

The role of legal frameworks in enabling energy storage: comparative insights from Germany, Austria and Romania within the European context

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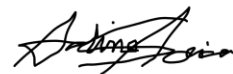
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Affidavit

I, **ADINA STOICA**, hereby declare

1. that I am the sole author of the present Master's Thesis, "THE ROLE OF LEGAL FRAMEWORKS IN ENABLING ENERGY STORAGE: COMPARATIVE INSIGHTS FROM GERMANY, AUSTRIA AND ROMANIA WITHIN THE EUROPEAN CONTEXT", 66 pages, bound, and that I have not used any source or tool other than those referenced or any other illicit aid or tool, and
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Abstract

This master's thesis investigates the pivotal role of energy storage in enhancing the flexibility of energy supply and demand, a crucial element for the successful integration of RES and the achievement of European decarbonization targets. The research specifically analyzes the complex interplay between energy storage deployment and the evolving legislative landscapes at both European Union and national levels comprising the legal framework in Germany, Romania, and Austria.

The choice of Germany, Romania, and Austria as case studies for analyzing the legal framework for energy storage is driven by their complementary positions within the European Union's energy landscape and their different stages of regulatory maturity.

Germany represents a highly advanced and mature market for renewable energy and storage solutions. It has one of the most developed legal and regulatory frameworks in Europe, shaped by its ambitious Energiewende policy and strong commitment to decarbonization. Germany currently offers the most mature and predictable permitting regime for energy-storage projects. The inclusion of storage in the Renewable Energy Sources Act and in the Energy Industry Act clarifies that storage is an independent energy activity, not classified as generation or consumption. This allows German developers to benefit from standardized procedures at federal and Länder level, as well as clear environmental-impact and building-code guidance. Examining Germany provides valuable insights into how a sophisticated legal environment supports large-scale deployment of storage technologies, integration into electricity markets and incentivization through regulatory instruments.

Romania, as an emerging market in the EU energy sector, stands at a different stage of development. While its renewable energy sector has grown significantly, the regulatory framework for energy storage is still evolving. Romania's permitting process remains lengthy and involves multiple authorities, with no standardized procedures or clear timelines. Unlike Germany and Austria, Romania has a single legislative framework applicable nationwide; however, the absence of uniform processes and defined timelines continues to pose challenges. Additionally, there is still no functioning market for Guarantees of Origin (GoOs), as the regulation transposing the Electricity Market Directive has been adopted but lacks an implementing methodology.

Austria offers an interesting comparative perspective, as it combines elements of a developed Western European regulatory framework with a strong focus on renewable energy and cross-border energy integration within the Central European region. Similar to Germany, Austria's permitting process is divided between federal and regional levels, which can lead to variations from one region to another. However, the draft EIWG introduces simplified procedures and standardized forms. Austria plays a pivotal role as a bridge between Western and Central-Eastern Europe, making its regulatory approach highly relevant for understanding how storage frameworks can support regional electricity markets and cross-border balancing.

By analyzing these three countries together, the thesis can capture a spectrum of regulatory approaches: from a leading innovator (Germany) to a regional integrator with hybrid characteristics (Austria), to an emerging framework still in formation (Romania). This comparative approach will not only illustrate best practices and gaps but also provide a nuanced understanding of how different legal contexts influence the deployment of energy storage solutions across the EU.

This workpaper examines the regulatory framework applicable to large-scale utility BESS, while providing only brief references—without extensive analysis—to other storage technologies such as pumped hydro storage, electrolysers, and decentralized storage solutions for small-scale community energy systems.

The primary objective is to dissect the parameters influencing the legal framework governing the regulation of energy storage in terms of definition, permits and licensing, charges and guarantees of origins. To this end, the thesis will undertake a comprehensive comparative analysis of national laws, examining key criteria such as juridical status, network access and fiscal regimes applicable to energy storage. The envisaged outcome is to identify best practices, pinpoint existing blocking points within current regulatory structures and propose actionable directions for policy development to accelerate energy storage implementation and effectively meet the European targets for RES electricity.

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List of Abbreviations

ACER	European Union Agency for the cooperation of Energy Regulators
AIB	Association of Issuing Bodies
BauGB	Baugesetzbuch or the Federal Building Code in Germany
BESS	Battery Energy Storage System
BNetzA	Federal Network Agency in Germany
Construction Law	Law No. 50/1991, which regulates the authorization of construction works in Romania
DSO	Distribution System Operator
E-control	Energie-Control Austria- the Austrian Regulatory Body for Electricity and Natural Gas Market
EEG	Erneuerbare-Energien-Gesetz or Renewable Energy Sources Act in Germany 2023
Electricity Market Directive	Directive (EU) 2019/944, of the European Parliament and of the Council of 5 June 2019 on Common Rules for the Internal Market for Electricity and amending Directive 2012/27/EU (Recast)
Electricity Regulation	Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the Internal Market for Electricity
EIA	Environmental Impact Assessment
EnWG	Energiewirtschaftsgesetz/ Energy Industry Act in Germany
Energy Law	Electricity and Natural Gas Law No 123/2012 in Romania
EnFG	Energiefinanzierungsgesetz or Energy Financing Act in Germany, 2023
ENTSO-E	European Network of Transmission System Operators For Electricity
EnUG	Energie-Umlagen-Gesetz in germany or Energy Surcharge Act
EGO	Emergency Government Ordinance
EGO 134/2024	Emergency Ordinance No. 134/2024 amending and supplementing Law No. 123/2012 on Electricity and Natural Gas, as well as amending Article 2(I) and (K) of Law No. 220/2008 Establishing the System For Promoting the Production of Energy From Renewable Energy Sources
EIWOG	Elektrizitätswirtschafts- und -Organisationsgesetz 2010 or Austrian Federal Law Consolidated: Complete Legal Provisions for the Electricity Industry and Organisation Act 2010, Version Of 27 August 2025
EIWG	Elektrizitätswirtschaftsgesetz Or Austrian Electricity Market Act - July 2025 (Draft)
EU	European Union
GoOs	Guarantees of Origin
GW	Gigawatt
GWh	Gigawatt-hour
REA	Federal Act on the Expansion of Energy From Renewable Sources (Renewable Energy Expansion Act), Enacted in July 2021
RED I	Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001

RED II	Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast)
RED III	Directive (EU) 2023/2413 of the European Parliament and of the Council of 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652
REO	Renewable Energy Ordinance in Germany, enacted in 2012
RES	Renewable energy source/s
MS	European Member States
MWh	megawatt-hour
NERA	National Energy Regulatory Authority in Romania
NECPs	National Energy and Climate Plans
NRRP	National Recovery and Resilience Plan
NPS	Romanian National Power System
NRA	National Regulatory Authority
New Electricity Market Directive	Directive (EU) 2024/1711 of the European Parliament and of the Council of 13 June 2024 amending Directives (EU) 2018/2001 and (EU) 2019/944 as regards improving the Union's Electricity Market Design
PPA	Power Purchase Agreement
StromStG	Stromsteuergesetz or Electricity Tax Act in Germany
StromNEV	Energy Grid Fees Ordinance
Storage resolution	Resolution on a Comprehensive European Approach to Energy Storage (2019/2189(INI)) Of European Parliament issued on 10 July 2020
TCA	Technical Connection Approval in Romania
TSO	Transmission System Operator
UDB	Union Database
Urbanism Law	Union Database Law No. 350/2001 on territorial planning and urbanism in Romania

1. Introduction

The need to enhance the performance and resilience of electricity grids has become increasingly evident in light of rising energy demand and the growing integration of RES. Conventional grid infrastructure was originally designed to accommodate centralized and predictable power generation. However, the modern energy mix is far more decentralized and variable, with a significant number of RES installations—particularly solar and wind—whose output is inherently intermittent.

The energy crisis following the conflict in Ukraine underscored the need for a more self-sufficient and robust electricity grid in Europe. In this context, the ability to store electricity and deploy it when needed has become a strategic asset. Energy storage, alongside other flexibility measures such as demand response and interconnectors, is now recognized as a critical enabler of energy resilience.

This shift presents substantial operational challenges for grid operators, who must now manage greater volatility in electricity supply while ensuring system stability and reliability. Such fluctuations can result in imbalances, service disruptions, or the activation of costly reserve generation, particularly during periods of peak demand or reduced renewable output.

Energy storage facilities are increasingly recognized as a viable and strategic tool to mitigate these risks. By storing excess energy generated during low-demand or high-output periods and releasing it during times of need, energy storage contributes to balancing supply and demand in real time. This not only improves grid stability but also reduces reliance on fossil fuel-based peaking plants, thereby supporting decarbonization targets.

Furthermore, energy storage facilities can provide ancillary services essential to grid functionality, including frequency regulation, voltage control and emergency backup. From a legal and regulatory standpoint, the integration of energy storage into the grid raises key questions regarding market access, licensing, grid connection rights and the classification of storage within the energy value chain. As battery technologies mature and become more cost-effective, there is a growing need for clear and adaptive regulatory frameworks to facilitate their deployment and ensure their optimal contribution to grid stability and energy transition objectives.

From a policy perspective, energy storage emerged as a clear policy priority for the European Union in the mid-2010s, when the growing penetration of RES highlighted the need for flexibility, system stability and security of supply. While early legislation, such as the 2009 RED 1¹, did not place storage at the center of EU energy policy, the situation shifted with the 2015 Energy Union Strategy² and most decisively, with the Clean Energy for All Europeans Package (2016–2019)³. This package formally recognized storage as a distinct activity within the electricity market and

¹ Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources

² European Commission, A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy, COM(2015) 80 final, 25 February 2015.

³ European Commission, Clean Energy for All Europeans Package, adopted 2018–2019 (including Electricity Directive (EU) 2019/944 and Electricity Regulation (EU) 2019/943)

established principles to ensure fair market access and to prevent practices such as double charging. Subsequent initiatives, including the European Green Deal (2020)⁴ and the REPowerEU Plan (2022)⁵, further consolidated energy storage as a cornerstone of EU energy policy, positioning it not only as an enabler of decarbonization but also as a strategic tool for enhancing energy security and resilience.

1.1. Core objectives

The main purpose of this thesis is to examine how legal and regulatory frameworks influence the deployment of energy storage in the EU, with a specific focus on Germany, Romania and Austria. The analysis will focus on the legal status quo of energy storage and the draft bills that are under public consultation both at EU and national levels. Further on, the permitting, licensing, and network tariff structures will be examined to determine whether current frameworks facilitate or hinder large-scale storage projects, especially utility-scale energy storage systems. The role of GoOs will be assessed in relation to energy storage and herein will be assessed the way the three MS ensure transparency and avoid double counting on GoOs.

1.2. Method of Approach

The thesis adopts a comparative legal analysis method, systematically examining EU-level and national laws governing energy storage. It is reviewing primary legal sources (EU directives, regulations, statutes, ordinances and agency guidelines) to interpret how each rule treats storage. Germany, Romania and Austria were chosen as case studies precisely because they occupy complementary positions in the EU energy landscape and exhibit different regulatory maturity levels. By contrast, examining only one country or using purely quantitative methods would miss important legal divergences. The chosen method therefore compares how EU directives (e.g. on electricity markets and renewables) are transposed and implemented in each country. In practice this involves identifying the legal status of storage deriving from definitions, examining permitting procedures, access and charges in each jurisdiction. This legislative, comparative approach highlights differences and commonalities in the legal frameworks, helping to pinpoint barriers and best practices considering EU energy objectives.

1.3. Structure

Chapter 2 outlines the EU-level policy rationales behind promoting renewables and storage, covering climate, economic competitiveness, energy security and social objectives, while Chapter 3 explains why energy storage is essential for integrating variable renewables – discussing grid flexibility, electrification trends, and case studies (e.g. the 2025 Iberian blackout) that underscore storage's role. In Chapter 4 is reviewed the existing EU legal instruments on storage (e.g. definitions and binding rules in the Clean Energy Package and RED II/III). Chapter 5 analyzes EU frameworks in depth: how the Electricity Market Directive and Electricity Regulation treat storage in terms of definitions, market access, unbundling, network tariffs. Chapter 6 presents national case studies. It is subdivided by country (Germany, Romania, Austria) and by topic (legal definition, permitting,

⁴ European Commission, The European Green Deal, COM(2019) 640 final, 11 December 2019

⁵ European Commission, REPowerEU Plan, COM(2022) 230 final, 18 May 2022

grid connection, charges, recent reforms). Chapter 7 examines the EU GoOs regime and its national implementation for storage where is compared how each state treats GoOs when electricity is stored and reinjected in the grid. Finally, Chapter 8 draws together the findings and compares the three systems to identify common trends, best practices and gaps, and suggests how national frameworks could be improved in line with EU decarbonization targets. Chapter 9 highlights potential policies' recommendation to be envisaged for the future and Chapter 10 responds to the question what the role of legislation at EU and national level in is supporting the energy transition.

This flow – from EU rationale to EU law to national specifics and back to comparative lessons – ensures coherence. The thesis starts at the broad EU level (policy drivers and harmonized rules) and then focuses on each country's treatment of storage, before synthesizing cross-country insights and recommendations.

1.4. Major Literature

This thesis draws upon a wide spectrum of legal and policy sources that collectively shape the debate on energy storage within the EU. At the foundation are key pieces of EU legislation, most notably the Electricity Market Directive and the Electricity Regulation. These are complemented by RED II and RED III, as well as the European Climate Law, which enshrines the EU's climate neutrality objective for 2050. Building on these binding instruments, the analysis also incorporates guidance from EU regulatory bodies, particularly the ACER, whose reports emphasize tariff reform and fair market conditions for storage. National regulators such as BNetzA in Germany, NARE in Romania, and E-Control in Austria provide further operational detail on how European principles are transposed into domestic frameworks.

Beyond the legal instruments, the thesis also situates storage within the context of EU policy initiatives, including the European Green Deal (2019), the REPowerEU Plan (2022), and the Fit-for-55 Package. The more recent Net-Zero Industry Act further elevates storage by linking it to industrial competitiveness and clean technology leadership. Industry literature, particularly publications by the European Association for Storage of Energy, Eurelectric, and the International Energy Agency, provides insights into market dynamics, investment barriers, and best practices across jurisdictions.

Finally, the national legal frameworks of the three case study countries—Germany's EEG and EnWG, Romania's Electricity Law and Emergency Ordinance 134/2024 and Austria's ElWOG and draft ElWG—serve as essential references for comparative analysis.

All references to legislation in this thesis concern the legal framework of the European Union, Germany, Romania, and Austria, as applicable up to September 2025. References to legislative drafts intended to amend or supplement the legal framework in force are cited for analytical purposes only and may be subject to subsequent amendments, modifications, or deviations from the form presented in this thesis.

2. The rationale behind the legal framework for RES deployment in the EU

The legal and regulatory framework governing the deployment of RES across the EU has evolved in response to a complex and interlinked set of policy rationales. These rationales—rooted in climate imperatives, energy security, socio-economic development, and market stability—have collectively shaped a strong normative push toward accelerating the expansion of utility-scale renewable projects and the integration of energy storage solutions.

2.1. Climate and Environmental Rationale

At the core of the European legislative response lies the imperative to combat climate change. The EU is a signatory to the Paris Agreement and has enshrined its commitments into binding legal instruments, most notably through the European Climate Law (Regulation (EU) 2021/1119). This regulation mandates climate neutrality by 2050 and a reduction of greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels. To meet these targets, the decarbonization of the energy sector, one of the largest contributors to emissions—requires an unprecedented scale-up of RES capacity. Energy storage plays a critical role in this process, ensuring that intermittent sources such as solar and wind can provide stable, dispatchable power and contribute reliably to a climate-compatible energy system.

