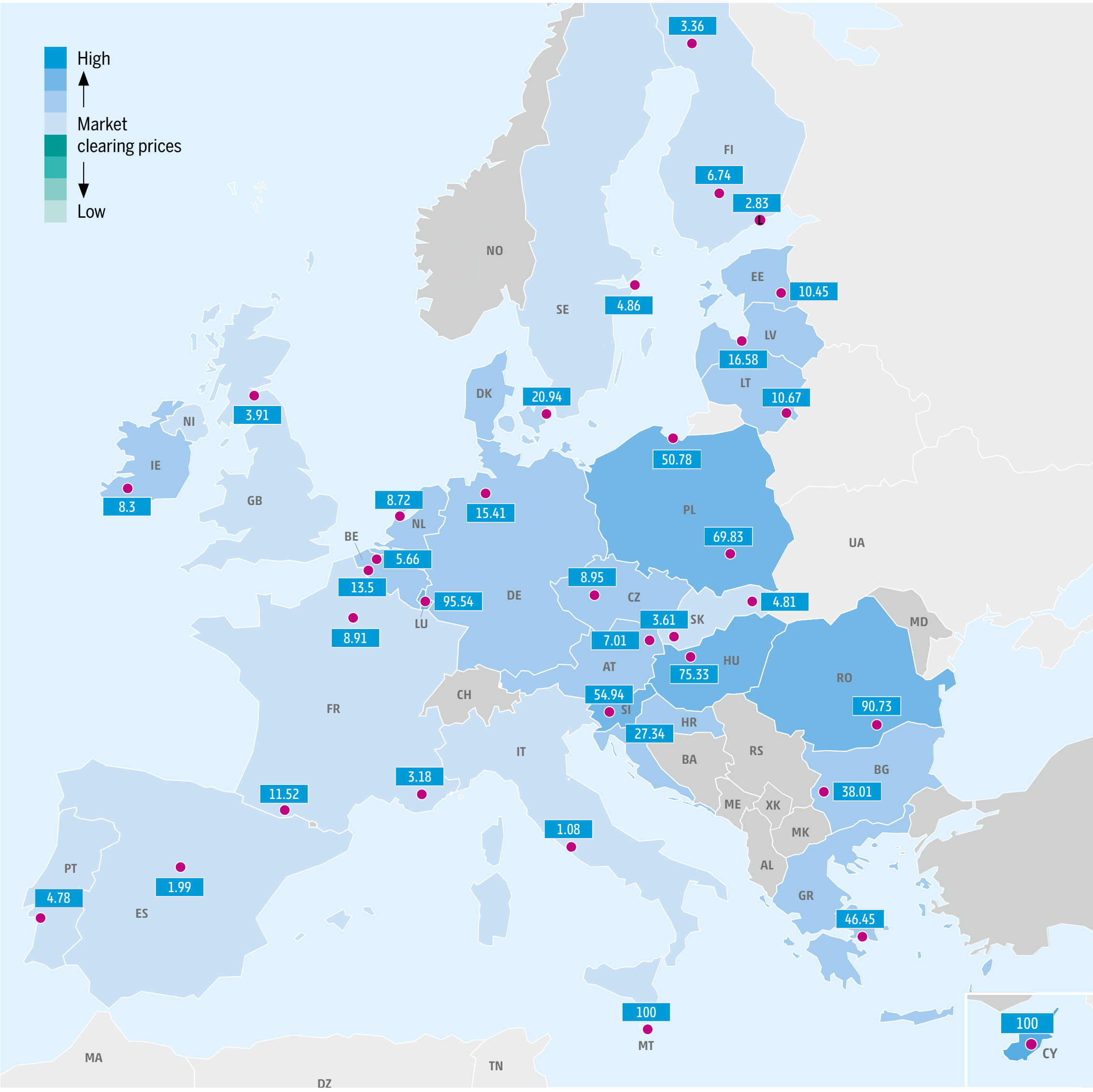

Figure 4: Yearly average hydrogen demand curtailment rate at country or node level in the PCI/PMI hydrogen infrastructure level in 2040 for reference year (unit: %).[7]

7 See the TYNDP 2024 Infrastructure Gaps Identification report for further details, available at https://tyndp2024.entsog.eu/downloads/.

KEY MESSAGE #5
GROWING BIOMETHANE VOLUMES ARE A DIRECT ENABLER OF SECURITY OF SUPPLY. WITHOUT IT, DECARBONISATION WOULD OCCUR AT A SLOWER PACE.

- Hydrogen infrastructure gaps would be higher, were it not for the increasing contribution of biomethane.
- ENTSOG'S TYNDP 2024 includes, for the first time, a biomethane progress report, as required by Regulation (EU) 2024/1789. This report monitors annual biomethane production compared to the REPowerEU target of 35 bcm by 2030.
- The report shows different investment trajectories compared to the target. Market and regulatory support is seen as key to unlock the full potential of biomethane and other renewable gases, so that their benefits – as security of supply, decarbonisation and flexibility – can materialise on time and at the desired scale.

KEY MESSAGE #6
STAKEHOLDER ENGAGEMENT AND TRANSPARENCY HAVE REACHED NEW LEVELS IN TYNDP 2024

- ENTSOG's TYNDP 2024 applied the new, extensive stakeholder consultation and reporting requirements stipulated in the revised TEN-E Regulation. TYNDP 2024 featured five stakeholder consultations[8], each with a dedicated hybrid or online workshop, and relied on the public consultation on the single-sector hydrogen cost-benefit analysis methodology for input.
- Engagement with the European Commission (EC) and the Agency for the Cooperation of Energy Regulators (ACER) also increased, with frequent informal exchanges aimed to minimise work reiteration. The increased cooperation and extended stakeholder consultation aligned with the increasingly complex process of assessing infrastructure from a cross-sector perspective and under a new methodology. As a result, the overall project timeline was impacted. Additional periods for opinion and approval by European institutions – prescribed by the revised TEN-E Regulation[9] – significantly increased the duration of the TYNDP 2024 process.
- The newly-established Stakeholder Reference Group (SRG) for the joint ENTSOG and ENTSO-E Scenarios 2024 furthermore enhanced engagement and transparency.

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8 1). Scenarios Storyline Report and key assumptions, 2). draft Guidelines for Project Inclusion, 3). draft Guidance Documents for TYNDP, 4). draft Hydrogen Infrastructure Gaps Identification report and 5). draft Natural Gas System Assessment report and draft Infrastructure report

9 According to the latest TEN-E revision, review and approval periods by ACER, Member States (MS) and the EC add up to a maximum of 20 months: up to 6 months for the CBA methodology, up to 6 months for the Scenarios report, up to 6 months for the IGI report and up to 2 months for the Draft TYNDP. Additional details can be found in ENTSOG's response to the European Commission call for evidence on the EU Grids Package

3 **WHAT'S NEW** IN ENTSOG'S TYNDP 2024

The TYNDP 2024 highlights several new elements, marking significant advancements compared to the previous edition, and reflecting a more ambitious, inclusive, and transparent approach to energy system planning.

3.1 STAKEHOLDER ENGAGEMENT

- In TYNDP 2024, ENTSOG has for the first time applied the provisions of the revised TEN-E Regulation. These amplify stakeholder engagement, adding extensive consultation requirements to 'key phases [...] such as the scenario development, infrastructure gaps identification and the cost-benefit analysis methodology for project assessment'[10]. A total of five stakeholder consultations have been organised for assumptions, guidance documents, as well as final deliverables. Consultations included hybrid presentation and discussion events, details about which can be found here.
- In particular for the TYNDP 2024 Scenarios process, a new, independent advisory forum was formally established and started its activities in November 2023. The SRG), as required by the revised TEN-E Regulation and the ACER Framework Guidelines for the joint TYNDP scenarios, brought complementing expert input to the development of scenarios. The SRG members are: associations of the gas and electricity markets, energy efficiency solutions, heating and cooling, CCS and CCU, demand response and supply operators, the EU DSO Entity, energy consumer organisations, independent aggregators and experts representing all relevant sectors. The balanced group composition brought improvements to engagement efficiency and effectiveness of Scenarios. More information about the 22 member associations of the SRG and the activities of its working groups is available here.
- The revised TEN-E added new processes for provision of formal opinions by the EC and ACER, in particular to scenario development, infrastructure gaps identification and the cost-benefit analysis methodology for project assessment. These complemented regular, informal exchanges, reinforcing the alignment process between the organisations. However, this change impacted the TYNDP process in terms of duration. Currently, total opinion and/or approval periods total 14 months[11]. To these, six months for approval of the Cost-Benefit Analysis (CBA) methodology are added, at least every 5 years, when the methodology is reviewed[12].

10 Recital 25 of regulation (EU) 2022/869, updated in May 2022. See also articles 11, 12 and 13 for detailed consultation requirements

11 3+3 months for the Scenarios report (Reg (EU) 2022/869 , Art. 12, points 5, 6), 3+3 months for the IGI report (Reg (EU) 2022/869, Art. 13, points 3, 4) and two months for the Draft TYNDP (Reg (EU) 2024/1789, Art 27, point 2)

12 Reg (EU) 2022/869, Art. 11, point 13

3.2 SCENARIOS

- The alignment of network planning for electricity, hydrogen, and methane, as required by the revised TEN-E Regulation, improved. It is the fourth joint exercise, performed in cooperation between ENTSO-E and ENTSOG.
- The NT+ scenario, which aggregates supply and demand values from national energy and climate plans, now covers all energy carriers, expanding beyond just electricity and gas. The assessment against regulated targets is therefore more comprehensive.
- The '+' in 'NT+' represents another innovation: the gap-filling methodology. This ensures that the scenario fully aligns with the EU's mandated energy and climate targets, including 2030 targets for energy and climate, the 2050 climate neutrality objective, and the energy efficiency first principle.
- Modelling and transparency: the *Energy Transition Model* (ETM) was used for demand quantification for the first time in TYNDP 2024. The model and input parameters are openly accessible online. Therefore, interested third parties can replicate the scenarios. The full package is available on the joint Scenarios website.


