EU national targets show gas in decline

Analysis of final National Energy and Climate Plans (NECPs) shows EU renewables are on the rise, with gas set for a 7% decline by 2030.

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About

This report uses data from EU Member States' National Energy and Climate Plans (NECPs) to provide an outlook for the bloc's gas demand and electrification rate in 2030. It also uses NECP data to give an overview of EU renewables targets in 2030. The report closes by reflecting on the NECP writing process, providing observations and recommendations for how plans could be improved in future cycles to aid stakeholders that make decisions based on the plans.

Explore more detailed data in our Live EU NECP Tracker which provides country-level comparisons of NECP targets.

Key highlights

-7%

EU gas demand is set to fall by 7% from 2023 to 2030 according to national plans.

30%

EU national plans reveal a 30% electrification rate by 2030, up from 23% in 2023.

66%

The EU is headed towards 66% renewables generation by 2030 if national plans are achieved.

EU gas is set for decline, as electrification and renewables grow

Analysis of final EU countries' energy and climate plans shows the EU economy is on the cusp of a shift towards a cleaner, more electrified energy system.

The final National Energy and Climate Plans (NECPs) of EU countries are in — for the most part. As countries set out how they will achieve EU energy and climate targets by 2030, key indicators reveal an EU energy transition in full swing.

Gas is set for a decline, showing that plans to expand EU gas infrastructure may result in stranded assets. Strong renewables targets combined with increasing electrification means the EU is heading towards an economy backed by clean electricity. Industry stakeholders, investors and policymakers should take note.

01 EU gas is set to drop 7% in 2030 compared to 2023

Member States' national plans show that consumption of gas is set to fall by 7% across the EU over the next five years. Building on previous Ember research, this indicates that additional build out of gas capacity could lead to oversupply and stranded assets.

02 EU plans an electrification rate of 30% by 2030

Across the EU, electrification is set to rise from 23% today to 30% by 2030. This shows that EU countries are planning on meeting future energy needs with more clean electricity and less fossil gas. Plans to increase electrification across the bloc signal that the EU is at the beginning of a new phase of its energy transition where the whole system is backed by clean electricity.

03 EU targets 66% renewables in electricity by 2030

Member States plan on doubling their total wind and solar capacity over the next five years, meaning renewables are set to generate two thirds of all EU electricity by 2030. However, these plans still fall short of REPowerEU targets.

“National targets send a strong signal: the EU is ditching fossil gas for good. This gas decline is already in progress, and 2030 targets show another strong fall to come. An electrified economy is where the EU is definitively heading, and any rush to overbuild gas infrastructure will inevitably end in costly stranded assets.”

Tomos Harrison
Electricity transition analyst, Ember

National plans show the EU's direction of travel on energy transition

EU Member States' National Energy and Climate Plans give an insight into where the bloc is headed. With geopolitical uncertainty ramping up, stakeholders can benefit from understanding that direction of travel.

National Energy and Climate Plans (NECPs) are the principal documents through which the EU Member States set out their plans to meet the EU's climate and energy targets. Taken together, they should provide a concrete direction of travel across the EU, giving industry, investors and other stakeholders certainty at a time when Europe's energy supplies are under intense scrutiny.

After a lengthy process, the current NECP cycle is drawing to an end. This revision cycle began in June 2023, when Member States had to submit draft NECP documents for the European Commission to appraise and provide feedback ahead of the June 2024 deadline for submission of final NECPs. At that time Ember analysis found that draft national targets put the EU just short of REPowerEU. Only a handful of Member States met the June 2024 deadline and to date, three countries (Belgium, Estonia and Poland) still have yet to submit a plan. However, the European Commission has recently published its own

assessment of the final NECPs that have been submitted, in effect calling the process to a close.

The end of this NECP cycle comes at a time when Europe is at a critical inflection point in its energy transition. Europe's dependence on imported fossil gas is at the core of the EU's energy crisis and vulnerabilities in international competitiveness. Despite this, some actors are rushing towards LNG contracts and gas infrastructure as a kneejerk reaction to geopolitical instability, with the EU currently planning on expanding its gas infrastructure.

However, the EU's own plans map a path away from imported fossil gas dependence and its inherent risks. There is growing understanding that clean smart electrification of Europe's economy can transform the bloc into a lasting and secure global competitor, as demonstrated by the recent Clean Industrial Deal and Action Plan for Affordable Energy. Analysis of the Member States' NECPs reflects an intention to deliver on this, showing how the bloc is increasingly shedding fossil gas reliance and moving to an electrified future.