2.2. Economic and Industrial Competitiveness

From an economic perspective, RES have transitioned from a subsidized niche to a competitive pillar of industrial policy. The declining cost curves for solar photovoltaics, onshore and offshore wind, and energy storage technologies have shifted the rationale from support-based to investment-based models. Storage is increasingly recognized as an industrial sector, with value chains spanning batteries, green hydrogen, and innovative grid-balancing technologies. At the same time, global competition in clean technologies has spurred the EU to strengthen its internal market for green energy through instruments such as the Green Deal Industrial Plan and REPowerEU. Legal reforms across Member States now aim to reduce administrative barriers and create bankable, investment-friendly environments not only for large-scale RES developers, but also for energy storage operators⁶.

2.3. Energy Security and Strategic Autonomy

The war in Ukraine that started in 2022 changed the way Europe thinks about energy strategy. The EU's excessive reliance on imported fossil fuels, especially Russian gas, put the cost, reliability, and political stability of energy at jeopardy. In this situation, RES deployment was no longer only an environmental or economic policy; it became a geopolitical need as well. The REPower EU Plan (2022) is the government's answer to this situation. It calls for faster permits, and cross-border infrastructure to make RES part of a safe and strong energy system. Energy storage is a cornerstone of this strategy, enabling Europe to reduce dependence on external gas imports by securing flexible

⁶ Recital 11 of RED III

balancing capacity, maintaining grid stability, and supporting cross-border electricity flows in times of supply shocks (Communication RePower EU, 2022).

2.4. Social and Distributional Rationale

The transition to RES also carries social dimensions. The clean energy shift is designed to generate new employment opportunities, reduce energy poverty, and enable participatory models such as energy communities and citizen-led RES projects. Storage technologies—from community-scale batteries to prosumer-level home systems—expand opportunities for citizen participation and energy self-sufficiency, fostering resilience at the local level⁷. EU law increasingly integrates social safeguards and public participation mechanisms, reflecting the fair transition principle as a cornerstone of energy law.

The International Court of Justice ruled that “a clean, healthy and sustainable environment” is a human right and breaking such right may represent a failure to comply with the international law provisions. This decision opens the door for the states for disputes among them due the climate changes (ICJ, 2025).

2.5. Legal Response and Harmonization

The cumulative effect of these rationales has been a continuous legal evolution at both EU and national levels. Key directives, including the RED III, and its proposed recast under the Fit for 55 packages, have harmonized targets and procedures across MS. Crucially, these frameworks now increasingly recognize energy storage as a distinct activity in the electricity sector, establishing rules for market participation, ownership, and access to flexibility and balancing markets. These instruments are complemented by regulatory reforms on grid access, storage integration, permitting acceleration, and priority dispatch for RES. Moreover, EU competition and state aid law has been adapted to allow public support not only for RES projects, but also for storage facilities, under certain conditions, reflecting the market's transition toward carbon-neutrality and the systemic role of storage in providing security of supply and flexibility (EU Commission Guideline , 2022).

3. Energy Storage: a prerequisite for large-scale RES integration

3.1. EU Electricity Grid Outlook

Europe has the largest interconnected electricity grid in the world, with over 400 interconnectors serving nearly 600 million people (Inside the world’s largest interconnected grid, 2024). The system is operated, expanded, and managed by the continent’s TSOs. These 40 TSOs collaborate through ENTSO-E (ENTSO-E Mission), which oversees the coordination and development of the integrated power network across Europe. As the share of variable RES grows, the integration of

⁷ Article 2 (11) of RED II

energy storage into this grid infrastructure becomes essential for ensuring stability, reducing curtailment, and enabling cross-border electricity balancing.

3.2. Increase of electrification

As the European goals set under the Green Deal the overarching goal for the EU to become the **first climate-neutral continent by 2050** (The European Green Deal, 2019). The Member states are obliged to contribute to the decarbonization plan and among other obligations, to deploy RES power plants. Energy storage acts as a structural enabler of this process by ensuring that the electricity system can accommodate increasing shares of variable renewable generation while maintaining reliability. To this end, between 2019 and 2024 the EU nearly doubled its combined wind + solar capacity, driving a decisive shift in the electricity generation mix toward renewables. Yet this expansion also revealed the necessity of parallel investments in storage technologies—from batteries to pumped hydro and emerging hydrogen storage—to optimize renewable integration.

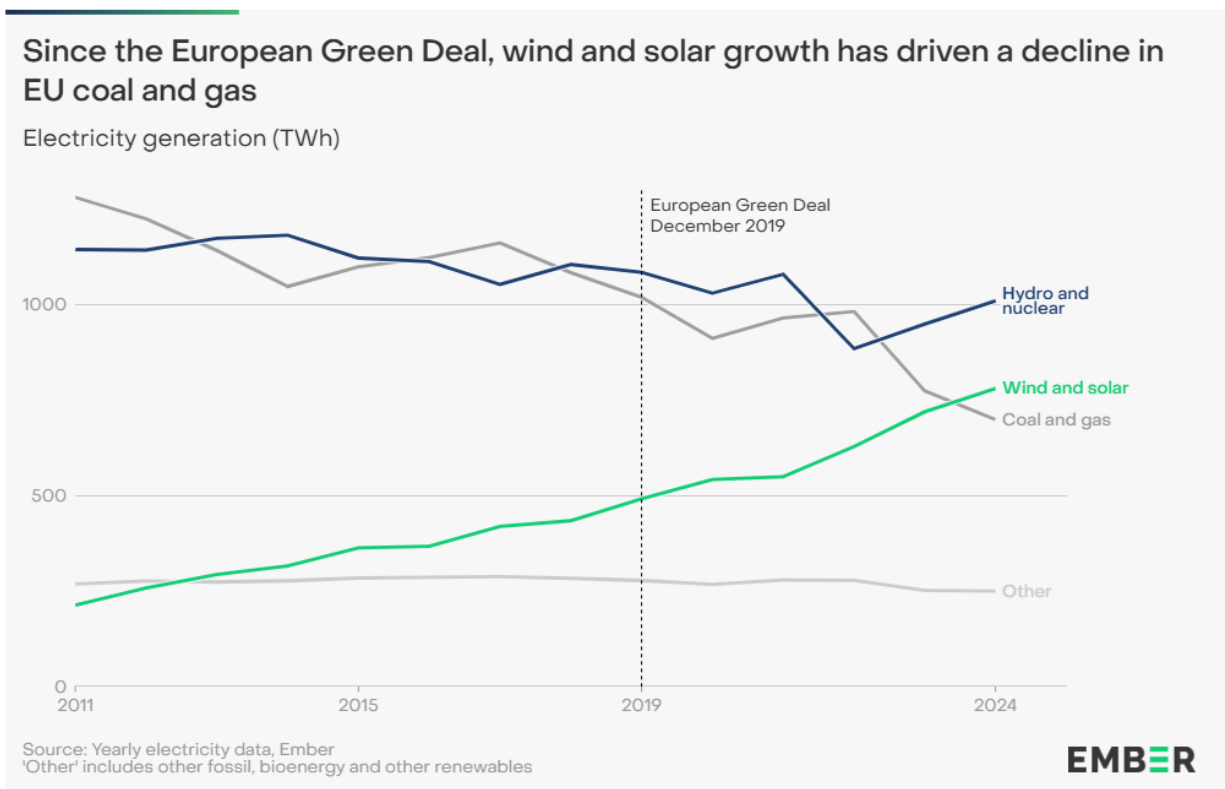


Figure 1. (European electricity review, 2025)

In 2024, 46.9% of net electricity generated in the EU came from renewable energy sources. Denmark registered the highest share of renewables in net electricity generation at 88.4%, mainly from wind power, followed by Portugal with 87.5% from wind and solar and Croatia with 73.7% largely from hydro (EUROSTAT, 2025).

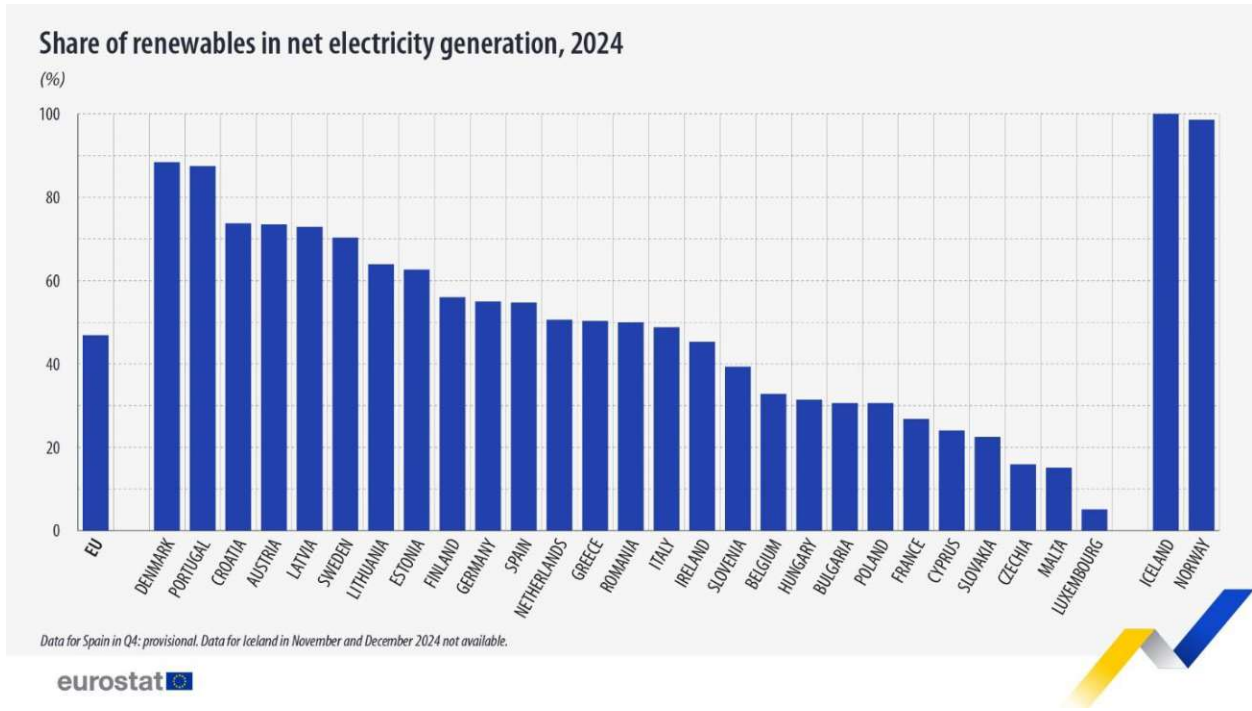


Figure 2- Share of RES in 2024 (EUROSTAT, 2025)

Given the increasing electrification of various sectors of the economy, most notably energy-intensive industry, transport, and heating and cooling, the strategic importance of electricity infrastructure is set to rise in the coming years.

3.3. Challenges for electrical networks in the Clean Energy Transition

Currently, MS is encountering difficulties related to outdated infrastructure, insufficient investment, and regulatory complications that impede the swift modernization of grids and the effective integration of energy production. As a consequence, the energy system is exposed due the need of integrating high volumes and variable renewables while accommodating rising electricity demand from industries, heat pumps, electric vehicles and data centers.

The European Commission projects around 584 billion will be necessary by 2030 to upgrade and enhance Europe's energy grid infrastructure. This encompasses investments in smart grids, digitalization, and various grid augmentation technologies. (European Grids Package, 2025). The Commission and International Energy Agency are highlighting that the investments costs of the grid development will affect the electricity bills. These effects can be already seen as by the end of 2024 EU electricity retail prices for industry were more than double comparing with the ones in US and twice as high as in China, according to the Commission's estimates (Butorac, 2025).

ACER highlights that a solution to keep the costs of grid modernization down, is that under the planning process shall take into account storage capacity (ACER, 2024) and in this way the investments can be mobilizes in a timely manner and target the most pressing needs.

In relation to the balance of the network system it can be observed that the increase of wind and solar power put more stress on Europe's power lines that translated in an increase of the congestion and the balancing costs. In 2023 ACER reported that EUR 4.26bn has been spent as costs for managing the congestion in the EU power grids (Montelnews, 2024).

3.4. An Examination of Grid Vulnerability- Iberian Electricity Outage

The extensive power outage in the Iberian Peninsula on April 28, 2025, exemplifies the risks inherent in contemporary systems with significant renewable energy integration. The incident that impacted Portugal, Spain and portions of France was first ascribed to a series of failures initiated by an unexpected system disruption. Although the exact cause remains under investigation, official reports from Spanish and Portuguese grid operators indicate that a rapid voltage surge triggered a cascade of generation losses. During the event, the region was deriving a substantial amount of its electricity from intermittent renewable sources, which do not possess the intrinsic inertia of conventional power facilities. This diminished the grid's capacity to endure the initial frequency disruption, resulting in the system's failure (Iberian Blackout- ENTSO-E, 2025).

3.5. Lessons learned from the Iberian blackout

The operation of the electricity system is exceedingly intricate. Electricity generation and usage must consistently align, transmission must adhere to grid constraints and voltage, and frequency must remain steady. Standard domestic plugs constantly provide 230V at a frequency of 50Hz. Producers and consumers autonomously determine the timing of power generation and use. Electricity supply, demand and transmission are coordinated through various markets and grid services to ensure stability. Malfunctions in these systems can induce imbalances, potentially resulting in power outages or blackouts (Facts and lessons learned from the Iberian blackout, 2025).

BESS is one of the main ways to deal with the problems that the Iberian blackout brought up. Their ability to add power almost instantly by managing energy surpluses and ensuring supply during critical moments, renders them an ideal choice for a contemporary utility that is heavily reliant on RES. Also, the initial power required to bring a grid back online without an external power source is provided by certain energy storage facilities that are equipped with "black start" capability. This would have considerably expedited the restoration efforts that were initiated in response to the Iberian outage (How battery energy storage systems enhance grid stability, 2024). The blackout could have been considerably reduced or even prevented by the strategic deployment of energy storage facilities.

4. Overview of the EU binding regulation on the energy storage

While the EU has not set a specific, binding target for the deployment of energy storage in terms of a GW or GWh figure, its legal framework and policy initiatives are increasingly and specifically designed to encourage and facilitate the deployment of energy storage facilities (EASE, 2025). Although energy storage is part of the RES legislative package and until recent times energy storage was not on the spotlight of the legislative framework, energy storage is a key enabler for achieving its ambitious climate and energy goals.

The "Clean Energy for all Europeans Package" and its subsequent revisions are the primary legal framework for this.

In terms of market and regulatory framework, energy storage was recognized as distinct activity, separating it from generation, transmission, and consumption. Also, under the RED II storage facilities have fair and non-discriminatory access to electricity markets. This includes allowing storage to participate in various market services, such as frequency regulation and reforming market design to properly value the flexibility that storage provides.

In addition to legislation, the European Commission has released recommendations to provide guidance to the MS in adoption their national policies. The most concrete encouragement for the broad deployment of energy storage is provided by the Commission Recommendation about Energy Storage (2023) that is urging the MS to:

- Integrate energy storage into their long-term strategic energy plans;
- Remove regulatory barriers, such as double taxation and inconsistent grid tariffs;
- Reform their electricity market design to incentivize storage;
- Accelerate permitting processes for energy storage facilities (EU Commission Recommendations, 2023).

Net-Zero Industry Act (2024) seeks to expedite the production of essential clean technology within the EU. Energy storage, in conjunction with technology such as batteries, is explicitly incorporated. This streamlines regulatory frameworks and unequivocally indicates that the EU regards storage as a key imperative for its energy security and industrial independence.

The EU Batteries Regulation (EU/2023/1542), effective from 2023, is a significant legislative measure that indirectly facilitates energy storage deployment by governing the complete battery life cycle (Environment EU Commission). Although it does not provide deployment targets, it fosters a more sustainable and predictable market for batteries, which are the fundamental component of most contemporary energy storage systems. The legislation mandates criteria for carbon footprint, recyclable content, and battery passports to promote a competitive and sustainable European battery business (FlashBattery, 2025).