Picture courtesy of FGSZ

3.3 SYSTEM-LEVEL ASSESSMENTS

- TYNDP 2024 system-level assumptions fully align with an updated hydrogen cost-benefit analysis methodology, completed as part of the 5-yearly revision cycle prescribed by the revised TEN-E Regulation[13], after a comprehensive review with stakeholders, including the EC and ACER. This ensures consistency with project-specific CBA. Alignment points include: the models used, infrastructure levels, time horizons, among others.
- A hydrogen-electricity interlinkage was added to the existing natural gas and hydrogen modelling. Thus, interactions between the hydrogen, natural gas and electricity sectors are better captured, using a tool called *Dual Hydrogen Electricity model* (DHEM) and the previously developed Dual Gas Model (DGM).
- To apply the DHEM to NT+ scenario data, an electrolyser capacity redistribution methodology is newly employed. In practice, this is done to attribute NT+ electrolysis capacity data to the separate zones modelled with the DHEM. A zone represents the main interconnected hydrogen infrastructure system and another represents hydrogen supply and demand areas that are not connected to the main system, like electrolysers connected to the electricity market or renewable energy capacity dedicated hydrogen production. The usage of such zones enables a more granular analysis of energy flows and infrastructure needs.
- System-level assessments for hydrogen (Infrastructure Gap Identification Report – IGI) and natural gas (System Assessment Report – SA), have been published for the first time as self-standing documents. These should be read along with ENTSO-E's Identification of System Needs (IoSN) Report, providing an integrated sector perspective.
- The Natural Gas System Assessment report should be read along with ENTSO-E's ERAA, for a complementing perspective not only from the point of view of the electricity sector, but also regarding the target years and scenario used.
- The IGI assessment is performed for two infrastructure levels – *PCI/PMI* and *Advanced* – providing a complementing perspective on infrastructure performance under a wider deployment of hydrogen-related projects.
- New sensitivities were introduced, for a series of hypothetical infrastructure cases with unlimited capacity. The aim is to investigate any system limitations due to potential bottlenecks without taking into account the development of specific projects.
- The natural gas system assessment and hydrogen infrastructure gaps identification are interdependent. The SA simulations build not only on the TYNDP 2024 Scenario Report but also on results from the IGI: electrolysis production, hydrogen demand, including for electricity, as well as natural gas demand for electricity. Furthermore, the SA report considers both natural gas and hydrogen infrastructure levels, i.e., *Low* natural gas and *Advanced* natural gas, combined with *PCI/PMI* hydrogen and *Advanced* hydrogen infrastructure levels, within the Dual Gas Model.

3.4 PROJECT ASSESSMENT

- New hydrogen classification categories are added to the TYNDP 2024, representing the continued shift towards hydrogen and other energy transition projects since the TYNDP 2022. Hydrogen projects are now presented under more varied subcategories: hydrogen transmission, reception facilities, storage, electrolysers, and mobility projects, and other categories, such as biomethane and CO_2 infrastructure.
- The prioritisation of deliverables related to hydrogen (requested by ACER and EC) in TYNDP 2024 is also visible though a change in cost-benefit analyses (CBA) performed, which is mainly for hydrogen-related projects. Natural gas-related projects are no longer covered by project-specific CBA, as they are no longer eligible for PCI/PMI status – with minor exceptions – in line with the updated provisions of the revised TEN-E.
- A simplified design for project fiches is used, in a more accessible, visualised, online format.

13 Reg. (EU) 2022/869, Article 11, point 13

4 REACHING **EUROPEAN ENERGY AND CLIMATE TARGETS** UNDER DIFFERENT TYNDP SCENARIOS

4.1 TYNDP 2024 SCENARIOS

- Scenarios aim to establish a quantitative basis for the infrastructure assessment and network planning. The TYNDP Scenarios aim to maintain robustness by ensuring consistency between successive TYNDPs while also incorporating new elements relevant to the ongoing development of the energy transition.
- The TYNDP 2024 scenario cycle included six scenarios, which are categorised as either National Trends+ ('NT+') scenarios or deviation scenarios (Distributed Energy, 'DE', and Global Ambition, 'GA'), based on the development approach.
- National Trends scenarios were developed for the 2030 and 2040 time-horizons.
- The deviation scenarios ('DE' and 'GA') address increased uncertainties after 2030. These scenarios diverge from the NT+ scenario starting from the NT+ 2030 baseline and extend into the 2040 and 2050 time horizons.
- The National Trends+ (NT+) scenario was selected in agreement with EC and ACER for TYNDP 2024 system- and project-level assessments.
- NT+ is developed for the 2030 and 2040 time-horizons, as complete 2050 datasets are not available from all Member States for this scenario, while GA and DE continue until 2050, reaching net-zero greenhouse gas emissions.
- Broadly, the NT+ scenario aligns with national energy and climate policies, including National Energy and Climate Plans (NECPs), national long-term strategies, and hydrogen strategies, all of which are derived from European targets. It can be referred to as 'the aggregation of national approaches, adjusted to reach EU targets'.
- The deviation scenarios provide alternative references, based on contrasting choices for high-level drivers such as green transition, energy efficiency, and choices of technologies:
  - Distributed Energy emphasises higher European autonomy with a renewable and decentralised focus, incorporating minimal Carbon Capture and Storage and nuclear energy.
  - Global Ambition reflects a global economy with centralised low-carbon and widely deployed renewable energy sources (RES) , including the integration of nuclear and CCS technologies.

In the TYNDP 2024 scenarios, natural gas plays a crucial role in providing resilience and flexibility to the European energy system as electricity production from variable RES scale up. Going towards 2040 and 2050, a gradual replacement of conventional natural gas with renewable and clean gases is foreseen, to complement hydrogen.

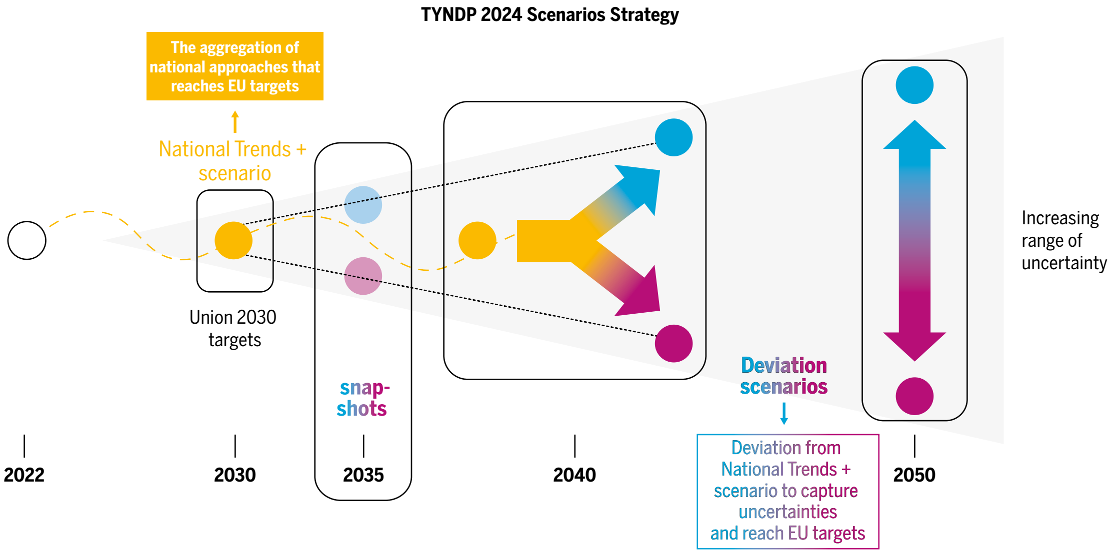

Figure 5: TYNDP Scenario horizon and framework[14]

14 Further details are available at https://2024.entsos-tyndp-scenarios.eu/wp-content/uploads/2025/01/TYNDP_2024_Scenarios_Report_FInal_Version_250128_web.pdf

Picture courtesy of Enagás

4.2 AIMING FOR NEW EUROPEAN ENERGY AND CLIMATE TARGETS

The TYNDP 2024 scenarios must be, according to the revised TEN-E Regulation, *fully in line with the energy efficiency first principle and with the Union's 2030 targets for energy and climate and its 2050 climate neutrality objective and shall take into account the latest available Commission scenarios, as well as, when relevant, the national energy and climate plans ('NECPs')*. Specifically:

- The energy efficiency first principle translates into an 11,7% reduction of primary energy use compared to 2020 energy consumption forecasts, contained in the EC's 2022 reference scenarios.
- The 2030 energy and climate targets have the core-objective of a 55% reduction of greenhouse gas emissions compared to 1990 levels, with a RES of 42,5%, plus an indicative top-up of 2,5%.
  - After applying a 'gap-closing' methodology, the original National Trends (NT) scenario is referred to as 'National Trends+' (NT+) and indicates a 45,4% RES share in 2030.
- The 2050 climate neutrality objective, agreed at the Paris COP21, translates to becoming carbon-negative by 2050.
- The EC's reference scenarios, in this case 'Fit for 55' and 'REPowerEU', as well as, where relevant, NECPs.

4.3 GAP CLOSING APPROACH

The 'gap closing' process was introduced in the 2024 cycle to ensure TYNDP scenarios comply with the above-mentioned targets.

- The starting point were the gaps measured between the respective targets and actual, final energy consumption figures, collected by survey from electricity and gas TSOs.
- The NT scenario revealed an 8% (818 TWh) gap compared to the 2030 energy efficiency target of 11,7%. The gap was adjusted based on the publicly consulted 'Gap Closing Methodology'. Where applicable, parameter assumptions were reassessed (for example, for oil or coal), and either the adjusted 2030 value or the submitted 2040 value for the 2040 time horizon was used. In this case, the minimum values were chosen as final assumptions, with an impact of 45 TWh less oil and respectively, 1 TWh less coal used at European level.
- It must be noted that the methodology was applied to aggregated figures and not to MS- or sector-level data. Gas and electricity figures did not require adjustment. The gap closing methodology was deemed appropriate after undergoing public consultation.

The importance of gas molecules as energy carriers is foreseen in all scenarios, where methane remains predominant in 2030 and hydrogen becomes more prominent in the long-term. The joint 2024 Scenarios report contains further details on the expected methane and hydrogen demand evolution per sector and under different scenarios.

