Working Group on Energy Storage and Power System Flexibility

Working Group – **alinnea** – 2026

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Introduction and objectives

Industrial decarbonization is one of the pillars of Europe's climate and economic transformation. In Spain, where industry accounts for nearly one fifth of total greenhouse gas emissions, advancing toward electrified, efficient, and competitive production models is a strategic priority. However, one of the main bottlenecks identified by companies, public administrations, and the financial sector is the insufficient availability of energy storage and the need to improve the flexibility of the power system, both essential elements to ensure a stable and economically viable supply for electrified industrial processes.

The deployment of energy storage at an industrial scale will:

- Improve the integration of renewable energy
- Reduce energy costs,
- Stabilize continuous production processes,
- and strengthen the competitiveness of energy-intensive sectors.

Spain has key regulatory frameworks to drive this transition: Royal Decree 997/2025, which facilitates the hybridization of photovoltaic plants with storage; the EU Batteries Regulation; the National Energy Storage Strategy (2020); and the targets set in the PNIEC, which aims to reach 22.5 GW of storage capacity by 2030. However, technological, regulatory, and financial barriers still persist, limiting its deployment.

Furthermore, energy storage is a central component for the success of other decarbonization strategies, such as the electrification of the chemical sector, the modernization of heavy industry, and the transition of the automotive sector toward fully electric models. The Industrial Decarbonization PERTE (2023–2026) mobilizes €11.6 billion to support this transformation, but its effectiveness depends on industries having access to flexible, competitive, and stable electricity.

In 2025, alinnea's Industrial Decarbonization Working Group identified energy storage and power system flexibility as an urgent priority for industrial competitiveness.

In 2026, alinnea will deepen its work on this challenge through a new Working Group aimed at generating evidence, facilitating sectoral dialogue, and developing a Strategic Roadmap on energy storage and power system flexibility to guide public policies, investments, and innovation.

This Working Group will be developed in alignment with:

- Law 24/2013 on the Electricity Sector and its recent amendments regarding storage and flexibility,
- Royal Decree 1183/2020 on access and connection and Royal Decree-Law 23/2020,
- Directive (EU) 2019/944 on common rules for the internal electricity market,
- Initiatives linked to the Clean Industrial Deal and the Industrial Accelerator Act (IAA),
- and best practices from countries such as Germany, Italy, and the United Kingdom, with which **alinnea** will promote technical exchange.

The ultimate objective is to support Spain in building an electrified, flexible, and competitive industry capable of leading Europe's green transformation.

Objective

The objective of this working group is to help overcome the obstacles that are hindering the deployment of energy storage in Spain, in order to improve the flexibility of the power system (enhancing demand and consumption), and to identify recommendations and ideas that will ensure the acceleration of storage deployment, thereby continuing to drive decarbonization through electrification.

Working Group Format

The Working Group will be composed of stakeholders connected to the industrial ecosystem, including industrial companies, project developers, energy companies, financial institutions, trade union representatives, public administration, environmental organizations, and academia.

The sessions will take place in person at different IE University venues in Madrid. Exceptionally, virtual participation will be facilitated when necessary. The planned dates for each session are detailed below, and any changes will be communicated in advance:

- First meeting: April 9 (9:30–13:30)
- Second meeting: May 7 (9:30–13:30)
- Third meeting: June 9 (9:30–13:30)

The sessions are designed as a multi-stakeholder dialogue under Chatham House rules. This means that participants may share the content and conclusions of the discussions, but may not attribute comments or positions to specific individuals.

Participation in the Working Group does not necessarily imply endorsement or commitment to the proposals that may be included in the recommendations report that will be produced as a result of these dialogues.

Sessions content

Below are the topics of interest identified by alinnea as a working basis. However, the specific content of each session may be adjusted depending on the issues identified by the group participants, as deemed appropriate.

1. First dialogue: regulatory framework and progress in storage and grid flexibility

This first session will analyze the regulatory framework shaping the development of energy storage and flexibility resources in the Spanish power system, in a context defined by the acceleration of the energy transition, the massive deployment of renewable energy, and the

structural growth in electricity demand. It will assess to what extent the current regulatory and planning environment enables the integration of storage and flexibility as structural pillars of the system, as well as the main recent regulatory advances and the remaining short- and medium-term challenges.

The discussion will address the coherence between energy planning, network regulation, market design, and public support instruments, evaluating their impact on competitiveness, system robustness, and industrial decarbonization. It will also address the challenges posed by cybersecurity.

- Storage as a strategic element of the power system
  The discussion will explore why strengthening the role of storage in Spain is necessary and how it relates to electricity prices, system robustness, renewable integration, industrial decarbonization, and current and projected increases in electricity demand. Its contribution to emissions reduction in the energy and industrial sectors will also be examined.

- Evolution of the Spanish regulatory framework and pending issues
  Recent progress in Spain's framework will be analyzed—including access and connection regulation and the recognition of storage and aggregation—along with key elements still to be defined to enable deployment in the short and medium term.

- Grid access and connection: generation, demand, and flexible Access
  The criteria defined by the CNMC for evaluating access and connection requests will be reviewed, along with proposals to introduce flexible or non-firm access modalities, particularly for new demand linked to storage.

- Capacity auctions and regulatory integration of storage
  The hybrid nature of storage—able to operate both as generation and demand—creates challenges within current capacity allocation mechanisms through access auctions. Potential regulatory misalignments and alternatives to adapt these instruments to storage projects will be analyzed.

