TYNDP // 2026

Version // June 2026

Annexes to the Draft Scenarios Report

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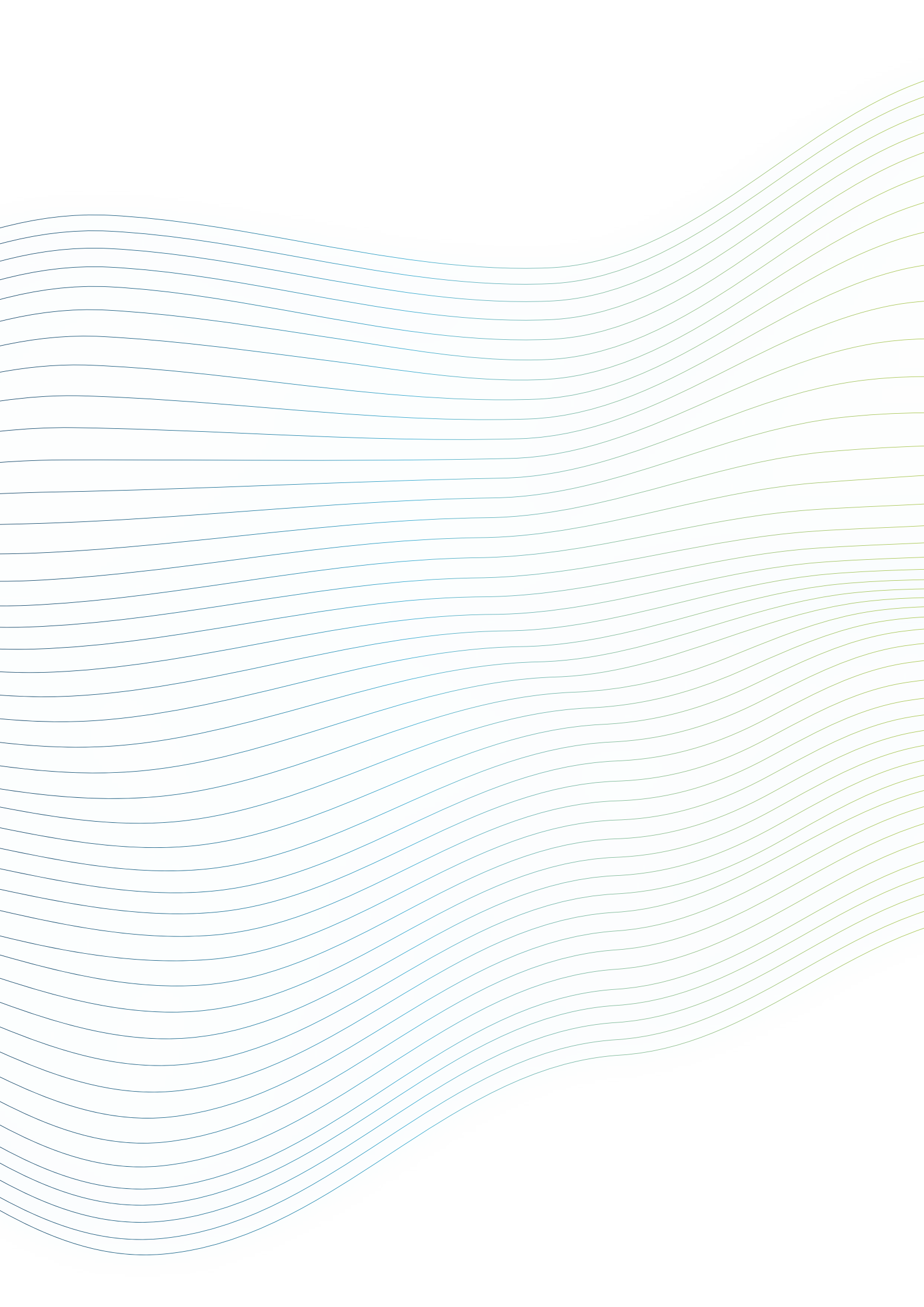


CONTENTS //

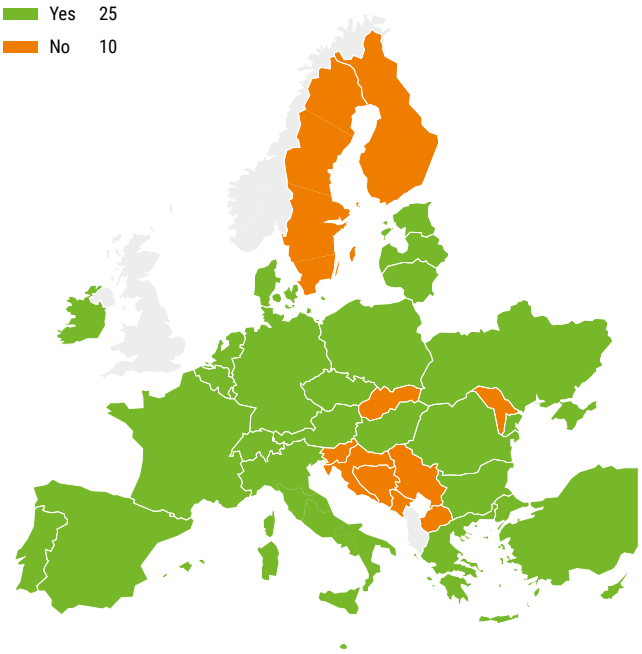
ANNEX I: TSO SURVEY OUTCOMES //

TSO Survey[1]

The TSOs completed a structured survey to align key input data across countries, ensuring consistency in the scenario-building process. The results were jointly assessed by ENTSOG and ENTSO-E to support the development of coherent joint TYNDP 2026 scenarios. This aligned dataset was also used to support the ERAA process.

The supporting evidence regarding country alignment (or misalignment) is outlined below.

1 // Validation of data before submission to ENTSO-E/ENTSOG



Q 8/9

Have you validated data before submission for the studies? If yes, with whom?

(Questions 8 and 9 // PDF)

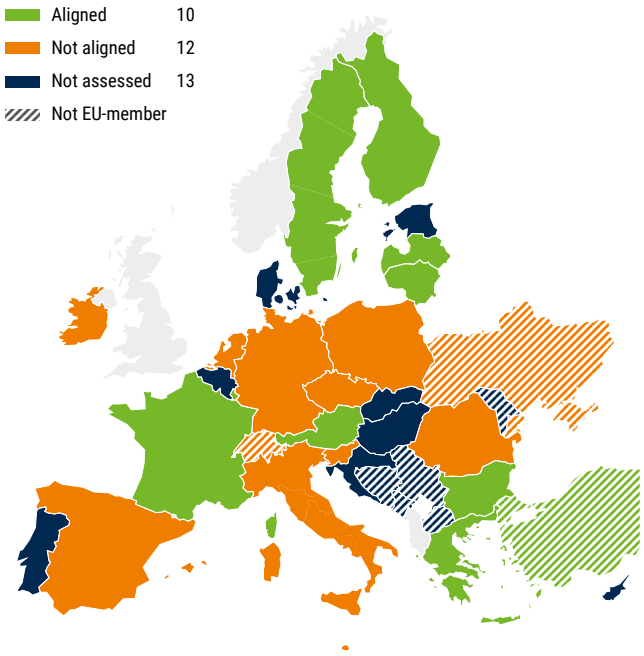
Have you validated data before submission for the studies? If yes, with whom?							
	Validated?	**NRA**	**Ministries**	**DSOs**	**Other authorities**	**Other Stakeholders**	**Others**
AT	Yes						Data supply by Umweltbundesamt (federal environmental agency)
BA	No						Not assessed
BE	Yes		×	×		×	The assumptions and values for demand of TYNDP 2026 were presented informally to Synergrid (network operators for gas and electricity) and to Federal authorities before the closure of the data collection period.
BG	Yes		×				

1 For countries in white no answer is available from the survey.

Have you validated data before submission for the studies? If yes, with whom?							
	Validated?	NRA	Ministries	DSOs	Other authorities	Other Stakeholders	Others
CH	Yes	×					Part of the data (mostly generation data) had been discussed with the NRA as common input data for an internal adequacy study. This applies to target years until 2035 included.
CY	Yes		×				
CZ	Yes		×			×	We receive the power generation data from large resource operators, associations and relevant government officials for NECP assessment (Ministry of Industry and Trade and Ministry of Environment).
DE	Yes	×	×			×	Most of the Data for ERAA 2025 and TYNDP 2026 is derived from other processes that are either carried out or approved by the NRA or German ministries (NECP or NDP). In some cases the data deviates from these processes.
DK	Yes		×		×		The Analysis Assumptions for Energinet 2024, delivered by the Danish Energy Agency to Energinet, has been modified by Energinet in terms of developments in the Danish energy sector and then utilised as the main scenario reported for ERAA 2025. The modified version and reasoning for this modification can be found here (in Danish). The Danish Energy Agency has been notified about this modified version.
EE	Yes		×			×	Market participants who submitted information about the future plans regarding their generation units
ES	Yes		×				
FI	No						
FR	Yes		×			×	French ministry has made available to RTE, Natran and Terega the assumptions from a draft version of SNBC (National Low-Carbon Strategy) under construction at the time of data collection for ERAA 2025 and TYNDP 2026 (not yet published), which was the main source of information for demand related data submitted for TYNDP.
GR	Yes	×	×				Centre For Renewable Energy Sources (CRES)
HR	No						
HU	Yes					×	Each year, significant effort is made to align the target years' data with both the NECP (currently: final NECP submitted in October, 2024 with target years 2030, 2040, 2050) and the latest annual Hungarian NDP (currently with target years 2030, 2035) as best as possible. Through formal surveys, the Energy Ministry, the NRA and other leading stakeholders of the industry are involved in the scenario-building process of the NDP. Besides that, the practical scenario-building is done by an expert group consisting of representatives of the NRA, the TSO and all the DSOs.
IE	Yes						
IT	Yes		×				Only for target year 2050
LT	Yes		×				Electricity and Gas TSOs always reconcile data before submitting for TYNDP.
LU	Yes		×				
LV	Yes	×					
MD	No						
ME	No						
MK	No						

Have you validated data before submission for the studies? If yes, with whom?							
	Validated?	**NRA**	**Ministries**	**DSOs**	**Other authorities**	**Other Stakeholders**	**Others**
MT	Yes		×		×		The Energy and Water Agency validated data for renewables and final energy demand.
NL	Yes	×	×	×	×	×	All of the above. The data submitted for NT+ has been extensively validated in the course of the national scenarios development process and are consulted with external stakeholders (sector representatives, experts, energy companies, industrial customers, regional authorities, etc.) and the relevant ministry (KGG). The national regulatory authority (ACM) has also been informed about the national scenario development process, assumptions and datasets. These consultations/alignments take place on different levels, e.g. stakeholder workshops, bilateral meetings, etc.
PL	Yes		×			×	Data validation is understood as data made available for the purposes of the process by individual entities (ministry and power sector entities).
PT	Yes				×		Portuguese Directorate for Energy and Geology – DGEG.
RO	Yes		×				
RS	No						
SE	No						The input data is based on the national short-term electricity market analysis and the long-term scenario EP.
SI	No						The data is not validated by other entities, however, all the data is aligned with national development plans, NECP and other relevant documents.
SK	No						
TR	Yes						
UA	Yes		×	×	×	×	• Ministry of Energy, Ministry of Economy, Ministry of Environment Protection • National Bank of Ukraine • Reform Support Team at the Ukrainian Ministry of Energy • private companies – owners of various types of generation incl. Nuclear, Hydro, Coal, Gas, Renewables, Municipal cogeneration, industrial works cogeneration, battery energy storages, professional associations

2 // Compliance with EU's renewable energy target on demand data



Q 10

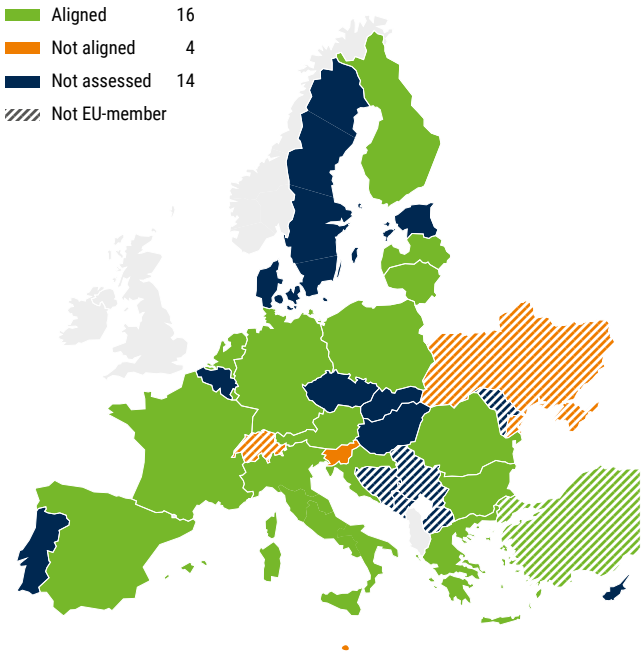
Please confirm if submitted energy demand data is compliant with indicative national contributions towards EU's final energy consumption targets sent to the Member States.

(Question 10 // PDF)

	Compliance with EU's RES target	If not aligned, please justify
AT	Aligned	
BA	Not assessed	
BE	Not assessed	At the time of the data collection in December 2024, no final NECP was available for Belgium. The submitted data was aligned as best as possible with existing draft NECP together with available national and regional policies (incl. known RES targets of the regions).
BG	Aligned	
CH	Not aligned	Not applicable to CH as a non-EU member. Data based on Swiss National Framework for Grid Planning, aiming at net zero by 2050.
CY	Not assessed	We used the data from the NECP submitted in December 2024. For years beyond those covered by the NECP, we were provided data through the ministry's underlying (unpublished) studies behind the NECP. As a TSO, we don't assess the NECP's compliance with EU targets.
CZ	Not aligned	TYNDP 2026 FEC is not aligned, because FEC in the ETM reference scenario (in 2019) was significantly higher than FEC in the reference scenario in NECP (1178 vs. 1030 PJ). Eurostat data also show lower FEC for CZ compared to the reference in the ETM. Therefore, to reach the desired national contribution in ETM, we would need about 28 % reduction (not 11.7 %). Besides, NECP does not provide sufficient data granularity to enable responsible adjustment of the utilisation of different technologies across the FEC sectors in the ETM. WGSB has not developed any methodology or guidelines for such a case. Therefore, the fallback solution was used. These concerns were raised multiple times during data collection by both TSOs.
DE	Not aligned	The final NECP is not aligned with the indicative target, we used data from the updated NECP published in August 2024.
DK	Not assessed	The Analysis Assumptions for Energinet 2024, delivered by the Danish Energy Agency to Energinet, has been utilised as the main scenario reported for TYNDP/SB 2026, which is generally compliant with the Danish NECP section A, but not section B.
EE	Not assessed	A final updated NECP was unavailable during data submission, but preliminary information is aligned.
ES	Not aligned	According to Table 4 in the Annex to COM (2025) 274 final, the Spanish NECP is "significantly above" the target contribution by member states. The TSOs aimed at meeting the NECP energy consumption targets, not the indicative national contributions. However, due to the difficulty in correctly reflecting the sector specific objectives stated in the NECP within the ETM, the total energy demand data for 2030 is 10.5 % above the final national contribution in the NECP.

	Compliance with EU's RES target	If not aligned, please justify
FI	Aligned	
FR	Aligned	Energy demand data for NT+ scenario were defined based on the NECP draft scenario from the Energy Transition Ministry whose objective was to comply with climate targets. We were particularly vigilant to approach electricity and gas consumptions, but due to the complexity of the reverse engineering process to fit the final demand in ETM tool (defining hypothesis in the ETM tool and not directly final energy demand by energy carrier), there might be discrepancies for other carriers of energy.
GR	Aligned	
HR	Not assessed	Data is aligned with last NECP and National energy strategy.
HU	Not assessed	We used final NECP submitted in October 2024, but as TSO we have not assessed the exact alignment of the figures with the indicative national contributions. Nevertheless, the submitted renewable energy capacities are equal to/higher than the NECP targets.
IE	Not aligned	Utilised WAM, which as recognised in the NECP that even with the full implementation of the very ambitious.
IT	Not aligned	NECP is not aligned.
LT	Aligned	
LU	Aligned	
LV	Aligned	
MD	Not assessed	Moldova is not an EU member state. Our NECP sets a target of at least a 27 % share of renewable energy in final energy consumption in 2030
ME	Not assessed	Montenegro is still not a part of the EU. The projections were based on previously available data and communication with the relevant institutions. The draft NECP was published only at the stage of the public consultation at the end of June 2025, therefore there are minor differences between the NECP projections and the submitted data. These differences are not expected to have a significant impact on the results or the relevant assessments.
MK	Not assessed	MK is not EU Member
MT	Not aligned	Final energy demand data is aligned with figures submitted in final NECP 2021–2030
NL	Not aligned	In principle the RES capacities submitted as part of the data collection should be sufficient to comply with this target (at least when considering import & export in the calculations). However, ultimately this depends on the supply modelling performed by the ENTSOs.
PL	Not aligned	The data PSE relied on is based on the latest version of the NECP project*, which was available at the time of data collection process. The values concerning energy demand data are not fully compliant with the indicative national contributions target.
PT	Not assessed	PT demand data is aligned with NECP but it was not assessed if it is aligned with indicative national contributions towards EU's final energy consumption targets.
RO	Not Aligned	
RS	Not assessed	Serbia is not an EU member.
SE	Aligned	Our scenarios for 2050 have been modeled with climate neutrality as a goal.
SI	Not aligned	TYNDP data is partially compliant with NECP for the gas related sectors. The data for the sectors: Buildings, Households, Industry, Transport, is compliant with NECP for years 2030, 2035 and 2040. The data for 2050 is not compliant due to the problems with accessing NECP in December 2024 and in May 2025. For the 2050 the fallback solution applies (average of DE/GA scenarios from previous TYNDP cycle).
SK	Not assessed	By the time of data collection for ERAA, approved updated SK NECP was not available. In case the TSOs did not dispose with the requested data, default solutions for such case was applied. Most of the RES data (such as solar and wind) is based on the NECP up to 2030. Data for the mid and long term is based on relevant prognoses and comes from internal studies.
TR	Aligned	
UA	Not aligned	The situation in Ukraine is changing from week to week; we based on the data from National bank of Ukraine, Ministry of Economy.

3 // Compliance with indicative national contributions on renewable energy target



Q 11

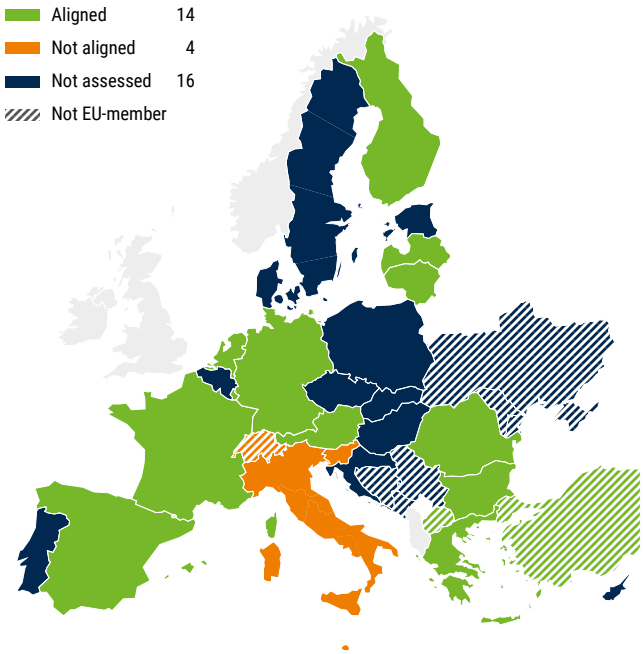
Please confirm if submitted data is compliant with indicative national contributions towards EU's renewable energy target.

(Question 11 // PDF)

	Compliance with EU's RES target	If not aligned, please justify
AT	Aligned	
BA	Not assessed	
BE	Not assessed	At the time of the data collection in December 2024, no final NECP was available for Belgium.
BG	Aligned	
CH	Not aligned	Not applicable to CH as a non EU member.
CY	Not assessed	We used the data from the NECP submitted in December 2024. For years beyond those covered by the NECP, we were provided data through the ministry's underlying (unpublished) studies behind the NECP. As a TSO, we don't assess the NECP's compliance with EU targets.
CZ	Not assessed	RES target is expressed as the share of RES in the gross final energy consumption. Submitted data include installed capacities only, while the actual share of RES in the gross final energy consumption will only be available after the market simulation. We expect not alignment with target proposed by EC (30,1 % as NECP target vs. 33 % proposed by EC), as RES installed capacities in the submitted data are aligned with the amount of the installed capacities in the CZ NECP.
DE	Aligned	
DK	Not assessed	The Analysis Assumptions for Energinet 2024, delivered by the Danish Energy Agency to Energinet, has been utilised as the main scenario reported for TYNDP/SB 2026, which is generally compliant with the Danish NECP section A, but not section B.
EE	Not assessed	A final updated NECP was unavailable during data submission, but preliminary information is aligned.
ES	Aligned	
FI	Aligned	
FR	Aligned	Data submitted to ERAA 2025 and TYNDP 2026 is compatible with the FitFor55 targets.

	Compliance with EU's RES target	If not aligned, please justify
GR	Aligned	
HR	Aligned	
HU	Not assessed	We used final NECP submitted in October 2024, but as TSO we have not assessed the exact alignment of the figures with the indicative national contributions. Nevertheless, the submitted renewable energy capacities are equal to/higher than the NECP targets.
IE		
IT	Aligned	
LT	Aligned	
LU	Aligned	
LV	Aligned	
MD	Not assessed	Moldova is not an EU member state. Our NECP sets a target of at least a 27 % share of renewable energy in final energy consumption in 2030
ME	Not assessed	In Table 3, only EU member states are listed, while Montenegro is not included since it is not an EU member. Therefore, the table does not contain an indicative RES target for Montenegro. The RES targets for Montenegro are defined through the National Energy and Climate Plan (NECP) and the obligations within the Energy Community. Montenegro already produces more than 60 % of its electricity from renewable energy sources.
MK	Not assessed	MK is not EU Member
MT	Not aligned	Figures provided are aligned with Final NECP published on 7 January 2025.
NL	Aligned	See above.
PL	Aligned	
PT	Not assessed	PT renewable data is aligned with NECP but it was not assessed if it is aligned with indicative national contributions towards EU's renewable energy target.
RO	Aligned	
RS	Not assessed	Serbia is not an EU member.
SE	Not assessed	We have not 2030 as a focus year in our scenarios.
SI	Not aligned	TYNDP data is partially compliant with NECP for the gas related sectors. The data for the sectors: Buildings, Households, Industry, Transport, is compliant with NECP for years 2030, 2035 and 2040. The data for 2050 is not compliant due to the problems with accessing NECP in December 2024 and in May 2025. For the 2050 the fallback solution applies (average of DE/GA scenarios from previous TYNDP cycle).
SK	Not assessed	By the time of data collection for TYNDP/SB 2026, approved updated SK NECP was not available. In case the TSOs did not dispose with the requested data, default solutions for such case was applied. Most of the RES data (such as solar and wind) is based on the NECP up to 2030. Data for the mid and long term is based on relevant prognoses and comes from internal studies. Contributions towards the EU's renewable energy target are not assessed in the case of the ETM data collection because the data is based on the ENTSO-E/ENTSOG fallback solution (an average of the DA and GA scenarios outcomes of the TYNDP 2024).
TR	Aligned	
UA	Not aligned	The NECP of Ukraine is used as a general roadmap, and National Renewables Development Action Plan until 2030 - as a direct plan.

4 // Compliance with indicative national contributions on 2030 GHG reduction target



Q 12

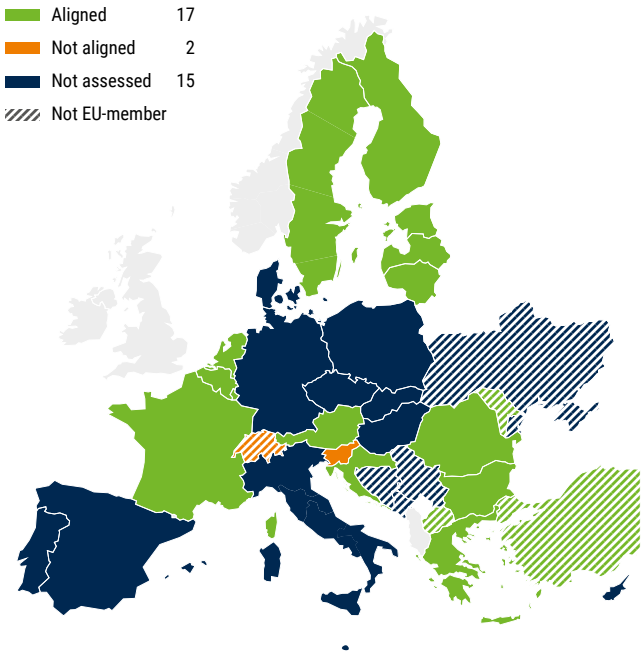
Please confirm if the delivered datasets are compliant with national references to comply with EU's binding 2030 GHG reduction target.

(Question 12 // PDF)

	Compliance EU's binding 2030 GHG reduction	If not aligned, please justify
AT	Aligned	
BA	Not assessed	
BE	Not assessed	At the time of the data collection in December 2024, no final NECP was available for Belgium. The submitted data was aligned as best as possible with existing draft NECP together with available national and regional policies.
BG	Aligned	
CH	Not aligned	Not applicable to CH as a non EU member. Data based on Swiss National Framework for Grid Planning, aiming at net zero by 2050.
CY	Not assessed	We used the data from the NECP submitted in December 2024. For years beyond those covered by the NECP, we were provided data through the ministry's underlying (unpublished) studies behind the NECP. As a TSO, we don't assess the NECP's compliance with EU targets.
CZ	Not assessed	Not Assessed, for power generation very likely not aligned because we submitted generation data according to the latest information from operators. The FEC is based on the fallback solution. Since both scenarios used for fallback solution (DE and GA for TYNDP 2024) are compliant with the EU's 2030 GHG reduction target (-55 % GHG compared to 1990 levels), does that mean the fallback solution should be aligned as well? Confirmation needed from WGSB team.
DE	Aligned	
DK	Not assessed	The Analysis Assumptions for Energinet 2024, delivered by the Danish Energy Agency to Energinet, has been utilised as the main scenario reported, which is generally compliant with section A of the Danish NECP. It has not been possible to assess this specific section as the Analysis Assumptions for Energinet 2024 do not include the entire Danish energy consumption and production, and not all sectors with greenhouse gas emissions.
EE	Not assessed	A final updated NECP was unavailable during data submission, but preliminary information is aligned.
ES	Aligned	
FI	Aligned	

	Compliance EU's binding 2030 GHG reduction	If not aligned, please justify
FR	Aligned	Energy demand data for NT+ scenario were defined based on the NECP draft scenario from the Energy Transition Ministry whose objective was to comply with climate targets, whereas only a global assessment of the energy consumptions (not only on final demand) can estimate the total amount of GHG emissions.
GR	Aligned	
HR	Not assessed	Data is aligned with last NECP and National energy strategy.
HU	Not assessed	We used final NECP submitted in October, 2024, but as TSO we have not assessed the exact alignment of the figures with the indicative national contributions.
IE	N/A	
IT	Not aligned	NECP is not aligned.
LT	Aligned	
LU	Aligned	
LV	Aligned	
MD	Not assessed	Moldova is not an EU member state. However, our NECP sets a target to reduce GHG emissions by 70 % below 1990 levels by 2030. According to the latest National Inventory Report "1990-2022: Greenhouse Gases and Sinks in the Republic of Moldova", GHG emissions in 2020 were 71.5 % lower than in 1990.
ME	Not assessed	Montenegro is not an EU Member State and therefore does not have binding EU 2030 GHG reduction targets. The country's commitments are defined through the Energy Community framework and the National Energy and Climate Plan (NECP). For this reason, the compliance with EU binding 2030 GHG targets has not been assessed.
MK	Aligned	In line with Macedonian NECP.
MT	Not aligned	Used data is aligned with Final NECP published on 7 January 2025.
NL	Aligned	See above.
PL	Not assessed	Poland did not submit a final updated NECP but provided preliminary information for "EU wide assessment of the final updated national energy and climate plans". Data used for TYNDP 2026 is primary based on the latest NECP project which was available at the time of data collection process.
PT	Not assessed	PT data is aligned with NECP but it was not assessed if it is aligned with national references to comply with EU's binding GHG reduction target.
RO	Aligned	
RS	Not assessed	Serbia is not an EU member.
SE	Not assessed	We have not 2030 as a focus year in our scenarios.
SI	Not aligned	TYNDP data is partially compliant with NECP for the gas related sectors. The data for the sectors: Buildings, Households, Industry, Transport, is compliant with NECP for years 2030, 2035 and 2040. The data for 2050 is not compliant due to the problems with accessing NECP in December 2024 and in May 2025. For the 2050 the fallback solution applies (average of DE/GA scenarios from previous TYNDP cycle).
SK	Not assessed	In the case of the TYNDP/SB 2026, which relates to the ETM data collection, it is not possible to provide an assessment, because the data is based on the ENTSO-E/ENTSOG fallback solution (an average of the DA and GA scenarios outcomes of the TYNDP 2024).
TR	Aligned	
UA	Not assessed	The NECP of Ukraine is used as a general roadmap, and the direct target for electricity generation mix for (25 % from hydro + renewables electric energy produced in the total one) 2030 is stated in the National Economy Development Strategy until 2030.

5 // Compliance with targets under EU's 2050 net-zero emission objective



Q 13

Please confirm the compliance of your datasets with national targets under EU's binding 2050 net-zero emissions objective.

(Question 13 // PDF)

	Compliance EU's binding 2030 GHG reduction	If not aligned, please justify
AT	Aligned	
BA	Not assessed	
BE	Aligned	The data submitted was aligned with previous studies performed by Elia and Fluxys and considering scenarios which comply with the 2050 net-zero objective.
BG	Aligned	
CH	Not aligned	Not applicable to CH as a non-EU member. Data based on Swiss National Framework for Grid Planning, aiming at net zero by 2050.
CY	Not assessed	We used the data from the NECP submitted in December 2024. For years beyond those covered by the NECP, we were provided data through the ministry's underlying (unpublished) studies behind the NECP. As a TSO, we don't assess the NECP's compliance with EU targets.
CZ	Not assessed	Not assessed as we opted for the fallback solution - see the reasoning in question 10. Besides, there are no established national targets under EU's binding 2050 net-zero emissions objective. If we have used only CZ NECP it would have been non compliant with net-zero target as CZ NECP does not reach net-zero in 2050 (approx. 8 $MtCO_2eq$ remains). However, for TYNDP, we opted for the fallback solution. Both scenarios (GA and DE for TYNDP 2024) are net-zero compliant at the EU level. Compliancy of the fallback solution needs to be confirmed by WGSB team. Power generation was submitted according to the information from operators.
DE	Not assessed	The Data submitted deviates in parts from the NECP and has been supplemented by data from the German hydrogen import strategy. The impact on GHG-emissions was not assessed.
DK	Not assessed	The Analysis Assumptions for Energinet 2024, delivered by the Danish Energy Agency to Energinet, has been utilised as the main scenario reported, which is generally compliant with section A of the Danish NECP. It has not been possible to assess this specific section as the Analysis Assumptions for Energinet 2024 do not include the entire Danish energy consumption and production, and not all sectors with green house gas emissions.
EE	Aligned	

	Compliance EU's binding 2030 GHG reduction	If not aligned, please justify
ES	Not assessed	The Spanish 2050 Long-Term Decarbonisation Strategy states that Climate Neutrality by 2050 is a scenario in which greenhouse gas emissions are completely absorbed by carbon sinks, achieving net-zero greenhouse gas emissions by 2050. In the case of this document, emissions will be reduced by 90 % compared to 1990, with the remaining 10 % absorbed by sinks. However, there is no long-term study or strategy that provides figures for installed capacities to achieve this goal. Spanish TSOs do not have a national reference on which to base their generation capacity by 2050, so they have provided data compatible with the European net-zero.
FI	Aligned	
FR	Aligned	Energy demand data for NT+ scenario were defined based on the NECP draft scenario from the Energy Transition Ministry whose objective was to comply with climate targets. Only a global assessment of the energy consumptions (not only on final demand) can estimate the total amount of GHG emissions.
GR	Aligned	
HR	Aligned	
HU	Not assessed	We used final NECP submitted in October, 2024, but as TSO we have not assessed the exact alignment of the figures with the indicative national contributions.
IE	N/A	N/A
IT	Not assessed	NECP is not bound to the climate neutrality targets for 2050, which will be further refined during the ongoing work on updating the Long-Term Strategy (LTS).
LT	Aligned	
LU	Aligned	
LV	Aligned	
MD	Aligned	
ME	Not assessed	Montenegro is not an EU Member State and is therefore not subject to the EU binding 2050 net-zero emissions objective. National long-term decarbonisation goals are addressed through the Energy Community process and national strategic documents (e. g., NECP). For this reason, the compliance with EU 2050 objectives has not been assessed.
MK	Aligned	In line with Macedonian NECP.
MT	Not assessed	Data is aligned with final NECP.
NL	Aligned	In principle the RES and CCS capacities submitted as part of the data collection should be sufficient to comply with this target (at least with the climate target benchmark methodology we applied). However, ultimately this depends on the supply modelling performed by the ENTSOs.
PL	Not assessed	Data used for TYNDP 2026 is primary based on the latest NECP project which was available at the time of data collection process. NECP covers the period up to 2040 only. According to the NECP project Poland's pathway and contribution to achieving the EU's climate neutrality target will be more precisely defined in the long-term strategy to 2050, which will be developed by the Ministry responsible for energy sector.
PT	Not assessed	PT data is aligned with NECP which does not cover 2050 horizon, therefore same data as for 2040 was used for 2050. In other cases, some data was based on PT National Resource Adequacy Assessment Studies and/or on data provided by the Portuguese Directorate for Energy and Geology - DGEG. Compliance with EU's binding 2050 net-aero emissions objective was not assessed.
RO	Aligned	
RS	Not assessed	Serbia is not an EU member.
SE	Aligned	
SI	Not aligned	TYNDP data is partially compliant with NECP for the gas related sectors. The data for the sectors: Buildings, Households, Industry, Transport, is compliant with NECP for years 2030, 2035 and 2040. The data for 2050 is not compliant due to the problems with accessing NECP in December 2024 and in May 2025. For the 2050 the fallback solution applies (average of DE/GA scenarios from previous TYNDP cycle).
SK	Not assessed	In the case of the TYNDP/SB 2026, which relates to the ETM data collection, it is not possible to provide an assessment, because the data is based on the ENTSO-E/ENTSOG fallback solution (an average of the DA and GA scenarios outcomes of the TYNDP 2024).
TR	Aligned	
UA	Not assessed	The NECP of Ukraine is used as a general roadmap.

6 // Compliance with EU's energy efficiency first principle

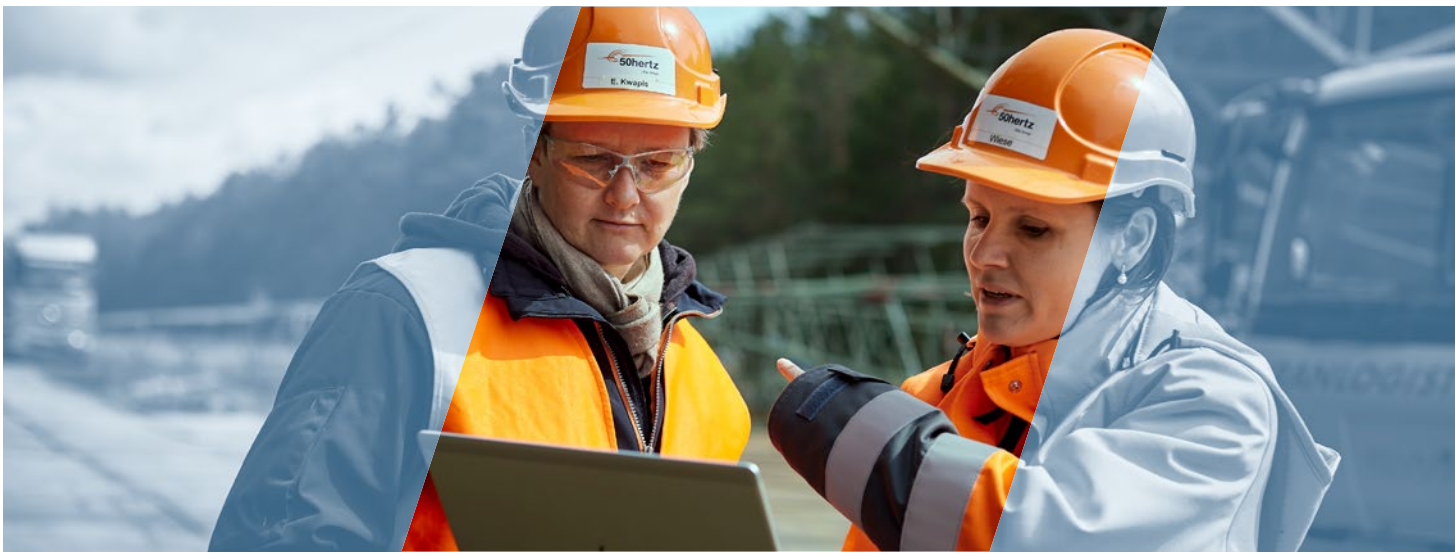
Please describe how specific assumptions are included in the datasets you provided for the National Trends Scenario for each time horizon (2030, 2035, 2040, 2050), for the inclusion of the EE1st principle on the supply side and on the demand side.

(Question 14 // PDF)

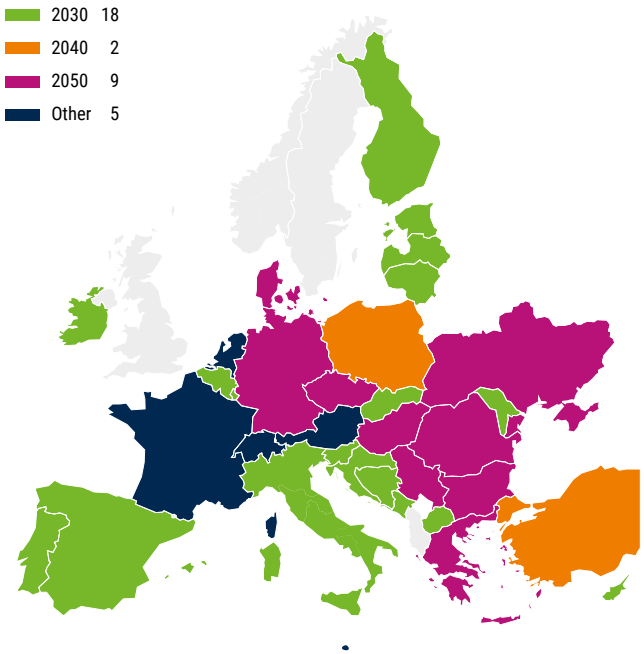
Q 14

	Assumptions description
AT	
BA	
BE	Electrification of Heating, Transport and Industrial Demand (including flexibility of demand). Increased renovation rates, therefore increasing insulation of buildings Modal shift of transport
BG	
CH	Not applicable to CH as a non-EU member. Data based on Swiss National Framework for Grid Planning, aiming at net zero by 2050.
CY	We used the data from the NECP submitted in December 2024. For years beyond those covered by the NECP, we were provided data through the ministry's underlying (unpublished) studies behind the NECP.
CZ	RES capacities follow NECP assumptions for solar and wind. Electrolysers capacities for 2030 follow NECP assumptions. Remaining assumptions are described in TYNDP 2024 Report as we opted for the fallback solution (the GA/DE scenarios were used as the fallback solution).
DE	The EE1st principle is included in the NECP and therefore also in the submitted Data. It is mainly considered by switching from less efficient technologies to more efficient technologies.
DK	The Analysis Assumptions for Energinet 2024, delivered by the Danish Energy Agency to Energinet, has been utilised as the main scenario reported, which do not explicitly included or assessed the EE1st principle.
EE	Demand forecasting objectives incorporate energy efficiency targets, with particular emphasis on the renovation of residential buildings and the decarbonisation of the transport and industrial sectors.
ES	Spanish TSOs have aimed to align with the NECP, which outlines how the Energy Efficiency First principle is embedded across sectors: · Buildings: Through long-term renovation strategies and efficiency targets for public buildings. · Transport: Via the 2030 Sustainable Mobility Strategy. · Industry and Households: By promoting behavioral change, digitalisation, and energy services. · Infrastructure Planning: The plan prioritises demand-side measures before considering new infrastructure, ensuring that energy savings are evaluated as the first option. For time horizons beyond 2030, where the NECP does not provide detailed guidance, TSOs have sought to follow the same trend. In particular, hydrogen is considered a substitute for other fuels, with renewable hydrogen production identified as the most efficient supply technology aligned with net-zero scenarios. Only those hydrogen end-uses are considered that represent the most energy-efficient pathway towards achieving net-zero emissions by 2050.
FI	
FR	NA
GR	Updated NECP data used
HR	Data is taken from NECP and national energy strategy forecast
HU	Demand side: heat pumps combined with PV panels (state aids, development programs), decreasing energy intensity assumptions (i.e. moderate electricity demand growth) due to insulation (e.g. state aid programs for improving energy efficiency of buildings) Supply side: penetration of new, more energy-efficient renewable technologies (e.g. innovative wind turbines, solar panels with tracking)
IE	
IT	For 2030, datasets follow the assumptions set in the national NECP. For 2035, 2040, and 2050, assumptions are aligned with national planning frameworks scenarios developed by TSOs and the national Long-Term Strategy
LT	Overall energy demand reduction for all time horizons due to efficiency and electrification.

	Assumptions description
LU	Our datasets are aligned with NECP.
LV	During preparation of the consumption this principle was not considered, due to low consumption and enough generating capacity + interconnections with neighboring countries consumption management measures are not necessary yet.
MD	
ME	The National Trends Scenario reflects the EE1st principle by integrating efficiency measures that keep demand in a moderate range (≈3.0–3.4 TWh by 2050). On the demand side, this includes building renovations, efficient heating, and transport electrification. On the supply side, reduced demand lowers the need for new fossil capacity, enabling a gradual coal phase-out with the Pljevlja TPP closing by 2040 and its replacement by RES expansion (solar, wind, hydro).
MK	In the data provided for the National Trends Scenario, the assumptions for North Macedonia are based on the NECP (2021), which transposes the Energy Efficiency First (EE1st) principle in line with EU targets under the Energy Community framework. On the demand side, the NECP adopts the EU methodology for reducing primary and final energy consumption by 2030, ensuring that demand growth is moderated through efficiency measures in buildings, appliances, transport, and industry. These reductions are consistent with the EU-wide 2030 efficiency target set in the Energy Efficiency Directive. On the supply side, the NECP applies EE1st by prioritising efficiency and flexibility measures over costly new generation or grid reinforcements, in line with the EU principle that system needs should first be addressed through demand reduction and system optimisation. This ensures that North Macedonia's scenario development remains consistent with EU long-term objectives for 2040–2050, where efficiency, flexibility, and decentralisation are considered before central supply expansion.
MT	Although NECP time horizon is up to 2030, the policies and measures included are designed to comply with the EU's 2050 net Zero Target.
NL	See above.
PL	Data used for TYNDP 2026 is primary based on the latest NECP project which was available at the time of data collection process. This project takes into account the implementation of planned policies and regulations aimed at improving energy efficiency.
PT	2030, 2035 and 2040 PT datasets assume energy efficiency principles according to NECP. Some data values were based on PT National Resource Adequacy Assessment Studies and/or on data provided by the Portuguese Directorate for Energy and Geology - DGEG.
RO	N/A
RS	Serbia is not an EU member.
SE	
SI	Data is partially aligned with NECP.
SK	The same assumptions that apply to the supply side in the ERAA also apply to long-term horizons. For the demand side, the ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios of the TYNDP 2024).
TR	
UA	Implicitly included in the demand for electric energy.



7 // Horizon covered by your country's NECP



Q 18

What is the time horizon covered by your country's NECP?

(Question 18 // PDF)

	Covered time horizon	Please specify below
AT	Other	Last update of the NECP covers the period 2021–2030 (acc. to 2018/1999); some trajectories cover until 2040 and 2050.
BA	2030	
BE	2030	
BG	2050	
CH	Other	Switzerland does not have a NECP. The Swiss National Framework for Grid Planning covers until 2040.
CY	2030	
CZ	2050	
DE	2050	
DK	2050	Parts of section A covers until 2050, however section B mostly covers until 2040. The time horizon for The Analysis Assumptions for Energinet 2024 covers up until 2050.
EE	2030	
ES	2030	
FI	2030	
FR		2030–2035
GR	2050	
HR	2030	
HU	2050	
IE	2030	
IT	2030	
LT	2030	
LU	2030	

	Covered time horizon	Please specify below
LV	2030	
MD	2030	
ME	2030	
MK	2030	
MT	Other	Time horizon of data provided in NECP varies. Renewables - 2030, Final Energy Demand - 2040, Electricity Supply - 2030.
NL	Other	The main focus of the Dutch NECP is the time horizon until 2030. However, it partly contains an outlook until 2050 (also see attachment to the NECP).
PL	2040	
PT	2030	
RO	2050	
RS	2050	
SE		
SI	2030	
SK	2030	Some parts of the NECP includes projections beyond 2030, extending to 2035, 2040, 2045 and 2050.
TR	2040	
UA	2050	N.B. There is no info for Ukraine at the links provided.

8 // Data for years beyond the NECP horizon

How is data derived for years beyond the NECP horizon? Please specify the sources with their dates and provide the source if publicly available (e.g., national long-term strategy published in November 2024).

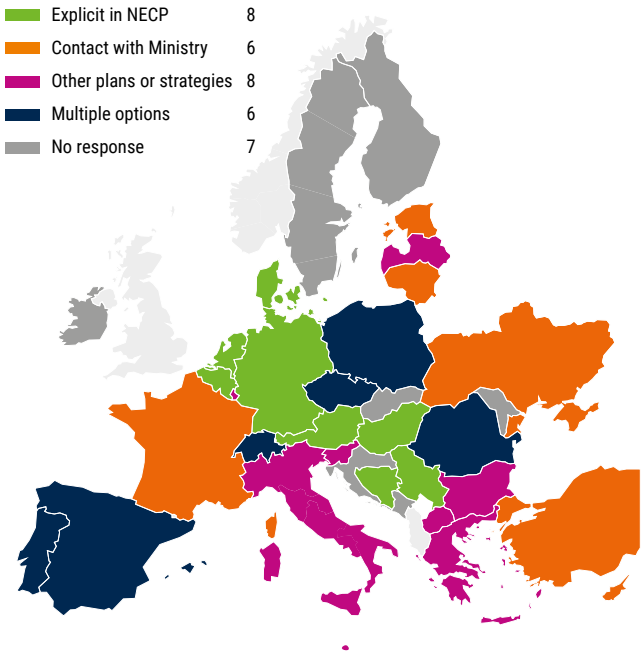
(Question 19 // PDF)

Q 19

How is data derived for years beyond the NECP horizon?								
	TSO/DSO studies and plans	Political targets	National (government) energy strategies	Connection requests	Studies from independent research institutions	NECP covers all years	Other drivers	If other, please specify
AT	×	×	×	×			×	Last update of the NECP covers period 2021–2030 (acc. to 2018/1999); some trajectories cover until 2040 and 2050.
BA	×							
BE	×	×	×	×	×			Stakeholder inputs from national consultation processes from the "Adequacy and Flexibility study 2026–2036".
BG								
CH			×					The reference energy strategy is the Energy Perspectives 2050+ (EP2050+).
CY							×	Data provided by the ministry, through their underlying studies for the NECP.
CZ								
DE						×		
DK			×			×		The Analysis Assumptions for Energinet 2024, delivered by the Danish Energy Agency to Energinet, has been utilised as the main scenario reported, which is generally compliant with section A of the Danish NECP. On 30 August 2024, the Danish Energy Agency published a consultation version of the Analysis Assumptions for Energinet 2024 to give external stakeholders the opportunity to comment on the assumptions and ask clarifying questions. A public consultation meeting was held on September 9, and it was possible to submit consultation responses until 19 September 2024.
EE	×	×	×	×	×			
ES	×	×	×	×	×		×	Spanish Economic Forecasting Centre Association
FI	×			×				
FR	×	×	×	×			×	National (government) energy strategies: draft of future NECP.
GR								
HR			×					
HU						×		
IE								
IT	×		×	×				

How is data derived for years beyond the NECP horizon?								
	TSO/DSO studies and plans	Political targets	National (government) energy strategies	Connection requests	Studies from independent research institutions	NECP covers all years	Other drivers	If other, please specify
LT			×				×	Lithuanian Energy Transformation Study to 2050.
LU			×		×		×	In the context of the NECP, the national long-term strategy has been supported by simulations carried out by STATEC. However, the data is not publicly available. In addition, complementary studies have been carried out by independent consultant.
LV	×			×				
MD	×							
ME	×			×				
MK			×					For longer-term projections (e.g., 2035, 2040, 2050), assumptions are typically extrapolated from NECP 2030 targets and in line with National Energy Strategy.
MT								
NL	×	×	×	×	×		×	The NECP for the Netherlands only partly contains quantitative information which we require to build scenarios. Furthermore, most of the figures (for example in Annex 4 of the NECP) are outdated. As a result, the NECP is not suitable as direct input to our scenarios. However, the underlying national climate and energy policies which are reflected in the NECP are of course considered in our national scenarios.
PL							×	Reverse-engineering carried out to retrieve some data.
PT			×				×	Years beyond NECP horizon were based on PT National Resource Adequacy Assessment studies and/or on data provided by the Portuguese Directorate for Energy and Geology (DGEG).
RO						×		
RS						×		Data for Serbia has been aligned with the connection requests for all of the time horizons.
SE		×	×	×				
SI								
SK					×		×	Studies by an independent consultancy company as well as from the internal forecasts and action plans (e.g. • https://www.minv.sk/?ros_ministerstvo-hospodarstva-slovenskej-republiky&sprava=gov-akcny-plan-rozvoja-elektromobility-v-sr • https://www.mhsr.sk/nvs) • ENTSO-E/ENTSOG fall back solution (an average DA and GA scenarios of TYNDP 2024)
TR	×							
UA	×					×	×	• NECP of Ukraine is treated as a general roadmap, TSO provide own results based on consultations with Ministries and stakeholders.

9 // Compliance with NECP in demand and capacity



Q 20

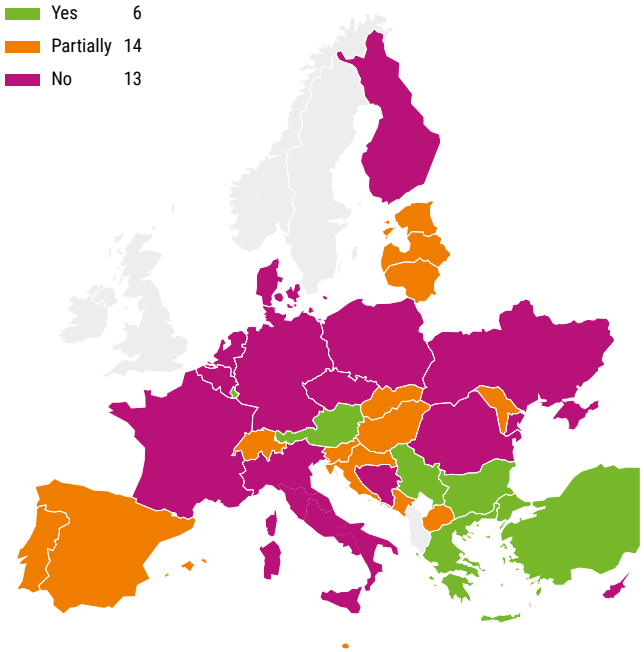
Please explain how you ensured the submitted energy demand and capacity data is compliant with NECP and provide the source.

(Question 20 // PDF)

	Demand and capacity compliant with NECP	Contact with Ministry for compliance with NECP	Using published plans for compliance with NECP	Please explain how you ensured the submitted energy demand and capacity data is compliant with NECP
AT			×	Nationaler Energie- und Klimaplan (NEKP) Please also refer to question 9
BA			×	Indicative Development Generation Plan, www.nosbih.ba
BE			×	Electricity Demand and Capacity is compliant with latest "Adequacy and Flexibility for Belgium 2026-2036" study of Elia.
BG	×			
CH	×		×	For years out of scope of the Swiss National Framework for Grid Planning, the published data in the EP2050+ scenarios was used.
CY		×		Explicit projections from the underlying NECP studies were provided, via the ministry, from their consultants that carried out the studies.
CZ	×		×	TYNDP dataset is not NECP compliant (fallback solution), thermal resources from operators, RES and electrolysers (for 2030 only) installed capacities from NECP.
DE			×	As the NECP provides only a high level overview, the technical report behind the NECP has been used as a source (Technischer Anhang der Treibhausgas-Projektionen 2024 für Deutschland).
DK			×	The Analysis Assumptions for Energinet 2024, delivered by the Danish Energy Agency to Energinet, has been utilised as the main scenario reported, which is generally compliant with section A of the Danish NECP.
EE		×		
ES	×	×	×	Data submitted has been shared and presented to the Ministry before its final submission.
FI				

	Demand and capacity compliant with NECP	Contact with Ministry for compliance with NECP	Using published plans for compliance with NECP	Please explain how you ensured the submitted energy demand and capacity data is compliant with NECP
FR		×		As no official trajectory was available at the time (up to 2050), we used non public data from NECP draft transmitted by the Energy Transition Ministry and try to approximate the energy demand data by defining assumptions in the ETM tool.
GR	×			
HR				Contact with NECP and energy strategy producer.
HU			×	Main sources: the NECP, official plans of power plants (regular consultation), official network connection plans/requests.
IE				
IT	×			Some figures were derived by data reported in the national NECP publicly available.
LT		×		
LU	×			
LV	×			
MD				
ME				
MK	×			
MT	×			
NL			×	We use one of our own grid operator scenarios for the TYNDP. We submitted the data from the scenario "Koersvaste Middenweg", which closely follows the national energy policies, ambitions and national strategies (i.e. National Plan Energysystem, NPE). This scenario had been jointly developed and published by both national TSOs (TenneT, Gasunie) and the regional distribution companies. See for more information here.
PL	×	×		Demand: data from WAM scenario of NECP project.
PT		×	×	Demand and capacity submitted data were based on both PT National Resource Adequacy.
RO		×	×	Thermal capacity are updated based of the most recent information from generators and discussed with Ministry.
RS			×	Submitted demand is aligned with the forecasts done within the National Development Plan.
SE				
SI	×			Additionally TSOs are in contact with all the relevant institutions and discuss the needs and projections that could change and differ from published documents.
SK				The final energy demand in individual sectors of the national economy, as well as the total energy demand are based on the WAM scenario of the NECP. Link
TR		×		
UA		×		The access to the energy information is restricted in Ukraine, only consultations with Ministries and stakeholders are available.