The EU is set to cut gas demand as it moves to an electrified economy

As the EU debates whether to seek new sources of imported fossil gas, NECPs reveal that in fact the bloc is planning to reduce gas demand and increase the role electricity plays in powering its economy.

2.1 EU gas demand set to fall 7% by 2030

Russia's invasion of Ukraine and the ensuing energy crisis in Europe have brought into sharp focus how the EU's reliance on imported gas exposes it to significant security and economic risks. Despite this, ongoing discussions show an appetite to lock in further gas dependence through new infrastructure. Recent Ember analysis shows that by 2030 the EU will have increased its LNG import capacity 54% compared to 2023, significantly exceeding demand.

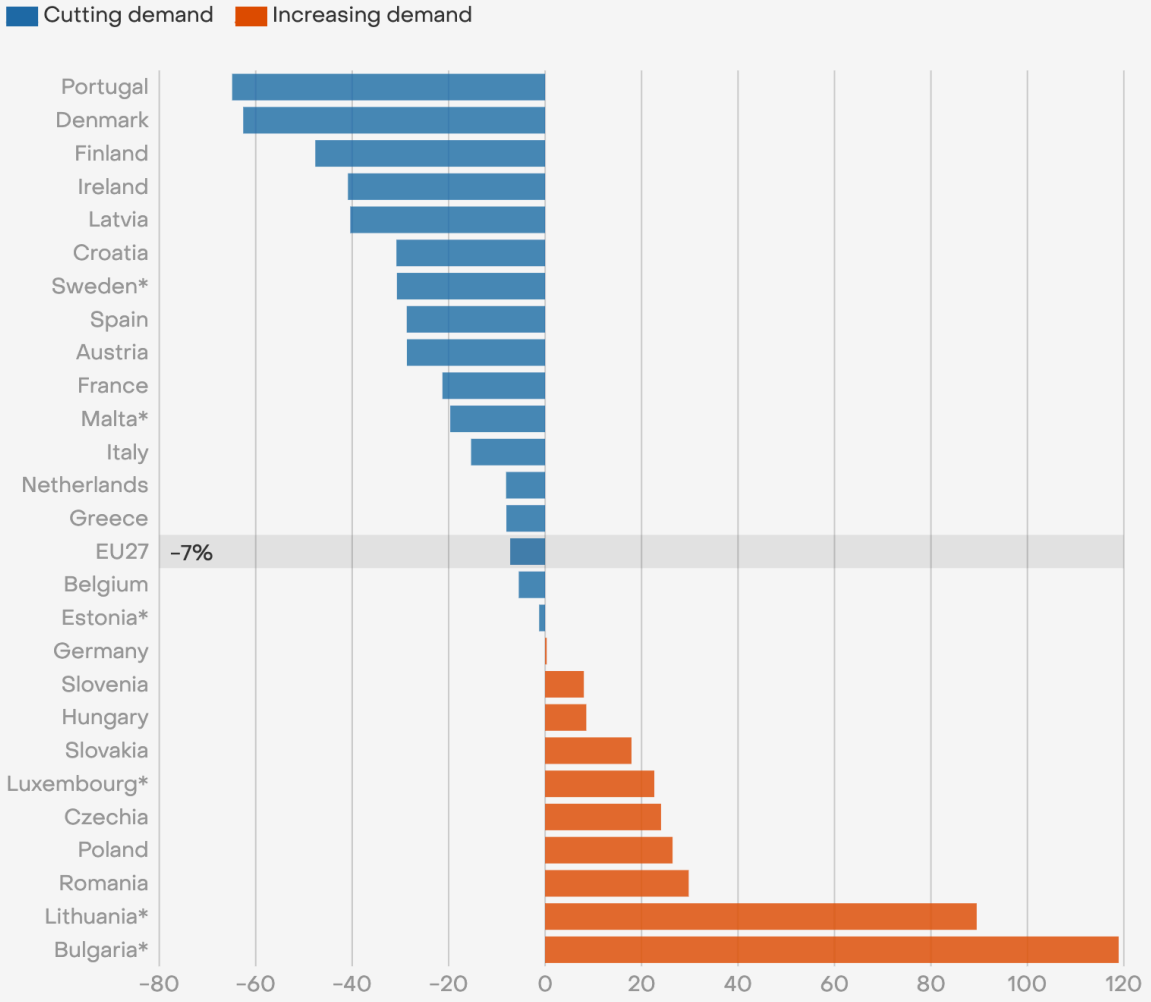
Analysis of the NECPs further emphasises the probability of over-investment in the bloc's gas infrastructure. The plans reveal that the EU is set to reduce its total gas demand by 7% in 2030 compared with 2023, from 326 billion cubic meters (bcm) to 302 bcm. This extends a decline already in progress, with gas demand falling sharply between 2021 and 2023, from 404 bcm to 326 bcm. With this