- Economic regulation of networks, digitalization, and new flexibility models
  The revision of transmission and distribution remuneration methodologies under the TOTEX (total expenditure) approach will be examined, assessing whether the current framework allows flexibility solutions to be valued as efficient alternatives to traditional grid investments. The growing role of digitalization, demand aggregation, and models such as Virtual Power Plants (VPPs) in coordinating distributed energy resources and enabling their participation in electricity markets will also be discussed.
- Energy planning and European strategic autonomy
  The role of the National Integrated Energy and Climate Plan (PNIEC) as a central planning instrument and reference for exercises such as the European Resource Adequacy Assessment (ERAA) will be analyzed. The discussion will explore the alignment between strategic planning, technical assessment, and regulatory design,

as well as implications for storage and flexibility deployment. It will also examine the importance of developing a European storage value chain within industrial policy and the energy transition.

- **Cybersecurity and resilience of the energy system**
  The impact of the NIS2 Directive will be addressed, which expands its scope to new energy sector actors—including generation, storage, and associated infrastructure—and introduces stricter requirements in risk management, incident reporting, supply chain protection, and operational continuity. The discussion will consider how these requirements strengthen the resilience of the power system in an increasingly digitalized and cyber-threat-exposed environment.

2. Second dialogue: storage technologies, flexibility applications, and territorial dimension

This second dialogue will examine the current state of energy storage technologies and their contribution to power system flexibility in a context of high renewable penetration and increasing electrification of demand. It will assess the technological and industrial maturity of the main available solutions, their applications across different segments of the energy system, and the innovation and industrial development opportunities linked to their deployment. It will also address the territorial dimension of deploying these infrastructures and the associated challenges of social acceptance.

- **Storage technologies and their role in system operation**
  The extent to which different solutions—electrochemical, hydraulic, thermal, and long-duration storage—can support renewable integration, congestion management, and the resolution of technical constraints will be analyzed. Their maturity, scalability, and suitability for different flexibility time horizons will also be assessed.

- **Innovation, value chain, and European industrial momentum**
  The role of R&D and European industrial policies in developing strategic storage technologies will be examined, within initiatives such as the Industrial Accelerator Act (IAA) and measures linked to the Clean Industrial Deal (the financial dimension will be addressed in the third session). The discussion will consider how to strengthen a resilient European value chain in a shifting geopolitical context.

- **Distributed solutions, behind-the-meter storage, and heat electrification**
  Applications of storage in industrial, commercial, and residential settings will be explored, including BESS systems and thermal storage, as well as their integration with renewable generation and industrial processes. Their contribution to active demand management and new decentralized flexibility models will also be analyzed.

- **Territorial dimension and just transition**
  The deployment of storage projects raises challenges related to spatial planning, social acceptance, and local impact. The role of regional governments, emerging territorial tensions, and proposals from local and social stakeholders will be

examined, along with responses from public authorities and the private sector to ensure balanced and socially sustainable development.

- **Expert insight and sectoral perspective**
  The state of technological development will be contrasted with the perspectives of companies, technology platforms, key industrial actors, and social stakeholders. Is the industrial ecosystem ready to scale these technologies? What technical, regulatory, or social barriers may affect their effective deployment?

3. Third dialogue: financing and business models for storage and flexibility

This third session will analyze the economic and financial models that can enable the deployment of energy storage and flexibility solutions in the power system, in a context characterized by regulatory uncertainty, energy market volatility, and increasing pressure to accelerate decarbonization. It will examine emerging business models, the factors affecting their economic viability, available financing opportunities, and risk allocation mechanisms associated with these investments.

- **European State aid framework, financial instruments, and industrial policy**
  The European regime for public support to the energy transition and industrial decarbonization will be analyzed, including CEEAG (Climate, Energy and Environmental Guidelines, 2022) and CISAF (Clean Industrial Deal State Aid Framework, 2025), as well as European financial instruments (NextGenerationEU, REPowerEU, Innovation Fund) and mechanisms beyond 2026 such as the España Crece Fund.

- **Business models and revenue structure of storage**
  Key value creation schemes will be examined, including behind-the-meter storage, stand-alone storage, pumped hydro, and hybridization with renewable generation. Revenue streams—electricity markets, system services, consumption optimization, or curtailment reduction—will be analyzed, along with the level of regulatory certainty required to support long-term investment decisions.

- **Taxation, contracts, and new collaboration schemes**
  The role of energy taxation, charges, and grid tariffs in project profitability will be discussed, along with the growing relevance of contractual models such as energy service agreements and integrated schemes combining generation, storage, and demand management.

- **Financial ecosystem and capital mobilization**
  The evolution of financial actors involved in storage and flexibility projects will be analyzed, including banks, infrastructure funds, debt funds, and alternative mechanisms such as crowdfunding and crowdlending. The role of European financial

instruments in risk reduction and in attracting private investment into strategic energy transition technologies will also be discussed.

Results

The final outcome will compile the main conclusions and insights derived from the dialogue process sessions, consolidating a set of strategic recommendations that will contribute to the debate on the deployment of energy storage, the instruments designed under the Clean Industrial Deal, and other related national regulations and plans.

This report will be publicly presented and will be accompanied by a specific outreach plan to share its results with those entities, organizations, and stakeholders interested in the decarbonization of the chemical sector, particularly in relation to the identified challenges and proposed recommendations.

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Paseo de la Castellana, 259E, 28046. Madrid