10 // Granularity of NECP data



Q 21/22

Does the NECP provide sufficient granularity for the TYNDP and ERAA datasets?

(Question 21 // PDF)

How did you obtain the missing data? (Please specify below)

(Question 22 // PDF)

	Is the NECP sufficiently granular?	Please specify missing datasets	How did you obtain the missing data?					
			Responsible entity for NECP	Other entity	By reverse-engineering	TSO's own internal scenarios	Other source	Please specify further
AT	Yes						×	Data supply by UBA (federal environmental agency).
BA	No					×		
BE	No		×					
BG	Yes		×					From the NECP, Scenario with additional measures.
CH	Partially	Higher granularity in some sectors would be useful. This includes the demand from big consumers and data centers, behaviour of e-mobility, heat pumps and decentralised and utility scale batteries or development of DSR. On the generation side, disaggregated targets for different PV installation types and explicit reservoir sizes per hydro technology (particularly for reservoir plants). More detail on sector coupling would also be helpful, specially for hydrogen and power-to-gas modelling.				×		The internal scenarios used are the ones from the published Strategic Grid 2040. They were used mostly for the demand modelling (EV profiles, additional load). Hydrogen related assumptions were obtained from Swiss gas internal assumptions and EP2050+.
CY	No	The published NECP data only goes until 2030. However, the ministry was able to provide projections for all years to 2050, based on their underlying studies.	×					All data was obtained through direct contact with the ministry, which is the body responsible for the NECP.
CZ	No	TYNDP 2026 does not provide sufficient granularity for adjusting the ETM. Besides, the FEC in the reference scenario in ETM is significantly higher than in the reference scenario used in the Czech NECP, which made relevant adjustments of the ETM basically impossible, for example, to apply the same energy savings trajectories, and so on.						Fallback solution based on TYNDP 2024 GA and DE scenarios.
DE	No	As the NECP provides only a high-level overview, the technical report behind the NECP has been used as a source (Technischer Anhang der Treibhausgas-Projektionen 2024 für Deutschland). Especially for the demand the granularity was not sufficient to fill the extremely detailed input of the ETM (Energy Transition Model, the tool used for demand modelling in TYNDP). One main issue is, that the energy demand in the NECP is grouped in different categories than in the ETM, for example no differentiation between households and buildings is made in the NECP. Other Problems are that some numbers are only published in figures and therefore hard to read and that in some cases the published data is aggregated on a very high scale for example the district heating demand for fossil fuels is listed, without further information on the type of fuel.		×	×			For some detailed ETM parameters that were not specifically mentioned in the NECP or the technical report other sources were used as a starting point and reverse engineered to obtain the same final energy demand as the NECP both for the sector and the energy carrier.

	Is the NECP sufficiently granular?	Please specify missing datasets	How did you obtain the missing data?					
			Responsible entity for NECP	Other entity	By reverse-engineering	TSO's own internal scenarios	Other source	Please specify further
DK	No	The NECP is not in itself detailed enough for the use of submitting data to TYNDP/SB 2026. Additionally Energinet is not directly using the NECP in its planning, but instead The Analysis Assumptions for Energinet 2024, delivered by the Danish Energy Agency to Energinet, which is generally compliant with the Danish NECP section A and has been utilised as the main scenario reported for TYNDP/SB 2026.	×		×			The Analysis Assumptions for Energinet 2024, delivered by the Danish Energy Agency to Energinet, has been utilised as the main scenario reported for TYNDP/SB 2026, which is generally compliant with the Danish NECP section A.
EE	Partially	Certain values had to be derived from targets that remained unchanged between the preliminary NECP and the updated NECP.	×		×	×		The Strategic Sector Development Plan was used as a source for certain data that is absent from the NECP The TSO's own scenarios were used for demand forecasting, as they also serve as the basis for several other national strategic objectives (Link)
ES	Partially	The granularity of the NECP has proven to be limited, as sectoral demand data is presented in a highly aggregated manner. Given that the ETM is a bottom-up model, it requires detailed assumptions at the end-use application level to accurately reflect expected transitions. In the context of the TYNDP 2026 data collection process, and considering the limited availability of detailed input from national authorities, TSOs proceeded to coordinate these bottom-up assumptions bilaterally, relying on internal analyses, third-party studies, and academic literature to ensure the robustness and validity of the input data.			×	×		The TSOs used own more elaborate scenarios to reverse engineer the data published in official national publications that lack the high level of granularity needed for filling the ETM. Internal scenarios were used for those years that are not specified or insufficiently specified in national publications for 2030 and 2050, namely 2035 and 2040. Special attention was paid to preserving consistency of data for these intermediate years with national publications Data obtained from national strategies, planning or studies
FI	No	All target years are not included in NECP time horizon, and the data collected for ERAA and TYNDP is more detailed and complex.				×		
FR	No	We had to estimate specific assumptions for sectorial consumptions to approach the energy volumes in the draft NECP.	×		×	×		The NECP was not finalised (not up to 2050) at the time of the data collection, so non public data from NECP draft transmitted by the. Based on the data from the NECP draft transmitted by the Energy Transition Ministry, RTE attempted to approximate the energy demand data by defining assumptions in the ETM tool. RTE Future Energy Scenario NO_3 Re-Industrialisation.
GR	Yes							

	Is the NECP sufficiently granular?	Please specify missing datasets	How did you obtain the missing data?					
			Responsible entity for NECP	Other entity	By reverse-engineering	TSO's own internal scenarios	Other source	Please specify further
HR	Partially	Public NECP and energy strategy does not provide additional granularity. Detailed data obtained from NECP and strategy produce does.		×				Contact with NECP and energy strategy producer.
HU	Partially	Certain capacities (e.g. biogas, biomethane), demand input figures. Import hydrogen demand.						Official plans of power plants (regular consultation), official network connection plans/requests. Electrolyser capacity calculated back from the electricity consumption for hydrogen production starting from 2035.
IE								
IT	No	Market nodes details, demand input figures, etc.			×	×		Further data and assumptions non reported in the NECP are aligned with national planning framework scenarios, elaborated jointly by the electricity and gas TSOs. The description of the process and assumptions is publicly available.
LT	Partially	The NECP for 2040 and 2050 presents only the goals and objectives set out in the National Energy Independence Strategy.				×		Based on NECP data and the goals and objectives set out in the National energy independence strategy, the electricity and gas TSO prepares forecasts for the coming years (after 2030) and coordinates them with the Ministry of Energy. Lithuanian Energy Transformation Study to 2050
LU	Yes		×			×		In the context of the NECP, the national long-term strategy has been supported by simulations carried out by STATEC. Complementary studies have been carried out in collaboration with an independent consultant, based on the not published long term NECP data until 2050.
LV	Partially	Data is prepared in several scenarios with low granularity, so it isn't possible to implement data properly into dataset.				×		
MD	Partially					×		
ME	Partially	As the draft NECP was published for public consultation at the end of June 2025, and the data from it were not available at the time of data submission. The NECP does not provide a sufficient level of detail by years and across all categories defined in the forms for data submission, particularly with quantifications for all years.			×			The extrapolation trend used for annual demand and the categories defined within it.

	Is the NECP sufficiently granular?	Please specify missing datasets	How did you obtain the missing data?					
			Responsible entity for NECP	Other entity	By reverse-engineering	TSO's own internal scenarios	Other source	Please specify further
MK	Partially	The NECP (2021) of North Macedonia provides high-level targets for energy efficiency, renewable deployment, and sectoral demand reduction up to 2030. However, it lacks detailed granularity required for TYNDP, such as hourly load profiles and unit-level generation data. MEPSO supplements the NECP with historical system data, planned projects, cross-border capacities, and flexibility assumptions to ensure the datasets accurately represent the Macedonian power system.	×		×	×		
MT	Partially	NECP datasets supplemented with internal assumptions and modelling.		×				The dataset provided for the TYNDP was based on energy demand projections in the NECP. However, not all data sets were published in the NECP. This included data sets on transport, heat pumps, etc.
NL	No	See above.				×		We use one of our own grid operator scenarios for the TYNDP. We submitted the data from the scenario "Koersvaste Middenweg", which closely follows the national energy policies, ambitions and national strategies (i.e. National Plan Energysystem, NPE). This scenario had been jointly developed and published by both national TSOs (TenneT, Gasunie) and the regional distribution companies. See for more information here.
PL	No	No TY2050.		×	×			Up-to-date information available for TSO from producers and system users (electricity and gas).
PT	Partially	Demand and capacity data from NECP don't provide sufficient granularity (e.g. hourly data) for TYNDP, which had to be based on input data used in National Resourse Adequacy Assessment studies and/or on data provided by the Portuguese Directorate for Energy and Geology - DGEG.						Datasets used for both ERAA and TYNDP were complemented by input data used in National Resource Adequacy Assessment, namely related to hourly demand, detailed hydro generation, inelastic generation profiles, electrolysers, etc.
RO	No	Demand input figures. Unit by unit evolution for thermal capacity.				×		
RS	Yes	Data delivered for the TYNDP and ERAA is aligned with the official data available to the TSO.						
SE								

	Is the NECP sufficiently granular?	Please specify missing datasets	How did you obtain the missing data?					
			Responsible entity for NECP	Other entity	By reverse-engineering	TSO's own internal scenarios	Other source	Please specify further
SI	Partially	Sometimes there could be dome inconsistencies that need some clarification. In these cases we coordinate with NECP consortium, as we as TSO are a member of. Regarding the gas data: NECP provides aggregated data for the major sectors (e.g. Industry, Transport, etc.). However, NECP does not provide the sufficient granularity of input data required by the ETM.						We are in contact with all the relevant institutions and discuss the needs and projections that could change and differ from published documents. If we find some inconsistencies or there are data missing, we coordinate with all the relevant stakeholders. We are also in NECP consortium, so the coordination is quick and effective.
SK	Partially	With regard to the extremely high level of granularity data which is required for the TYNDP/SB 2026 (specifically the ETM tool), it is not possible to specify missing data. For the TYNDP/SB 2026 purposes, the ENTSO-E/ENTSOG fallback solution was used. (an average of the DA and GA scenarios an average of the DA and GA scenarios outcomes of the TYNDP 2024).						The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of theTYNDP 2024).
TR	Yes							
UA	No	The Ukrainian NECP was adopted in 2024, due to uncertain situation in Ukraine it should be time to time reviewed.		×				Consultations with and data from: • Ministry of Energy, Ministry of Economy, Ministry of Environment Protection • National Bank of Ukraine • Reform Support Team at the Ukrainian Ministry of Energy • private companies – owners of various types of generation incl. Nuclear, Hydro, Coal, Gas, Renewables, Municipal cogeneration, industrial works cogeneration, battery energy storages, professional associations Scenarios are built based on consultations with and data from: • Ministry of Energy, Ministry of Economy, Ministry of Environment Protection • National Bank of Ukraine • Reform Support Team at the Ukrainian Ministry of Energy • private companies – owners of various types of generation incl. Nuclear, Hydro, Coal, Gas, Renewables, Municipal cogeneration, industrial works cogeneration, battery energy storages, professional associations

11 // Date and version of NECP for 2030-data

Please confirm the date and the version of the NECP that you have consulted for the study (e.g., Draft NECP as of date 24 December 2024) for 2030.

(Question 23 // PDF)

Q 23

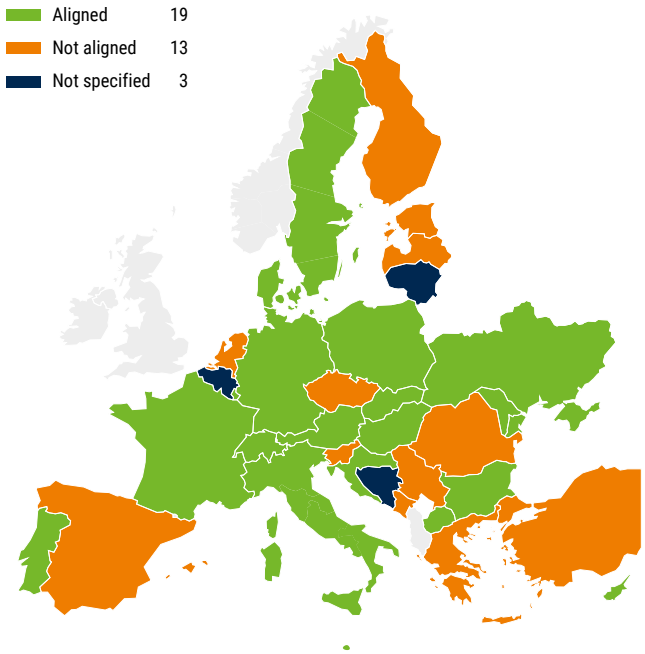
	Assumptions description
AT	Final version of NECP as of December 3 2024
BA	Draft NECP, July 2024
BE	Draft updated NECP 2021-2030 (as of date 4th December 2023)
BG	June 2024
CH	November 2022
CY	Final updated NECP 2021-2030, published in December 2024
CZ	December 18 2024
DE	Final updated NECP 2021-2030 (submitted in 2024), published 29 August 2024
DK	Denmark - Final updated NECP 2021-2030 (submitted in 2024)
EE	Draft NECP as of date 17 August 2023, where relevant
ES	"Final"(Plan Nacional Integrado de Energía y Clima) - September 2024
FI	Finland - Final updated NECP 2021-2030 (1 July 2024)
FR	Non public data for 2035-2050 but aligned with draft NECP for 2030
GR	Final Updated NECP 7 January 2025
HR	Draft updated integrated national energy and climate plan of Croatia covering the period 2021-2030 (2023).
HU	Final NECP, October, 2024
IE	
IT	FINAL UPDATED NECP as of date 1st of July 2024
LT	NECP updated and sent to the EC on 2 October 2024
LU	24 July 2024
LV	Final version of NECP, December 2024
MD	NECP as of date 26 February 2025 for 2030
ME	At the time of providing the data, the NECP draft was not available.
MK	NECP
MT	Final NECP published on 7th January 2025
NL	Update of the NECP, as of June 2024
PL	October 2024
PT	Revised PNEC as of 1 October 2024, published by DGEG
RO	Integrated National Energy and Climate Plan of Romania 2025-2030 Update October 2024
RS	Data delivered for the TYNDP and ERAA is aligned with the official data available to the TSO.
SE	
SI	18 December 2024 (Draft version was used for the data collection, but the energy demand projections remain unchanged in the final version on 18 December 2024).
SK	The NECP version from December 2024 which had not yet been approved at the time of data collection.
TR	
UA	Ukrainian NECP was officially adopted in July 2024.

12 // Alignment of energy demand figures with NECP

Please confirm alignment of submitted energy demand figures with the NECP for 2030.

Q 24

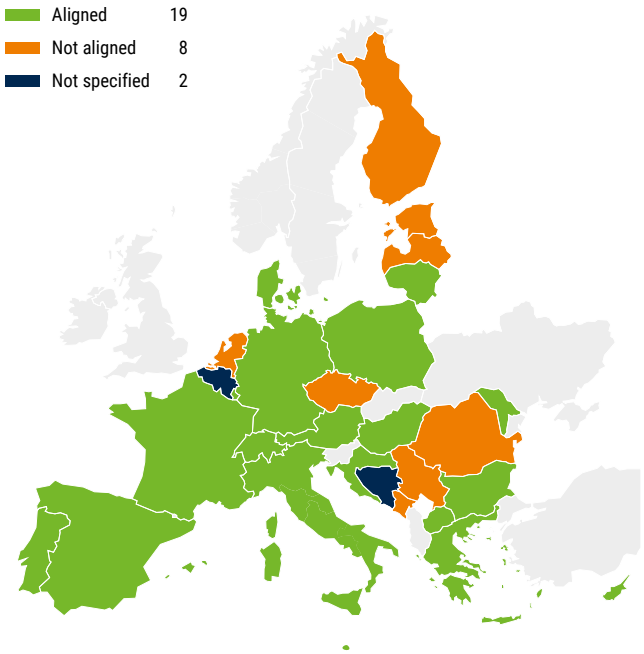
(Question 24 // PDF)



Please confirm alignment of submitted annual electricity demand figures with the NECP for 2030.

Q 25

(Question 25 // PDF)



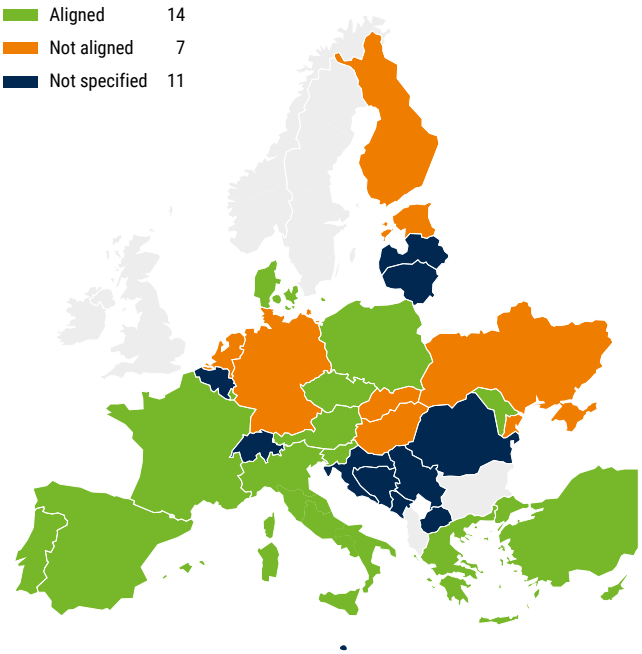
	Energy demand aligned with NECP for 2030	If energy demand is not aligned with the NECP for 2030, please justify
AT	Aligned	
BA	Not specified in NECP (please specify below)	Indicative Development Generation Plan, Internal data of Gas TSO. Draft BiH Hydrogen Roadmap.
BE	Not specified in NECP (please specify below)	At the time of the data collection in December 2024, no final NECP was available for Belgium. The submitted data was aligned as best as possible with existing draft NECP together with available national and regional policies.
BG	Aligned	
CH	Aligned	
CY	Aligned	

	Electricity demand aligned with NECP for 2030	If electricity demand is not aligned with the NECP for 2030, please justify
AT	Aligned	
BA	Not specified in NECP (please specify below)	Indicative Development Generation Plan
BE	Not specified in NECP (please specify below)	The submitted data was aligned as best as possible with existing draft NECP together with available national and regional policies. For electricity the demand is aligned with the latest "Adequacy and Flexibility study for Belgium 2026-2036" and the "Belgian Electricity System BluePrint for 2035-2050"
BG	Aligned	
CH	Aligned	
CY	Aligned	

	Energy demand aligned with NECP for 2030	If energy demand is not aligned with the NECP for 2030, please justify	Electricity demand aligned with NECP for 2030	If electricity demand is not aligned with the NECP for 2030, please justify
CZ	Not aligned (please specify below)	Not aligned for TYNDP, because the NECP does not provide sufficient data granularity to enable responsible adjustment of the utilisation of different technologies across the FEC sectors in the ETM. WGSB has not developed any methodology or guidelines for such a case, besides trial-by-error method. Besides, FEC in the ETM reference scenario (in 2019) was significantly higher than FEC in the reference scenario in NECP (1178 vs. 1030 PJ). Eurostat data also show lower FEC for CZ compared to the reference in the ETM. Therefore, we opted out of using ETM and the fallback solution was used. These concerns were raised multiple times during data collection by both TSOs.	Not aligned (please specify below)	ETM requires too specific details which are not available in the NECP + discrepancy in reference scenarios demand, therefore the fallback solution was used.
DE	Aligned		Aligned	
DK	Aligned		Aligned	
EE	Not aligned (please specify below)	The Strategic Sector Development Plan was used as a source instead, as the final NECP data was not available at the time of submission.	Not aligned (please specify below)	The Strategic Sector Development Plan was used as a source instead, as the final NECP data was not available at the time of submission.
ES	Not aligned (please specify below)	The Spanish NECP was used as the main data source to complete the ETM, as it provides energy demand figures by sector and energy carriers. However, it lacks the level of detail needed to populate all ETM input parameters. Additionally, some ETM default settings made it difficult to match demand values accurately, sometimes requiring non-logical inputs. As a result, there is a deviation between the NECP and ETM demand figures due to the compromise between using logical inputs and achieving NECP demand figures.	Aligned	
FI	Not aligned (please specify below)	The forecast horizon and granularity of NECP data are not sufficient for study, and the available data does not reflect the TSOs' latest view and analysis for the future developments.	Not aligned (please specify below)	The forecast horizon and granularity of NECP data are not sufficient for study, and the available data does not reflect the TSOs' latest view and analysis for the future developments.
FR	Aligned	The energy demand data we use were available for every year and we try to best approach it with the ETM.	Aligned	
GR	Not aligned (please specify below)	Electricity and Gas (incl. Hydrogen, Methane, etc.) Sectors are aligned with NECP.	Aligned	
HR	Aligned		Aligned	
HU	Aligned		Aligned	
IE				
IT	Aligned		Aligned	
LT	Not specified in NECP (please specify below)	Targets taken from National Energy Independence Strategy.	Aligned	
LU	Aligned		Aligned	
LV	Not aligned (please specify below)	Demand data are coming from TSO best estimate and compared with NECP, but not identically aligned.	Not aligned (please specify below)	Demand data are coming from TSO best estimate and compared with NECP, but not identically aligned.
MD	Aligned		Aligned	

	Energy demand aligned with NECP for 2030	If energy demand is not aligned with the NECP for 2030, please justify	Electricity demand aligned with NECP for 2030	If electricity demand is not aligned with the NECP for 2030, please justify
ME	Not aligned (please specify below)	At the time of submitting the data, the draft NECP was not available. The draft NECP was published at the end of June 2025 as part of the public consultation process. The data were submitted on the basis of several materials, including data provided for previous plans, as well as data obtained through communication with institutions dealing with specific issues related to the type of data requested.	Not aligned (please specify below)	At the time of submitting the data, the draft NECP was not available. The draft NECP was published at the end of June 2025 as part of the public consultation process. The data were submitted on the basis of several materials, including data provided for previous plans, as well as data obtained through communication with institutions dealing with specific issues related to the type of data requested. With regard to the specific data, the differences are minor.
MK	Aligned		Aligned	
MT	Aligned		Aligned	
NL	Not aligned (please specify below)	See above.	Not aligned (please specify below)	See above.
PL	Aligned		Aligned	
PT	Aligned		Aligned	
RO	Not aligned (please specify below)		Not aligned (please specify below)	
RS	Not aligned (please specify below)	Data delivered for the TYNDP and ERAA is aligned with the official data available to the TSO.	Not aligned (please specify below)	Data delivered for the TYNDP and ERAA is aligned with the official data available to the TSO.
SE	Aligned			
SI	Not aligned (please specify below)			
SK	Aligned	The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of the TYNDP 2024).		The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of the TYNDP 2024). The electricity data has an acceptable deviation from the NECP, respectively PEMMDB. For this reason the electricity demand is flagged as aligned.
TR	Not aligned (please specify below)			
UA	Aligned	Due to the fast change of situation in Ukraine the electricity demand is lower than in any NECP scenario.		Due to the fast change of situation in Ukraine the electricity demand is lower than in any NECP scenario.

13 // Alignment of hydrogen demand figures with NECP



Q 26

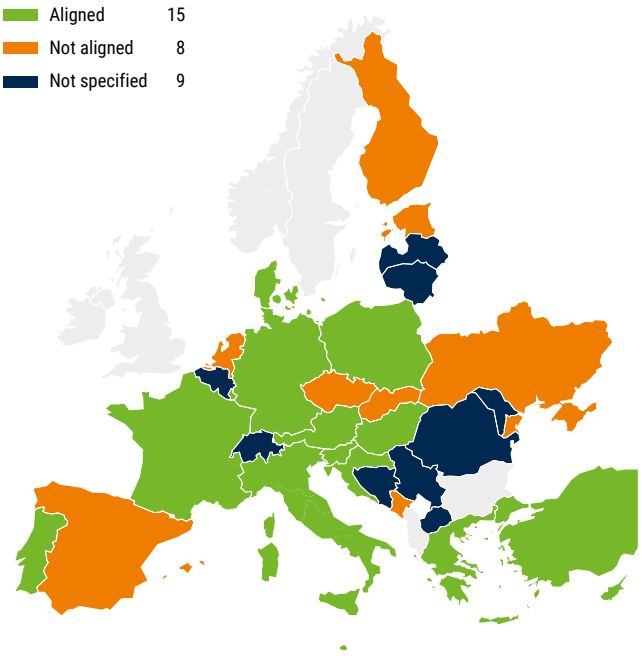
Please confirm alignment of submitted annual hydrogen demand figures with the NECP for 2030.

(Question 26 // PDF)

	Alignment of annual hydrogen demand figures with the NECP for 2030	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	Internal data of Gas TSO. Draft BiH Hydrogen Roadmap.
BE	Not specified in NECP	At the time of the data collection in December 2024, no final NECP was available for Belgium. The submitted data was aligned as best as possible with existing draft NECP together with available national and regional policies. When NECP data is missing or not quantitatively defined, Fluxys input was based on authorities and market signals, internal modelling and projections, and other available publications.
BG		
CH	Not specified in NECP	Since hydrogen demand values are not available in the Swiss National Framework for Grid Planning, the values where taken from internal references from Swissgas or from the EP2050+.
CY	Aligned	
CZ	Aligned	The total final demand for hydrogen in the submitted figures is basically in line with the NECP. However, the shares of demand in industry and transport differ from those in the NECP (most of the demand is in industry in the submitted data, whereas most of the demand is in transport in the NECP).
DE	Not aligned	In the NECP the national strategy on hydrogen imports was not considered. This strategy is reflected in the national system development strategy, that defines boundaries for the national system development of the electrcity and gas infrastructure. Compared to the NECP, the hydrogen demand has been increased to reflect these strategies. Fossil fuels have been reduced to compensate the hydrogen increase.
DK	Aligned	
EE	Not aligned	The Strategic Sector Development Plan was used as a source instead, as the final NECP data was not available at the time of submission.
ES	Aligned	
FI	Not aligned	The forecast horizon and granularity of NECP data are not sufficient for study, and the available data does not reflect the TSOs' latest view and analysis for the future developments.
FR	Aligned	

	Alignment of annual hydrogen demand figures with the NECP for 2030	If not aligned, please justify
GR	Aligned	
HR	Not specified in NECP	Hydrogen strategy data is used.
HU	Not aligned	NECP focuses on final energy consumption, ENTSOG ETM data request includes both energetic and non-energetic data. That is why there is a difference between the two. ETM is based on TSO best estimation. TSO doesn't have detailed data from all the sectors. We tried to follow the aggregate NECP figures and we have consulted with some major expected hydrogen consumers. RFNBO obligation is higher than the NECP value. We finally applied estimates by the TSO, based partially on some expected hydrogen consumer forecasts.
IE		
IT	Aligned	
LT	Not specified in NECP	Lithuanian Energy Transformation Study to 2050.
LU	Aligned	
LV	Not specified in NECP	NECP doesn't have any specific hydrogen demand data, therefore best estimate from TSO are coming, based on applications and projectiles.
MD	Aligned	
ME	Not specified in NECP	In draft NECP hydrogen was not considered and treated at the level of concrete figures. Currently, hydrogen is not included in our plans.
MK	Not specified in NECP	
MT	Not specified in NECP	NECP does not consider hydrogen demand and supply investments by 2030.
NL	Not aligned	The NECP for the Netherlands only partly contains quantitative information which we require to build scenarios. Furthermore, most of the figures (for example in Annex 4) are outdated. The data provided for NT+ stems for our national policy scenario, which has been consulted with external stakeholders (sector representatives, experts, energy companies, industrial customers, regional authorities, etc.) and the relevant ministry (KGG). See scenario report publication here.
PL	Aligned	
PT	Aligned	
RO	Not specified in NECP	
RS	Not specified in NECP	Data delivered for the TYNDP and ERAA is aligned with the official data available to the TSO.
SE		
SI	Aligned	NECP does not differ between hydrogen and climate neutral (renewable) methane based gas (biogas, synthetic gas) and provides only the aggregated (combined) renewable gas demand. The division to hydrogen and green gas was based on the TSO data and projections.
SK	Not aligned	The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of the TYNDP 2024).
TR	Aligned	
UA	Not aligned	No data for the hydrogen demand in the NECP of Ukraine.

14 // Alignment of Methane demand figures with NECP



Q 27

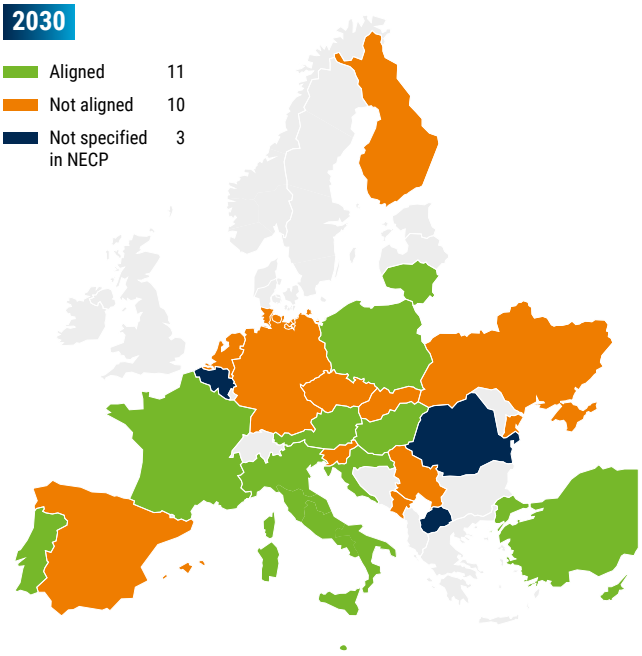
Please confirm alignment of submitted annual methane demand figures with the NECP for 2030.

(Question 27 // PDF)

	Alignment of annual Methane demand figures with the NECP for 2030	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	Internal data of Gas TSO.
BE	Not specified in NECP	At the time of the data collection in December 2024, no final NECP was available for Belgium. The submitted data was aligned as best as possible with existing draft NECP together with available national and regional policies. When NECP data is missing or not quantitatively defined, Fluxys input was based on authorities and market signals, internal modelling and projections, and other available publications.
BG		
CH	Not specified in NECP	Since methane demand values are not available in the Swiss National Framework for Grid Planning, the values were taken from internal references from Swissgas or from the EP2050+.
CY	Aligned	
CZ	Not aligned	The NECP data is not sufficiently granular to enable responsible adjustments to be made to the utilisation of different gas technologies across the FEC sectors in the ETM, nor in combination with other technologies and energy carriers. WGSB has not developed any methodology or guidelines for such a case. These concerns were raised multiple times during data collection by both TSOs.
DE	Aligned	
DK	Aligned	
EE	Not aligned	The Strategic Sector Development Plan was used as a source instead, as the final NECP data was not available at the time of submission.
ES	Not aligned	The Spanish NECP was used as the main data source to complete the ETM, as it provides energy demand figures by sector and energy carriers. However, it lacks the level of detail needed to populate all ETM input parameters. Additionally, some ETM default settings made it difficult to match demand values accurately, sometimes requiring non-logical inputs. As a result, there is a deviation between the NECP and ETM demand figures due to the compromise between using logical inputs and achieving NECP demand figures.

	Alignment of annual Methane demand figures with the NECP for 2030	If not aligned, please justify
FI	Not aligned	The forecast horizon and granularity of NECP data are not sufficient for study, and the available data does not reflect the TSOs' latest view and analysis for the future developments.
FR	Aligned	
GR	Aligned	
HR	Aligned	
HU	Aligned	
IE		
IT	Aligned	
LT	Not specified in NECP	Lithuanian Energy Transformation Study to 2050.
LU	Aligned	
LV	Not specified in NECP	TSO are not submitting such information.
MD	Not specified in NECP	TSOs' own internal scenarios.
ME	Not aligned	At the time of submitting the data, the draft NECP was not available. The draft NECP was published at the end of June 2025 as part of the public consultation process. Montenegro currently does not have access to natural gas sources, nor the infrastructure that would support its use. The Energy Development Strategy until 2030 clearly recognises natural gas as an important energy source that would contribute to the diversification of Montenegro's energy mix. The planned use of natural gas is as a substitute for other forms of energy, particularly for the use of electricity and the replacement of coal for heating and cooling.
MK	Not specified in NECP	
MT	Aligned	
NL	Not aligned	The NECP for the Netherlands only partly contains quantitative information which we require to build scenarios. Furthermore, most of the figures (for example in Annex 4) are outdated. The data provided for NT+ stems for our national policy scenario, which has been consulted with external stakeholders (sector representatives, experts, energy companies, industrial customers, regional authorities, etc.) and the relevant ministry (KGG). See scenario report publication here.
PL	Aligned	
PT	Aligned	
RO	Not specified in NECP	
RS	Not specified in NECP	Data delivered for the TYNDP and ERAA is aligned with the official data available to the TSO.
SE		
SI	Aligned	NECP does not differ between hydrogen and climate neutral (renewable) methane based gas (biogas, synthetic gas) and provides only the aggregated (combined) renewable gas demand. The division to hydrogen and green gas was based on the TSO data and projections. Natural gas demand was specified in NECP.
SK	Not aligned	The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of the TYNDP 2024).
TR	Aligned	
UA	Not aligned	Due to the fast change of situation in Ukraine the methane demand is not aligned with NECP scenario.

15 // Alignment of other energy carriers' demand figures with NECP



Q 28

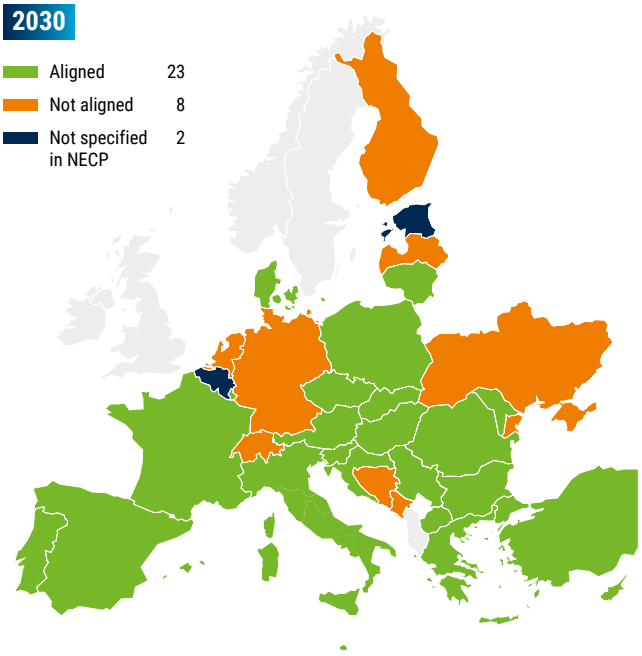
Please confirm alignment of other energy carriers' demand figures with the NECP for 2030.

(Question 28 // PDF)

	Please specify the carrier(s)	alignment of annual energy carriers demand figures with the NECP for 2030	If not aligned, please justify
AT	Biomethane, crude oil, e-liquids, solid fossil, biomass	Aligned	
BA			
BE	Ammonia, Synthetic and Bio Fuels, Fossil Fuels and Heat	Not specified in NECP	At the time of the data collection in December 2024, no final NECP was available for Belgium. The submitted data was aligned as best as possible with existing draft NECP together with available national and regional policies. When NECP data is missing or not quantitatively defined, Fluxys input was based on authorities and market signals, internal modelling and projections, and other available publications.
BG			
CH			
CY	All energy carriers	Aligned	
CZ		Not aligned	The NECP data is not sufficiently granular to enable responsible adjustments to be made to the utilisation of different technologies across the FEC sectors in the ETM, nor in combination with other technologies and energy carriers. WGSB has not developed any methodology or guidelines for such a case. These concerns were raised multiple times during data collection by both TSOs.
DE	Coal, lignite, oil	Not aligned	Fossil fuel demand has been reduced to compensate for additional hydrogen demand.
DK			
EE			
ES	Solids, oil	Not aligned	The Spanish NECP was used as the main data source to complete the ETM, as it provides energy demand figures by sector and some energy carriers. However, deviations for other energy carriers are due to the lack of information of input parameters/assumption in the NECP and the difficulty of accurately matching demand values without relying on non-logical ETM input parameters.
FI		Not aligned	

	Please specify the carrier(s)	alignment of annual energy carriers demand figures with the NECP for 2030	If not aligned, please justify
FR		Aligned	Due to difficulties in configuring ETM to reflect final demand volumes there might be some discrepancies on energy carriers other than electricity, gas or hydrogen for some horizons.
GR			
HR		Aligned	
HU	Other	Aligned	
IE			
IT	All others	Aligned	
LT	Other	Aligned	Lithuanian Energy Transformation Study to 2050.
LU			
LV	None		
MD			
ME		Not aligned	At the time of submitting the data, the draft NECP was not available. The draft NECP was published at the end of June 2025 as part of the public consultation process. The data were submitted on the basis of several materials, including data provided for previous plans, as well as data obtained through communication with institutions dealing with specific issues related to the type of data requested.
MK		Not specified in NECP	
MT		Aligned	
NL	Various energy & feedstock carriers	Not aligned	The NECP for the Netherlands only partly contains quantitative information which we require to build scenarios. Furthermore, most of the figures (for example in Annex 4) are outdated. The data provided for NT+ stems for our national policy scenario, which has been consulted with external stakeholders (sector representatives, experts, energy companies, industrial customers, regional authorities, etc.) and the relevant ministry (KGG). See scenario report publication here.
PL	Energy carriers have been represented in the ETM based on data in the NECP project	Aligned	
PT	Electricity, methane, hydrogen	Aligned	
RO	N/A	Not specified in NECP	
RS		Not aligned	Data delivered for the TYNDP and ERAA is aligned with the official data available to the TSO.
SE			
SI		Not aligned	Data for other carriers was not submitted by the TSOs.
SK	All other energy carriers' demand	Not aligned	The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of the TYNDP 2024).
TR		Aligned	
UA		Not aligned	Due to the fast change of situation in Ukraine the data is not aligned.

16 // Alignment of renewable electricity generation capacities with the NECP for 2030



Q 29

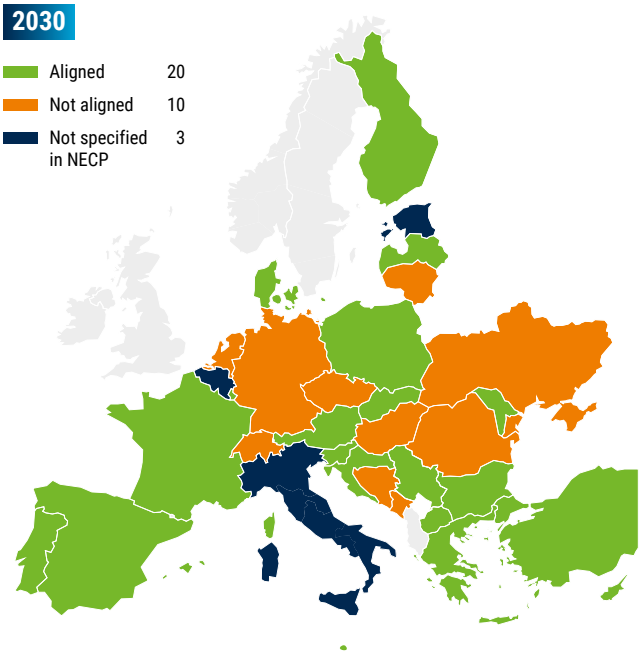
Please confirm alignment of renewable electricity generation capacities with the NECP for 2030.

(Question 29 // PDF)

	Please confirm alignment of renewable electricity generation capacities with the NECP for 2030.	If not aligned, please justify
AT	Aligned	
BA	Not aligned	
BE	Not specified in NECP	At the time of the data collection in December 2024, no final NECP was available for Belgium. The submitted data was aligned as best as possible with existing draft NECP together with available national and regional policies. This is aligned with renewable targets from the regions and the public consultation of the "Belgian Electricity System BluePrint for 2035-2050".
BG	Aligned	
CH	Not aligned	For technologies (PV, Wind) where goals have been already reached or those where the goals do not seem realistic, new values where given. These new values have been discussed with the NRA as they are common to the most recent national adequacy assessment.
CY	Aligned	
CZ	Aligned	
DE	Not aligned	Wind Onshore, PV and Biomass is aligned with the NECP. Wind Offshore is based on TSO project information taken into account for the draft of the network development scenario framework (Network Development Plan 2037/2045). Hydro capacities are also taken from this source.
DK	Aligned	
EE	Not specified in NECP	The Strategic Sector Development Plan was used as a source instead, as the final NECP data was not available at the time of submission.
ES	Aligned	
FI	Not aligned	The forecast horizon and granularity of NECP data are not sufficient for study, and the available data does not reflect the TSOs' latest view and analysis for the future developments.

	Please confirm alignment of renewable electricity generation capacities with the NECP for 2030.	If not aligned, please justify
FR	Aligned	RES capacities are aligned with the NECP for 2030; nevertheless PV capacity submitted at 2030 appears slightly lower than in the NEC published in 2024, as it accounts for latest developments. Indeed, national renewable targets are currently being debated at the Parliament especially those of PV installed capacities. Targets have already been lowered in the updated version of the draft "Multi-annual energy plan 3 of the French strategy for energy and climate" at the beginning of 2025. The values reported for ERAA correspond to the reference scenario from the latest national adequacy study performed by RTE, in line for 2035 with the national objectives currently discussed.
GR	Aligned	
HR	Aligned	
HU	Aligned	The submitted renewable energy capacities are equal to/higher than the NECP targets.
IE		
IT	Aligned	
LT	Aligned	
LU	Aligned	
LV	Not aligned	Generations capacities are best estimate from TSO based on technical applications and overall assumptions on RES development.
MD	Aligned	
ME	Not aligned	At the time of submitting the data, the draft NECP was not available. The draft NECP was published at the end of June 2025 as part of the public consultation process. Wind, hydro, and solar power plants, which are part of the updated transmission network development plan for the period 2023–2032, have been included. Data for the specified power plants have also been provided as input for the preparation of the NECP.
MK	Aligned	
MT	Aligned	
NL	Not aligned	The NECP for the Netherlands only partly contains quantitative information which we require to build scenarios. Furthermore, most of the figures (for example in Annex 4) are outdated. The data provided for NT+ stems for our national policy scenario, which has been consulted with external stakeholders (sector representatives, experts, energy companies, industrial customers, regional authorities, etc.) and the relevant ministry (KGG). See scenario report publication here.
PL	Aligned	
PT	Aligned	
RO	Aligned	
RS	Aligned	Data delivered for the TYNDP and ERAA is aligned with the official data available to the TSO. In NECP, only the minimal expected targets for RES integration are provided. Since values submitted by EMS exceed those significantly, those can be treated as aligned.
SE		
SI	Aligned	
SK	Aligned	RES capacities are aligned with the NECP up to 2030.
TR	Aligned	
UA	Not aligned	Renewables are aligned with the national renewables development action plan until 2030.

17 // Alignment of thermal and (including nuclear) electricity generation capacities with the NECP for 2030



Q 30

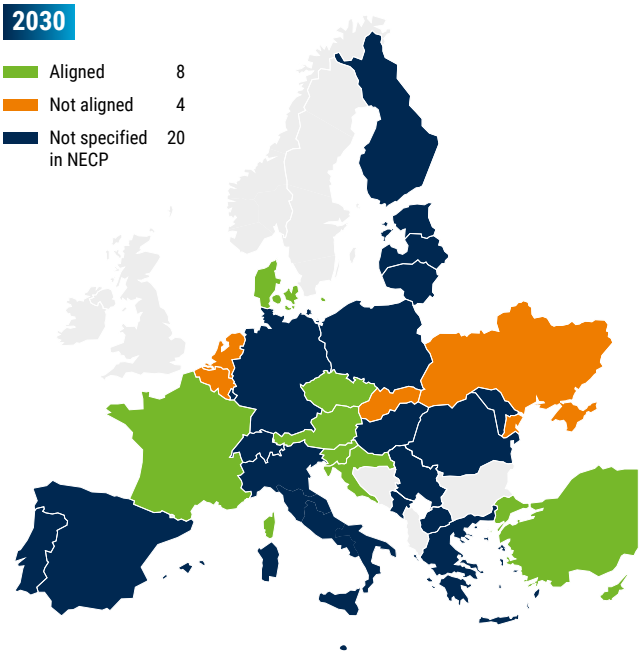
Please confirm alignment of thermal and (including nuclear) electricity generation capacities with the NECP for 2030.

(Question 30 // PDF)

	Please confirm alignment of thermal and electricity generation capacities	If not aligned, please justify
AT	Aligned	
BA	Not aligned	Indicative Development Generation Plan
BE	Not specified in NECP	At the time of the data collection in December 2024, no final NECP was available for Belgium. The submitted data was aligned as best as possible with existing draft NECP together with available national and regional policies This is aligned with renewable targets from the regions and the public consultation of the "Belgian Electricity System BluePrint for 2035-2050".
BG	Aligned	
CH	Not aligned	Nuclear power plants were given a 60 year long lifetime as opposed to the 50 year long lifetime in the Swiss National Framework for Grid Planning as discussed with the NRA.
CY	Aligned	
CZ	Not aligned	All Thermal data were based on Data collection from operators in 2024 by ČEPS.
DE	Not aligned	Coal: In the NECP scenario MWMS, a coal phase-out is predetermined exogenously by 2030 and in the scenario MMS for 2030 4 GW of coal are assumed. In TYNDP 2026, however, the coal phase-out is reported based on the legal framework (KVBG, 08/2020), which means that a total of 15.4 GW of coal capacity is still installed in 2030. However, there is the possibility of effectively observing a coal phase-out in the results through low operating hours of these power plants. Gas: In the NECP scenario MWMS, 37.6 GW of natural gas and 10.6 GW of hydrogen power plants are assumed for 2030 - while in scenario MMS 34.1 GW of natural gas and no hydrogen. Currently, there is no legal basis for such a rapid increase in installed capacity as shown in MWMS. However, in order to reflect the medium- and long-term targets for 2035 and 2040 in the TYNDP, a linear increase in installed capacity of natural gas and hydrogen power plants between 2024 and 2037 is assumed. This is done while considering an adoption curve toward fuel-switched hydrogen power plants - with the goal of having no natural gas-fired power plants by 2045, only hydrogen power plants. Along this trajectory, 39.5 GW of natural gas and 1 GW of hydrogen power plants are represented for 2030.
DK	Aligned	
EE	Not specified in NECP	The Strategic Sector Development Plan was used as a source instead, as the final NECP data was not available at the time of submission.
ES	Aligned	

	Please confirm alignment of thermal and electricity generation capacities	If not aligned, please justify
FI	Aligned	
FR	Aligned	
GR	Aligned	
HR	Aligned	
HU	Not aligned	Nuclear and oil are aligned, we foresee more gas capacity than in NECP based on plans of power plants (regular consultation).
IE		
IT	Not specified in NECP	
LT	Not aligned	Thermal capacities are presented taking into account information, received during the annual survey of the largest electricity producers on long-term capacity development/decommissioning plans.
LU	Aligned	
LV	Aligned	
MD	Aligned	
ME	Not aligned	At the time of submitting the data, the draft NECP was not available. The draft NECP was published at the end of June 2025 as part of the public consultation process. For the Pljevlja Thermal Power Plant, data previously available were used, as well as data obtained from the competent authorities during the preparation of the NECP.
MK	Aligned	
MT	Aligned	
NL	Not aligned	The NECP for the Netherlands only partly contains quantitative information which we require to build scenarios. Furthermore, most of the figures (for example in Annex 4) are outdated. The data provided for NT+ stems for our national policy scenario, which has been consulted with external stakeholders (sector representatives, experts, energy companies, industrial customers, regional authorities, etc.) and the relevant ministry (KGG). See scenario report publication here.
PL	Aligned	
PT	Aligned	
RO	Not aligned	
RS	Aligned	
SE		
SI	Aligned	
SK	Aligned	
TR	Aligned	
UA	Not aligned	The data rather aligned with the vision of electricity market participants - owners of appropriate generating facilities, than with NECP.

18 // Alignment of DSR with the NECP for 2030



Q 31

Please confirm alignment of DSR with the NECP for 2030.

(Question 31 // PDF)

	Please confirm alignment of thermal and electricity generation capacities	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	No data.
BE	Not aligned	At the time of the data collection in December 2024, no final NECP was available for Belgium. The submitted data was aligned as best as possible with existing draft NECP together with available national and regional policies This is aligned with DSR from latest "Adequacy and Flexibility study for Belgium 2026-2036" and the "Belgian Electricity System BluePrint for 2035-2050".
BG		
CH	Not specified in NECP	No explicit DSR provided, only implicit DSR.
CY	Aligned	
CZ	Aligned	
DE	Not specified in NECP	DSR is not specified in the NECP and taken from national studies. Data refers to the scenario framework draft of the German grid development plan (Network Development Plan 2037/2045 (2025)) and the system analysis (Bundesnetzagentur - Netzreserve). It should be noted that shiftable DSR could not be modelled in the TYDNP. Assumption: The shiftable DSR is assigned to demand shedding or not considered based on the activation price.
DK	Aligned	
EE	Not specified in NECP	The Strategic Sector Development Plan was used as a source instead, as the final NECP data was not available at the time of submission.
ES	Not specified in NECP	e-TSO projections
FI	Not specified in NECP	

	Please confirm alignment of thermal and electricity generation capacities	If not aligned, please justify
FR	Aligned	Demand response - particularly demand shedding capacities - is consistent with the national target of reaching around 6.5 GW by 2030. This target covers demand shedding across various sectors, excluding new electricity uses such as electric mobility and hydrogen, for which no NECP target has been set. Several flexibility scenarios have been analysed.
GR	Not specified in NECP	
HR	Aligned	
HU	Not specified in NECP	No concrete provision about DSR is included in the NECP.
IE		
IT	Not specified in NECP	
LT	Not specified in NECP	Only importance of DSR is mentioned in NECP, not specific values. Values used in TYNDP/SB 2026 are best estimated of TSO.
LU	Not specified in NECP	
LV	Not specified in NECP	DSR assumptions are made based on previously carried out study and hasn't been updated in a while.
MD	Not specified in NECP	TSOs' own internal scenarios.
ME	Not specified in NECP	DSR is not part of the data provided.
MK	Not specified in NECP	
MT	Not specified in NECP	No data on Demand-Side Response was provided.
NL	Not aligned	The NECP for the Netherlands only partly contains quantitative information which we require to build scenarios. Furthermore, most of the figures (for example in Annex 4) are outdated. The data provided for NT+ stems for our national policy scenario, which has been consulted with external stakeholders (sector representatives, experts, energy companies, industrial customers, regional authorities, etc.) and the relevant ministry (KGG). See scenario report publication here.
PL	Not specified in NECP	In the NECP there is a common level of DSR and import provided.
PT	Not specified in NECP	DSR was not included in both ERAA and TYNDP since there is no indication regarding DSR in PT NECP.
RO	Not specified in NECP	
RS	Not specified in NECP	There are no reliable sources that could be taken into account for DSR value estimation.
SE		
SI	Aligned	
SK	Not aligned	The NECP intends to implement DSR from 2035 onwards. Projections of the DSR beyond 2030 were not provided.
TR	Aligned	
UA	Not aligned	We are only preparing for development of DSR in Ukraine. NECP - general roadmap, the actual situation is dramatically different than in the NECP.

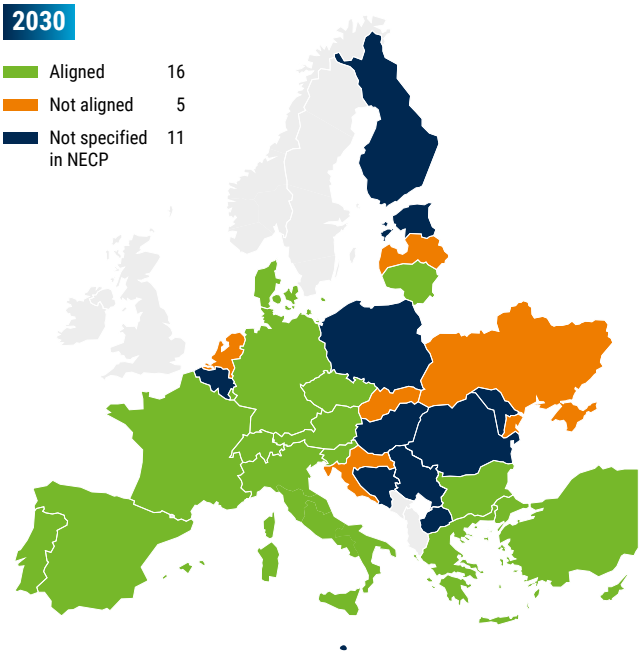
Please explain how is demand-side flexibility (e.g. DSR) already reflected in your datasets for 2030.