downward trend expected to continue beyond 2030, the EU's demand for gas is now in terminal decline.

Recent EU-level initiatives may add momentum to this pathway of decline. The European Commission's Roadmap towards ending Russian energy imports, published after the NECPs were submitted, sets out a very strong ambition to reduce gas demand in order to strengthen energy security. Achieving this could mean a steeper fall in gas demand by 2030 than the 7% set out in the NECPs.

EU country plans show 7% cut in gas demand by 2030

Percent change in total gas demand 2023-2030 (%) according to national targets



Source: European Commission, Eurostat, ENTSOs · Ember analysis
* NECPs from these countries do not provide data, gas demand data is taken from ENTSOs TYNDP 2024

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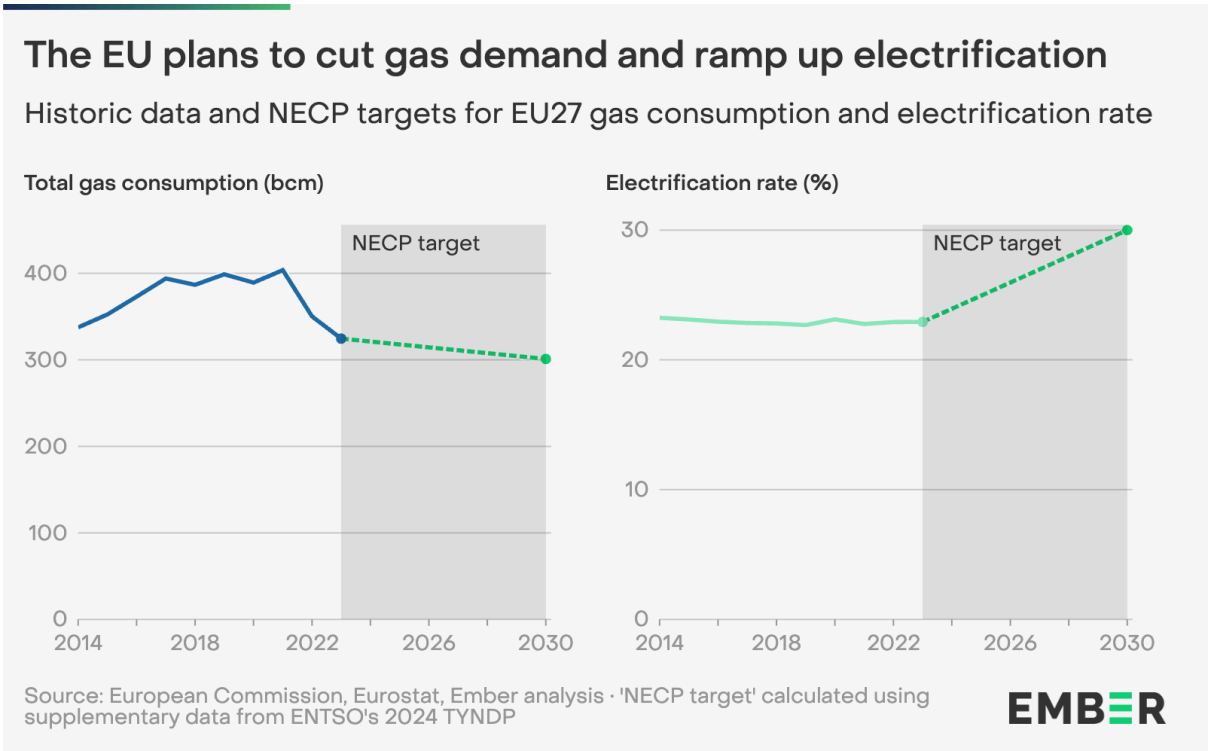
2.2 Rising electrification rate

In order to minimise security risks and maximise competitiveness, the EU will need to reduce fossil fuel consumption across all economic sectors and replace it with domestically generated clean electricity. Doing this will mean electrifying current technologies that are fossil fuel dependent, for example by replacing transportation that uses internal combustion engines with electric vehicles and replacing fossil-consuming heating and cooling with electrically-powered heat pumps. To reap the benefits of this shift, clean power must meet the additional power demand of those new technologies at the same time as displacing fossils' share in electricity.