To enable Member States to track and implement measures towards climate-neutral Europe, the EU introduced the NECPs as a strategic governance tool. Through these plans, each Member State outlines how it will contribute to the Union's collective climate and energy objectives for 2030.

NECPs address five core dimensions of the Energy Union: decarbonization, energy efficiency, energy security, the internal energy market, and research, innovation, and competitiveness. Member States must set national targets and policies in these areas, submit their plans to the European Commission, and regularly report on their progress and based on these reports European Commission issues recommendations (EU Commission-NECPs, 2025).

5. Analysis of EU frameworks and critical factors for energy storage deployment

5.1. The evolving Regulatory landscape for energy storage

In 2015, the European Commission launched a public consultation on a new energy market design. The consultation emphasized that, to make the European Union a global leader in renewable energy, the “efficiency first” principle needed to be given greater importance. In this context, the Commission highlighted the necessity of ensuring sufficient system flexibility to enable the integration of increasing shares of renewable energy. Accordingly, among other measures, the Commission underlined the importance of incorporating energy storage into the electricity market to enhance flexibility. Storage allows electricity to be absorbed when there is a surplus and prices are low and released when generation is scarce and prices are high, thereby smoothing out variable power production.

As a result of the European Commission public consultation, in 2019 the Electricity Market Directive set up common rules for the internal market for electricity and amending Directive 2012/27/EU. With the storage, the directive follows “efficiency first” principle and flexibility in the network system and recognizes the energy storage as an element that facilitates the operation of the electricity system, enabling short-term and seasonal adjustments to address variability in electricity production from renewable sources and the related contingencies within those timeframes.

At the EU Level there is no dedicated and unique legal framework for energy storage. Nonetheless, relevant provisions on energy storage can be found, for instance under the Electricity Market Directive and Electricity Regulation. While the Directive defines what energy storage is and who can or cannot own it, the Regulation is providing obligations for the MS related to market access and use of the electricity storage, ensuring that a fair treatment in the electricity markets, granting non-discriminatory access to balancing, capacity, and other services. In short terms, the Directive role is fundamental in providing the structural recognition of storage by defining storage and its place in the system while the Regulation establishes the market integration procedures necessary for operationalizing that recognition. Both legislative acts seek to establish an equitable framework for storage and prevent market distortions, such as double charging and the dominance TSOs and DSOs.

While these two legislative acts are touching the storage in the sense of drawing general rules and objectives for the MS, the MS are remaining with the flexibility in determining the specific methods and legal instruments to issue the national legislation in accordance and compliant with

the above-said regulations. The variations in national strategies, regulatory obstacles, and market frameworks will influence the efficacy of energy storage implementation within the EU.

5.2. Definition and classification of energy storage

The Electricity Market Directive, within the EU's Clean Energy for All Europeans legislative package, is comprising provisions that aim for amending the EU electricity policy framework to facilitate the clean energy transition and the flexibility and consumer engagement in energy markets. The directive seeks to eliminate obstacles to energy storage, including non-discriminatory and competitive procurement of balancing services, as well as equitable regulations for network access and charging.

The directive defines the energy storage within the power system as *“a deferring the final use of electricity to a moment later than when it was generated, or the conversion of electrical energy into a form of energy which can be stored, the storing of such energy, and the subsequent reconversion of such energy into electrical energy or use as another energy carrier”*⁸.

As a general observation, the definition is providing what energy storage can do, basically its functionality, namely the electrical energy can be converted and reconverted or alternatively the electrical energy can be used as another energy carrier.

The definition is extensively regulated, under which a wide range of technologies can be considered, such as pumped hydro storage, compressed air energy storage, thermal storage (e.g., in hot water tanks) or BESS. It can be observed that the broad regulation of energy storage is on purpose regulated as such to avoid a discriminatory regulatory framework that favors one technology over another.

On the last part of the definition, the energy storage can be use as another energy carrier. This pertains to the "Power-to-X" idea, wherein electricity is transformed into an alternative energy source and utilized in that form, rather than being reconverted into electricity.

Interestingly, is that the directive recognizes energy storage as a distinct asset class, separate from generation, supply and consumption therefore, there are debates that the energy storage should not be subject to the same regulatory burdens, such as excessive licensing requirements (Eurelectric, 2023).

With regard of a distinct asset class of the energy storage, the legal ground comes from the Electricity Market Directive, where the concept “energy storage” is listed in the subject-matter of Article 1 among other concepts -generation, transmission, distribution, supply- showing its separate status.

The fact that energy storage is defined separately under Article 2(59), distinct from generation and supply, highlights its recognition as an independent asset class alongside the core functions (generation, supply, etc.). This phenomenon can be observed in many MS where the classification of energy storage is still based on legacy regulatory frameworks that predate the Electricity Market

⁸Point 59 of the Article 2- of Electricity Market Design Directive

Directive. Prior to its implementation, a distinct legal and regulatory definition for electricity storage was absent from most EU electricity laws. This necessitated the classification of storage assets, as a form of generation due to their function of injecting electricity back into the grid (Norton Rose FulBright, 2021). Consequently, in current practice MS continues to perpetuate the classification of energy storage as a generator, rather a separate asset, despite the Directive's introduction of a new, separate definition for energy storage. The energy in the electricity system is stored in a storage facility based on which the Electricity Market Directive is defining as being “*a facility where energy storage occurs.*”

The Electricity Regulation creates the conditions for a competitive and integrated electricity market, where energy storage plays a crucial role in enabling higher shares of renewable energy and providing necessary grid flexibility.

The Electricity Regulation specifically ensures market access for storage⁹ and permits TSO/DSO ownership only under extraordinary circumstances¹⁰, thereby integrating storage as a competitive, market-oriented flexibility resource within the EU electricity framework.

The key provisions of the Electricity Regulation in relation to the energy storage are referring to (i) including energy storage as technology in having access to balancing markets either individually or via aggregation¹¹, (ii) participation by the storage technologies within the capacity market mechanics¹² and derogation for specific MS to let TSOs/DSOs own or operate storage facilities where necessary for security of supply¹³:

In summary, the debate on defining energy storage in the Electricity Market Directive goes beyond technical wording; it is about creating a technology-neutral, pro-competitive regulatory framework that underpins the clean energy transition. The goal is to facilitate the deployment of a wide range of storage technologies by removing regulatory barriers, clarifying ownership rules and treating storage as a distinct and vital component of the electricity market.

Almost one year after the adoption of the Electricity Market Directive and the Electricity Regulation, the European Parliament issued the Storage Resolution under which explored the status quo of energy storage by that time and addressed few recommendations for the European Commission and MS to thoroughly investigate the storage capacity inside the EU. The Storage Resolution calls for a broad approach to align different factors like efficiency, environmental impact, skills and permissions, along with a careful and in-depth study of each type of storage technology, especially when it comes to environmental impact (Storage Resolution, 2020).

In March 2022, the European Commission issued a communication to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, calling for action to ensure more affordable, secure, and sustainable energy. The call for action came because of the need gain independency from using fossil fuels that was sustained mostly

⁹ Articles 16 and 18 of the Regulation (EU) 2019/943

¹⁰ Articles 54 of the Regulation (EU) 2019/943

¹¹ Article 6 of the Regulation (EU) 2019/943

¹² Article 18 of the Regulation (EU) 2019/943

¹³ Articles 54 and 6 of the Regulation (EU) 2019/943

from resources coming from Russia. By 2022 Russia was providing more than 40% of the EU's total gas consumption and 27% of oil imports and 46% of coal imports (Communication RePower EU, 2022). The RePower EU initiative aims to rapidly decrease dependence on fossil fuels in residential, commercial, and industrial sectors, as well as within the power system. This will be achieved by enhancing energy efficiency, increasing the proportion of renewable energy sources, and addressing infrastructure limitations.

On 13 June 2024, Regulation 2024/1747 and Directive 2024/1711 of the European Parliament and Council were officially adopted with the aim of amending the Electricity Market Directive, to improve the Union's electricity market design.

The amendment of the Electricity Market Directive was necessitated by the energy crisis ensuing from the Russian Federation's aggression against Ukraine. The resulting sanctions and supply disruptions in gas, coal and oil, compounded by reduced nuclear and hydropower availability, intensified electricity price volatility, thereby justifying the adoption of the Directive.

The Electricity Market Directive primarily addresses electricity market design improvements, such as flexible connection agreements, energy sharing and customer protection measures. In relation to energy storage the new Directive introduces flexible connection agreements, which may involve consideration of energy storage¹⁴—but this is in the context of enabling grid access, not redefining what energy storage is.

5.3. Unbundling rules for energy storage

Under the Electricity Market Directive and Electricity Regulation, TSOs and DSOs are generally prohibited from owning, developing, managing, or operating energy storage facilities¹⁵.

The discussions around this point focus on ensuring a level playing field and promoting competition. The directive allows for some exceptions, but only under strict conditions and subject to the approval of regulatory authorities. The primary goal is to ensure that storage assets are owned and operated by market participants.

The exemption opportunities for grid operators to possess, develop, manage, or operate energy storage facilities are equally applicable to TSOs and DSOs. Both TSOs and DSOs are subject to common unbundling requirements designed to ensure the separation of network operation from generation and supply activities, thereby preventing conflicts of interest and market distortions. However, under Article 36 and Article 54 of Electricity Market Directive, both categories of operators may, under clearly defined conditions and subject to regulatory approval, own, develop, manage, or operate energy storage facilities when such facilities are necessary for the secure and reliable operation of the electricity system, and when no other market participant is able to provide the service on a competitive basis. In this way, the EU legal framework establishes a consistent approach to exemptions for both TSOs and DSOs, balancing market integrity with system stability and flexibility needs.

¹⁴ Article 6a of the Directive 2024/171

¹⁵ Articles 36 and 64 of Directive 2019/944

According to the Electricity Market Directive, the role of the DSOs is seen as an actor in the system that shall use services from distributed energy resources such as demand response and energy storage, based on market procedures, to efficiently operate their networks and to avoid costly network expansions.

DSO unbundling is typically less rigorous than the framework imposed on TSOs. For bigger DSOs—those serving over 100,000 customers—the stipulations concentrate mainly on guaranteeing functional and legal separation from generation and supply operations. This indicates that although the DSO may be included in a vertically integrated group, it must function as a separate legal entity, possessing autonomous management, and decision-making procedures. Furthermore, branding and messaging must be distinctly separated to prevent ambiguity between DSO's network operations and any associated supplier enterprises. The aim is to ensure neutrality and equitable access to the distribution network, without enforcing the complete ownership separation mandated for TSOs.

Restrictions on the ownership of energy storage facilities aim to prevent competitive distortion, eliminate discrimination risks, ensure equitable access to energy storage services for all market participants, and promote the effective and efficient utilization of energy storage facilities, beyond the operation of distribution or transmission systems. The requirement must be construed and implemented in alignment with the rights and principles enshrined in the Charter of Fundamental Rights of the European Union (the 'Charter'), specifically the freedom to conduct business and the right to property as guaranteed by Articles 16 and 17 of the Charter. (Electricity Market Directive, 2019)

This prohibition, however, includes a dual exemption opportunity for MS: they may permit TSOs and DSOs to possess, develop, manage, or operate energy storage facilities:

- a) when there are fully integrated network components and the regulatory authority has provided its approval, or
- b) when a set of cumulative conditions is met, including a tendering process, when other parties have not been granted the right to own, develop, control, manage, or operate such facilities, or have failed to deliver these services at a reasonable cost and in a timely manner.
- c) such facilities are essential for the TSOs to meet their obligations under this Directive for the efficient, reliable, and secure operation of the transmission system, and they are not utilized for buying or selling electricity in the electricity markets.
- d) prior review and approval by the NRA.

This entails further responsibilities for NRAs, notably the obligation to grant approval in cases of derogation. Such derogations will be subject to periodic review by the NRA, considering the phase-out of TSO energy storage activities, while also ensuring that the phase-out is duly implemented.

The New Electricity Directive introduces a first-time exception from unbundling principle by allowing TSOs from Estonia, Latvia, and Lithuania to own and or manage storage and participate

in balancing markets¹⁶. Such storage facilities are authorized to engage in the purchase and sale of power inside balancing markets. These exemptions are applicable for a duration of up to three years following synchronization with the Continental Europe Synchronous Area. The Commission may issue extensions of up to five extra years if necessary to ensure the security of supply. By February 9, 2025, ENTSO-E has announced the successful integration of the Baltic States' electricity systems into the Continental European grid (Entso, 2025).

The derogation arose from the connection of the Baltic countries to the Russian grid network. This situation postponed their transition to market-based balancing services and impeded the development of competitive balancing tools, such as storage. The exemption serves to safeguard grid stability throughout the synchronization process.

Cyprus is also part of the derogation of the Electricity Directive, where TSO may own, develop, manage, and operate energy storage facilities without engaging in open tenders. This exception remains valid until Cyprus's electricity system is interconnected with those of other EU Member States.

As an isolated grid, Cyprus encounters distinct security and stability problems. The derogation permits TSO to rapidly implement essential storage infrastructure without procedural obstacles.

6. Regulatory approaches to energy storage in Germany, Romania and Austria

6.1. Germany: overview of the legal framework for energy storage

In Europe, Germany is regarded as the most advanced market for energy storage. However, like any other country undergoing the energy transition, it is not exempt from the need to adapt its regulatory framework to address the challenges arising from new technologies, the growing number of RES installations, and the balancing of energy in the market. In recent years, several amendments to the national legal framework for energy storage systems have supported the creation of a more favorable market environment, particularly for large-scale storage projects. These improvements have mainly consisted of exemptions from grid fees, levies, and electricity tax, granted under specific conditions.

The recent regulatory framework marks significant progress in adapting legislation to support the deployment of energy storage facilities as an integral part of renewable energy expansion. In this context, the EnWG establishes an overriding public interest in the development of energy storage, thereby prioritizing such projects in the balancing of legal interests.

Another innovative measure is that under Article 20b of EnWG is established the rules for a joint internet platform for the handling of grid access.

¹⁶ Article 66 of the New Electricity Design Directive derogating from Article 40(4) and Article 54(2) of the Electricity Design Directive

The EEG further promotes storage by providing financial incentives—such as feed-in premiums. Electricity producers can benefit from a 20-year feed-in tariff for renewable generation up to 100 kW, while plants older than 20 years receive remuneration at the average annual market value, with the condition that subsidized producers must deliver their output to the public grid—unless used locally—and may not trade the supported electricity on the market. The feed-in tariff even if the electricity is temporarily stored before being fed into the grid (EU Commission, 2025).

6.1.1. Meeting NECPs commitments

Germany's latest NECP signals an intention to enhance flexibility in the energy system by expanding storage deployment; however, it fails to translate this ambition into measurable targets or quantified flexibility needs. The plan underscores sector coupling between storage, heating, and mobility, while referencing the 2023 electricity storage strategy as a step toward creating a dedicated legal framework for battery systems. On permitting, the proposal to establish central contact points within the Federal Network Agency is presented as a means to streamline administrative procedures, yet its effectiveness will depend on concrete enforcement mechanisms. Furthermore, while the NECP alludes to projects designed to strengthen system flexibility, these are not systematically reflected in the report submitted by Germany (EU Commission- Germany NECP , 2025).

6.1.2. Definition of energy storage

Under Article 3(15d) of EnWG electricity storage system is defined as a “*An installation in an electricity network which postpones the final use of electrical energy to a later time than that at which it is generated, or which converts electrical energy into a storable form of energy, stores such energy and then converts it back into electrical energy or uses it as another energy source.*” (EnWG, 2025).”

In other words, there is not a specific definition for energy storage as a concept as opposed to the definition seen in Austria or Romania, but the legislation is defining the instrument, namely the energy storage facilities. In any case, it reflects the Electricity Market Directive's definition of energy storage.

