

Enhancing Procurement Efficiency and Supply Chain Resilience in European Electricity Distribution Networks

May 2026

Table of Contents

1. Executive Summary	2
2. Introduction	3
Context	3
Objective and Scope of the Report.....	4
3. Supplier Access, Pre-Qualification and Digital Enablement.....	5
3.1 Supplier Access to Tenders and Market Openness	5
3.2 Pre-Qualification Processes and Models	6
3.4 Information Requirements, Data Reuse and Harmonisation	7
3.5 Digital Tools and Systems Supporting Pre-qualification and Tendering	9
3.6 Governance, Roles and Responsibilities.....	9
3.7 DSO Practices and Case Examples.....	10
3.8 Key Challenges and Mitigation Measures.....	11
4. Procuring Technological Innovations	14
4.1 Use of Innovation Instruments	14
4.2 Current Practices Across the Innovation Procurement Lifecycle	15
4.3 Key Challenges	17
4.4 Replicability and Success Factors	17
5. Framework Agreements & Supplier Resilience	19
5.1 Role and Structure of Framework Agreements	19
5.2 Supplier Resilience Assessment.....	20
5.3 Monitoring, Incentives and Performance Management	20
5.4 Regulatory and Structural Constraints	21
5.5 Operational Practices for Framework Effectiveness and Supplier Resilience	22
5.6 Key Challenges and Mitigation Measures.....	23
5.7 European Collaboration	24
6. Key Findings and Strategic Directions.....	26
6.1 Key Findings	26
6.2 Supporting Grid Deployment through Resilient Supply Chains: Strategic Directions for DSOs.....	26
7. Conclusions	28

1. Executive Summary

This report presents the findings of a structured assessment of procurement and supply chain practices among European Distribution System Operators (DSOs), undertaken in support of the Grid Action Plan (Action Point 13) on supply chains.

The analysis is based on a comprehensive data collection exercise, including two structured questionnaires addressed to DSO members, through which operational practices, challenges and recommendations were systematically gathered and analysed.

Across participating Member States, DSOs demonstrate a high degree of procedural maturity and increasingly strategic procurement approaches. Framework agreements, structured supplier monitoring, digital tools and sustainability integration are well established. However, persistent structural and operational challenges continue to affect procurement efficiency and supply chain resilience. These include legal and regulatory fragmentation across Member States, limited interoperability between digital procurement systems, duplication of administrative requirements, and inconsistencies in technical specifications and qualification frameworks.

There is limited support among stakeholders for the creation of a fully centralised European procurement platform. Instead, DSOs consistently favour pragmatic and targeted harmonisation measures, focusing on documentation equivalence, interoperability of digital systems, alignment of sustainability requirements, and proportionate regulatory flexibility.

The findings indicate that efforts should prioritise targeted regulatory refinement, enhanced coordination and practical enablement measures, rather than structural centralisation of procurement systems.

Overall, strengthening supply chain resilience in the electricity distribution sector will depend on improving the functioning and alignment of existing systems, reducing administrative burden, and enabling more flexible and interoperable procurement practices across the European Union.

2. Introduction

Context

The Grid Action Plan, adopted by the European Commission, recognises that accelerated grid deployment is indispensable to achieving the Union's decarbonisation, electrification and energy security objectives. A substantial share of renewable generation, electrified demand and decentralised flexibility will be connected at distribution level. This implies an unprecedented transformation of electricity networks in terms of scale, digitalisation and technical complexity. This transformation places significant pressure on procurement systems and supply chains, which must scale rapidly while ensuring reliability, resilience and cost-efficiency.

This report focuses specifically on procurement efficiency and supply chain resilience for grid infrastructure. Distribution System Operators (DSOs), as contracting entities under the EU procurement acquis, notably the Utilities regime, must deliver large-scale infrastructure investment within a highly regulated legal framework. While EU directives establish common principles, their national transposition and administrative application vary significantly between Member States, shaping the practical environment in which DSOs operate.

To support this analysis, a structured methodology was applied, combining qualitative and quantitative inputs collected through two targeted questionnaires addressed to DSO members. These questionnaires captured current practices, operational challenges and proposed improvements across key procurement and supply chain dimensions.