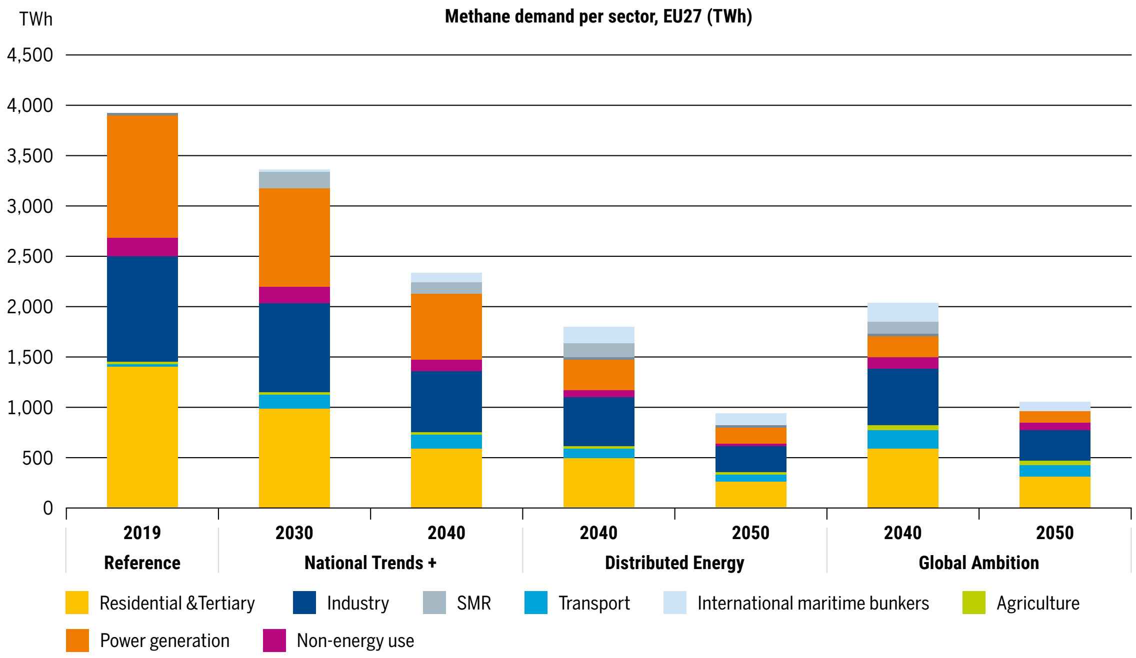

Figure 6: Methane demand per sector, EU27 (TWh)[15]

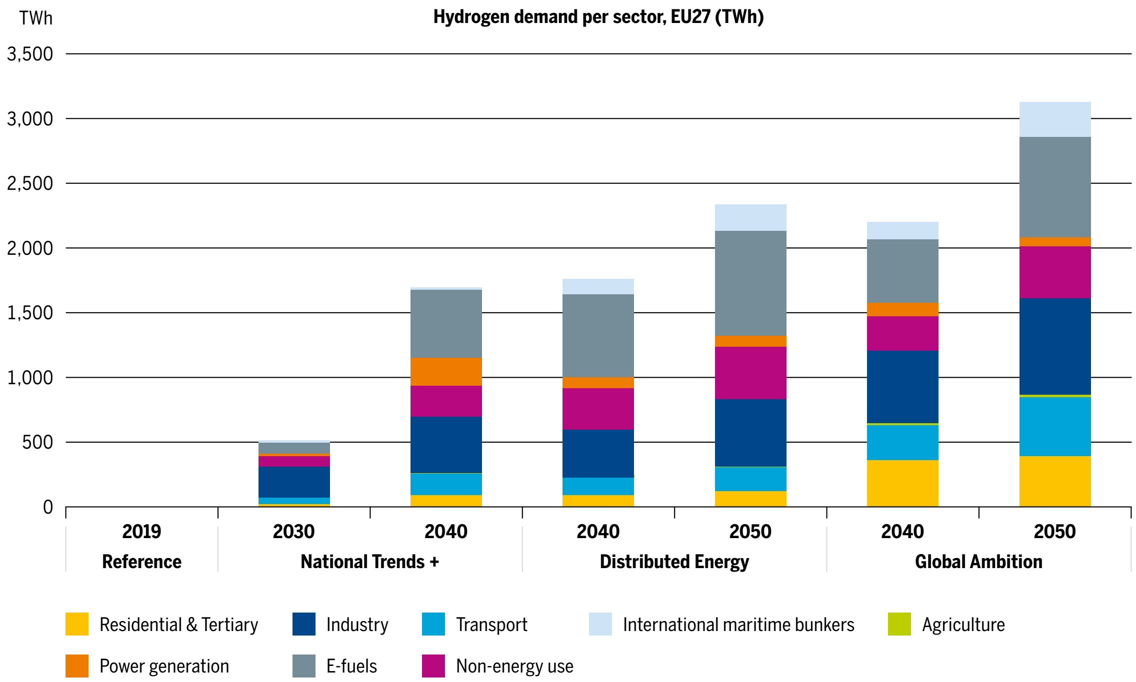

Figure 7: Methane demand per sector, EU27 (TWh)[15]

15 Further details are available at https://2024.entsos-tyndp-scenarios.eu/wp-content/uploads/2025/01/TYNDP_2024_Scenarios_Report_FInal_Version_250128_web.pdf

5 **AMBITION TO DEVELOP HYDROGEN INFRASTRUCTURE** ACCELERATES AND DOMINATES IN TYNDP 2024 **COMPARED TO NATURAL GAS**

TYNDP 2024 investments amount to more than 210 billion euros in terms of capital expenditure. 80% of capex corresponds to the hydrogen category, while the remaining 20% are mostly investment in the field of natural gas. Further details can be found in the draft TYNDP 2024 Infrastructure Report.

5.1 NEW PROJECT CATEGORIES

- The *Energy Transition Projects* category was introduced in TYNDP 2020, and expanded in TYNDP 2022 to include the new infrastructure categories *Hydrogen*, *Biomethane*, *Retrofitted*[16] and *Other*.
- In TYNDP 2024, hydrogen projects are presented separately for: *hydrogen transmission*, *reception facilities*, *storage*, *electrolysers* and *mobility projects*.
- Other categories include *biomethane* and *CO_2* infrastructure[17].

5.2 KEY NUMBERS

- Innovation is visible in each TYNDP cycle. Figure 8 highlights the increasing focus on hydrogen, in the form of a growing proportion of submissions under the hydrogen subcategories mentioned above, currently at 62% from just over 40% in the previous TYNDP.
- The majority of projects from previous TYNDPs are carried over to the next, proving long-term infrastructure planning consistency.
- Completion rates remain low, with 36 projects completed by 2022, and 28 more by 2024, suggesting lengthy development timelines or barriers. Specifically, between TYNDP 2022 and TYNDP 2024, 19 natural gas transmission projects, five LNG and two other infrastructure-related projects were completed, while 23 natural gas projects are planned be commissioned before end-2025, further contributing to the reduction of infrastructure gaps that the TYNDP aims to address.

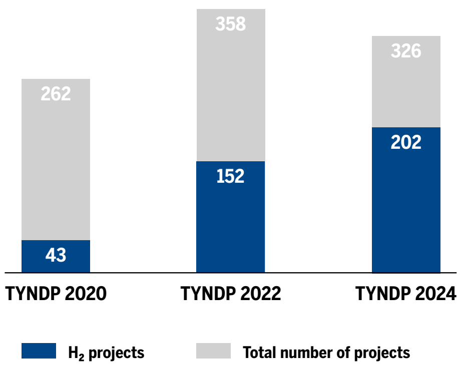

Figure 8: Evolution of total number of projects and hydrogen projects.

16 Retrofitting existing gas infrastructure for blending of (bio-) methane with hydrogen, as defined in the TYNDP 2024 Guidelines for Project Inclusion (p. 38), available at https://tyndp2024.entsog.eu/downloads/.

17 Repurposing of natural gas infrastructure for CO2 transport and/or storage, as defined in the TYNDP 2024 Guidelines for Project Inclusion (p. 42), available at https://tyndp2024.entsog.eu/downloads/.

The following map shows all the projects that were completed since the last TYNDP edition.

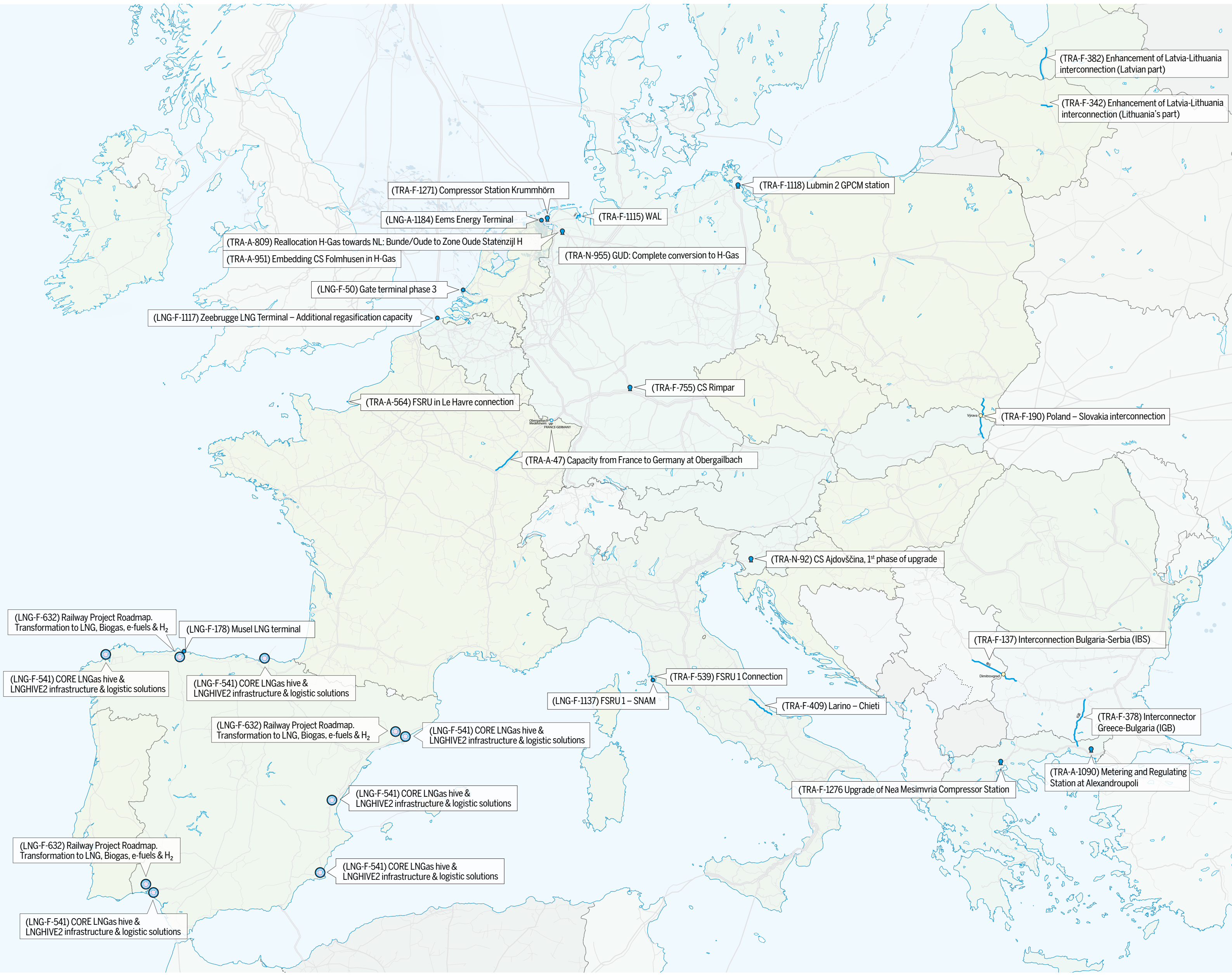

Figure 9: Map of projects commissioned since 2022[18]

- Regarding completion of hydrogen projects, the majority (74%) are expected to be commissioned by 2029. Comparably, over 80% of natural gas projects are planned to be commissioned by the same year.
- A growing number of projects are now included in NDPs. For hydrogen, 33% of projects are part of NDPs, up from 17% in TYNDP 2022. Germany leads, with 24 hydrogen projects. For natural gas projects, Italy and Romania have more included in their NDPs than other countries.
- 71 hydrogen projects were included in the first PCI/PMI Union list, 13 of which belong to the electrolyser subcategory. Two natural gas projects were also included on the list due to exceptional criteria[19], related to security of supply.