The classification of energy storage systems reflects their dual nature—charging and discharging—under which electricity must be regarded both as final consumption and as production. This follows from the fact that the storage function itself consists of creating a controllable delay between generation and consumption (BMWK- Electricity storage strategy, 2023). This classification aligns with the European Commission Recommendation of 14 March 2023 on Energy Storage and does not lead to preferential or detrimental treatment of electricity storage facilities relative to other producers, consumers, or flexibility providers. Instead, as mandated by Union law, it accurately represents the diverse functionalities of electricity storage facilities within the energy sector and technical context, thereby facilitating non-discriminatory market participation (EU Commission Recommendations, 2023).

6.1.3. Permitting Regulation for Energy Storage

6.1.3.1. Urban planning and permits

In general, energy storage facilities require a building permit in accordance with the corresponding federal building laws (in German “Landesbauordnung”) where the project is located. However, there are some exceptions and unique circumstances that may alter this criterion. For instance under the Bavarian regulation BESS projects may no longer require a building permit at all under certain circumstances (e.g. if the BESS project is to be classified as a privileged project according to Section 35 (1) no. 3 BauGB) (MCDermott Will&Schulte, 2025). The BESS are exempted to proceed with the zoning planning procedure whereas the is qualified as a “privileged project” pursuant to Section 35 (1) nos. 1 to 9 BauGB. The consequence is that the investors shall seek on a case-by-case basis whether the project is exempted from zoning planning procedure or not (MCDermott Will&Schulte, 2025).

Generally, projects may not be developed in areas outside existing settlements (referred to in Germany as the ‘Außenbereich’). However, by way of exception, projects may be built if they comply with Section 35 (1) No. 3 of the BauGB, which provides that: “(1) *In the external area (outside built-up areas), a project is permissible only if public interests do not conflict, sufficient access is secured, and if it [...] 3. serves the public supply with electricity, gas, telecommunications services, heating and water, waste-water management, or a site-bound commercial operation.*”

Regarding electricity, the BauGB contains a general clause referring to projects that ‘serve the public supply of electricity.’ On the basis of this regulatory exemption, it may be argued that a BESS provides electricity to the public in the same way as a renewable energy plant, acting as a generator—only with the distinction that the supply occurs at a later, deferred point in time.

An exception to the general rule exists in the form of a softened permitting requirement for so-called ‘co-opted privilege’ (in German “*mitgezogene Privilegierung*”) energy storage facilities. Pursuant to § 35 (1) of BauGB, a BESS may qualify for ‘privileged status’ if it is co-located with a wind or solar farm on the same site and serves the purpose of storing and managing the electricity generated by that specific installation. (Brahms Nebel&Kolegen, 2023). This legal provision creates favorable market behavior by encouraging developers to create hybrid solar/wind and storage facilities. In this way the regulatory procedure for co-located projects is aligned with the trend of integrating generation and storage assets at the same point of connection.

Outside the “co-opted privilege”, most of the federal states have not provided yet in their regulations the manner to evaluate if a BESS can be regarded a privileged project or on the contrary.

The ambiguity surrounding planning procedures for BESS, although previously justifiable when the volume of projects was limited, is now viewed as increasingly inadequate by developers in an era where significant expansion of BESS is essential. The German legislator ought to evaluate the necessity of amending current planning laws to adequately acknowledge the significance of BESS projects as viable options for flexibility.

In principle grid scale BESS do not require an emission-control permit (Brahms Nebel&Kollegen, 2024). Under the Federal Emission Control Act (in German “BImSchG”), the establishment and construction of industrial facilities that could adversely impact the environment necessitate a permit. The role of the BImSchG is to avoid harmful effects on the environment caused by emissions into the air, water and soil are to be avoided and reduced and to achieve high level of protection for the environment (OeKoplan). Since BESS are regarded as emission-free and batteries are typically not included in the annexes of the BImSchG, they generally require only standard building permits. However, large-scale projects, particularly those combining storage with generation or involving very high capacities, may still be subject to environmental or planning approval procedures.

6.1.3.2. *Grid connection: capacity allocation*

Due to increased demand and for storage capacity, Germany is currently experiences challenges in allocating the capacity for the BESS constructions. The country has now approximately 1.9 GW of large-scale BESS deployed, with substantial growth in development and investment anticipated in the future. The capacity is projected to rise to around 7 GW by 2026. The Federal Network Agency attempted to establish a procedure of capacity allocation, and in this respect released for public consultation a draft under which capacities shall be allocated equally on specific dates, with a pro rata (proportional to the amount of requested capacity) or per capita (equal shares) distribution among all applicants. The draft was not advanced due the non-consensus in the market, therefore the BESS operators must address for capacity allocation based on the principle “first come first served (MCDermott Will&Schulte, 2025).”

6.1.4. **Network charges and levies**

In general, energy storage facilities are subject to taxes and levies, although certain legal provisions grant specific exemptions under defined conditions.

Under Section 118 (6) of the EnWG it is provided that “*Newly constructed electrical energy storage facilities constructed after December 31, 2008, which are commissioned within 18 years from August 4, 2011, shall be exempt from grid access charges for the purchase of the electrical energy to be stored for a period of 20 years from commissioning. (...) This shall only be granted if the electrical energy is stored in an electrical, chemical, mechanical or physical electricity storage facility and is taken from a transmission or distribution network and the electrical energy recovered for feed-in is fed back into the same network after a time delay.*”

The time on the complete exemption from grid fees as per section 118(6) EnWG is a transitional disposition of law which is applicable until August 4, 2029 (BMWK- Electricity storage strategy, 2023).

The prerequisite condition is that the electricity is stored in an electrical, chemical, mechanical or physical electricity storage facility and is fed back into the same network.

Also, under the section 19(2) and (4) of StromNev is providing that “*operators of electricity supply networks [...] must offer end consumers who withdraw electricity from the grid exclusively for storage in an electricity storage system and feed the recovered electricity back into the grid, an*”

individual grid fee. The grid fee consists [...] only of an annual capacity charge in euros per kilowatt.” Thus section 19(2) creates incentives for operating the facilities by allowing storage operators to benefit of a special fee if they operate the storage facilities in a way that relieves the load on the grid (Roedl, 2025).

According to Section 19(4), operators may be exempted from the grid usage fee, on the assumption that the electricity is only temporarily withdrawn from the grid and will be fed back into the network at a later point in time (BMWK- Electricity storage strategy, 2023).

Section 14a of EnWG provides incentives for consumer participation, including the energy storage operators, while contributing in keeping a balanced grid (Episensor, 2025). As controllable consumption devices, storage facilities may benefit from reduced tariffs or direct payments by charging or discharging their batteries in response to peak or load demand requirements.

EnFG is providing under article 21 the rules with respect of levy collection for electricity storages in the sense that *“For the withdrawal of electricity from the grid that is consumed in a calendar year for the purpose of interim storage in an electrical, chemical, mechanical, or physical electricity storage facility, **the obligation to pay levies is reduced to zero to the extent that electricity generated in the same calendar year with the storage facility is fed into a grid.** If in the storage facility there are amounts of electricity subject to different levy obligations being consumed, the duty to pay levies is waived in proportion to the consumption of the different electricity amounts relative to one another.”*

The German legislator has determined that double taxation should not apply to energy storage facilities where the electricity is injected back into the grid within the same calendar year. Charges are therefore payable only on the net difference between the electricity withdrawn from the grid and the amount re-fed from the storage facility during that year.

Whereas in the past operators had to apply a request for an exemption from double taxation, the recent amendment of Article 5(4) of the StromStG now grants an automatic exemption to all stationary electricity storage facilities. These facilities are treated as part of the transmission and distribution grid, provided they are registered in the Market Data Register.

The application of grid connection tariff regarding energy storage facilities has long been debated in Germany. Energy storage operators argued that such tariff should not apply to storage facilities, stressing that they would discourage urgently needed deployment and expansion. They also highlighted that well-managed storage facilities can reduce the need for costly grid expansion. In contrast, BNetzA maintained its position in the sense that that energy storage facilities should be treated in the same way as end users for the portion of electricity drawn from the public grid and therefore be subject to grid connection tariff (Roedl, 2025).

On July 15, 2025, the Federal Court of Justice ruled on the matter, holding that battery operators are not exempt from grid connection tariff where such measures are required for their connection. The Court acknowledged that grid connection tariff places a greater burden on battery storage systems than on other end consumers and that storage systems differ from households and businesses since they feed electricity back into the grid and act as both consumers and producers.

Nevertheless, it concluded that the equal treatment of storage systems and other end consumers is ‘objectively justified’ in light of the purpose of the grid connection tariff (Bundesgerichtshof, 2025).

6.1.5. Future changes in Germany legal framework

There are ongoing efforts to amend EnWG by two draft bills introduced under public discussions in July (Bundesverband, 2025) and August 2025 (Bundeswirt, 2025). In relation to storage the aim is to align the EU requirements and to regulate the expansion of energy storage. The amendment concerns the extension of the “overriding public interest” concept which is already in place in the current EnWG by adding that: *“As long as the electricity supply in Germany is not almost greenhouse-neutral, the accelerated expansion of energy storage facilities should be included as a priority concern in the respective weighing of protected interests.”* Under this new amendment the energy storage facilities will gain more priority in the respective weighing of protected interests until net greenhouse gas neutrality is achieved in 2045. In practice, this means storage projects will generally take precedence over most other interests, though some uncertainty remains due to the undefined threshold of what counts as “almost greenhouse gas neutral”. This is likely to be particularly relevant for the approval of battery storage facilities in outdoor areas where numerous stakeholders contested the privileges for battery storage facilities under Section 35(1)(3) of the BauGB (Taylor Wessing, 2025).

Another innovative measure is that under Article 20b the rules for a joint internet platform for the handling of grid access are established. This platform should be managed by the DSO and it will serve as a tool through which grid connections can be applied for. With this new platform the management of the grid will be standardized and digitalized, offering benefits for RES technologies, including energy facilities.

Also, it is proposed that an operator of large-scale BESS to be exempted from electricity tax it must be reregistered within Core Energy Market Data Register (in German “Marktstammdatenregister”).

Article 5 of StromStG is proposed to be amended in the sense that that electricity discharged from storage is treated as if “through-flowing” the grid, not new generation. Also, there are envisaged amendments of StromStG comprising new regulations for the operation of electricity storage systems and improvements to grid connections, and aspects that could affect the taxation of electricity generated and stored for commercial and self-consumption purposes.

6.2. Romania: overview of the legal framework for energy storage

The basic legal framework for the Romanian energy sector is set by Energy Law on electricity and natural gas. This normative act served as the foundation for the operation of the NERA and the energy market. At first, the law didn't have a clear definition of energy storage, this being more evidently as technologies for making renewable energy improved.

Law no. 155/2020, which amended and supplemented the Energy Law, was the first major step in adapting the law. This law was the first time that the government recognized the need to regulate new activities, such as energy storage, and provided its definition for the first time. The definition

established a nascent framework but fell short of adequately addressing the practical challenges and market demands.

On November 26, 2024, EGO no. 134/2024 came into force, a major normative act adopted by the Government during its session on November 21. The explanatory memorandum provides that the ordinance's stated goal was to make changes and additions to the current laws so that real solutions for storing electricity could be put into place (Juridice.ro, 2024). These solutions are meant to make energy use more efficient, fix big changes in production, and make it easier to use energy from different types of renewable sources (Romanian Ministry of Energy, 2024). The reason clearly underscores the substantial risks Romania would face regarding energy supply, increased economic burdens for customers, and the capacity to meet the objectives outlined in the NRRP, should there be a postponement of these measures. Thus, by passing this law, the government has made it clear that energy storage is a top priority for the NPS and an important part of energy security, especially in the current geopolitical situation.

6.2.1. The political and economic bases of the change

The enactment of EGO 134/2024 is integral to Romania's comprehensive strategy to conform to the ambitious objectives established at the European Union level. The EGO was implemented as a direct response to the EU's pledge to decarbonize the European economy, as indicated in the European Green Deal. The policy explicitly addresses the necessity of incorporating intermittent renewable energy sources, such as wind and solar, which demand increased flexibility within the storage energy system (Storage EU Legislation, 2025). The normative act aims to enhance and align national legislation with the stipulations of pertinent European directives concerning the internal electricity market, specifically Energy Market Directive and Energy Regulation.

The necessity to enhance storage was a fundamental aspect of the European Commission's proposals and those of other entities, which recognized the absence of legislation as a barrier to attaining energy and climate objectives. In this regard, the EGO and following NERA laws constitute a crucial advancement in the transposition of European legislation and the elimination of obstacles, such as dual network costs, that hindered investments in cross-sectoral energy solutions.

6.2.2. National Context and Energy Strategy

The primary domestic rationale for legislative modification is the necessity to enhance flexibility within the national power system. The swift expansion of production capacities from renewable sources, inherently intermittent and unpredictable, presents substantial challenges for the national power system in sustaining equilibrium between production and demand. Short-term and seasonal storage is seen crucial for guaranteeing supply security and mitigating severe price volatility.

Moreover, the geopolitical backdrop has heightened the necessity of these actions. EGO 134/2024 was specifically driven by the necessity to enhance Romania's energy security by diminishing reliance on energy imports, particularly considering the tensions arising from the war in Ukraine. Romania seeks to enhance its resilience to external shocks and optimize the utilization of its energy resources by augmenting storage capacities.

6.2.3. Meeting NRRP and NECP commitments

The new law is very important for Romania to reach the goals set by the NRRP and NECP. The EU Council approved Romania's NRRP, which calls for huge investments in the energy transition, with specific goals for storage capacities. Official papers say that Romania has promised to build at least particularly power battery storage with a target of at least 1200 MW or 2400 MWh by 2030 and around 2000 MW by 2035 (NRPP Romania). It would have been very hard to reach these goals without clear rules and without getting rid of tax barriers like double taxation. Without a mechanism for storage projects to generate revenue, investors would have been less inclined to finance them. This could have jeopardized milestone achievement and led to the loss of European funds allocated under the NRRP. The legislative change enables Romania to effectively tap into these funds to modernize its energy infrastructure.

Identified Problem	Legal / Regulatory Solution	Strategic Motivation
Double taxation of stored energy	Modification of the definition through EGO 134/2024 and the NARE Order that eliminated network charges.	Alignment with EU standards (Clean Energy Package) and encouragement of private investment in storage.
Administrative gridlock for major projects	Introduction of the concept of "project of national importance" in the energy sector.	Acceleration of strategic investments (e.g., pumped-storage hydropower plants) to ensure energy security.
Fluctuations in the national power system due to RES	Creation of a favorable framework for the development of storage capacities	Ensuring the stability of the national grid and the efficient integration of wind and solar energy.
Dependence on imports	Facilitation of the use of surplus renewable energy, preventing it from being wasted.	Strengthening energy security and reducing the economy's vulnerability to external energy shocks.

6.2.4. Initiating Strategic Initiatives

EGO 134/2024 additionally established an emergency mechanism to expedite strategic initiatives within the energy industry. Declaring projects as "national interest and public utility" via a government decision streamlines the permission process and mitigates bureaucratic obstacles, which is essential for large-scale initiatives. (Juridice.ro, 2025)

The primary purpose of this strategy is to facilitate the development of pumped-storage hydropower plant developments. The EGO's explanatory brief states that institutional deadlock has hindered the advancement of these programs for more than 30 years. The EGO establishes a legislative framework enabling the Ministry of Energy to assume control over essential areas, including accumulation lakes, for the construction of these key facilities. Consequently, the bill addresses an administrative and ownership issue that has impeded a key aspect of Romania's energy plan for decades (Juridice.ro, 2024).

6.2.5. Definition of energy storage

6.2.5.1. Definition according to Law no. 155/2020

Law no. 155/2020 established a key definition, which, while a step forward, created an interpretive ambiguity that had major practical consequences. According to this normative act, energy storage was defined as:

"Energy storage - *the process of transforming electrical energy into a form of energy that can be stored for the purpose of delaying its use for a later time than the time of generation and the subsequent reconversion of that energy into electrical energy or its use in another energy vector;*"

This definition mentioned two possible end-uses for the stored energy: either reconversion back into electrical energy or its direct use "in another energy vector" (power-to-X). The text, however, did not clarify the subsequent destination of the reconverted electrical energy, leaving room for an interpretation that generated fiscal uncertainty.