In parallel, DSOs face structural market challenges that extend beyond procedural design. These include:

- Limited manufacturing capacity for strategic grid components;
- Persistent demand–supply imbalances in key equipment markets;
- Increasing delivery times for transformers, cables and digital components;
- Growing resilience considerations for critical assets;
- Administrative burdens linked to documentation, eForms and certification equivalence.

These factors highlight that procurement efficiency is intrinsically linked not only to regulatory design but also to broader industrial and market dynamics.

It is therefore essential to distinguish between procedural inefficiencies that may be addressed through simplification, and structural market constraints that cannot be resolved solely through changes to procurement rules.

Objective and Scope of the Report

The objective of this report is threefold:

1. **To assess** how current procurement practices among European DSOs contribute to supply chain resilience, innovation, sustainability and efficiency in the context of accelerated grid deployment.
2. **To identify** regulatory, administrative and market barriers that may hinder effective implementation of procuring practices.
3. **To formulate** targeted recommendations for refining the EU public procurement framework in a manner that supports the energy transition while preserving legal certainty, competition and value for money.

The report adopts a practical and evidence-based perspective, focusing on operational realities and implementable improvements rather than theoretical redesign of procurement systems.

The scope of the report covers five core thematic areas:

- Supplier access, pre-qualification and digital enablement;
- Procurement of technological innovation;
- Framework agreements and long-term resilience.

The analysis does not advocate a fundamental redesign of the EU procurement framework or the introduction of centralised procurement structures. Rather, it evaluates how targeted adjustments, particularly within the Utilities regime, can better reflect the operational realities of technically complex, capital-intensive and security-sensitive grid procurements, while maintaining flexibility for Member States and contracting entities.

3. Supplier Access, Pre-Qualification and Digital Enablement

The acceleration of grid investment requires procurement systems that are proportionate, predictable and operationally efficient. Reducing procedural complexity is therefore a key priority for DSOs, not only to shorten procurement lead times but also to ensure broader supplier participation and strengthen supply chain resilience.

In this context, procurement simplification is increasingly understood as a balance between ensuring robust qualification and compliance requirements, and avoiding unnecessary administrative burden for both contracting authorities and suppliers.

While procurement frameworks must ensure transparency, equal treatment and regulatory compliance, excessive fragmentation of requirements and systems can generate inefficiencies. These include duplicated documentation, increased transaction costs and barriers to cross-border participation.

Efforts should therefore prioritise simplification through harmonisation, data reuse and interoperability, rather than structural centralisation.

3.1 Supplier Access to Tenders and Market Openness

Supplier access to DSO tenders is formally open across the internal market. In practice, however, several structural and administrative barriers limit cross-border participation.

- **Language requirements:** Tender documentation and submission are frequently restricted to national languages. This may discourage participation by non-domestic suppliers, particularly SMEs lacking local representation. In other countries, greater flexibility exists for submission of documentation in English, particularly for technically standardised equipment.
- **Certification and signature requirements:** National electronic signature systems and certification equivalence rules may create additional compliance burdens. Suppliers operating in multiple Member States often face the need to obtain country-specific digital credentials or to translate and re-certify documentation that has already been validated elsewhere.
- **Market structure considerations:** In strategic equipment segments - such as high-voltage transformers or specialised cables - the number of qualified suppliers is limited at European level. In such markets, procedural simplification alone will not materially increase competition. However, reducing entry friction may facilitate participation by emerging or smaller manufacturers.

Overall, improving effective market openness requires addressing practical access barriers rather than introducing additional procedural layers. Beyond formal barriers, suppliers may also face indirect access constraints linked to pre-qualification requirements and system-specific registration processes, which can create cumulative administrative effort when participating in multiple jurisdictions.

3.2 Pre-Qualification Processes and Models

Pre-qualification systems and approved vendor lists are used for strategic and safety-critical materials. However, their application is not universal and varies significantly in scope, governance and level of maturity across DSOs. It is a model that runs in parallel of system development and provides with suitable list of providers for the procurement and construction phases.