18 See the TYNDP 2024 Infrastructure Report for further details, available at https://tyndp2024.entsog.eu/downloads/.

19 Reg. (EU) 2022/869, Article 24

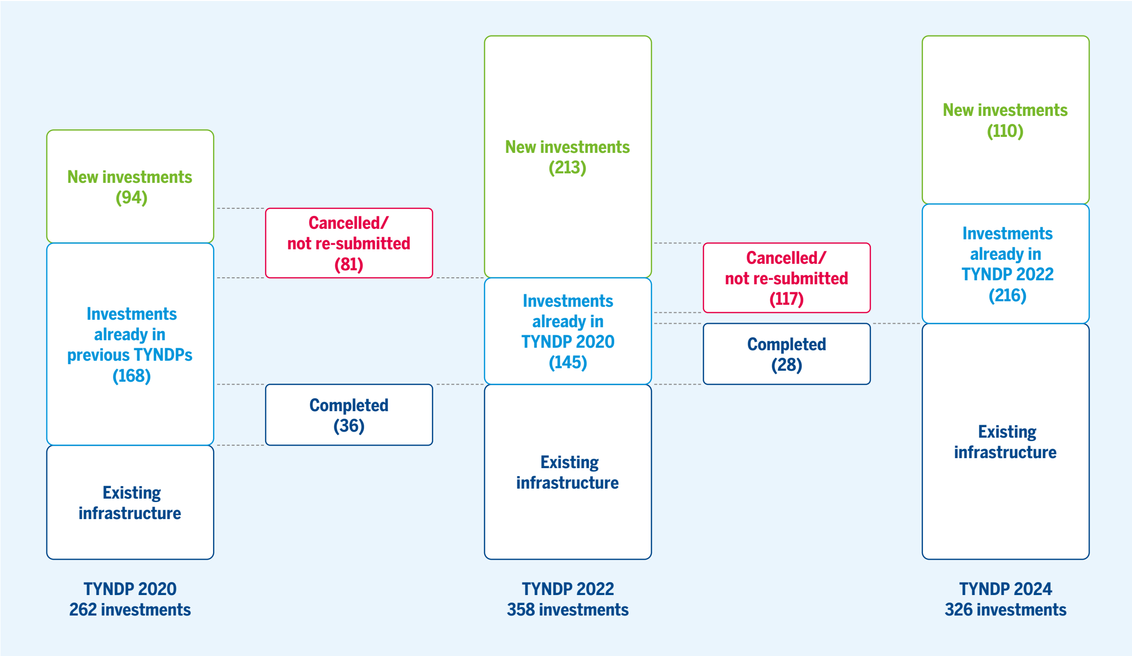

Figure 10: Comparison between TYNDP 2020, TYNDP 2022 and TYNDP 2024.

5.3 INFRASTRUCTURE LEVELS

- The concept of 'infrastructure levels' (sets of infrastructure corresponding a defined maturity status) is also used in TYNDP 2024. There serve as references, compared to which infrastructure gaps are assessed, as well as individual projects.

- There are two infrastructure levels for hydrogen and two for natural gas in TYNDP 2024, graphically represented below. Details can be found in the Infrastructure report, as well as in guidance documents Annex D1 and D2.

See the TYNDP 2024 Infrastructure Report for a comprehensive overview of projects and their evolution compared to previous editions.

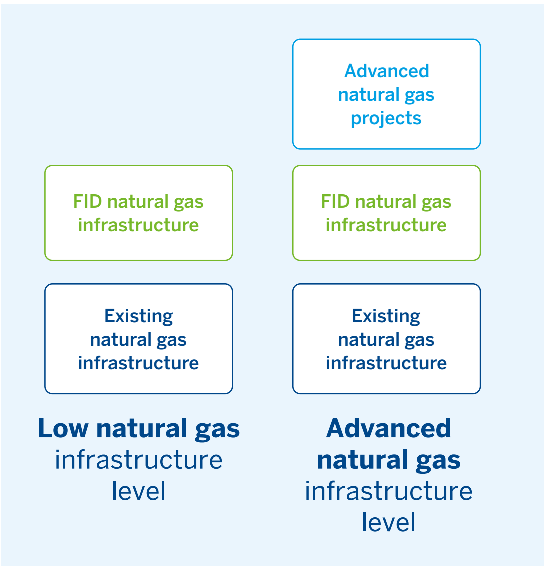

Figure 11: Natural gas infrastructure levels in TYNDP 2024.

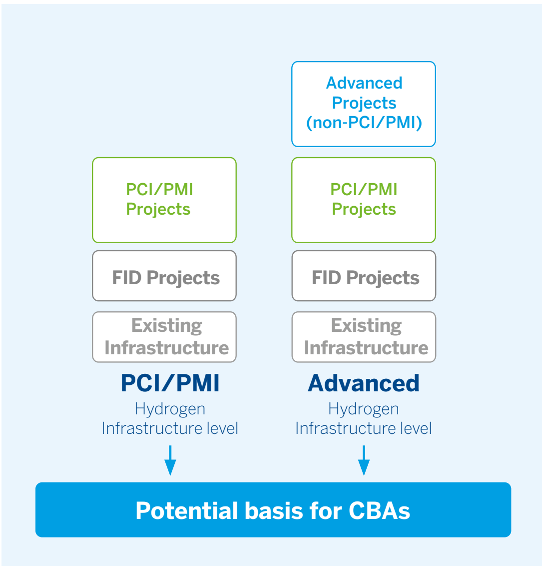

Figure 12: Hydrogen infrastructure levels in TYNDP 2024.

6 NATURAL GAS INFRASTRUCTURE – A KEY-ENABLER OF SECURITY OF SUPPLY, ADEQUACY AND FLEXIBILITY

The natural gas system remains critical in enabling Europe's energy security. It will continue to play a significant role in ensuring a stable and reliable energy supply, transporting declining national production and imports, partly offset by biomethane and synthetic methane. Moreover, gas infrastructure plays a pivotal role in providing the capacity needed for the electricity sector to back up variable RES, helping to mitigate electricity price volatility and reducing costs for industry and society as a whole. Repurposing to hydrogen should follow a comprehensive assessment with the involvement of stakeholders, as mentioned in the joint ENTSOG-ENNOH draft report on Criteria for natural gas infrastructure repurposing.

6.1 DECREASING NATURAL GAS INVESTMENTS

- 17 new and 78 existing projects were submitted to the TYNDP 2024 under the natural gas category. Overall, the share of new natural gas projects decreased from 20% to 14% between TYNDP 2022 and 2024.
- In contrast to hydrogen, natural gas project submissions have been progressively decreasing in recent TYNDP cycles, making up a significant part of the cancelled/not re-submitted projects.
- This can be attributed to two main factors: the development of the hydrogen sector and natural gas projects are no longer eligible for PCI/PMI status, with two exceptions: the EastMed Pipeline and the Malta connection.

6.2 REPURPOSING, SUPPLY ADEQUACY AND SUSTAINABILITY

- Repurposing existing natural gas infrastructure to hydrogen is expected to significantly contribute to the future European hydrogen network: 41 of 100 projects in the hydrogen transmission category of TYNDP 2024 have repurposed components.
- Assessing the implications of such repurposing is critical in the context of security of supply, as it can affect the availability and resilience of the natural gas network – especially if the energy transition is slow to materialise. Any delays in the completion of projects or repurposing to hydrogen may additionally lead to congestion, affecting sustainability, competition and diversification. This process must be planned transparently and in coordination between operators, while safeguarding natural gas security of supply and fulfilling regulatory requirements. An EU-wide security of supply assessment should complement analyses to evaluate the impact of repurposing on system resilience, as mentioned in the conclusions of the 2025 Copenhagen forum.

- As part of the transition, the steady decline in conventional natural gas production in Europe (see chart below) is expected to be mainly offset by biomethane, as well as synthetic methane[20]. All types of methane are also expected to contribute to sustainability needs derived from coal-to-gas switching.
- The imports from Norway, LNG, North Africa, and the Caspian region are increasingly substituted by national production. The invasion of Ukraine by Russia in 2022 led to a major overhaul of energy policy objectives in terms of energy security and diversification of supply. The future development of gas infrastructure must consider the ongoing decarbonisation trend and a need to no longer use Russian gas by 2027, in line with EC legislative proposals of June 2025 outlining the gradual phase-out of Russian gas imports into the EU. The DGM is designed to minimise the use of Russian supply in order to assess potential dependency. Simulation results indicate that Russian pipeline supply does not contribute to the overall supply mix, including in peak demand situations.

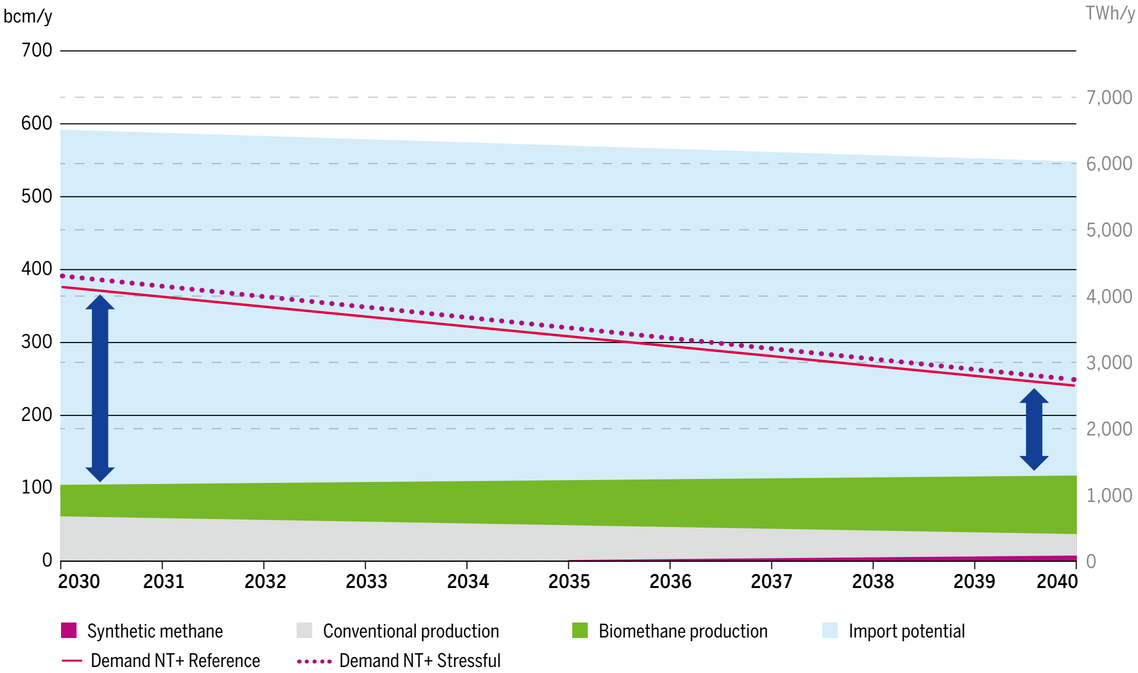

Figure 13: Supply Adequacy Outlook[21]

20 A synthetic fuel produced by conversion from hydrogen and biogenic CO_2, through processes like methanation. This contrasts with biomethane, which is derived from biomass, mainly from agriculture.

