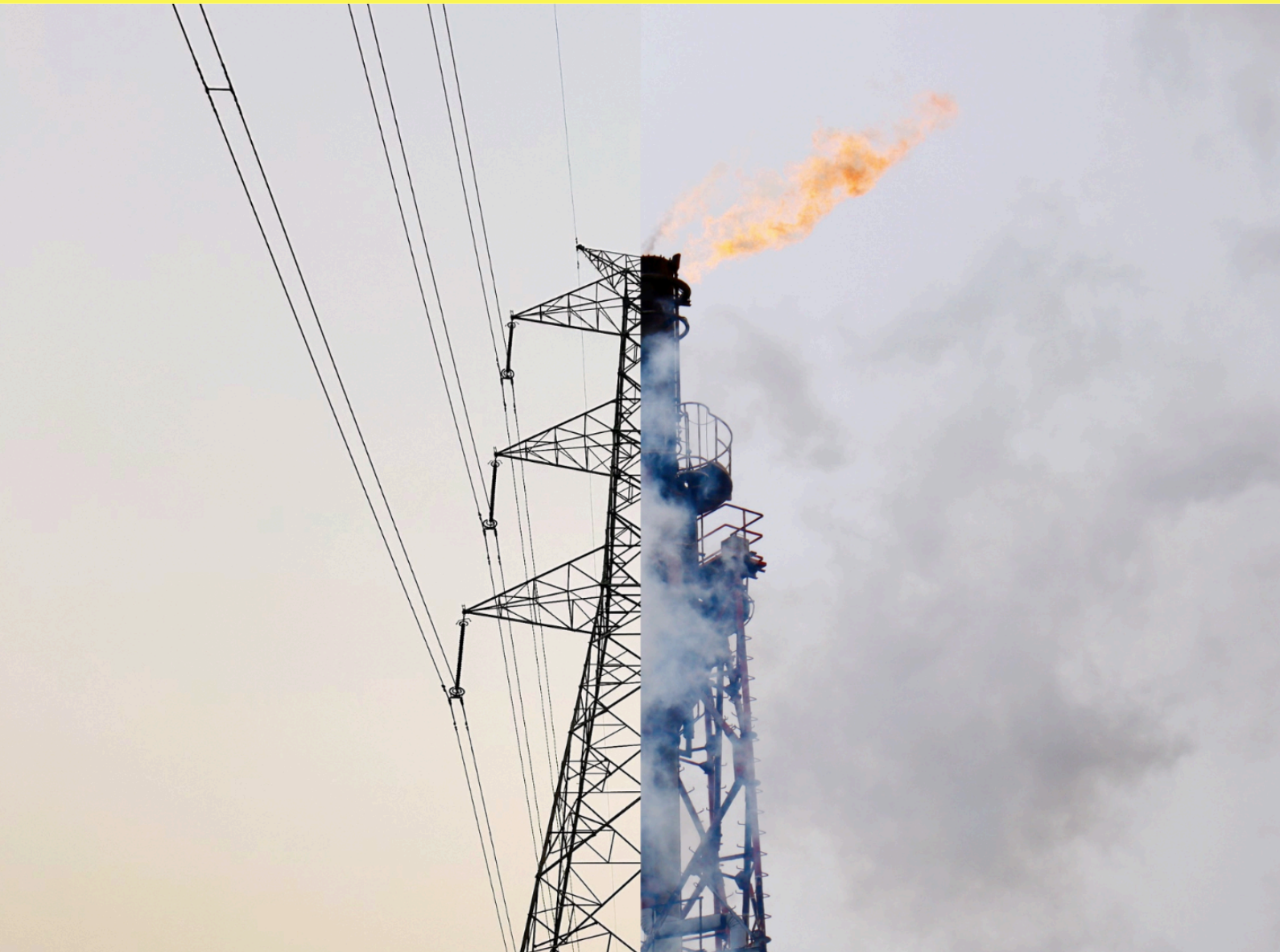
BEYOND FOSSIL FUELS

JULY 2026

Gas maths

Revealing the **fossil bias** of Europe's electricity grid operators



Gas maths: Revealing the fossil bias of Europe's electricity grid operators

The US-Israeli led conflict in Iran has once again sent global fossil fuel prices spiralling. European households and businesses find themselves paying the price for the continent's reliance on imported fossil fuels. Higher fossil gas prices have caused increases not only in gas costs but also electricity, especially in countries that rely heavily on gas to produce power.