(Question 32 // PDF)

Q 32

	If not aligned, please justify
AT	Demand shedding and demand shifting
BA	No data.
BE	See answer Question 18.
BG	There is no Demand-Side Flexibility included in the data sets for 2030.
CH	Only implicit DSR provided for EV, HP and decentralised batteries, as derived from the Swiss National Framework for Grid Planning.
CY	No DSR in 2030.
CZ	DSR is assumed to be implemented as load shedding in the industrial sector.
DE	Demand side flexibility is considered by Electrolysis, Power to Heat and DSR. For the latter one different bands for industrial processes and flexibilities in the commerce, trade, and service sector are defined, where the demand can be shifted or shaded based on an activation price. It should be noted that shiftable DSR could not be modelled in the TYDNP. Assumption: The shiftable DSR is assigned to demand shedding or not considered based on the activation price. In the ETM just the Demand tab has been filled, and no additional flexibility has been defined.
DK	The DSR which has been submitted for Denmark in the PEMMDB app is P2X and P2H. The activation price for P2X is calculated centrally by ENTSO-E. The activation price for P2H is based on market model simulations.
EE	It was assumed that a share of demand would become flexible once the day-ahead price exceeds a specified threshold.
ES	DSR (demand shedding) has not been considered in demand figures (ETM), but in supply capacities (PEMMDB).
FI	DSR data reflects the TSOs' latest views on DSR developments, which includes industrial, residential and heating sector developments of DSR.
FR	To model demand-side response, two approaches are considered: · For demand-side response not participating in the electricity market (e.g., time-of-use tariffs): it is integrated into the electricity load dataset as a specific demand profile, reflecting consumption patterns shaped by tariffs that encourage flexibility (such as shifting consumption to PV peak periods). This approach applies to water heating in France. · For demand-side response participating in market mechanisms: specific data is submitted using PEMMDB database. This includes demand shedding capacities, flexible operation of electrolysers, and electric mobility.
GR	Explicit DSR was submitted at the PEMMDB.
HR	
HU	No explicit/implicit DSR capacities submitted.
IE	
IT	Internal assumptions based on TSO studies.
LT	Steady increase of DSR from now until 2030 is forecasted. A single price band is used. Type of DSR is demand shedding.
LU	Generalised flexibility of 3–30 %, depending on the sector.
LV	TSO doesn't have explanation.
MD	
ME	DSR is not part of the data provided.
MK	N/A
MT	Not reflected.
NL	See above.
PL	The estimation of non-market DSR up to 2050 was provided. Market DSR is allowed to expand up to expansion constrains provided in PEMMDB.
PT	DSR was not included in both ERAA and TYNDP since there is no indication regarding DSR din PT NECP.
RO	N/A
RS	
SE	
SI	Main numbers come as projections of future DSR capabilities.
SK	The NECP intends to implement DSR from 2035 onwards. Projections of the DSR beyond 2030 were not provided.
TR	
UA	Absent

19 // Alignment of electrolysers installed capacities with the NECP for 2030



Q 33

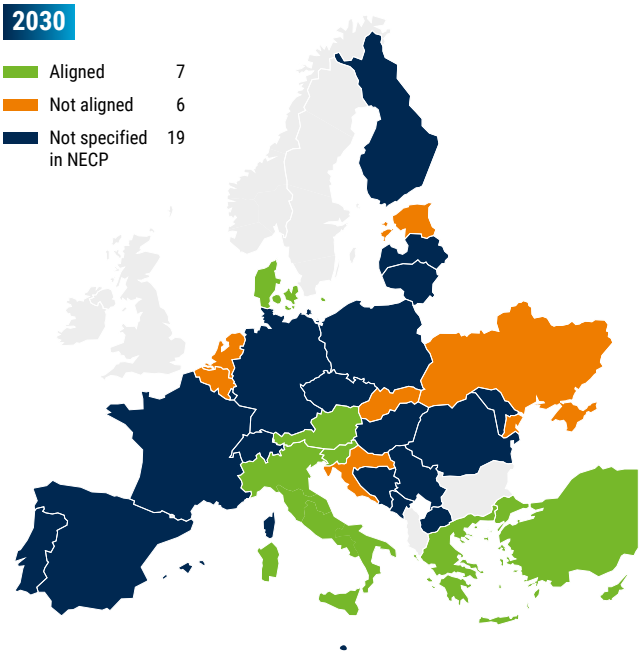
Please confirm alignment of electrolysers installed capacities with the NECP for 2030.

(Question 33 // PDF)

	Please confirm alignment of thermal and electricity generation capacities	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	No data.
BE	Not specified in NECP	See answer Question 18. When NECP data is missing or not quantitatively defined, input was based on authorities and market signals, internal modelling and projections, and other available publications.
BG	Aligned	
CH	Aligned	
CY	Aligned	
CZ	Aligned	
DE	Aligned	
DK	Aligned	
EE	Not specified in NECP	The Strategic Sector Development Plan was used as a source instead, as the final NECP data was not available at the time of submission.
ES	Aligned	
FI	Not specified in NECP	
FR	Aligned	
GR	Aligned	
HR	Not aligned	Hydrogen strategy data is used.
HU	Not specified in NECP	For 2030 we consider the HU hydrogen strategy (2021).
IE		

	Please confirm alignment of thermal and electricity generation capacities	If not aligned, please justify
IT	Aligned	
LT	Aligned	
LU	Aligned	
LV	Not aligned	NECP doesn't have projectiles on electrolysers development capacity.
MD	Not specified in NECP	TSOs' own internal scenarios.
ME		Electrolysers are not included in the submitted data. At the time of submitting the data, the draft NECP was not available. The draft NECP was published at the end of June 2025 as part of the public consultation process.
MK	Not specified in NECP	
MT	Not specified in NECP	No electrolysers are envisaged for hydrogen production for 2030 in any of the data sets or NECP.
NL	Not aligned	The NECP for the Netherlands only partly contains quantitative information which we require to build scenarios. Furthermore, most of the figures (for example in annex 4) are outdated. The data provided for NT+ stems for our national policy scenario, which has been consulted with external stakeholders (sector representatives, experts, energy companies, industrial customers, regional authorities, etc.) and the relevant ministry (KGG). See scenario report publication here.
PL	Not specified in NECP	Reverse-engineering carried out to retrieve some data from supporting analysis with inclusion of unbiding market research conducted by gas TSO.
PT	Aligned	
RO	Not specified in NECP	
RS	Not specified in NECP	There are no reliable sources that could be taken into account for electrolyser value estimation.
SE		
SI	Aligned	
SK	Not aligned	Electrolysers installed capacity is based on TSO's internal prognoses. TSO's internal prognoses are based on the outcomes of studies by an independent external consultancy company. These relevant prognoses are used e.g. in the TSO's ten-year development plan as well as in the assessment of the adequacy resource of the Power system of the Slovak Republic for the Ministry of Economy purposes. However, the data provided may differ slightly from internal prognoses due to different processing times.
TR	Aligned	
UA	Not aligned	The hydrogen development roadmap for Ukraine is absent. The data for the electrolysers are absent. NECP is a general roadmap only.

20 // Alignment of hydrogen production (SMR & pyrolysis) capacities with the NECP for 2030



Q 34

Please confirm alignment of hydrogen production (SMR & pyrolysis) capacities with the NECP for 2030.

(Question 34 // PDF)

	Please confirm alignment of thermal and electricity generation capacities	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	
BE	Not aligned	When NECP data is missing or not quantitatively defined, Fluxys input was based on authorities and market signals, internal modelling and projections, and other available publications.
BG		
CH	Not specified in NECP	Since hydrogen production values are not available in the Swiss National Framwork for Grid Planning, the values where taken from internal references from Swissgas or from the EP2050+.
CY	Aligned	
CZ	Not specified in NECP	No data on SMR/pyrolysis are available in the CZ NECP (only electrolysers) - not considered in data collection.
DE	Not specified in NECP (please specify below)	Data from a market survey done for national grid development studies was used. This Survey collects planned installations of large consumers.
DK	Aligned	
EE	Not aligned	The Strategic Sector Development Plan was used as a source instead, as the final NECP data was not available at the time of submission.
ES	Not specified in NECP	SMR capacities are aligned with the NECP for 2030 given that 74% of all of today's hydrogen use in industry shall be renewable. The remaning 26 % of industrial hydrogen demand is therefore still met with existing SMR technologies. Since the NECP assumes no new SMR or pyrolysis projects, the TYNDP 2026 scenarios for Spain do not contemplate with any additional SMR or pyrolisis capacity. A phase out of SMR for hydrogen production in industry is assumed for the 2035-2040 horizon.
FI	Not specified in NECP	
FR	Not specified in NECP	
GR	Aligned	

	Please confirm alignment of thermal and electricity generation capacities	If not aligned, please justify
HR	Not aligned	
HU	Not specified in NECP	Partially we consider the HU hydrogen strategy (2021) and the NECP data for electricity for hydrogen production.
IE		
IT	Aligned	
LT	Not specified in NECP	Gas TSO forecast used for SMR.
LU	Not specified in NECP	No specification in the NECP.
LV	Not specified in NECP	TSO doesn't have any estimates on this technology.
MD	Not specified in NECP	TSOs' own internal scenarios.
ME	Not specified in NECP	At the time of submitting the data, the draft NECP was not available. The draft NECP was published at the end of June 2025 as part of the public consultation process.
MK	Not specified in NECP	
MT	Not specified in NECP	No hydrogen is envisaged for hydrogen production for 2030.
NL	Not aligned	The NECP for the Netherlands only partly contains quantitative information which we require to build scenarios. Furthermore, most of the figures (for example in Annex 4) are outdated. The data provided for NT+ stems for our national policy scenario, which has been consulted with external stakeholders (sector representatives, experts, energy companies, industrial customers, regional authorities, etc.) and the relevant ministry (KGG). See scenario report publication here.
PL	Not specified in NECP	Not confirmed for the TYNDP purpose. It is assumed, based on non-biding market research conducted by gas TSO, that SMR installations will provide hydrogen for own needs only, will not be connected to the hydrogen network.
PT	Not specified in NECP	There is no indication regarding SMR and pyrolysis production of hydrogen in NECP (just green hydrogen), but regarding SMR capacity included in "ENTSOG data collection" the data was provided by the Portuguese Directorate for Energy and Geology - DGEG.
RO	Not specified in NECP	
RS	Not specified in NECP	There are no reliable sources that could be taken into account for this.
SE		
SI	Aligned	No SMR capacities, only electrolisers.
SK	Not aligned	The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of the TYNDP 2024).
TR	Aligned	
UA	Not aligned	The hydrogen development roadmap for Ukraine is absent. The data for the electrolysers are absent. NECP is a general roadmap only.

21 // Date and version of NECP for 2035-data

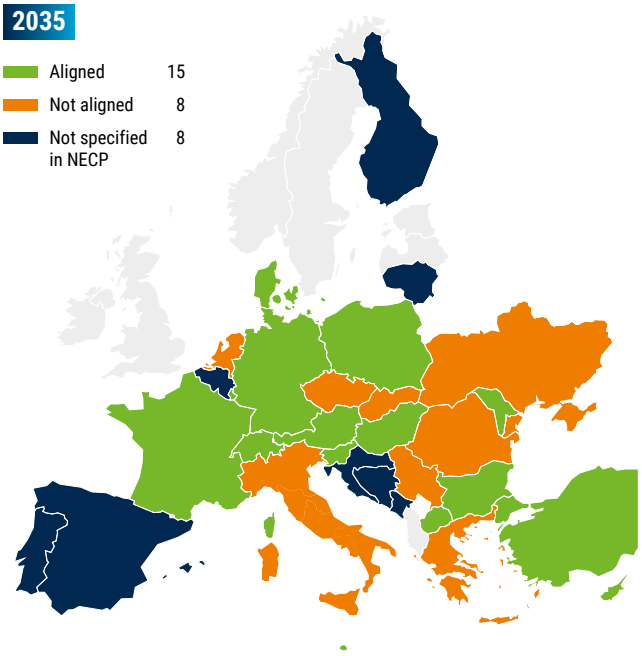
Please confirm the date and the version of the NECP that you have consulted for the study (e.g., Draft NECP as of date 24 December 2024) for 2035.

(Question 35 // PDF)

Q 35

	If not aligned, please justify
AT	Final version of NECP as of December 3 2024
BA	
BE	N/A
BG	Draft NECP - June 2024
CH	November 2022
CY	Final updated NECP 2021-2030, published in December 2024
CZ	December 18 2024
DE	Final updated NECP 2021-2030 (submitted in 2024), published 29 August 2024
DK	Denmark - Final updated NECP 2021-2030 (submitted in 2024)
EE	Draft NECP as of date 17 August 2023, where relevant
ES	The Spanish NECP does not specify data for horizons beyond 2030 "Final" - September 2024
FI	Finland - Final updated NECP 2021-2030 (1 July 2024)
FR	Non public data but aligned with draft NECP for 2035
GR	Final Updated NECP 7 January 2025
HR	draft updated integrated national energy and climate plan of Croatia covering the period 2021-2030 (2023.)
HU	Final NECP, October, 2024.
IE	
IT	FINAL UPDATED NECP as of date 1 July 2024
LT	The NECP covers the period 2021-2030; therefore, other sources used for the subsequent years.
LU	24 July 2024
LV	
MD	NECP as of date 26 February 2025
ME	The current draft NECP covers only the period up to 2030 (It has not yet been adopted), with certain indicative projections up to 2050.
MK	ERAA 2021 combined with National Energy Strategy
MT	Final NECP published on 7 January 2025
NL	Update of the NECP, as of June 2024
PL	October 2024
PT	Revised PNEC as of 1 October 2024, published by DGEG
RO	Integrated National Energy and Climate Plan of Romania 2025-2030 Update October 2024
RS	Data delivered for the TYNDP and ERAA is aligned with the official data available to the TSO.
SE	
SI	18 December 2024 (Draft version was used for the data collection, but the energy demand projections remain unchanged in the final version on 18 December 2024).
SK	The NECP version from December 2024 which had not yet been approved at the time of data collection.
TR	
UA	NECP for Ukraine was adopted in July 2024.

22 // Alignment of submitted energy demand figures with the NECP for 2035



Q 36

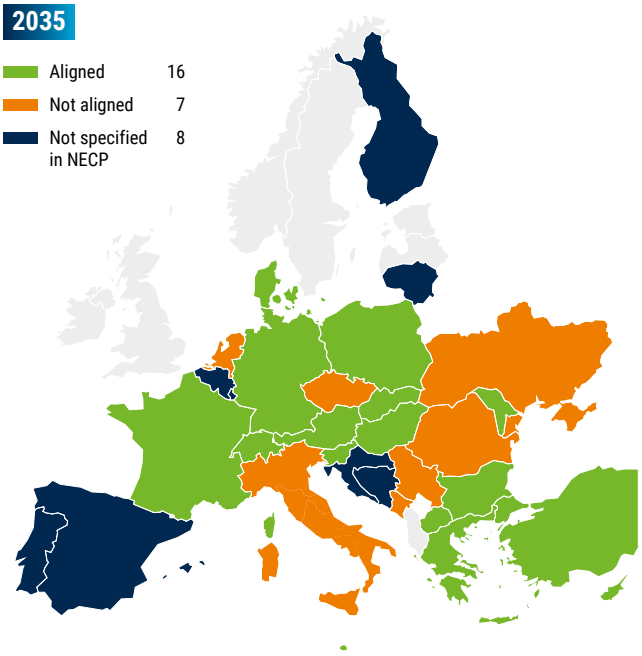
Please confirm alignment of submitted energy demand figures with the NECP for 2035.

(Question 36 // PDF)

	Alignment of submitted energy demand figures with the NECP for 2035	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	Indicative Generation Development Plan Internal data of Gas TSO. Draft BiH Hydrogen Roadmap.
BE	Not specified in NECP	See answers for 2030.
BG	Aligned	
CH	Aligned	
CY	Aligned	
CZ	Not aligned	Not aligned for TYNDP, because the NECP does not provide sufficient data granularity to enable responsible adjustment of the utilisation of different technologies across the FEC sectors in the ETM. WGSB has not developed any methodology or guidelines for such a case, besides trial-by-error method. Besides, FEC in the ETM reference scenario (in 2019) was significantly higher than FEC in the reference scenario in NECP (1178 vs. 1030 PJ). Eurostat data also show lower FEC for CZ compared to the reference in the ETM. Therefore, we opted out of using ETM and the fallback solution was used. These concerns were raised multiple times during data collection by both TSOs.
DE	Aligned	
DK	Aligned	
EE		
ES	Not specified in NECP	Internal scenarios were used for those years that are not specified or insufficiently specified in national publications for 2030 and 2050, namely 2035 and 2040. Special attention was paid to preserving consistency of data for these intermediate years with national publications.e-demand: NDP, eTSO projections, Spanish Economic Forecasting Centre Association.
FI	Not specified in NECP	

	Alignment of submitted energy demand figures with the NECP for 2035	If not aligned, please justify
FR	Aligned	The energy demand data we use were available for every year and we try to best approach it with the ETM.
GR	Not aligned	Electricity and Gas (incl Hydrogen, Methane, etc.) Sectors are aligned with NECP.
HR	Not specified in NECP	
HU	Aligned	
IE		
IT	Not aligned	Target year not covered by NECP.
LT	Not specified in NECP	Lithuanian Energy Transformation Study to 2050.
LU	Aligned	
LV		
MD	Aligned	
ME	Not specified in NECP	The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050.
MK	Aligned	
MT	Aligned	
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Aligned	
PT	Not specified in NECP	Whenever necessary, datasets used for both ERAA and TYNDP were complemented by input data used in PT National Resource Adequacy Assessment and/or on data provided by the Portuguese Directorate for Energy and Geology - DGEG.
RO	Not aligned	
RS	Not aligned	Data delivered for the TYNDP and ERAA is aligned with the official data available to the TSO.
SE		
SI	Aligned	
SK	Not aligned	The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of the TYNDP 2024).
TR	Aligned	
UA	Not aligned	The demand for 2035 is projected based on the consultations with Ministries and other stakeholders.

23 // Alignment of submitted annual electricity demand figures with the NECP for 2035



Q 37

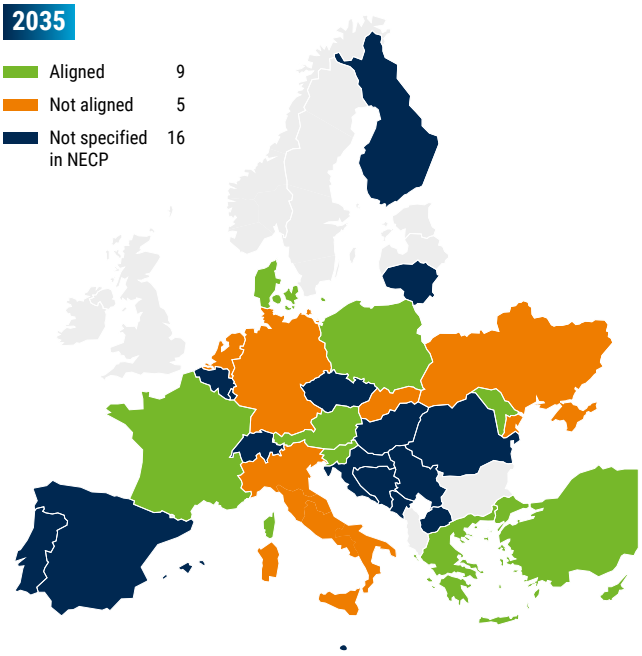
Please confirm alignment of submitted annual electricity demand figures with the NECP for 2035.

(Question 37 // PDF)

	Please confirm alignment of hydrogen production	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	Indicative Generation Development Plan
BE	Not specified in NECP	See answers for 2030
BG	Aligned	
CH	Aligned	
CY	Aligned	
CZ	Not aligned	ETM requires too specific details which are not available in the NECP + discrepancy in reference scenarios demand, therefore the fallback solution was used.
DE	Aligned	
DK	Aligned	
EE		
ES	Not specified in NECP	NDP, e-TSO projections, Spanish Economic Forecasting Centre Association.
FI	Not specified in NECP	
FR	Aligned	
GR	Aligned	
HR	Not specified in NECP	
HU	Aligned	
IE		
IT	Not aligned	Target year not covered by NECP.

	Please confirm alignment of hydrogen production	If not aligned, please justify
LT	Not specified in NECP (please specify below)	Based on NECP data and the goals and objectives set out in the National energy independence strategy, the electricity TSO prepares forecasts for the coming years (after 2030) and coordinates them with the Ministry of Energy.
LU	Not specified in NECP	even though it is not specified with the publicly available NECP data, we are aligned with the figures extending to 2050.
LV		
MD	Aligned	
ME	Not aligned	At the time of submitting the data, the draft NECP was not available. The draft NECP was published at the end of June 2025 as part of the public consultation process. The data were submitted on the basis of several materials, including data provided for previous plans, as well as data obtained through communication with institutions dealing with specific issues related to the type of data requested. With regard to the specific data, the differences are minor. Also, the current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050.
MK	Aligned	
MT	Aligned	
NL	Not aligned (please specify below)	See response to same question on 2030 assumptions.
PL	Aligned	
PT	Not specified in NECP (please specify below)	Whenever necessary, datasets used for both ERAA and TYNDP were complemented by input data used in National Resource Adequacy Assessment.
RO	Not aligned (please specify below)	
RS	Not aligned (please specify below)	Data delivered for the TYNDP and ERAA is aligned with the official data available to the TSO.
SE		
SI	Aligned	
SK	Aligned	The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of the TYNDP 2024). The electricity data has an acceptable deviation from the NECP, respectively PEMMDB. For this reason the electricity demand is flagged as aligned.
TR	Aligned	
UA	Not aligned (please specify below)	The demand for 2035 is projected based on the consultations with Ministries and other stakeholders.

24 // Alignment of submitted annual hydrogen demand figures with the NECP for 2035



Q 38

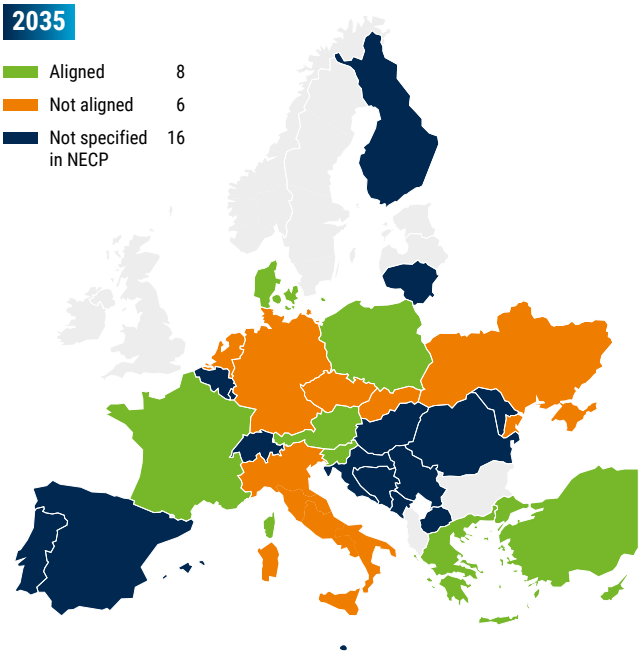
Please confirm alignment of submitted annual hydrogen demand figures with the NECP for 2035.

(Question 38 // PDF)

	Please confirm alignment of hydrogen production	If not aligned, please justify
AT	Not specified in NECP	Austrian hydrogen strategy does not cover data until 2050, hence EHB data and project specific data (SouthH_2 Corridor) have been considered too.
BA	Not specified in NECP	Internal data of Gas TSO. Draft BiH Hydrogen Roadmap.
BE	Not specified in NECP	See answers for 2030.
BG		
CH	Not specified in NECP	Since hydrogen demand values are not available in the Swiss National Framwork for Grid Planning, the values where taken from internal references from Swissgas or from the EP2050+.
CY	Aligned	
CZ	Aligned	
DE	Not aligned	In the NECP the national strategy on hydrogen imports was not considered. This strategy is reflected in the national system development strategy, that defines boundaries for the national system development of the electrcity and gas infrastructure. Compared to the NECP, the hydrogen demand has been increased to reflect these strategies. Fossil fuels have been reduced to compensate the hydrogen increase to keep the sectoral energy demand stated in the NECP.
DK	Aligned	
EE		
ES	Not specified in NECP	g-TSO projections
FI	Not specified in NECP	
FR	Aligned	
GR	Aligned	
HR	Not specified in NECP	

	Please confirm alignment of hydrogen production	If not aligned, please justify
HU	Not specified in NECP	The 2035 value is interpolated. For target years (2030,2040,2050), the NECP focuses on final energy consumption, ENTSOG ETM data request includes both energetic and non-energetic data. That is why there is a difference between the two. ETM is based on TSO best estimation. TSO doesn't have detailed data from all the sectors. We tried to follow the aggregate NECP figures and we have consulted with some major expected hydrogen consumers. RFNBO obligation is higher than the NECP value. We finally applied estimates by the TSO, based partially on some expected hydrogen consumer forecasts.
IE		
IT	Not aligned	Target year not covered by NECP.
LT	Not specified in NECP	Lithuanian Energy Transformation Study to 2050.
LU	Not specified in NECP	even though it is not specified with the publicly available NECP data, we are aligned with the figures extending to 2050.
LV		
MD	Aligned	
ME	Not specified in NECP	Hydrogen is not included in the submitted data. The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050.
MK	Not specified in NECP	
MT	Not specified in NECP	Time horizon of the NECP is till 2030.
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Aligned	
PT	Not specified in NECP	In case of hydrogen demand, datasets used for both ERAA and TYNDP were complemented by input data provided by the Portuguese Directorate for Energy and Geology.
RO	Not specified in NECP	
RS	Not specified in NECP	Data delivered for the TYNDP and ERAA is aligned with the official data available to the TSO.
SE		
SI	Aligned	NECP does not differ between hydrogen and climate neutral (renewable) methane based gas (biogas, synthetic gas) and provides only the aggregated (combined) renewable gas demand. The division to hydrogen and green gas was based on the TSO data and projections.
SK	Not aligned	The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of theTYNDP 2024).
TR	Aligned	
UA	Not aligned	There is no hydrogen demand for 2035.

25 // Alignment of methane demand figures with the NECP for 2035



Q 39

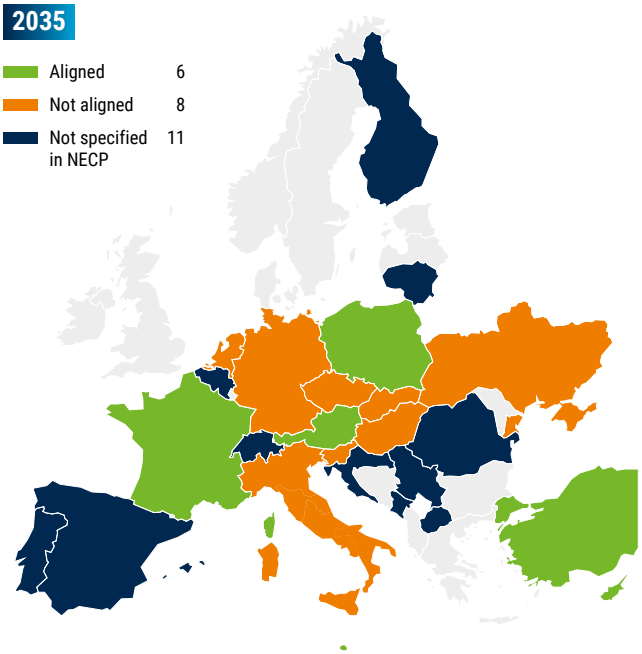
Please confirm alignment of submitted annual methane demand figures with the NECP for 2035.

(Question 39 // PDF)

	Please confirm alignment of methane production	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	Internal data of Gas TSO.
BE	Not specified in NECP	See answers for 2030.
BG		
CH	Not specified in NECP	Since methane demand values are not available in the Swiss National Framwork for Grid Planning, the values where taken from internal references from Swissgas or from the EP2050+.
CY	Aligned	
CZ	Not aligned	The NECP data is not sufficiently granular to enable responsible adjustments to be made to the utilisation of different gas technologies across the FEC sectors in the ETM, nor in combination with other technologies and energy carriers. WGSB has not developed any methodology or guidelines for such a case. These concerns were raised multiple times during data collection by both TSOs.
DE	Not aligned	Methane demand has been reduced to compensate for additional hydrogen demand.
DK	Aligned	
EE		
ES	Not specified in NECP	g-TSO projections
FI	Not specified in NECP	The forecast horizon and granularity of data are not of NECP are not sufficient for study. and do not correspond to the latest TSOs' view for the coming years. The available data also does not reflect the TSOs' latest view on sector developments.
FR	Aligned	
GR	Aligned	
HR	Not specified in NECP	
HU	Not specified in NECP	The 2035 value is interpolated.

	Please confirm alignment of methane production	If not aligned, please justify
IE		
IT	Not aligned	Target year not covered by NECP.
LT	Not specified in NECP	Lithuanian Energy Transformation Study to 2050.
LU	Not specified in NECP	even though it is not specified with the publicly available NECP data, we are aligned with the figures extending to 2050.
LV		
MD	Not specified in NECP	TSOs' own internal scenarios.
ME	Not specified in NECP	The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050. Montenegro currently does not have access to natural gas sources, nor the infrastructure that would support its use. The Energy Development Strategy until 2030 clearly recognises natural gas as an important energy source that would contribute to the diversification of Montenegro's energy mix. The planned use of natural gas is as a substitute for other forms of energy, particularly for the use of electricity and the replacement of coal for heating and cooling.
MK	Not specified in NECP	
MT	Not specified in NECP	Time horizon of the NECP is till 2030.
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Aligned	
PT	Not specified in NECP (please specify below)	Whenever necessary, datasets used for both ERAA and TYNDP were complemented by input data used in National Gas Adequacy Assessment.
RO	Not specified in NECP	
RS	Not specified in NECP	Data delivered for the TYNDP and ERAA is aligned with the official data available to the TSO.
SE		
SI	Aligned	NECP does not differ between hydrogen and climate neutral (renewable) methane based gas (biogas, synthetic gas) and provides only the aggregated (combined) renewable gas demand. The division to hydrogen and green gas was based on the TSO data and projections. Natural gas demand was specified in NECP.
SK	Not aligned	The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of the TYNDP 2024).
TR	Aligned	
UA	Not aligned	The situation in Ukraine is uncertain.

26 // Alignment of other energy carriers' demand figures with the NECP



Q 40

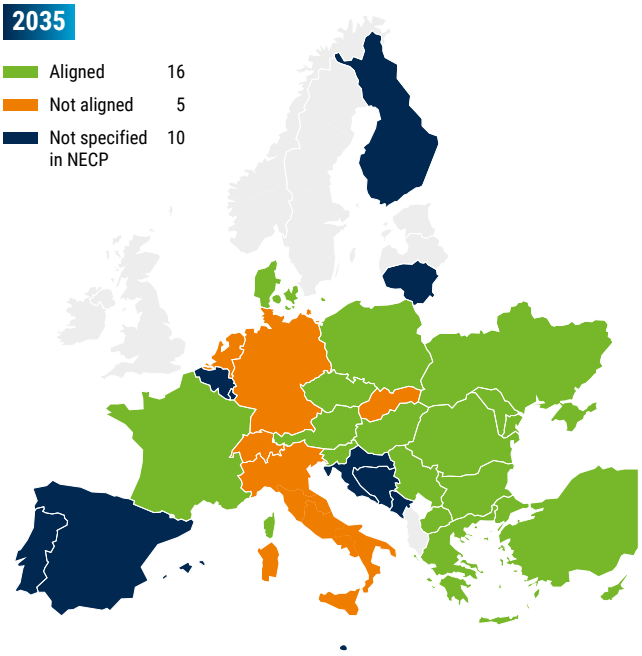
Please confirm alignment of other energy carriers' demand figures with the NECP for 2035.

(Question 40 // PDF)

	Please specify the carrier	Please confirm alignment of other energy carriers'	If not aligned, please justify
AT	Biomethane, crude oil, e-liquids, solid fossil, biomass	Aligned	
BA			
BE	See answers for 2030	Not specified in NECP (please specify below)	See answers for 2030.
BG			
CH		Not specified in NECP (please specify below)	
CY	All energy carriers	Aligned	
CZ		Not aligned (please specify below)	The NECP data is not sufficiently granular to enable responsible adjustments to be made to the utilisation of different technologies across the FEC sectors in the ETM, nor in combination with other technologies and energy carriers. WGSB has not developed any methodology or guidelines for such a case. These concerns were raised multiple times during data collection by both TSOs.
DE	Oil, coal, lignite	Not aligned (please specify below)	Fossil fuel demand has been reduced to compensate for additional hydrogen demand.
DK			
EE			
ES	Heat, biofuels, solids, oil, ammonia, others	Not specified in NECP (please specify below)	e/g-TSO projections + European policies
FI		Not specified in NECP (please specify below)	

	Please specify the carrier	Please confirm alignment of other energy carriers'	If not aligned, please justify
FR		Aligned	Due to difficulties in configuring ETM to reflect final demand volumes there might be some discrepancies on energy carriers other than electricity, gas or hydrogen for some horizons.
GR			
HR		Not specified in NECP (please specify below)	
HU	Other	Not aligned (please specify below)	It was not possible/sensible in ETM.
IE			
IT	All others	Not aligned (please specify below)	Target year not covered by NECP.
LT	Other	Not specified in NECP	Lithuanian Energy Transformation Study to 2050.
LU			
LV			
MD			
ME		Not specified in NECP	The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050. The data were submitted on the basis of several materials, including data provided for previous plans, as well as data obtained through communication with institutions dealing with specific issues related to the type of data requested.
MK	N/A	Not specified in NECP	
MT	LPG households aligned with NECP figures	Aligned	
NL	Various energy & feedstock carriers.	Not aligned	See response to same question on 2030 assumptions.
PL	Energy carriers have been represented in the ETM based on data in the NECP project	Aligned	
PT	Electricity, methane, hydrogen	Not specified in NECP	Whenever necessary, datasets used for both ERAA and TYNDP were complemented by input data used in both electricity and gas PT National Resource Adequacy Assessments and/or on data provided by the Portuguese Directorate for Energy and Geology - DGEG.
RO	N/A	Not specified in NECP	
RS		Not specified in NECP	Data delivered for the TYNDP and ERAA is aligned with the official data available to the TSO.
SE			
SI		Not aligned	Data for other carriers was not submitted by the TSOs.
SK	All other energy carriers' demand	Not aligned	The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of theTYNDP 2024).
TR		Aligned	
UA		Not aligned	The situation in Ukraine is uncertain.

27 // Alignment of renewable electricity generation capacities with the NECP for 2035



Q 41

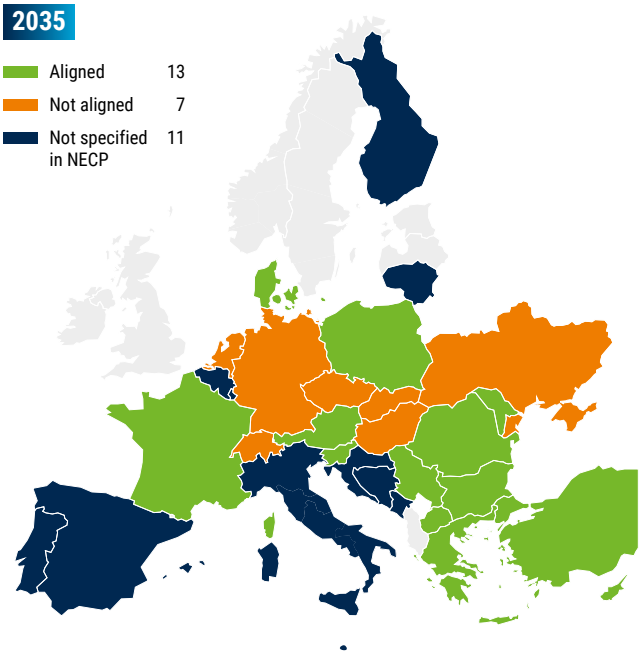
Please confirm alignment of renewable electricity generation capacities with the NECP for 2035.

(Question 41 // PDF)

	Please confirm alignment of methane production	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	Indicative Generation Development Plan
BE	Not specified in NECP	See answers for 2030
BG	Aligned	
CH	Not aligned	For technologies (PV, Wind) where goals have been already reached or those where the goals do not seem realistic, new values where given. These new values have been discussed with the NRA as they are common to the most recent national adequacy assessment.
CY	Aligned	
CZ	Aligned	
DE	Not aligned	PV and Biomass is aligned with the NECP. Wind Onshore is aligned with legally defined targets (Erneuerbaren-Energien-Gesetz 2023). Wind Offshore is based on TSO project information taken into account for the draft of the network development scenario framework (Network Development Plan 2037/2045 (2025)). Hydro capacities are also taken from this source.
DK	Aligned	
EE		
ES	Not specified in NECP	National Long-Term Strategy, information from stakeholders, etc.
FI	Not specified in NECP	
FR	Aligned	
GR	Aligned	
HR	Not specified in NECP	
HU	Aligned	The submitted renewable energy capacities are equal to/higher than the NECP targets.

	Please confirm alignment of methane production	If not aligned, please justify
IE		
IT	Not aligned	Target year not covered by NECP.
LT	Not specified in NECP	Based on NECP data and the goals and objectives set out in the National energy independence strategy, the electricity TSO prepares forecasts for the coming years (after 2030) and coordinates them with the Ministry of Energy.
LU	Not specified in NECP	
LV		
MD	Aligned	
ME	Not specified in NECP	The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050. The data have been harmonised in accordance with communication and inputs from the institutions concerned with the requested type of data.
MK	Aligned	
MT	Not specified in NECP	Onshore solar PV - no information beyond 2030 was provided in the NECP. Offshore renewables aligned with MS non binding agreements.
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Aligned	
PT	Not specified in NECP	Whenever necessary, datasets used for both ERAA and TYNDP were complemented by input data used in both electricity and gas National Resource Adequacy Assessments.
RO	Aligned	
RS	Aligned	Data delivered for the TYNDP and ERAA is aligned with the official data available to the TSO. In NECP, only the minimal expected targets for RES integration are provided. Since values submitted by EMS exceed those significantly, those can be treated as aligned.
SE		
SI	Aligned	
SK	Not aligned	Projections beyond 2030 are based on internal prognoses. These relevant prognoses are used e.g. in the TSO's ten-year development plan as well as in the assessment of the adequacy resource of the Power system of the Slovak Republic for the Ministry of Economy purposes. However, the data provided may differ slightly from internal prognoses due to different processing times.
TR	Aligned	
UA	Aligned	These data are based on National Renewable Action plan until 2030 and further extrapolated.

28 // Alignment of thermal and (including nuclear) electricity generation capacities with the NECP for 2035



Q 42

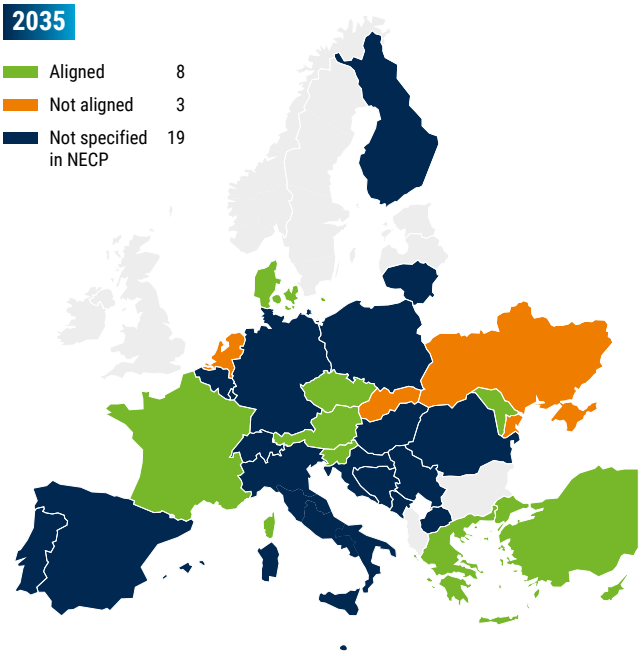
Please confirm alignment of thermal and (including nuclear) electricity generation capacities with the NECP for 2035.

(Question 42 // PDF)

	Please confirm alignment of methane production	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	Indicative Generation Development Plan
BE	Not specified in NECP	See answers for 2030.
BG	Aligned	
CH	Not aligned	Nuclear power plants were given a 60 year long lifetime as opposed to the 50 year long lifetime in the Swiss National Framework for Grid Planning as discussed with the NRA.
CY	Aligned	
CZ	Not aligned	All Thermal data were based on Data collection from operators in 2024 by ČEPS.
DE	Not aligned	Coal: In the NECP scenario MWMS, a coal phase-out is predetermined exogenously by 2030 and in the scenario MMS for 2035. In TYNDP 2026, however, the coal phase-out is reported based on the legal framework (KVBG, 08/2020), which means that a total of 4.8 GW of coal capacity is still installed in 2035. However, there is the possibility of effectively observing a coal phase-out in the results through low operating hours of these power plants. Gas: In the NECP scenario MWMS, 30.8 GW of natural gas and 23.8 GW of hydrogen power plants are assumed for 2035 - while in scenario MMS 32.3 GW of natural gas and no hydrogen. Currently, there is no legal basis for such a rapid increase in installed capacity. However, in order to reflect the long-term targets for 2040/2050 in the TYNDP, a linear increase in installed capacity of natural gas and hydrogen power plants between 2024 and 2037 is assumed. This is done while considering an adoption curve toward fuel-switched hydrogen power plants - with the goal of having no natural gas-fired power plants by 2045, only hydrogen power plants. Along this trajectory, 32.7 GW of natural gas and 16.5 GW of hydrogen power plants are represented for 2035.
DK	Aligned	
EE		
ES	Not specified in NECP	Nuclear: Official Closure Schedule from Ministry. Others: Ministry/Useful Lifetime.

	Please confirm alignment of methane production	If not aligned, please justify
FI	Not specified in NECP	
FR	Aligned	
GR	Aligned	
HR	Not specified in NECP	
HU	Not aligned	Nuclear is aligned, we foresee more gas and oil capacity than in NECP based on plans of power plants (regular consultation).
IE		
IT	Not specified in NECP	Target year not covered by NECP.
LT	Not specified in NECP	Thermal capacities are presented taking into account information, received during the annual survey of the largest electricity producers on long-term capacity development/decommissioning plans.
LU	Not specified in NECP	No nuclear generation considered.
LV		
MD	Aligned	
ME	Not specified in NECP	The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050. The data have been harmonised in accordance with communication and inputs from the institutions concerned with the requested type of data.
MK	Aligned	
MT	Not specified in NECP	Time horizon of the NECP is till 2030.
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Aligned	
PT	Not specified in NECP	Whenever necessary, datasets used for both ERAA and TYNDP were complemented by input data used in both electricity and gas National Resource Adequacy Assessments.
RO	Aligned	
RS	Aligned	
SE		
SI	Aligned	
SK	Not aligned	Projections beyond 2030 are based on internal prognoses. These relevant prognoses are used e.g. in the TSO's ten-year development plan as well as in the assessment of the adequacy resource of the Power system of the Slovak Republic for the Ministry of Economy purposes. However, the data provided may differ slightly from internal prognoses due to different processing times.
TR	Aligned	
UA	Not aligned	These data are based on consultations with Ministries and stakeholders.

29 // Alignment of DSR with the NECP for 2035



Q 43

Please confirm alignment of DSR with the NECP for 2035.

(Question 43 // PDF)

	Please confirm alignment of DSR	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	No data.
BE	Not specified in NECP	See answers for 2030.
BG		
CH	Not specified in NECP	No explicit DSR provided, only implicit DSR.
CY	Aligned	
CZ	Aligned	
DE	Not specified in NECP	DSR is not specified in the NECP and taken from national studies. Data refers to the scenario framework draft of the German grid development plan (Network Development Plan 2037/2045 (2025)) and the system analysis (Bundesnetzagentur - Netzreserve). It should be noted that shiftable DSR could not be modelled in the TYDNP. Assumption: The shiftable DSR is assigned to demand shedding or not considered based on the activation price.
DK	Aligned	
EE		
ES	Not specified in NECP	e-TSO internal studies
FI	Not specified in NECP	
FR	Aligned	
GR	Aligned	
HR	Not specified in NECP	
HU	Not specified in NECP	No concrete provision about DSR is included in the NECP.
IE		

	Please confirm alignment of DSR	If not aligned, please justify
IT	Not specified in NECP	Target year not covered by NECP.
LT	Not specified in NECP	Same as 2030.
LU	Not specified in NECP	Generalised flexibility of 3–30%, depending on the sector.
LV		
MD	Not specified in NECP	TSOs' own internal scenarios.
ME	Not specified in NECP	The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050. DSR is not part of the data provided.
MK	Not specified in NECP	
MT	Not specified in NECP	No data on DSR was provided.
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Not specified in NECP	In the NECP there is a common level of DSR and import provided.
PT	Not specified in NECP	DSR was not included in both ERAA and TYNDP since there is no indication regarding DSR.
RO	Not specified in NECP	In PT NECP.
RS	Not specified in NECP	
SE		There is no reliable source available for this parameter.
SI	Aligned	
SK	Not aligned	
TR	Aligned	Projections of the DSR beyond 2030 were not provided.
UA	Not aligned	

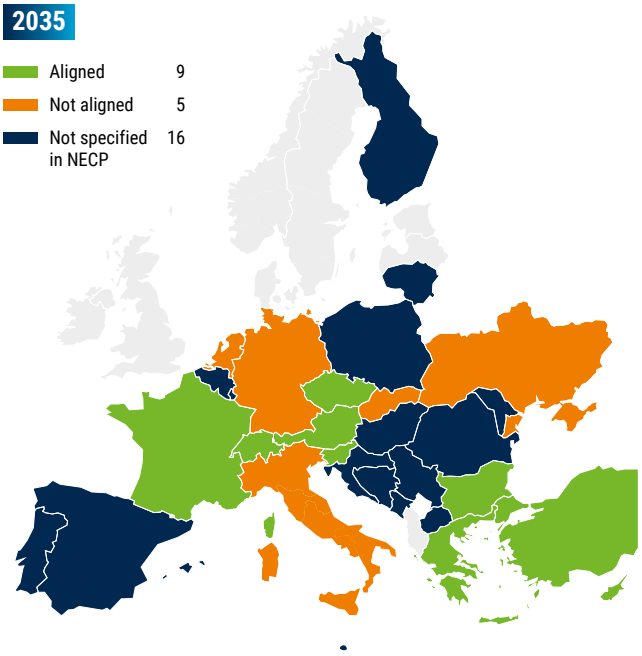
Please explain how is demand-side flexibility (e.g. DSR) already reflected in your datasets for 2035.

(Question 44 // PDF)

Q 44

	Please explain how is demand-side flexibility already reflected in your datasets for 2035.
AT	Demand shedding and demand shifting.
BA	No data.
BE	See answers for 2030.
BG	No Demand-Side Flexibility is considered in the NECP.
CH	Only implicit DSR provided for EV, HP and decentralised batteries, as derived from the Swiss National Framework for Grid Planning.
CY	No DSR for 2035.
CZ	DSR is assumed to be implemented as load shedding in the industrial sector.
DE	Demand side flexibility is considered by Electrolysis, Power to Heat and DSR. For the latter one different bands for industrial processes and flexibilities in the commerce, trade, and service sector are defined, where the demand can be shifted or shaded based on an activation price. It should be noted that shiftable DSR could not be modelled in the TYDNP. Assumption: The shiftable DSR is assigned to demand shedding or not considered based on the activation price.
DK	In the ETM just the Demand tab has been filled, and no additional flexibility has been defined.
EE	The DSR which has been submitted for Denmark in the PEMMDB app is P2X and P2H. The activation price for P2X is calculated centrally by ENTSO-E. The activation price for P2H is based on market model simulations.
ES	DSR (demand shedding) has not been considered in demand figures (ETM), but in supply capacities (PEMMDB).
FI	
FR	DSR data reflects the TSOs' latest views on DSR developments, which includes industrial, residential and heating sector developments of DSR.
GR	
HR	Explicit DSR was submitted at the PEMMDB.
HU	
IE	No explicit/implicit DSR capacities submitted.
IT	
LT	Internal assumptions based on TSO studies.
LU	Same as 2030.
LV	Generalised flexibility of 3-30%, depending on the sector.
MD	
ME	
MK	DSR is not part of the data provided.
MT	N/A
NL	Not reflected.
PL	See response to same question on 2030 assumptions.
PT	The estimation of non-market DSR up to 2050 was provided. Market DSR is allowed to expand up to expansion constrains provided in PEMMDB.
RO	DSR was not included in both ERAA and TYNDP since there is no indication regarding DSR.
RS	In PT NECP.
SE	N/A
SI	
SK	
TR	
UA	Projections of the DSR beyond 2030 were not provided.

30 // Alignment of alignment of electrolysers installed capacities with the NECP for 2035



Q 45

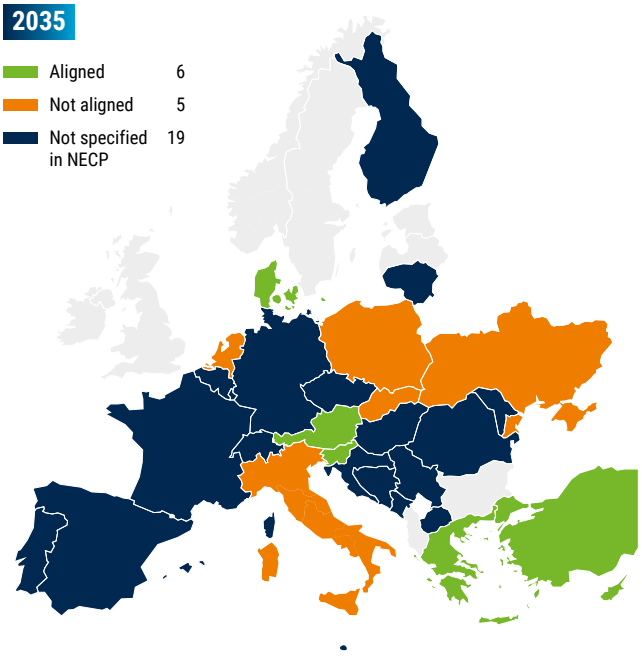
Please confirm alignment of electrolysers installed capacities with the NECP for 2035.

(Question 45 // PDF)

	Please confirm alignment of of electrolysers installed capacities	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	No data.
BE	Not specified in NECP	See answers for 2030.
BG	Aligned	
CH	Aligned	
CY	Aligned	
CZ	Aligned	
DE	Not aligned	In the NECP the national strategy on hydrogen imports (BMWE - National Hydrogen Strategy Update) was not considered. This strategy is reflected in the national system development strategy (BMWE - Die Systementwicklungsstrategie), that defines boundaries for the national system development of the electricity and gas infrastructure. To align with the hydrogen demand and import share projections, the electrolyser capacities have been increased compared to the NECP. The draft of the scenario framework for the NEP2037/2045 has been used as reference (Network Development Plan 2037/2045 (2025)).
DK		
EE		
ES	Not specified in NECP	g-TSO projections
FI	Not specified in NECP	
FR	Aligned	
GR	Aligned	
HR	Not specified in NECP	

	Please confirm alignment of of electrolysers installed capacities	If not aligned, please justify
HU	Not specified in NECP	Partially we consider the HU hydrogen strategy (2021) and the NECP data for electricity for hydrogen production. Electrolyser and SMR/pyrolysis capacities were estimated based on the NECP trajectories of electricity demand and renewable electricity production. 2035 values are interpolated.
IE		
IT	Not aligned	Target year not covered by NECP
LT	Not specified in NECP	Data - N/A
LU	Not specified in NECP	Even though it is not specified with the publicly available NECP data, we are aligned with the figures extending to 2050.
LV		
MD	Not specified in NECP	TSOs' own internal scenarios.
ME	Not specified in NECP	Electrolysers are not included in the submitted data.
MK	Not specified in NECP	
MT	Not specified in NECP	Time horizon of NECP is till 2030, however we do not expect any installation of electrolysers by 2035.
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Not specified in NECP	Reverse-engineering carried out to retrieve some data from supporting analysis with inclusion of unbiding market research conducted by gas TSO.
PT	Not specified in NECP	Whenever necessary, datasets used for both ERAA and TYNDP were complemented by input data used in both electricity and gas PT National Resource Adequacy Assessments and/or on data provided by the Portuguese Directorate for Energy and Geology - DGEG.
RO	Not specified in NECP	
RS	Not specified in NECP	There is no reliable source available for this parameter.
SE		
SI	Aligned	
SK	Not aligned	Electolysers installed capacity is based on TSO's internal prognoses. TSO's internal prognoses are based on the outcomes of studies by an independent external consultancy company. These relevant prognoses are used e.g. in the TSO's ten-year development plan as well as in the assessment of the adequacy resource of the Power system of the Slovak Republic for the Ministry of Economy purposes. However, the data provided may differ slightly from internal prognoses due to different processing times.
TR	Aligned	
UA	Not aligned	

31 // Alignment of alignment of hydrogen production (SMR & pyrolysis) capacities with the NECP for 2035



Q 46

Please confirm alignment of hydrogen production (SMR & pyrolysis) capacities with the NECP for 2035.

(Question 46 // PDF)

	Alignment of hydrogen production (SMR & pyrolysis) capacities	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	
BE	Not specified in NECP	See answers for 2030.
BG		
CH	Not specified in NECP	Since hydrogen production values are not available in the Swiss National Framwork for Grid Planning, the values where taken from internal references from Swissgas or from the EP2050+.
CY	Aligned	
CZ	Not specified in NECP	No data on SMR/pyrolysis are available in the CZ NECP (only electrolysers) - not considered in data collection.
DE	Not specified in NECP	Data from a market survey done for national grid development studies was used. This Survey collects planned installations of large consumers.
DK	Aligned	
EE		
ES	Not specified in NECP	A phase out of SMR for hydrogen production in industry is assumed for the 2035-2040 horizon.
FI	Not specified in NECP	
FR	Not specified in NECP	
GR	Aligned	
HR	Not specified in NECP	Hydrogen strategy data is used.
HU	Not specified in NECP	Partially we consider the HU hydrogen strategy (2021) and the NECP data for electricity for hydrogen production. Electrolyser and SMR/pyrolysis capacities were estimated based on the NECP trajectories of electricity demand and renewable electricity production. 2035 values are interpolated.