21 See the TYNDP 2024 System Assessment Report for further details, available at https://tyndp2024.entsog.eu/downloads/.

Picture courtesy of TAP

6.3 GROWING ROLE OF STORAGE FOR CROSS-SYSTEM FLEXIBILITY

- The role played by gas infrastructure in providing capacities for the electricity sector to back up variable renewable energy sources is pivotal. It can help to mitigate electricity price hikes, leading to lower costs for industries and society as a whole. The ERAA 2024 also confirms this finding of the Natural Gas System Assessment report, quantifying it at a minimum of 50 GW more flexible fossil gas capacity, required by 2035.
- The expected decline in methane demand over the years would also decrease sufficiency required from storage. Nevertheless, underground storages remain essential to support supply and demand balance – not only in Peak Demand (PD) situations but also in the event of supply disruptions.
- Infrastructure stress case simulations, consisting of the Single Largest Infrastructure Disruption (SLID) during a PD situation – *excluding* underground storage facilities and domestic production – under different natural gas and hydrogen infrastructure level combinations indicate the following:
  - A generally robust level of infrastructure cooperation across the EU countries exists. This resilience is further supported by the projected decline in natural gas demand and the anticipated increase in biomethane production, both of which are key assumptions in the NT+ scenario.
  - Impact is most significant in countries located at the periphery of the Europe, due

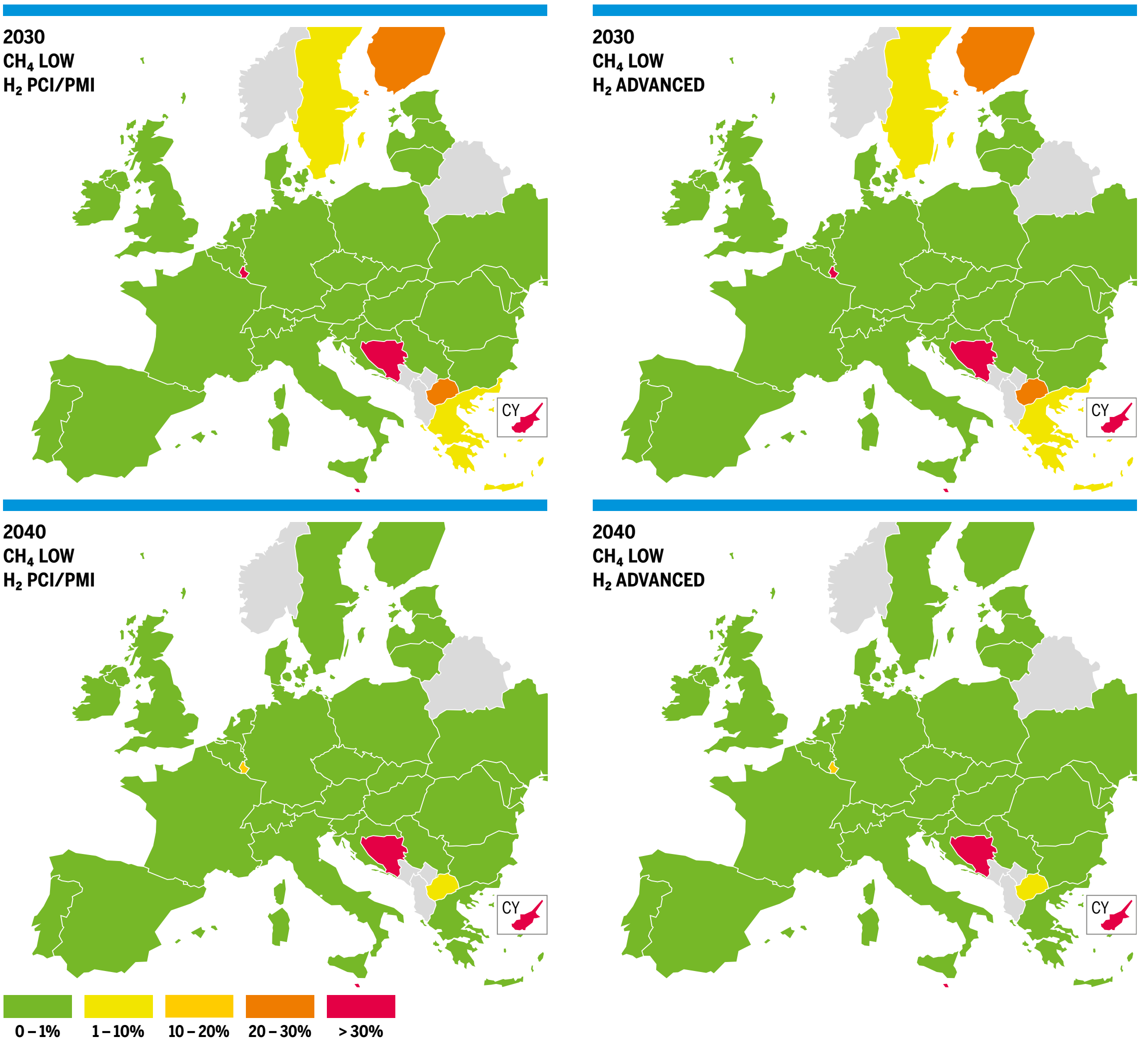

Figure 14: SLID Peak Demand results in Low natural gas infrastructure level

to limited interconnection and reliance on a reduced number of import routes. Cyprus, Malta and Bosnia and Herzegovina are exposed to 100 % demand curtailment, as they each have only one interconnection.

– Other countries, like Sweden, Finland, Northern Ireland, Luxembourg, North Macedonia and Greece show curtailment in 2030 but the situation improves in 2040, with decreasing gas demand and/or growing biomethane availability.

An example of simulation results can be seen in the graphs below. The complete analyses are available in the Natural Gas System Assessment report[22]. In addition, an online visualisation platform, with flexible filtering, is available here.

A coordinated approach, integrating electricity and gases – including natural gas, biomethane, synthetic methane and hydrogen – is critical to ensuring cost-effective and efficient infrastructure development in a technology-neutral way.

22 The report is available on https://tyndp2024.entsog.eu/downloads/.

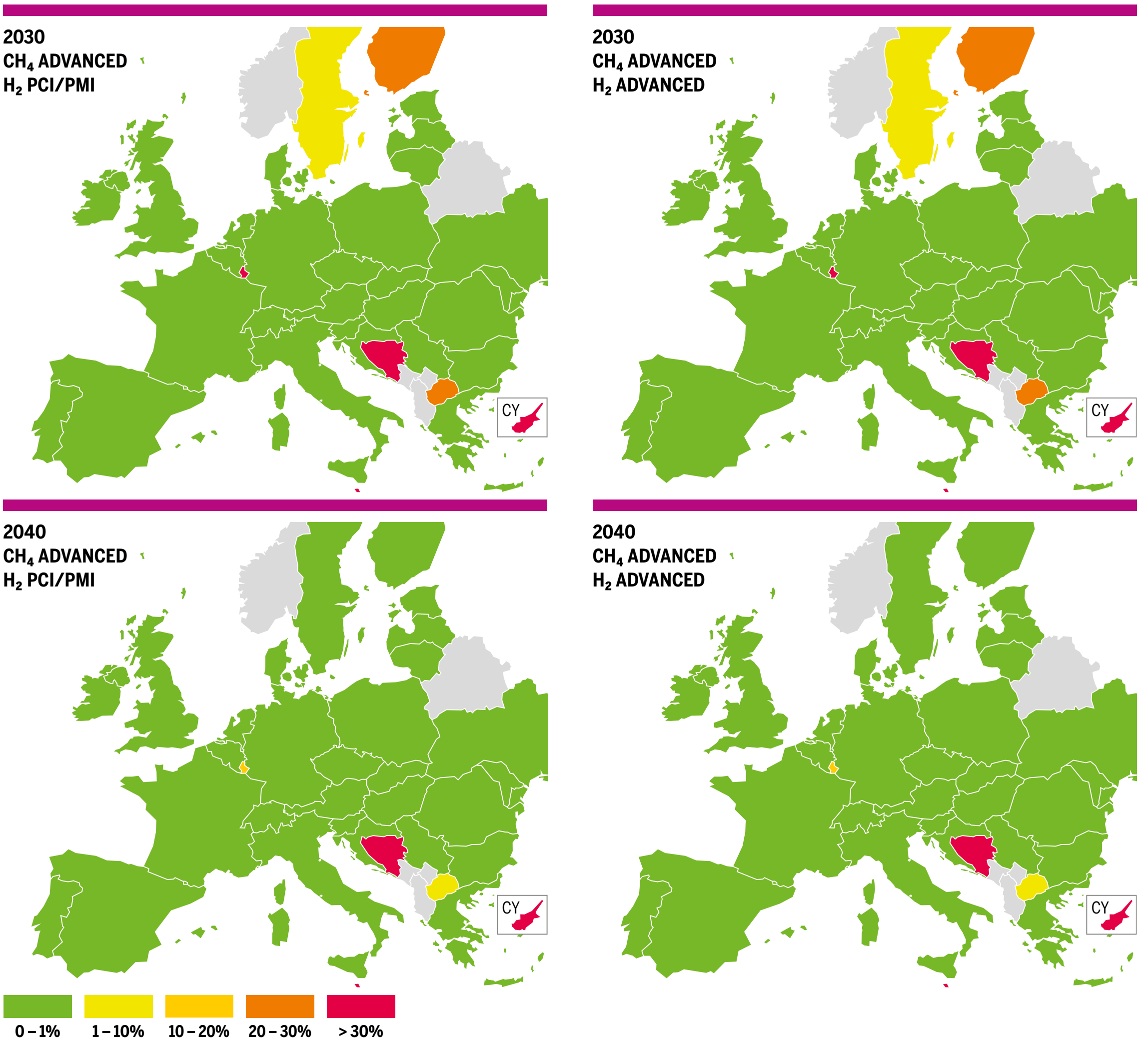

Figure 15: SLID Peak Demand results in Advanced natural gas infrastructure level

7 SIGNIFICANT INFRASTRUCTURE GAPS FOR HYDROGEN FOUND IN 2030 AND 2040, EVEN WITH MOST AMBITIOUS PROJECTS IN PLACE

The Hydrogen IGI report assesses the European hydrogen system using two time horizons as reference, 2030 and 2040, for two hydrogen infrastructure levels. It looks at demand satisfaction, market integration, and future planning.