When it comes to the electricity sector, Europe has two pathways open: lock in a new generation of gas fleets across Europe and extend the life of existing fossil plants; or invest in future-proof clean flexibility solutions that can support Europe's energy independence through renewables-based electrification.

These decisions will be ultimately driven by politics, but also informed and underpinned by the modelling and analysis of Europe's Transmission System Operators (TSOs).

Our research shows that many TSOs have been systematically underestimating fossil-free flexibility solutions, leading to a possible overestimation of the fossil gas capacity needed. This risks creating a self-fulfilling prophecy wherein gas-biased modelling is used to justify the construction of new gas plants, or the prolonged presence of existing gas plants – resulting in discrimination against fossil-free flexibility options and leaving Europe energy insecure.

We have identified a number of flaws and limitations in the current approaches, evidenced in recent analyses carried out by TSOs across several EU Member States:

- **Certain clean technologies are entirely overlooked:** We were unable to find any consideration of the flexibility that will be brought by the growing number of heat pumps and electric vehicles (EVs) in Italy's 2025 National Resource Adequacy Assessment (NRAA), nor Spain's 2024 NRAA.

- **Only 'pessimistic', not 'ambitious' clean technology growth is considered**: Both Romania and Italy consider 'realistic' and 'pessimistic/conservative', but not 'ambitious' trends in their main scenarios. More worryingly, the 'pessimistic' scenario and not the realistic one is used as the reference. This was the case to determine the

volumes of the new Italian energy storage auction. In the latest Romanian adequacy study, the main reference scenario is based on "pessimistic trends" for battery storage and prosumers, which are already outdated thanks to the recent rapid growth of storage and solar prosumers. There is no consideration of potentially more ambitious outcomes that would align better with current trends and current favorable policies.

- **Assumptions are out-of-step with market trends**: While in the past three years Italy has installed 1.5 GWh of behind-the-meter batteries on average per year, its NRAA foresees only a 3 GWh increase between 2025 and 2030. Similarly, Spain adopted an over-conservative approach for batteries: only considering the capacity that has already been granted public support.

- **The potential take-off of renewables and clean flexibility is underestimated**. The Greek TSO's latest analysis, the 2025 Ten Year Network Development Plan, will soon be outdated, despite having just been approved by the Greek regulator. The solar capacity target for 2030 should be reached in 2026. Similarly, Czechia's latest adequacy study is underestimating the foreseen increase in battery capacity.

- **The cost of gas power is underestimated, while the cost of clean technologies is overestimated.** In its assessment of storage requirements, the Italian TSO included a "conservative scenario" that is not only conservative, but unrealistic. It assumes a gas price of €22/MWh. This has not been seen since 2021, with prices above 30€/MWh even before the Iran war. Meanwhile, the battery cost is considered at 60% higher than the average price of the most recent battery auction.

- **More ambitious modelling is ignored by conservative policy makers.** In Germany, the TSO modelling of clean flexibility appears in line with more climate-aligned assumptions. It also foresees a much smaller role for gas in the future – considering that in 2045, the gas fleet could be running on average for just one hour per day. This seems out of step with the government's proposal to *de facto* exclude clean flexibility from forthcoming capacity market auctions, and to instead focus on building an expensive new fleet of gas plants.

These findings are particularly concerning given that 2026-27 will see several important policy decisions that will shape the future of Europe's energy systems, including the first set of national Flexibility Needs Assessments due in July 2026, as well as decisions on new and existing capacity markets (see box).

Key policy moments 2026-27:

Subsidy decisions which will shape Europe's energy future

TSOs are currently informing ongoing energy market processes through their analysis and assumptions. This includes the outcomes of the Flexibility Needs Assessments (FNA), as well as the introduction and operation of capacity markets. The FNA is a new, mandatory EU process wherein Member States must calculate the clean flexibility (energy storage and demand side response) needed in their country, with this analysis used to set up support schemes to boost deployment. If done properly, this could prompt Member States to set up robust legislative frameworks and subsidies to support technologies like batteries, dynamic tariffs and long duration storage. However, if the potential of clean flexibility is under-estimated in these analyses, countries could under invest in these solutions and end up relying on gas for longer than would otherwise have been necessary. The first set of FNAs are due in July 2026.