	Alignment of hydrogen production (SMR & pyrolysis) capacities	If not aligned, please justify
IE		
IT	Not aligned	Target year not covered by NECP.
LT	Not specified in NECP	Data - N/A
LU	Not specified in NECP	No specification in the NECP focus.
LV		
MD	Not specified in NECP	TSOs' own internal scenarios.
ME	Not specified in NECP	Hydrogen is not included in the submitted data. The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050.
MK	Not specified in NECP	
MT	Not specified in NECP	Time horizon of NECP is till 2030, however we do not expect any hydrogen production by 2035.
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Not aligned	Not confirmed for the TYNDP purpose. It is assumed, based on unbiding market research conducted by gas TSO, that SMR installations will provide hydrogen for own needs only, will not be connected to the hydrogen network.
PT	Not specified in NECP	There is no indication regarding SMR and pyrolysis production of hydrogen in NECP (just green hydrogen), but regarding SMR capacity included in "ENTSOG data collection" the data was provided by the Portuguese Directorate for Energy and Geology - DGEG.
RO	Not specified in NECP	
RS	Not specified in NECP	There is no reliable source available for this parameter.
SE		
SI	Aligned	No SMR capacities, only electrolysers.
SK	Not aligned	The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of the TYNDP 2024).
TR	Aligned	
UA	Not aligned	No hydrogen production for 2035.

32 // Date and version of NECP for 2040-data

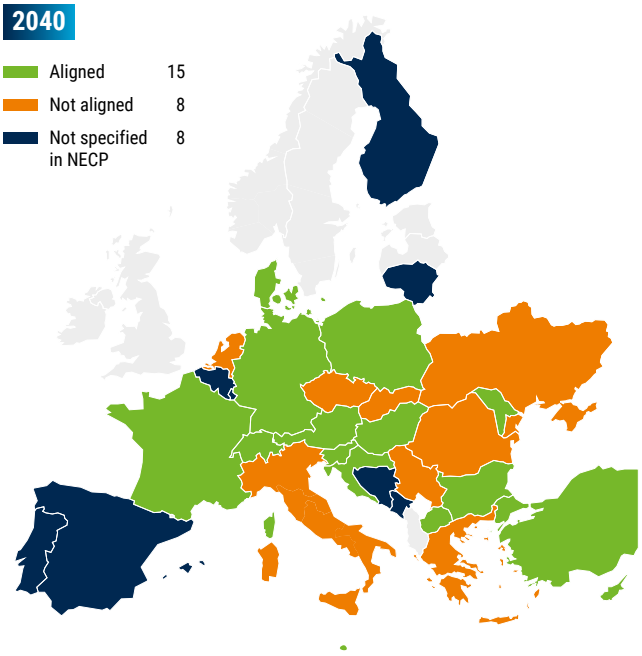
Please confirm the date and the version of the NECP that you have consulted for the study for 2040. – For TYNDP/SB 2026.

(Question 47 // PDF)

Q 47

	If not aligned, please justify
AT	Final version of NECP as of December 3 2024
BA	
BE	NA
BG	Draft NECP - June 2024
CH	November 2022
CY	Final updated NECP 2021-2030, published in December 2024
CZ	18 December 2024
DE	Final updated NECP 2021-2030 (submitted in 2024), published 29 August 2024
DK	Denmark - Final updated NECP 2021-2030 (submitted in 2024)
EE	
ES	The Spanish NECP does not specify data for horizons beyond 2030 "Final" - September 2024
FI	Finland - Final updated NECP 2021-2030 (1 July 2024)
FR	Non public data for 2035-2050
GR	Final Updated NECP 7 January 2025
HR	draft updated integrated national energy and climate plan of Croatia covering the period 2021-2030 (2023.)
HU	Final NECP, October, 2024.
IE	
IT	Final updated NECP as of date 1 July 2024
LT	The NECP covers the period 2021-2030; therefore, other sources used for the subsequent years.
LU	24 July 2024
LV	
MD	NECP as of date 26 February 2025 for 2030
ME	The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050.
MK	NECP combined with National Energy Strategy
MT	Final NECP, published 7 January, 2025.
NL	Update of the NECP, as of June 2024.
PL	October 2024
PT	Revised PNEC as of 1 October 2024, published by DGEG
RO	Integrated National Energy and Climate Plan of Romania 2025-2030 Update October 2024
RS	
SE	
SI	18 December 2024 (Draft version was used for the data collection, but the energy demand projections remain unchanged in the final version on 18 December 2024).
SK	The NECP version from December 2024 which had not yet been approved at the time of data collection.
TR	
UA	NECP of Ukraine adopted in July 2024.

33 // Alignment of submitted energy demand figures with the NECP for 2040



Q 48

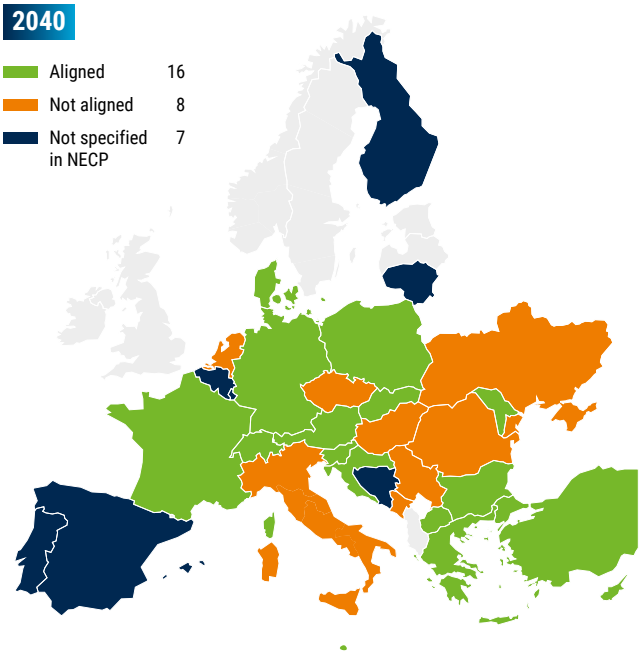
Please confirm alignment of submitted energy demand figures with the NECP for 2040.

(Question 48 // PDF)

	Alignment of submitted energy demand figures with the NECP for 2040	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	Internal data of Electricity TSO. Internal data of Gas TSO. Draft BiH Hydrogen Roadmap.
BE	Not specified in NECP	See answers for 2030.
BG	Aligned	
CH	Aligned	
CY	Aligned	
CZ	Not aligned	Not aligned for TYNDP, because the NECP does not provide sufficient data granularity to enable responsible adjustmet of the utilisation of different technologies across the FEC sectors in the ETM. WGSB has not developed any methodology or guidelines for such a case, besides trial-by-error method. Besides, FEC in the ETM reference scenario (in 2019) was significantly higher than FEC in the reference scenario in NECP (1178 vs. 1030 PJ). Eurostat data also show lower FEC for CZ compared to the reference in the ETM. Therefore, we opted out of using ETM and the fallback solution was used. These concerns were raised multiple times during data collection by both TSOs.
DE	Aligned	
DK	Aligned	
EE		
ES	Not specified in NECP	Internal scenarios were used for those years that are not specified or insufficiently specified in national publications for 2030 and 2050, namely 2035 and 2040. Special attention was paid to preserving consistency of data for these intermediate years with national publications e-demand: NDP, eTSO projections, Spanish Economic Forecasting Centre Association.
FI	Not specified in NECP	
FR	Aligned	

	Alignment of submitted energy demand figures with the NECP for 2040	If not aligned, please justify
GR	Not aligned	Electricity and Gas (incl. Hydrogen, Methane, etc.) Sectors are aligned with NECP.
HR	Aligned	
HU	Aligned	
IE		
IT	Not aligned	Target year not covered by the NECP: 2040 outlook in NECP is a non-binding trend projection, not supported by additional policy measures and therefore not aligned with a structured decarbonisation pathway.
LT	Not specified in NECP	Lithuanian Energy Transformation Study to 2050.
LU	Not specified in NECP	Even though it is not specified with the publicly available NECP data, we are aligned with the figures extending to 2050.
LV		
MD	Aligned	
ME	Not specified in NECP	The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050.
MK	Aligned	
MT	Aligned	
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Aligned	
PT	Not specified in NECP	Whenever necessary, datasets used for both ERAA and TYNDP were complemented by input data used in PT National Resource Adequacy Assessment and/or on data provided by the Portuguese Directorate for Energy and Geology - DGEG.
RO	Not aligned	
RS	Not aligned	Data delivered for the TYNDP and ERAA is aligned with the official data available to the TSO.
SE		
SI	Aligned	
SK	Not aligned	The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of the TYNDP 2024).
TR	Aligned	
UA	Not aligned	Same as for 2030, 2035.

34 // Alignment of submitted annual electricity demand figures with the NECP for 2040



Q 49

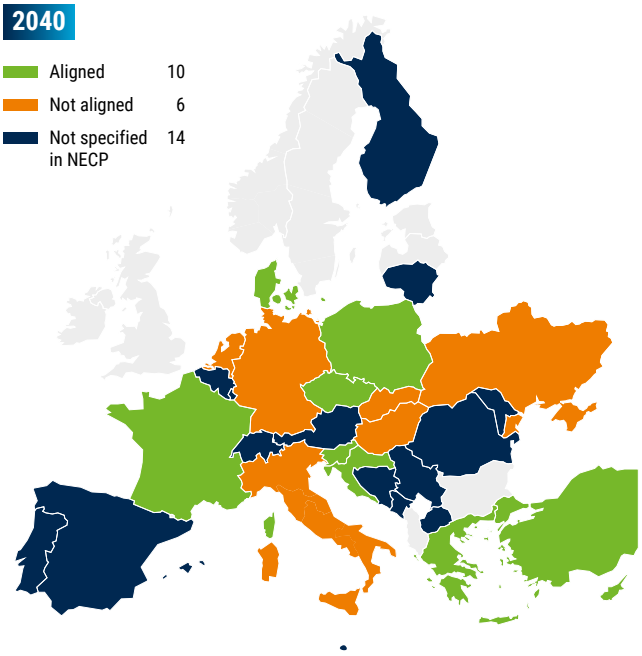
Please confirm alignment of submitted annual electricity demand figures with the NECP for 2040.

(Question 49 // PDF)

	Alignment of submitted energy demand figures with the NECP for 2040	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	Internal data of Electricity TSO.
BE	Not specified in NECP	See answers for 2030.
BG	Aligned	
CH	Aligned	
CY	Aligned	
CZ	Not aligned	ETM requires too specific details which are not available in the NECP + discrepancy in reference scenarios demand, therefore the fallback solution was used.
DE	Aligned	
DK	Aligned	
EE		
ES	Not specified in NECP	NDP, e-TSO projections, Spanish Economic Forecasting Centre Association
FI	Not specified in NECP	
FR	Aligned	
GR	Aligned	
HR	Aligned	
HU	Not aligned	Approximately aligned but it was not possible/sensible in ETM to reach the target.
IE		

	Alignment of submitted energy demand figures with the NECP for 2040	If not aligned, please justify
IT	Not aligned	Target year not covered by the NECP: 2040 outlook in NECP is a non-binding trend projection, not supported by additional policy measures and therefore not aligned with a structured decarbonisation pathway.
LT	Not specified in NECP	Based on NECP data and the goals and objectives set out in the National energy independence strategy, the electricity TSO prepares forecasts for the coming years (after 2030) and coordinates them with the Ministry of Energy.
LU	Not specified in NECP	even though it is not specified with the publicly available NECP data, we are aligned with the figures extending to 2050.
LV		
MD	Aligned	
ME	Not aligned	At the time of submitting the data, the draft NECP was not available. The draft NECP was published at the end of June 2025 as part of the public consultation process. The data were submitted on the basis of several materials, including data provided for previous plans, as well as data obtained through communication with institutions dealing with specific issues related to the type of data requested. With regard to the specific data, the differences are minor.
MK	Aligned	
MT	Aligned	
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Aligned	
PT	Not specified in NECP	Whenever necessary, datasets used for both ERAA and TYNDP were complemented by input data used in National Resource Adequacy Assessment.
RO	Not aligned	
RS	Not aligned	Data delivered for the TYNDP and ERAA is aligned with the official data available to the TSO.
SE		
SI	Aligned	
SK	Aligned	The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of the TYNDP 2024). The electricity data has an acceptable deviation from the NECP, respectively PEMMDB. For this reason the electricity demand is flagged as aligned.
TR	Aligned	
UA	Not aligned	Same as for 2030, 2035.

35 // Alignment of submitted annual hydrogen demand figures with the NECP for 2040



Q 50

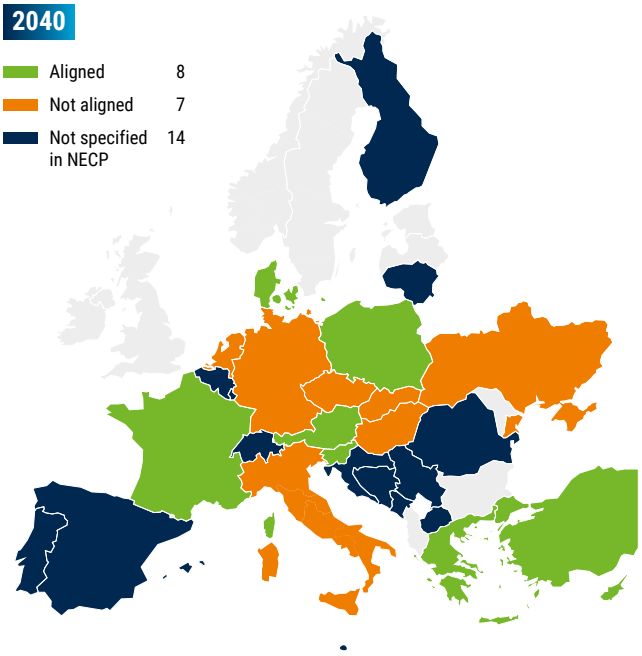
Please confirm alignment of submitted annual hydrogen demand figures with the NECP for 2040.

(Question 50 // PDF)

	Alignment of annual hydrogen demand figures with the NECP for 2040	If not aligned, please justify
AT	Not specified in NECP	Austrian hydrogen strategy does not cover data until 2050, hence EHB data and project specific data (SouthH_2 Corridor) have been considered too.
BA	Not specified in NECP	Internal data of Gas TSO. Draft BiH Hydrogen Roadmap.
BE	Not specified in NECP	See answers for 2030.
BG		
CH	Not specified in NECP	Since hydrogen demand values are not available in the Swiss National Framework for Grid Planning, the values where taken from internal references from Swiss gas or from the EP2050+.
CY	Aligned	
CZ	Aligned	
DE	Not aligned	In the NECP the national strategy on hydrogen imports was not considered. This strategy is reflected in the national system development strategy, that defines boundaries for the national system development of the electricity and gas infrastructure. Compared to the NECP, the hydrogen demand has been increased to reflect these strategies. Fossil fuels have been reduced to compensate the hydrogen increase.
DK	Aligned	
EE		
ES	Not specified in NECP	g-TSO projections
FI	Not specified in NECP	
FR	Aligned	
GR	Aligned	
HR	Aligned	

	Alignment of annual hydrogen demand figures with the NECP for 2040	If not aligned, please justify
HU	Not aligned	NECP focuses on final energy consumption, ENTSOG ETM data request includes both energetic and non-energetic data. That is why there is a difference between the two. ETM is based on TSO best estimation. TSO doesn't have detailed data from all the sectors. We tried to follow the aggregate NECP figures. We have consulted with major expected hydrogen consumers. RFNBO obligation is higher than the NECP value. We apply TSO suggested data, based on partially on some expected hydrogen consumer forecasts. We add the NECP transport hydrogen demand.
IE		
IT	Not aligned	Target year not covered by the NECP: 2040 outlook in NECP is a non-binding trend projection, not supported by additional policy measures and therefore not aligned with a structured decarbonisation pathway.
LT	Not specified in NECP	Lithuanian Energy Transformation Study to 2050.
LU	Not specified in NECP	Even though it is not specified with the publicly available NECP data, we are aligned with the figures extending to 2050.
LV		
MD	Aligned	
ME	Not specified in NECP	Hydrogen is not included in the submitted data. The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050.
MK	Not specified in NECP	
MT	Not specified in NECP	Time horizon of the NECP is till 2030.
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Aligned	
PT	Not specified in NECP	In case of hydrogen demand, datasets used for both ERAA and TYNDP were complemented by input data provided by the Portuguese Directorate for Energy and Geology.
RO	Not specified in NECP	
RS	Not specified in NECP	Data delivered for the TYNDP and ERAA is aligned with the official data available to the TSO.
SE		
SI	Aligned	NECP does not differ between hydrogen and climate neutral (renewable) methane based gas (biogas, synthetic gas) and provides only the aggregated (combined) renewable gas demand. The division to hydrogen and green gas was based on the TSO data and projections.
SK	Not aligned	The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of the TYNDP 2024).
TR	Aligned	
UA	Not aligned	Same as for 2030, 2035.

36 // Alignment of submitted annual methane demand figures with the NECP for 2040



Q 51

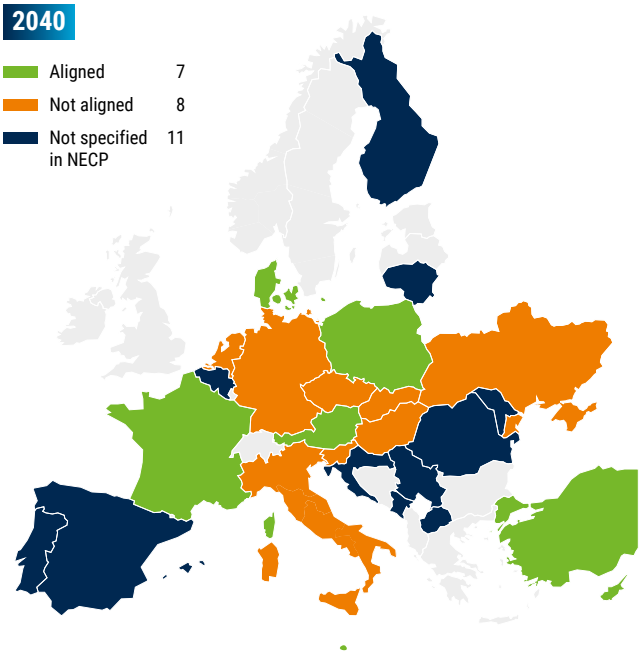
Please confirm alignment of submitted annual methane demand figures with the NECP for 2040.

(Question 51 // PDF)

	Alignment of submitted annual methane demand figures with the NECP	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP (please specify below)	Internal data of Gas TSO.
BE	Not specified in NECP	See answers for 2030.
BG		
CH	Not specified in NECP	Since methane demand values are not available in the Swiss National Framwork for Grid Planning, the values where taken from internal references from Swissgas or from the EP2050+.
CY	Aligned	
CZ	Not aligned	The NECP data are not sufficiently granular to enable responsible adjustments to be made to the utilisation of different gas technologies across the FEC sectors in the ETM, nor in combination with other technologies and energy carriers. WGSB has not developed any methodology or guidelines for such a case. These concerns were raised multiple times during data collection by both TSOs.
DE	Not aligned	Methane demand has been reduced to compensate for additional hydrogen demand.
DK	Aligned	
EE		
ES	Not specified in NECP	g-TSO projections
FI	Not specified in NECP	
FR	Aligned	
GR	Aligned	
HR	Not specified in NECP	

	Alignment of submitted annual methane demand figures with the NECP	If not aligned, please justify
HU	Not aligned	NECP focuses on final energy consumption, ENTSOG ETM data request includes both energetic and non-energetic data. That is why there is a difference between the two. ETM is based on TSO best estimation. TSO doesn't have detailed data from all the sectors. We tried to follow the aggregate NECP figures.
IE		
IT	Not aligned	Target year not covered by the NECP: 2040 outlook in NECP is a non-binding trend projection, not supported by additional policy measures and therefore not aligned with a structured decarbonisation pathway.
LT	Not specified in NECP	Lithuanian Energy Transformation Study to 2050.
LU	Not specified in NECP	Even though it is not specified with the publicly available NECP data, we are aligned with the figures extending to 2050.
LV		
MD		
ME	Not specified in NECP	The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050. Montenegro currently does not have access to natural gas sources, nor the infrastructure that would support its use. The Energy Development Strategy until 2030 clearly recognises natural gas as an important energy source that would contribute to the diversification of Montenegro's energy mix. The planned use of natural gas is as a substitute for other forms of energy, particularly for the use of electricity and the replacement of coal for heating and cooling.
MK	Not specified in NECP	
MT	Not specified in NECP	Time horizon of the NECP is till 2030.
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Aligned	
PT	Not specified in NECP	Whenever necessary, datasets used for both ERAA and TYNDP were complemented by input data used in National Gas Adequacy Assessment.
RO	Not specified in NECP	
RS	Not specified in NECP	Data delivered for the TYNDP and ERAA is aligned with the official data available to the TSO.
SE		
SI	Aligned	NECP does not differ between hydrogen and climate neutral (renewable) methane based gas (biogas, synthetic gas) and provides only the aggregated (combined) renewable gas demand. The division to hydrogen and green gas was based on the TSO data and projections. Natural gas demand was specified in NECP.
SK	Not aligned	The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of the TYNDP 2024).
TR	Aligned	
UA	Not aligned	Same as for 2030, 2035.

37 // Alignment of other energy carriers' demand figures with the NECP for 2040



Q 52

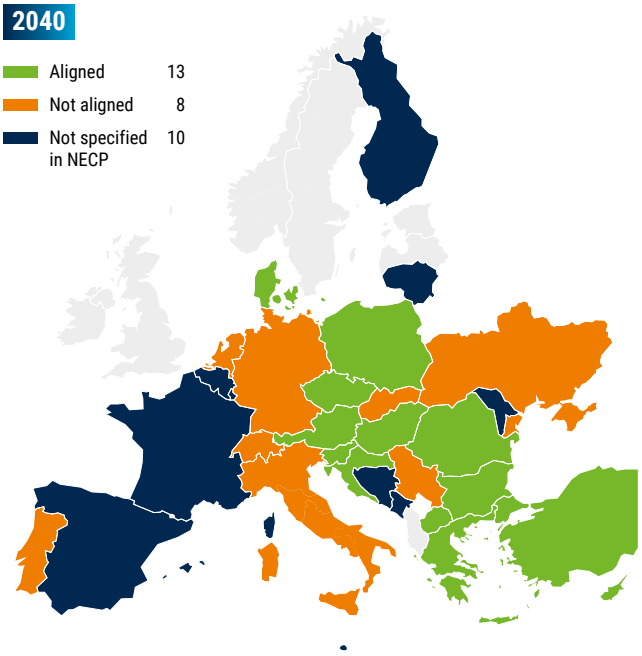
Please confirm alignment of other energy carriers' demand figures with the NECP for 2040.

(Question 52 // PDF)

	Alignment of submitted of other energy carriers' demand figures with the NECP for 2040	If not aligned, please justify
AT	Aligned	
BA		
BE	Not specified in NECP	See answers for 2030.
BG		
CH		
CY	Aligned	
CZ	Not aligned	The NECP data are not sufficiently granular to enable responsible adjustments to be made to the utilisation of different technologies across the FEC sectors in the ETM, nor in combination with other technologies and energy carriers. WGSB has not developed any methodology or guidelines for such a case. These concerns were raised multiple times during data collection by both TSOs.
DE	Not aligned	Fossil fuel demand has been reduced to compensate for additional hydrogen demand.
DK	Aligned	
EE		
ES	Not specified in NECP	e/g-TSO projections + European policies
FI	Not specified in NECP	
FR	Aligned	Due to difficulties in configuring ETM to reflect final demand volumes there might be some discrepancies on energy carriers other than electricity, gas or hydrogen for some horizons.
GR		
HR	Not specified in NECP	

	Alignment of submitted of other energy carriers' demand figures with the NECP for 2040	If not aligned, please justify
HU	Not aligned	It was not possible/sensible in ETM.
IE		
IT	Not aligned	Target year not covered by the NECP: 2040 outlook in NECP is a non-binding trend projection, not supported by additional policy measures and therefore not aligned with a structured decarbonisation pathway.
LT	Not specified in NECP	Lithuanian Energy Transformation Study to 2050.
LU		
LV		
MD	Not specified in NECP	TSOs' own internal scenarios.
ME	Not specified in NECP	The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050. The data were submitted on the basis of several materials, including data provided for previous plans, as well as data obtained through communication with institutions dealing with specific issues related to the type of data requested.
MK	Not specified in NECP	
MT	Aligned	LPG consumption included in TYNDP is aligned with NECP modelling.
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Aligned	
PT	Not specified in NECP	Whenever necessary, datasets used for both ERAA and TYNDP were complemented by input data used in both electricity and gas PT National Resource Adequacy Assessment Studies and/or on data provided by the Portuguese Directorate for Energy and Geology – DGEG.
RO	Not specified in NECP	
RS	Not specified in NECP	Data delivered for the TYNDP and ERAA is aligned with the official data available to the TSO.
SE		
SI	Not aligned	Data for other carriers was not submitted by the TSOs.
SK	Not aligned	The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of the TYNDP 2024).
TR	Aligned	
UA	Not aligned	Same as for 2030, 2035.

38 // Alignment of renewable electricity generation capacities with the NECP for 2040



Q 53

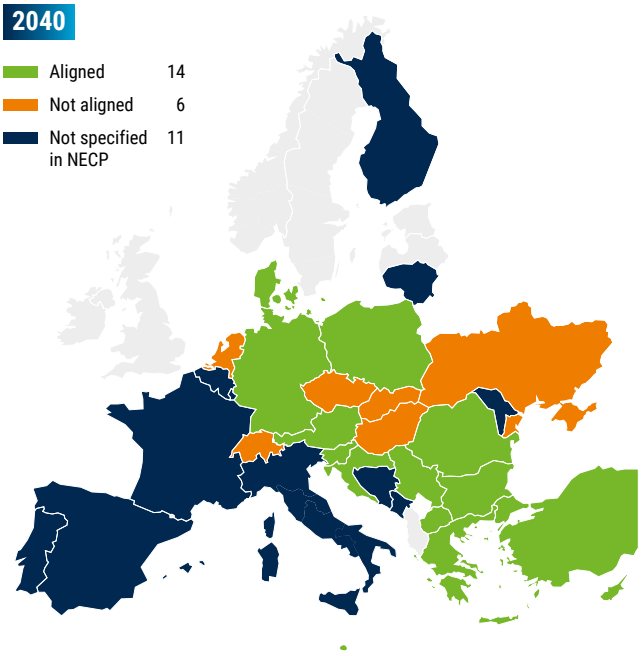
Please confirm alignment of renewable electricity generation capacities with the NECP for 2040.

(Question 53 // PDF)

	Alignment of submitted of renewable electricity generation capacities with the NECP for 2040	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	Internal data of Electricity TSO.
BE	Not specified in NECP	See answers for 2030.
BG	Aligned	
CH	Not aligned	Added alpine PV, which is not included in the Swiss National Framework for Grid Planning but is developing as part of the national energy strategy. The rest is aligned.
CY	Aligned	
CZ	Aligned	
DE	Not aligned	Wind Onshore, PV and Biomass are aligned with the NECP. Wind Offshore is based on TSO project information taken into account for the draft of the network development scenario framework (Network Development Plan 2037/2045 (2025)). Hydro capacities are also taken from this source.
DK	Aligned	
EE		
ES	Not specified in NECP	National Long-Term Strategy, information from stakeholders, etc.
FI	Not specified in NECP	
FR	Not specified in NECP	
GR	Aligned	
HR	Aligned	
HU	Aligned	The submitted renewable energy capacities are equal to/higher than the NECP targets.
IE		

	Alignment of submitted of renewable electricity generation capacities with the NECP for 2040	If not aligned, please justify
IT	Not aligned	Target year not covered by the NECP: 2040 outlook in NECP is a non-binding trend projection, not supported by additional policy measures and therefore not aligned with a structured decarbonisation pathway.
LT	Not specified in NECP	Based on NECP data and the goals and objectives set out in the National energy independence strategy, the electricity TSO prepares forecasts for the coming years (after 2030) and coordinates them with the Ministry of Energy.
LU	Not specified in NECP	even though it is not specified with the publicly available NECP data, we are aligned with the figures extending to 2050.
LV		
MD	Not specified in NECP	TSOs' own internal scenarios.
ME	Not specified in NECP	The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050. The data have been harmonised in accordance with communication and inputs from the institutions concerned with the requested type of data.
MK	Aligned	
MT	Not specified in NECP	No information for Onshore solar PVs provided beyond 2030.
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Aligned	
PT	Not aligned	Whenever necessary, datasets used for both ERAA and TYNDP were complemented by input data used in both electricity and gas National Resource Adequacy Assessments.
RO	Aligned	
RS	Not aligned	Data delivered for the TYNDP and ERAA is aligned with the official data available to the TSO.
SE		
SI	Aligned	
SK	Not aligned	Projections beyond 2030 are based on internal prognoses. These relevant prognoses are used e.g. in the TSO's ten-year development plan as well as in the assessment of the adequacy resource of the Power system of the Slovak Republic for the Ministry of Economy purposes. However, the data provided may differ slightly from internal prognoses due to different processing times.
TR	Aligned	
UA	Not aligned	Same as for 2030, 2035.

39 // Alignment of thermal and (including nuclear) electricity generation capacities with the NECP for 2040



Q 54

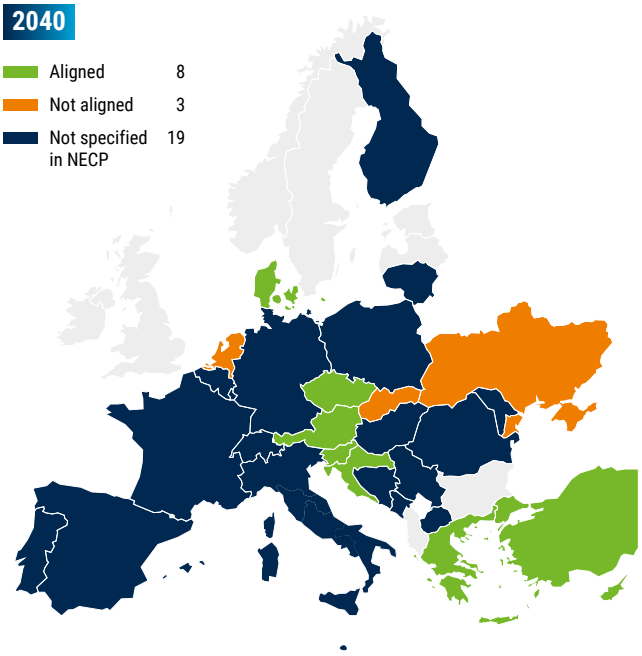
Please confirm alignment of thermal and (including nuclear) electricity generation capacities with the NECP for 2040.

(Question 54 // PDF).

	Alignment of submitted of thermal and (including nuclear) electricity generation capacities	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	Internal data of Electricity TSO.
BE	Not specified in NECP	See answers for 2030.
BG	Aligned	
CH	Not aligned	Nuclear power plants were given a 60 year long lifetime as opposed to the 50 year long lifetime in the Swiss National Framework for Grid Planning as discussed with the NRA.
CY	Aligned	
CZ	Not aligned	All Thermal data were based on Data collection from operators in 2024 by ČEPS.
DE	Aligned	Coal: Aligned In the NECP scenario MWMS/MMS, the coal phase-out is predetermined exogenously by 2030/2035. In TYNDP 2026, however, the coal phase-out is reported based on the legal framework (KVBG, 08/2020), which includes the phase-out until 2038. In any case, no coal fired power plants are assumed by 2040. Gas: Aligned In the NECP scenario MWMS 29.1 GW of natural gas and 23.8 GW of hydrogen power plants are assumed for 2040 (in total, this amounts to 52.9 GW) - while in scenario MMS 30.6 GW natural gas and no hydrogen. In TYNDP 2026 53.1 GW of installed gas-fired power plants are reported (sum of natural gas und hydrogen) - aligned with NECP MWMS scenario. However, the adoption curve toward fuel-switched hydrogen power plants is assumed differently, which leads to 4 GW of natural gas and 49.1 GW of hydrogen power plants in 2040.
DK	Aligned	
EE		
ES	Not specified in NECP	Nuclear: Official Closure Schedule from Ministry. Others: Ministry/Useful Lifetime.

	Alignment of submitted of thermal and (including nuclear) electricity generation capacities	If not aligned, please justify
FI	Not specified in NECP	
FR	Not specified in NECP	
GR	Aligned	
HR	Aligned	
HU	Not aligned	Nuclear is aligned, we foresee more gas and oil capacity than in NECP based on plans of power plants (regular consultation).
IE		
IT	Not specified in NECP	Target year not covered by the NECP: 2040 outlook in NECP is a non-binding trend projection, not supported by additional policy measures and therefore not aligned with a structured decarbonisation pathway.
LT	Not specified in NECP	Thermal capacities are presented taking into account information, received during the annual survey of the largest electricity producers on long-term capacity development/decommissioning plans.
LU	Not specified in NECP	No nuclear generation considered.
LV		
MD	Not specified in NECP	TSOs' own internal scenarios.
ME	Not specified in NECP	The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050. The data have been harmonised in accordance with communication and inputs from the institutions concerned with the requested type of data.
MK	Aligned	
MT	Aligned	
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Aligned	
PT	Not specified in NECP	Whenever necessary, datasets used for both ERAA and TYNDP were complemented by input data used in both electricity and gas National Resource Adequacy Assessments.
RO	Aligned	
RS	Aligned	
SE		
SI	Aligned	
SK	Not aligned	Projections beyond 2030 are based on internal prognoses. These relevant prognoses are used e.g. in the TSO's ten-year development plan as well as in the assessment of the adequacy resource of the Power system of the Slovak Republic for the Ministry of Economy purposes. However, the data provided may differ slightly from internal prognoses due to different processing times.
TR	Aligned	
UA	Not aligned	Same as for 2030, 2035.

40 // Alignment of DSR with the NECP for 2040



Q 55

Please confirm alignment of DSR with the NECP for 2040.

(Question 55 // PDF)

	Alignment of DSR with the NECP	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	Internal data of Electricity TSO.
BE	Not specified in NECP	See answers for 2030.
BG		
CH	Not specified in NECP	No explicit DSR provided, only implicit DSR.
CY	Aligned	
CZ	Aligned	
DE	Not specified in NECP	DSR is not specified in the NECP and taken from national studies. Data refers to the scenario framework draft of the German grid development plan (Network Development Plan 2037/2045 (2025)) and the system analysis (Bundesnetzagentur - Netzreserve). It should be noted that shiftable DSR could not be modelled in the ERAA. Assumption: The shiftable DSR is assigned to demand shedding or not considered based on the recovery window time.
DK	Aligned	
EE		
ES	Not specified in NECP	e-TSO internal studies
FI	Not specified in NECP	
FR	Not specified in NECP	
GR	Aligned	
HR	Aligned	
HU	Not specified in NECP	No concrete provision about DSR is included in the NECP.

	Alignment of DSR with the NECP	If not aligned, please justify
IE		
IT	Not specified in NECP	Target year not covered by the NECP: 2040 outlook in NECP is a non-binding trend projection, not supported by additional policy measures and therefore not aligned with a structured decarbonisation pathway.
LT	Not specified in NECP	Same as 2030.
LU	Not specified in NECP	Generalised flexibility of 3–30 %, depending on the sector.
LV		
MD	Not specified in NECP	TSOs' own internal scenarios.
ME	Not specified in NECP	The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050. DSR is not part of the data provided.
MK	Not specified in NECP	
MT	Not specified in NECP	No data on demand-side response was provided in the NECP.
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Not specified in NECP	In the NECP there is a common level of DSR and import provided.
PT	Not specified in NECP	DSR was not included in both ERAA and TYNDP since there is no indication regarding DSR in PT NECP.
RO	Not specified in NECP	
RS	Not specified in NECP	No reliable source for this parameter.
SE		
SI	Aligned	
SK	Not aligned	Projections of the DSR beyond 2030 were not provided.
TR	Aligned	
UA	Not aligned	Same as for 2030, 2035.

41 // How is demand-side flexibility (e.g. DSR) already reflected in your datasets for 2040?

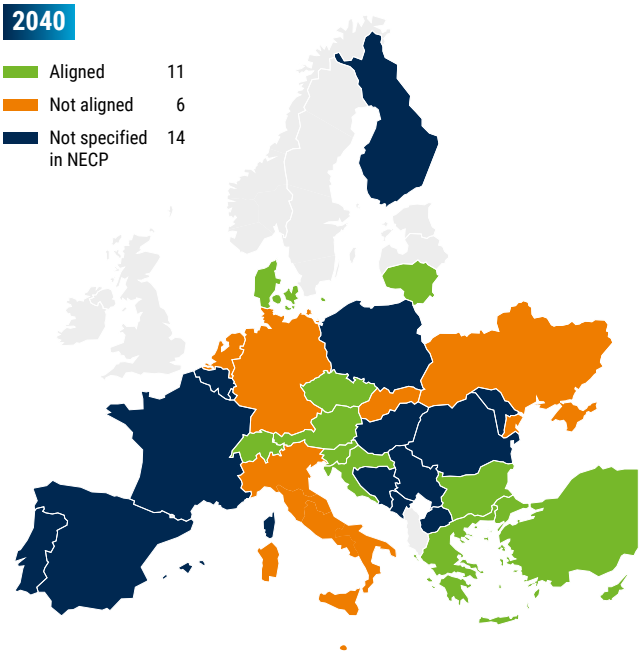
Please explain how is demand-side flexibility (e.g. DSR) already reflected in your datasets for 2040.

(Question 56 // PDF)

Q 56

	Explain how is demand-side flexibility (e.g. DSR) already reflected in your datasets for 2040
AT	Demand shedding and demand shifting
BA	
BE	See answers for 2030.
BG	No DSR is considered in the NECP.
CH	Only implicit DSR provided for EV, HP and decentralised batteries, as derived from the Swiss National Framework for Grid Planning.
CY	No DSR in 2040.
CZ	DSR is assumed to be implemented as load shedding in the industrial sector.
DE	Demand side flexibility is considered by Electrolysis, Power to Heat and DSR. For the latter one different bands for industrial processes and flexibilities in the commerce, trade, and service sector are defined, where the demand can be shifted or shaded based on an activation price. It should be noted that shiftable DSR could not be modelled in the TYDNP. Assumption: The shiftable DSR is assigned to demand shedding or not considered based on the activation price. In the ETM just the Demand tab has been filled, and no additional flexibility has been defined.
DK	The DSR which has been submitted for Denmark in the PEMMDB app is P2X and P2H. The activation price for P2X is calculated centrally by ENTSO-E. The activation price for P2H is based on market model simulations.
EE	
ES	DSR (demand shedding) has not been considered in demand figures (ETM), but in supply capacities (PEMMDB).
FI	DSR data reflects the TSOs' latest views on DSR developments, which includes industrial, residential and heating sector developments of DSR.
FR	
GR	Explicit DSR was submitted at the PEMMDB.
HR	
HU	No explicit/implicit DSR capacities submitted.
IE	
IT	Internal assumptions based on TSO studies.
LT	Same as 2030.
LU	Generalised flexibility of 3–30 %, depending on the sector.
LV	
MD	
ME	DSR is not part of the data provided.
MK	N/A
MT	Not reflected.
NL	See response to same question on 2030 assumptions.
PL	The estimation of non-market DSR up to 2050 was provided. Market DSR is allowed to expand up to expansion constrains provided in PEMMDB.
PT	DSR was not included in both ERAA and TYNDP since there is no indication regarding DSR in PT NECP.
RO	N/A
RS	
SE	
SI	
SK	Projections of the DSR beyond 2030 were not provided.
TR	
UA	Same as for 2030, 2035.

42 // Alignment of electrolysers installed capacities with the NECP for 2040



Q 57

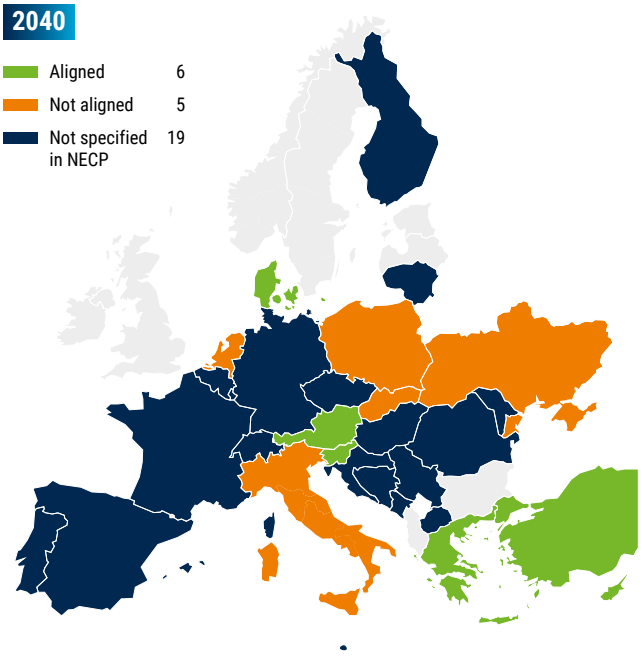
Please confirm alignment of electrolysers installed capacities with the NECP for 2040.

(Question 57 // PDF).

	Alignment of submitted of electrolysers installed capacities with the NECP for 2040	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	No data
BE	Not specified in NECP	See answers for 2030.
BG	Aligned	
CH	Aligned	
CY	Aligned	
CZ	Aligned	
DE	Not aligned	In the NECP the national strategy on hydrogen imports (BMWE - National Hydrogen Strategy Update) was not considered. This strategy is reflected in the national system development strategy (BMWE - Die Systementwicklungsstrategie), that defines boundaries for the national system development of the electricity and gas infrastructure. To align with the hydrogen demand and import share projections, the electrolyser capacities have been increased compared to the NECP. The draft of the scenario framework for the NEP2037/2045 has been used as reference (Network Development Plan 2037/2045 (2025)).
DK	Aligned	
EE		
ES	Not specified in NECP	g-TSO projections
FI	Not specified in NECP	
FR	Not specified in NECP	
GR	Aligned	
HR	Aligned	

	Alignment of submitted of electrolysers installed capacities with the NECP for 2040	If not aligned, please justify
HU	Not specified in NECP	Partially we consider the HU hydrogen strategy (2021) and the NECP data for electricity for hydrogen production. Electrolyser and SMR/pyrolysis capacities were estimated based on the NECP trajectories of electricity demand and renewable electricity production.
IE		
IT	Not aligned	Target year not covered by the NECP: 2040 outlook in NECP is a non-binding trend projection, not supported by additional policy measures and therefore not aligned with a structured decarbonisation pathway.
LT	Aligned	
LU	Not specified in NECP	Even though it is not specified with the publicly available NECP data, we are aligned with the figures extending to 2050.
LV		
MD	Not specified in NECP	TSOs' own internal scenarios.
ME	Not specified in NECP	Electrolysers are not included in the submitted data.
MK	Not specified in NECP	
MT	Not aligned	Time horizon of NECP is till 2030, however we do not expect any installation of electrolysers by 2035.
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Not specified in NECP	Reverse-engineering carried out to retrieve some data from supporting analysis with inclusion of unbiding market research conducted by gas TSO.
PT	Not specified in NECP	Whenever necessary, datasets used for both ERAA and TYNDP were complemented by input data used in both electricity and gas PT National Resource Adequacy Assessments and/or on data provided by the Portuguese Directorate for Energy and Geology – DGEG.
RO	Not specified in NECP	
RS	Not specified in NECP	No reliable source for this parameter.
SE		
SI	Aligned	
SK	Not aligned (please specify below)	Electolysers installed capacity is based on TSO's internal prognoses. TSO's internal prognoses are based on the outcomes of studies by an independent external consultancy company. These relevant prognoses are used e. g. in the TSO's ten-year development plan as well as in the assessment of the adequacy resource of the Power system of the Slovak Republic for the Ministry of Economy purposes. However, the data provided may differ slightly from internal prognoses due to different processing times.
TR	Aligned	
UA	Not aligned	Same as for 2030, 2035.

43 // Alignment of hydrogen production (SMR & pyrolysis) capacities with the NECP for 2040.



Q 58

Please confirm alignment of hydrogen production (SMR & pyrolysis) capacities with the NECP for 2040.

(Question 58 // PDF)

	Alignment of submitted hydrogen production (SMR & pyrolysis) capacities	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	
BE	Not specified in NECP	See answers for 2030.
BG		
CH	Not specified in NECP	Since hydrogen production values are not available in the Swiss National Framwork for Grid Planning, the values where taken from internal references from Swissgas or from the EP2050+.
CY	Aligned	
CZ	Not specified in NECP	No data on SMR/pyrolysis are available in the CZ NECP (only electrolysers) - not considered in data collection.
DE	Not specified in NECP	Data from a market survey done for national grid development studies was used. This Survey collects data on planned installations of large consumers.
DK	Aligned	
EE		
ES	Not specified in NECP	A phase out of SMR for hydrogen production in industry is assumed for the 2035-2040 horizon.
FI	Not specified in NECP	
FR	Not specified in NECP	
GR	Aligned	
HR	Not specified in NECP	
HU	Not specified in NECP	Partially we consider the HU hydrogen strategy (2021) and the NECP data for electricity for hydrogen production. Electrolyser and SMR/pyrolysis capacities were estimated based on the NECP trajectories of electricity demand and renewable electricity production.

	Alignment of submitted hydrogen production (SMR & pyrolysis) capacities	If not aligned, please justify
IE		
IT	Not aligned	Target year not covered by the NECP: 2040 outlook in NECP is a non-binding trend projection, not supported by additional policy measures and therefore not aligned with a structured decarbonisation pathway.
LT	Not specified in NECP	Gas TSO forecast is used for SMR.
LU	Not specified in NECP	No specification in the NECP focus.
LV		
MD	Not specified in NECP	TSOs' own internal scenarios.
ME	Not specified in NECP	Hydrogen is not included in the submitted data. The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050.
MK	Not specified in NECP	
MT	Not specified in NECP	Time horizon of NECP is till 2030, however we do not expect any hydrogen productions by 2035.
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Not aligned	Not confirmed for the TYNDP purpose. It is assumed, based on unbiding market research conducted by gas TSO, that SMR installations will provide hydrogen for own needs only, will not be connected to the hydrogen network.
PT	Not specified in NECP	There is no indication regarding SMR and pyrolysis production of hydrogen in NECP (just green hydrogen), but regarding SMR capacity included in "ENTSOG data collection" the data was provided by the Portuguese Directorate for Energy and Geology - DGEG.
RO	Not specified in NECP	
RS	Not specified in NECP	No reliable source for this parameter.
SE		
SI	Aligned	No SMR capacities, only electrolisers.
SK	Not aligned	The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of the TYNDP 2024).
TR	Aligned	
UA	Not aligned	Same as for 2030, 2035.

44 // Date and version of NECP for 2050-data

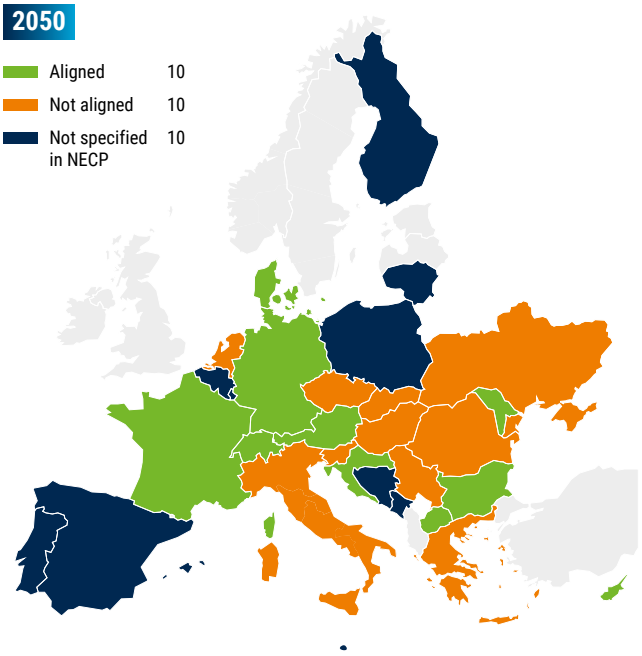
Please confirm the date and the version of the NECP that you have consulted for the study (e.g., Draft NECP as of date 24 December 2024) for 2050.

(Question 59 // PDF)

Q 59

	Explain how is demand-side flexibility (e.g. DSR) already reflected in your datasets for 2040
AT	Final version of NECP as of December 3 2024
BA	
BE	NA
BG	Draft NECP - June 2024
CH	November 2022
CY	Final updated NECP 2021-2030, published in December 2024
CZ	December 18 2024
DE	Final updated NECP 2021-2030 (submitted in 2024), published 29 August 2024
DK	Denmark - Final updated NECP 2021-2030 (submitted in 2024)
EE	
ES	The Spanish NECP does not specify data for horizons beyond 2030 "Final" - September 2024
FI	Finland - Final updated NECP 2021-2030 (1 July 2024)
FR	Non public data for 2035-2050
GR	Final Updated NECP 7 January 2025
HR	Draft updated integrated national energy and climate plan of Croatia covering the period 2021-2030 (2023.)
HU	Final NECP, October, 2024.
IE	
IT	Final updated NECP as of date 1 July 2024
LT	The NECP covers the period 2021-2030; therefore, other sources used for the subsequent years.
LU	24 July 2024
LV	
MD	NECP as of date 26 February 2025 for 2030.
ME	The current draft NECP covers only the period up to 2030 (not yet adopted), with certain indicative projections up to 2050.
MK	NECP combined with National Energy Strategy.
MT	Not applicable. Malta's NECP has a time horizon up to 2030, with an outlook towards 2040.
NL	Update of the NECP, as of June 2024.
PL	NECP covers period up to 2040.
PT	PNEC has no quantification regarding 2050 horizon.
RO	Integrated National Energy and Climate Plan of Romania 2025-2030 Update October 2024.
RS	
SE	
SI	18 December 2024 (Draft version was used for the data collection, but the energy demand projections remain unchanged in the final version on 18 December 2024).
SK	The NECP version from December 2024 which had not yet been approved at the time of data collection.
TR	
UA	NECP of Ukraine adopted in July 2024.

45 // Alignment of submitted energy demand figures with the NECP for 2050



Q 60

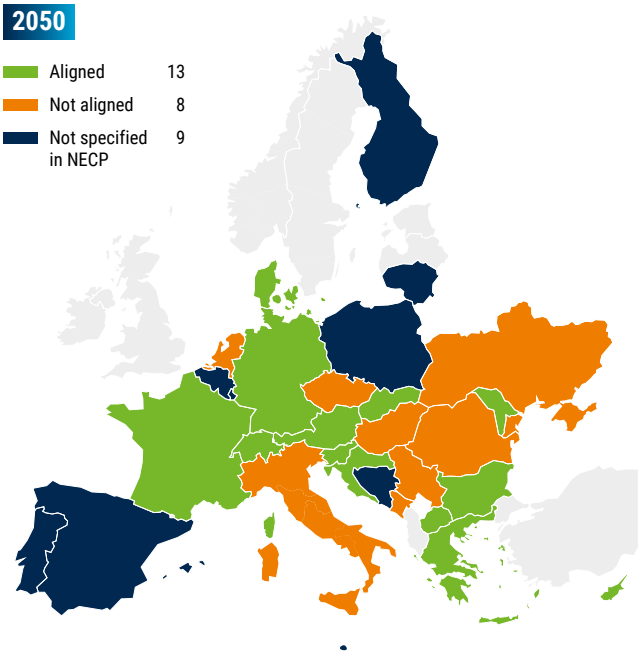
Please confirm alignment of submitted energy demand figures with the NECP for 2050.

(Question 60 // PDF)

	Alignment of submitted energy demand figures with the NECP for 2050	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP (please specify below)	Internal data of Electricity TSO. Internal data of Gas TSO. Draft BiH Hydrogen Roadmap.
BE	Not specified in NECP (please specify below)	See answers for 2030.
BG	Aligned	
CH	Aligned	
CY	Aligned	
CZ	Not aligned (please specify below)	Not aligned for TYNDP, because the NECP does not provide sufficient data granularity to enable responsible adjustmet of the utilisation of different technologies across the FEC sectors in the ETM. WGSB has not developed any methodology or guidelines for such a case, besides trial-by-error method. Besides, FEC in the ETM reference scenario (in 2019) was significantly higher than FEC in the reference scenario in NECP (1178 vs. 1030 PJ). Eurostat data also show lower FEC for CZ compared to the reference in the ETM. Therefore, we opted out of using ETM and the fallback solution was used. These concerns were raised multiple times during data collection by both TSOs.
DE	Aligned	
DK	Aligned	
EE		
ES	Not specified in NECP	Internal scenarios were used for those years that are not specified or insufficiently specified in national publications for 2030 and 2050, namely 2035 and 2040. Special attention was paid to preserving consistency of data for these intermediate years with national publications. e-demand: NDP, e-TSO projections, Spanish Economic Forecasting Centre Association
FI	Not specified in NECP	

	Alignment of submitted energy demand figures with the NECP for 2050	If not aligned, please justify
FR	Aligned	
GR	Not aligned	Electricity and Gas (incl Hydrogen, Methane, etc.) Sectors are aligned with NECP.
HR	Aligned	
HU	Not aligned	The required decrease in energy demand was not possible to reach in ETM (it would have resulted in highly unrealistic parameters).
IE		
IT	Not aligned	Target year not covered by the NECP.
LT	Not specified in NECP	Lithuanian Energy Transformation Study to 2050.
LU	Not specified in NECP	Even though it is not specified with the publicly available NECP data, we are aligned with the figures extending to 2050.
LV		
MD	Aligned	
ME	Not specified in NECP	The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050.
MK	Aligned	
MT	Not specified in NECP	Population figures were based on publicly available data sets. Kept default values where information is not available.
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Not specified in NECP	Reverse-engineering carried out to retrieve some data
PT	Not specified in NECP	PNEC has no quantification regarding 2050 horizon. For 2050, projections of demand based on 2035-2040 trends were used and/or on data provided by the Portuguese Directorate for Energy and Geology - DGEG.
RO	Not aligned	
RS	Not aligned	Data used for submission was taken from the official data available to the TSO.
SE		
SI	Not aligned	TYNDP data is partially compliant with NECP for the gas related sectors. The data for the sectors: Buildings, Households, Industry, Transport, is compliant with NECP for years 2030, 2035 and 2040. The data for 2050 is not compliant due to the problems with accessing NECP in December 2024 and in May 2025. For the 2050 the fallback solution applies (average of DE/GA scenarios from previous TYNDP cycle).
SK	Not aligned	The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of the TYNDP 2024).
TR		
UA	Not aligned	Same as for 2030, 2035.