6.2.5.2. Definition according to Emergency Government Ordinance no. 134/2024

Emergency Government Ordinance no. 134/2024 modified the definition of "energy storage" to make it more precise and eliminate ambiguities. The new text, reflected in Law 123/2012, is as follows:

"Energy storage - *the process of transforming electrical energy into a form of energy that can be stored for the purpose of delaying its use for a later time than the time of generation and the subsequent reconversion of that energy into electrical energy for its use in another energy vector or for delivery into electricity grids;*"

The essential difference between the two definitions lies in the addition of the phrase "or for delivery into electricity grids". This seemingly simple clarification has profound strategic and economic implications. The previous definition allowed for an ambiguous interpretation of the reconversion into electrical energy, which led to a major problem in the market: double taxation (EU support for batteries storage, 2019).

The fiscal issue arose from the fact that electrical energy, after being taken from the grid and taxed once to be stored, risked being taxed again upon re-injection into the grid as a "new" delivery. This applied to transmission, distribution, and system services tariffs. For investors in storage projects, this doubling of costs represented a major financial obstacle, directly affecting the economic viability and profitability of investments. The explanatory memorandum for EGO 134/2024 explicitly acknowledges that this double taxation is "a major impediment to the development of electricity storage capacities".

The new definition eliminated this barrier by legally recognizing delivery into the grid as an integral part of the storage process. This clarification allowed NERA to intervene with specific regulations, issuing an order that explicitly exempted stored energy that is re-injected into the grid from the payment of regulated tariffs, apart from the plant's own consumption and technological losses. Thus, a simple textual change provided the necessary legal basis to unlock investments and

ensure fair fiscal treatment, in line with European best practices and ACER recommendations, which encourage incentives for grid flexibility.

Normative Act	Definition of "Energy Storage"	Ambiguities and Implications
Law no. 155/2020	“..., and the subsequent reconversion of that energy back into electrical energy or its use in another energy vector” ¹⁷ ;	The definition was interpreted ambiguously, allowing for the application of double taxation for energy that was re-injected into the grid.
EGO no. 134/2024	..., and the subsequent reconversion of that energy into electrical energy for its use in another energy vector or for delivery into electricity grids;” ¹⁸	Explicitly clarified the destination of stored energy, removing the legal basis for double taxation and unlocking investments in large-scale storage capacities.

Both normative acts also anticipate the future of the energy market by introducing the concept of 'using electrical energy in another energy vector.' In this way, the legislative framework does not limit itself to a specific technology, such as electrochemical storage systems, but instead paves the way for emerging solutions like Power-to-X. This strategic approach demonstrates the legislator’s intention to align Romania with European objectives, fostering the development of diverse technological solutions that are essential in the current context of the energy transition.

The new set of rules, along with actions taken by the NERA after that, makes energy storage a key part of the energy security strategy. This is important for bringing together renewable resources that don't always work and for keeping the stable national power system in a market that is always changing and with tensions between countries.

6.2.6. Permitting Regulation

The current legal framework is a complex comprising legal requirements in terms of urbanism technical norms. Navigating the complexity of developing an energy storage facility requires an understanding of the authorization, licensing, and grid connection procedures. The process entails a series of administrative and technical steps that must be coordinated between the investor, public stakeholders, NERA and the DSO/TSO.

6.2.6.1. The General Legal Framework for Territorial Planning and Construction Works

Romanian legislation on territorial planning and construction is based on two fundamental normative acts: Construction Law and Urbanism Law, which regulates the authorization of

¹⁷ Article 8 of the Law no. 155/2020

¹⁸ Article I, point 7 of the EGO no. 134/2024

construction works. These laws establish the principles, norms, and procedures for planning territorial development and authorizing interventions on the built environment. Through their application, they define the land use, building and infrastructure destinations, and their dimensions.

Article 2 letter (i) of the Construction Law stipulates that construction works for electricity production and storage capacities require a building permit, establishing a mandatory general framework. This permit is based on complete technical documentation, which includes the approvals and permits requested through the urbanism certificate. Before 2023 the initial legislation did not contain specific regulations for energy storage installations, which were categorized generically as "energy infrastructure" or "technical-communal constructions," creating a regulatory framework that was insufficiently adapted to the specificities of this technology.

Acquiring an urbanism certificate is the initial step in the permitting procedure. This document, provided by local urban planning authority, enumerates all the approvals, agreements, and studies that the applicant must secure from various public institutions (such as environmental agencies and cultural heritage authorities).

Prior to 2023, construction Law and the Urbanism Law required an amendment to the zonal urban plan before a building permit could be issued for an energy storage facility, due to the absence of explicit classification for such facilities and the reliance on general rules applicable to real estate and industrial constructions. Under this legislative framework the period required for obtaining the building permit was significantly increased which led to a gap between the urban planning legislation and the dynamics of the energy sector.

A major simplification of the Urbanism Law occurred with the enforcement of Law No. 21/2023 and Law No. 166/2023.

Law No. 21/2023 correlated several previous normative acts. It introduced the exception to the restriction on building on extra-muros land, allowing the development of renewable energy projects on agricultural lands of fertility classes III, IV, and V, with a maximum area of 50 hectares, based on a simple building permit and the approval of the change in agricultural purpose (TPA, 2023). There was no specific reference to battery energy storage facilities, but by way of interpretation it can be argued that at least for the behind the meter storage facilities they are part of the RES projects.

Subsequently, Law No. 166/2023 supplemented both Law No. 350/2001 and Law No. 50/1991. This law explicitly introduced an exception, stipulating that the right to build is granted even in the absence of approved territorial and urban planning documentation for "*construction works for electricity and hydrogen generation and storage capacities from renewable sources located in the urban and rural areas of localities*". The amendment also includes transformation stations, cables, and related connection installations, thus clarifying that the associated infrastructure benefits from the same facility.

Despite the intention of simplification, the legislative changes have created new ambiguities. A legal analysis indicates a contradiction within Law No. 50/1991. Letter g) of Article 11¹ limits the urbanistic zonal plan exemption to agricultural lands of classes III, IV, and V, with a maximum limit of 50 hectares, while letter i) seems to extend the facility to any type of land in intra-murros and extra-murros, without mentioning a surface or soil class limit. This situation has created confusion and has allowed for divergent interpretations by local authorities, instead of providing the necessary clarity for investors (Universul Juridic, 2023).

A more nuanced problem with major implications is the legal status of "standalone" storage projects—i.e., those installations that are not integrated with a renewable energy production capacity (ESS News, 2024). Laws 21/2023 and 166/2023 explicitly refer to "construction works for electricity and hydrogen generation and storage capacities from renewable sources". (Romanian Competition Council, 2023). Therefore, the urbanistic zonal plan exemption applies only to storage systems that are part of a renewable energy project. A standalone storage installation does not benefit from this exemption and, consequently, is still required to go through the urbanistic zonal plan elaboration procedure, both to reclassify extra-murros land and to establish urban planning parameters (ESS News, 2024).

6.2.6.2. Comparative Table: Authorization Requirements for Energy Storage Projects

Project Scenario	Location	Urbanism zoning plan	Building Permit	Notes
Hybrid Project (with Renewable Source)	Extravilan	NO	YES	Benefits from the exemption in Law 166/2023. Requires change of land use and specific approvals.
Hybrid Project (with Renewable Source)	Intravilan	NO	YES	Benefits from the exemption in Law 166/2023. Requires compliance with the existing PUG or elaboration of a PUD.
Standalone Project (without Renewable Source)	Extravilan	YES	YES	Does not benefit from the exemption in Law 166/2023. Requires an urbanism zoning plan to change land use and reclassify it as intra-murros.
Standalone Project (without Renewable Source)	Intravilan	YES	YES	Does not benefit from the exemption in Law 166/2023. Requires a urbanism zoning plan to establish urban regulations, in the absence of a relevant a general urbanism plan.

This aspect highlights a major gap and demonstrates that the legislative changes were not a fundamental reform, but a series of "patches" added to an old framework, which generated an incoherent framework and shifted the risk from a clear procedural barrier to a legal interpretation one.

6.2.6.3. Grid Connection

Beyond urban planning authorization, the development of energy storage facilities also requires technical authorization and licensing.

For storage installations with a discharge capacity exceeding 1 MW, the first critical step is obtaining a set-up authorization from NARE, followed by the commercial operation license issued upon completion of construction and installation works. Overall, the development of a storage project should be understood as a continuous process requiring coordinated actions from the investor, NARE, and the network operator. The table below summarizes the key stages of authorization and grid connection.

STAGE	RESPONSIBLE PARTY	KEY DOCUMENTS	ESTIMATED/REGULATED DURATIO
1. Feasibility Study & Design	Investor	Feasibility study, technical project	Variable
2. Installation Authorization	Investor & NARE	Application, supporting documents, project budget	Variable (pays 0.1% of investment value)
3. Grid Connection: TCA Application	Investor & DSO	Connection application, technical documentation	1 calendar day
4. Grid Connection: TCA Issuance	Grid Operator (DSO)	Technical Connection Notice (TCA)	30 calendar days
5. Grid Connection: Contracting works	Investor & DSO/Certified Company	Connection/works execution contract	30 calendar days
6. Grid Connection: Design & Execution	DSO or Certified Company	Connection installation file	90 calendar days (estimated)
7. Operation License	Investor & NARE	Application, supporting documents	Variable (pays fee based on power)
8. Grid Connection: User file	Investor	User installation file	15 calendar days (estimated)
9. Grid Connection: Connection Certificate	Grid Operator (DSO)	Connection Certificate	3 business days

10. Connection: Energization	Grid Supplier & DSO	Supply contract	5 business days (estimated)
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While this table provides a clear path, it is important to note that the new capacity allocation procedure through auction, which comes into force on January 1, 2026, for projects larger than 5 MW, adds a component of additional cost and risk, transforming connection from a simple administrative step into a critical point of strategic risk. The new legislative framework will be applicable for behind the meter storage facilities or stand alone with an installed capacity of at least 5 MW or more.

The primary result of this change is that the process for acquiring the TCA is now dependent on the outcome of the auction. An TCA can be issued only after the project has secured a specific capacity in a public auction. In practice, even if a project is technically and urbanistically prepared, it cannot secure the TCA, and therefore, cannot advance with the authorization process without having been granted a MW in the auction. Projects with an installed capacity under the 5 MW threshold will adhere to the conventional connection procedure.

NARE has indicated that this auction mechanism was created to foster a competitive environment and enhance predictability within the energy system. The funds raised through auctions will be utilized by network operators for the advancement of electrical grids. (Energynomics, 2024). In the context of the new capacity allocation methodology through auction, performing detailed analyses of the grid capacity in the targeted locations becomes an essential component of the feasibility study.

In terms of operation of the energy storage facility, TSO and DSO established minimal requirements for connecting new installations to public utility grids. These regulate critical aspects such as:

- Frequency stability: Storage installations with nominal active power greater than 0.8 MW must remain connected to the grid and operate (producing or consuming energy) within specific frequency ranges and under certain conditions of frequency variation (Transelectrica, 2025)¹⁹.
- Fault Ride-Through Capability (FRT or LVRT): Installations must remain connected to the grid during voltage sags caused by faults, adhering to specific voltage curves (Transelectrica, 2025)²⁰.
- Control and protection schemes: Operators of storage installations must submit their control and automation schemes to the network operators for coordination and approval at least 3 months before commissioning. The electrical protection systems must have priority

¹⁹ Article 6 of the TSO norm on technical requirements for connection to public electricity networks for electricity storage facilities and the procedure for notification of electricity storage facilities

²⁰ Article 13 of the TSO norm on technical requirements for connection to public electricity networks for electricity storage facilities and the procedure for notification of electricity storage facilities

over dispatcher commands to ensure operational safety and must have extended self-testing and event logging functions for Categories C and D installations (Transelectrica, 2025)²¹.

6.2.7. Network charges and levies

The primary practical outcome of the revised definition is the eradication of the double taxation issue, which is formally acknowledged as a significant barrier to investment. Prior to EGO 134/2024, transmission and distribution tariffs were imposed at each energy entry point into the grid. Following the legal clarification issued by the EGO, NARE issued an order that establishes methodological standards for the exemption from regulated tariff payments (NARE, 2025), contingent upon the subsequent reinjection of stored energy into the grid. This legislation sought to exempt the payment of tariffs for transmission, distribution, and system services, in addition to green certificates for stored energy. The effective partnership between the legislator and the regulatory body converted a textual clarification into a tool with direct financial implications, offering predictability and a favorable signal for investors.

6.2.8. Future changes in legal framework

The new legislative framework is currently being implemented via specific investment projects. The Ministry of Energy has initiated solicitations for projects utilizing NRRP funds, focusing on BESS.

A significant domain is the storage of green hydrogen. The Society for the Administration of Energy Holdings SA (SAPE) has secured funding from the NRRP for a project focused on the production and storage of green hydrogen, illustrating that energy storage encompasses not only batteries but also other energy vectors. By means of these investments, Romania aids in the decarbonization of several industries outside energy, so generating novel economic and technological prospects.

To summarize, the alteration of the "energy storage" term by EGO 134/2024 constitutes significant legislative action rather than a mere rephrasing. The inclusion of the phrase "or for delivery into electricity grids" has resolved the core issue of double taxation, which previously hindered investments. The new legal framework, in conjunction with NARE rules, is crucial for meeting NRRP obligations and for the effective integration of renewable energy sources into the NPS. Furthermore, EGO 134/2024 has strategically facilitated essential investments for Romania's energy security by adopting the notion of "project of national importance," particularly in pumped-storage hydropower initiatives.

To optimize the advantages of the new legal framework, the subsequent activities are advised:

- Vigilant oversight of the execution of NARE regulations is essential to guarantee the thorough removal of fiscal impediments and to prevent the emergence of new administrative or technical barriers.

²¹ Article 17 of the TSO norm on technical requirements for connection to public electricity networks for electricity storage facilities and the procedure for notification of electricity storage facilities

- Establishing a transparent and efficient administrative structure for executing the "projects of national importance" idea via government decisions is essential to prevent delays and use the new legislative provisions;
- Ongoing financing initiatives and governmental support mechanisms are crucial for attracting both private and public investments across various storage technologies, including batteries and green hydrogen;
- Authorities must persist in conveying the critical role of storage as a cornerstone of energy security and price stability, thereby fostering investor and consumer confidence in the energy transition.

6.3. Austria: overview of the legal framework for energy storage

6.3.1. Current regulation of energy storage- EIWOG

In Austria, only pumped-storage hydroelectric power facilities have a longstanding legacy as a method of energy storage. However, supplementary storage capacity utilizing alternative technologies, such as battery storage, will be necessary for electricity supply, heating and cooling, and transportation (Oesterreichs energie).

Legislative competence in the electricity sector is divided between the federal state and the nine provinces. The federal state is competent for framework legislation, and the provinces are competent for implementation legislation. The relevant governmental departments in Austria are on a national level, and on a provincial level and there are specific departments in the governments of each of the nine provinces. (CMS Guideline, 2018)

The Austrian legislative framework does not provide a distinct definition for electricity storage. Neither the national Electricity Act (“EIWOG”) nor the provincial implementation statutes designate the term electricity storage. Pumped-storage power plants are nonetheless referenced in multiple regulations. The EIWOG employs the phrase “electricity storage facility” (Stromspeicher) without providing a definition. Thus under the current EIWOG, a storage facility is initially provided with electricity or generates electricity on-site. Subsequently, it injects electricity into the grid as a producer (Einspeiser), and when providing electricity to its consumers, it functions as a supplier in the legal context (Energielieferant) (CMS-Electricity Storage in Austria, 2024).