A capacity market pays power suppliers for their commitment to meet future electricity needs – rather than for energy produced – and to date, they have generally favoured thermal assets like gas plants over distributed sources of flexibility, such as batteries and demand side response. Around 60% of European capacity market contracts have been allocated to fossil fuels – with that total higher than 80% in countries like Italy and Ireland.[1]

Several countries are in the process of introducing capacity markets – including Germany, Greece, Spain, Portugal, the Netherlands and Czechia. Various existing capacity markets will require EU state aid reapproval in the coming years, as they come up to their 10-year lifespan, including Italy, Ireland and Poland.

The findings of our research point to the need for improved energy system modelling and planning which is better aligned with Europe's goal to deliver affordable, clean and secure energy.

Our recommendations

- **TSOs** must ensure their modelling is aligned with clean energy security by taking a number of steps to increase robustness and reliability:
    - Modelling assumptions should be assessed to ensure they do not contain a bias favouring incumbent, fossil assets; but take a transparent and innovative approach to better understand the potential of clean flexibility.

[1] https://beyondfossilfuels.org/2026/06/23/energy-market-wild-west-european-capacity-mechanism-2026-state-of-play/

  - Modelling assumptions and inputs, such as future technology growth, should be published under an open licence and be based on diverse and up-to-date sources of information, including academic and independent studies, and be subject to a public consultation.
  - To increase the impartiality of the scenarios in view of investment needs and to allow for seamless cooperation across energy sectors and planning levels, open-source modelling should become the standard.
  - Renewable energy and energy savings targets which reflect climate goals and on-the-ground sector growth should be used in modelling. National Energy and Climate Plans (NECPs) should be considered as a minimum, rather than the limit of potential renewables growth – with market trends taken into account to understand scenarios which could see much faster growth.
  - The cost of renewables, and particularly batteries, have been rapidly falling in a way that was not always predicted through conservative and business-as-usual scenarios. TSOs should consider much more ambitious scenarios in terms of deployment and costs.
  - Uncertainty around building and operating gas plants should be considered. Gas-fired plants construction costs have risen due to the low availability of gas turbines. Gas markets have become more volatile, with prices proving increasingly unpredictable and trending upward in recent years.

- **Energy regulators** must undertake more rigorous monitoring of TSO network planning, with a move towards independent energy system planning and operation. Where the modelling and analysis of TSOs has fallen short of the criteria outlined above, energy regulators should intervene to ensure the process is improved.

- **National governments** must ensure that energy regulators are well-resourced to critically examine the modelling and assumptions of TSOs, and have the mandate to penalise TSOs where they are not taking a climate-aligned approach.

- The **European Commission** should ensure coherence between national network plans, national Flexibility Needs Assessments, National Resource Adequacy Assessments and NECPs. It should also ensure that state aid authorisation for capacity markets only be granted if the underpinning evidence base is not biased towards gas over fossil-free flexibility. The Commission should promote a shift towards Independent System Operator and Planner at the Member State level.

- **The EU Agency for the Cooperation of Energy Regulators (ACER)** already plays an important role in ensuring that analysis from the European **Network of Transmission System Operators for Electricity (ENTSO-E)** is robust and not biased towards fossil gas. This role should be strengthened by making ACER opinions and recommendations binding, funding ACER capacity to develop independent modelling

capacity and allowing more access to TSO raw data as well as data sets from alternative sources.

Methodology

In this research, we analysed the latest reports published by nine European TSOs. The full list of references is available in the Annex. We sought to compare TSOs' modelling assumptions with ambitious but realistic trends needed for a fossil-free, renewable-based electricity system.

We compared the assumptions for renewable capacity and clean flexibility energy resources included in TSO reports with current and historic numbers and trends, NECP targets, and/or assumptions made available in other studies, such as ENTSO-E's European Resource Adequacy Assessment (ERAA). We also benchmarked them against Ember's scenarios for clean flexibility,[2] considering future trends in technologies like batteries, heat pumps and EVs. Ember's scenarios can be considered as ambitious yet attainable. They are based on data from the Ten Years Network Development Plan (TYNDP) Scenarios Input Data,[3] different countries' reports and flexibility potential analyses.

Please note: the reports analysed may not have included all the data used by TSOs, or some explanations may not have been publicly available or open to interpretation. We have strived to extract and correctly interpret the assumptions and scenarios of the different reports to the best of our understanding.