46 // Alignment of submitted annual electricity demand figures with the NECP for 2050



Q 61

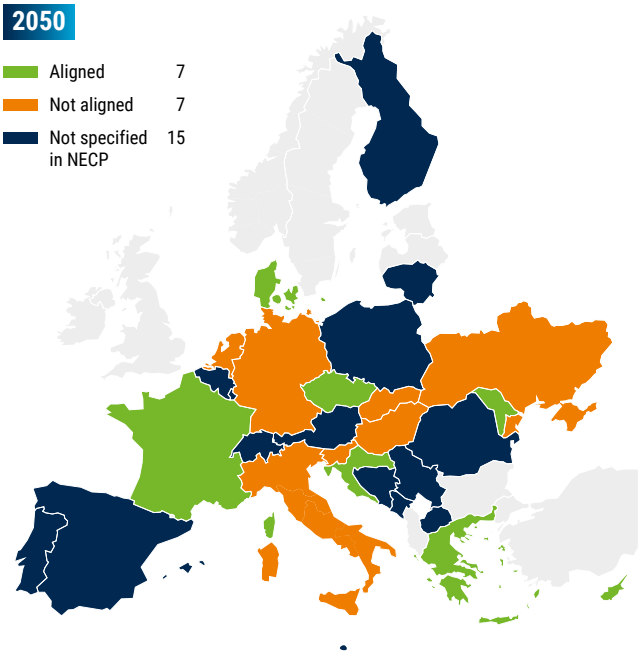
Please confirm alignment of submitted annual electricity demand figures with the NECP for 2050.

(Question 61 // PDF)

	Alignment of annual electricity demand figures with the NECP for 2050	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	Own data of Electricity TSO.
BE	Not specified in NECP	See answers for 2030.
BG	Aligned	
CH	Aligned	
CY	Aligned	
CZ	Not aligned	ETM requires too specific details which are not available in the NECP + discrepancy in reference scenarios demand, therefore the fallback solution was used.
DE	Aligned	
DK	Aligned	
EE		
ES	Not specified in NECP	NDP, e-TSO projections, Spanish Economic Forecasting Centre Association
FI	Not specified in NECP	
FR	Aligned	
GR	Aligned	
HR	Aligned	
HU	Not aligned	The required level of electricity demand was not possible to reach in ETM (it would have resulted in highly unrealistic parameters).
IE		
IT	Not aligned	Target year not covered by the NECP.

	Alignment of annual electricity demand figures with the NECP for 2050	If not aligned, please justify
LT	Not specified in NECP	Based on NECP data and the goals and objectives set out in the National energy independence strategy, the electricity TSO prepares forecasts for the coming years (after 2030) and coordinates them with the Ministry of Energy.
LU	Not specified in NECP	Even though it is not specified with the publicly available NECP data, we are aligned with the figures extending to 2050.
LV		
MD	Aligned	
ME	Not aligned	At the time of submitting the data, the draft NECP was not available. The draft NECP was published at the end of June 2025 as part of the public consultation process. The data were submitted on the basis of several materials, including data provided for previous plans, as well as data obtained through communication with institutions dealing with specific issues related to the type of data requested. With regard to the specific data, the differences are minor.
MK	Aligned	
MT	Not specified in NECP	Population figures were based on publicly available data sets. Kept default values where information is not available.
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Not specified in NECP	Reverse-engineering carried out to retrieve some data.
PT	Not specified in NECP	PNEC has no quantification regarding 2050 horizon. For 2050, projections of demand based on 2035-2040 trends were used.
RO	Not aligned	
RS	Not aligned	Data used for submission was taken from the official data available to the TSO.
SE		
SI	Aligned	
SK	Aligned	The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of the TYNDP 2024). The electricity data has an acceptable deviation from the NECP, respectively PEMMDB. For this reason the electricity demand is flagged as aligned.
TR		
UA	Not aligned	Same as for 2030, 2035.

47 // Alignment of submitted annual hydrogen demand figures with the NECP for 2050



Q 62

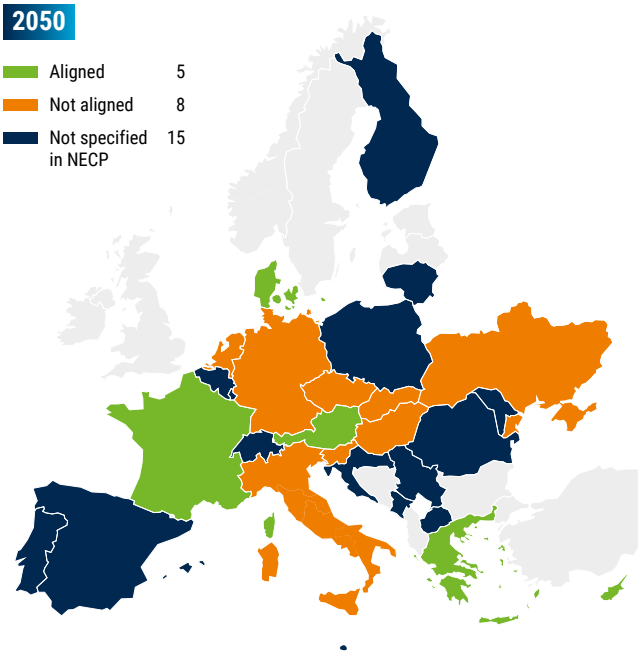
Please confirm alignment of submitted annual hydrogen demand figures with the NECP for 2050.

(Question 62 // PDF)

	Alignment of submitted annual hydrogen demand figures with the NECP for 2050	If not aligned, please justify
AT	Not specified in NECP	Austrian hydrogen strategy does not cover data until 2050, hence EHB data and project specific data (SouthH_2 Corridor) have been considered too.
BA	Not specified in NECP	Internal data of Gas TSO. Draft BiH Hydrogen Roadmap.
BE	Not specified in NECP	See answers for 2030.
BG		
CH	Not specified in NECP	Since hydrogen demand values are not available in the Swiss National Framwork for Grid Planning, the values where taken from internal references from Swissgas or from the EP2050+.
CY	Aligned	
CZ	Aligned	
DE	Not aligned	In the NECP the national strategy on hydrogen imports was not considered. This strategy is reflected in the national system development strategy, that defines boundaries for the national system development of the electrcity and gas infrastructure. Compared to the NECP, the hydrogen demand has been increased to reflect these strategies. Fossil fuels have been reduced to compensate the hydrogen increase.
DK	Aligned	
EE		
ES	Not specified in NECP	g-TSO projections
FI	Not specified in NECP	
FR	Aligned	
GR	Aligned	
HR	Aligned	

	Alignment of submitted annual hydrogen demand figures with the NECP for 2050	If not aligned, please justify
HU	Not aligned	NECT focuses on final energy consumption, ENTSOG ETM data request includes both energetic and non-energetic data. That is why there is a difference between the two. ETM is based on TSO best estimation. TSO doesn't have detailed data from all the sectors. We tried to follow the aggregate NECT figures. We have consulted with major expected hydrogen consumers.
IE		
IT	Not aligned	Target year not covered by the NECP.
LT	Not specified in NECP	Lithuanian Energy Transformation Study to 2050.
LU	Not specified in NECP	Even though it is not specified with the publicly available NECP data, we are aligned with the figures extending to 2050.
LV		
MD	Aligned	
ME	Not specified in NECP	Hydrogen is not included in the submitted data. The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050.
MK	Not specified in NECP	
MT	Not specified in NECP	NECP horizon is until 2030.
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Not specified in NECP	Reverse-engineering carried out to retrieve some data.
PT	Not specified in NECP	PNEC has no quantification regarding 2050 horizon. For 2050, projections of hydrogen demand based on data provided by DGEG were used.
RO	Not specified in NECP	
RS	Not specified in NECP	Data used for submission was taken from the official data available to the TSO.
SE		
SI	Not aligned	TYNDP data is partially compliant with NECP for the gas related sectors. The data for the sectors: Buildings, Households, Industry, Transport, is compliant with NECP for years 2030, 2035 and 2040. The data for 2050 is not compliant due to the problems with accessing NECP in December 2024 and in May 2025. For the 2050 the fallback solution applies (average of DE/GA scenarios from previous TYNDP cycle).
SK	Not aligned (please specify below)	The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of the TYNDP 2024).
TR		
UA	Not aligned (please specify below)	Same as for 2030, 2035.

48 // Alignment of submitted annual methane demand figures with the NECP for 2050



Q 63

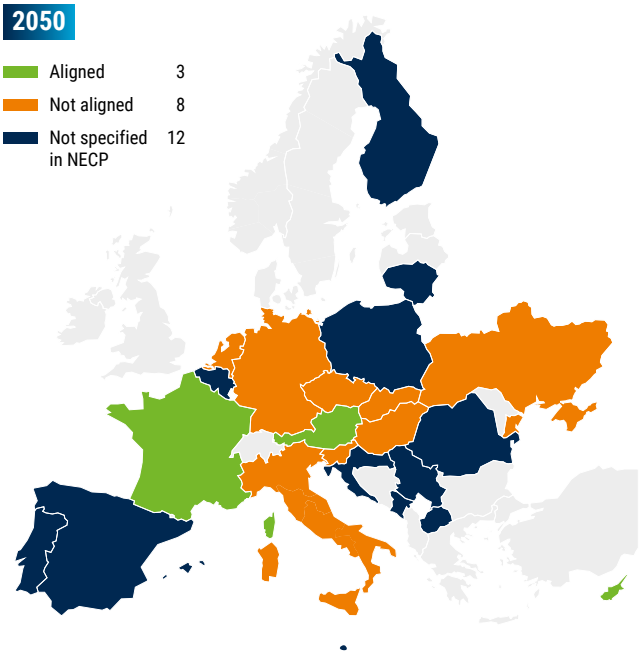
Please confirm alignment of submitted annual methane demand figures with the NECP for 2050.

(Question 63 // PDF)

	Alignment of submitted annual hydrogen demand figures with the NECP for 2050	If not aligned, please justify
AT	Aligned	
BA		Internal data of Gas TSO.
BE	Not specified in NECP	See answers for 2030.
BG		
CH	Not specified in NECP	Since methane demand values are not available in the Swiss National Framwork for Grid Planning, the values where taken from internal references from Swissgas or from the EP2050+.
CY	Aligned	
CZ	Not aligned	The NECP data is not sufficiently granular to enable responsible adjustments to be made to the utilisation of different gas technologies across the FEC sectors in the ETM, nor in combination with other technologies and energy carriers. WGSB has not developed any methodology or guidelines for such a case. These concerns were raised multiple times during data collection by both TSOs.
DE	Not aligned	Methan demand has been reduced to compensate for additional hydrogen demand.
DK	Aligned	
EE		
ES	Not specified in NECP	g-TSO projections
FI	Not specified in NECP	
FR	Aligned	
GR	Aligned	
HR	Not specified in NECP	

	Alignment of submitted annual hydrogen demand figures with the NECP for 2050	If not aligned, please justify
HU	Not aligned	NECT focuses on final energy consumption, ENTSOG ETM data request includes both energetic and non-energetic data. That is why there is a difference between the two. ETM is based on TSO best estimation. TSO doesn't have detailed data from all the sectors. We tried to follow the aggregate NECT figures.
IE		
IT	Not aligned	Target year not covered by the NECP.
LT	Not specified in NECP	Lithuanian Energy Transformation Study to 2050.
LU	Not specified in NECP	Even though it is not specified with the publicly available NECP data, we are aligned with the figures extending to 2050.
LV		
MD	Not specified in NECP	TSOs' own internal scenarios
ME	Not specified in NECP	The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050. Montenegro currently does not have access to natural gas sources, nor the infrastructure that would support its use. The Energy Development Strategy until 2030 clearly recognises natural gas as an important energy source that would contribute to the diversification of Montenegro's energy mix. The planned use of natural gas is as a substitute for other forms of energy, particularly for the use of electricity and the replacement of coal for heating and cooling.
MK	Not specified in NECP	
MT	Not specified in NECP	NECP horizon is until 2030.
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Not specified in NECP	Reverse-engineering carried out to retrieve some data.
PT	Not specified in NECP	PNEC has no quantification regarding 2050 horizon. For 2050, projections of methane demand based on data provided by DGEG were used.
RO	Not specified in NECP	
RS	Not specified in NECP	Data used for submission was taken from the official data available to the TSO.
SE		
SI	Not aligned	TYNDP data is partially compliant with NECP for the gas related sectors. The data for the sectors: Buildings, Households, Industry, Transport, is compliant with NECP for years 2030, 2035 and 2040. The data for 2050 is not compliant due to the problems with accessing NECP in December 2024 and in May 2025. For the 2050 the fallback solution applies (average of DE/GA scenarios from previous TYNDP cycle).
SK	Not aligned	The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of the TYNDP 2024).
TR		
UA	Not aligned	Same as for 2030, 2035.

49 // Alignment of other energy carriers' demand figures with the NECP for 2050



Q 64

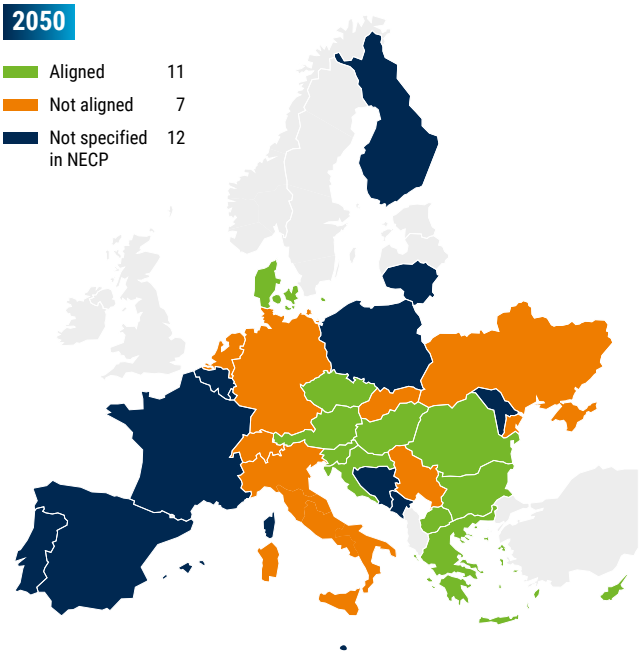
Please confirm alignment of other energy carriers' demand figures with the NECP for 2050.

(Question 64 // PDF)

	Please specify the carrier(s)	Alignment of other energy carriers' demand figures with the NECP for 2050	If not aligned, please justify
AT	Biomethane, crude oil, e-liquids, solid fossil, biomass	Aligned	
BA			
BE	See answers for 2030	Not specified in NECP	See answers for 2030.
BG			
CH			
CY	All carriers	Aligned	
CZ		Not aligned (please specify below)	The NECP data is not sufficiently granular to enable responsible adjustments to be made to the utilisation of different technologies across the FEC sectors in the ETM, nor in combination with other technologies and energy carriers. WGSB has not developed any methodology or guidelines for such a case. These concerns were raised multiple times during data collection by both TSOs.
DE	Coal, lignite, oil	Not aligned	Fossil fuel demand has been reduced to compensate for additional hydrogen demand.
DK			
EE			
ES	Heat, biofuels, solids, oil, ammonia, others	Not specified in NECP	e/g-TSO projections + European policies
FI		Not specified in NECP	
FR		Aligned	Due to difficulties in configuring ETM to reflect final demand volumes there might be some discrepancies on energy carriers other than electricity, gas or hydrogen for some horizons.

	Please specify the carrier(s)	Alignment of other energy carriers' demand figures with the NECP for 2050	If not aligned, please justify
GR			
HR		Not specified in NECP	
HU	Other	Not aligned	It was not possible/sensible in ETM.
IE			
IT	All Others	Not aligned	Target year not covered by the NECP.
LT	Other	Not specified in NECP	Lithuanian Energy Transformation Study to 2050.
LU			
LV			
MD			
ME		Not specified in NECP	The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050. The data were submitted on the basis of several materials, including data provided for previous plans, as well as data obtained through communication with institutions dealing with specific issues related to the type of data requested.
MK	N/A	Not specified in NECP	
MT		Not specified in NECP	NECP Horizon is until 2030.
NL	Various energy & feedstock carriers.	Not aligned	See response to same question on 2030 assumptions.
PL	NECP covers period up to 2040	Not specified in NECP	Reverse-engineering carried out to retrieve some data.
PT	Electricity, methane, hydrogen	Not specified in NECP	PNEC has no quantification regarding 2050 horizon. For 2050, projections of demand based on 2035-2040 trends were used and/or on data provided by the Portuguese Directorate for Energy and Geology - DGEG.
RO	N/A	Not specified in NECP	
RS		Not specified in NECP	Data used for submission was taken from the official data available to the TSO.
SE			
SI		Not aligned	Data for other carriers was not submitted by the TSOs.
SK	All other energy carriers' demand	Not aligned	The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of the TYNDP 2024).
TR			
UA		Not aligned	Same as for 2030, 2035.

50 // Alignment of renewable electricity generation capacities with the NECP for 2050



Q 65

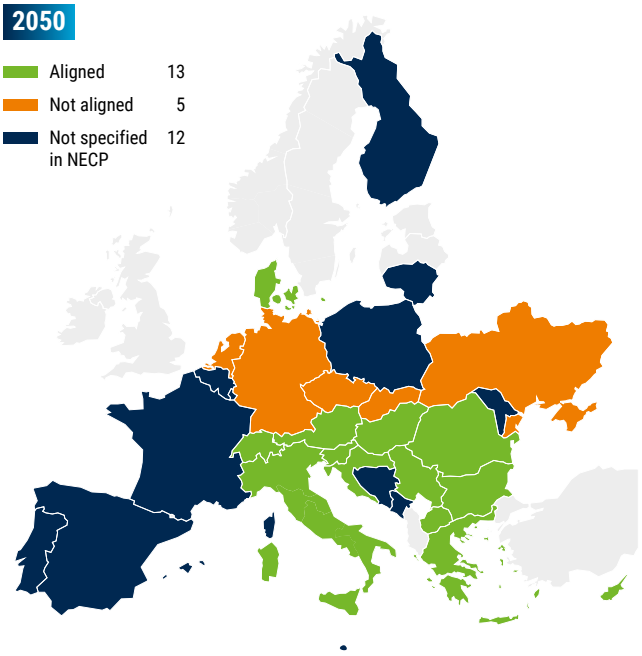
Please confirm alignment of renewable electricity generation capacities with the NECP for 2050.

(Question 65 // PDF)

	Please confirm alignment of renewable electricity generation capacities with the NECP for 2050	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	Internal data of Electricity TSO.
BE	Not specified in NECP	See answers for 2030.
BG	Aligned	
CH	Not aligned	Added alpine PV, which is not included in the Swiss National Framework for Grid Planning but is developing as part of the national energy strategy. The rest is aligned.
CY	Aligned	
CZ	Aligned	
DE	Not aligned	Wind Onshore, PV and Biomass are aligned with the NECP. Wind Offshore is based on TSO project information taken into account for the draft of the network development scenario framework (Network Development Plan 2037/2045 (2025)). Hydro capacities are also taken from this source.
DK	Aligned	
EE		
ES	Not specified in NECP	National Long-Term Strategy, information from stakeholders, etc.
FI	Not specified in NECP	
FR	Not specified in NECP	
GR	Aligned	
HR	Aligned	
HU	Aligned	The submitted renewable energy capacities are equal to/higher than the NECP targets.

	Please confirm alignment of renewable electricity generation capacities with the NECP for 2050	If not aligned, please justify
IE		
IT	Not aligned	Target year not covered by the NECP.
LT	Not specified in NECP	Based on NECP data and the goals and objectives set out in the National energy independence strategy, the electricity TSO prepares forecasts for the coming years (after 2030) and coordinates them with the Ministry of Energy.
LU	Not specified in NECP	Even though it is not specified with the publicly available NECP data, we are aligned with the figures extending to 2050.
LV		
MD	Not specified in NECP	TSOs' own internal scenarios.
ME	Not specified in NECP	The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050. The data have been harmonised in accordance with communication and inputs from the institutions concerned with the requested type of data.
MK	Aligned	
MT	Not specified in NECP	NECP Horizon is until 2030.
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Not specified in NECP	Reverse-engineering carried out to retrieve some data.
PT	Not specified in NECP	PNEC has no quantification regarding 2050 horizon. For 2050, electricity generation was assumed the same as in 2040.
RO	Aligned	
RS	Not aligned	Data used for submission was taken from the official data available to the TSO.
SE		
SI	Aligned	
SK	Not aligned	Projections beyond 2030 are based on internal prognoses. These relevant prognoses are used e. g. in the TSO's ten-year development plan as well as in the assessment of the adequacy resource of the Power system of the Slovak Republic for the Ministry of Economy purposes. However, the data provided may differ slightly from internal prognoses due to different processing times.
TR		
UA	Not aligned	Same as for 2030, 2035.

51 // Alignment of thermal and (including nuclear) electricity generation capacities with the NECP for 2050



Q 66

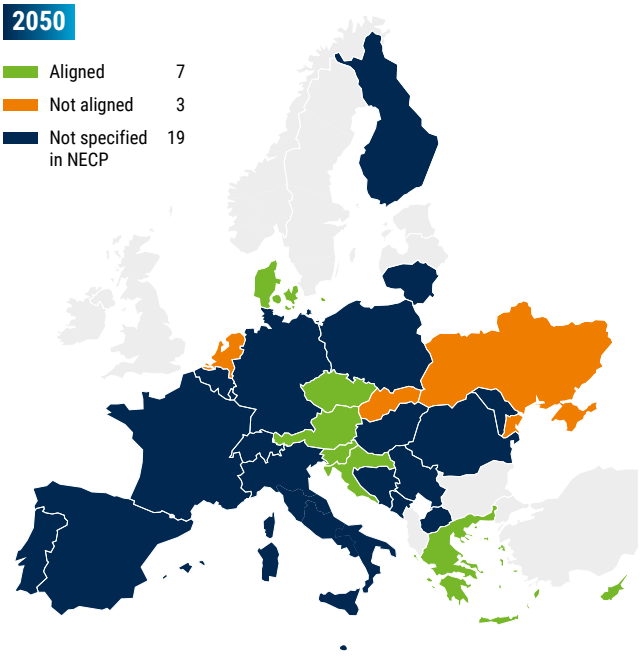
Please confirm alignment of thermal and (including nuclear) electricity generation capacities with the NECP for 2050.

(Question 66 // PDF)

	Please confirm alignment of thermal and (including nuclear) electricity generation capacities with the NECP	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	Internal data of Electricity TSO.
BE	Not specified in NECP	See answers for 2030.
BG	Aligned	
CH	Aligned	
CY	Aligned	
CZ	Not aligned	All Thermal data were based on Data collection from operators in 2024 by ČEPS.
DE	Not aligned	The capacity of the gas power plants in total (natural gas and hydrogen) is aligned, but compared to the NECP a complete switch to hydrogen power plants is assumed by 2045 to account for a climate neutral energy system. This goes along with assumptions in the system development strategy and the approval of the scenario framework of the grid development plan. The NECP scenarios MWMS and MMS assume for 2050 28.4 GW respectively 29.9 GW of natural gas-fired power plants, contradicting the approved scenario framework for national grid development plan.
DK	Aligned	
EE		
ES	Not specified in NECP	Nuclear: Official Closure Schedule from Ministry. Others: Ministry/Useful Lifetime.
FI	Not specified in NECP	
FR	Not specified in NECP	
GR	Aligned	
HR	Aligned	

	Please confirm alignment of thermal and (including nuclear) electricity generation capacities with the NECP	If not aligned, please justify
HU	Aligned	
IE		
IT	Aligned	
LT	Not specified in NECP (please specify below)	Thermal capacities are presented taking into account information, received during the annual survey of the largest electricity producers on long-term capacity development/decommissioning plans.
LU	Not specified in NECP	No nuclear generation considered.
LV		
MD	Not specified in NECP	TSOs' own internal scenarios.
ME	Not specified in NECP	The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050. The data have been harmonised in accordance with communication and inputs from the institutions concerned with the requested type of data.
MK	Aligned	
MT	Not specified in NECP	NECP Horizon is until 2030.
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Not specified in NECP	Reverse-engineering carried out to retrieve some data.
PT	Not specified in NECP	PNEC has no quantification regarding 2050 horizon. For 2050, electricity generation was assumed the same as in 2040.
RO	Aligned	
RS	Aligned	
SE		
SI	Aligned	
SK	Not aligned	Projections beyond 2030 are based on internal prognoses. These relevant prognoses are used e. g. in the TSO's ten-year development plan as well as in the assessment of the adequacy resource of the Power system of the Slovak Republic for the Ministry of Economy purposes. However, the data provided may differ slightly from internal prognoses due to different processing times.
TR		
UA	Not aligned	Same as for 2030, 2035.

52 // Alignment of DSR with the NECP for 2050



Q 67

Please confirm alignment of DSR with the NECP for 2050.

(Question 67 // PDF)

	Please confirm alignment of DSR with the NECP for 2050	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	Internal data of Electricity TSO.
BE	Not specified in NECP	See answers for 2030.
BG		
CH	Not specified in NECP	No explicit DSR provided, only implicit DSR.
CY	Aligned	
CZ	Aligned	
DE	Not specified in NECP	DSR is not specified in the NECP and taken from national studies. Data refers to the scenario framework draft of the German grid development plan (Network Development Plan 2037/2045 (2025)) and the system analysis (Bundesnetzagentur - Netzreserve). It should be noted that shiftable DSR could not be modelled in the ERAA. Assumption: The shiftable DSR is assigned to demand shedding or not considered based on the recovery window time.
DK	Aligned	
EE		
ES	Not specified in NECP	e-TSO internal studies
FI	Not specified in NECP	
FR	Not specified in NECP	
GR	Aligned	
HR	Aligned	
HU	Not specified in NECP	No concrete provision about DSR is included in the NECP.

	Please confirm alignment of DSR with the NECP for 2050	If not aligned, please justify
IE		
IT	Not specified in NECP	Target year not covered by the NECP.
LT	Not specified in NECP	Same as 2030.
LU	Not specified in NECP	Generalised flexibility of 3-30 %, depending on the sector.
LV		
MD	Not specified in NECP	TSOs' own internal scenarios
ME	Not specified in NECP	The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050. DSR is not part of the data provided.
MK	Not specified in NECP	
MT	Not specified in NECP	NECP Horizon is until 2030.
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Not specified in NECP	Reverse-engineering carried out to retrieve some data.
PT	Not specified in NECP	DSR was not included in both ERAA and TYNDP since there is no indication regarding DSR in PT NECP.
RO	Not specified in NECP	
RS	Not specified in NECP	No reliable source for this parameter.
SE		
SI	Aligned	
SK	Not aligned	Projections of the DSR beyond 2030 were not provided.
TR		
UA	Not aligned	Same as for 2030, 2035.

53 // How is demand-side flexibility (e.g. DSR) already reflected in your datasets for 2050?

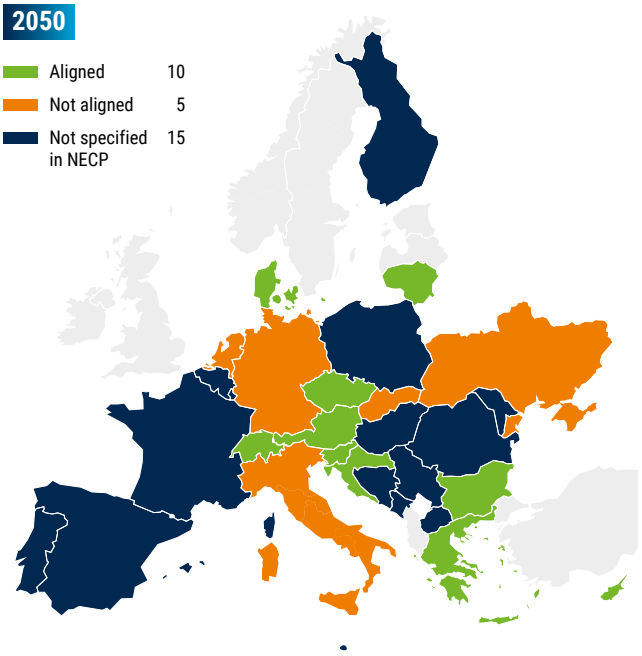
Please explain how is demand-side flexibility (e.g. DSR) already reflected in your datasets for 2050.

(Question 68 // PDF)

Q 68

	Answer
AT	
BA	
BE	See answers for 2030.
BG	No DSR is considered in the NECP.
CH	Only implicit DSR provided for EV, HP and decentralised batteries, as derived from the Swiss National Framework for Grid Planning.
CY	No DSR in 2050.
CZ	DSR is assumed to be implemented as load shedding in the industrial sector.
DE	Demand side flexibility is considered by Electrolysis, Power to Heat and DSR. For the latter one different bands for industrial processes and flexibilities in the commerce, trade, and service sector are defined, where the demand can be shifted or shaded based on an activation price. It should be noted that shiftable DSR could not be modelled in the TYDNP. Assumption: The shiftable DSR is assigned to demand shedding or not considered based on the activation price. In the ETM just the Demand tab has been filled, and no additional flexibility has been defined.
DK	The DSR which has been submitted for Denmark in the PEMMDB app is P2X and P2H. The activation price for P2X is calculated centrally by ENTSO-E. The activation price for P2H is based on market model simulations.
EE	
ES	DSR (demand shedding) has not been considered in demand figures (ETM), but in supply capacities (PEMMDB).
FI	DSR data reflects the TSOs' latest views on DSR developments, which includes industrial, residential and heating sector developments of DSR.
FR	
GR	Explicit DSR was submitted at the PEMMDB
HR	
HU	No explicit/implicit DSR capacities submitted.
IE	
IT	Internal assumptions based on TSO studies.
LT	Same as 2030.
LU	Generalised flexibility of 3 - 30 %, depending on the sector.
LV	
MD	
ME	DSR is not part of the data provided.
MK	N/A
MT	Not reflected.
NL	See response to same question on 2030 assumptions.
PL	The estimation of non-market DSR up to 2050 was provided. Market DSR is allowed to expand up to expansion constrains provided in PEMMDB.
PT	DSR was not included in both ERAA and TYNDP since there is no indication regarding DSR in PT NECP.
RO	N/A
RS	
SE	
SI	
SK	Projections of the DSR beyond 2030 were not provided.
TR	
UA	Same as for 2030, 2035.

54 // Alignment of electrolysers installed capacities with the NECP for 2050



Q 69

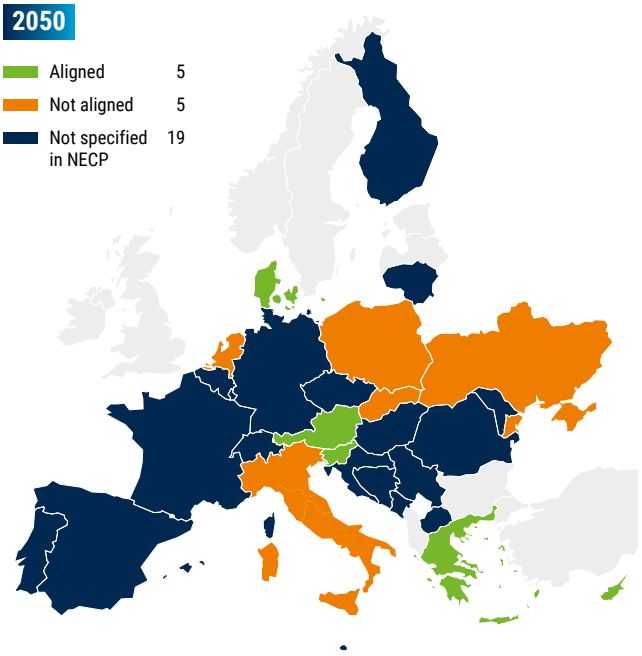
Please confirm alignment of electrolysers installed capacities with the NECP for 2050.

(Question 69 // PDF)

	Please confirm alignment of electrolysers installed capacities with the NECP for 2050	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	No data.
BE	Not specified in NECP	See answers for 2030.
BG	Aligned	
CH	Aligned	
CY	Aligned	
CZ	Aligned	
DE	Not aligned	In the NECP the national strategy on hydrogen imports (BMWE - National Hydrogen Strategy Update) was not considered. This strategy is reflected in the national system development strategy (BMWE - Die Systementwicklungsstrategie), that defines boundaries for the national system development of the electricity and gas infrastructure. To align with the hydrogen demand and import share projections, the electrolyser capacities have been increased compared to the NECP. The draft of the scenario framework for the NEP2037/2045 has been used as reference (Network Development Plan 2037/2045 (2025)).
DK	Aligned	
EE		
ES	Not specified in NECP	g-TSO projections
FI	Not specified in NECP	
FR	Not specified in NECP	
GR	Aligned	
HR	Aligned	

	Please confirm alignment of electrolysers installed capacities with the NECP for 2050	If not aligned, please justify
HU	Not specified in NECP	Partially we consider the HU hydrogen strategy (2021) and the NECP data for electricity for hydrogen production. Electrolyser and SMR/pyrolysis capacities were estimated based on the NECP trajectories of electricity demand and renewable electricity production.
IE		
IT	Not aligned	Target year not covered by the NECP.
LT	Aligned	
LU	Not specified in NECP	Even though it is not specified with the publicly available NECP data, we are aligned with the figures extending to 2050.
LV		
MD	Not specified in NECP	TSOs' own internal scenarios.
ME	Not specified in NECP	Electrolysers are not included in the submitted data.
MK	Not specified in NECP	
MT	Not specified in NECP	NECP Horizon is until 2030.
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Not specified in NECP	Reverse-engineering carried out to retrieve some data from supporting analysis with inclusion of unbiding market research conducted by gas TSO.
PT	Not specified in NECP	PNEC has no quantification regarding 2050 horizon. For 2050, the data was provided by the Portuguese Directorate for Energy and Geology - DGEG.
RO	Not specified in NECP	
RS	Not specified in NECP	No reliable source for this parameter.
SE		
SI	Aligned	
SK	Not aligned	Electolysers installed capacity is based on TSO's internal prognoses. TSO's internal prognoses are based on the outcomes of studies by an independent external consultancy company. These relevant prognoses are used e. g. in the TSO's ten-year development plan as well as in the assessment of the adequacy resource of the Power system of the Slovak Republic for the Ministry of Economy purposes. However, the data provided may differ slightly from internal prognoses due to different processing times.
TR		
UA	Not aligned	Same as for 2030, 2035.

55 // Alignment of hydrogen production (SMR & pyrolysis) capacities with the NECP for 2050



Q 70

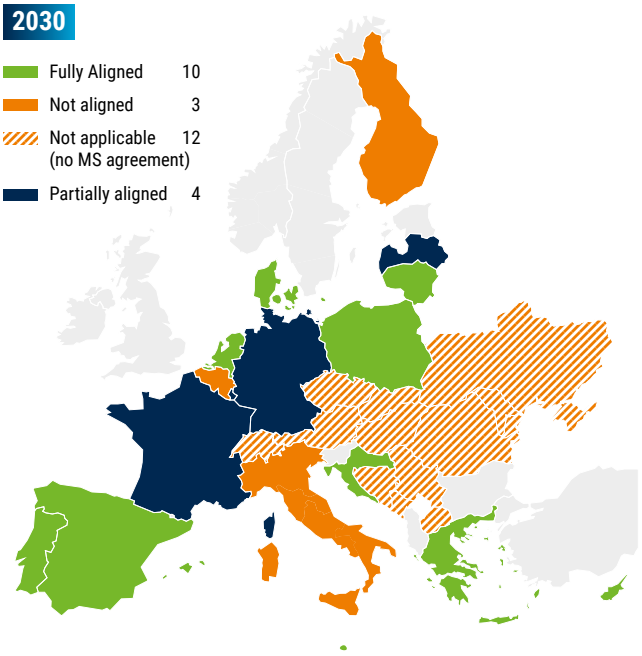
Please confirm alignment of hydrogen production (SMR & pyrolysis) capacities with the NECP for 2050.

(Question 70 // PDF)

	Please confirm alignment of hydrogen production (SMR & pyrolysis) capacities with the NECP for 2050	If not aligned, please justify
AT	Aligned	
BA	Not specified in NECP	
BE	Not specified in NECP	See answers for 2030.
BG		
CH	Not specified in NECP	Since hydrogen production values are not available in the Swiss National Framwork for Grid Planning, the values where taken from internal references from Swissgas or from the EP2050+.
CY	Aligned	
CZ	Not specified in NECP	No data on SMR/pyrolysis are available in the CZ NECP (only electrolysers) - not considered in data collection.
DE	Not specified in NECP	Data from a market survey done for national grid development studies was used. This Survey collects planned installations of large consumers.
DK	Aligned	
EE		
ES	Not specified in NECP	A phase out of SMR for hydrogen production in industry is assumed for the 2035-2040 horizon.
FI	Not specified in NECP	
FR	Not specified in NECP	
GR	Aligned	
HR	Not specified in NECP	
HU	Not specified in NECP	Partially we consider the HU hydrogen strategy (2021) and the NECP data for electricity for hydrogen production. Electrolyser and SMR/pyrolysis capacities were estimated based on the NECP trajectories of electricity demand and renewable electricity production.

	Please confirm alignment of hydrogen production (SMR & pyrolysis) capacities with the NECP for 2050	If not aligned, please justify
IE		
IT	Not aligned	Target year not covered by the NECP.
LT	Not specified in NECP	Gas TSO forecast is used for SMR.
LU	Not specified in NECP	No specification in the NECP focus.
LV		
MD	Not specified in NECP	TSOs' own internal scenarios.
ME	Not specified in NECP	Hydrogen is not included in the submitted data. The current draft NECP covers only the period up to 2030, with certain indicative projections up to 2050.
MK	Not specified in NECP	
MT	Not specified in NECP	NECP Horizon is until 2030.
NL	Not aligned	See response to same question on 2030 assumptions.
PL	Not aligned	Not confirmed for the TYNDP purpose. It is assumed, based on unbiding market research conducted by gas TSO, that SMR installations will provide hydrogen for own needs only, will not be connected to the hydrogen network.
PT	Not specified in NECP	There is no indication regarding SMR and pyrolysis production of hydrogen in NECP (just green hydrogen).
RO	Not specified in NECP	
RS	Not specified in NECP	No reliable source for this parameter.
SE		
SI	Aligned	No SMR capacities, only electrolisers.
SK	Not aligned	The ENTSO-E/ENTSOG fallback solution was used (an average of the DA and GA scenarios outcomes of the TYNDP 2024).
TR		
UA	Not aligned	Same as for 2030, 2035.

56 // Alignment on MS non-binding offshore agreements in 2030



Q 71

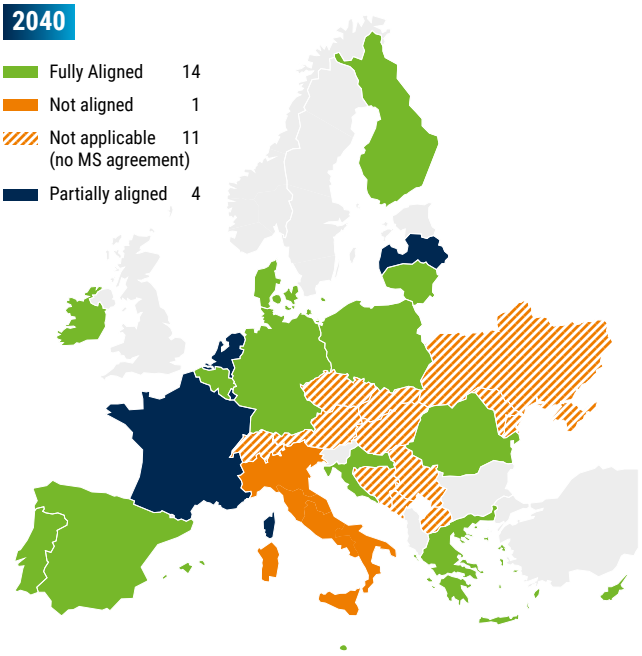
Is the 2030 dataset aligned with Member States' non-binding offshore agreements?

(Question 71 // PDF)

	Please confirm alignment with Member States' non-binding offshore agreements	If not aligned, please justify
AT	Not applicable	
BA	Not applicable	
BE	Not aligned	The non-binding target is 6GW (5.8 GW) for 2030 is no longer realistic. Recent developments and alignment with the assumptions of the latest "Adequacy and Flexibility study for Belgium 2026-2036" have been taken into consideration for 2030.
BG		
CH	Not applicable	
CY	Fully aligned	
CZ	Not applicable	
DE	Partially aligned	Based on the current project status it is unlikely to reach the envisaged 30 GW of offshore wind power in North and Baltic sea. This is already stated in footnote 11 of the non-binding offshore agreements: "expansion may fall short of the target by approximately 1 year due to project lead times and grid delays".
DK	Fully aligned	The Analysis Assumptions for Energinet 2024, delivered by the Danish Energy Agency to Energinet, has been utilised as the main scenario reported for the TYNDP/SB, which is compliant with Member States' non-binding agreements on offshore. Important to keep in mind that the member States' non-binding offshore agreements are targets for end of year (ultimo), where the submitted data for TYNDP/SB are for the start of the year (primo), hence to compare the target with the dataset, one should compare the target with start of year capacities for 2031 in the dataset.
EE		
ES	Fully aligned	
FI	Not aligned	Based on the status of current offshore projects and latest TSO view it is assumed that any projects are not commissioned before 2030.

	Please confirm alignment with Member States' non-binding offshore agreements	If not aligned, please justify
FR	Partially aligned	The 2030 dataset of the TYNDP 2026 is aligned with the reference scenario of the SDDR (the French NDP). The draft of the French NDP was released after the Member State' non binding offshore agreements were communicated.
GR	Fully aligned	
HR	Fully aligned	
HU	Not applicable	
IE		
IT	Not aligned	The dataset reports higher values than those indicated in the non-binding agreements.
LT	Fully aligned	
LU	Partially aligned	While Luxembourg, having no national maritime space, does not participate through specific offshore renewable target contributions, Luxembourg plans to contribute significantly through cooperation on cross-border projects, especially through contributing via the Renewable Energy Financing Mechanism in exchange of statistical transfers.
LV	Partially aligned (please clarify below)	Data has been updated and have an different projectile in 2030.
MD	Not applicable	
ME	Not applicable	Montenegro is not an EU Member State and therefore these non-binding agreements between EU Member States on offshore activities do not apply. However, such agreements may be considered as references or best practices in planning offshore energy projects.
MK	Not applicable	MK is not EU Member.
MT	Fully aligned	
NL	Fully aligned	
PL	Fully aligned	
PT	Fully aligned	
RO	Not applicable	
RS	Not applicable	
SE		
SI		
SK	Not applicable	
TR		
UA	Not applicable	

57 // Alignment on MS non-binding offshore agreements in 2040



Q 72

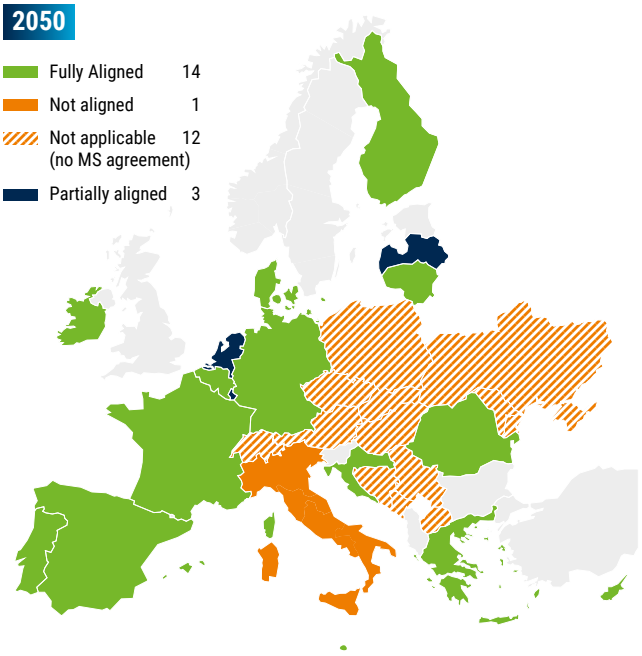
Is the 2040 dataset aligned with Member States' non-binding offshore agreements?

(Question 72 // PDF)

	Please confirm alignment with Member States' non-binding offshore agreements	If not aligned, please justify
AT	Not applicable	
BA	Not applicable	
BE	Fully aligned	The target of 8 GW is considered.
BG		
CH	Not applicable	
CY	Fully aligned	
CZ	Not applicable	
DE	Fully aligned	
DK	Fully aligned	The Analysis Assumptions for Energinet 2024, delivered by the Danish Energy Agency to Energinet, has been utilised as the main scenario reported for the TYNDP/SB, which is compliant with Member States' non-binding agreements on offshore. Important to keep in mind that the member States' non-binding offshore agreements are targets for end of year, where the submitted data for TYNDP/SB are for the start of the year, hence to compare the target with the dataset, one should compare the target with start of year capacities for 2041 in the dataset.
EE		
ES	Fully aligned	
FI	Fully aligned	
FR	Partially aligned	The 2040 dataset of the TYNDP 2026 is aligned with the reference scenario of the SDDR (the French NDP). The draft of the French NDP was released after the Member State' non binding offshore agreements were communicated.
GR	Fully aligned	

	Please confirm alignment with Member States' non-binding offshore agreements	If not aligned, please justify
HR	Fully aligned	
HU	Not applicable	
IE	Fully aligned	Aligned to Ireland 2040 offshore wind target 20 GW
IT	Not aligned	The dataset reports higher values than those indicated in the non-binding agreements.
LT	Fully aligned	
LU	Partially aligned	While Luxembourg, having no national maritime space, does not participate through specific offshore renewable target contributions, Luxembourg plans to contribute significantly through cooperation on cross-border projects, especially through contributing via the Renewable Energy Financing Mechanism in exchange of statistical transfers.
LV	Partially aligned	TSO projectile of offshore wind is very close to non-binding offshore.
MD	Not applicable	
ME	Not applicable	Montenegro is not an EU Member State and therefore these non-binding agreements between EU Member States on offshore activities do not apply. However, such agreements may be considered as references or best practices in planning offshore energy projects.
MK	Not applicable	MK is not EU Member.
MT	Fully aligned	
NL	Partially aligned	Partially, the non-binding offshore agreements reflect the current ambitions of the national government. The capacities submitted for NT+ are (slightly) lower to account for possible delays.
PL	Fully aligned	
PT	Fully aligned	
RO	Fully aligned	
RS	Not applicable	
SE		
SI		
SK	Not applicable	
TR		
UA	Not applicable	

58 // Alignment on MS non-binding offshore agreements in 2050



Q 73

Is the 2050 dataset aligned with Member States' non-binding offshore agreements?

(Question 73 // PDF)

	Please confirm alignment of 2050 data sert with Member States' non-binding offshore agreements	If not aligned, please justify
AT	Not applicable (no MS agreement)	
BA	Not applicable (no MS agreement)	
BE	Fully aligned	The target of 8 GW is considered.
BG		
CH	Not applicable (no MS agreement)	
CY	Fully aligned	
CZ	Not applicable (no MS agreement)	
DE	Fully aligned	
DK	Fully aligned	The Analysis Assumptions for Energinet 2024, delivered by the Danish Energy Agency to Energinet, has been utilised as the main scenario reported for the TYNDP/SB, which is compliant with Member States' non-binding agreements on offshore. Important to keep in mind that the member States' non-binding offshore agreements are targets for end of year, where the submitted data for TYNDP/SB are for the start of the year, hence to compare the target with the dataset, one should compare the target with start of year capacities for 2051 in the dataset.
EE		
ES	Fully aligned	
FI	Fully aligned	
FR	Fully aligned	
GR	Fully aligned	
HR	Fully aligned	
HU	Not applicable (no MS agreement)	

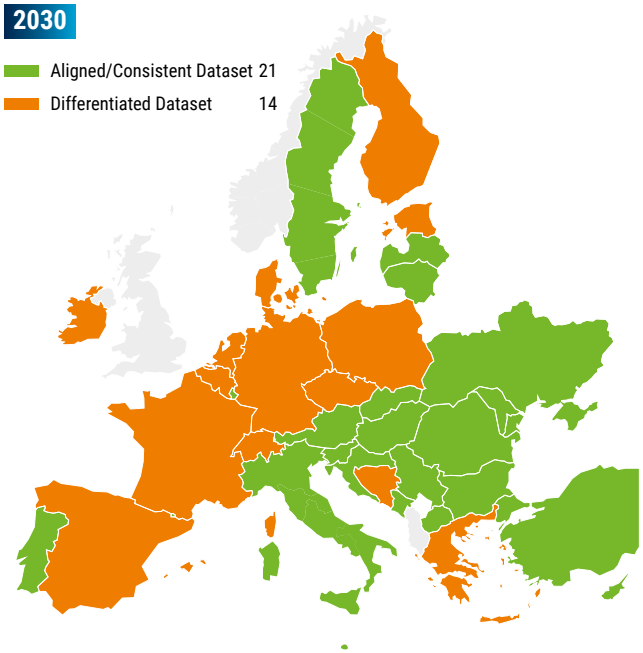
	Please confirm alignment of 2050 data sert with Member States' non-binding offshore agreements	If not aligned, please justify
IE	Fully aligned	Aligned to Ireland 2050 offshore wind target 37 GW.
IT	Not aligned	The dataset reports higher values than those indicated in the non-binding agreements.
LT	Fully aligned	
LU	Partially aligned	While Luxembourg, having no national maritime space, does not participate through specific offshore renewable target contributions, Luxembourg plans to contribute significantly through cooperation on cross- border projects, especially through contributing via the Renewable Energy Financing Mechanism in exchange of statistical transfers.
LV	Partially aligned	TSO projectile of offshore wind is very close to non-binding offshore.
MD	Not applicable (no MS agreement)	
ME	Not applicable (no MS agreement)	Montenegro is not an EU Member State and therefore these non-binding agreements between EU Member States on offshore activities do not apply. However, such agreements may be considered as references or best practices in planning offshore energy projects.
MK	Not applicable (no MS agreement)	MK is not EU Member.
MT	Fully aligned	
NL	Partially aligned	Partially, the non-binding offshore agreements reflect the current ambitions of the national government. The capacities submitted for NT+ are (slightly) lower to account for possible delays.
PL	Not applicable (no MS agreement)	Currently, there are no legally binding documents setting offshore renewable targets for 2050 in Poland.
PT	Fully aligned	
RO	Fully aligned	
RS	Not applicable (no MS agreement)	
SE		
SI		
SK	Not applicable (no MS agreement)	
TR		
UA	Not applicable (no MS agreement)	

59 // Consistency of data sets among TYNDP & ERAA for 2030 and 2035 time horizon

Are all submitted datasets consistent among TYNDP 2026 and ERAA 2025 for 2030 time horizon?

(Question 74 // PDF)

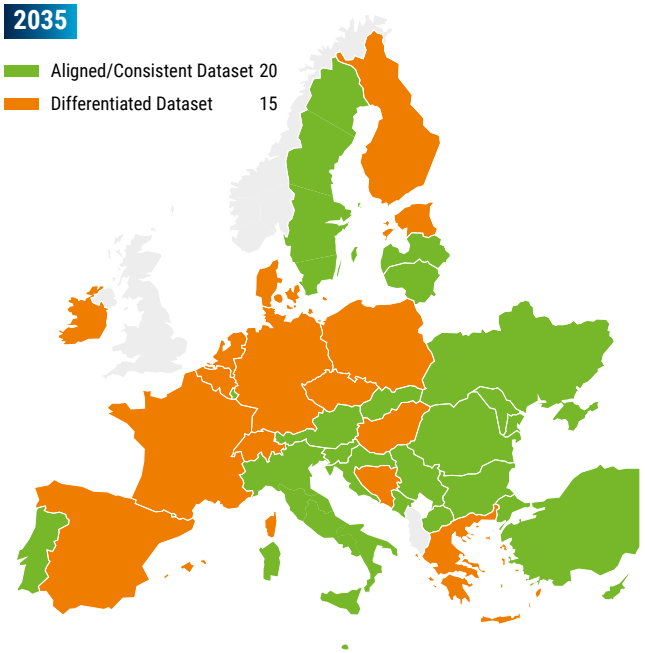
Q 74



Are all submitted datasets consistent among TYNDP 2026 and ERAA 2025 for 2035 time horizon?