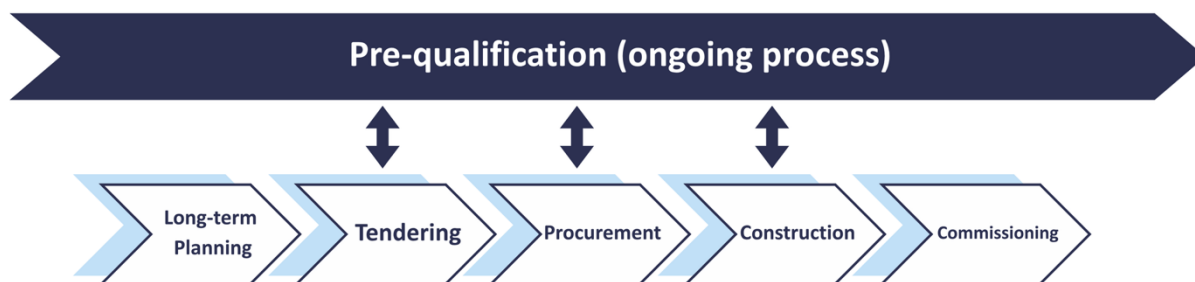


Figure 1. Process Timeline

These systems typically include:

- Technical conformity assessments (e.g. compliance with network codes, material specifications and cybersecurity requirements);
- Financial capacity and solvency checks;
- Legal compliance checks with labour laws, bribery/corruption laws, sanctions etc;
- Quality management and production capability audits;
- Two-stage procedures for complex or high-value procurements.

Pre-qualification is applied across a broad range of procurement categories, including services, works, equipment and materials, as well as ICT and, in some cases, innovation-related procurement. This reflects an increasing reliance on structured qualification processes beyond traditional infrastructure components.

Implementation models differ substantially and may include internal DSO-managed systems, national qualification systems, third-party platforms, or joint systems shared among multiple DSOs. This diversity reflects both national regulatory frameworks and organisational preferences.

For example, in transformer procurement, DSOs may conduct factory audits, type testing validation and lifecycle performance assessments before admitting suppliers to an approved list. Similarly, metering equipment suppliers may be required to demonstrate interoperability with national smart metering architectures.

Such systems enhance efficiency by reducing repeated verification at each tender stage. They also contribute to resilience by ensuring that technical and organisational reliable suppliers enter strategic supply chains.

However, divergence in technical standards and qualification methodologies between Member States can limit cross-border applicability of pre-qualification status. A supplier pre-qualified in one

jurisdiction may be required to undergo substantially similar processes in another. A balanced policy approach would preserve DSO autonomy in defining requirements, while promoting greater transparency and comparability of qualification criteria.

While such systems enhance efficiency and reduce repeated verification, stakeholders also highlight that pre-qualification processes may introduce additional administrative burden for both DSOs and suppliers, particularly where similar data must be submitted across multiple systems or jurisdictions.

In certain contexts, particularly in markets with limited competition, pre-qualification may also reduce the number of bidders or create lock-in effects favouring established suppliers. A balanced approach is therefore required to ensure that qualification systems do not unintentionally overly restrict market access or innovation.

3.4 Information Requirements, Data Reuse and Harmonisation

Suppliers frequently report duplication in documentation requirements across procedures and jurisdictions. Financial statements, compliance declarations, insurance certificates and technical attestations are repeatedly submitted in slightly varying formats. While instruments such as the European Single Procurement Document (ESPD) aim to streamline self-declaration, practical implementation remains uneven. In addition:

- Publicly available company data (e.g. corporate registration, tax status) is not systematically reused through automated verification;
- Documentation templates vary between contracting entities;
- Certification equivalence mechanisms lack full operational clarity;
- Strengthening and operationalising tools that facilitate certificate comparability.