🇮🇹 Major flexibility modelling gaps could hamper Italy's storage potential

Italy generates almost half of its electricity with renewables, but remains heavily reliant on costly gas power.[4] While the current Italian government pursues a pro-fossil gas energy policy,[5] framing gas as a "transition fuel" and looking to expand LNG import infrastructure and supporting ENI's gas expansion;[6] the country has incredible potential to be a leader on cheap, clean energy.

[2] https://ember-energy.org/latest-insights/batteries-and-demand-flexibility-are-ready-to-scale-across-the-eu/
[3] https://2026.entsos-tyndp-scenarios.eu/download/
[4] https://ember-energy.org/countries-and-regions/italy/
[5] For example, see https://www.politico.eu/article/italy-calls-for-ets-suspension-pending-overhaul/
[6] https://decode39.com/14689/italy-libya-push-to-speed-up-gas-projects/

New storage assessments risk holding back Italy's battery potential

The MACSE (Meccanismo di Approvvigionamento di Capacità di Stoccaggio Elettrico) is Italy's landmark support mechanism for grid-scale battery energy storage systems (BESS). The initial tender held in 2025 smashed expectations, with clearing prices nearly 65% below the maximum price cap.[7] The combination of renewables and storage could significantly help Italy lower energy costs: Ember finds, in its European Electricity review, that combining solar with batteries in Italy could offer dispatchable clean power for around €64/MWh—almost half the €111/MWh average for gas plants in 2025.[8] Italy has already proven to be able to install batteries at a sustained rate, and has the second biggest installed battery capacity (grid-scale and behind-the-meter,[9] 8 GW), just after Germany.

Despite this, the Italian TSO Terna seems to be underestimating the country's flexibility potential. In a new assessment of storage requirements by 2029, published in May 2026,[10] Terna's assessment includes two scenarios:

1) A "base case", with gas prices at €32.4/MWh in 2030. It predicts the battery cost to be at the average winning bid price from the 2028 auction: €13,000/MWh/year.
2) A "conservative scenario", with a reduced gas price (€22/MWh). In this scenario, the battery cost is estimated at the marginal winning bid price from the 2028 auction on the Italian islands, increased by 10% to €20.9k/year.

Their "conservative scenario" appears to be unrealistic. The average gas prices have not been this low since 2021, and were above 30€/MWh even before the closure of the Strait of Hormuz.

Their conclusion is that with the base case scenario, by 2030, the efficient capacity is 104 GWh of storage; while with the conservative scenario, the efficient capacity is 42 GWh of storage. To determine the target capacity of the MACSE auction, the Ministry of the Environment and Energy Security did not use the base case scenario, but followed Terna's recommendations to use the conservative one. Italy's energy regulator ARERA issued a favorable opinion on this target.[11]

This clearly shows how unambitious and potentially misleading modelling assumptions can have a dampening impact on policy decisions. This capacity procurement will make it very challenging for Italy to reach its target of 61 GWh grid-scale battery for 2030, as foreseen in its latest NRAA.

[7] https://timera-energy.com/blog/investor-impact-of-macse-price-dive/
[8] https://ember-energy.org/latest-insights/european-electricity-review-2026/early-signs-of-the-impact-of-batteries/
[9] https://dati.terna.it/en/generation#storage
[10] https://download.terna.it/terna/Fabbisogno_di_nuova_capacita_di_stoccaggio_al_2029_8debcba830a85f3.pdf
[11] https://news.metal.com/newscontent/103835564-smm-pv-news-italys-arera-backs-16-gwh-target-for-2029-macse-storage-auction

Italy's adequacy assessment does not consider the full potential of behind-the-meter batteries

In March 2026, Terna published its 2025 NRAA.[12] While the assumptions for grid-scale batteries are quite ambitious and in line with Ember's scenarios for clean flexibility, behind-the-meter batteries could be largely underestimated. The modelling assumes only an increase of 3 GWh between 2025 and 2030, from 11 GWh to 14 GWh, and an even smaller increase of 2 GWh, from 14 GWh to 16 GWh between 2030 and 2035[13].