One indicator for aligning these two crucial aspects of the energy transition is electricity demand. The EU's demand for electricity has remained relatively unchanged for the past two decades and in fact underwent a sharp decline between 2021 and 2023. However, 2024 saw a small 1% uptick in demand compared with 2023. Analysis of the NECPs suggests that this rebound is set to continue as EU Member States plan to increase demand in coming years. Of the 17 NECPs that report 2030 electricity demand, all show a demand increase compared with 2023.

The NECPs show that this increase in demand will happen hand-in-hand with a ramp up in electrification. The rate of electrification describes the share of electricity in the final energy demand of all sectors of an economy. The NECPs show that across all Member States, the EU is planning to achieve an electrification rate of 30% by 2030. This is a significant step up from today's rate of 23% and is quite close to the EU-level indicative 2030 electrification rate target of 32-33% set out in the Action Plan for Affordable Energy.



2.3 Toward a clean, electrified EU economy

These indicators taken together show that in the EU, new electricity demand and electrified technologies will increasingly be met by clean power, not gas. This puts the EU on the cusp of the next phase of energy transition: where the focus is not solely on ramping up renewables, but on a whole-system transition of the EU's economy to be backed by clean power.

Investors, policymakers and industry stakeholders should take note of this trajectory. Falling gas demand is not a temporary blip, but evidence of a wider structural shift towards domestically produced clean electricity and away from fossil fuel imports. Equally, this also highlights the urgency with which Member States need to plan and implement the smart and flexible electricity infrastructure that will facilitate the electrification of the EU's economy.

The EU is planning to significantly increase renewables in the next five years

NECPs show that Europe's rapid rise in renewables generation is set to continue, but attention on effective infrastructure planning remains critical.

3.1 EU national targets aim for higher renewables

Renewables have been surging across Europe in recent years, rising from 34% of EU generation in 2019 to 47% of generation in 2024. Analysis of the final NECPs shows that the EU is not slowing down as Member States collectively target a 66% renewables share of electricity generation by 2030. This is a significant step up from today's share, but still falls short of the REPowerEU ambition of 72%.

To achieve this, wind and solar capacities are roughly set to double. The final NECP documents show that the EU is aiming to build 670 GW solar and 450 GW wind capacity by 2030, up from 338 GW and 231 GW in 2024. This will require annual additions of 55 GW solar and 37 GW wind until the end of 2030. These solar additions are completely achievable given that between them, EU Member

States built 65 GW of solar capacity in 2024. On the other hand, achieving the level of annual wind additions set out in the NECPs will require a significant step up in collective efforts. EU Member States have never before built more than 16 GW of wind capacity in a single year. However, there are encouraging signs that the wind pipeline is strengthening with 2024 seeing increased levels of wind farm permitting compared with recent years as well as more turbine orders and record levels of capacity up for auction.

The final NECPs show a slight increase in solar (+20 GW) compared to the previous draft documents submitted early last year, perhaps reflecting growing confidence in solar amid an EU-wide boom. However, even despite this increase and the high pace of planned build out, solar targets still put the final NECPs short of the REPowerEU target of 720 GW solar. On the other hand, Member States' ambitious wind targets put final NECPs on track to meet the REPowerEU target of 440 GW wind by 2030 (see Methodology).

The strong upward growth in EU renewables planned over the next five years means that renewable energy will meet an increased share of energy demand. According to the European Commission's assessment of the final NECPs, the EU is set to achieve a 41% share of renewables in gross energy consumption by 2030, putting the bloc within touching distance of the 42.5% target set out in the Renewable Energy Directive.

The result of a growing share of renewables in the EU's energy mix is a reduction in economy-wide emissions. Final NECPs show that the EU plans to reduce total emissions by 54% from 1990 levels, very nearly hitting the EU's target of a 55% reduction by 2030.