An “electricity storage facility” is differentiated from a pumped-storage facility (Pumpspeicherkraftwerk), but both are “energy storage facilities” (Energiespeichieranlage) and market participants (Marktteilnehmer).

Pumped-storage power plants are qualified as energy generators and have to comply with the relevant legislation with the EIWOG. As a result, projects usually have to hold a generation licence pursuant to the provincial EIWOG.

6.3.2. Meeting NECPs commitments

Austria’s latest NECP introduces a legal framework for flexibility through the EIWG draft and refers to sector integration yet provides limited detail on their practical design. It proposes to

accelerate permitting procedures via amendments to the Environmental Impact Assessment Act, though these remain under discussion and thus uncertain in scope and impact. Notably, the NECP does not quantify flexibility needs nor establish storage targets, leaving a critical gap in planning (EASE- Austria NECP, 2025).

6.3.3. Definition of energy storage

However, in the context of subsidies, the energy storage is regulated under the REA Investment Subsidy Ordinance for Electricity—as *stationary electricity storage system that can absorb electrical energy on an electrochemical basis in accumulators and make it available again for time-delayed use and it includes definitions and eligibility rules for photovoltaic systems paired with storage*, as explicitly referenced in § 56 REA (Complete legal regulation for the EAG Investment Grants Ordinance for Electricity, 2025).

6.3.4. Permitting Regulation for Energy Storage

The permitting process for energy storage facilities is fragmented in central and provincial that are regulating the permitting of renewable energy infrastructure. At the central level, permitting provisions can be found under the EIA Act (“*Umweltverträglichkeitsprüfungsgesetz*”), Water Act (“*Wasserrechtsgesetz*”), High Voltage Current Lines Act (“*Starkstromwegegesetz*”), Forest Act (“*Forstgesetz*”), Trade Act (“*Gewerbeordnung*”) while at the provincial level, the respective Building Codes (“*Bauordnungen*”), provincial electricity acts Nature Protection Laws (“*Naturschutzgesetze*”) and Spatial Planning Laws (“*Raumordnungsgesetze*”) (ICLG24, 2024).

6.3.4.1. The General Legal Framework for Territorial Planning and Construction Works

Depending on the placement of the energy storage facilities, the deployment of it may encounter several permits and authorization.

The federal law EIWOG is the core legislation regulating the operation of electricity facilities (including the energy storage facilities) and the rights of obligation of the market participants. On the other hand, depending on the location where energy storage facilities are placed, the deployment of it may require specific permits and endorsements from provincial or municipalities bodies, such as:

- Permits under the Spatial Planning Law- the operators must ensure that the chosen site for placing the energy storage facility is zoned for commercial or industrial activities; Currently, there are generally no dedicated planning zones specifically for energy storage in the way there might be for wind farms or solar parks. This means that storage facilities are usually treated as a type of building or industrial plant and must comply with the zoning and building regulations that apply to such structures.
- Permits under the Nature Conservation laws, if the project is located near a protected area.
- Construction and land use permits governed by the Building Codes.

Under the federal laws might be required:

- EIA under EIA Act for matters concerning environmental protection, water rights, forestry, etc. Usually, the EIA is required for large-scale projects, such as pumped-storage hydropower plants or combined with another project that is subject to EIA.
- Trade licenses are necessary for commercial use where many smaller and medium-sized energy storage projects may fall under this legislation, as they often fall under the category of industrial or commercial plants.

There is no specific regulation with regard of the site of location of the energy storage facility. Thus, in the lack of specific provisions, energy storage facilities can be placed on the land of choice or even on a building structure, depending on the size and capacity.

6.3.4.2. Grid connection:

Grid connection and grid-access rights are regulated under the EIWOG. In terms of electricity lines, similar to the generation unit, the storage unit attached to the grid must be contractually agreed with the DSO or the APG, depending on the connection point of the energy storage facility (E-control, 2022).

The operator of a storage facility is a market participant and is subject to the compliance of the market rules. Also, from the regulatory point of view, the storage facility operator is regarded as a generator of energy and in this respect must obtain the local DSO permits in order to access the grid.

The existing permitting procedure for an energy storage facility in Austria is intricate and multifaceted, necessitating adherence to many federal and provincial statutes, encompassing commerce, construction, and energy legislation. The procedure is tailored to the project and necessitates meticulous navigation of the disjointed legal framework. Although the system will probably undergo significant reform with the new EIWG and associated legislation, these changes have not yet been enacted.

6.3.5. Network charges and levies

In Austria E-Control is the regulatory body that sets the tariffs and grid costs on a yearly basis under the grid tariff ordinance and subject to observe the provisions of EIWOG. Once the EIWG enters into force, tariffs will remain regulated by E-Control in accordance with the new rules. However, the EIWG in its current draft form would grant E-Control greater flexibility in setting those tariffs. The network charges vary by region and network operator. This is because the costs of grid operation are different depending on geography, population density, and the state of the local grid infrastructure and RES expansion. For example, maintaining a network in a rural, mountainous area is often more expensive per customer than in a densely populated city (AT Network Costs, 2025). In any case, in Austria the network charges are regulated by E-control and any deviation from them by the regional network operators must be prior approved by the E-control.

While these charges appear technical, they are decisive for the economic viability of different market participants, especially operators of storage facilities, who sit at the crossroads between consumption and generation.

Under Austrian electricity law, the cost structure for using the grid is defined by a complex system of charges and levies. At present, there are distinct network charges, and a specific network tax apply (Energy Magazine Austria, 2025):

- The Network Provision Charge („*Netzbereitstellungsentgelt*“)

The network provision charge is distinct from the usage fee. It is intended to cover costs linked to grid extensions and reinforcement, ensuring that new or expanded connections can be accommodated without jeopardizing network stability. The amount of the charge depends directly on the voltage level at which a user connects to the system. All users who physically take electricity from the grid are subject to this fee, regardless of their role as consumers, producers, or hybrid operators.

- The Grid Access Charge („*Netzzutrittsentgelt*“)

The grid access charge is a one-off payment made by every grid user upon establishing a connection. This charge reflects the administrative and infrastructural costs of connecting to the electricity system. Unlike the usage-based charges, this fee does not recur once access has been granted.

The Network Provision Charge and the Grid Access Charge represent one-time fees applied now of connection to the electricity grid.

- The network usage charge („*Netznutzungsentgelt*“)

The network usage charge is one of the most significant cost components. It is levied on every user with a registered meter, but only when electricity is taken from the public grid. This charge finances the construction, expansion, operation, and maintenance of Austria’s electricity networks.

A legal nuance arises for storage facilities connected behind the meter: when such facilities are directly linked to a generating plant, they may avoid paying this fee altogether, since technically no electricity is taken from the grid. This creates a clear financial advantage and demonstrates how metering requirements can critically influence the economics of storage projects.

Operators of pumped-storage facilities in hydropower plants or facilities converting electricity into hydrogen or synthetic gas are free from certain network charges. Other operators criticize this as lacking technology neutrality, i.e., discriminatory.

- The Network Losses Charge („*Netzverlustentgelt*“)

Another layer is the network losses charge, which reflects the unavoidable losses that occur when electricity is transported through the grid. Energy losses that cannot be avoided happen when electricity is transmitted through lines. These losses are compensated for by the loss of energy fee.

- The System Services Charge („*Systemdienstleistungsentgelt*“)

The system services charge ensures funding for ancillary services, particularly the procurement of secondary balancing power needed to maintain grid frequency and stability. This charge is levied on all users who feed electricity into the grid above 5MW, thereby ensuring that those who introduce volatility into the system contribute to its ongoing stability. Additionally, there are perceived metering charges and a charge for other services

To summarize, under the current legislation Austria’s system of network charges is comprehensive but still rooted in a traditional distinction between producers and consumers. Storage facilities, which embody both roles, fit uneasily within this framework.

There are several debates on the applied taxes and tariffs as the interest of the parties might be contradictory. On one hand the interest of the grid operators is to assure that all grid costs are covered, while the storage facility operators will seek to be exempted from particular charges, especially when they act in a grid-friendly manner.

From the perspective of the grid operator, both the extraction of power from the grid and its subsequent storage, along with the reintegration of stored electricity into the grid, are regarded as utilizations of the grid. Both activities can incite system usage costs (“*Systemnutzungsentgelte*”) (Electricity Storage in Austria, 2024). The administrative court has upheld the grounds for the grid operator's viewpoint. Any utilization of the grid, irrespective of its designation, may incur charges if such charges pertain to grid usage and result in expenses for the DSO.

Until the law explicitly recognizes storage as a distinct category of grid users, questions around their obligations for network losses, usage charges, and other levies will persist.

6.3.6. Future changes in Austrian legal framework

6.3.6.1. *EIWG Draft- a new legislation framework*

The EIWG will regulate electricity storage for the first time, ensuring parity in grid tariff and levy reductions. The proposed legislation, which commenced its assessment process on July 3, 2025, seeks to establish a complete legislative framework for the contemporary electricity market, emphasizing the integration of energy storage solutions. The principal elements of the proposed EIWG encompass fair electricity prices, grid expansion and stability, and the further advancement of the energy transition through the expansion of renewable energies.

The EIWG takes the definition provided under Electricity Market Directive and defines energy storage facility in Section 6 (36) “*as any system that retains electrical energy, either by temporal displacement (e.g., batteries) or by transforming it into a storable energy form (e.g., hydrogen via electrolysis)*”.

In the power grid, 'energy storage' will refer to either:

- postponing the ultimate utilization of electricity to a time after its generation, or

- transforming electrical energy into a storable form, the retention of such energy, and the later reconversion or application as an alternative energy carrier.

The novelty of this legislative draft is that energy storage is integrated within the functions that are performed by an electricity undertaking, having the effect of treating the storage facilities either as consumers or generators to the grid, thereby incurring the associated rights and obligations. In particular §82 of the draft and explanatory notes affirm that storage operators are recognized as electricity undertakings, possessing distinct legal status—rather than merely being consumers or producers.

The current Austrian legislation is not clearly defining the energy storage and the market felt the need of determining the rules for energy storage as well as alignment with the Electricity Market Directive and with its older version which is essential for providing legal certainty and fostering investment in storage technologies, which are indispensable for Austria’s transition to a renewable, flexible, and resilient energy system.

On 12 January 2024, the draft EIWG was released for public consultation and review, acknowledging that EIWOG no longer serves the needs of the electricity market (OTS.at, 2024). This draft was not enacted and has been under public consultation until July 2025, when a new version of the draft was re-entered under review process. According to official sources, the public review window was from 7 July 2025 to 15 August 2025 (Oesterreich.gv.at, 2025).

The legal framework acknowledges energy storage operators as autonomous market actors, marking a substantial shift. Under Section 119 (3) EIWG it is provided that energy storage systems that are grid-friendly, in the sense that when operated it supports the grid network, are to be exempted from network use charge for 20 years from their commissioning (CMS- Battery storage in the EIWG).

The EIWG imposes stringent limitations on grid operators regarding the ownership and operation of storage facilities. This aims to guarantee market neutrality and equitable competition. Exceptions are permitted just in particular circumstances, such as for grid stabilization when no market alternatives exist.

The proposed legislation endorses "active customers" who generate, store, and utilize their own electricity, as well as energy communities and peer-to-peer electricity trading. This is a vital element for dispersed storage systems such as residential batteries.

6.3.6.2. Network charges and levies under EIWG draft

According to the EIWG draft currently under review in Austria, energy storage operators—specifically those providing services that benefit the electricity system—face a markedly revised and more favorable framework for network charges and levies. EIWG introduces the concept of a “system friendly” energy storage operation under which it is expected that storage operators may benefit from certain exemptions on network charges because of the contribution to the electricity network flexibility. The new network charges are to be established by E-control as provided under Article 32 of the EIWG.

The federal government's FAQ regarding the EIWG clarifies the scope and technical application of the exemption of the grid usage charges and grid loss charges stating that “all energy storage systems—without any technical limitation—should be exempt from both the network usage fee (§ 120 EIWG) and the network losses fee (§ 121 EIWG), provided they are operated in a system-supporting manner (BMWET.gv.at, 2025).”

This confirms that the legislative intent extends coverage to all energy storage installations, so long as system-supportive operation is demonstrable, regardless of the specific technology.

Below is a comprehensive breakdown of what charges system-supporting energy storage operators must pay (and which they’re exempt from) under the draft EIWG:

Charge / Levy	System-Supporting Storage (20-yr exemption)	Behind-the-Meter Self-Supply	Relevant EIWG Draft Section
Network Usage Charge	Exempt	No charge	§120(with§119(3))
Network Losses Charge	Exempt	No charge	§121
Other Services Fee	Typically pays only if used; some exemptions exist	Same as general users	§124
Network Connection Charge	Must pay (proportional to capacity increase)	Same as general users	§122 (new combined charge)

6.3.6.3. Conclusion

The EIWG is designed to reduce administrative burdens. It proposes that energy storage facilities used for self-consumption by private individuals and small and medium-sized enterprises (SMEs) may be exempt from the need for a separate permit under the EIWG itself. However, it's crucial to note that other legal requirements, such as those stipulated by the Trade Regulation Act (“*Gewerbeordnung*”) and provincial building codes, would still apply. This distinction aims to simplify deployment for smaller, decentralized systems without compromising safety and commercial standards.

The draft EIWG and related legislation aim to create a more favorable financial environment for energy storage.

- **Exemption from Network Fees:** The legislation includes specific provisions that can exempt certain research and demonstration projects from network charges. This is intended to stimulate innovation and the development of new storage technologies and business models.
- **Grid Access for Storage Operators:** Under the new framework, energy storage operators are recognized as distinct market participants and classified as electricity suppliers. This classification grants them non-discriminatory access to the grid under standardized contracts, with tariffs and regulations overseen by the national regulator, E-Control.

- **Subsidies and Market Support:** The REA and other government schemes provide a robust system of subsidies for the deployment of energy storage, particularly for distributed systems paired with solar installations. A notable feature of these subsidy programs is a premium for equipment certified as "Made in Europe," which is a strategic move to foster a domestic and regional supply chain

7. EU legal framework and treatment of GoOs for energy storage

GoOs are the EU's key instrument for certifying to final consumers that a certain share or quantity of energy was generated from renewable sources. Their sole function, as confirmed in RED II (RED II, Official Journal of the European Union, 2018) is to demonstrate renewable origin to the end user. GoOs have been instituted as a market-based mechanism that "*can be transferred, irrespective of the associated energy, from one holder to another,*" while ensuring that "*double counting and double disclosure of guarantees of origin are avoided*"²²

So far, energy storage facilities have not been explicitly addressed in the EU framework regarding the rules for GoOs corresponding to electricity released from storage systems such as BESS.

The first legal basis for GoOs dates back to 2009, when they were introduced for electricity from renewable sources in general, with no mention of storage.

In 2018, RED II entered into force, requiring MS to ensure that GoOs are issued upon request for energy produced from renewable sources²³. The directive made it clear that GoOs are to be issued for renewable electricity generators, with no provisions for new GoOs at storage discharge.

In 2023, RED III was adopted, repealing and replacing RED II, while largely carrying forward its core definitions and provisions. The new directive maintains the same principle of linking GoOs to production: they are issued upon request for energy generated from renewable sources. A notable addition, however, is Recital 66, which emphasizes the need for transparency and the avoidance of double counting. Still, no explicit rules on storage have been introduced.

Questions have arisen regarding whether GoOs can (or should) be issued for electricity discharged from storage facilities.

Under the current regulatory framework, GoOs are legally distinct from the physical electricity to which they relate. EU recitals expressly provide that a GoO "*can be transferred, independently of the energy to which it relates, from one holder to another.*"²⁴. However, once a GoO has been transferred and used, the corresponding MWh of renewable electricity can no longer be claimed as renewable. In other words, when a consumer or supplier claims the use of a certain MWh amount of renewable electricity, GoOs issued for those MWh cannot be claimed a second time using the same GoO. GoOs are issued at the request of electricity generators, with one GoO

²² Recital 55 of RED II

²³ Article 19, first paragraph of RED II

²⁴ Recital 55 of RED II

representing one MWh of electricity produced from renewable sources. This establishes a clear correspondence between GoOs and renewable electricity generation. To reinforce this link, RED III requires that double counting is avoided and that disclosure rules ensure the integrity of GoOs.