Hydrogen infrastructure gaps are associated to differences in hydrogen market clearing prices between different country nodes (IGI Indicator 1). These are complemented by demand curtailment levels, assessed for both reference and stressful[23] weather conditions (IGI indicators 2.1 and 2.2).

Hydrogen supply and infrastructure in the two infrastructure levels are insufficient at the European level, as indicated by the IGI indicators. Several countries, especially islands and countries in South-East Europe, are not connected to the European hydrogen backbone in one or both infrastructure levels, showing demand curtailment, in particular under stressful weather conditions.

A solution is to anticipate the realisation of hydrogen projects. Anticipatory investments might not be fully utilised in 2030, but have high utilisation expected by 2040. Projects under Advanced maturity status would be required to reduce unsatisfied demand levels, albeit not completely eliminate them. Projects currently in a less developed stage (Less-Advanced) should be considered in order to improve the supply and demand balance in 2040, under the NT+ scenario.

7.1 ADDING THE ADVANCED INFRASTRUCTURE VISIBLY DECREASES OR CLOSES PRICE SPREADS

- Significant price spreads are already visible in the 2030 PCI/PMI analysis, for instance between Poland-South and Czechia, Belgium and the UK.
  - Adding the Advanced infrastructure level leads to a reduction or even elimination of price spreads at several borders (e.g., Hungary-Austria, Slovakia-Czechia), as new interconnections allow for market convergence.
  - Notably, Italy forms a price region itself. While it has access to new Algerian imports, bottlenecks with Austria assessed on the basis of the current projects configuration limit cross-border transit into the EU. By 2040, increased hydrogen demand results in a general rise in average hydrogen market clearing prices across Europe.
  - Price spreads widen at many borders, like: Finland/Sweden and Germany, Finland and Estonia, Lithuania and Poland-North as fully-used interconnections turn into bottlenecks.
  - Adding the Advanced infrastructure level improves connectivity. More countries gain access to hydrogen supply, which maximises overall socio-economic welfare even if some prices remain high.

23 A stressful weather year has a combination of: lower renewable electricity production (limiting electrolytic hydrogen production), higher electricity consumption (limiting electricity availability for electrolytic hydrogen production) or a combination of cases described above. For further details, see Annex D1 – Implementation Guidelines for Project-specific Cost-Benefit Analyses of Hydrogen Projects, available on https://tyndp2024.entsog.eu/downloads/.

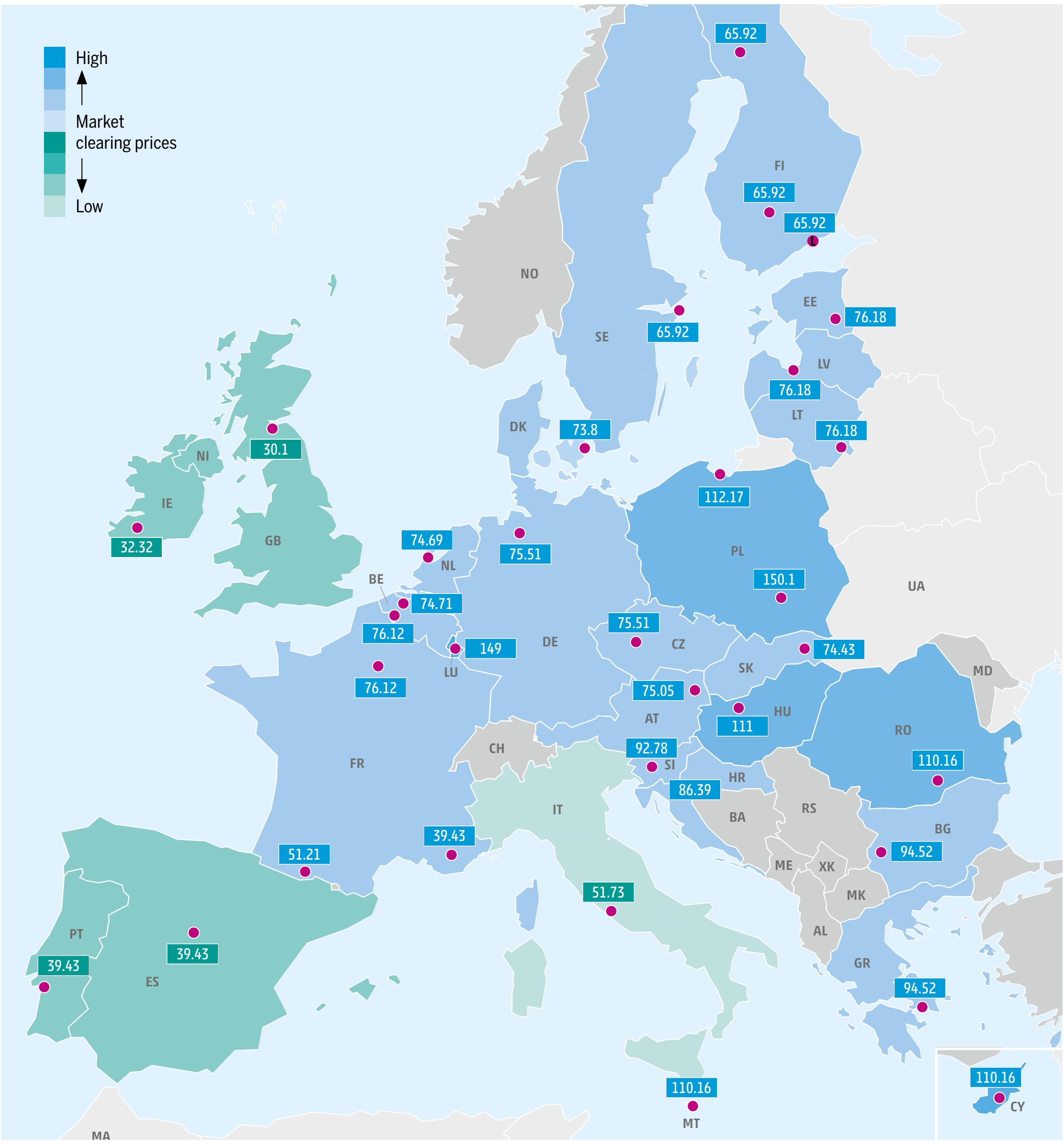

Figure 16: Average of the hourly hydrogen market clearing prices per country in the PCI/PMI hydrogen infrastructure level in 2040 (unit: €/MWh).[24]

24 See the TYNDP 2024 Infrastructure Gaps Identification report for further details, available at https://tyndp2024.entsog.eu/downloads/.

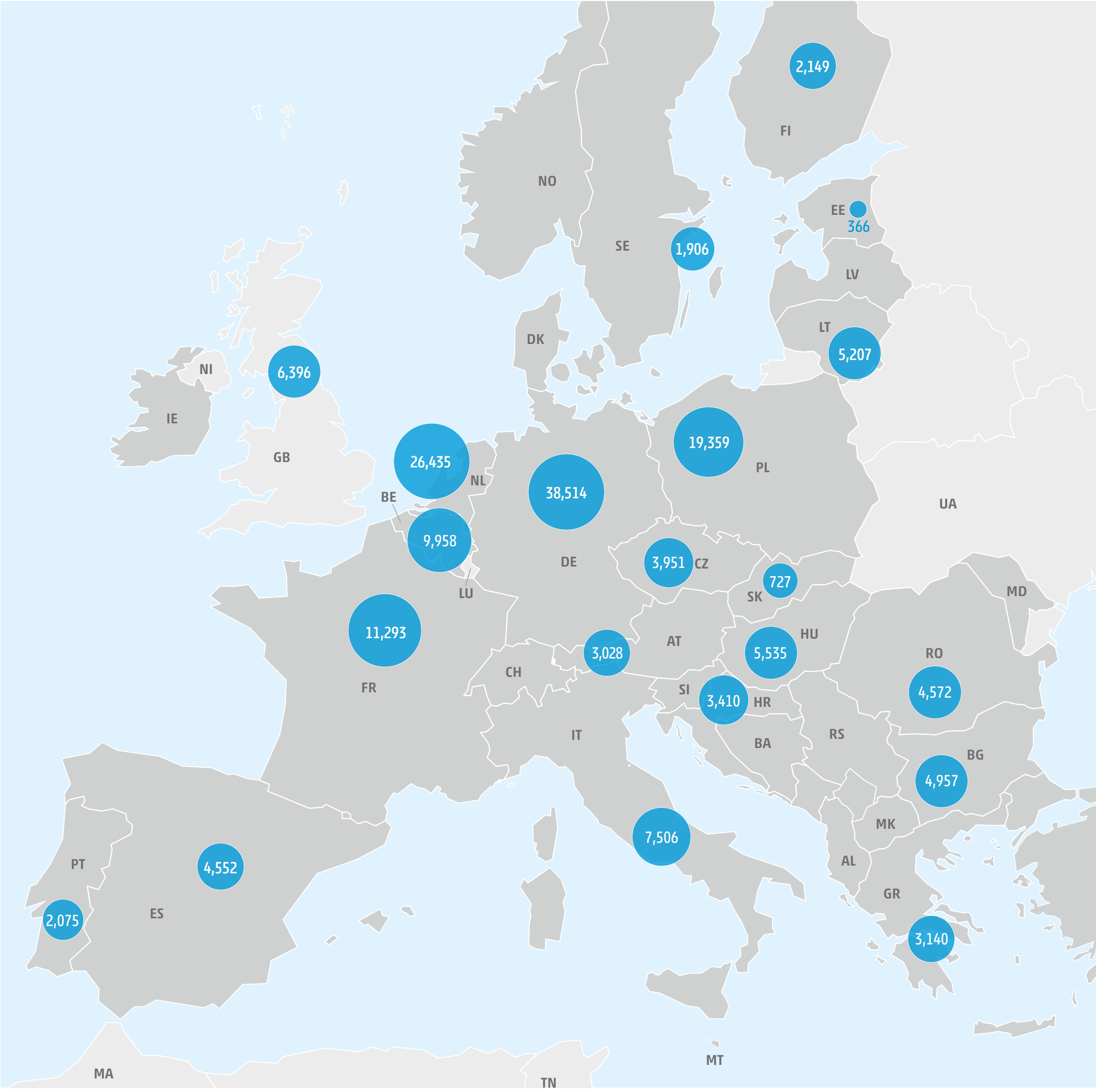

Figure 17: Distribution of hydrogen production from natural gas in the PCI/PMI hydrogen infrastructure level in 2040 for stressful weather year (unit: GWh/y).[25]

25 The SMR capacities are based on the joint TYNDP Scenarios and represent both the expected future operation of currently installed SMR capacities and – where applicable – new-built SMR capacities for producing low-carbon hydrogen. See the TYNDP 2024 Infrastructure Gaps Identification report for further details, available at https://tyndp2024.entsog.eu/downloads/.