3.2 Implementing national targets

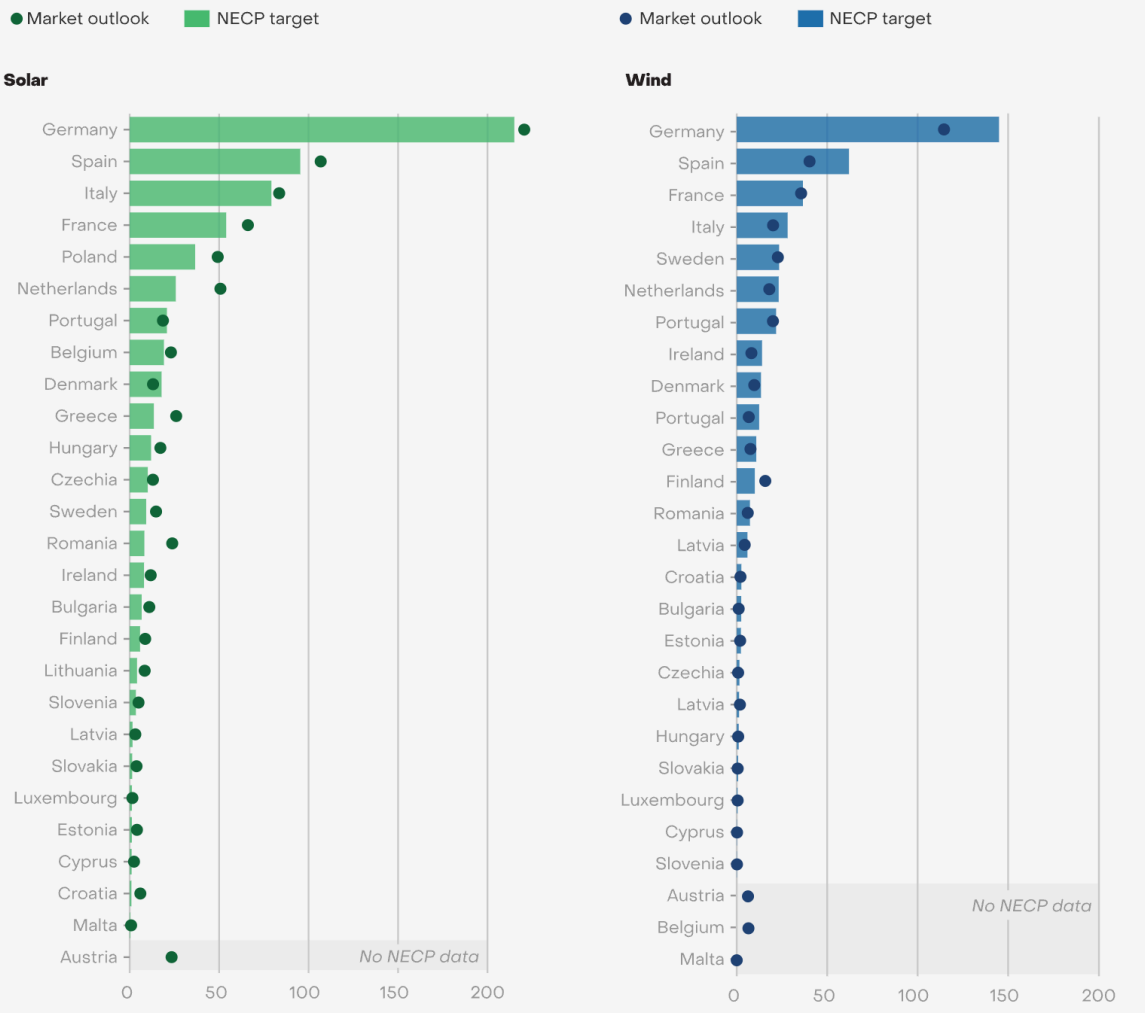
Comparing NECPs against industry market outlooks gives an indication on what Member States should focus on to successfully deliver on targets. Solar continues to beat expectations, with new infrastructure needs as a result, whereas significant action is required to achieve wind targets.

Solar installations have surpassed global expectations in the past few years and the most recent market outlooks for the EU suggest that this trend is set to continue. SolarPower Europe has forecasted that solar capacity will reach 816 GW by 2030. Not only does this comfortably surpass the REPowerEU target of 720 GW, but it also far exceeds the NECP plans for 670 GW solar. This is further evidence that solar is outpacing expectations and highlights the urgency with which Member States must plan and implement the policies to deploy more battery storage and smart electrification that will be necessary to maintain solar's impressive growth.