From a technical perspective, energy storage facilities do not generate new electricity; rather, they store electricity already produced from renewable sources or taken from the grid. When considering the provisions of RED III in light of the technical role of energy storage facility, it follows that electricity discharged from storage cannot give rise to the issuance of new GoOs.

In conclusion, once a GoO has been transferred, the related MWh of renewable electricity cannot be claimed again. In practice, this means that storage may transfer an existing GoO together with the discharged electricity, but it cannot trigger the creation of an additional GoO beyond the one already issued at the point of generation.

In light of the rapid expansion of the European energy storage market—with a record 21.9 GWh of installed capacity in 2024 and projected growth of up to 400 GWh by 2030 (Solar Power Europe, 2025)—the current regulatory framework does not fully keep pace with market developments. Until now, legislative attention has primarily focused on increasing the share of RES and regulating the issuance of GoOs for electricity generators. However, as energy storage facilities deployment becomes increasingly central to the energy transition, the regulatory framework must also evolve to address this new reality, including clear rules on the treatment and potential issuance of GoOs for electricity discharged from storage.

European industry associations, representing key market stakeholders, have formally called for amendments to the GoOs framework in order to ensure that it adequately reflects the role of storage within the evolving energy system. In May 2025 Solar Power Europe issued a report, urging the introduction of “updated Guarantees of Origin frameworks” that explicitly account for battery energy storage systems. In this sense the GoOs should be issuable for stored renewable energy, to ensure tracking accuracy and opening new routes-to-market for batteries, (Solar Power Europe, 2025). Certifying stored renewable electricity will enable industrial decarbonization through hybrid power purchase agreements and certified renewable-based electricity.

ENTSO-E likewise advocates for a 24/7 (hourly) GoOs system to better reflect real-time generation and consumption. In line with the granularity principle of GoOs introduced under the RED III, ENTSO-e highlights two key evolutions for GoOs: (i) temporal matching, shifting from annual to hourly or 15-minute alignment of renewable production and consumption, thereby capturing the real value of green electricity at each moment; and (ii) locational matching, by introducing market boundaries and capacity considerations, which would incentivize renewable deployment and consumption in the most efficient geographical locations.

Recognizing the increasing role of flexible technologies like batteries, the RED III amendment encourages the development of “Granular GoOs.” Unlike standard GoOs that only specify the date of production, granular GoOs would include more precise information, such as the sub-hourly time of production. This innovation is designed to allow for more accurate matching of renewable electricity generation with consumption, which is particularly relevant for electricity that is first stored and then discharged. This creates a stronger incentive for investment in battery storage.

The regulation of the GoOs system and its connection with emerging technologies such as energy storage remains a subject of extensive debate and analysis at the highest echelons of the EU. The European Commission has contracted a consultancy company to oversee the operation of the GoOs system and to devise labeling options of GoOs (Publication Office, 2025). This mandate stems from Article 19(13a) of RED III, which requires the European Commission to: (i) monitor the functioning of the GoOs' system; (ii) assess the balance between supply and demand in the GoO market; and (iii) identify the key factors influencing that supply and demand.

The AIB is concurrently enhancing its system to provide hourly certificates in compliance with the new EU standards and whether a special GoOs treatment is needed for stored energy (to avoid both greenwashing and under-recognition of storage's role) (Renewabl, 2025), while industry organizations like ENTSO-E have released position papers on a "Future-Proof Market Design for Guarantees of Origin (Entso, 2025)." These conversations highlight that, although the legal framework is progressing, the consensus is to enhance the current system of production-based GoOs to incorporate storage, rather than to fundamentally alter it by permitting the establishment of new GoOs.

7.1. National implementation of GoOs- Legislation Comparison: Germany, Romania and Austria

The way these EU directives are transposed into national law varies significantly, leading to different approaches for electricity from battery storage.

7.1.1. Germany

Germany continues to treat GoOs as certificates tied to the original generation of electricity (Buzer-Section 79 of Renewable Energy Sources Act), not to storage discharge. Storage does not create a new GoO when it discharges as any GoO associated with an MWh must come from the original generation and be transferred/entitled accordingly.

Germany applies a 'double-marketing/double-compensation' principle to many EEG-supported installations, meaning that GoOs are not issued for subsidized volumes in the same way as for unsubsidized generation. This approach significantly limits the amount of domestic GoOs available for trading (Treibhausgas-Projektionen 2024 , 2024). The principle also governs co-located installations: where renewable output benefits from EEG support, the issuance and marketing of GoOs is restricted to avoid double-counting. As a result, many EEG-supported MWhs are not available as tradable GoOs, which affects what stored electricity can claim/carry as a GoO. Although amendments to the EEG and related market rules from 2023 onward have refined the treatment of co-located storage, they still do not permit storage facilities to generate new GoOs upon discharge (Transnet-EEG funding).

If an energy storage facility is powered by renewable electricity with an existing GoO, that GoO must be transferred to the storage account (or to the entity holding the rights) and subsequently cancelled upon final sale or consumption; the storage process does not generate an additional GoO upon discharge. The register regulations mandate traceability through account registrations and terminations (Herkunftsnachweisregister für Strom aus erneuerbaren Energien).

The costs associated with the registration, transfer and cancellation of the GoOs under the German GoO register (in German “Herkunftsnachweisregister”) are borne by producers’ suppliers, with the aim of supporting transparency in the renewable energy market. The fees are regulated by the REO and provides registrations fees that is a one-time fee for the first registration of the RES installation; transactions fee concerning the issuing, transferring or canceling a GoO and annual fee that is paid to maintain the account and access within the register (Gesetze -Reneable Energy Ordinance, 2012).

In practice, GoOs are issued in the official register upon application by the renewable energy producer. They may subsequently be transferred or traded between authorized market participants, including across borders, in accordance with applicable regulatory provisions. For the corresponding electricity to be lawfully designated and disclosed as renewable to end consumers, the GoOs must ultimately be cancelled in the supplier’s account, as depicted in the flow chart below:

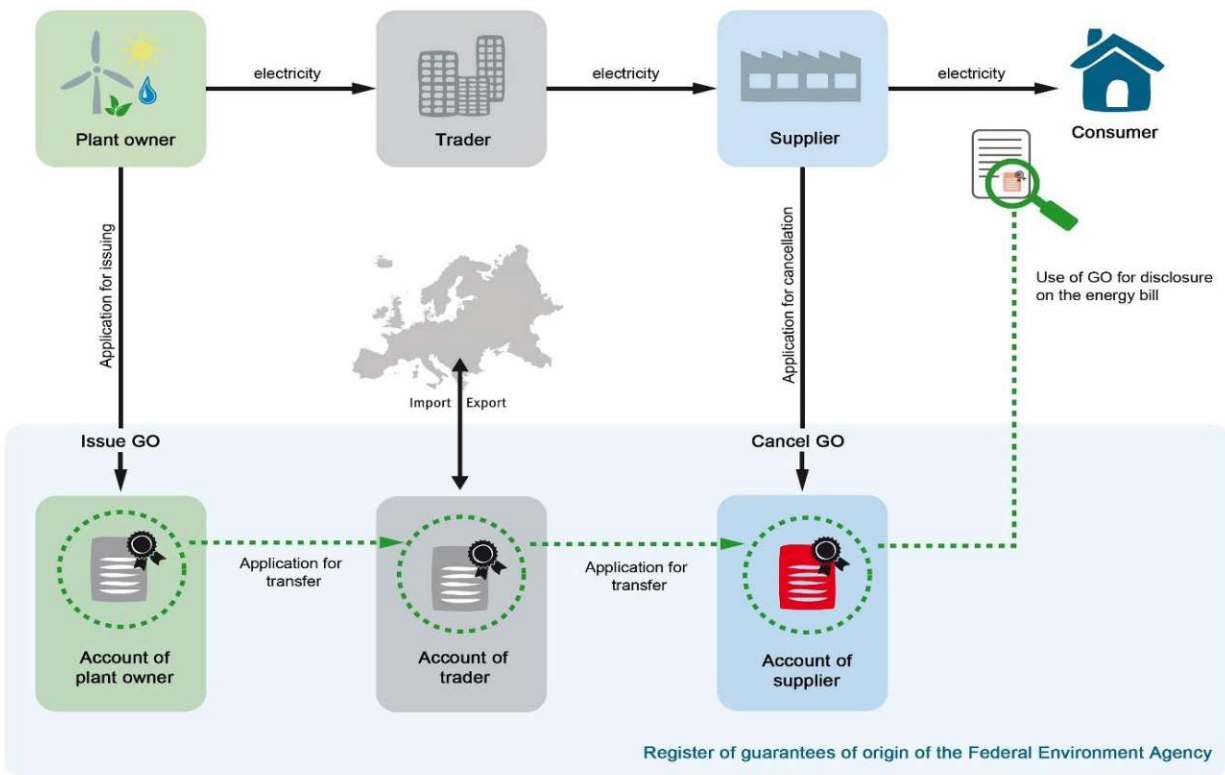


Figure 3- GoOs in Germany (Umwelt Bundesamt, 2023)

In conclusion, the German framework for GoOs maintains a strict link between the certificate and the original act of renewable electricity generation, excluding storage discharge as a basis for new GoO issuance. The application of the double-marketing and double-compensation principle under the EEG substantially reduces the volume of tradable GoOs, particularly from subsidized installations, and imposes corresponding limitations on storage-related claims. While recent

legislative refinements have clarified procedures for co-located storage, they continue to uphold the principle that storage does not generate independent GoOs. The regulated registration, transfer, and cancellation processes within the Herkunftsnachweisregister, including associated cost obligations, ensure traceability, market integrity, and consumer transparency, but at the same time reinforce the restrictive nature of Germany's GoO system compared to less constrained regimes in other jurisdictions.

7.1.2. Romania

The GoOs system in Romania, which transposes the RED III, is regulated by Energy Law and the regulations of NARE. Suppliers are required to reveal their mix of energy through GoOs. Currently an established GoOs market does not yet exist and GoOs are transferable "for free" to substantiate their utilization of renewable energy. Romanian law lacks a specific regulation regarding storage. Consequently, a Romanian energy-storage operator would just transfer the GoOs from the original renewable source, rather than generating a new GoO (RO ICLG Report, 2024).

Romania is currently in a transitional phase to align with EU regulations. The new framework is being developed by the NERA.

Romania is in the process of implementing a new legal framework for GoOs, with the goal of becoming a full member of AIB by 2027. This means that a fully functional, tradable GoOs market is still under development.

Although RED III provides that GoOs may be transferred independently of the electricity to which they relate, and this rule has been transposed into the national framework for the issuance and traceability of GoOs under Government Decision no. 1232/2011, in practice NARE allows the transfer of GoOs only together with the underlying electricity. For this purpose, NARE requires proof in the form of the contract and invoice for the sale of electricity by the generator to the supplier or trader and it matches the quantities of electricity sold with the corresponding quantities of GoOs issued.

In conclusion, Romania's GoOs legal framework remains in a transitional stage, reflecting partial transposition of RED III into national law but without the establishment of a fully functional and tradable GoO market. Current practice, administered by NARE, links the transfer of GoOs to the physical sale of electricity, thereby limiting the flexibility envisaged by EU law, which permits independent transfer. The absence of a storage-specific regime reinforces the principle that GoOs must remain tied to the original renewable generation and simply be passed through by storage operators without creating new GoOs. Romania's planned integration into the AIB system by 2027 signals a move toward greater harmonization with EU standards and market practices, but until the new framework is in place, the Romanian GoOs system remains constrained, underdeveloped, and largely formalistic in nature.

7.1.3. Austria

Austria enacts EU GoOs regulations through its ElWOG and REA. Austrian authorities allocate GoOs for every MWh of renewable energy fed into the grid, in accordance with the RED II. No specific exception exists for storage. In practice, a battery charged by solar or wind energy only

"inherits" the initial green offset and the stored energy retains the same GoO obtained at the time of generation, with no new certificate being produced.

The current Austrian legislation presents a challenge, as the rules governing (sub)metering for co-located or hybrid storage and power generation facilities remain unclear and must be defined in coordination with the respective grid operator. However, the draft EIWG is expected to provide greater legal certainty once enacted, as it would empower the regulator to establish standardized measurement concepts. The first draft of these measurement concepts is already under consolidation (E-Control Hybrid, 2025).

It is currently unclear how GoOs can be issued in cases where a power generation facility and an energy storage system are located behind the same metering point, and electricity is first stored before being injected into the public grid. While GoOs are typically generated at the point of grid injection, the methodology for tracing and certifying electricity that has passed through storage prior to being fed into the grid remains undefined under the current framework.

Evidence used for labelling must be consistent with the actual amount of energy delivered to end customers. If not, imbalances may occur, along with risks of double counting or double use of GoOs and the information they contain. In Austria the GoOs corresponding to the quantity of electricity stored are placed in a dedicated account for the duration of the storage period. Once the electricity is released back into the grid, the GoOs are withdrawn from the account according to a defined key and passed on to the supplier, who ultimately transfers them to the end consumer, as can it is illustrated bellow (E-Control GoOs, 2023):.

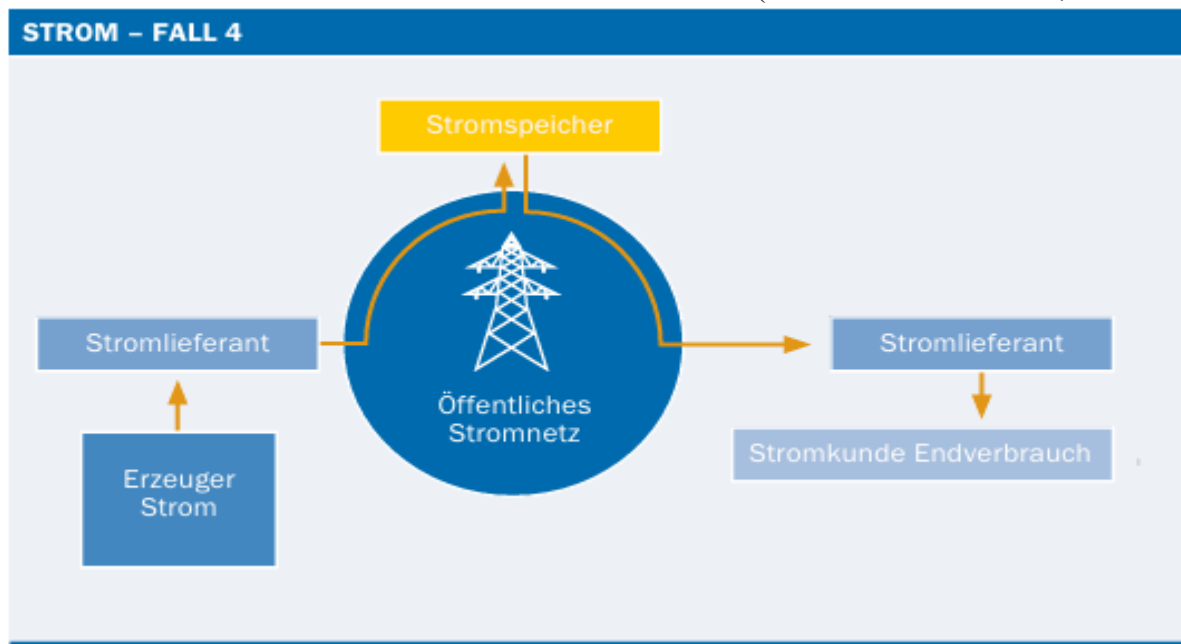


Figure 4- traceability of GoOs when the energy is stored (E-Control GoOs, 2023)

Austrian specialists indicate that when solar energy is stored and subsequently integrated into the grid, the original GoO remains associated with that energy, as electrons lack an independent designation (CMS-Electricity Storage in Austria, 2024).