(Question 75 // PDF)

Q 75



	Electrolysers capacity aligned with NECP for 2030	If electrolysers capacity not aligned with NECP for 2030	Electrolysers capacity aligned with NECP for 2035	If electrolysers capacity not aligned with NECP for 2035
AT	Aligned/Consistent datasets		Aligned/Consistent datasets	
BA	Differentiated datasets		Differentiated datasets	
BE	Differentiated datasets	In ERAA lifetime extension units are subject to Economic Viability Assessment. In TYNDP these units are assumed to be available.	Differentiated datasets	In ERAA lifetime extension units are subject to Economic Viability Assessment. In TYNDP these units are assumed to be available.
BG	Aligned/Consistent datasets		Aligned/Consistent datasets	
CH	Differentiated datasets	Difference in NTC data with more conservative but plausible values in ERAA. The rest is consistent.	Differentiated datasets	Difference in NTC data with more conservative but plausible values in ERAA. The rest is consistent.
CY	Aligned/Consistent datasets		Aligned/Consistent datasets	
CZ	Differentiated datasets	Additional expected gas power plants included for TYNDP. TYNDP demand also not aligned with NECP in contrast with ERAA.	Differentiated datasets	Additional expected gas power plants included for TYNDP. TYNDP demand also not aligned with NECP in contrast with ERAA.
DE	Differentiated datasets	While the submitted dataset for the electricity demand in the TYNDP is based on the NECP, the demand for ERAA is based on national studies and its underlying research. This data has been considered more adequate to fill the DFT. With 2.5% deviation on the overall demand the difference is very small. Gas respectively hydrogen power plants that could be incentivized by a capacity mechanism were not considered in ERAA but in TYNDP. As shiftable DSR could not be modelled in TYNDP and ERAA, different assumptions have been taken to translate this technology to existing ones. In ERAA it is divided into load shedding DSR or not considered based on the recovery window time, in the TYNDP this distinction has been made based on the activation price to account for the different purposes of the studies.	Differentiated datasets	While the submitted dataset for the electricity demand in the TYNDP is based on the NECP, the demand for ERAA is based on national studies and its underlying research. This data has been considered more adequate to fill the DFT. With 2.5% deviation on the overall demand the difference is very small. Gas respectively hydrogen power plants that could be incentivized by a capacity mechanism were not considered in ERAA but in TYNDP. As shiftable DSR could not be modelled in TYNDP and ERAA, different assumptions have been taken to translate this technology to existing ones. In ERAA it is divided into load shedding DSR or not considered based on the recovery window time, in the TYNDP this distinction has been made based on the activation price to account for the different purposes of the studies.

	Electrolysers capacity aligned with NECP for 2030	If electrolysers capacity not aligned with NECP for 2030	Electrolysers capacity aligned with NECP for 2035	If electrolysers capacity not aligned with NECP for 2035
DK	Differentiated datasets	For TYNDP/SB: The Analysis Assumptions for Energinet 2024, delivered by the Danish Energy Agency to Energinet, has been utilised as the main scenario reported, which is generally compliant with section A of the Danish NECP. For ERAA: For ERAA 2025 data submission, The Analysis Assumptions for Energinet 2024, delivered by the Danish Energy Agency to Energinet, has been modified by Energinet in terms of developments in the Danish energy sector and then utilised as the main scenario reported. The modifications are mainly concerning data after target year 2030 primo. The details of the modified version and reasoning for this modification can be found here (in Danish). The Danish Energy Agency has been notified about this modified version. The modifications are postponing windfarms, Energy islands and electrolyser capacities, compared to the original dataset. The modified version is considered a more accurate projection for offshore wind capacity, PtX, and energy island development–particularly in the short/mid-term scope and hence within the ten-year horizon of ERAA. Overall, the data is in line with the long-term NECP/offshore goals, but adjusted in the short term to reflect recent developments. The risk of not adjusting the ERAA submission to align with the modified version is that Denmark's adequacy assessment may be rated higher than expected, hence wrong conclusions will be made. Additionally the data collection guideline allowed for more freedom in terms of compliance with NECP for the ERAA submission, than for the TYNDP/SB. TYNDP/SB has a longer time horizon (main years of interest are 2040 and 2050) than ERAA, which provides greater opportunity to initiate political initiatives aimed at achieving the political objectives reflected in the NECP section A and the Member States' non-binding offshore targets. Hence why the original version of The Analysis Assumptions for Energinet 2024 has been submitted for the TYNDP/SB.	Differentiated datasets	For TYNDP/SB: The Analysis Assumptions for Energinet 2024, delivered by the Danish Energy Agency to Energinet, has been utilised as the main scenario reported, which is generally compliant with section A of the Danish NECP. For ERAA: For ERAA 2025 data submission, The Analysis Assumptions for Energinet 2024, delivered by the Danish Energy Agency to Energinet, has been modified by Energinet in terms of developments in the Danish energy sector and then utilised as the main scenario reported. The modifications are mainly concerning data after target year 2030 primo. The details of the modified version and reasoning for this modification can be found here (in Danish). The Danish Energy Agency has been notified about this modified version. The modifications are postponing windfarms, Energy islands and electrolyser capacities, compared to the original dataset. The modified version is considered a more accurate projection for offshore wind capacity, PtX, and energy island development–particularly in the short/mid-term scope and hence within the ten-year horizon of ERAA. Overall, the data is in line with the long-term NECP/offshore goals, but adjusted in the short term to reflect recent developments.. The risk of not adjusting the ERAA submission to align with the modified version is that Denmark's adequacy assessment may be rated higher than expected, hence wrong conclusions will be made. Additionally the data collection guideline allowed for more freedom in terms of compliance with NECP for the ERAA submission, than for the TYNDP/SB. TYNDP/SB has a longer time horizon (main years of interest are 2040 and 2050) than ERAA, which provides greater opportunity to initiate political initiatives aimed at achieving the political objectives reflected in the NECP section A and the Member States' non-binding offshore targets. Hence why the original version of The Analysis Assumptions for Energinet 2024 has been submitted for the TYNDP/SB.
EE	Differentiated datasets	Different forced outage rates for subsea cables.	Differentiated datasets	Different forced outage rates for subsea cables.
ES	Differentiated datasets	Electricity demand aligned. Generation Capacity: Differences due to modelling requirements and Ministry amendments in the call for evidence ERAA 2025.	Differentiated datasets	Electricity demand aligned. Generation Capacity: Differences due to modelling requirements and Ministry amendments in the call for evidence ERAA 2025
FI	Differentiated datasets	In ERAA datasets there are assumed less flexiblity on demand side as there are more inflexble industrial demand compared to TYNDP where are more flexible eletrolysers. Different datasets are used to avoid too high and optimistic flexibility assumptions in adequacy study.	Differentiated datasets	In ERAA datasets there are assumed less flexiblity on demand side as there are more inflexble industrial demand compared to TYNDP where are more flexible eletrolysers. Different datasets are used to avoid too high and optimistic flexibility assumptions in adequacy study.

	Electrolysers capacity aligned with NECP for 2030	If electrolysers capacity not aligned with NECP for 2030	Electrolysers capacity aligned with NECP for 2035	If electrolysers capacity not aligned with NECP for 2035
FR	Differentiated datasets	ERAA 2025 integrates 36 nuclear availability time series to strengthen security of supply analysis whereas TYNDP relies on only one central nuclear availability scenario. TYNDP's offshore wind power trajectories have been revised downward to account for delays in the sector, these changes could not be made at the time of the ERAA 2025 data collection. In some cases, NTC data is reported with finer granularity for ERAA 2025 (seasonal and hourly breakdown), whereas it is based on yearly granularity for TYNDP 2026.	Differentiated datasets	ERAA 2025 integrates 36 nuclear availability time series to strengthen security of supply analysis whereas TYNDP relies on only one central nuclear availability scenario. TYNDP's offshore wind power trajectories have been revised downward to account for delays in the sector, these changes could not be made at the time of the ERAA 25 data collection. In some cases, NTC data is reported with finer granularity for ERAA 2025 (seasonal and hourly breakdown), whereas it is based on yearly granularity for TYNDP 2026.
GR	Differentiated datasets	Differentiation in electrolyser capacity, pumped storage capacities, small variations in the evolution of wind onshore and pv technologies, differentiation in offshore wind installed capacity, and in electricity demand. All of the aforementioned discrepancies were based in TSO's best estimate for 2030, the reason being, that 2030 is closer to short-term than long-term, and the current status (or lack of), strongly dictates the respective 2030 status for specific technological developments (e.g. offshore wind).	Differentiated datasets	Datasets are mostly aligned. Variations in electrolyser capacity and wind offshore.
HR	Aligned/Consistent datasets		Aligned/Consistent datasets	
HU	Aligned/Consistent datasets		Differentiated datasets	Electrolyser capacities differ due to TYNDP gas coordination.
IE	Differentiated datasets	ERAA data is taken from the All-Island Resource Adequacy Assessment 2025-2034 which reports on resource adequacy out to 2034. This purpose differs to the Tomorrow's Energy Scenarios study, from which the TYNDP data was taken. This study looks to assess the future electricity network, operating at net zero emissions, over a longer time horizon. As such, the portfolio of generation and demand forecast differ.	Differentiated datasets	ERAA data is taken from the All-Island Resource Adequacy Assessment 2025-2034 which looks to identify any risk in the security of electricity supply out to 2034. This purpose differs to the Tomorrow's Energy Scenarios study, from which the TYNDP data was taken. This study look to assess the future electricity network, operating at net zero emissions, over a longer time horizon. As such, the portfolio of generation and demand forecast differ.
IT	Aligned/Consistent datasets		Aligned/Consistent datasets	
LT	Aligned/Consistent datasets		Aligned/Consistent datasets	
LU	Aligned/Consistent datasets		Aligned/Consistent datasets	
LV	Aligned/Consistent datasets		Aligned/Consistent datasets	

	Electrolysers capacity aligned with NECP for 2030	If electrolysers capacity not aligned with NECP for 2030	Electrolysers capacity aligned with NECP for 2035	If electrolysers capacity not aligned with NECP for 2035
MD	Aligned/Consistent datasets		Aligned/Consistent datasets	
ME	Aligned/Consistent datasets		Aligned/Consistent datasets	
MK	Aligned/Consistent datasets		Aligned/Consistent datasets	
MT	Aligned/Consistent datasets	Input assumptions for ERAA and TYNDP aligned. Datasets for electricity demand for ERAA based on local modelling. Datasets for electricity demand for TYNDP based on ETM tool.	Aligned/Consistent datasets	Input assumptions for ERAA and TYNDP aligned. Datasets for electricity demand for ERAA based on local modelling. Datasets for electricity demand for TYNDP based on ETM tool.
NL	Differentiated datasets	This only concerns scenario assumptions on gas power plant capacity. For ERAA 2025, we consider all announced decommissioning plans whereas for TYNDP 2026 we assume today's gas power plants to remain largely open due to another study scope and in the course of an expected increasing electricity demand.	Differentiated datasets	This concerns scenario assumptions on gas power plant capacity. For ERAA 2025, we consider all announced decommissioning plans of producers but do not consider new-built of additional backup power plant capacities. For TYNDP 2026, we assume today's gas power plants to remain largely open and additional backup capacity to be introduced on the longer term, based on system balance and flexibility need analyses.
PL	Differentiated datasets	Thermal: Up-to-date information available for TSO from producers. DSR: For ERAA purpose a specific numbers of out-of-market DSR were taken into account for years in which CM is contracted. For TYNDP: The estimation of non-market DSR was provided for entire time horizon of the analysis.	Differentiated datasets	Thermal: Up-to-date information available for TSO from producers. DSR: For ERAA purpose a specific numbers of out-of-market DSR were taken into account for years in which CM is contracted. For TYNDP: The estimation of non-market DSR was provided for entire time horizon of the analysis.
PT	Aligned/Consistent datasets		Aligned/Consistent datasets	
RO	Aligned/Consistent datasets		Aligned/Consistent datasets	
RS	Aligned/Consistent datasets		Aligned/Consistent datasets	
SE	Aligned/Consistent datasets		Aligned/Consistent datasets	
SI	Aligned/Consistent datasets		Aligned/Consistent datasets	

	Electrolysers capacity aligned with NECP for 2030	If electrolysers capacity not aligned with NECP for 2030	Electrolysers capacity aligned with NECP for 2035	If electrolysers capacity not aligned with NECP for 2035
SK	Aligned/Consistent datasets	Regarding the consistency of the input data on the supply side (generation capacity), it is possible conclude, that the submitted dataset is aligned among the ERAA and TYNDP/SB2026. The situation is a bit different in the case of consistency of the input data on the demand side between ERAA and TYNDP. Some common parts of the electricity consumption can differ each other (e.g. EVs consumption, heat pumps consumptions ...etc.) due to the different approaches to data collection by the ETM and PEMMDB tools, which are not compatible with each other. An important factor contributing to the inconsistency is that the ENTSO-E/ENTSOG fallback solution dataset (an average of the DA and GA scenarios of the TYNDP2024) for TYNDP/SB2026 through the ETM tool was used. However, despite that it is possible to conclude ,t the final and also the total electricity consumption shows acceptable deviations from the ERAA electricity consumption, which comes from the NECP. Ultimately, the two (ERAA and TYNDP/SB2026 electricity consumption) can be considered as aligned. Consistency is also ensured on the common technologies with Gas TSO.	Aligned/Consistent datasets	Regarding the consistency of the input data on the supply side (generation capacity), it is possible conclude, that the submitted dataset is aligned among the ERAA and TYNDP/SB2026. The situation is a bit different in the case of consistency of the input data on the demand side between ERAA and TYNDP. Some common parts of electricity consumption can differ each other (e.g. EVs consumption, heat pumps consumptions ...etc.) due to the different approaches to data collection by the ETM and PEMMDB tools, which are not compatible with each other. An important factor contributing to the inconsistency is that the ENTSO-E/ENTSOG fallback solution dataset (an average of the DA and GA scenarios of the TYNDP2024) for TYNDP/SB2026 through the ETM tool was used. However, despite that it is possible to conclude, the final and also the total electricity consumption shows acceptable deviations from the ERAA electricity consumption, which comes from the NECP. Ultimately, the two (ERAA and TYNDP/SB2026 electricity consumption) can be considered as aligned. Consistency is also ensured on the common technologies with Gas TSO.
TR	Aligned/Consistent datasets		Aligned/Consistent datasets	
UA	Aligned/Consistent datasets		Aligned/Consistent datasets	

What are the key uncertainties in your dataset for TYNDP/SB 2026? Risk factors

(Question 76 // PDF)

Q 76

	Key uncertainties in dataset for TYNDP/SB 2026
AT	Uncertainty from: · the modelling process for a detailed PEMMDB. This is because of many (partially conflicting) sources on planned projects and their location in the grid · NECP doesn't cover the entire time horizon, at a certain granularity, as required for TYNDP scenario data submission.
BA	
BE	Nuclear, RES, Batteries, Flexibility, Storage, Electrification of Industry. Synthetic and biofuels, transition to hydrogen, deployment of CCS. Moreover it is was very challenging to accommodate all the above uncertainties into one "best estimate" national trends scenario (neither by the use of economic variants).
BG	The main risk factors would probably prove to be the counterintuitive use and handling of the input data via the ETM platform. We expressed our dissatisfaction with the ETM platform and suggest in the future that ENTSO-E and ENTSO-G use some more user-friendly tool which allows for a direct input of the required data.
CH	The dataset has some uncertainty as whole, as it is based on forecasts and assumptions. Specific not exhaustive uncertainties are: development of market for hydrogen and methane, development of wind and hydro capacities, finalisation of projects relevant for cross-border exchanges.
CY	Whether the NECP planned policies will be effectively implemented in a timely manner, and whether they will have the anticipated effect on both the demand side and the supply side.
CZ	Main risk factors include demand estimation from TYNDP 2024, including discrepancies between reference scenarios FEC in 2019 (ETM vs. NECP/Eurostat). Additional sources of uncertainty are the future availability of support for RES development and the reliability of the onshore wind development assumptions, NECP further seems to significantly underestimate the battery capacity and power currently being installed.
DE	The main factors of uncertainty are: · Development of the electricity demand, in particular the evolution of electric vehicles and heat pumps · Technological maturity and development of hydrogen demand and supply · Construction and type of incentive for additional peak power plants · Timeline of Hydrogen Fuel Switch · Political uncertainty and its impact on legislation and targets · Development of flexibilities, in particular the contribution of large-scale batteries and household flexibilities
DK	The development pathway in The Analysis Assumptions for Energinet 2024 is an attempt to present a relevant scenario for the purpose, based on currently available knowledge and assuming the realization of political objectives (NECP section A). The further into the future the pathway extends, the greater the range of possible outcomes, and the more uncertain the assumptions become. It is therefore important that The Analysis Assumptions for Energinet 2024 is understood and used with a focus on the uncertainty associated with its assumptions. In particular, long-term expansion with offshore wind and corresponding PtX is subject to considerable uncertainty. This applies both to the total expansion and to assumptions about connection to the collective grid. Additionally electricity consumption for data centers are also associated with significant uncertainty - especially in light of the AI development at the current time. The Danish Energy Agency states that in Energinet's use of The Analysis Assumptions for Energinet 2024, these assumptions can be adjusted depending on the purpose of the analysis–for example, to illustrate the value of new international interconnections or the connection of Danish offshore wind to the collective grid in other countries, resulting in a smaller Danish expansion of PtX. The above is part of the reasoning for why the datasets submitted to ERAA and TYNDP/SB differ, as there are different purposes for ERAA and TYNDP. However the main reasoning is that after the Danish Energy Agency had submitted The Analysis Assumptions for Energinet 2024 to Energinet, no bids were received for the first of two 3 GW offshore wind project tenders in December 2024, which led to major cancellations and a later re-tendering. This led to Energinet creating the modified version of The Analysis Assumptions for Energinet 2024, with the postponing of offshore wind, energy islands and electrolyser capacities. The modified version is considered a more accurate projection for offshore wind capacity, PtX, and energy island development–particularly in the short/mid-term scope and hence within the ten-year horizon of ERAA. Overall, the data is in line with the long-term NECP/offshore goals, but adjusted in the short/mid-term horizon to reflect recent developments.. The risk of not adjusting the ERAA submission to align with the modified version is that Denmark's adequacy assessment may be rated higher than expected, hence wrong conclusions will be made. Additionally the data collection guideline allowed for more freedom in terms of compliance with NECP for the ERAA submission, than for the TYNDP/SB. TYNDP/SB has a longer time horizon (main years of interest are 2040 and 2050) than ERAA, which provides greater opportunity to initiate political initiatives aimed at achieving the political objectives reflected in the NECP section A and the Member States' non-binding offshore targets. Hence why the original version of The Analysis Assumptions for Energinet 2024 has been submitted for the TYNDP/SB.

	Key uncertainties in dataset for TYNDP/SB 2026
EE	The timeline for the adoption of the hydrogen economy would have the greatest impact on the TYNDP.
ES	The publicly available information–such as the NECP and national 2050 targets–often lacks the level of granularity required to populate the dataset for the TYNDP 2026, particularly in areas where detailed input data is needed (e.g. ETM). As a result, TSOs had to make several assumptions, especially for intermediate years, which could not be validated due to the limited availability of detailed public data. In the case of Spain, the figures were presented to the Ministry as part of the scenario development process, ensuring transparency. Moreover, the ETM itself introduces additional uncertainty. TSOs were tasked with translating highly aggregated national data into detailed inputs, which sometimes extended beyond their core areas of expertise–such as the future role of liquid and solid fuels in the energy mix. Additionally, the ETM has limitations in representing certain aspects of the transition to net-zero emissions. For example, it does not fully account for non-energetic uses of fuels in industry or allow for complete sectoral transitions. A case in point is the steel sector, where a shift to circular economy practices may lead to increased natural gas consumption and emissions. These structural constraints within the ETM can make it challenging to develop consistent and comprehensive transition pathways aligned with net-zero objectives.
FI	These scenarios represent high-growth pathways and depict a future where many aspects have changed significantly compared to today. They involve multiple uncertainties driven by both local dynamics and global factors, making the outcomes highly unpredictable.
FR	On the energy consumpion side, the principal difficulty is to define a trajectory based on still evolving national NECP while it has not been finalised yet at the time of the present survey. On the electricity production side, main uncertities are related to life extension of existing nuclear fleet and on the planning and commissioning dates of new nuclear units ; on offshore wind and solar pv development.
GR	
HR	
HU	plans of power plants for longer time horizons (i.e. 2040, 2050), commissioning of renewable/thermal power plants with approved network connection requests, electricity demand of the industry, DSR capacities, electrolyser capacities
IE	
IT	Regulatory, permitting and financial matters.
LT	Not all data are available in national plans - especially for the period beyond 2030. Different sources apply varying methodologies, which introduces uncertainty into the dataset. Key technologies (e.g., hydrogen, CCS) are not yet fully deployed, creating implementation risks. Political and regulatory decisions (e.g., permitting, CO_2 pricing, legislation) are evolving and difficult to predict.
LU	
LV	Currently in Latvia most crucial risk factor is development of RES and electrolysers. Many market participants have shown huge interest in building Wind and Solar power plants, but in reality only part of them are activly working on implementation of the project. Therefore RES porjectile is rather conservative. Legislative part also can become a problem, since people, who are living near possible solar and especially wind power plants, are resisting to construction.
MD	Geopolitical instability in the region (Russia-Ukraine war), lack of financing.
ME	Key concerns regarding the TSO data for ERAA 2025/TYNDP 2026 include uncertainty in consumption and load projections, as well as potential changes in legislation, renewable energy support, and market mechanisms. Integration of renewable energy sources (RES) also poses uncertainties that could affect system stability and projected data.
MK	
MT	Uncertainty about hydrogen market development, price and supply-chain uncertainties, and technology immaturity in floating off-shore technology.
NL	Political dynamics: International tensions, a shifting EU direction, and national decisions shape energy policy. Economic factors: Energy prices, subsidies, taxes, and raw material trade influence feasibility and earning potential. Industrial activity: decisions of the preservation or possible relocation of large industry has a major impact on the energy demand. Social support: Success of the energy transition depends on behavioural change, fair cost distribution, and shared responsibility among citizens,businesses, and governments. Technological uncertainty: The pace and scalability of innovations like hydrogen, storage, and carbon capture are uncertain but crucial. Climate and environmental acceptance: Public acceptance of impactful solutions (e.g., onshore wind, CO_2 storage) is key to progress. Policy consistency: Clear regulations and reliable permitting processes are essential for large-scale project success.

	Key uncertainties in dataset for TYNDP/SB 2026
PL	We see the following risks: 1. The scope and speed of technological change 2. The progress rate of electrification 3. Access to financing 4. Availability and price of the primary energy sources 5. Prices of new technologies 6. Availability of facilities 7. It is difficult to predict how the hydrogen sector will develop in the long-term horizon (e.g. 2040, 2050), including hydrogen network.
PT	N/A
RO	Demand evolution. Commissioning of new units.
RS	
SE	The uncertainty mainly has to do with how much the electricity demand will be. Sweden is undergoing an electrification of our industry sector and final demand will be dependent on weather projects will be realised or not.
SI	
SK	Because of the ENTSO-E/ENTSOG fallback solution dataset (an average DA and GA scenario of the TYNDP 2024) was used, it is not possible to assess main drivers of uncertainty and main risk factors properly.
TR	
UA	The warfare situation.

ANNEX II: INNOVATION ROADMAP IMPLEMENTATION IN 2026 SCENARIOS CYCLE //

Innovation Number	Innovation	How the innovation was or wasn't implemented in 2026 cycle/where to find evidence	Was prioritised to be reviewed in 2026 cycle (Innovation Roadmap chapter 10)
Toolchain innovations			
	Visualisation Platform	Added time was set aside for proofreading and data cleaning, to ensure the platform is free from spelling mistakes and other errors so as to not detract from the results. Along with clear unit display, EU27 aggregation is also included for every chart, giving users the option to filter the dashboard by EU membership or at country level. These measures address specific SRG feedback received last cycle and are part of a process to ensure greater transparency and tailoring of the visualisation platform for users.	
	Data interfaces	This cycle required targeted interface innovations to avoid double counting of energy flows across tools, particularly for hybrid heat pumps (HHPs) and electric vehicles (EVs). HHP modelling was refined through increased disaggregation, ensuring consistent allocation of energy carriers across operating modes. For EVs, structured mappings were developed to translate ETM output templates into PLEXOS® input formats, preserving behavioural assumptions while maintaining internal model consistency.	
	Documentation	To strengthen transparency and methodological robustness, structured documentation tables were developed for the economic variants exercise and the gap filling methodology and shared with the SRG. For the variants, country specific tabs allowed users to explore parameter choices and resulting variations, complemented by dedicated tables capturing lower level methodological nuances. These documentation tools were not static annexes: they were actively used as discussion instruments during dedicated workshops and webinars, enabling iterative refinement.	
Innovations on the ETM			
5.1	Dashboard	A new energy balance template (based on Eurostat's methodology) was integrated in the Dashboard. This feature allows users to easily compare final energy consumptions in their ETM scenarios with future targets. Eurostat's EU27 2023 values were integrated in the dashboard.	Upgrading Scenario Modelling Tools: developing web-based interfaces for transparent scenario sharing in data visualisation.
5.2	Improvements of reference values	New reference scenarios based on 2023 data were not yet available in ETM. The official reference year on ETM remains 2019. The results of the demand scenarios developed by TSOs on ETM were re-organised based on Eurostat's energy balance methodology on the Dashboard and compared with 2023 values from Eurostat.	
5.3	Addition of climate year functionality	ETM's climate year functionalities were not used for this cycle but an own methodology was developed instead. In our tool chain ETM yearly values are interpreted as averaged weather year demand figures. Downstream tools (like DFT) take into account weather variability when creating hourly time series. Here climate change was considered (see 9.2).	Improving climate assumptions in modelling.
5.4	Addition of countries to ETM	Reference scenarios for new countries such as Serbia and Norway were built. GB and NI split was implemented. For this cycle ETM was only used by one non-EU country: Switzerland.	Non-EU countries like Norway and Switzerland by 2026.

Innovation Number	Innovation	How the innovation was or wasn't implemented in 2026 cycle/where to find evidence	Was prioritised to be reviewed in 2026 cycle (Innovation Roadmap chapter 10)
5.5	Stable ETM server for 2026 cycle	A dedicated server was used for TYNDP 2026. All ETM scenarios for TYNDP 2026 were developed and saved in the stable server. This ensured that the version of the model remained consistent throughout the scenario cycle.	Developing web-based interfaces for transparent scenario sharing in data visualisation.
5.6	Integration of supply tool features in ETM	For TYNDP 2026, only the "Demand" tab of ETM was used. Supply-side values like domestic production of alternative fuels were collected and analysed using other tools.	Developing web-based interfaces for transparent scenario sharing in data visualisation.
5.7	Demand profile modelling in ETM	Annual demand values were collected from ETM. Such annual values were then converted into hourly profiles using other tools like DFT.	
Transition to pan-European market modelling database (PEMMDB) app			
	Transition to PEMMDB app	The PEMMDB app recollects the relevant data from the different electricity TSOs. This data encompasses installed capacities, the PECD zones where the supply capacities are located, commissioning and decommissioning dates per supplying source. Since this data is provided in a disaggregated format, it then needs to be converted to an aggregated per bidding zone format to be fed into the model. The files can be consulted in the input data for download on the 2026 Scenarios website.	
Quality control innovations			
	Quality control innovations	In this cycle, a dedicated effort was undertaken to systematically map the most relevant data pipelines across the full Scenarios process. This mapping exercise enabled a clearer identification of critical data dependencies and high impact subsystems, improving transparency and traceability along the entire modelling chain. Building on this, a transversal Quality Control Task Force was formally established in mid2025. The Task Force brought together representatives from all main scenario subteams (demand, supply, toolchain and market modelling), enabling a coordinated, end-to-end approach to data quality management. Regular cross-team interactions allowed early detection of inconsistencies, improved alignment across tools and datasets, and reduced reliance on late-stage manual checks. Together, these initiatives marked a shift from isolated, team-specific quality checks towards a more integrated and process-oriented quality control framework, resulting in more robust data handling and more efficient ways of working.	
System modelling innovations			
8.1	Hydrogen storage	Operation of hydrogen storages has been improved by a better representation of system flexibility offered by other hydrogen infrastructure and supply sources. An improved parametrisation of storage facilities. Continuous assessment whether the modeling of other flexibility sources is in accordance with reality. @(i): Cross-border flow fluctuations are slightly constrained to better reflect local hydrogen storage needs. Furthermore the flexibility in hydrogen import flows (piped and shipped) are severely constrained to better reflect take-or-pay behaviour in this emerging market. @(ii) Parametrisation of storage behaviour (IN, OUT, Working Gas Volume) has been improved, and differentiation between different storage types (seasonal, short term) has been analysed, though the latter has not yet been implemented in the model.	Differentiating short-term and seasonal needs for storage and flexibility.
8.2	Integration of hybrid heat pumps	The behaviour in the last cycle, where only electricity was used in hybrid heat pumps, was solved in this cycle by finetuning input data, resulting in the use of both electricity and hydrogen or electricity and natural gas depending on the type of hybrid heat pump.	
8.3	Grid topology	The hydrogen grid topology has been improved in some aspects but the system wide granularity of the hydrogen system has not been revised. To better account for the physical hydrogen flow constraints , ramp rates are incorporated into the IC flow modelling. This enables more accurate simulations of hydrogen flow dynamics.	Flow speed in pipelines and cross-border flows.

Innovation Number	Innovation	How the innovation was or wasn't implemented in 2026 cycle/where to find evidence	Was prioritised to be reviewed in 2026 cycle (Innovation Roadmap chapter 10)
8.4	Gas turbine usage and peaking unit utilisation	The Gas turbine usage and peaking units utilisation, is monitored explicitly by the Full Load Hours FLH [h] as one of the KPI included in the KPI Dashboard (see also Quality control innovations and Toolchain innovations above)	
8.5	EV modelling	Compared with the TYNDP 2024 cycle, EV passenger car modelling in TYNDP 2026 was revised through a PLEXOS®-native implementation that resolves a previously identified battery bypass issue, where part of EV driving demand was met directly from the grid instead of through the battery. The updated setup also introduced a more detailed EV fleet structure, retaining the street/prosumer split but adding fixed charging profiles and a separation between commuter and non-commuter fleets to reduce the overestimation of charging flexibility observed in the earlier approach. In contrast to TYNDP 2024, the new formulation explicitly represents additional flexibility drivers such as updated driving profiles, fixed charging shares, and charger-to-vehicle ratios. Evidence for these changes is provided in the TYNDP 2026 EV modelling documentation and methodology material.	Simulating accurate charging and discharging patterns accurately by 2026, Grid flexibility.
8.6	Economic assessment	A simplified method was developed using the concept of "periodic payment" (PMT) and Annuity. However, it was finally decided that an economic assessment was out of scope within the performed simulations of this cycle. In any case the Full Load Hours FLH [h] and Electricity and Hydrogen Price (EUR/MWh_el & EUR/MWh_h_2) , as part of the KPI Dashboard, allow to easily compute revenues together with the merit order - marginal costs of each technology modelled and would easily allow to assess the annuity of assets once these are compared with other economic inputs like CAPEX and FOM, WACC, hurdle rates.	
8.7	Methane pricing structure and formation	The production of synthetic gases (SNG) is now subject to the marginal domestic hydrogen production cost. SNG import pricing has been determined following a marginal cost approach that includes the entire value chain required for producing and importing SNG.	
8.8	Ammonia import costs	The full supply chain for ammonia imports has been considered for calculating the marginal cost of producing, shipping, importing and conversion (to hydrogen) of ammonia (section 5.7 of TYNDP 2026 Scenarios Methodology Report). A split has been made between concrete projects which, when executed, are expected to be based on take-or-pay contracts (low marginal costs) and future ambitions, for which no take-or-pay contracts can be assumed (high marginal costs). Please note that shipped ammonia imports are used as proxy for all hydrogen carriers (mains: LOHC, LH_2, Ammonia)	
8.9	Distinction in hydrogen usage	Hydrogen demand for synfuel is being calculated considering the feedstock need for their production processes. However, methodologies used for synfuel imports vs domestic production still differ especially due to the difficulty faced when modelling hydrogen production dynamics in exporting countries. The model considers the domestic production potential of synfuel, hydrogen prices and the availability of biogenic CO_2. Hence, hydrogen consumption for domestic production of synfuels is an output of the model.	
8.10	Flexibility of heat pumps	Focus on this innovation was out of scope for the 2026 cycle timeframe due to schedule constraints and the prioritisation of core scenario deliverables.	
8.11	Modelling of E-fuels	The model still assumes that e-fuels produced within the European Union can be transported freely across Single Market to meet domestic demand. Domestic production competes with imports to meet domestic demand. However, since reported domestic production capacities are lower than domestic demand for e-fuels a significant share of supply will need to be imported. Furthermore, domestic production is constrained by the availability of biogenic CO_2 as well as the stated production capacity limits per country.	
8.12	Higher granularity topology	The higher granularity of the electricity modelling is outside of the scope of the scenario modelling exercise. Such higher granularity it is considered later within the electricity TYNDP in the so called "Identification of System Needs" (IoSN) phase.	
8.13	Improved modelling for prosumer demand	Besides improved passenger EV modelling for prosumers (see EV modelling) modelling of PV and battery capacities behind the meter was implemented for several countries.	

Innovation Number	Innovation	How the innovation was or wasn't implemented in 2026 cycle/where to find evidence	Was prioritised to be reviewed in 2026 cycle (Innovation Roadmap chapter 10)
8.14	Consider peaking units as expansion candidates	No expansion has been considered in this cycle. Therefore, no technology (thus also no peaking units) has been considered as expansion candidates in this cycle. Still a SoS loop is performed after the main simulations to ensure the adequacy of the scenarios. The capacity added in the SoS loop is assumed 100% available and technology agnostic (i.e. no specific choice of technology is made when adding 'virtual capacity' during the SoS loop)	
8.15	Check on Remaining CO_2 emission in 2050	The Carbon budget reported in section 10.3 of the TYNDP 2026 Draft Scenarios Report is investigating if emission reduction is on track in 2050. In this cycle the budget is done ex post the modelling for all scenarios. This process could be improved as described so the model is considering the budget and targets when running. But this has not been implemented in this cycle.	
8.16	Implementation of hybrid electrolyser plants	Hybrid electrolyser plants have been successfully implemented as shared RES electrolyser into the model during the TYNDP 2026 cycle	
8.17	Hydrogen imports and pipeline assessments	A revised hydrogen pipeline import methodology reflecting the seasonal availability of renewable hydrogen production in exporting countries has been implemented (section 5.7 of TYNDP 2026 Scenarios Methodology Report).	
8.18	Geographical correlation in hydrogen production	The scenario results are not contradicting the stipulations of the Delegated Acts regarding geographic correlation of renewable electricity generation and hydrogen production. Hydrogen producer specific compliance cannot be captured by the modelling framework used for the scenarios since optimization models that minimise total system costs assume a system optimal behaviour of electricity generators and hydrogen producers.	
Stakeholder Reference Group and other stakeholders' proposals			
9.1	Synthetic fuels	Methanol was considered as being modelled as shipping fuels. However, for simplicity ammonia was used as a proxy representing all synthetic fuel demand for the shipping industry. Methanol might be part of the demand since the demand is only referred to as liquid.	
9.2	Climatic variability	The key innovations implemented: 1. Shift to PECDv4.2 (new database). The 2026 cycle explicitly adopts the updated Pan-European Climate Database (PECDv4.2), replacing the older PECD dataset used in TYNDP 2024. 2. Climate change-aware future weather scenarios. The most significant methodological leap: Instead of selecting historical years to represent the future, TYNDP 2026 selects weather scenarios for specific target years (2030, 2035, 2040, 2050) that explicitly account for climate change trends. This moves from a retrospective to a prospective framing. 3. Improved clustering algorithm: The methodology has changed the use of K-medoids to K-means clustering for greater representativeness. The new methodology used Cooling Degree Days and Heating Degree days as proxy for the demand variability metrics, this allowed to select weather scenarios required for the process early in time, before the demand profiles are generated using Demand Forecasting Tool. Also, Principle Component Analysis has been used within the new methodology, which allowed to use more variables for the selections, while decreasing the computational burden. 4. Multi-target-year specific selection. Whereas within the 2024 cycle selected 3 climatic years selected were applicable across time horizons, TYNDP 2026 performs target-year-specific selection (separate sets for 2030, 2035, 2040, 2050), better reflecting the different climate and system conditions at each horizon.	Improving climate assumptions in modelling.
9.3	Industrial applications	The National Trends scenario (NT+) reflects national plans on the industrial transformations required to meet 2030 targets and long-term climate goals. In general, industrial transformations are not part of the modelling exercise. One of the exceptions is synfuel production, since it is coupling hydrogen with final demand for hydrocarbons. The model defines the operational levels of domestic production required to meet the targets and its competitiveness to alternative supply routes. Hence, considering the transformation needs for this sector.	

Innovation Number	Innovation	How the innovation was or wasn't implemented in 2026 cycle/where to find evidence	Was prioritised to be reviewed in 2026 cycle (Innovation Roadmap chapter 10)
9.4	Sector-specific modelling	Sector coupling is implemented in the hydrogen and e modelling, explicit modelling of hybrid heat pumps as well as transport modelling of passenger EVs. The hydrogen system's split into Z1 and Z2 does not represent an explicit sectoral split. Instead, it serves to isolate grey hydrogen in Zone 1, to ensure that the Zone 2 hydrogen market contains only low-carbon hydrogen (green, blue). However, it is assumed that grey hydrogen is used primarily in industrial clusters.	
9.5	EV modelling techniques	A taskforce was installed to assess the passenger EV modelling. For details see 8.5.	
9.6	District heating	In the 2026 cycle district heating technologies and efficiencies was collected from the TSOs in the 2nd data collection. However, setting up a dedicated tool and working group was considered out of scope in this cycle.	
9.7	Liquefied hydrogen	For most import projects and future ambitions it is not yet clear in what form hydrogen will be imported. Main candidates are ammonia, LH_2, or LOHC, as also specified in Ten Year Network Development Plan, Annex A, please refer to column N. Based on these input data no clear split could be made between these carriers. Therefor only Ammonia has been modelled, but with the understanding that Ammonia is representing all possible carriers.	
9.8	Hydrogen import quotas	An hydrogen import quota is only specified for the year 2030 by RePOWER EU. Despite the improvement of hydrogen import methodologies (section 5.7 of TYNDP 2026 Scenarios Methodology Report/innovations 8.8 and 8.17), for modelling technical reasons the import of hydrogen in 2030 was limited to ~27% compared to ~73% renewable hydrogen produced in the EU, thus not achieving the 50/50 split as specified in RePOWER EU. This was basically due to an oversupply of (renewable) energy compared to demand.	
9.9	Electric heat pumps	Hybrid heat pumps are modelled in PLEXOS®, electric heat pumps not.	
9.10	Optimisation across energy sectors	Hydrogen, electricity and hybrid heat pumps are modelled in PLEXOS® and allow for sector coupling.	
9.11	Transmission system losses	An update/check of the statistics related to transmission losses has been performed during the data collection & data quality process within this cycle.	
9.12	Additional hydrogen production pathways	Pyrolysis was the only hydrogen production pathway added in the 2026 cycle since data for expected capacities was reported by 2 countries. No other additional hydrogen production pathway has been reported for any of the countries covered by the scenarios. The maturity of other hydrogen production technologies seems not far enough to be considered by the TSOs.	
9.13	Flexibility in modelling	The modelling of flexibility is continuously revised within each cycle. Regarding the electricity market, the modelling was improved /refined, when possible, between the different end-use technologies and for modelling demand-side flexibility. Flexibility from electric vehicles, heat pumps, electric boilers, residential batteries and other electrified end uses is considered based on technology-specific characteristics such as load profiles, charging or thermal storage possibilities and constraints, and aggregation potentials. These improvements aim to reflect as realistic as possible how various technologies can provide short-term and medium-term flexibility. The modelling strikes a balance between optimistic and conservative assumptions regarding flexibility. Eg a new data collection was launched to revise the assumptions regarding i) split of Passenger EVs between home and street charging; ii) Home and street charging EVs are split into fixed and flexible EVs; iii) Flexible Charging EVs are split into V2G and non-V2G EVs. For some countries prosumer nodes a battery dispatch calculation was performed before the PLEXOS® modelling to optimize the behavior of batteries (and PV) behind the meter. On the hydrogen side, the ability of different supply, demand and infrastructure resources to offer flexibility has been reviewed and adjusted. The flexibility of ICs, non-EU import infrastructure, SMR and synfuel production has been reduced to better reflect technical and operational limits.	

Innovation Number	Innovation	How the innovation was or wasn't implemented in 2026 cycle/where to find evidence	Was prioritised to be reviewed in 2026 cycle (Innovation Roadmap chapter 10)
9.14	Price setting for hydrogen	For Imported hydrogen (both piped and shipped), two different marginal costs bands are used. Concrete projects in an emerging market will only be economic feasible when an underlying take-or-pay contract is in place. Therefore, the Long Term Contract (LTC) band has been defined, characterised in a dispatch model by a low marginal cost (due to the take-or-pay character) and relatively low flexibility in production. Additional to LTC contracts, import infrastructure will be designed to cope with additional, more flexible, supplies. These supplies are modeled with high marginal costs, covering full production and transportation costs. In case of ammonia imports, all additional import potentials that cannot be imported by currently reported terminal capacities are included with the high marginal costs in the SOS runs. For hydrogen produced in the marginal hydrogen production costs are being considered. In case of electrolysers, these costs include at least water and operational costs. If connected to the e-market node, also the corresponding marginal electricity costs are considered. The marginal hydrogen cost to meet demand is determined for each hour of the year considering all available hydrogen sources available to each of the domestic hydrogen nodes. Marginal cost differences across countries and regions are the caused by limitations of IC capacities and their operational characteristics.	
9.15	Sensitivity to commodity prices	A sensitivity exercise regarding commodity prices would have a limited reach due to the nature of the assumptions made in the model. For the Economic Variants preparation, a sensitivity on the commodity prices was performed using a range of +/-10 %. In this sensitivity only a minor change in the merit order happened, making the "lignite new" units 0.1 EUR/MWh more expensive than the "Gas OCGT new" ones. This reflects the expected behaviour of the possible sensitivities: the merit order for the thermal generation units will change depending on the specific emissions factor and the commodity prices.	
9.16	Inclusion of emerging technologies	Focus on this innovation was out of scope for the 2026 cycle timeframe due to schedule constraints and the prioritisation of core scenario deliverables.	
9.17 a	Out of scope innovation: Carbon capture and utilisation	CCS and CCUS has in this scenario cycle been collected from TSOs an added ex post to the carbon budget. Including these technologies in the model would require a lot of work and are considered out of scope in this cycle. The electricity consumption of CCS facilities not attached to power plants was collected in a 2nd data collection. CCS energy consumption in power plants is considered in the PLEXOS® model via the power plants efficiencies.	
9.17 b	Out of scope innovation: Innovative grid technologies	The scenario models use net transfer capacities (NTCs) to represent the bottlenecks of the electric grid and do not consider static or dynamic grid modelling. Thus, Dynamic Line Rating and Power Flow Control are out of scope of this exercise.	

ANNEX III: ADDRESSING ACER'S FRAMEWORK GUIDELINES //

Timely scenario preparation process

Recital	Criteria	How the criteria are met / where to find evidence
(16)	Biennial publication frequency	This criteria has been achieved.
(17)	Scenario timing is not fixed, but TEN-E regulation implies a six-month review and six-month reporting cycle.	For information only - no actions required for this recital.
(18)	Scenario expected to be delivered by the end of odd-numbered years with scrutiny period for member states, Commission and ACER of six months.	In the case of TYNDP 2026 scenarios, the delivery occurred later than planned. This delay was driven by justified process and methodology considerations. These steps were necessary to ensure consistency, robustness and alignment with the ACER Framework Guidelines. Despite the adjusted timeline, the process preserves the principles of transparency underpinning the TYNDP.
(19)	Identify and propose, together with SRG, a cut-off date until when adopted energy and climate policies should be taken into account by ENTSOs, agreed with Commission and ACER.	The cut-off date was set to 24 December 2024 and communicated to the SRG on the 14 October 2024.
(20)	Draft National Energy and Climate Plans (NECPs), taken into account in the scenario preparation to the extent possible.	The most up-to-date data available reflecting the latest updated National Energy and Climate Plans (NECPs) or more recent National development plans with a cut-off date of 24 December 2024.
(21)	Storylines process separated and preceding the scenario preparation process, remaining applicable for more editions of the TYNDP scenarios, without restricting possibility for storylines to evolve.	For TYNDP 2026 scenario cycle National Trend + (NT+) was approved to be modelled as central scenario, thus following NT+'s storyline. Evolution of storylines did not apply. For TYNDP 2026 2 variants were developed, a high and low economic variant.
(22)	Prepare living roadmap document, detailing planned changes and larger innovations to be implemented for newly started and future scenarios cycles; invite feedback from stakeholders.	Innovation Roadmap published in February 2025 and implementation in 2026 cycle summarised in Scenarios Report chapter. Updated in a second edition before start of 2028 development cycle. For first edition, SRG provided potential innovation to be included in roadmap. Feedback on first published edition was provided via public consultations period June-July 2025. The innovation Roadmap is a living ever evolving document

Robust objective-driven scenarios

A Central Scenario – a best-estimate projection aligned with Member States' National Energy and Climate Plans as well as the EU's 2030 and 2050 climate and energy targets – was developed. This scenario, typically represented by National Trends+, reflects the most recent climate policy and market evolution based on adopted targets. In addition to the Central Scenario, the Economic Variants to test the Central Scenario's robustness under different future conditions were developed. These variants explore contrasting pathways such as differing levels of electrification or hydrogen uptake to ensure uncertainty is properly captured across the Scenario set.

Throughout the scenario development, methodological transparency, documenting all assumptions, data sources, and modelling tools in a clear and accessible manner were ensured.

Complementing this, the requirement for data transparency by publishing input datasets and assumptions in machine-readable formats, enabling external validation and stakeholder analysis were met. Both methodological construction and data were published on the ENTSOs' joint TYNDP 2026 Scenarios website[2].

In the 2026 Scenario development process ENTSOs followed the principles of stability, agility and comparability as defined in the FG to achieve requested level of scenario robustness. This was done by building on the NT+ storyline from the previous cycles. The Distributed Energy storyline and Global Ambition storyline was not used in this cycle. ENTSOs focused on the contrasting "low" economy and "high" economy variants for the 2035- and 2040-time horizons. To secure the agility of the Scenario, the latest relevant policy of the respective member state was taken into consideration in case that by the cut- off date was in available than the latest NECP.

Recital	Criteria	How the criteria are met/where to find evidence
(23)	Scenarios shall comply with European Union's 2030 targets for energy and climate and 2050 climate neutrality objective and any adopted updates of EU's concerned policies. Scenarios shall also consider NECPs and shall consider latest European Commission scenarios.	NT+ is NECP-based scenario, whereas gap between sum of EU 27 NECPs (and data collected) and EC targets, was closed utilising gap filling methodology. 2050 climate neutrality objective as centre point in NT+. A benchmark is done against the EC scenario.
(24)	Details how specific assumptions are included in each time horizons.	For more details see Scenario Methodology report chapters covering the topics: EE1 on supply side, EE1 on demand side; Level of flexibility (such as DSR); Offshore wind generation; Energy storage; Sector integration, Consideration of regional differences (e.g. in technology cost efficiency of wind and solar between North and South).
(25)	Analysis how the considered EU targets are achieved, including sufficient information about GHG from the energy sector and carbon budget.	For more details see Scenario report, chapter 10 Compliance with the 2030 European energy and climate targets and carbon neutrality in 2050.
(26)	Take into account up-to-date information on observed changes in energy sector due to climate change.	Weather year concept implemented, see Scenario Methodology report, chapter 7 Weather Year Selection and Annex III. Regular robust internal data quality process implemented.
(27)	Qualitative assessment of how scenarios would be impacted by uncertainty around main selected assumptions and drivers.	For more details see Scenario report, chapter 9.3 Known limitations and interpretation context, chapter 9.2 sub-chapter Hydrogen supply variant analysis.
(28)	Stability - choice of storylines do not necessarily deviate from one TYNDP cycle to another one.	For the TYNDP 2026 cycle existing NT+ storyline was applied.
(28)	Agility - adaptation of the changes (up-to-date assumptions and data) while stability in terms of direction.	Regular robust internal data quality process implemented, for scenario framework see Scenario report, chapter 4 TYNDP 2026 Scenario Framework, Annex I.
(29)	Unexpected disruptions require fast update process to keep scenario assumptions meaningful.	For information only - no action required for this recital.
(30)	Scenarios shall build on feasible and broadly supported assumptions on energy supply and demand most probably through bottom-up of consultation and validation at national level.	Methodology bottom-up data collection; see Scenario Report, chapter 11 TSO Survey introduction and Annex I.

2 https://2026.entsos-tyndp-scenarios.eu/.

Recital	Criteria	How the criteria are met/where to find evidence
(31)	Consideration of NECP, if up to date.	Final updated NECPs, as available in May 2025, taken in. Alignment of the data collected from TSOs with the NECP in the relevant carriers, see Scenario Report chapter 11 TSO survey introduction and Annex I.
(32)	Stakeholder scrutiny of scenario inputs and assumptions.	Public consultation, SRG regular exchanges, ENTSOs-EC-ACER meetings, see Scenario report, chapter 6 How Stakeholder Engagement Shaped the Scenario, Annex V.
(33)	Stability and comparability enhanced by building the scenarios around consistent time horizons.	Target years compatible with TYNDP 2024 cycle and EU climate target years: 2030, 2035, 2040, 2050.
(34)	Stability of the scenarios across TYNDP cycles.	NT+ storyline continuously used into 2026 cycle. Central Scenario and economic variants to be applied in 2028 cycle.
(35)	Set of scenarios must be objective oriented and must cover the main uncertainties that affect network development, possible further sensitivity analysis.	Implemented, see Scenario Report, chapter 4 TYNDP 2026 Scenario Framework.
(36)	For the short-term best estimate scenario based on the NECP is prepared.	TYNDP 2026 scenario framework founded on NECP-based best estimate scenario. see Scenario Report, chapter 4 TYNDP 2026 Scenario Framework.
(37)	The set of mid-terms and long-term shall include the best estimate central scenario and contrasting "low" -economy and "high" -economy variants that serve as a stress-test of the central scenario.	TYNDP 2026 scenario framework founded on best estimate central scenario and contrasting low and high economic variants serving as stress tests to central scenario. see Scenario Report, chapter 4 TYNDP 2026 Scenario Framework.
(38)	Possible additional, balanced scenarios, including storylines confirmed by SRG, for mid-term and long-term.	Thus far, possibility of adding additional scenarios has been touched upon by ENTSOs in 2026 development cycle.
(39)	Inputs are checked for consistency both internally within scenarios and between scenarios.	Regular robust internal data quality process implemented. see Scenario Methodology report, chapter 2.3. Core principles and assumptions guiding the methodological development.
(40)	Consistency is maintained as much as possible between the TYNDP scenarios and inputs used for the ERAA.	Alignment of the data collected from TSOs with the ERAA in the relevant carriers, see Scenario Report, chapter 11 TSO Survey Introduction, Annex I.

Transparent, inclusive and streamlined development process

Recital	Criteria	How the criteria are met/where to find evidence
(41)	The development of the scenario shall follow as much as possible an open process to involve stakeholders, enabling broad participation.	Public consultation processes in June-July 2025, weekly SRG exchanges, ENTSOs-EC-ACER meetings. More in chapter 6 How stakeholder Engagement Shaped the Scenarios.
(42)	Create Stakeholder Reference Group (SRG).	SRG fully operational since autumn 2023.
(43)	SRG: Balanced representation of stakeholders in SRG, ENTSOs as observers and facilitators, ACER, European Commission, member state representatives, ESABCC as observers.	Balanced representation of stakeholders in SRG, but missing demand-side representative. ENTSOs observe and facilitate SRG activities through answerable weekly engagement, digital workspace and website hosting. ACER, European Commission, ESABCC are observers. Member state representatives not involved yet. Full members and observers list available on SRG website.
(44)	SRG: One SRG convenor to ensure non-discriminatory dialogue, manage meetings, take minutes. SRG to propose new members to ENTSOs and issue public members list.	Two elected SRG convenors and working group convenors facilitate SRG activities. Stakeholders apply for SRG member via SRG website. Timely updates of public members list.
(45)	SRG as independent body from ENTSOs.	ENTSOs respect SRG's independence and act as facilitator of SRG-decided activities.
(46)	Publish a comprehensive process timeline and stakeholder engagement plan before starting the scenario-building cycle.	Process timeline and stakeholder engagement plan published on TYNDP 2026 Scenarios website.
(47)	Requirements put on process timelines, comprehensive stakeholder engagement plan.	Implemented, see TYNDP 2026 Scenarios website.
(48)	Comprehensive recording of all stakeholder interaction in Stakeholder Engagement Plan.	Implemented, see Stakeholder Engagement Plan and stakeholder engagement timeline published on TYNDP Scenarios 2026 website.
(49)	Record of all stakeholder interactions by ENTSOs.	Available upon request.
(50)	Clear communication about the assumptions and proper documentation of the inputs, assumptions, models and scenarios.	Implemented, see Scenario Report, chapter 2 Content of the Scenarios package.
(51)	Adopt academic standards for the presentation of inputs, assumptions, models and final scenarios.	Implemented, see Scenario Report, chapter 2 Content of the Scenarios package.
(52)	ENTSOs must make available information adjusted to different stakeholder needs and capabilities, shall publish all data sets, qualitative assumptions and formal hypotheses in an appropriate and predefined format, they shall provide technical documentation of the tools and model used.	Implemented, see Scenario Report, chapter 2 Content of the Scenarios package.
(53)	ENTSOs shall benchmark their scenarios with the most relevant external scenarios by providing a comparison of key inputs and outputs for the whole scenario time frame.	Implemented, see Scenario Report, chapter 12 Benchmark.

Ensuring stakeholder scrutiny

A strong emphasis was placed on stakeholder engagement, ensuring that stakeholders, including the Stakeholder Reference Group (SRG), were involved in a structured and timely way from the earliest stages in 2024 until publication in 2026.

This engagement was supplemented with formal public consultations and workshops in 2024 and 2025, where feedback from a wider audience was gathered and responses to comments to improve the Scenarios verbally given or published in the Consultations Summary Report[3].

In parallel, the SRG fulfilled its independent advisory role. Acting separately from the ENTSOs, the SRG ensured neutrality, robustness, and transparency of the process: the group reviewed scenario assumptions, methodologies, and results and provided continuous feedback to the ENTSOs. To conclude their involvement, the SRG issues a public recommendations report within the TYNDP 2026 Report, summarising its assessment and providing guidance for future improvements.