This is out-of-step with reality: in the past three years, the average market growth in Italy was 1.5 GWh *per year*. Maintaining this current pace would result in an additional 7 GWh every five years, significantly exceeding Terna's projection. What's more, it is unclear whether demand side response is considered in the modelling at all particularly regarding the significant potential offered by heat pumps and EVs. According to Ember's scenarios, 8% of the peak demand could for example be shifted thanks to heat pumps.

The NRAA concludes that a capacity market is still needed to guarantee sufficient thermal assets that would be economically unviable otherwise. The assumed commissioning of thermal assets (+2.9 GW between 2025 and 2030) is inconsistent with Italy's current projects. Italy currently has 5.5 GW of gas capacity planned, pre-construction and construction. All in all, the report does not provide precise numbers regarding the magnitude of thermal capacity needed, when a 2023 report from Terna stated that 50 GW of thermal capacity is needed in the medium term.

🇩🇪 Ambitious German clean flexibility scenarios overlooked

In Germany, successive governments have been working to introduce tenders for a new fleet of gas plants. The *StromVKG* (Electricity Security of Supply and Capacity Act), passed by the Bundestag on 9 July 2026, establishes subsidies for 12 GW of new dispatchable capacity,[14] designed in a way to support gas-fired power plants. Batteries are effectively excluded from 10 GW of the tender volume, while demand-side response is formally excluded altogether.

The environmental law charity ClientEarth highlights how this runs in contradiction with a number of EU rules – including technology neutrality requirements; and the fact that alternative ways to ensure energy security were not assessed.[15]

[12] https://download.terna.it/terna/National_Resource_Adequacy_Assessment_Italy_2025_8deaa98e55259ef.pdf
[13] These figures were estimated from Figure 9 of the NRAA and are therefore slightly approximate.
[14] https://www.bundeswirtschaftsministerium.de/Redaktion/DE/Pressemitteilungen/2026/05/20260513-meilenstein-fuer-die-versorgungssicherheit-strom-kapazitaetsmarkt-sichert-zukuenftig-die-versorgung-mit-strom-ab.html
[15] https://www.clientearth.org/latest/press-office/press-releases/letter-to-commission-german-gas-power-plant-plans-remain-incompatible-with-european-state-aid-laws/

However, this policy direction appears inconsistent with the scenarios considered by Germany's grid operators. In March 2026, the four German TSOs (50Hertz, Amprion, Tennet, Transnet) published the second draft of the Network Development Plan (NDP) 2037/2045.[16] In this plan, the requirements for a carbon-neutral grid were presented using three scenarios for the respective target horizons of 2037 and 2045. In it, they consider high-ambitous flexibility scenarios.

In the NDP, thermal capacity, namely gas plants running either on fossil gas or hydrogen, is calculated to be between 48.2 and 64.2 GW in 2037, and between 62.5 and 83.5 GW in 2045. Those capacities are quite similar to Germany's current installed fossil capacity (68.5 GW in 2025). However, when looking at the planned thermal generation from the NDP scenarios, it is, as expected, much lower than today's thermal generation. While there was 205 TWh of thermal generation in 2025, the scenarios foresee around 50 TWh in 2037, and around 30 TWh in 2045. In practice, it means that the capacity factors of the thermal assets would be extremely low, both for 2037 (around 10%) and 2045 (around 5%) – in comparison to around 30% today. 5% would mean that thermal plants are running on average one hour per day.

This analysis brings into question the direction of travel currently being considered by the German government. The plans to build out the gas fleet could come with upfront costs well over €20 billion,[17] raising questions of whether this would be a prudential investment, should these plants only need to run one hour per day by 2045.

Indeed, research from RBID GmbH for Deutsche Umwelthilfe finds that electricity production from solar and onshore wind power plants is comparatively cheaper than from combined cycle gas turbine (CCGT) power plants using fossil gas as fuel. This holds true even when system costs for grid expansion and electricity storage are included.[18]

🇪🇸 Spain needs to plan for a high-storage grid

Spain is widely regarded as a leader on renewable energy, and has some of the lowest wholesale electricity prices in Europe owing to the country's strong solar and wind growth, which reduced the influence of expensive coal and gas power.[19] However, the country currently has fairly limited grid scale battery capacity:[20] 0.2 GW of operating grid-scale batteries[21], with 1 GW permitted or under construction, and 6 GW announced.[22]