Reducing duplication in information requirements would directly decrease administrative burden without altering the core legal framework. Thus, mutual documentation requirements recognition shall be considered for utility procurement. To this end, the following table can provide an overview of the information that is used in a pre-qualification phase per country:

Category	Data / Evidence Used	Purpose of Evaluation
Legal Eligibility	<ul style="list-style-type: none"> • Company registration documents • Articles of association • Criminal record clearance of managing directors • Declarations of honour / Solemn declaration 	Ensure legal standing and compliance with exclusion criteria
Financial Capacity	<ul style="list-style-type: none"> • Annual financial statements • Turnover figures; Credit ratings • Tax compliance certificates 	Assess solvency and financial resilience
Technical Capacity	<ul style="list-style-type: none"> • Reference project lists • Staff CVs (project managers) • Equipment capability • Technical standards compliance 	Verify ability to deliver complex infrastructure
Product Qualification / Type Approval	<ul style="list-style-type: none"> • IEC or ASTM type tests • Product certifications • Factory audits • Homologation • Compliance with DSO technical standards 	Ensure technical reliability and network compatibility
Quality Management	<ul style="list-style-type: none"> • ISO 9001 • Quality assurance procedures • Internal quality manuals 	Ensure production and process consistency
Environmental & Sustainability	<ul style="list-style-type: none"> • ISO 14001 • Carbon footprint • Environmental Product Declarations (EPD) • EcoVadis ratings 	Integrate sustainability objectives
Health & Safety	<ul style="list-style-type: none"> • ISO 45001 • Safety policies • Incident statistics 	Mitigate operational risk
Information Security & Data Protection	<ul style="list-style-type: none"> • ISO 27001 • Cybersecurity compliance (especially for smart metering and digital systems) 	Protect critical infrastructure and digital assets
Performance Monitoring (Post-Award)	<ul style="list-style-type: none"> • Supplier evaluation metrics • KPI monitoring • Risk assessment scoring 	Enable dynamic supplier management
Administrative Compliance	<ul style="list-style-type: none"> • Electronic signatures • National platform registration • Standard template completion 	Ensure procedural compliance

Table 1: Data Categories used in Pre-qualification Processes

The concept of “once-only” data submission is increasingly identified as a key principle, whereby suppliers provide harmonised documentation a single time and allow controlled reuse across multiple procurement processes.

3.5 Digital Tools and Systems Supporting Pre-qualification and Tendering

Most DSOs rely on nationally mandated e-procurement platforms, often embedded within administrative and judicial oversight systems. These platforms are typically integrated with enterprise resource planning (ERP) systems managing contract execution, invoicing and supplier performance monitoring.

Given this deep integration into domestic legal and administrative ecosystems, wholesale replacement by a single EU-level platform would be operationally complex and costly. Instead, the principal challenge lies in **interoperability**, not structural centralisation. Digital systems currently:

- Operate with differing data architectures;
- Require country-specific digital credentials;
- Provide limited cross-platform data portability.

In addition, the absence of structured data-sharing mechanisms limits the ability of DSOs to leverage existing supplier information across systems and jurisdictions. Emerging practices include the development of shared repositories, enabling suppliers to upload standard documentation once and grant access to multiple contracting authorities.

3.6 Governance, Roles and Responsibilities

Procurement governance in the utilities sector typically involves:

- National legislators transposing EU directives;
- Supervisory authorities overseeing compliance;
- Administrative courts adjudicating disputes;
- DSOs acting as contracting entities with operational autonomy.

In several cases, governance models are evolving towards more centralised or coordinated supplier management structures, enabling greater consistency in qualification processes and reducing duplication across business units.

Digital procurement platforms are often operated or supervised by national public authorities, reflecting their integration into judicial review systems. Policy reform must therefore clearly delineate responsibilities:

- The EU level may define interoperability considerations and minimum documentation requirements;
- Member States retain responsibility for platform governance and enforcement;
- DSOs remain accountable for technical specifications and supplier qualification criteria.

Clarity in governance design is essential to avoid overlapping competences or dual reporting obligations.

3.7 DSO Practices and Case Examples

Across jurisdictions, organisations have primarily focused on improving procurement efficiency through incremental optimisation of existing frameworks rather than structural reform. Despite differences in national contexts, several consistent practice areas emerge, reflecting shared operational constraints and converging solutions.