While solar has surged in recent years, wind deployment in Europe has slowed due to grid bottlenecks and permitting issues. Indeed, industry body WindEurope forecasts the EU to have built only 350 GW of wind power by 2030, which is significantly (roughly 100 GW) lower than the NECP and REPowerEU targets. This does not mean that Member States should revise targets in line with market conditions, but rather highlights the urgency with which Member States need to address grid and permitting issues in order to deliver on their ambitions.

Solar exceeds EU targets in market outlooks, but wind falls just short

Installed capacity 2030 (GW)



Source: European Commission, SolarPower Europe, Wind Europe · Ember analysis

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Recommendations for strengthening the NECP process

Improvements to the governance of the NECP process will be essential to ensuring the plans remain effective planning tools as Europe enters the next stage of its energy transition.

Analysis of the final NECPs provides crucial insights into the EU's future energy ambitions. However, building a more complete understanding of the bloc and Member States' plans is prevented by some failures of the NECP writing process.

The European Commission is currently in the process of reviewing the regulations that govern the NECP process. In this context, we present three key criticisms of the NECP process and provide recommendations to the Commission for governance improvements.

4.1 Enforce full reporting by Member States

The Commission has provided a template for reporting key energy and climate targets as part of its implementation regulation, which includes emissions, final energy demand, electricity generation and installed capacity. Yet, few Member

States provide a complete set of data for key energy metrics covered by the reporting template. Data coverage becomes even poorer for the years post 2030. Although 2030 is the primary consideration of this iteration of NECPs, providing data and targets all the way out to 2050 is very important for providing long-term certainty to stakeholders.

In the next NECP cycle, we recommend that the Commission uses all measures available to it to enforce full and proper reporting by Member States, and if existing measures are insufficient, to consider introducing new ones.

We also recommend that the Commission ensures the reporting process is as simplified and streamlined as possible to minimise the administrative burden on Member States and better facilitate complete reporting.

Final NECPs are still lacking data on key energy metrics

Complete 2030 targets for key aspects of the energy transition are essential in providing a clear direction of travel for Member States and the EU as a whole