[16] https://www.netzentwicklungsplan.de/sites/default/files/2026-04/EN_NDP-compact_2037_2045_V2025_2nd_draft_3.pdf
[17] https://www.duh.de/fileadmin/user_upload/download/Projektinformation/Energiewende/20260426_RBID_Systemkostenvergleich_Erdgas_-_PV_-_Wind_an_Land.pdf
[18] https://www.duh.de/fileadmin/user_upload/download/Projektinformation/Energiewende/20260426_RBID_Systemkostenvergleich_Erdgas_-_PV_-_Wind_an_Land.pdf
[19] https://ember-energy.org/latest-insights/renewables-shield-spanish-consumers-from-elevated-gas-prices/
[20] https://elperiodicodelaenergia.com/comienza-la-era-de-las-baterias-en-espana-ya-hay-conectados-125-mw/
[21] https://www.ree.es/en/datos/storage/installed-capacity-storage
[22] https://ses.jrc.ec.europa.eu/storage-inventory

Spain will need to rapidly expand this to reap the full benefits of cheap, homegrown renewable energy. The country has taken steps towards boosting clean flexibility – such as strengthening the ability of independent aggregators to participate in energy markets,[23] as well as Brussels' approval of a €9 billion capacity market,[24] which if well designed, could help foster the market for new battery storage units.[25] However, it is not clear whether the grid is being planned in line with this much needed rapid expansion of storage capacity.
In September 2025, the Spanish TSO Red Eléctrica published its latest NRAA.[26] The EU energy watchdog, ACER, published an opinion on it in November 2025.[27] Compared to the ERAA, the analysis considered significantly lower battery capacity, in particular for grid-scale. While the ERAA scenario contained 7 GW for Spain, Red Eléctrica only considers 1.5 GW of grid-scale battery in its NRAA. Meanwhile, Ember's scenario predicts 6.7 GW of grid-scale batteries, close to the ERAA numbers.

Red Eléctrica justifies that they have only considered the capacity that has already been granted public support, and that the "*expected expansion of storage is subject to the implementation of a capacity market*" which at the time of writing, had not been approved by the European Commission. ACER did not support this adjustment and commented that "*taking battery projects already under financial support as the sole basis for future capacity expansion is deemed overly conservative.*"[28]

In May 2026, the European Commission approved the capacity market.[29] Spain now needs to ensure that the money is targeted at the development of clean flexibilities, and that Red Eléctrica is planning the grid for future potential volumes of energy storage, with updated scenarios reflecting higher-ambition outcomes – building genuine resilience and preventing the kind of blackouts that expose the fragility of fossil-dependent systems.

🇬🇷 Greece's just approved network plan soon to be out-of-date

Greece has increased its gas-fired power reliance in recent years, and is looking to position itself as a regional strategic hub for gas.[30] However, recent lessons show how Greece can

[23] https://www.energiaestrategica.com/strategicenergy/en/notes/spain-regulates-independent-aggregators-unlocking-new-power-flexibility-model
[24] https://elpais.com/economia/2026-05-29/bruselas-autoriza-a-espana-a-pagar-9000-millones-a-las-electricas-para-garantizar-la-estabilidad-del-suministro.html
[25] https://www.energiaestrategica.com/es/notes/subasta
[26] https://www.ree.es/sites/default/files/14_OPERACION/Documentos/20250901_SpanishPeninsularPowerSystem_NRAA_ERAA24.pdf
[27] https://www.acer.europa.eu/sites/default/files/documents/Official_documents/Acts_of_the_Agency/Opinions/Opinions/ACER-Opinion-11-2025-Spanish-National-Resource-Adequacy-Assessment.pdf
[28] https://www.acer.europa.eu/sites/default/files/documents/Official_documents/Acts_of_the_Agency/Opinions/Opinions/ACER-Opinion-11-2025-Spanish-National-Resource-Adequacy-Assessment.pdf
[29] https://ec.europa.eu/commission/presscorner/detail/en/ip_26_1163
[30] https://ieefa.org/resources/greece-increases-gas-fired-power-reliance

reduce energy costs via increasing clean energy sources.[31] This February, when increased electricity production from wind and hydropower displaced significant amounts of fossil fuels, the impact on wholesale electricity prices was striking. The average price dropped to €78.4/MWh—almost half (-49.2%) compared to last year.