7.2 CURTAILMENT IS VISIBLE IN ALL SIMULATIONS, EVEN WITH ADVANCED INFRASTRUCTURE

- Every simulation, across both infrastructure levels, and for both reference and stressful weather years, identified hydrogen demand curtailment, particularly in winter. This means that even with planned infrastructure, supply will not always meet demand.
- In 2030, the PCI/PMI hydrogen infrastructure level shows an 8.3% average curtailment rate in Europe for the reference weather year, rising to 11.1% in a stressful weather hypothesis.
  - Electrolytic hydrogen production is the main hydrogen supply source in Europe in the 2030 PCI/PMI case, with Spain, Finland, Sweden and Germany as the top producers.
  - Adding Advanced infrastructure significantly reduces curtailment, to 4.3% (reference year) and 6.1% (stressful year), due to access to extra-EU supplies and improved interconnections.

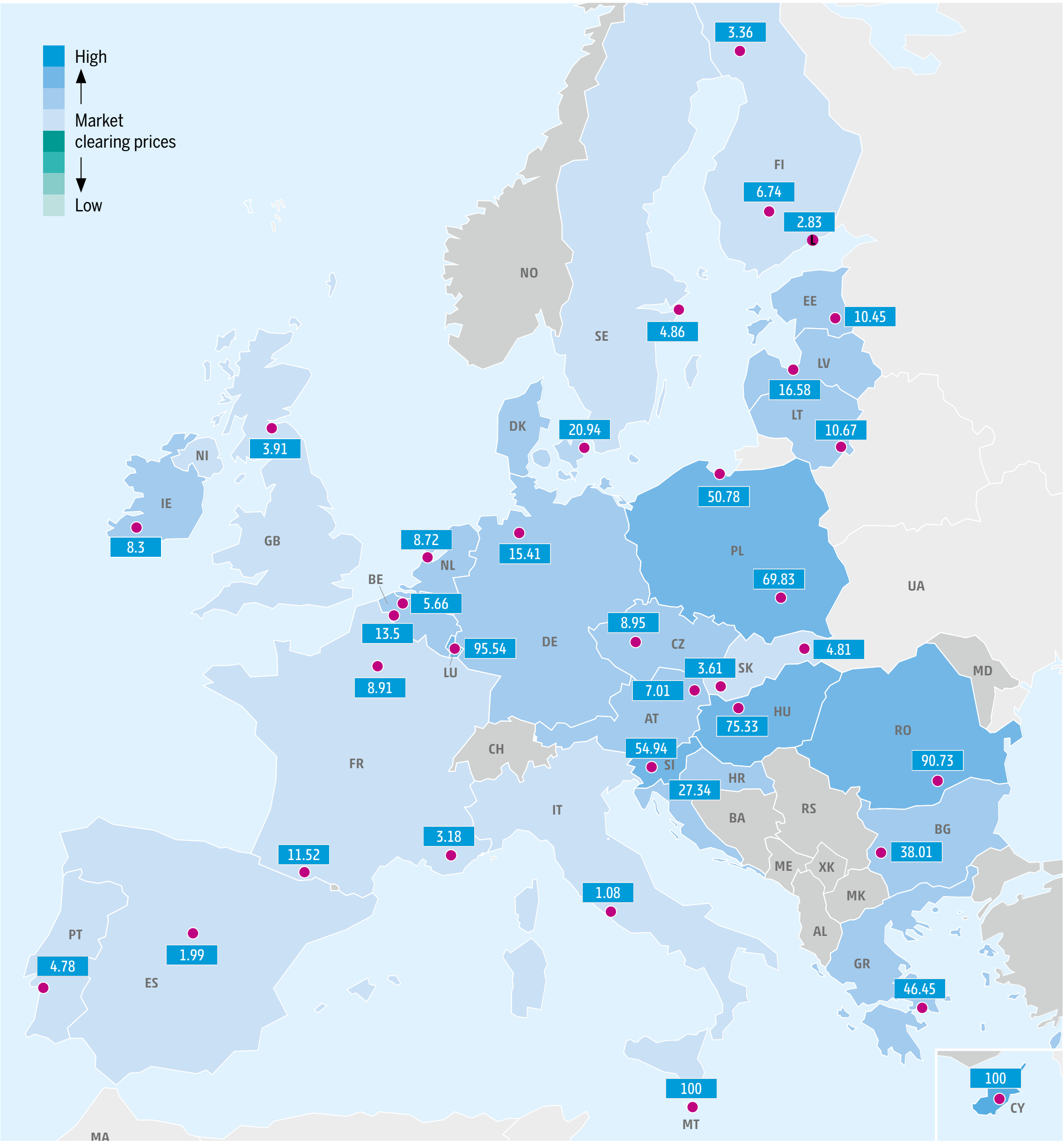

Figure 18: Yearly average hydrogen demand curtailment rate at country or node level in the PCI/PMI hydrogen infrastructure level in 2040 for reference year (unit: %).

- In 2040, when overall hydrogen demand triples, curtailment rates in the PCI/PMI infrastructure level follow this trend, reaching an average of 15% in a reference year and 18% in a stressful weather year.
  - All countries show over 0% curtailment in the PCI/PMI case. Electrolytic hydrogen production remains the main hydrogen supply source in Europe, satisfying 56% of demand.
  - With mitigation through advanced infrastructure, a reduction can be seen, to 12% on average (reference year) and 15% (stressful year) in Europe. This is because such infrastructure includes non-PCI/PMI capacities, that enable transport to countries that were isolated in the PCI/PMI hydrogen infrastructure level. Examples are: the transit route through Slovakia, Hungary and Romania, which complement the maximisation of national hydrogen production enabled by increased capacities.

The complete analyses are available in the draft Hydrogen Infrastructure Gaps Identification report. In addition, an online visualisation platform, with flexible filtering, is available here.

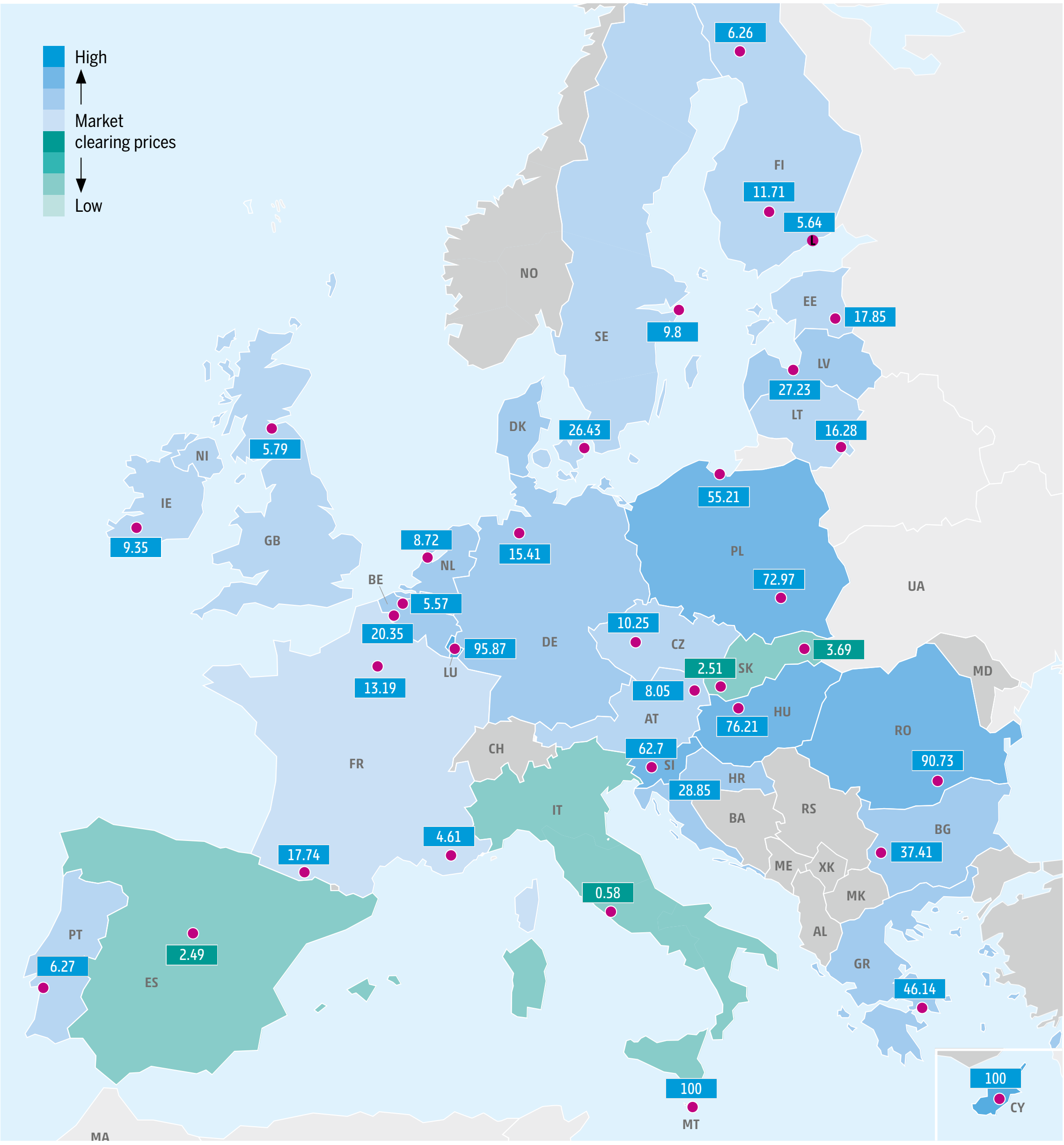

Figure 19: Yearly average hydrogen demand curtailment rate at country or node level in the PCI/PMI hydrogen infrastructure level in 2040 for stressful weather year (unit: %).