Recital	Criteria	How the criteria are met/where to find evidence
(54)	Based on comprehensive information and prepared impartially, non-discriminatory scenario development process. Independent SRG scrutiny of inputs, assumptions and methodologies proposed by ENTSOs.	Implemented. see Scenario report, chapter 6 How Stakeholder Engagement Shaped the Scenarios.
(55)	SRG provides advice to ENTSOs covering main outcomes of discussions, reflecting majority views and minority views. Advice to be included in draft Scenario Report.	Implemented. Further information in SRG opinion. add link tosee Scenario Report, chapter 6 How Stakeholder Engagement Shaped the Scenarios.
(56)	ENTSOs seek further advice from energy and climate scientists and experts in case SRG cannot reach significant majority view.	Implemented.
(57)	SRG can request all information and documents to carry out its tasks; ENTSOs make available information without harming confidential information in line with legal requirements.	Implemented.
(58)	ENTSOs responsible for inputs, assumptions and timely submission of draft Scenario Report, not bound by advice of SRG.	Implemented.
(58)	SRG advice must be recorded and published in line with transparency requirements established in Section 4 of TYNDP Scenario Guidelines.	Implemented.

3 ENTSO-E/ENTSOG TYNDP 2026 Scenarios Consultations Summary Report, January 2026.

Establishing a quick-update process

Recital	Criteria	How the criteria are met/where to find evidence
(59)	Quick update is meant to add agility to scenario-development process if last minute changes need to be made to at least one of main scenario assumptions.	Not required in 2026 cycle as following sequential recitals' requirements were not made use of.
(60)	Sufficiently and unintended significant event must occur after cut-off date; quick-update process can be activated by European Commission or ACER, or proposal to activate by either of ENTSOs, SRG or ESABCC.	Not made use of.
(61)	Activating entity provides list of assumptions to be re-assessed by ENTSOs, answered by ENTSOs within one month from receipt of activation note.	Not made use of.
(62)	SRG review proposed amendments; within three weeks provide non-binding recommendations to ENTSOs.	Not made use of.
(63)	ENTSOs decide on scenario adaptations, taking account of SRG's recommendations; produce amended scenario(s) within three weeks after receiving non-binding SRG recommendations.	Not made use of.
(64)	Quick-update process performed on central scenario, unless time allows also adaption of its variants; clear outline of changes in Scenario report.	Not made use of.
(65)	Scenario update and process transparently explained in final Scenario Report.	Not made use of.

Implementation reporting requirement

The ENTSOs complied with ACER's requirement to submit a draft joint Scenarios Report to ACER, the European Commission, and Member States, allowing for regulatory and institutional review before the finalisation of the work.

After integrating the inputs received, the final Scenarios Report, detailing the entire scenario development process, its strengths and limitations, and recommendations for future cycles, is to be published on the joint Scenarios', ENTSO-E's and ENTSOG's websites.

Recital	Criteria	How the criteria are met/where to find evidence
(66)	ENTSOs transparently report on how scenarios and development process ensure compliance with TYNDP Scenarios Guidelines; appropriately cover all criteria in Guidelines and integrated in Scenario Report.	Criterion met via chapters 2–6.
(67)	After draft Scenario Report submission, SRG shall formulate advice on evaluation of development process and recommendations for improvements for next cycle; share advice with ACER and ENTSOs.	SRG formulated advice after draft Scenario Report submission, included in final Scenario Report, shared with ENTSOs, ACER, European Commission, member states.

Addressing ACER Opinion 05-2024

A summary of critical feedback points that were provided by ACER on the TYNDP Scenarios 2024 via ACER's Opinion 05-2024[4] and how the ENTSOs addressed ACER's critical feedback can be found in the table below, while further context is given underneath the table.

Feedback Item	Solution implemented for 2026 TYNDP Scenario cycle
Continued usage of diverging scenarios.	Not applicable for 2026 cycle, only NT+ scenario + high and low economic variants are developed.
Unbalanced set of scenarios.	Not applicable for the 2026 cycle, only NT+ scenario + high and low economic variants are developed.
Late creation of the Stakeholder Reference Group.	SRG established and has worked during whole 2026 cycle, for more detail see chapter 6 How Stakeholder Engagement Shaped the Scenarios/Annex II.
Unmet transparency standards.	Transparency requirements according to FG met, for more details see chapter 2 Content of the Scenario Package.
Significantly delayed delivery of draft TYNDP 2024 Scenarios Report.	Stil delay noted in the 2026 cycle, but impacts on ENTSOs TYNDPs deliveries mitigated.
Unclear alignment with policy targets and latest national data.	For more details on alignment of EU policy targets and latest national data See chapter 10 Compliance with 2030 European energy and climate targets and carbon neutrality in 2050.

Continued usage of diverging scenarios: In 2024, the ENTSOs used diverging scenarios such as Distributed Energy and Global Ambition instead of the required high and low economic variants, leading to non-compliance with ACER's TYNDP Scenarios Guidelines. This was mainly due to a timing misalignment between when scenario development began in mid-2022 and the adoption of the guidelines in January 2023. In the 2026 cycle, with the full application of one Central Scenario and two Economic Variants in the 2026 cycle, the ENTSOs discontinued the usage of diverging scenarios.

Unbalanced set of scenarios: In 2024, the deviation scenarios did not balance around the central scenario (NT+), as both showed higher hydrogen demand than the central case. This lack of symmetry reduced their value for stress-testing and informed decision-making. In the 2026 cycle, the variants include one scenario reflecting higher economic growth and another reflecting lower economic growth. Parameter changes are applied symmetrically across variants (e.g. +x% in one, -x% in the other) to ensure balanced comparison and interpretability.

Late creation of the Stakeholder Reference Group: In 2024, the SRG was established too late, resulting in weaker stakeholder involvement throughout scenario development. Although partly caused by timing misalignment with guideline adoption, ACER noted that a faster setup would have strengthened trust and participation. During the 2026 cycle, the SRG was fully operational and the ENTSOs and SRG collaborated on a regular basis. This allowed for an increased sharing of Scenario development information, high levels of participation, and strengthened relations between the ENTSOs and SRG.

Unmet transparency standards: In 2024, despite improvements, key transparency requirements were not fulfilled, such as detailed planning of the scenario process and stakeholder involvement. These gaps might have hindered effective engagement by stakeholders and could have limited improvements for future scenario cycles. In the 2026 cycle, the TYNDP 2026 Scenarios Timeline, Stakeholder Engagement Plan and 2026 Scenarios Stakeholder Engagement Timeline were updated several times to accurately reflect latest developments in stakeholder participation and the scenario process.

Significantly delayed delivery of draft TYNDP 2024 Scenarios Report: In May 2024, the draft report was delivered late , reducing available time for project assessments and possibly weakening the coherence between national scenarios and the TYNDP. The delays were not explained, despite having negative consequences for the overall TYNDP process. In the 2026 cycle, the delay in the TYNDP Scenarios and subsequently the TYNDP development process was ameliorated by several months. During this and all previous cycles, delays – mainly caused by input data having been inconsistent, untimely updated, incomplete or missing – have been regularly communicated between the Scenarios and TYNDP project teams to account for interdependent time regression.

Unclear alignment with policy targets and latest national data: In 2024, the latest revised NECPs were not incorporated, and the report did not clarify how this gap was addressed, raising doubts about whether scenarios reflected current policy targets. The European Scientific Advisory

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Board on Climate Change further found that the draft scenarios were not compatible with EU 2030 and 2050 climate objectives. In the 2026 cycle, the Central Scenario reflects national and EU policies: data sets were collected from TSOs, reflecting latest policy and market developments scrutinised at national level. 24 NECPs were updated to the TYNDP 2026 Scenarios set cut-off date. EU climate objectives until 2050 were incorporated by 24 December 2024.

During this process, differences between updated NECPs and national datasets were identified, mainly due to differences in the data granularity and level of details requested for collected data beyond the time horizon of the NECP. According to the European Commission's latest communication on the EU-wide assessment of the final updated NECPs (28 May 2025)[5], the latest available NECPs demonstrate that the EU is closing in on its 2030 targets comparing to the draft updated NECPs. However, some gaps between the latest available aggregated NECPs and the EU-wide targets still remain. To ensure that the Scenarios remain aligned with EU-wide targets while accommodating NECPs, a methodological approach was developed to bridge the gaps. This EU-wide "gap-filling" methodology applies a transparent and consistent approach across all Member States, ensuring neutrality and equal treatment. It formed an integral part of the consultation process, offering stakeholders the opportunity to give feedback on the approach. For more information on data alignment please consult chapter 13 TSO survey.

5 Link

ANNEX IV: ADDRESSING KEY FEEDBACK FROM THE EUROPEAN COMMISSION //

In the TYNDP 2026 scenario cycle, the ENTSOs paid due attention to incorporating key comments from the European Commission, addressing the European Commission's justification on the approval of the joint Scenarios Report for the 2024 TYNDP.

Key feedback from the European Commission has been addressed the following way:

- Further elaboration on the application of the energy efficiency first principle in building the joint scenarios would be welcome in the future:
  - The demand scenarios developed by TSOs are based on the latest national energy and climate plans and those policy documents must comply with the energy efficiency first principle. Such scenarios show an increasing trend in the application of electricity and hydrogen to meet future final energy demand. For example, the market share of heat pumps and hydrogen boilers in the residential and tertiary sectors is expected to grow over time. In addition, electricity and hydrogen grids used for TYNDP 2026 are based on the list of PCI/PMI projects. TEN-E regulation (REGULATION (EU) 2022/869) states that any project of common/mutual interest should comply with the energy efficiency first principle.
- Better planned and more timely development of the scenario report:
  - Project management devoted increased attention to meeting the desired deadline set in the ACER Framework Guidelines. The ENTSOs tried to find the appropriate balance between the requests placed on the process and results and the time required to meet these demands (for example granularity of the input data, their consistency, completeness and availability/existence, vast consultation needs, etc.). The ENTSOs adopted internal mitigation measures including information exchange between scenario and TYNDP project teams to minimise impacts of the experienced scenario development delays into TYNDP development processes.
- Streamlined data collection ensuring compliance with the NECPs and the latest national data:
  - significant improvements were reported since in this cycle the update of the NECP and data collection deadline for the purposes of the scenario development coincided in time.
- Clear and extensive explanation in the report how compliance with the framework guidelines and the requirements of the TEN-E Regulation (EU) 2022/869 is ensured:
  - Compliance with the TEN-E Regulation and ACER TYNDP Framework Guidelines have been outlined in this and previous chapters.
- Better alignment of the indicators with the Eurostat definitions allowing for easier analysis and comparison of the results, in particular regarding the renewable energy and energy efficiency indicators:
  - Demand values collected from ETM outputs were re-organised based on Eurostat's energy balance methodology. The dataset was then used to derive Final Energy Consumption in the TYNDP 2026 demand scenarios.
- Further improvements in the calculation of the estimated GHG emissions to ensure higher credibility of the results and that they are fully in line with the Union's 2030 targets for energy and climate and its 2050 climate neutrality objective:
  - Methodology for emissions from international navigation and aviation was developed.
  - Non energetic carbon emissions from industry was sourced from the NECPs and from the EU impact assessment report – to be sure all emissions from this sector is accounted for.
  - A better overview of use of CCS and CCUS and a clear relation to the production of synthetic fuels has been applied.

ANNEX V: SRG OPINION ON 2026 TEN-YEAR NETWORK DEVELOPMENT PLAN (TYNDP) SCENARIOS //

About this paper: This paper has been developed collaboratively by members of the Stakeholder Reference Group. The Group brings together a diverse range of stakeholders, united by the objective of providing timely, expert input into the development of the Ten-Year Network Development Plan (TYNDP) Scenarios.

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Disclaimer: The information contained in this Opinion does not necessarily reflect the views of individual members of the Stakeholder Reference Group or the organisations they represent. The views and recommendations set out in this document have been developed through a collective effort. References to specific projects, products or companies do not imply endorsement and should be regarded as the sharing of the best available knowledge and existing practices by members of the Stakeholder Reference Group.

STAKEHOLDER REFERENCE GROUP FOR THE TYNDP SCENARIOS

INTRODUCTION

Article 12(3) of Regulation 2022/869 (TEN-E Regulation) of 30 May 2022[1] specifies that ENTSO-E and ENTSOG "shall invite the organisations representing all relevant stakeholders, including the EU DSO entity, associations involved in electricity, gas and hydrogen markets, heating and cooling, carbon capture and storage and carbon capture and utilisation stakeholders, independent aggregators, demand-response operators, organisations involved in energy efficiency solutions, energy consumer associations, civil society representatives, to participate in the scenarios development process, in particular on key elements such as assumptions and how they are reflected in the scenarios data."

Article 12(1) of the same Regulation tasked ACER to develop Framework Guidelines on the joint TYNDP scenarios to be produced by ENTSO-E and ENTSOG. The Framework Guidelines, published in January 2023, state that the development of scenarios for the Ten-Year Network Development Plan ("TYNDP") process "shall follow as much as possible an open process to involve stakeholders, enabling a broad participation." For that to happen, the Guidelines required ENTSO-E and ENTSOG to create a Stakeholder Reference Group (SRG) within three months after the adoption of the Framework Guidelines. A call for interest targeted stakeholders listed in Article 12(3) of the TEN-E Regulation as well as other relevant organisations and independent experts.[2]

The Stakeholder Reference Group was established in autumn 2023, "with the aim of providing timely, expert input to the ENTSOs' development of scenarios in accordance with the ENTSOs' scenario development timeline."[3] The SRG has organised itself as an entity independent of the ENTSOs, and established terms of reference to guide the group's work. The SRG's tasks include, among others:

[1] REGULATION (EU) 2022/869 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 May 2022 on guidelines for trans-European energy infrastructure (May 30, 2022), available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022R0869&qid=1654587354725&from=en.
[2] ACER Framework Guidelines at para. 43.
[3] ACER, Framework Guidelines (Jan. 25, 2023) at para. 45, available at: https://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Framework_Guidelines/Framework%20Guidelines/FG_For_Joint_TYNDP_Scenarios.pdf.

- Scrutiny of inputs, assumptions and modelling methodologies
- Providing an informed and balanced view, reflecting majority and minority views
- Co-creation of stakeholder engagement plans (to be published by the ENTSOs)
- Evaluation of the scenario-development process and recommendations for improvements in the next TYNDP cycle.

To engage in these tasks in an efficient manner, the SRG has created four working groups that helped to organise the 'day-to-day' work of the SRG in the 2026 TYNDP cycle: Working Group 1, TYNDP Process Overview; Working Group 2, Demand and Transport; Working Group 3, Supply and Flexibility, and Working Group 4, Carbon Budget. In addition to their own work, the SRG has engaged with observers to the SRG, including the ENTSOs, ACER, DG ENER and the European Scientific Advisory Board for Climate Change (ESABCC).

From an operational perspective, SRG has organised itself to remain transparent, active and updated throughout the 2026 TYNDP cycle. The SRG's work has included dedicated meetings, workshops and exchanges with a thematic focus driven by the scope of the Working Groups as well as weekly SRG meetings, during which the updates on thematic-related activities and outputs as well as organisational, technical and administrative issues have been shared.

The document below provides **the SRG's advice to the ENTSOs on the 2026 TYNDP Scenarios process**, covering the main outcomes of SRG's discussions, **reflecting majority and minority views of SRG members**, as per recital of **Article (55) of ACER Framework Guidelines**. The earlier version of this document was shared out of courtesy with colleagues from the ENTSOs to make sure that the structure is understandable and messaging clear. The SRG appreciated the feedback received from the ENTSOs and reflected upon it in this advice wherever relevant, given the principle of **the SRG's independence** outlined in their terms of reference.

Furthermore, after the draft Scenario Report by the ENTSOs is published, the SRG will formulate an advice that includes a broader evaluation of the 2026 TYNDP scenarios-development process itself, and recommendations for improvements for the upcoming cycles, as per recital of **Article (67) of ACER Framework Guidelines.**

SCENARIO FRAMEWORK

The new scenario framework for TYNDP 2026, which follows ACER Scenario Guidelines, consists of one central scenario (National Trends+ or "NT+"), developed by ENTSOs based on updated National Energy and Climate Plans (NECPs), which is then complemented by two deviations, as economically induced variants. These two deviations are based on different levels for economic growth (high and low) as the main drivers of energy infrastructure development. Since the beginning of its activity, SRG was proactively requesting information and updates related to the development of the framework, and at the same time, SRG was delivering its considerations and ideas. Consequently, SRG was regularly informed about relevant developments by ENTSOs, but numerous uncertainties remained about the exact design of the framework.

National Trends+ use of the National and Energy Climate Plans (NECPs)

The central scenario (NT+) was developed based on the National and Energy Climate Plans (NECPs), and is, therefore, intended to illustrate the level of national political commitment, as a bottom-up approach. An initial challenge to relying on NECPs is that current NECPs were designed to meet 2030 targets, but not targets past 2030, and therefore most NECPs present demand and supply data only for 2030.

Another practical challenge in using the NECPs stems from the differences in and diverse quality of the NECPs. The varying data going into the central scenario raises questions about the consistency of assumptions applied across the central scenario. There is a lack of transparency and data around the national assumptions – this missing information and inconsistency exists across many sectors and assumptions, and across Member States in various ways. From the current practice, SRG finds it difficult for stakeholders or the public to assess the assumptions that TSOs applied nationally in the key demand sectors, such as buildings, industry or transport (see Section on Demand), or for other underlying parameters. This key limitation has been raised and discussed by the SRG throughout the 2026 TYNDP scenarios cycle.

Overall, it is difficult for stakeholders and the public to assess the scenarios as a result of the lack of consistency in the NECPs, and the limited transparency of the national-level assumptions and data sources deployed by the TSOs. The inconsistent data also causes limitations in assessing

how the TYNDP dispatch model implements national demand and supply capacity scenarios, and also subsequent investment, land and material needs. **SRG underscores that this issue requires dedicated attention in the next scenario cycle.**

Two deviation scenarios – high and low economic growth without storylines

In the new framework, the two deviations from the central scenario are based on the evolution of Europe's economy, as one approachable driver for policymakers and the public, and the high & low economic variants. According to the ENTSOs, the purpose of the economic variants in this cycle has been to serve as stress tests of the central scenario (as per Article 37 of the ACER Scenario Guidelines). ENTSOs have prepared these variants applying a top-down approach and as stress tests, the variants assumed a *narrow* differentiation between the central scenario and the high- and low-growth deviations – in other words, there is not a wide range that is tested in the modelling. This narrow analysis can be seen when the scenarios are translated into quantifiable indicators (see also Section on NT+ and Economic Variants Scenario Results). Implementation of the stress tests, and furthermore, prevented ENTSOs from carrying out the storylines process.

During the 2026 TYNDP cycle (mostly throughout 2024 and 2025, when the SRG participated in workshops on the modelling of economic variants), the SRG expressed reservations about the interpretation of the framework, where a central scenario and two quite conservative variants can resemble a "single scenario" approach. First, considering that the storylines process has not taken place in the 2026 cycle, stakeholders have not been able to provide input into the stories behind the scenarios or variants, a limitation that contradicted Articles 21, 28 and 38 of ACER Scenario Guidelines. Furthermore, in the previous TYNDP cycles, the two deviation scenarios called Distributed Energy and Global Ambition differentiated European pathways to climate neutrality and were thus *wider* by their nature. These deviation scenarios were accompanied and underpinned by storylines that explored greater variation in possible futures (see TYNDP 2024 Storylines Report). The absence of storylines in the top-down economic variants (or deviation scenarios), may make the TYNDP 2026 Scenarios framework less approachable or understandable to stakeholders and the public.

Second, applying economic variants stress tests and providing them as deviation scenarios, can present a reductionist view. While the economic variants could be interpreted as a story of the

future health of the economy and its linkages with the energy transition, previous analyses and studies (e.g., in Europe and beyond) suggest that economic variants are not the most important driver or uncertainty. The energy transition has an economic dimension, and it can be incorporated into a modelling exercise, but equally, there are many other types of important drivers, risks, and uncertainties for energy infrastructure.

SRG pointed out this challenge and underscored that uncertainties to the energy transition and to energy infrastructure development arrive from multiple sources, not only from economic fluctuations, as has been demonstrated by cascading crises of the 2020s, such as the pandemic and Russia's attack on Ukraine. In summer 2024, the SRG therefore collected a range of additional infrastructural drivers and key uncertainties that the SRG saw as important considerations, and shared this input with the ENTSOs. The SRG analysis identified a range of political, economic, social, technological, ecological, and cultural drivers as well as important uncertainties (including, but not limited to: resource scarcity/circularity, skills shortage, or manufacturing capacity), which could be highly relevant for Europe's energy infrastructure development and that could be potentially integrated into economic considerations. The diversity of such driving factors was reflected in the previous TYNDP cycle, when some high-level drivers were reported (see TYNDP 2024 Storylines Report), but they are not shared by the ENTSOs in the 2026 cycle, nor are any other scenario uncertainties.

Third, apart from the economic variants, a strict scenario-building timeline, combined with the introduction of a new scenario framework, has prevented ENTSOs from being able to conduct other sensitivity analyses. This limitation can be treated on the one hand as a deficiency in the TYNDP scenarios process, and on the other hand, as a lesson learned from implementation of such a specific scenario framework. It may be difficult to assess how infrastructure can be optimised without sensitivity analyses on other relevant topics.

SRG strongly recommends that storyline exercises (which also can benefit from horizon scanning, as a foresight technique), **should continue in future scenario cycles as they are an important element of scenario-building processes in general and can ensure stability across TYNDP cycles and fulfil requirements described in Articles (28), (34) and (38) of Scenario Guidelines.** The list of high-level drivers compiled by the SRG could serve as a starting point.

Communicating key data and headline figures

Communicating key data points about demand and supply, as a user-friendly dashboard, alongside information about the scenario framework, is important for the communicability of the TYNDP scenario framework for the stakeholders and for the public. This issue was already highlighted by the SRG in its feedback to the ENTSOs on the TYNDP 2024 scenarios (see especially proposals 3 and 9). The headline figures of the central scenario and the two variants are published only at the end of the TYNDP 2026 scenario cycle, once all modelling results have arrived, limiting the ability of the SRG to review this data. As a consequence, it has been challenging for the SRG to analyse the high-level picture of the scenario results. When these figures are received at the end of the cycle, it also raises some questions as to the extent to which the SRG has time to scrutinise and critically discuss these figures, and similarly, of the ability of ENTSOs then to provide necessary adjustments or changes to the framework, should issues be detected.

Benchmarking against other scenarios

The SRG also finds that clear benchmarking against other scenarios[4] needs to be improved in the TYNDP process, as per Article (53) of ACER Scenario Guidelines. This article requires the ENTSOs to "benchmark their scenarios with the most relevant external scenarios by providing a comparison of key inputs and outputs for the whole scenario time frame."

At the point in time of developing this SRG opinion, the benchmarking exercise had not been completed by the ENTSOs. As a result, it was not possible for the SRG to be fully involved in the benchmarking, demonstrating a misalignment of the benchmarking work within the larger scenario development process.

The SRG nevertheless made general observations about the benchmarking process, which it shared with the ENTSOs. First, while the Scenario Guidelines require benchmarking of both inputs and outputs, the ENTSOs have planned the benchmarking only once the TYNDP scenario results are complete, suggesting that they would be looking only at outputs. Throughout the 2026

[4] As per article (53) of ACER Scenario Guidelines.

TYNDP Scenarios process, it was not clear to the SRG whether benchmarking of inputs took place. If it did not, this deficiency can be interpreted as serious shortcoming as benchmarking should also inform the scenario development. Second, although the Scenario Guidelines recommend that the SRG could provide the list of external scenarios to be used for benchmarking[5], the SRG was informed, only at the time of finalisation of this opinion, of the scenarios that the ENTOS are planning to use for benchmarking for TYNDP 2026 scenarios: the Impact Assessment on 2040 climate targets, the EU Joint Research Centre (JRC) scenarios (December 2024), and the IRENA's Regional energy transition outlook (2025). The EU Reference scenario (2021) had not been updated by the EC for this TYNDP scenario cycle.

The SRG recommends that both ENTSOs and the EU institutions study the inputs, outputs and lessons learned from key alternative scenarios offering long-term climate and energy outlooks, produced by other recognised entities. Such recent scenario studies, with their key messages, may include (at least) the following:

- European Scientific Advisory Board for Climate Change (ESABCC)'s recommendations towards the 2040 climate target (2023-2024). ESABCC (2023) screened 1 000 scenarios, then hen filtered them into 36 scenarios to identify three types of "iconic pathways: 1) demand-side focus pathways, 2) high renewable energy pathways, and 3) mixed options pathways". The analysis also provides feasibility thresholds and guidance for infrastructure development. These thresholds address geophysical, technological as well as socio-cultural feasibility criteria, all of which have been quantified and also cited.
- In addition, an assessment of major EU and climate scenarios with a view to the 2040 milestone on climate ambition and feasibility by the négaWatt Association (2025) compares different scenarios, including TYNDP 2024 scenarios, based on their key headline indicators.
- Agora Energiewende study (2025) on a climate-neutral energy system discusses the benefits of integrated planning, demonstrating the resulting cost-savings with four scenarios. It also advocates open-source modelling across energy carriers, as a best practice.

[5] What the SRG did, while sharing an initial draft of this document.

- Other scenario studies, such as "Collaborative Low Energy Vision for the European Region" (2023) and "Paris Agreement Compatible Scenarios for Energy Infrastructure (2024)" articulate how the integration of demand-side measures helps in optimising energy supply, and in minimising land-use and spatial requirements, material use and resources, and highlight the amount of needed investment as an important consideration, owing to the financial aspects related to the energy transition.
- Climate and energy studies published in the academic realm, and updates on related developments could further strengthen alignment with science-based needs.
- Concerning the carbon budget, SRG recommends that the ENTSOs continue to benchmark against ESABCC recommendations and for future TYNDP cycles, assess latest developments on carbon budget aspects, with a view to the on-going IPCC scenarios and a new process. [6]

As noted above and in ACER's Scenario Guidelines, the benchmarking exercise is required to compare results and also highlight deviations in the scenarios. The benchmarking should therefore go beyond a mere comparison of results but should also highlight different inputs and methodological differences across the studies. Scenarios include different underlying assumptions about our society and the future energy system, and, thus inputs and results may vary significantly across different studies. Without taking a hard look at the inputs and deviations that lead to those different outcomes, the benchmarking does not accomplish its intended purpose.

SRG recommends that the ENTSOs advance an increasingly proactive scenario-building approach for enhanced comparability across tools, data and datasets used. The TYNDP scenarios, including the ones from the 2026 cycle, are an important data source not just for the TYNDP itself but more broadly. Stakeholders and experts use the data from the TYNDPs as inputs for upcoming cycles, for generating new results and to give useful guidance on where further innovations will be needed. **As a general recommendation, open data frameworks and open-source methodologies would make benchmarking and replicability easier**.

[6] *See* IPCC CCS CCU CDR Methodology report 2027 (outline has been published and a methodology report is expected).

Another issue observed by the SRG concerns the timeline of the TYNDP scenario-building process. The strict timeline constraints in the TYNDP 2026 scenario-building – in addition to constraining time for SRG review – have limited some SRG suggestions, such as requests for sensitivity analyses or more detailed assessments on demand. A lack of such analyses may pose limitations on the usability of the scenarios. If the only limitation on such analyses is a lack of time, a greater allocation of time into the scenario timeline should be investigated in the future. Further guidance will also be needed on how the TYNDP 2026 framework, with the two variants as deviations without storylines, will be used for the TYNDP 2028 scenario cycle. **For the TYNDP 2028 scenarios cycle, the SRG already recommends that the ENTSOs evaluate timeline adjustments to allow for other analyses to be conducted, also considering the open-source possibilities**.

Results on modelling the central scenario (NT+) and economic variants

The ENTSOs shared the intermediate results of the TYNDP 2026 scenarios with the SRG with request for feedback under a very constrained timeline. As a result, the SRG's review of results for this report is limited. The SRG did not have time to perform a detailed assessment of hourly outputs and focused instead on the KPI dashboard, which provided a useful high-level overview of system performance and enabled the identification of key trends and inconsistencies. Because of the complexity and magnitude of the task, combined with a short deadline, these insights have been shared with the ENTSOs as observations and not as formal SRG recommendations.

Key observations from the first iteration

The initial results revealed several important concerns across both the central scenario and the economic variants:

- **Misalignment with NECP targets**: Renewable deployment, particularly wind, appeared inconsistent with 2030 national targets in several countries (e.g., in Spain), raising questions about underlying assumptions.
- **Internal inconsistencies and plausibility issues**: Some results appeared unrealistic, including very high curtailment levels (e.g., in Ireland), implausible EV charging peaks (e.g., in Germany), and contradictory combinations of low prices, low utilisation, and high renewable shares.

- **System adequacy and reliability**: The model showed low firm capacity relative to average load, alongside sometimes low utilisation of nuclear and gas. This has raised questions on reliability and whether such assets remain "in the money." While typically outside TYNDP scope (more relevant for ERAA), it was just flagged by the SRG, though not assessed in detail.
- **Price signals**: Inconsistencies between electricity and hydrogen prices suggested unrealistic arbitrage opportunities and distorted investment signals.
- **Hydrogen and e-fuels modelling**: Limited transparency and structural inconsistencies were observed, including unclear demand drivers, missing grey hydrogen in 2030, and questionable CO_2 accounting.
- **Transparency gaps**: It was often unclear how key variables were defined (inputs vs. outputs) and how different parts of the system were linked.
- **Relevance of economic variant scenarios**: Differences across variants partly reflect modelling choices, as capacity was kept constant. This can make high-demand scenarios appear less favourable due to higher prices. Allowing supply and flexibility to vary with demand would provide more realistic outcomes and better inform investment needs.

Following the SRG's feedback, the ENTSOs made several improvements in the results shared in **the second iteration**:

- **Better transparency and usability**: Clearer data structures (including input/output distinction) and improved disaggregation enhanced the interpretability of results.
- **More consistent price signals**: Electricity and hydrogen prices followed more coherent patterns across scenarios.
- **Improved system behaviour**: Some unrealistic outcomes, including extreme price spikes and energy-not-served, were reduced, and key indicators (e.g. hydrogen demand, flexibility use) show more plausible trends.

Despite progress, several issues and challenges persisted:

- Ongoing internal inconsistencies in some countries
- Limited improvements in hydrogen and e-fuels modelling
- Continued concerns on investment signals
- Structural limitations in the design of economic variants
- Remaining gaps in transparency and system boundary definitions

The SRG welcomed the improvements, particularly in transparency and consistency. However, further work is needed to address remaining structural issues and ensure that TYNDP scenarios provide a robust and credible basis for investment and policy decisions.

PROCESS

The TYNDP Scenarios 2026 is the first full cycle of involvement with the Scenarios Stakeholder Reference Group.

Implementing SRG advice

Prior to this cycle, SRG provided recommendations on TYNDP Scenarios 2024 results in February 2024 (link). During this cycle, SRG would have expected more clarity on how their 2024 recommendations (link) were applied for the TYNDP 2026 Scenarios.

Notably, during the 2026 TYNDP Scenarios cycle the ENTSOs and the SRG created a tracking system in order to allow for regular checks and follow-up on different action points. This system has proven to be a useful tool in ensuring continuation and consistency in implementation of certain pending tasks and follow-ups. For it to fully serve its purpose, however, it requires improvements considering its efficiency, level of details and the resources needed to guarantee diligence.

In the 2026 TYNDP scenarios cycle, SRG has provided feedback mostly in two distinct ways: (1) during numerous interactions, including weekly meetings, working group meetings, thematic workshops, dedicated calls or email exchanges, commenting inputs, solutions or pending questions; and (2) and through a formal voting process that allowed the SRG to adopt topic-specific recommendations. SRG has provided advice through six distinct sets of recommendations, all available online:

1) Stakeholder Engagement Plan for the TYNDP 2026 scenarios
2) Innovation Roadmap
3) Gap Filling Methodology
4) Commodity Prices
5) Interlinked Modelling Process (ILM)
6) Enhancing Transparency in Demand Modeling

In addition, SRG reviewed questions by ENTSOs for the main public consultation of the scenario cycle on input assumptions, data, parameters and methodologies that took place in June-July 2025 (link).

Engagement of stakeholders and the SRG

On stakeholder engagement, SRG provided the ENTSOs with 8 recommendations on the 2026 cycle's Stakeholder Engagement Plan (link), which articulate the importance of process visibility and regular timeline updates that ensure high-quality stakeholder engagement.

SRG has emphasised that it is important for ENTSOs to define overall and specific aims and objectives in engaging with different stakeholder groups. Further detail should include precision on the formats of engagement and feedback collection at each step of the scenario-building. In addition, it will continue to be important to differentiate when the SRG, and when other stakeholders are involved, and for what reasons. Overall, SRG recommended to the ENTSOs to always articulate the type of stakeholder engagement: informative, consultative, co-creative or joint activity, with foreseeable timelines, and adequate time for feedback. Throughout the 2026 TYNDP cycle, SRG has witnessed substantial improvement in ENTSOs meeting these objectives, but encourages them to further develop these practices.

When ENTSOs organise workshops and other exchanges with the SRG or the wider public, SRG underscores the importance of clarity, clear definitions of aims of the meeting or the workshop, as well as applied methodology, and associated terminology, especially in moments when technical results from the modelling work are presented in multiple phases, to ensure inclusiveness and the quality of stakeholder engagement. SRG continues to encourage a diversity of views to be collected by ENTSOs through public workshops, consultations and other formats, at the key moments of each scenario cycle. Concerning the preparations to the Public Consultation in July 2025, SRG sees that it could have been challenging for stakeholders outside of the SRG to understand the premises of the questions asked in the consultation. In addition, hydrogen aspects were not incorporated into the consultation materials (see also Section on Supply, especially the paragraphs on Hydrogen).

As a sound practice, SRG appreciates that ENTSO-E and ENTSOG publish a summary report from feedback in public consultations (**and in the future, recommends similar practices** involving ENNOH). Using the 2026 Scenarios Consultation Summary Report as an example, SRG recommends including, in future consultation summary reports, how the inputs received were considered, providing further details of planned response for each individual topic consulted.

Cut-off date

The cut-off date to the TYNDP 2026 scenario-building – which concerns the inclusion of different policies, such as NECPs, into datasets to be considered in TYNDP 2026 scenarios – was set for 24 December 2024. ENTSOs informed the SRG of taking this decision, but SRG was not consulted on it, as required by Article 19 of ACER Scenario Guidelines. In 2025, the European Commission introduced a 2040 climate target, submitted to the European Parliament and the Council, to be voted by the European Parliament, which SRG expects ENTSOs to systematically incorporate into the TYNDP 2028 scenario cycle.

Furthermore, **SRG suggests a more forward-looking approach for future TYNDP scenario cycles, when it comes to considerations of upcoming policies and their implications**, which might have substantial impacts on parameters, assumptions or overall modelling architecture, such as the electrification target (foreseen in the EU Electrification Action Plan) or the implications of the Carbon Border Adjustment Mechanism (CBAM).

Overall, SRG has recommended that ENTSOs enhance how collected input informs operative work. Witnessing improvements on this, further progress is recommended to explain and specify to the SRG how its feedback has been treated.

INNOVATION ROADMAP

In the 2026 TYNDP scenarios cycle, SRG was consulted on the Innovation Roadmap and provided 12 recommendations (link). In the current TYNDP cycle, it was not clear how improvements in the Innovation Roadmap to the TYNDP Scenarios and overall improvements on the Interlinked Modelling Framework (ILM) are connected (see also the Section on ILM).

A key issue raised by the SRG was clarity over which innovations should receive priority, and why. Although SRG's feedback was partially recognised, further improvements are requested. To be precise, the status of implementation of different innovations is not clear from the Innovation Roadmap due to its current format. **SRG recommends the implementation status of each innovation to be provided, and expects a timeline of implementing innovations to be**

established, whenever possible, as per Scenario Guidelines Article (47). Transparent documentation (link) on innovations and recommendations that have not been addressed should be established.

The practice of ENTSOs that evaluated the potential to implement innovations was based on internal operational criteria, based on resources necessary for implementation and potential impact achieved. This approach seems to have limited consideration of **external criteria**. In this cycle, SRG already recommended, for example, that **advice for climate-neutrality, including from the European Scientific Advisory Board on Climate Change (ESABCC), should receive a high priority.** SRG has not progressed with recommending a comprehensive methodology on how innovations could be prioritised – an activity that can be taken up in the upcoming 2028 TYNDP cycle. Appreciating that the Innovation Roadmap (link) is intended to be a living document, annual reviews are proposed. As a basis of these reviews, SRG recommends a proactive approach and process follow ups by the ENTSOs. These reviews would transparently inform stakeholders which innovations have been considered, included from the previous cycles, or omitted. In addition, it would outline the status of each innovation and an explanation of that status. The SRG also asks ENTSOs to openly invite recommendations from a wider group of stakeholders, also outside of the SRG, and to plan for the most suitable modality to do so. The revision should also seek for potential synergies with other tasks and activities related to scenarios building.

As this analysis is an important moment in the scenario building cycle, SRG also could be involved in such assessment. SRG needs sufficient time, which will allow it to discuss and develop its advice, before ENTSOs formally adopt decisions related to selection and following implementation of specific innovations.

METHODOLOGY

The Innovation Roadmap provides a useful overview of the toolchain that is used for the 2026 TYNDP scenarios. It would be helpful if the description of this toolchain is expanded with more comprehensive information on types of inputs (exogenous) and outputs (endogenous) of the different tools, the underlying algorithms applied, the order of use (including potential iterative steps and gap filling steps), which organisation is responsible for which step, to what extent models are run based on similar techno-economic input data, etc. TSOs, for example, provide electricity and hydrogen demand data based on ETM, and electricity generation capacities data to ENTSOs for use in PLEXOS. It is unclear to what extent these inputs are also partially adapted by optimisation process in PLEXOS.

At this moment, it is difficult to obtain the full picture of the toolchain as information seems not fully complete and/or is scattered over various documents.

The TSOs have been trained to use the ETM to supply their national data. For the TYNDP Scenarios 2028 cycle, **SRG would request that the ENTSOs share their data collection template and instructions to TSOs in advance**, so that the process would be clearly understood and documented, and also that in the future, the SRG and other stakeholders would be able to comment on them. Such documentation would also improve the stakeholders' ability to comment when the ETM is used. Furthermore, SRG would like to point out the general shortcomings of the ETM – its developers claim that ETM is "open source", however, how the model works and which assumptions are taken across the different sectors is not very transparent and is hard to follow. This fact should trigger general discussion about the modelling suite applied for the TYNDP scenarios.

SRG underscores that although the TYNDP scenarios overall aim to comply with the EU energy and climate goals – and distinct topics and modelling issues have received attention – in the absence of full access to transparent documentation, it has been challenging to examine assumptions across topics. This lack of clarity makes it more difficult for stakeholders to assess where the key gaps are and where more dedicated thematic focus needs to be placed. Consequently, **improvement in the documentation of assumptions, also across all specific topics, is recommended for the next scenario cycle(s)**.

Interlinked Modelling Framework

The SRG was requested to provide feedback on the draft Interlinked Modelling (ILM) report. Although the ILM is not formally a part of the TYNDP scenario process, the SRG shared its comments[7] ahead of the ILM submission to ACER and the European Commission by the ENTSOs at the end of October 2025. The SRG members appreciated the opportunity to give feedback on the draft ILM progress report, even if the short deadline made it difficult to provide more than high-level comments, which can be found below:

- The SRG noted that clarification of terminology, in line with regulatory and framework guidelines requirements, would be a useful starting point to the report.
- More importantly, the SRG believes the goal of the ILM should remain: to move towards proper cross-sectoral integration and joint analysis across vectors.
- It would be illustrative and beneficial to discuss in the report any current limitations of the TYNDP process, and to better highlight already achieved benefits from the ILM process.
- The SRG further recommends clarifying how the ILM process or framework relates to the Innovation Roadmap for the TYNDP. It is important to avoid overlaps through better coordination, and it might be useful to integrate the two processes.
- The ILM process should include a systematic review and reuse of existing (open-source) models and frameworks already capable of cross-sectoral optimisation across multiple energy vectors.
- It would be very useful to see a comparison of ILM against current energy modelling tools, to assist in a systematic illustration of capabilities and limitations[8].

Gap-Filling Methodology

"Gap-Filling" refers to the step, within the TYNDP scenarios methodology, the purpose of which is to align the country-specific demand data collected bottom-up from TSOs with EU 2030 and 2050 goals, as specified in the ACER Scenario Framework Guidelines. Gap-Filling is primarily

[7] https://www.entsos-tyndp-scenarios.eu/wp-content/uploads/2025/10/TYNDP_2026_SRG_recommendations_on_the_ILM_161025.pdf
[8] .See also the Section on benchmarking against other scenarios.

done through demand reduction applied to certain energy carriers, namely solid fossil fuels (lignite and coal) and liquid fossil fuels (crude oil and petroleum products).

The SRG considers the potential impact of this process particularly relevant to the alignment of the TYNDP with EU decarbonisation ambitions. However, the current process of demand reduction creates a risk that Europe is underpreparing for the infrastructural requirements of the future energy system. Thus, five recommendations were delivered to the ENTSOs for the 2026 cycle.

Feedback from the SRG addressed consistency issues in the current Gap-Filling Methodology, which allows for demand destruction by not complementing reduction in Final Energy Consumption (FEC) from specific carriers and sectors with corresponding increases in substitute demand areas (such as electrification of transport). Addressing this critical element should be possible through the Energy Transition Model (ETM), a tool already employed for demand data collection. Such a methodological change, while still leaving space for transparency, could also be used to introduce a more reasonable consideration of further target years (2040 and 2050) and a fairer distribution of FEC reductions across Member States, according to the national contributions recommended by the European Commission.

The Gap Filling Methodology so far focused on the energy efficiency target. SRG points out to the need of learning whether a gap-filling step is executed or would be required for other targets such as the CO_2-targets (55% reduction in 2030, 100% reduction in 2050) and the target of reaching a minimum of renewables in the energy system. And if yes, what is the role of PLEXOS in estimating whether these targets are reached or not.

A concrete implementation of SRG recommendations would turn the Gap-Filling Methodology from a pure compliance exercise into a pre-modelling step, the outputs of which would have, as reasonably expectable, an impact on the results of the TYNDP analysis.

DEMAND

Reference Heat Demand Data in the Energy Transition Model (ETM)

Several issues were identified in the reference heat demand data used in the Energy Transition Model (ETM). The reference year used is 2019, which is relatively far off for a scenario that will be published in 2026. In addition, the data lack recent real-world heating demand profiles. These inconsistencies in the baseline heat demand figures could influence heating projections across the scenarios. ENTSOs were responsive to the concerns raised and facilitated discussions with the ETM developer, Quintel, to review the issue in detail. Due to timing constraints within the current TYNDP 2026 Scenarios cycle, the corrections identified by the SRG could not be implemented, however, ENTSOs have agreed to address them in the upcoming TYNDP cycle.

The representation of Europe's building stock also requires improvement. Current modelling insufficiently distinguishes between new/renovated and non-renovated buildings, despite their different heat demand and input energy demand profiles. This gap could affect downstream assumptions, including on heat pump performance. For example, the coefficient of performance (COP) formulas, do not differentiate efficiency below and above 7°C, and between regions, limiting the accuracy of heat pump deployment estimates. Such inaccuracies could result in an overestimation of heat pump deployment, leading to an underestimation of electricity demand for heating and the required infrastructure. Incorporating clearer building categories, distinguishing between regions (where required temperature differs), and making temperature-sensitive COP calculations based on real life performance of current heat pump models[9], are recommended for the next TYNDP 2028 scenarios cycle. If available, the draft National Building Renovation Plans (Art. 3 of the Energy Performance of Buildings Directive, EPBD, and respective guidance) could serve as a basis / bottom-up approach.

[9] Taking into account new heat pumps are more efficient than old ones and maintain high COP at below freezing temperatures.

Electric Vehicle (EV) Modelling

The electric vehicle (EV) modelling approach applied in the TYNDP 2026 cycle has insufficiently reflected the rapid evolution of electric mobility. Assumptions such as a fixed 50% share of inflexible charging, a constant 70% home / 30% street-charging split, and the treatment of fast charging only within the inflexible load do not fully capture expected developments in smart charging, vehicle-to-grid (V2G) and public charging infrastructure. Heavy-duty trucks and buses, as electrified, are included only implicitly in the electricity load, total demand is represented, but their distinct charging patterns, operational constraints, and flexibility options are not modelled. Such an approach can lead to misestimation of peak loads, undervaluation of demand-side flexibility, and distorted investment signals for generation, storage, and network capacity. ENTSOs have introduced more flexible national trajectories for EV flexibility in the 2026 cycle, while other structural refinements are planned for the updates in the upcoming 2028 TYNDP cycle.

ENTSOs have committed to revisiting several of these aspects in future updates, particularly around more granular fleet segmentation, integration of heavy-duty vehicles and improved treatment of fast and ultra-fast charging as infrastructure expands. Smart charging and ToU (Time of Use)-based optimisation are already embedded in the model structure, but further enhancements should be explored as EV penetration grows. While fleet segmentation has been addressed in the TYNDP 2026 cycle to some extent, and the integration of heavy-duty electric trucks is planned for inclusion in the TYNDP 2028 cycle, other recommendations on EV modelling have been included in the SRG's feedback to the Innovation Roadmap. Therefore, it would be efficient for all of these recommendations to be considered jointly in the 2028 TYNDP cycle, aiming at coherence and efficiency in implementation.

Additionally, ENTSOs expressed openness to collaborating with SRG on research examining alternative demand-side futures, including scenarios with lower energy demand for transport due to improved uptake of public transport, thereby decreasing the energy system cost.

Transparency of Demand Projection Assumptions

Finally, the documentation of demand assumptions and primary model inputs need to be more transparent and detailed. Other European-wide scenario exercises, such as the CLEVER

(Collaborative Low Energy Vision for the European Region) scenario by négaWatt, provide clearer explanations of input data and methodological choices (see: documentation). The SRG recognises that the demand projections in the TYNDP scenarios are supplied by national TSOs based on NECPs (National Energy and Climate Plans), which themselves are sometimes not fully quantified or documented transparently, resulting in gaps in transparency of methodology and result interpretation. Many times, TSOs might have to fill these gaps. This practice should be improved with a consistent, transparent and well documented methodology to fill the gaps.

To summarise, enhancing transparency in the TYNDP scenarios demand assumption documentation would improve usability, interpretability, and stakeholder confidence. Therefore, the SRG recommended ENTSOs the following to improve the documentation and transparency of the TYNDP demand modelling:

Recommendation 1: Each modelling step for both the reference demand and the projected demand is described and documented as comprehensively as possible, including all input data and parameter selections. All sources should be appropriately and accurately referenced.

Recommendation 2: Where feasible, assumptions and results are crosschecked against available publications and models, and the corresponding documentation is provided to ensure full transparency.

Flexibility as a bridge between supply and demand

Several flexibility potentials appear to be less explored or only partially represented in the current TYNDP Scenarios framework, notably industrial demand, electric heat pumps, and emerging loads such as data centers. Following topics seem to be the most prominent for further research:

- **Industrial demand:** A simplified level of flexibility seems to be assumed, but it is not clearly defined at sectoral or technological level.
- **Heat pumps:** contrary to fuel switching capability offered by hybrid systems, the demand-side flexibility potential from electric heat pumps is not taken into account. This could be included in the next Innovation Roadmap.

- **Data centers:** Given their expected significant growth in electricity demand, they may require specific treatment in demand modelling, including exploration of whether certain categories could provide flexibility.
- **Modelling clarity and transparency:** It is understood that flexibility potentials at the demand side are assessed at the demand level together with the demand side development. It is expected that in PLEXOS, the flexibility needs are matched with the flexibility solutions, finding a cost-effective mix of flexibility options at both the demand side and supply side (e.g., investment in and operation of storage at the supply side versus investments in oversizing at the demand side to be able to provide flexibility). It is not fully clear whether the flexibility potentials and associated costs at the demand side are implemented in PLEXOS, and compete with flexibility at the supply side. SRG is interested in learning more about this process.

SRG would welcome continuing this discussion in the 2028 TYNDP cycle to better understand and further refine the approach.

SUPPLY

Hydrogen (H2)

In the 2026 TYNDP cycle, the SRG was informed and consulted about the hydrogen supply methodologies by the ENTSOs in two areas: 1) Hydrogen Methodologies; and 2) Hydrogen import methodology, Import routes and potentials.

The former quantifies the volume of green hydrogen that can be produced from renewable sources in Europe. In the electricity market it reveals the amount of renewable energy diverted to (green) hydrogen, and consequently, the remaining renewable energy available to the grid. The hydrogen import methodology, on the other hand, models hydrogen imports based on inputs from TSOs via pipelines or ships.

Feedback on H2 Methodologies

The SRG requested substantially clearer explanations and additional detail across multiple components of the hydrogen modelling methodology presented by ENTSOs. The feedback highlighted difficulties in interpreting the 2026 typology, the need to explain the interaction between methodologies, and concerns about zone delineation, demand splits, and the underlying assumptions. Further clarification was requested on node granularity, synthetic fuel stoichiometry, Power Purchase Agreements (PPAs) versus dedicated RES categories, storage characteristics, pipeline flow constraints, price-formation logic, and electrolyser parameters.

Feedback on the H2 Import Methodology

The SRG indicated that the import methodology description was insufficient for understanding key assumptions, requesting clearer delineation between TSO-provided data and modelled results, as well as justification for the categorisation of import routes. Major concerns included the rationale for fixed versus flexible contract volumes, transparency on long-term contract assumptions, treatment of project-based import potentials, and the linkage between import modelling and intra-European topology. The SRG also questioned the pricing approach – particularly the exclusion of electricity costs – and sought explanations for cost differentials among import routes, safeguards against circular hydrogen flows, and methods for validating TSO-submitted data. Additional clarity was also requested on ammonia supply assumptions and how they influence market dynamics.

While the ENTSOs responded in some detail to the questions posed by the SRG, the hydrogen modelling methodologies included in the consultation package in July 2025 remained largely the same. This indicates that SRG's feedback was not effectively taken into account at this stage of the process. **SRG recommends that for the upcoming 2028 TYNDP cycle, these questions, needs, and improvements will be recognised and implemented by ENTSOs**, also considering that they have been included in the SRG's feedback on the Innovation Roadmap.

Commodity prices

Within the modelling exercise behind the 2026 TYNDP Scenarios, the SRG considers commodity prices, especially for fossil fuels and carbon dioxide, as key inputs.

Before a series of exchanges and consultations with the SRG, ENTSOs were proposing the IEA's "Announced Pledges Scenario" (APS) as the main source for European commodity prices projections for target years 2030 and 2040. The SRG recommended, instead, to refer to estimates presented in the European Commission's "With Additional Measures" (WAM) scenario.

First, the position of the SRG sought to guarantee higher compliance with ACER Scenario Guidelines (Article 23), which clearly indicate that the TYNDP scenarios should consider the latest Commission scenarios (whose content was not publicly available yet at the time of data collection, but had been discussed between ENTSOs and the EC).

Second, the SRG sees the EC WAM scenario data as a more loyal representation of single countries in the National Trends Scenario, due to a higher alignment to Member States' NECPs and a better incorporation of storylines, with fossil fuel prices mostly increasing from 2030 to 2040 in national outlooks, as opposed to what was shown in the IEA's APS.

Commodity prices recommendations from the SRG were openly accepted and implemented by the ENTSOs and are currently reflected on the input datasets for the TYNDP 2026 Scenarios model. More details are available in existing SRG Recommendation on Commodity Price Projections.

Other key issues

Other issues discussed by the SRG within the frame of supply-related topics, to which feedback was provided to the ENTSOs participating in the meetings, while not resulting in formal outputs:

- Biogas and biomethane production potentials in the EU Member States
- Demand-side flexibility of Electric Vehicle charging
- Demand-side flexibility offered by electric heat pumps

CARBON BUDGET

A specific working group was providing inputs on the carbon budget methodology for the TYNDP 2026 scenarios, also considering the relevant feedback from the ESABCC[10].

In the 2026 TYNDP scenarios cycle, in the context of the methodology determining the carbon budget (set to 16 Gt_$CO_{2\text{-eq}}$ in the period 2030-2050[11]), SRG's feedback focused on several aspects listed below. This feedback and recommendations were shared during dedicated meetings, e-mail exchanges and workshops, and not in a separate dedicated document that was voted upon.

SRG underlined the need to streamline definitions between Carbon Capture and Storage (CCS) and Carbon Capture and Utilisation (CCU) and Carbon Dioxide Removal (CDR) (what is captured, what is stored), clarify emission factors for solid biomass, discuss the addition of upstream emissions from fuel value chains (i.e., not only combustion), present emission avoidance through CCU without risking any double counting effect, avoiding double counting with regards to bioenergy and land use, define CCS in a way that it does not appear automatically as negative emissions or synonym to CDR.

Furthermore, SRG members pointed out that ENTSOs should ensure that quantitative values on CCU, CCS, CDR are not primarily based on gap filling methodology to reach the envisaged carbon budget, but are either directly modelled or retrieved from already existing modelling activities (e.g., Impact Assessment for the 2040 climate target). In the datasets, ENTSOs should share references where the quantification of CCU/CCS at EU, national or sectoral level is provided.

SRG recommends that the ENTSOs also introduce non-energy related emissions (i.e., industrial emissions from the ETS activities) in the carbon budget methodology, as this inclusion would allow for a better and more complete representations of the emission pool. This

[10] https://climate-advisory-board.europa.eu/reports-and-publications/towards-climate-neutral-and-resilient-energy-networks-across-europe-advice-on-draft-scenarios-under-the-eu-regulation-on-trans-european-energy-networks
[11] https://eur-lex.europa.eu/resource.html?uri=cellar:6c154426-c5a6-11ee-95d9-01aa75ed71a1.0001.02/DOC_5&format=PDF

could be addressed by providing references/statistics for quantification and projections of those emissions. Finally, **SRG suggests considering emissions from the aviation and maritime sectors**.

The SRG will also monitor to which extent the new Methodology Report[12] of the IPCC on CDR, CCS ad CCU expected in 2027 will have an impact on the estimation of the carbon budget and how this can be incorporated in the 2028 TYNDP cycle.