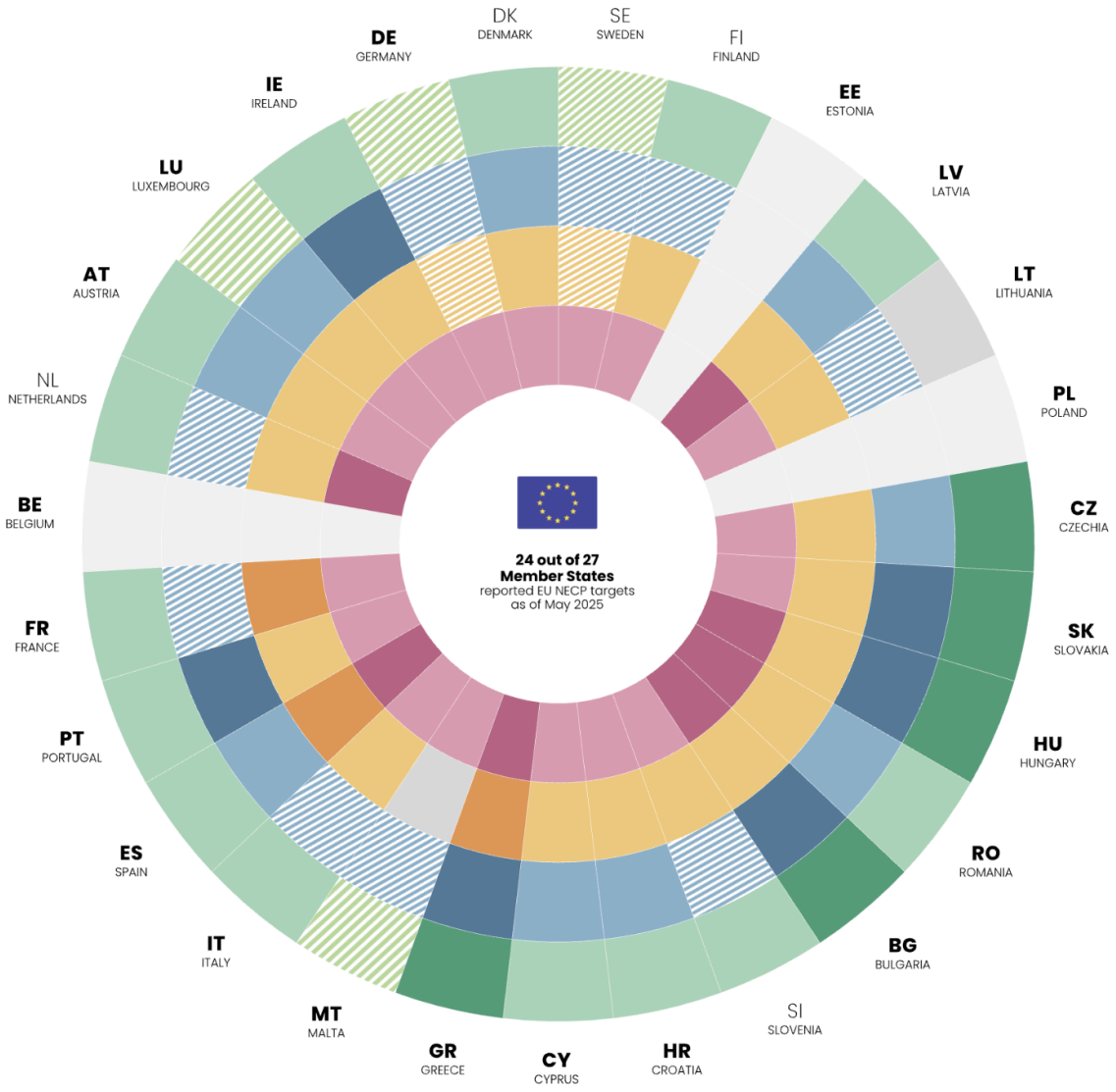
How to read the graphic*

How well each country reported their targets based on key energy transition metrics and scenarios:

Scenario used for target reporting

SE SWEDEN — Reporting under the'With Existing Measures' (WEM) scenario

AT AUSTRIA — Reporting under the 'With Additional Measures' (WAM) scenario



Source: European Commission, Ember analysis
*Methodology available in the report.
Infographic by Reynaldo Dizon. Content by Tomos Harrison.

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4.2 More comprehensive reporting requirements

The next iteration of NECPs will be looking beyond 2030 to 2040. In the coming years Europe's energy mix will become even more dominated by renewables and its energy system will become increasingly electrified. Ensuring adequate system flexibility, through improved grid infrastructure, demand side flexibility and expanded energy storage, will be essential to delivering a clean, efficient and secure energy system.

4.2.1 Expand reporting categories for new system needs

The NECP template needs to be updated to better reflect Europe's changing energy landscape and capture its key elements.

We recommend that the Commission updates the reporting template to include clear targets on electrification rate and deployment of associated key technologies (such as EVs and heat pumps).

We recommend that the template is updated to include quantified targets for storage and demand-side flexibility that are fully aligned with the flexibility needs assessment process set out in the Electricity Market Design reform. In addition to this, NECPs should include comprehensive and detailed policies and measures for delivering these targets.

We also recommend that the template is updated to include targets on grid planning. This includes planned investment volumes at the transmission level and distribution level respectively, as well as an assessment of whether external plans drawn up by TSOs and DSOs are compatible with the renewables targets set out in the NECP.

4.2.2 Increase detail on existing metrics

NECPs could also provide greater visibility of which sectors of Member States' economies will be most dependent on fossil fuels in the future. This can help

provide stakeholders with clarity on where resources can be best allocated to maximise fossil fuel displacement and accelerate the energy transition.

We recommend that the NECPs reporting requirements for final energy demand are expanded to cover all sectors of the economy (transport, buildings, industry, other sectors) and by fuel type (coal, oil, gas, electricity, renewables and biofuels, other fossil, heat).

4.3 Provide greater data accessibility

The Commission does not make data from the NECPs readily available in a single data source. This means in order to analyse and understand the EU and Member States' targets, stakeholders must examine NECPs individually, extracting data manually. Often key data will not be made clear and obvious in the documents — it can be hidden within charts or referred to only in text without clear consistency or structure. As a result, NECP data is highly inaccessible and stakeholders are faced with a huge challenge to create clear outlooks that are consistent across Member States.

It is vital that NECPs are accessible and understandable to the public, otherwise they cannot serve their purpose as roadmaps for the energy transition.

We recommend that the Commission requires all reporting templates to be completed in full and submitted digitally, after which the Commission can collate all of this information into one publicly available data source.