When it comes to energy system planning, the latest document published by the Greek TSO, ΑΔΜΗΕ (ADMIE, IPTO), is the TYNDP 2025-2034[32], submitted for public consultation in August 2025 and approved by the Greek energy regulator in May 2026. The analysis by ΑΔΜΗΕ contains the latest NECP renewable targets for Greece. Yet, those assumptions will soon be outdated. For example, the solar capacity target for 2030 will very likely already be reached in 2026.[33] The other clean flexibility assets (batteries, EVs, heat pumps, etc) do not seem to be considered in the development plan.

The Greek example reminds how quickly renewables and clean flexibility can gain ground, and even exceed TSOs' expectations, particularly when they were unambitious to start with. This serves as a reminder that modeling studies must be kept up to date with current trends and technologies.

🇷🇴 Romania seriously underestimating flexibility and solar potential

While Romania has been pursuing a push towards fossil gas,[34] the country has good potential for solar and wind power. Romania has surpassed 7 GW of installed solar capacity, installing 2.2 GW in 2025 alone.[35] Romania has also entered its battery era, with installed capacity having grown significantly, and recently surpassed 1 GWh.[36]

Despite this market growth, official documentation and strategies tend to take a more conservative approach. Romania's strategic target of 2 GW of BESS by 2030 is already expected to be exceeded by the end of 2026.[37]

In April 2026, the Romanian TSO, Translectrica, published a study on the adequacy of the system for 2027, 2030 and 2035.[38] The adequacy study is composed with one reference scenario and three alternative scenarios.

[31] https://thegreentank.gr/en/2026/03/16/res-prices-feb-march-2026-en/
[32] https://www.raaey.gr/energeia/diavoulefseis/116083/
[33] https://balkangreenenergynews.com/greece-to-hit-its-2030-goal-for-solar-power-already-next-year/
[34] https://bankwatch.org/blog/romania-s-gas-trap-fossil-fuel-expansion-threatens-clean-energy-transition
[35] https://www.pv-magazine.com/2026/01/14/romania-installs-2-2-gw-of-solar-in-2025/
[36] https://energyindustryreview.com/power/romania-enters-the-battery-era/
[37] https://energyindustryreview.com/power/romania-enters-the-battery-era/
[38] https://www.transelectrica.ro/documents/10179/22561337/Raport+Public+-+Studiu+de+Adecvanta+SEN+2027+2030+2035.pdf/fb9116f1-0bb6-46fa-9738-96cbca6f4534

The reference scenario includes, according to Transelectrica, “pessimistic” trends in installed capacity for prosumers and batteries. For batteries, they assume 0.5 GW for 2027, and 1.2 GW in 2030 and 2035. This is not only “pessimistic” but already outdated. The 2027 estimate has already been surpassed, and the 2030/2035 estimates should be largely reached by the end of 2026.

Similarly, the assumptions for grid-scale solar and prosumer solar capacities do not match the recent solar boom. The reference scenario foresees a 2.2 GW increase in solar between 2027 and 2035, and a 2.7 GW increase in prosumer solar capacity. In practice, in 2025, in only one year, solar prosumer capacity increased by 1 GW, and solar utility-scale projects by 1.2 GW.

Given the recent positive developments for solar, prosumers and batteries, there is a widening gap between the report's assumptions and the actual trajectory. In its opinion on the Romanian NRAA[39] published on 10 July, ACER deplores the conservative battery deployment trajectory, that they do not consider consistent with the ongoing renewable energy expansion and favourable policies. ACER also criticises the absence of demand side flexibility when new demand side flexibility regulatory measures[40] where recently introduced by Romania.This underscores once more the importance to consider more realistic and ambitious targets, in adequation with recent deployment and policies.

Translectrica recommended against implementing a capacity market due to *“the high implementation costs and the possibility of meeting the adequacy needs criteria without these additional reserves”*. They advise for a strategic reserve of fossil gas power stations (over 1 GW by 2035). However, a better consideration of future clean flexible assets and renewable capacity in the modelling could reduce the need for costly strategic reserves of gas, and put Romania on a better path for energy independence.

🇨🇿 Battery boost overlooked in Czechia

Energy market experts are predicting that recent regulatory changes in Czechia could support a considerable build-out in utility-scale battery energy storage – allowing batteries to participate in wholesale markets and in balancing markets, with simplified connection procedures.[41] However, this potential boost is not reflected in the energy system analysis of the country’s TSO, ČEPS.