SUMMARY & OUTLOOK

The SRG would like to express our appreciation for the opportunity to participate in the 2026 TYNDP Scenarios process and to contribute with our knowledge and perspective throughout its development. It has been a valuable experience to observe and engage with the work as it progressed, and we commend the progress achieved. The SRG is grateful for the openness and responsiveness demonstrated by the ENTSOs throughout the process, which allowed for the building a trustworthy relationship, increased transparency and mutual understanding.

At the same time, it is important to underline that further improvements in the TYNDP process and the upcoming (and future) TYNDP cycle are necessary to ensure the effectiveness and reliability of the process going forward. Next to thematic recommendations shared in separate documents and further advice included in this opinion, we find the establishment of a clear and structured timeline essential to enable timely feedback and meaningful engagement. Without this, the quality and impact of contributions risk being diminished. In this context, it is also crucial that the high level of transparency is maintained, and in certain activities and topics even further enhanced, as highlighted throughout this text.

The SRG remains fully committed to addressing these areas and is ready to work collaboratively to strengthen both the process and its outcomes in the 2028 TYNDP cycle. We look forward to the possibility of continued and fruitful collaboration in the future, building on the positive experience reflected in this work.

[12] https://www.ipcc.ch/site/assets/uploads/2025/11/Decision-6-MR-CDR.pdf

STAKEHOLDER REFERENCE GROUP FOR THE TYNDP SCENARIOS

Stakeholder Reference Group Members*

Stakeholder category (Art. 12(3) of the TEN-E)	Entity represented	Member name
Convenors		
Other organisations	Renewables Grid Initiative	Andrzej Ceglarz
Other organisations	Ember	Elisabeth Cremona
Vice-Convenors		
Supply-side operators	WindEurope	Vasiliki Klonari
Members		
Associations involved in the electricity market	Eurelectric	Abi Afthab Olikathodi
Associations involved in the electricity market	International Hydropower Association	Brandon Marler
Associations involved in the electricity market	Energy Storage Europe	Daniel Vig
Associations involved in the gas market	Gas Infrastructure Europe (GIE)	Timo Cordeiro Gerres
Associations involved in the gas market	Eurogas, GD4S, GEODE, CEDEC	Martin Kaspar
Associations involved in the gas market	Hydrogen Europe	Isabel Alcalde
Associations involved in the gas market	European Biogas Association	Herman Dekker
Carbon capture/ storage/ utilisation	CO2 Value Europe	Anastasios Perimienis
Civil society representatives	Climate Action Network (CAN) Europe	Thomas Lewis
Civil society representatives	Bellona	Ganni Vasallo
Civil society representatives	Regulatory Assistane Project (RAP)	Zsuzsanna Pato
Energy consumers associations	IFIEC Europe	Lasse Torgersen
Organisations involved in energy efficiency solutions	International Council on Clean Transportation	Hussein Basma
Organisations involved in energy efficiency solutions	CurrENT	Christian Kjaer
EU DSO Entity	EU DSO Entity	Stephan Gross
Heating and cooling	European Heating Industry	Giuseppe Lorubio
Independent experts	Open Energy Transition	Daniel Rüdt
Independent experts	Agora Energiewende	Megan Anderson
Independent experts	TU Delft	Machteld van den Broek
Supply-side operators	EUTurbines/EUGINE	Theofilos Abraham
Supply-side operators	T&D Europe	Alexandre Oudalov
Other organisations	négaWatt	Nicolas Taillard

*At the time when this document was voted upon, i.e., 4.05.2026.

ANNEX VI: CAPACITIES FOR NON CONNECTED DANISH OFFSHORE NODES PROVIDED BY ENERGINET //

"The Analysis Assumptions for Energinet 2024", delivered by the Danish Energy Agency has been used as the basis for Energinet's submission. This is to ensure compliancy with the Danish National Energy and Climate Plan (NECP) as well as Denmark's non-binding offshore agreements.

The dataset includes a significant amount of offshore wind capacity that is dedicated to export. Thus, to be consistent with the national required database and as an agreement with any neighbour does not exist yet, related offshore generation has been included in the model without any connection to any onshore system. This inclusion was necessary to prepare the ONDP modelling, which is the step after the scenario step.

Denmark has quite some non-connected offshore capacities in the Scenarios. The non-connected offshore wind capacity amounts to 1.7 GW in 2035, increasing to 14.2 GW in 2050, with associated offshore electrolysis corresponding to 63% of the offshore wind capacity as seen in Table 1 and Table 2.

This modelling setup results in significant energy curtailment from these nodes. To avoid affecting the overall Danish statistics for curtailment and FLH this curtailment is excluded from the results. Consequently, the capacities in Table 1 and Table 2 are included in resulting figures, but with no generation nor curtailment.

Offshore electrolysis capacity in non-connected nodes (MW)				
	2030	2035	2037	2050
DKN6		1,677	1,677	1,677
DKN7			4,193	4,193
DKN8				4,193
DKN9				4,193
Total		1,677	5,870	14,256

Table 1: Wind capacity in danish non-connected offshore nodes

Offshore electrolysis capacity in non-connected nodes (MW)				
	2030	2035	2037	2050
DKN6		1,056	1,056	1,056
DKN7			2,641	2,641
DKN8				2,641
DKN9				2,641
Total		1,056	3,697	8,979

Table 2: Electrolysis capacity in danish non-connected offshore nodes

ANNEX VII: TYNDP 2026 SCENARIOS – CONTEXT FOR INTERPRETATION AND KNOWN LIMITATIONS //

Known limitations interpretation context and model disclaimer

The TYNDP 2026 Scenarios provide a consistent European wide reference framework for the assessment of long term energy system developments. As with any large scale, forward looking modelling exercise, their interpretation benefits from an understanding of certain known limitations and boundary conditions that arise from data availability, harmonised methodological choices and the modelling scope applied across countries and sectors.

From the perspective of the transmission system operators, the following aspects should be taken into account when interpreting the scenario results on national level. In the next scenario development cycle, the ENTSOs aim to further improve their modelling inputs and methodologies.

The key points and disclaimers described in the next pages are:

- Data submission scope, cut off date and late national updates
- Modelling scope and cross sector representation
- Demand modelling and load profiles
- Infrastructure representation, cross-border exchanges and trade patterns
- Operational indicators and system behaviour
- Price outcomes

Data submission scope, cut-off date and late national updates

As highlighted in Chapter 2 of the Methodology Report, the preparation of the TYNDP 2026 scenarios is supported by a coordinated data collection between ENTSO-E and ENTSOG, reflecting the increasing integration of Europe's energy system. The objective is to ensure the scenario dataset reflects the latest available updated NECPs, complemented where needed by national planning and strategies, including those of non EU countries. A cut-off date of December 24th 2024 applies, meaning only policies, plans and assumptions available before that date are used in the dataset.

In several cases, national planning information continued to evolve after the submission cut off date, particularly for long term horizons. As a result, differences may exist between scenario assumptions and more recent national planning updates, both for electricity and gas/hydrogen sector.

This affects, for instance, long term capacity assumptions in Portugal, where later updates for 2050 included additional electrolysis, Wind and Solar PV[6].

In Finland, Dedicated Renewable Energy Sources (DRES) capacity is not fully reflected in the scenario supply side capacity assumptions[7]. As a result, Finnish capacity assumptions should be interpreted as indicative.

In Malta, National Trends inputs reflect the national energy plan at the time of submission, and subsequent plan updates influence the interpretation of generation and interconnection developments.

In Belgium, assumptions for electricity and hydrogen supply and demand are based on end-2024 data and therefore differ from the validated scenarios to be used in the forthcoming federal network development plans. The assumptions for the later have been consulted upon and jointly developed within the 'Taskforce multi-energy scenarios' and followed an approval process as set in the Belgian law and royal decrees. Therefore differences in results could be observed between TYNDP scenario results and national federal network development plans results. Regarding cross-border hydrogen flows, these should therefore be interpreted as modelling outcomes rather than outlooks.

6 23,239 MW of electrolysis in 2050, with corresponding SRES capacities (Onshore 1,669 MW; Offshore 15,439 MW; Solar 21,699 MW)

7 This corresponds, under national perspectives, to off-grid electrolyser capacities of 7.5 GW in 2040 and 15 GW in 2050.

They are indicative and depend on the development of future interconnections, which realisation will depend on market conditions and risk mitigation.

In Cyprus, due to the need of consistency with NECP and cut-off date for data collection, data do not fully capture more recent developments, including the emergence of new significant electricity loads and updated assumptions regarding fuel availability and generation conditions.

In Spain, synthetic fuels and ammonia demand and production figures were submitted using a convention that leads to an overstatement of the implied hydrogen demand for synthetic fuels and hydrogen carriers[8]. The effect propagates to the hydrogen supply balance and, through increased power to gas requirements, also affects electricity dispatch outcomes. These interactions should be interpreted within the context of this data submission issue.

In Switzerland, long-term assumptions have already evolved since the policy cut-off date, particularly related to PV and Nuclear generation, batteries and demand.

In Germany, due to the legally mandated timeframe of planning products, preliminary datasets of the NDP were used and the hydrogen strategy was considered to complement scenario inputs. Due to remaining model flexibility, hydrogen demand is not fully represented, leading to demand levels differing from those projected in the national hydrogen import strategy.

In Lithuania, scenario outcomes should be interpreted under the assumption that the objectives defined in the National Energy Independence Strategy are fully achieved.

In Hungary, grid loss assumptions added to native electricity demand were lower than expected. This results in lower final electricity demand levels across scenarios and weather scenarios. Electricity demand indicators for Hungary should therefore be interpreted in that context.

In Czechia, at the time of data collection information on the capacities of hydrogen-fired power plants was not available, and therefore no data were reported. Nevertheless, newly planned gas-fired power plants are already hydrogen ready. While exact capacity figures are not yet known, co-firing methane with hydrogen shall be feasible, and electricity producers are actively preparing for its future deployment.

With regard to hydrogen, demand projections are subject to revision over time, while demand levels represented in the scenarios may differ from more recent national assessments or from those underpinning federal or national network development plans. Differences in hydrogen demand projections should therefore be interpreted in light of the timing of the data collection and the scenario consistency requirements applied across all countries.

Modelling scope and cross-sector representation

The scenario framework applies common modelling boundaries across all countries to ensure internal consistency at European level. In some cases, this implies that specific sectoral interactions are represented through simplified or aggregated approaches.

In the Scenarios 2026 modelling framework, electricity demand for electrolysis is not imposed as an ex ante input but is normally optimised endogenously when a coupled electricity–hydrogen market representation is applied.

Norway has been historically represented as a non-EU hydrogen import node and, as such, no hydrogen market or interlinked electricity–hydrogen model is applied. Power-to-gas and electrolysis are therefore not modelled for Norway, and the reported electricity demand does not include additional consumption related to hydrogen production via electrolysis, leading to a higher-than-expected positive energy balance. Electricity demand levels and system balances for Norway should be interpreted in light of this modelling boundary condition.

Demand modelling and load profiles

Demand projections and hourly load profiles are derived using harmonised methodologies. In some cases, the level of granularity required by the modelling framework differs from the level of detail available in national planning data, leading to the use of fallback or proxy approaches agreed during the process.

This is particularly relevant in Czechia, where a fallback solution was applied. Resulting annual demand levels, hourly profiles and peak demand values should therefore be interpreted in the context of the applied modelling approach rather than as direct reflections of national demand projections.

8 The impact is limited in earlier target years but increases over time, reaching +0.7 TWh in 2030, +2.7 TWh in 2035, +4.1 TWh in 2040, and +18.7 TWh in 2050.

Infrastructure representation, cross-border exchanges and trade patterns

The representation of electricity and hydrogen infrastructure in Scenarios 2026 is based on a common scenarios grid and a harmonised set of assumptions applied across all scenarios. While this approach ensures comparability at European level, it may not fully capture project specific characteristics, flexibility options or planning considerations reflected in national development processes.

The hydrogen system model used in TYNDP 2026 scenarios operates with a nodal topology, in which each country is generally represented as a single node. As a result, hydrogen flows that supply demand between two regions within the same country, but physically transit through another country, are not explicitly represented as cross-border import or export flows in the transit country. This is for example the case between two regions in Germany, where the transit through Czech Republic via the Czech H_2 Backbone West project is not explicitly represented as cross-border import or export flows in the scenario results.

Furthermore, in the hydrogen sector, the representation of demand coverage reflects the interaction between assumed demand levels and the applied modelling structure. The preference for domestic electrolytic hydrogen production over international imports is driven by the applied cost structure and system marginal price assumptions embedded in the model which may not represent national perspectives and plans of the involved Member states. Potential security of supply implications associated with the high electricity and hydrogen import levels, as well as with the limited utilisation of hydrogen import corridors, are not assessed within the scenario framework and should therefore be interpreted in the context of dedicated national adequacy and security of supply analyses.

Consequently, cross border flows, corridor utilisation and import/export patterns should be interpreted as modelling outcomes under the applied infrastructure representation, rather than as detailed infrastructure planning results or forecasts of future trade volumes. Additionally, the TYNDP 2026 scenarios modelling framework does not include a dedicated economic assessment of the utilisation of individual infrastructure projects and hence modelling results should not be interpreted as assessment of the economic viability of individual assets.

Particular attention should be given to the context and observations outlined below.

Hydrogen grid representation in the TYNDP 2026 scenarios relies on the projects included in ENTSOG's TYNDP 2024. The cross-border hydrogen pipeline between Finland and Germany has therefore been modelled as unidirectional with only export from FI to DE. However, most recent developments indicate this pipeline to operate allowing bi-directional flows. The current unidirectional operating mode included in the modelling leads to some hydrogen deficit in the region and, as a consequence, noticeably raising prices at both hydrogen and electricity sectors. As a result, the electricity price seen in the results strongly deviates from Finland's historical levels and national TSO's expectations. In any studies relying on the TYNDP scenarios data, it is recommended the cross-border hydrogen pipeline between Finland and Germany to be modelled as bidirectional, better reflecting most recent developments expected for the hydrogen grid and resulting hydrogen and electricity prices.

Hydrogen infrastructure assumptions have also evolved around Germany. For example, prospective non EU hydrogen import volumes via the United Kingdom–Germany interconnector are not represented in the scenario assumptions. As a result, potential hydrogen import flows from the UK to German are not represented in the modelling outcomes. Also, prospective offshore hydrogen connections and thus resulting flows from Denmark to Germany as well as from the Netherlands to Germany are not considered. Furthermore, the onshore hydrogen connection between Denmark and Germany are modelled as bidirectional, while this pipeline is designed solely for export towards Germany.

In Switzerland, electricity exchanges observed in the scenario results significantly exceed ranges observed in recent years reflecting the interaction between scenario assumptions, applied infrastructure representation and system wide optimisation. In regions such as the Eastern Mediterranean, selected hydrogen and electricity flow patterns resulting from the scenarios modelling do not directly represent specific national or regional infrastructure strategies.

The result of the applied modelling assumptions, showing a lower utilisation rate of hydrogen corridors in Slovakia, does not reflect national policies. This is evidenced by the Slovak National Energy and Climate Plans and related strategies, which assume hydrogen pipeline utilisation at levels allowing for positive investment decision, reflecting national planning expectations. Scenarios based on policy objectives should reflect pragmatic industrial perspectives, technological progress, system constraints, and operational realities.

In particular the scenario results for Italy indicate that electricity import levels exceed historically observed ranges (40–50 TWh), reaching about 80 TWh/year in 2040. These import levels are not only higher than historical values but also significantly higher than those envisaged in previous national scenarios provided by government, national TSOs and other national entities. Such a high level of imports cannot be utilized as reference to assess the adequacy of the Italian energy system.

Considering a gas thermal fleet of about 50 GW, their current average efficiency and a load factor of 20%, translates into an annual natural gas consumption for the power sector of around 190 TWh (20 Bcm/year equivalent to around 110 Mm^3/d) coherent with an import level as historically observed. This level of gas demand for the power sector is part of total gases demand (natural gas, biomethane and hydrogen). Considering stable the gas demand in other sectors the total volume reaches approximately 660 TWh in the scenario time horizon (with an estimate variation of 10% relate to climate and renewables variation or contingencies). This volume represents the value to be considered for the purpose of addressing Italian gas infrastructure needs.

In addition, the recent trends are showing a delay in hydrogen and biomethane developments. As consequence in case more realistic green gases developments are considered, natural gas demand values should be revised in the light of mentioned 660 TWh (until around 60 Bcm/year at 2040). In the light of these considerations, the Scenarios Report alone cannot be used for the purpose of addressing Italian gas infrastructure needs.

Operational indicators and system behaviour

Operational results such as dispatch patterns, full load hours, utilisation of generation technologies, storage behaviour and curtailment levels are outcomes of the applied scenario assumptions and the system wide optimisation implemented in the modelling framework. These indicators reflect interactions between demand, supply, infrastructure and flexibility under the given scenario settings and should be interpreted accordingly.

In Ireland, relatively high levels of renewable energy curtailment are observed in some cases. This reflects the combination of very high offshore wind capacity assumptions aligned with long term policy ambitions and limited demand growth or interconnection capacity within the scenario configurations. Curtailment levels for Ireland should therefore be interpreted in the context of the applied scenario assumptions and system representation. In Norway, hydropower production patterns in the Scenarios differ from national expectations due to inflow representations and European-wide optimisation, being significantly higher than historical values. Consequently, Norway's energy balance is more positive than anticipated. In Austria, run of river inflow representations result in lower peak production outcomes than those suggested by historical observations. In France and Czechia, nuclear utilisation reflects modelling assumptions related to outages and modulation and may differ from national operating practices; in particular, the high modulation observed is largely driven by the Linear Programming formulation, which does not include on-off constraints - such as ramp rates or minimum up/down times – that are relevant for realistic nuclear operation.

In addition, wind capacity factor indicators for some countries are higher than values suggested by national assessments. Such outcomes reflect the applied weather years and modelling assumptions and should be interpreted as scenario outcomes rather than as technology specific performance expectations. Thermal generation utilisation reflects aggregated representation and system optimisation. This is particularly relevant in Czechia and Slovakia, where aggregated thermal generation categories are dispatched according to market conditions and may exhibit lower utilisation than implied by national planning assumptions. Italian gas demand levels in the scenarios are lower than national estimates across several end use sectors, notably in power and thermal generation. These assumptions should be interpreted in the context of the scenario framework and do not represent a national demand outlook. These assumptions, moreover, should be assessed in the light of energy system resilience and avoiding risk of underestimating future system needs.

Low full load hour indicators for hydrogen fired power plants, SMR or pyrolysis units reflect modelling outcomes under the applied assumptions within the scenario framework. Such utilisation indicators should be interpreted considering modelling specifics rather than as indicative of long term operational strategies. Storage operation, including limited differentiation between short cycle and seasonal storage patterns, also emerges from system-level optimisation and should be interpreted accordingly. This is particularly relevant for the Netherlands.

Price outcomes

Electricity and hydrogen price levels and regional differentials emerging from the scenarios reflect the interaction of assumptions across sectors, technologies and infrastructures under common boundary conditions. Price results are scenario dependent and are intended to support comparative analysis across scenarios and variants: in particular, electricity prices in 2040 are noticeably higher than in the other target years, especially in Central European and Nordic countries. This outcome is primarily driven by significantly lower wind generation profiles in the weather years used for 2040 compared to those adopted for the other target years.

ANNEX VIII: QUESTIONNAIRE FOR THE SURVEY ON TYNDP 2026 SCENARIOS //

Overview

This survey supports the development of the TYNDP 2026 Scenarios and ERAA 2025 and aims to ensure transparency, consistency, and regulatory compliance in the data collection process. It is jointly conducted in the context of the ERAA 2025 and TYNDP 2026 scenario-building exercises led by ENTSO-E and ENTSOG.

The responses collected through this survey will:

- Confirm that national datasets submitted by TSOs align with key European requirements, including the TEN-E Regulation [1] and the ACER Framework Guidelines [2].
- Demonstrate how TSOs datasets considers the energy-efficiency-first principle and complies with the EU 2030 climate and energy targets and the 2050 climate neutrality objective [3] [4].
- Validate the use and interpretation of NECPs [5], national strategies, latest EC scenarios [6] and MS' non-binding offshore agreements.
- Consistency between the inputs used for ERAA and TYNDP (2030/2035 horizons), with clear explanations of any differences [7].
- Contribute to the Scenarios Report, where both quantitative inputs and qualitative uncertainties on the datasets that are provided [8] will be assessed.

All responses will be published as part of the TYNDP 2026 Scenarios Report and ERAA 2025 report, supporting a transparent and credible scenario development process.

Submission guidelines:

The survey will be open from 25 July to 29 August 2025. Each country is expected to provide one joint response submitted collaboratively by the national electricity and gas TSOs.

If the survey responses reveal any inconsistencies or divergences between the submitted datasets and the legal or regulatory requirements (e.g. TEN-E Regulation, ACER Framework Guidelines, NECPs), the concerned datasets may need to be revised and re-submitted to ensure full alignment for the TYNDP 2026 scenario development.

Submission instructions:

Please respond to this questionnaire based on the datasets you submitted for TYNDP 2026 National Scenarios+ Scenario and ERAA 2025 National Trends Scenario.

Why your views matter

In November 2024, ENTSO-E and ENTSOG launched the joint data collection exercise for ERAA 2025 and TYNDP 2026, guided by the *Joint ERAA 2025 and TYNDP 2026 Scenarios Data Collection Guidelines* (**link** *<https://eepublicdownloads.blob.core.windows.net/public-cdn-container/clean-documents/sdc-documents/ERAA/ERAA_2025/ERAA2025%20_%20TYNDP2026%20Data%20Collection%20Guidelines.pdf>*).

Per the Guidelines, TSOs are instructed to provide the datasets for the National Trends scenario **with a cut-off date 24 December 2024** as following:

'TSOs are responsible for submitting data for the central National Trends scenario built on the basis of the scenario perspectives included in the final NECPs, which were due to be submitted by the MSs by 30 June 2024. If the datasets are not part of the NECPs they can be complemented by national planning and strategies and national strategies of non-EU countries. If the final NECPs are not yet published, draft NECPs submitted in 2023 together with any national strategies can be considered also as potential basis.'

Moreover, TSOs are informed that at the end of the data collection process a survey will be conducted to provide the data sources, explain and justify any divergences.

Section 1 - General information

1 What country are you submitting on behalf of?

Country *(Required)*

Please select only one item

- ◯ AL
- ◯ AT
- ◯ BA
- ◯ BE
- ◯ BG
- ◯ CH
- ◯ CY
- ◯ CZ
- ◯ DE
- ◯ DK
- ◯ EE
- ◯ ES
- ◯ FI
- ◯ FR
- ◯ GR
- ◯ HR
- ◯ HU
- ◯ IE
- ◯ IS
- ◯ IT
- ◯ LT
- ◯ LU
- ◯ LV
- ◯ MD
- ◯ ME
- ◯ NI
- ◯ NL
- ◯ NO
- ◯ MK
- ◯ PL
- ◯ PT
- ◯ RO
- ◯ RS
- ◯ SE
- ◯ SI
- ◯ SK
- ◯ TR
- ◯ UA
- ◯ UK

2 What is your organisation?

Organisation(s) - multiple possible *(Required)*

Please note that for TYNDP/SB 2026, we request responses to be jointly submitted for electricity and gas TSOs.

3 What is your name?

Name *(Required)*

4 What is your email address?

If you enter your email address then you will automatically receive an acknowledgement email when you submit your response.

Email *(Required)*

5 Please indicate level of confidentiality of your answers. Please note that if you opt to consider your comments confidential, those anonymized comments could be still shared with EU and national authorities, drafting committee members, and other persons or entities involved in the adoption process of the consulted document to ensure the performance of ENTSO-E legally mandated tasks.

(Required)

Please select only one item

- ◯ My comments may be published unanonymised
- ◯ My comments may be published but only anonymised
- ◯ My comments are confidential and shall not be published

6 Privacy Policy

(Required)

Please select only one item

- ◯ I agree to ENTSO-E's Consultation Hub Privacy Policy

Read the **ENTSO-E's Consultation Hub Privacy Policy** *</privacy_policy/>*

Section 2 - Data validation

7 Are the datasets submitted for ERAA 2025 and TYNDP/SB 2026 identical?

(Required)

Please select only one item

- ◯ Yes
- ◯ No

8 Have you validated data before submission for the studies?

(Required)	Yes	No
ERAA 2025 *Please select only one item*	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯

9 If yes, with whom is the data validated before submission?

	NRA	Ministries	DSOs	Other national authorities (please specify below)	Other stakeholders* (please specify below)
ERAA 2025	☐	☐	☐	☐	☐
TYNDP/SB 2026	☐	☐	☐	☐	☐

**for example, through dedicate stakeholder engagement or through other national processes if the same data are used for other national exercises*

If other national authorities or stakeholders for ERAA 2025, please specify below

If other national authorities or stakeholders for TYNDP/SB 2026, please specify below

Section 3 - Compliance with EU Targets (2030 & 2050)

10 Please confirm if submitted energy demand data is compliant with indicative national contributions towards EU's final energy consumption targets sent to the Member States.

*Please refer to Table.4, 'target' column to see the indicative targets (**link** <https://eur-lex.europa.eu/resource.html?uri=cellar:61de6ed0-3b8d-11f0-8a44-01aa75ed71a1.0001.02/DOC_2&format=PDF>). Please note that same table 'final contributions' column presents the FEC figures from your final NECP. If the 'ambition' is not in line, it means your final NECP is not aligned with the indicative national contribution targets.*

(Required)	Aligned	Not aligned (please justify below)	Not assessed (please justify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

For ERAA 2025: If "not aligned", please justify the reason and specify the data used and the source (e.g. final NECP is not aligned with the indicative target, we used final NECP submitted in December, 2024) If "not assessed" please specify and justify.

For TYNDP/SB 2026: If "not aligned", please justify the reason and specify the data used and the source (e.g. final NECP is not aligned with the indicative target, we used final NECP submitted in December, 2024) If "not assessed" please specify and justify.

11 Please confirm if submitted data is compliant with indicative national contributions towards EU's renewable energy target

This answer shall only confirm dataset submitted consistency with national references and does not confirm the expected outcomes of TYNDP/ERAA modelling results.

*Please refer to Table 3, 'formula result' column to see the indicative targets (**link** <https://eur-lex.europa.eu/resource.html?uri=cellar:61de6ed0-3b8d-11f0-8a44-01aa75ed71a1.0001.02/DOC_2&format=PDF>). Please note that same table 'contribution' column presents the figures from your final NECP. If the 'ambition' is not in line, it means your final NECP is not aligned with the indicative national contribution targets.*

	Aligned	Not aligned (please justify below)	Not assessed (please justify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

For ERAA 2025: If "not aligned", please justify the reason and specify the data used and the source (e.g. final NECP is not aligned with the indicative target, we used final NECP submitted in December, 2024) If "not assessed" please specify and justify.

For TYNDP/SB 2026: If "not aligned", please justify the reason and specify the data used and the source (e.g. final NECP is not aligned with the indicative target, we used final NECP submitted in December, 2024) If "not assessed" please specify and justify.

12 Please confirm if the delivered datasets are compliant with national references to comply with EU's binding 2030 GHG reduction target.

This answer shall only confirm dataset submitted consistency with national references and does not confirm the expected outcomes of TYNDP/ERAA modelling results.

	Aligned	Not aligned (please justify below)	Not assessed (please justify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

For ERAA 2025: If “not aligned”, please justify the reason and specify the data used and the source (e.g. final NECP is not aligned with the target, we used final NECP submitted in December, 2024). If “not assessed” please specify and justify.

For TYNDP/SB 2026 If “not aligned”, please justify the reason and specify the data used and the source (e.g. final NECP is not aligned with the target, we used final NECP submitted in December, 2024). If “not assessed” please specify and justify.

13 Please confirm the compliancy of your datasets with national targets under EU's binding 2050 net-zero emissions objective.

This answer shall only confirm dataset submitted consistency with national references and does not confirm the expected outcomes of TYNDP modelling results.

For TYNDP/SB 2026:
Please select only one item

◯ Aligned
◯ Not aligned
◯ Not assessed

For TYNDP/SB 2026: If “not aligned”, please justify the reason and specify the data used and the source (e.g. final NECP is not aligned with the target, we used final NECP submitted in December, 2024). If “not assessed” please specify and justify.

Section 4 - Consideration of EU principles and adoption in national frameworks

14 Please describe how specific assumptions are included in the datasets you provided for the National Trends Scenario for each time horizon (2030, 2035, 2040, 2050), for the inclusion of the EE1st principle on the supply side and on the demand side.

For ERAA 2025

For TYNDP/SB 2026

15 Did your country consider the Recovery and Resiliency Facility in the completion of the dataset for ERAA 2025?

More information on the Recovery Resilience Facility: **Recovery and Resilience Facility - European Commission** *<https://commission.europa.eu/business-economy-euro/economic-recovery/recovery-and-resilience-facility_en>*

Please select only one item

- ◯ Yes
- ◯ No
- ◯ Other (please specify below)

If other, please specify

16 Market reforms (Article 23(5)(e) and Article 20(3) of the Electricity Regulation) shall be considered in the ERAA 2025 scenarios. Has your country initiated national market reforms?

Please select only one item

- ◯ Yes, currently
- ◯ Yes, in the future
- ◯ Neither currently nor in the future

Please further explain on whether or not your country is initiating (currently or in the future) national market reforms (e.g. price cap rules, scarcity pricing).

17 Which market reforms have been implemented or considered in the ERAA 2025 dataset?

Please select all that apply

- [ ] None
- [ ] Price cap rules
- [ ] Scarcity pricing
- [ ] Explicit DSR
- [ ] Implicit DSR
- [ ] Interconnection reinforcement
- [ ] Storage facilities

How were the reforms listed above considered when providing ERAA 2025 data for PEMMDB?

Section 5 - Integration of NECPs and EC Scenarios

Please refer to the following resources:

The final version of the NECPs (**LINK** <*https://commission.europa.eu/energy-climate-change-environment/implementation-eu-countries/energy-and-climate-governance-and-reporting/national-energy-and-climate-plans_en*>)
The Commission's individual country analysis of NECPs (**LINK** <*https://energy.ec.europa.eu/publications/individual-assessments_en*>)
The Commission's analysis **EU-wide assessment** <*https://commission.europa.eu/publications/communication-delivering-unions-2030-energy-and-climate-objectives_en*> of the final updated National Energy and Climate plans (NECPs)

18 What is the time horizon covered by your country's NECP?

Please select only one item

- ◯ 2030
- ◯ 2035
- ◯ 2040
- ◯ 2045
- ◯ 2050
- ◯ Other [Please specify below]

Please specify 'Other' time horizons here

19 How is data derived for years beyond the NECP horizon? Please specify the sources with their dates and provide the source if publicly available (e.g., national long-term strategy published in November 2024).

	TSO/DSO studies and plans	Political targets	National (government) energy strategies	Connection requests	Studies from independent research institutions	NECP covers all years	Other (please specify below)
ERAA 2025	☐	☐	☐	☐	☐	☐	☐
TYNDP/SB 2026	☐	☐	☐	☐	☐	☐	☐

Please specify "Other" or more information for ERAA 2025

Please specify "Other" or more information for TYNDP/SB 2026

20 Please explain how you ensured the submitted energy demand and capacity data is compliant with NECP and provide the source.

(For example, explicit in the NECP – Please specify if NECP contributions to the targets or WAM used, contact with minister).

	Explicit in the NECP	Contact with Ministry	Using published plans (please specify source)
ERAA 2025	☐	☐	☐
TYNDP/SB 2026	☐	☐	☐

Please elaborate for ERAA 2025 and specify the source.

Please elaborate for TYNDP/SB 2026 and specify the source.

21 Does the NECP provide sufficient granularity for the TYNDP and ERAA datasets?

	Yes	No (please specify below)	Partially (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

Please specify missing datasets (e.g., demand input figures) for ERAA 2025

Please specify missing datasets (e.g., demand input figures) for TYNDP/SB 2026

22 How did you obtain the missing data? (Please specify below)

	Data obtained from the entity in charge of preparing the NECPs [1]	Data obtained from another entity [2]	Reverse-engineering carried out to retrieve some data [3]	TSOs' own internal scenarios [4]	Other (please specify below) [5]
ERAA 2025	☐	☐	☐	☐	☐
TYNDP/SB 2026	☐	☐	☐	☐	☐

[1] [TYNDP/SB only] If selected, please clarify the datasets where the data obtained from the entity in charge of preparing the NECPs is used. Please provide the source if available

[2] [TYNDP/SB only] If selected, please clarify the datasets where the data obtained from national strategies is used, planning or studies is used. Please provide the source if available

[3] [TYNDP/SB only] If selected, please clarify the datasets where the reverse-engineering is used. Please elaborate (e.g., retrieve the demand input parameters to reach the annual energy demand volumes) and provide the source if available

[4] [TYNDP/SB only] If selected, please clarify the datasets where TSO's own internal scenarios are used. Please provide the source if available

[5][ERAA 2025] If selected, please clarify the datasets where other sources are used. Please list and provide the source if available

[5][TYNDP/SB 2026] If selected, please clarify the datasets where other sources are used. Please list and provide the source if available

Section 5 - Integration of NECPs and EC Scenarios [2030]

23 Please confirm the date and the version of the NECP that you have consulted for the study (e.g., Draft NECP as of date 24 December 2024) for 2030.

For ERAA 2025

For TYNDP/SB 2026

24 Please confirm alignment of submitted energy demand figures with the NECP for 2030.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	○	○	○
TYNDP/SB 2026 *Please select only one item*	○	○	○

For ERAA 2025: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

For TYNDP/SB 2026: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

25 Please confirm alignment of submitted annual electricity demand figures with the NECP for 2030.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

For ERAA 2025: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

For TYNDP/SB 2026: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

26 [TYNDP/SB only] Please confirm alignment of submitted annual hydrogen demand figures with the NECP for 2030.

Please select only one item

◯ Aligned

◯ Not aligned (please specify below)

◯ Not specified in NECP (please specify below)

For TYNDP/SB 2026: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

27 [TYNDP/SB only] Please confirm alignment of submitted annual methane demand figures with the NECP for 2030.

Please select only one item

- ◯ Aligned
- ◯ Not aligned (please specify below)
- ◯ Not specified in NECP (please specify below)

For TYNDP/SB 2026: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

28 [TYNDP/SB] Please confirm alignment of other energy carriers’ demand figures with the NECP for 2030.

Please specify the carrier(s)

Please select only one item

- ◯ Aligned
- ◯ Not aligned (please specify below)
- ◯ Not specified in NECP (please specify below)

For TYNDP/SB 2026: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

29 Please confirm alignment of renewable electricity generation capacities with the NECP for 2030.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

If not aligned or not specified in NECP for ERAA 2025, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

If not aligned or not specified in NECP for TYNDP/SB 2026, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

30 Please confirm alignment of thermal and (including nuclear) electricity generation capacities with the NECP for 2030.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

If not aligned or not specified in NECP for ERAA 2025, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

If not aligned or not specified in NECP for TYNDP/SB 2026, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

31 Please confirm alignment of DSR with the NECP for 2030.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

If not aligned or not specified in NECP for ERAA 2025, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

If not aligned or not specified in NECP for TYNDP/SB 2026, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

32 Please explain how is demand-side flexibility (e.g. DSR) already reflected in your datasets for 2030.

For example, explain the assumptions behind the DSR bands and consideration of the flexibility in the demand (ETM) datasets.

For ERAA 2025

For TYNDP/SB 2026

33 Please confirm alignment of electrolysers installed capacities with the NECP for 2030.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

If not aligned or not specified in NECP for ERAA 2025, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

If not aligned or not specified in NECP for TYNDP/SB 2026, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

34 Please confirm alignment of hydrogen production (SMR & pyrolysis) capacities with the NECP for 2030.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

If not aligned or not specified in NECP for ERAA 2025, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

If not aligned or not specified in NECP for TYNDP/SB 2026, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

Section 5 - Integration of NECPs and EC Scenarios [2035]

35 Please confirm the date and the version of the NECP that you have consulted for the study (e.g., Draft NECP as of date 24 December 2024) for 2035.

For ERAA 2025

For TYNDP/SB 2026

36 Please confirm alignment of submitted energy demand figures with the NECP for 2035.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

For ERAA 2025: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

For TYNDP/SB 2026: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

37 Please confirm alignment of submitted annual electricity demand figures with the NECP for 2035.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

For ERAA 2025: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

For TYNDP/SB 2026: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

38 [TYNDP/SB only] Please confirm alignment of submitted annual hydrogen demand figures with the NECP for 2035.

Please select only one item

◯ Aligned

◯ Not aligned (please specify below)

◯ Not specified in NECP (please specify below)

For TYNDP/SB 2026: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

39 [TYNDP/SB only] Please confirm alignment of submitted annual methane demand figures with the NECP for 2035.

Please select only one item

- ◯ Aligned
- ◯ Not aligned (please specify below)
- ◯ Not specified in NECP (please specify below)

For TYNDP/SB 2026: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

40 [TYNDP/SB] Please confirm alignment of other energy carriers’ demand figures with the NECP for 2035.

Please specify the carrier(s)

Please select only one item

- ◯ Aligned
- ◯ Not aligned (please specify below)
- ◯ Not specified in NECP (please specify below)

For TYNDP/SB 2026: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

41 Please confirm alignment of renewable electricity generation capacities with the NECP for 2035.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

If not aligned or not specified in NECP for ERAA 2025, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

If not aligned or not specified in NECP for TYNDP/SB 2026, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

42 Please confirm alignment of thermal and (including nuclear) electricity generation capacities with the NECP for 2035.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

If not aligned or not specified in NECP for ERAA 2025, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

If not aligned or not specified in NECP for TYNDP/SB 2026, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

43 Please confirm alignment of DSR with the NECP for 2035.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

If not aligned or not specified in NECP for ERAA 2025, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

If not aligned or not specified in NECP for TYNDP/SB 2026, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

44 Please explain how is demand-side flexibility (e.g. DSR) already reflected in your datasets for 2035.

For example, explain the assumptions behind the DSR bands and consideration of the flexibility in the demand (ETM) datasets.

For ERAA 2025

For TYNDP/SB 2026

45 Please confirm alignment of electrolysers installed capacities with the NECP for 2035.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

If not aligned or not specified in NECP for ERAA 2025, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

If not aligned or not specified in NECP for TYNDP/SB 2026, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

46 Please confirm alignment of hydrogen production (SMR & pyrolysis) capacities with the NECP for 2035.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

If not aligned or not specified in NECP for ERAA 2025, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

If not aligned or not specified in NECP for TYNDP/SB 2026, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

Section 5 - Integration of NECPs and EC Scenarios [2040]

47 Please confirm the date and the version of the NECP that you have consulted for the study (e.g., Draft NECP as of date 24 December 2024) for 2040.

For ERAA 2025

For TYNDP/SB 2026

48 Please confirm alignment of submitted energy demand figures with the NECP for 2040.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

For ERAA 2025: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

For TYNDP/SB 2026: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

49 Please confirm alignment of submitted annual electricity demand figures with the NECP for 2040.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

For ERAA 2025: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

For TYNDP/SB 2026: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

50 [TYNDP/SB only] Please confirm alignment of submitted annual hydrogen demand figures with the NECP for 2040.

Please select only one item

◯ Aligned

◯ Not aligned (please specify below)

◯ Not specified in NECP (please specify below)

For TYNDP/SB 2026: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

51 [TYNDP/SB only] Please confirm alignment of submitted annual methane demand figures with the NECP for 2040.

Please select only one item

- ◯ Aligned
- ◯ Not aligned (please specify below)
- ◯ Not specified in NECP (please specify below)

For TYNDP/SB 2026: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

52 [TYNDP/SB] Please confirm alignment of other energy carriers’ demand figures with the NECP for 2040.

Please select only one item

- ◯ Aligned
- ◯ Not aligned (please specify below)
- ◯ Not specified in NECP (please specify below)

For TYNDP/SB 2026: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

53 Please confirm alignment of renewable electricity generation capacities with the NECP for 2040.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

If not aligned or not specified in NECP for ERAA 2025, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

If not aligned or not specified in NECP for TYNDP/SB 2026, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

54 Please confirm alignment of thermal and (including nuclear) electricity generation capacities with the NECP for 2040.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

If not aligned or not specified in NECP for ERAA 2025, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

If not aligned or not specified in NECP for TYNDP/SB 2026, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

55 Please confirm alignment of DSR with the NECP for 2040.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

If not aligned or not specified in NECP for ERAA 2025, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

If not aligned or not specified in NECP for TYNDP/SB 2026, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

56 Please explain how is demand-side flexibility (e.g. DSR) already reflected in your datasets for 2040.

For example, explain the assumptions behind the DSR bands and consideration of the flexibility in the demand (ETM) datasets.

For ERAA 2025

For TYNDP/SB 2026

57 Please confirm alignment of electrolysers installed capacities with the NECP for 2040.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

If not aligned or not specified in NECP for ERAA 2025, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

If not aligned or not specified in NECP for TYNDP/SB 2026, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

58 Please confirm alignment of hydrogen production (SMR & pyrolysis) capacities with the NECP for 2040.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

If not aligned or not specified in NECP for ERAA 2025, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

If not aligned or not specified in NECP for TYNDP/SB 2026, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

Section 5 - Integration of NECPs and EC Scenarios [2050]

59 Please confirm the date and the version of the NECP that you have consulted for the study (e.g., Draft NECP as of date 24 December 2024) for 2050.

For ERAA 2025

For TYNDP/SB 2026

60 Please confirm alignment of submitted energy demand figures with the NECP for 2050.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

For ERAA 2025: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

For TYNDP/SB 2026: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

61 Please confirm alignment of submitted annual electricity demand figures with the NECP for 2050.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

For ERAA 2025: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

For TYNDP/SB 2026: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

62 [TYNDP/SB only] Please confirm alignment of submitted annual hydrogen demand figures with the NECP for 2050.

Please select only one item

◯ Aligned

◯ Not aligned (please specify below)

◯ Not specified in NECP (please specify below)

For TYNDP/SB 2026: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

63 [TYNDP/SB only] Please confirm alignment of submitted annual methane demand figures with the NECP for 2050.

Please select only one item

- ◯ Aligned
- ◯ Not aligned (please specify below)
- ◯ Not specified in NECP (please specify below)

For TYNDP/SB 2026: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

64 [TYNDP/SB] Please confirm alignment of other energy carriers’ demand figures with the NECP for 2050.

Please specify the carrier(s)

Please select only one item

- ◯ Aligned
- ◯ Not aligned (please specify below)
- ◯ Not specified in NECP (please specify below)

For TYNDP/SB 2026: If “not aligned”, please justify the reason and specify the data used and the source. If “not specified” please specify the data used and the source

65 Please confirm alignment of renewable electricity generation capacities with the NECP for 2050.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

If not aligned or not specified in NECP for ERAA 2025, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

If not aligned or not specified in NECP for TYNDP/SB 2026, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

66 Please confirm alignment of thermal and (including nuclear) electricity generation capacities with the NECP for 2050.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

If not aligned or not specified in NECP for ERAA 2025, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

If not aligned or not specified in NECP for TYNDP/SB 2026, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

67 Please confirm alignment of DSR with the NECP for 2050.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

If not aligned or not specified in NECP for ERAA 2025, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

If not aligned or not specified in NECP for TYNDP/SB 2026, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

68 Please explain how is demand-side flexibility (e.g. DSR) already reflected in your datasets for 2050.

For example, explain the assumptions behind the DSR bands and consideration of the flexibility in the demand (ETM) datasets.

For ERAA 2025

For TYNDP/SB 2026

69 Please confirm alignment of electrolysers installed capacities with the NECP for 2050.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

If not aligned or not specified in NECP for ERAA 2025, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

If not aligned or not specified in NECP for TYNDP/SB 2026, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

70 Please confirm alignment of hydrogen production (SMR & pyrolysis) capacities with the NECP for 2050.

	Aligned	Not aligned (please specify below)	Not specified in NECP (please specify below)
ERAA 2025 *Please select only one item*	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯

If not aligned or not specified in NECP for ERAA 2025, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

If not aligned or not specified in NECP for TYNDP/SB 2026, please specify the technology and justify together with the source which is used instead (e.g., offshore wind technology is aligned with MS non-binding agreements) and provide the publication date of this source:

Section 6 - Compliance with Member States' non-binding agreements on offshore

Please refer to the following resource: When confirming the compliance, lower ranges should be considered as minimum capacities (**link** *<https://energy.ec.europa.eu/news/member-states-agree-new-ambition-expanding-offshore-renewable-energy-2024-12-18_en>* **).**

71 Is the 2030 dataset aligned with Member States' non-binding offshore agreements?

	Fully aligned	Partially aligned (please clarify below)	Not aligned (please clarify below)	Not applicable (no MS agreement)
ERAA 2025 *Please select only one item*	◯	◯	◯	◯
TYNDP/SB 2026 *Please select only one item*	◯	◯	◯	◯

If not or partially aligned for the 2030 dataset for ERAA 2025, please describe discrepancies and justify

If not or partially aligned for the 2030 dataset for TYNDP/SB 2026, please describe discrepancies and justify

72 Is the 2040 dataset aligned with Member States' non-binding offshore agreements?

For TYNDP/SB 2026
Please select only one item

- ◯ Fully aligned
- ◯ Partially aligned (please clarify below)
- ◯ Not aligned (please clarify below)
- ◯ Not applicable (no MS agreement)

If not or partially aligned for the 2040 dataset for TYNDP/SB 2026, please describe discrepancies and justify

73 Is the 2050 dataset aligned with Member States' non-binding offshore agreements?

For TYNDP/SB 2026

Please select only one item

- ◯ Fully aligned
- ◯ Partially aligned (please clarify below)
- ◯ Not aligned (please clarify below)
- ◯ Not applicable (no MS agreement)

If not or partially aligned for the 2050 dataset for TYNDP/SB 2026, please describe discrepancies and justify

Section 7 - Consistency among ERAA and TYNDP input data

Both studies (ERAA 2025 and TYNDP Scenarios 2026) will include a National Trends scenario for 2030 and 2035 time horizons where TSOs need to submit datasets according to their final available NECPs and align with EU and national policy objectives. Therefore, TSOs are encouraged to submit aligned datasets for both studies to ensure the consistency between them. However, due to differences in the purposes of the two scenarios, some differences in input data can occur. If this is the case, these differences should be well identified and documented in the Scenarios Report. The identified reasons where TSOs might submit different datasets on the same technologies are as following:

TYNDP scenarios must align on the common technologies with gas TSOs, whereas it is not an obligation for ERAA.
ERAA should include plants only with an awarded CRM, whereas additional expected plants can be included for TYNDP scenarios.
TSOs are allowed to make their national scenarios adequate for TYNDP by flagging these additional capacities, whereas this should not be the case for ERAA.

74 Are all submitted datasets consistent among TYNDP 2026 and ERAA 2025 for 2030 time horizon?

(Required)

Please select only one item

- ◯ Aligned/Consistent datasets
- ◯ Differentiated datasets

If not aligned for 2030 time horizon, please explain any differences, specify the technology and justify the reason of divergence (e.g., CRM eligibility, TYNDP gas coordination)

75 Are all submitted datasets consistent among TYNDP 2026 and ERAA 2025 for 2035 time horizon?

(Required)

Please select only one item

- ◯ Aligned/Consistent datasets
- ◯ Differentiated datasets

If not aligned for 2035 time horizon, please explain any differences, specify the technology and justify the reason of divergence (e.g., CRM eligibility, TYNDP gas coordination)

Section 8 - Uncertainty & risk assessment

76 What are the key uncertainties in your dataset for TYNDP/SB 2026?

Please highlight the main drivers of uncertainty and the main risk factors that could seriously alter the envisaged datasets. Such factors could include, e.g., lack of raw materials, energy price fluctuations, technology immaturity, etc. Your response will be part of qualitative assessment of how the scenarios would be impacted by the uncertainty around the main selected assumptions and drivers.

End of Questionnaire

Please ensure all answers are completed based on the datasets submitted for ERAA 2025 and TYNDP 2026 NT scenarios. Responses will directly inform the Scenarios Report and ensure regulatory transparency.

LIST OF ACRONYMS //

ACER	Agency for the Cooperation of Energy Regulators
ACM	Authority for Consumers and Markets
CBA	Cost Benefit Analysis
CCS	Carbon Capture and Storage
CCU	Carbon Capture and Utilisation
CRES	Center For Renewable Energy Sources
DA	Day-ahead
DE	Distributed Energy
DRES	Dedicated Renewable Energy Sources
DSO	Distribution System Operator
DSR	Demand Side Response
EC	European Commission
EE1st	Energy Efficiency First
EHB	European Hydrogen Backbone
ENTSO-E	European Network of Transmission System Operators for Electricity
ENTSOG	European Network of Transmission System Operators for Gas
ERAA	The ERAA is a pan-European monitoring assessment of power system resource adequacy of up to 10 years ahead
ESABCC	European Scientific Advisory Board on Climate Change
ETM	Energy Transition Model
EU	European Union
EV	Electric Vehicle
FEC	Final Energy Consumption
FLH	Full Load Hours
GA	Global Ambition
GHG	Greenhouse Gas
IoSN	Identification of System Needs
KPI	Key Performance Indicator
LTC	Long-term Contract
LTS	Long-Term Strategy
MMS	German: Mit-Maßnahmen-Szenario (with measures scenario)
MWMS	German: Mit-weiteren-Maßnahmen-Szenario (with additional measures scenario)
NDP	Network Development Plan
NECPs	National Energy and Climate Plans
NRA	National Regulatory Authority
NT+	National Trends +
NTCs	Net Transfer Capacities
OCGT	Open-cycle Gas Turbines
ONDP	Offshore Network Development Plan
P2H	Power-to-Heat
P2X	Aggregation of power to gas and power to liquids
PECD	Pan-European Climate Database
PEMMDB	Pan-European Market Modelling Database
PtX	Power-to-X
PV	Photovoltaic
RES	Renewable Energy Source
SMR	Steam Methane Reforming
SNG	Sythetic Natural Gas
SoS	Security of Supply
SRG	Stakeholder Reference Group
TEN-E	Trans-European Networks for Energy
TSO	Transmission System Operator
TYNDP	Ten-Year Network Development Plan
V2G	Vehicle to Grid
WAM	Projections with Additional Measures
WGSB	Working Group Scenario Building

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www.znconsulting.com

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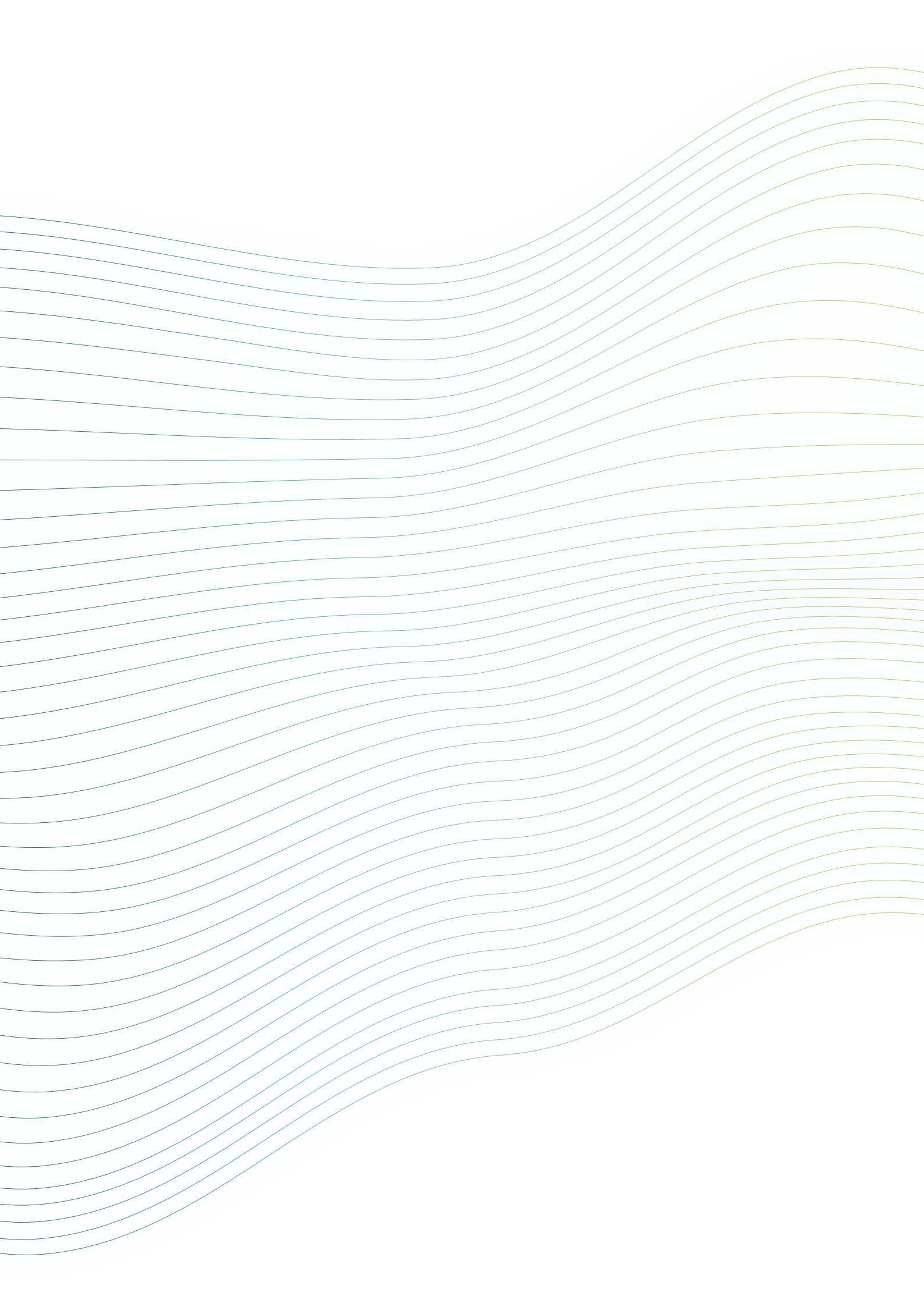


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