8 SIMULATIONS WITH HYPOTHETICAL INFRASTRUCTURE APPROACH

The different sections of the IGI report describe system limitations related to potential bottlenecks in the PCI/PMI and Advanced infrastructure levels. To explore different possibilities and limitations beyond these bottlenecks, four different hypothetical scenarios were defined:

- **Unlimited Pipes (UP):** unlimited connections between (transmission) nodes;
- **Unlimited Pipes + Storages (UPS):** unlimited connections between nodes + unlimited storage withdrawal, injection and working gas volume in existing storage countries;
- **Unlimited Imports (UI):** unlimited imports capacities for imports defined in each infrastructure level and reference years;
- **Unlimited Storages (US):** unlimited storage withdrawal, injection and working gas volume in existing storage countries.

UPS simulation showed the most room for benefits for both infrastructure levels and both simulated years (2030 and 2040). Curtailment was almost totally mitigated in 2030 and reduced by over 60% in 2040. Also, the integration of hydrogen production from electrolysers was best integrated in thisthese specific hypothetical casecases.

These simulations emphasise that additional investment in transmission and storage are needed to meet supply and demand in 2030 and 2040 compared to current PCI/PMI and Advanced infrastructure levels.

Picture courtesy of Gas Connect Austria

9 GROWING BIOMETHANE VOLUMES ENABLE SECURITY OF SUPPLY AND ACCELERATE DECARBONISATION

Biomethane can be injected directly into both TSO and DSO networks as a renewable and locally produced alternative to natural gas. It can thus bring a significant contribution, alongside renewable hydrogen and other technologies, to decarbonise nearly 80% of the EU's gas production by 2030 and to achieve complete decarbonisation by 2050. For instance, the role of biomethane in decarbonisation of flexible thermal power generation, necessary for system reliability, is achieved by switching from fossil fuels like natural gas or coal.

Biomethane further contributes to security of supply of the European energy system by compensating for part of the declining national natural gas production, including in underground storages, especially during peak demand situations or periods of low renewable energy generation. These are likely to occur more often and more intensely in future, in proportion to growing variable RES capacities.

ENTSOG's Natural Gas System Assessment report includes a Supply Adequacy Outlook, containing a biomethane progress report, which monitors evolution compared to the biomethane targets as outlined in the REPowerEU Plan.

The biomethane progress report shows that:

- Biomethane production has grown at a strong pace in recent years, but perspectives on future progress differ. While the current trajectory in the NT+ scenario indicates biomethane potential 5 bcm above the REPowerEU target of 35 bcm by 2030, the recently published 2024 Investment Outlook of the European Biogas Association (EBA) presents much lower figures, close to 11 bcm. It must however be noted that methodology, assumptions and underlying data used for the estimations differ.
- Market and regulatory support is seen as key to unlock the full potential of biomethane and other renewable gases, so that their benefits – to support security of supply, decarbonisation and flexibility – can materialise on time.
- The Natural Gas SA report identifies Italy, France and Spain as top producers in 2030, each with an estimated potential of approximately 6 bcm, followed by Germany with 4 bcm.
- The NT+ scenario foresees that in 2040 the overall production of renewable gases as sufficient to offset the decline in conventional natural gas production. A clear trend in the scenarios is that more biomass will be used in the future for production of biomethane, while less will be used directly for electricity generation. For 2040, biomethane supply in the NT+ scenario is aligned with the level in the EU impact assessment.
- In TYNDP 2024, biomethane projects are classified as a subcategory under the 'Smart Gas Grid' category. More information is available in the TYNDP 2024 System Assessment Report, accessible on https://tyndp2024.entsog.eu/downloads/.

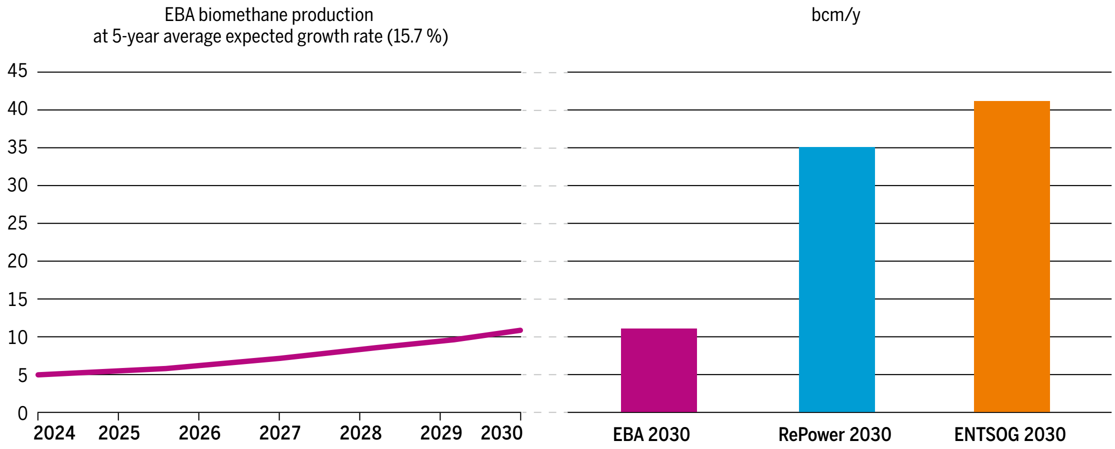

Figure 20: Biomethane production progress comparison

Picture courtesy of Gas Connected Austria

10 TYNDP 2026 ON ITS WAY, BUILDING ON THE SUCCESSES OF TYNDP 2024

ENTSOG remains committed to the goal of achieving a net-zero greenhouse gas emissions energy system in Europe by 2050. The TYNDP 2024 assessments marked a significant advancement in this direction, in particular by progressing on cross-sector modelling. ENTSOG demonstrated its capability in this field by successfully adding a third interlinkage – with the electricity system – to its dual hydrogen-methane network model.

System- and project-level assessments thus became more robust, grounded in a comprehensive cross-sectoral perspective, including for quantification of greenhouse gas emissions. The TYNDP 2026 will enhance this modelling foundation, by implementing further refinements to the optimisation techniques and methodology used, leveraging the learnings from the first application of this approach in TYNDP 2024.

Model improvements for the 2026 Scenarios are already underway, developed collaboratively by ENTSOG and ENTSO-E and supported for the second consecutive cycle by a diversified body of experts, the Stakeholder Reference Group.

Transparent, inclusive stakeholder engagement remains a cornerstone of the TYNDP process. The 2026 edition will build on the extensive consultation and collaboration established according to the revised TEN-E Regulation, the Hydrogen and Decarbonised Gas Market Package (Regulation (EU) 2024/1789) provisions and ACER's Framework Guidelines for the joint scenarios. A new collaboration – with ENNOH – is part of this commitment.

The upcoming 'European Grids Package' expected by end-2025, may further contribute to cross-sector integration, through further optimised network planning mechanisms and support for improved technical solutions.

Looking ahead to TYNDP 2026, ENTSOG is well-prepared to continue the assessment of methane and hydrogen networks, within an increasingly integrated and interconnected energy landscape.

Looking forward to 2026!

Picture courtesy of TAP

LIST OF **FIGURES**

LIST OF **ABBREVIATIONS**

ACER	Agency for the Cooperation of Energy Regulators
bcm	Billion cubic meters/Billion cubic meters per annum
CBA	Cost-Benefit Analysis
CCGT	Combined Cycle Gas Turbine
CCS	Carbon Capture and Storage
CCU	Carbon Capture and Utilisation
CH_4	Methane/Natural Gas
CO_2	Carbon Dioxide
DE	Distributed Energy
DGM	Dual Hydrogen/Natural Gas Model or Dual Gas Model
DHEM	Dual Hydrogen/Electricity Model
DSO	Distribution System Operator
EBA	European Biogas Association
EC	European Commission
ERAA	European Resource Adequacy Assessment
ENTSO-E	European Network of Transmission System Operators for Electricity
ENTSOG	European Network of Transmission System Operators for Gas
ETM	Energy Transition Model
EU	European Union
FID	Final Investment Decision
GA	Global Ambition
GHG	Greenhouse Gases
GPI	Guidelines for Project Inclusion
GWh	Gigawatt hour
H_2	Hydrogen
H2E	Electrolysers for hydrogen production
H2L	Hydrogen reception facilities
H2M	Hydrogen in the transport sector for mobility
H2S	Hydrogen storage facilities
H2T	Hydrogen transmission pipeline
IGI	Infrastructure Gaps Identification
IoSN	Identification of System Needs
LNG	Liquefied Natural Gas
MS	Member State

MWh	Megawatt hour
NDP	National Development Plan
NECPs	National Energy and Climate Plans
NT	National Trends
OCGT	Open Cycle Gas Turbine
PCI	Project of Common Interest
PD	Peak Demand
PMI	Project of Mutual Interest
RES	Renewable Energy Sources
SLID	Single Largest Infrastructure Disruption
SRG	Stakeholder Reference Group
TEN-E	Trans-European Networks for Energy Regulation
TSO	Transmission System Operator
TWh	Terawatt hour
TYNDP	Ten-Year Network Development Plan

COUNTRY CODES (ISO)

AL	Albania
AT	Austria
AZ	Azerbaijan
BA	Bosnia and Herzegovina
BE	Belgium
BG	Bulgaria
BY	Belarus
CH	Switzerland
CY	Cyprus
CZ	Czech Republic
DE	Germany
DK	Denmark
DZ	Algeria
EE	Estonia
ES	Spain
FI	Finland
FR	France
GR	Greece
HR	Croatia
HU	Hungary
IE	Ireland
IT	Italy
LT	Lithuania
LU	Luxembourg
LV	Latvia
LY	Libya
MA	Morocco
ME	Montenegro
MK	North Macedonia
MT	Malta
NL	Netherlands, the
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
RS	Serbia
RU	Russia
SE	Sweden
SI	Slovenia
SK	Slovakia
TM	Turkmenistan
TN	Tunisia
TR	Turkey
UA	Ukraine
UK	United Kingdom

LEGAL **DISCLAIMER**

The TYNDP was prepared by ENTSOG on the basis of information collected and compiled by ENTSOG from its members and from stakeholders, and on the basis of the methodology developed with the support of the stakeholders via public consultation. The TYNDP contains ENTSOG own assumptions and analysis based upon this information.

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In particular, the information hereby provided with specific reference to the Projects of Common Interest ("PCIs") and Projects of Mutual Interest ("PMIs") is not intended to evaluate individual impact of the PCIs and PMIs and PCI candidates and PMI candidates. For the relevant assessments in terms of value of each PCI and PMI the readers should refer to the information channels or qualified sources provided by law.

Publisher ENTSOG AISBL
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