[39] https://www.acer.europa.eu/sites/default/files/documents/Official_documents/Acts_of_the_Agency/Opinions/Opinions/ACER-Opinion-14-2026-Romanian-National-Resource-Adequacy-Assessment.pdf
[40] https://anre.ro/proiect-de-ordin-pentru-aprobarea-regulamentului-privind-serviciul-de-flexibilitate-a-consumului/
[41] https://www.ess-news.com/2025/11/14/utility-scale-bess-to-drive-czechias-storage-market/

ČEPS's most recent energy system study assesses the adequacy of the energy supply until 2040, published in October 2024.[42] It is another clear example of how the rapid development in the battery sector was not fully anticipated in the modelling assumptions.

ČEPS analyses two scenarios. The first one is called "respondent" and assumes 3.6 GW of coal in 2030 based on thermal operators' self-declared plans and intentions, with less ambitious targets for renewables, and no demand side response. The second is called "progressive", and assumes a coal phase out by 2030, more solar and wind, as well as more batteries and demand side response.

In both scenarios, battery capacity is modelled at a much lower level than Ember's scenarios for flexibility: 2.5 GW in "respondent", and 2.9 GW in "progressive" in 2030. In comparison, Ember's scenario foresees 6.5 GW in 2030, more in line with current trends and potential.

ČEPS recognises in the study that "*As work on the study took place during 2023, the figures for the near future may not fully reflect the current accelerated development of installations*." This highlights once more that the high speed of development of new technologies can be difficult to anticipate for TSOs.

With Czechia's capacity market now approved by the European Commission,[43] it is particularly important that these much more ambitious market projections for growth in clean flexibility are properly integrated into future modelling, to ensure that the country does not over-procure expensive gas plants.

[42] https://www.ceps.cz/cs/novinka/ceps-vydava-maf-cz-2023-analyzuje-zdrojovou-primerenost-do-roku-2040
[43] https://beyondfossilfuels.org/2026/06/23/energy-market-wild-west-european-capacity-mechanism-2026-state-of-play/

Annex: TSO reports analysed in this report

Country	TSO	Name of the study	Date of publication	Link
Italy	Terna	Fabbisogno di nuova capacità di stoccaggio al 2029 (Requirements for new storage capacity by 2029)	April 2026	https://download.terna.it/terna/Fabbisogno_di_nuova_capacita_di_stoccaggio_al_2029_8debcba830a85f3.pdf
Italy	Terna	2025 National Resource Adequacy Assessment for Italy	March 2026	https://download.terna.it/terna/National_Resource_Adequacy_Assessment_Italy_2025_8deaa98e55259ef.pdf
Germany	50Hertz, Amprion, Tennet, Transnet	Network Development Plan Electricity 2037 (NDP)	March 2026	https://www.netzentwicklungsplan.de/sites/default/files/2026-04/EN_NDP-compact_2037_2045_V2025_2nd_draft_3.pdf
Spain	REE	Spanish peninsular power system National Resource Adequacy Assessment	September 2025	https://www.ree.es/sites/default/files/14_OPERACION/Documentos/20250901_SpanishPeninsularPowerSystem_NRAA_ERAA24.pdf
Greece	Admie	ΔΕΚΑΕΤΈΣ ΠΡΌΓΡΑΜΜΑ ΑΝΆΠΤΥΞΗΣ ΣΥΣΤΉΜΑΤΟΣ ΜΕΤΑΦΟΡΆΣ 2025-2034 (The Ten-Year Development Plan 2025–2034)	August 2025	https://www.raaey.gr/energeia/diavoulefseis/116083/
Romania	Transelectrica	Studiu de adecvanță a SEN pentru orizontul 2030 (Study on the adequacy for the 2030 horizon)	April 2026	https://www.transelectrica.ro/documents/10179/22561337/Raport+Public+-+Studiu+de+Adecvanta+SEN+2027+2030+2035.pdf/fb9116f1-0bb6-46fa-9738-96cbca6f4534
Czechia	ČEPS	Hodnocení zdrojové přiměřenosti ES ČR do roku 2040 (Assessment of the adequacy of the Czech Republic's energy supply up to 2040)	October 2024	https://www.ceps.cz/cs/novinka/ceps-vydava-maf-cz-2023-analyzuje-zdrojovou-primerenost-do-roku-2040

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