Methodology

Total gas consumption

In order to build a complete picture of the gas demand outlook for all 27 Member States, the NECPs were supplemented with 2030 gas demand projections from the 'National Trends +' (NT+) scenario of ENTSO's 2024 Ten-Year Network Development Plan (TYNDP).

This report defines 'gas demand' according to Eurostat's definition of 'gross inland consumption' (GIC). Twelve NECPs directly report GIC of gas in 2030. Nine NECPs report Primary consumption of gas in 2030. Primary consumption and GIC differ by inclusion of consumption for non-energy uses: GIC = Primary consumption + consumption for non-energy uses

A historic average ratio of non-energy uses to GIC was calculated for each Member State using Eurostat data. This ratio was used to convert Primary consumption to GIC where necessary.

For those NECPs that do not report GIC or primary consumption of gas, projections for total gas consumption in 2030 were taken from the NT+ scenario of ENTSO's 2024 TYNDP. Data was taken from the 'Supply Tool (MS Excel)' download available from the TYNDP website. For each Member State, GIC of gas was found as the sum of the final energy demands for 'Natural gas', 'Methane (LNG)', 'heat production (natural gas)', gas for 'Electricity generation' and gas for 'SMR'.

2023 GIC for gas was taken from the Eurostat database.

Electrification rate

Electrification rate is calculated as the ratio of electricity demand to total final energy demand. Twenty three NECPs provide data for total final energy demand in 2030. Seventeen of these NECPs also provide final energy demand for electricity. For the remaining six NECPs, projections for final energy demand for electricity were taken from the same source as gas consumption projections. The TYNDP data on final energy demand for electricity used in this report excludes the category 'Electrical heating'. When supplemented with electricity demand projections from the NT+ scenario of the 2024 TYNDP, the electrification rates of 23 out of 27 Member States can be calculated, which together cover 95% of total final energy demand in 2023.

Data quality assessment

Each NECP's coverage of data on emissions, final energy demand, electricity generation and installed capacity was classified as 'complete', 'adequate', 'inadequate' or 'missing' according to the below criteria.

Emissions

1. Complete – total emissions provided and complete breakdown of emissions by sector and sub sector
2. Adequate – total emissions provided, emissions by sector mostly provided
3. Inadequate – (not applicable here)
4. Missing – no data on emissions provided

Demand

1. Complete – total final energy demand provided, complete breakdown of final energy demand by sector by fuel provided
2. Adequate – total final energy demand provided, breakdown of demand by either fuel type or sector provided
3. Inadequate – total demand provided, none to some data on demand by fuel or sector provided
4. Missing – no data on final energy demand provided

Generation

1. Complete – total generation and data on all fuel types provided (including onshore and offshore wind split), any absent data can be clearly assumed to equate to zero values
2. Adequate – total generation, total renewables generation and total fossil generation at least provided or calculable
3. Inadequate – total generation, total renewables generation and total fossil generation not provided or calculable
4. Missing – no generation data provided

Capacity

1. Complete – installed capacity data for all fuel types provided (including onshore and offshore wind split), any absent data can be clearly assumed to equate to zero values
2. Adequate – at least data for wind and solar provided, total renewables and total fossil data provided or can be clearly inferred
3. Inadequate – at least data for wind and solar provided, data for other fuel types missing or limited meaning no totals calculable
4. Missing – no capacity data provided

Solar capacity

Solar capacity can be expressed in terms of alternating current (AC) or direct current (DC). Capacity stated in AC differs from capacity stated in DC by a factor of 1.25. However, member states do not follow a strict convention when reporting solar capacity and rarely specify whether they are reporting in terms of AC or DC. All care has been taken to ensure that the capacity numbers presented here are in units of direct current (DC, gross output). However, due to the lack of transparency on this issue in national reporting, not all capacity data can be guaranteed to be in units of DC.

REPowerEU wind capacity targets

In order to achieve a 45% share of renewables in total energy consumption, the REPowerEU plan targets 510 GW of wind capacity by 2030. However, according to WindEurope these targets assume an outdated average capacity factor for wind turbines in Europe. Using more recent capacity factors, WindEurope estimated that the goals of REPowerEU could be achieved with 440 GW of wind capacity.

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Contributors

Ember: Ali Candlin, Reynaldo Dizon, Beatrice Petrovich, Chris Rosslowe, Lauren Orso, Claire Kaelin, Leo Heberer and Izabela Urbańska.

Photo credit

Joris Van Ostaeyen / Alamy Stock Photo