To safeguard the traceability, the GoOs, the Electricity Labeling Ordinance enacted in 2022 concerning the reporting obligations of GoOs. For electricity storage facilities with a capacity of at least 250 kWh, Article 10 requires systematic reporting and management of GoOs. Network operators must report monthly to the GoOs register both the amounts of electricity stored and the amounts released back into the grid. Storage operators, in turn, must transfer valid GoOs to a dedicated account within 14 days of charging the storage. The storage system's efficiency must also be reported, and GoOs must be cancelled proportionally to storage losses. The remaining GoOs serve as proof of the renewable character of electricity released from storage. If the operator does not specify which GoOs to use, the system defaults to applying the oldest certificates first. Operators may, however, substitute certificates at any time with others from the same primary energy source (Stromkennzeichnungsverordnung, 2022).

In practice, this provision significantly reduces the administrative burden for very small electricity suppliers. Instead of having to obtain, transfer, and cancel GoOs for each unit of supplied electricity, these suppliers may rely on an automatic mechanism: their GoOs are directly recorded and cancelled in the register by default. The only active compliance obligation is a yearly notification to E-Control, with auditor confirmation, confirming that they meet the thresholds, namely < 500 metering points and < 100 MWh/year, and supply exclusively from their own plants. Thus, the rule functions as a *de minimis* exemption, streamlining compliance for micro-suppliers while maintaining transparency through the GoO register (Stromkennzeichnungsverordnung, 2022).

In conclusion, Austria applies a rigorous GoO framework aligned with RED III, ensuring that certificates remain tied to the original generation and are adjusted for storage losses rather than reissued upon discharge. Through systematic reporting obligations and the Electricity Labeling Ordinance, the system safeguards traceability and prevents double counting, while a *de minimis* exemption eases compliance for small suppliers. Austria's model combines strict oversight of storage-related GoOs with pragmatic mechanisms that balance transparency and administrative efficiency.

In summary, operators of energy storage facilities cannot obtain new renewable GoOs under current EU law – only the original production does. RED II explicitly limits one GoO per MWh produced. Consequently, storage operators must transfer the 1 MWh associated GoO when they discharge the electricity in the grid. National regimes in Austria, Germany and Romania follow this EU rule. All three countries issue GoOs based on generation only, and none grants new GoOs for stored energy. The financial burden of GoO issuance falls on producers/suppliers (e.g. registry fees in Germany), and ultimately on end-consumers (in Austria), while in Romania there are no costs associated with the GoOs.

Under the EU regulatory framework, the establishment of the UDB for GoOs was intended to serve as a central instrument to ensure cross-border consistency, traceability, and transparency of GoOs throughout the internal energy market. The UDB, mandated under Article 19(13a) of RED II and maintained under RED III, was expected to consolidate national registries and facilitate harmonized tracking of certificates, including those related to stored electricity.

However, despite being legally required, the UDB has not yet been implemented. Its absence continues to hinder the seamless exchange of GoOs among MS and creates a gap in monitoring and verification at EU level.

In practice, national registries — such as Germany’s Herkunftsnachweisregister, Austria’s E-Control GoO Register, and Romania’s developing NARE registry — continue to operate independently. This fragmentation leads to discrepancies in data quality, traceability, and certificate interoperability, particularly in cases involving cross-border electricity flows or hybrid and co-located installations. The absence of the UDB thus perpetuates inconsistencies across MMS and undermines the EU’s broader goal of establishing a uniform, transparent, and storage-inclusive GoO system.

8. Conclusions:

8.1. EU Legal Framework

This thesis demonstrates that the legal framework plays a decisive role in enabling the deployment of energy storage solutions, which are essential for integrating renewable energy sources, ensuring grid stability, and achieving European decarbonization targets. Electricity Market Directive explicitly forbids “double charges, including network charges” for electricity stored on-site or used to provide system services (Electricity Market Directive, 2019). The recent Commission recommendation on storage reiterates that MS must treat storage as both load and resource, prevent double taxation, and streamline permitting (EU Commission Recommendations, 2023). In practice, however, the EU framework is still evolving there is no dedicated EU permit process for storage and existing rules were written before grid-scale batteries became prevalent. Similarly, GoOs are tied to generation by RED II/III (one GoO per MWh produced), so stored electricity simply inherits the original GoO rather than earning a new one. All three case-study countries follow this principle and carry a renewable GoO through the storage cycle rather than re-issuing it.

8.2. Comparative Insights

8.2.1. Permitting and Licensing

Among the three jurisdictions, Germany currently offers the most mature and predictable permitting regime for energy-storage projects. Its energy legislation ensures a largely transparent and reliable process, complemented by a special “co-opted privilege” in planning law (§35 BauGB) that fast-tracks hybrid projects (storage co-located with wind or solar). As a result, co-located battery projects can often bypass lengthy zoning procedures. Stand-alone storage generally requires standard building permits, with additional approval (an “optional plan approval” under EnWG §43(2)) only for very large facilities (>50 MW) (CMS-Energy Storage trends, 2022).

Romania lags both countries. The current Energy Law contains no dedicated permitting track for storage, forcing developers to apply under general generation provisions and to seek multiple non-coordinated permits from NARE local councils, and environmental authorities. With the reforms enacted in 2024 by introducing the concept of “projects of national interest,” for the RES related

infrastructure it is expected that Romania will implement a fast-track strategic storage project and override local delays.

Austria, by contrast, has no separate storage permitting shortcut: under current EIWOG, storage operators are treated as electricity undertakings and must secure the same electricity and construction permits as generators (ICLG Austria, 2025). Still, licensing remains largely decentralized: storage projects must be authorized under the provincial electricity laws, while the forthcoming EIWG aims to harmonize procedures and explicitly recognize storage as a system service. Until its entry into force, developers face administrative fragmentation and varying provincial interpretations.

In all three countries, energy storage can trigger a complex mix of consents (zoning, environmental, trade and building law), but Germany's co-location rule and Romania's "national interest" category provide some additional clarity and speed for major projects.

8.2.2. Network Charges and Exemptions

All countries have addressed the risk of double charging in different ways.

Germany applies the most detailed network-tariff framework. Historically Germany imposed both generation surcharges and grid fees on batteries (reflecting their dual role) (CMS-Energy Storage trends, 2022), but recent legislation simplifies this: the EEG and EnUG now apply levies only on grid withdrawals of electricity (CMS-Energy Storage trends, 2022). Nevertheless, other levies remain, and German regulators have signaled an end to the long-standing exemption from network usage fees. Draft BNetzA regulations (2025) propose phasing out these avoided-grid-fee payments by 2029 and even eliminating all network-fee exemptions for storage (Baker Mckenzie-Germany, 2025).

By contrast, in Romania, NARE has explicitly exempted storage from transmission, distribution and system services charges and green certificate levies for energy charged from and re-injected to the grid. This effectively eradicates "double taxation" of the stored energy, a major barrier to investors (Energy Storage-Romania, 2025).

In Austria, the draft EIWG similarly recognizes storage's system value: storage facilities deemed "grid-supportive" enjoy a 20-year exemption from network usage and loss charges on electricity procured for storage (Practice Guide Chambers-Austria, 2025).

In sum, Romania have adopted explicit long-term exemptions to lower storage costs and Austria is envisaged to be providing these exceptions under EIWG, whereas Germany is moving to abolish its exemptions, potentially raising the cost of new batteries.

8.2.3. Grid Connection Procedures:

Ease of grid access varies:

Germany again provides the most codified grid-connection process. BNetzA sets uniform rules and timelines, and DSOs/TSOs must publish available capacities and standard contracts. EnWG now mandates TSOs to grant connections to generators and storage "within a reasonable time" and

a new centralized “grid access platform” (Article 20b EnWG) is being implemented to digitize applications. However, transmission grid capacity is increasingly constrained, and there is no special queue priority for batteries.

On the other side Romania still faces challenges in reinforcing the grids while the RES extension is increasing and provides uncertainty in the grid connection permits requiring lengthy grid studies and distribution operators lack standardized timelines. Connection costs are paid entirely by the applicant, with no cost-sharing mechanism.

In Austria, E-Control supervises connection procedures, but implementation still varies among DSOs. The draft EIWG foresees simplified procedures and standard forms for both standalone and hybrid storage.

EIWG takes a proactive approach: it introduces flexible grid access (shortening waiting times) and allows “partial connections,” enabling storage projects to energize a fraction of capacity immediately and expand later (CMS- Battery storage in the EIWG). DSOs must reserve capacity transparently and justify any connection refusal.

The combination of these reforms means Austrian batteries can be connected more quickly and can co-locate with renewables at the same point, whereas German and Romanian systems still rely on conventional first-come-first-served access (albeit within overall connecting obligations).

8.2.4. Guarantees of Origin

In all three countries, the national GoO systems treat storage energy as carrying the original certificate from its generation moment; no country currently issues a new GoO when stored electricity is discharged.

Germany strictly enforces the “double marketing” prohibition under the EEG, preventing issuance of new GoOs for electricity discharged from storage; only the original certificate follows the energy through the storage cycle.

Austria applies a comparable rule but complements it with detailed reporting obligations under the Electricity-Labeling Ordinance which requires network operators to track stored volumes and storage efficiency, placing GoOs in a dedicated account during storage and cancelling certificates to cover losses. This ensures traceability but adds to an administrative burden.

Among all three countries Romania’s GoO market is still nascent; today GoOs transfer only alongside an actual energy sale contract. In practice, however, all three align with EU law: storage simply carries forward the one GoO per MWh issued at original renewable generation and never produces its own.

However, there are still gaps and practical challenges in the context of modern storage: for example, co-located and behind-the-meter setups blur the line between generation and storage, and current registries were not designed to track energy flow through batteries. Stakeholders note that without major updates, the GoO framework will lag rapid growth in storage capacity (Solar Power Europe, 2025). Industry and grid operators are urging more granular and real-time certification (e.g. 15-minute or hourly GoOs) and better tracking so that stored renewable electricity can be

transparently accounted. Until such reforms and the promised UDB integration are in place, the GoO system will continue to work on the generation-only basis – a solid baseline, but one that raises practical challenges as battery storage scales up. This delay also complicates the treatment of energy storage facilities, as no EU-wide mechanism currently exists to consistently trace renewable electricity that has been stored and later discharged.

8.2.5. Overall Comparative Insight: Conclusion and Outlook

Across all assessed dimensions, **Germany** stands out for its mature and coherent legal environment for energy storage. It has embedded storage within its core energy legislation, ensured procedural transparency for grid access, and implemented robust double-charging prevention. However, its strict “double-marketing” restrictions and complex subsidy interactions still limit flexibility and market participation.

Austria follows closely, characterized by a technically precise and transparent regulatory framework. Its Electricity Labelling Ordinance sets a high standard for GoO traceability and accountability, while the forthcoming EIWG promises to streamline permitting and harmonize grid-connection procedures. Yet, administrative decentralization and the lack of finalized metering rules for hybrid installations continue to slow implementation.

Romania, meanwhile, remains in a developmental phase. Its legal framework has begun aligning with EU directives but still lacks the institutional maturity and market instruments found in the other two countries. The absence of a fully operational GoO registry, storage-specific tariff treatment, and integrated connection processes constrains investor confidence. Nevertheless, Romania’s planned reforms and prospective AIB accession by 2027 indicate meaningful progress toward European harmonization.

In comparative terms, Germany leads in legal clarity and grid-integration procedures, Austria excels in data transparency and compliance mechanisms, and Romania shows the strongest growth potential once its reforms are fully enacted.

8.2.5.1. Outlook:

When the pending reforms are implemented—Germany’s tariff refinements, Austria’s EIWG, and Romania’s new secondary legislation—the three frameworks will collectively recognize storage as an independent and system-relevant activity. However, full competitiveness of storage will still depend on several missing elements at both national and EU levels:

- ✓ The operationalization of the UDB to ensure cross-border traceability of GoOs;
- ✓ The introduction of granular (hourly) GoOs to accurately value storage’s temporal flexibility.
- ✓ Dynamic and storage-neutral network tariffs that reward flexibility instead of penalizing energy cycling; and
- ✓ Continued simplification of permitting and grid-connection procedures to reduce administrative burden and lead times.

Only once these measures are realized will energy storage operate on an equal footing with generation and consumption—functioning not merely as a supportive technology but as a core enabler of the European decarbonized power system.

9. Policy Recommendations

9.1. Streamline Permitting

Establish one-stop or centralized permits for storage. For example, Germany’s plan to create a Federal Network Agency contact point should be implemented with clear timelines, and Austria should coordinate its multiple permit authorities. Legislatures should explicitly categorize large storage projects as priority or public-utility installations (as Romania’s “national interest” does), triggering accelerated approval. Where possible, extend Germany’s co-location privilege nationally or allow standalone storage to qualify under utility infrastructure exemptions. EU guidance or directives could encourage digitalized procedures (online applications, standardized requirements) to reduce delays.

9.2. Optimize Network Charges

Adopt transparent, long-term exemption or reduction schemes for storage. National policymakers should follow Austria’s model of exempting storage from grid usage fees, ensuring the exemption spans decades (Practice Guide Chambers-Austria, 2025). Romania’s ANRE order exempting both transmission fees and green-certificate levies (Energy Storage-Romania, 2025) is a best practice; it should be enshrined in permanent law. Germany should reconsider eliminating storage fee exemptions. At minimum, storage should pay only on net withdrawals (as Germany’s new law provides (CMS-Energy Storage trends, 2022) and not be hit by charges for the same MWh twice. Regulators can design bespoke tariff models (e.g. lower demand charges for batteries) in line with the Commission’s recommendation to avoid double taxation (EU Commission Recommendations, 2023).

9.3. Facilitate Grid Connection

Introduce prioritization and flexible connection rules for storage. Policymakers should mandate partial or interim connections (like Austria’s “faster start-up” provision) (CMS- Battery storage in the EIWG), so projects can begin service even if full grid capacity is pending. All countries should require DSOs to reserve and allocate grid capacity for high-value storage projects and transparently justify any refusals. Enhancing digital access — through online portals or queues — will also speed applications. In short, treat large storage like generation with high public benefit: allow interconnection in phases and reduce procedural bottlenecks.

9.4. Harmonize Guarantees of Origin

In the short term, maintain traceability rules: require storage operators to retire original GoOs upon discharge and prohibit double counting. Looking ahead, EU legislators should consider the industry’s proposal to issue time-stamped or storage-specific certificates. At the national level, encourage membership in the AIB and adoption of 24/7 renewable matching to fully reflect stored

energy value. All states should clarify in regulation that no new GoO is created by discharge and should publish transparent rules for storage's GoO accounting (Romania's pending NERA regulations should do this).

By implementing these targeted measures — such as long-term network exemptions, expedited permitting tracks, flexible connection rules, and coherent GoO accounting — policymakers can remove legal barriers and unlock storage deployment across the EU. The comparative evidence shows that countries with clear, supportive rules (like Germany's long-term policies) are much more attractive to investors than those with uncertainty or complexity.

10. Role of the Legal Framework

In conclusion, the study underscores that law is destiny for energy storage integration: well-crafted regulations enable storage to deliver flexibility, whereas legal gaps and burdens can stifle it. The European Commission has stressed that storage must be treated on a level playing field, without unnecessary taxation or procedural hurdles. Where the legal framework explicitly recognizes storage's dual role and rewards its grid services, deployment accelerates. Conversely, ambiguous rules or punitive fees deter investment. Thus, coherent legal frameworks — from EU directives down through national laws — play a decisive role in either unlocking or constraining grid-scale storage. To meet EU decarbonization goals, legislators and regulators must ensure that rules consistently reflect storage's value and remove disincentives, transforming the law into a catalyst rather than an obstacle for the energy transition.

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