- A first key area concerns **supplier qualification and pre-selection mechanisms**, which are widely used to reduce repetitive administrative checks and ensure minimum quality standards. Many organisations have implemented pre-qualification systems, internally, nationally, or via third-party platforms - covering services, works, materials, and increasingly ICT-related procurement. This is particularly evident in countries such as Austria, Italy, Spain, Belgium, Greece, Portugal, Ireland and the Czech Republic, where structured qualification processes are applied across multiple procurement categories. These systems typically assess legal, financial, and technical capacity, supported by certifications and, in more advanced cases, sustainability and cybersecurity criteria, as observed in Sweden, Ireland, and Greece. Qualification is most often based on a binary pass/fail approach, notably in Austria, Germany, Ireland and Belgium, although mixed methodologies are applied in Spain, Italy, Portugal, and Greece.

A common feature across Austria, Italy, Spain, Belgium, Ireland and Greece is the use of dynamically maintained qualification data, updated periodically or upon changes, allowing reuse across multiple tenders. This approach significantly reduces duplication and shortens procurement timelines. However, respondents from Sweden, Portugal, and Greece highlight trade-offs, noting that such systems can increase administrative burden and may limit competition, particularly for smaller suppliers.

- A second cluster of practices relates to **process standardisation and centralisation**. Many organisations rely on standardised templates and document repositories covering contractual, technical, and administrative elements, as reported in Finland, Belgium, Spain, Romania, Hungary, Italy, France, Bulgaria, Greece, and Denmark. These tools ensure consistency and reduce complexity across procurement procedures. In parallel, centralised procurement or supplier management functions, particularly developed in Spain and France, help consolidate expertise and streamline supplier-related processes. These are often supported by structured internal governance mechanisms, such as early-stage validation and requirement review processes, as highlighted in France and Denmark.

Closely linked to this is the use of **framework agreements and long-term contracting strategies**, particularly for recurring or standardised needs. This approach is well established in Finland, Austria, Ireland and Greece, where long-term agreements, approved vendor lists, and continuous qualification systems are used to enhance supply continuity while reducing the need for repeated tendering exercises.

- A third important area is **digitalisation and automation**, which plays an increasing role in improving efficiency. Organisations operate across a diverse landscape of IT platforms, including national systems (e.g. Belgium, Austria, Romania, Hungary, Bulgaria and Ireland), third-party solutions (e.g. Finland, Italy, France, Greece, Denmark), and internally developed tools (e.g. Spain,

Poland, Romania), often integrated with ERP environments such as SAP Ariba in Spain and Romania. Digital tools are used to automate administrative tasks, standardise supplier evaluation, and monitor supplier performance, with Spain notably reporting the use of robotic process automation and centralised supplier analysis models. However, fragmentation across platforms, combined with language barriers and interoperability issues, continues to limit cross-border accessibility. For instance, while Belgium, Denmark, Spain, Ireland and Finland provide relatively good access for non-national suppliers, more restrictive conditions are observed in Austria, Romania, Hungary, Poland, France, and Bulgaria.

In response, some organisations have adopted **pragmatic simplification measures**, such as the use of self-declarations in early tender stages, as reported in Greece, allowing full documentation to be required only from selected bidders. Additional practices, including contract lotting to enhance competition (Greece), early market engagement (France, Denmark), and internal process alignment and training (Belgium), further contribute to smoother procurement execution.

- Finally, **collaborative approaches** are emerging, although unevenly across jurisdictions. These include shared qualification systems between organisations, as observed in Belgium and Sweden, as well as joint tenders for standardised materials in Bulgaria. Discussions are also ongoing in several countries, including Greece, Romania, and Austria, regarding the potential development of common supplier databases or broader alignment of qualification requirements. While these initiatives remain constrained by legal and technical factors, they reflect a growing interest in harmonising key elements such as supplier data and certification standards.

Overall, these practices demonstrate that efficiency gains are already being achieved through a combination of pre-qualification, standardisation, digitalisation, and procedural simplification. While full harmonisation remains constrained by regulatory fragmentation, the strong convergence of approaches across countries provides a solid basis for gradual alignment building on existing systems.

3.8 Key Challenges and Mitigation Measures

Key challenges

- **Legal and Regulatory Fragmentation**
Divergent national procurement frameworks, legal requirements and administrative procedures remain a fundamental constraint. Differences in documentation rules, certification recognition and platform governance create barriers to harmonisation and complicate cross-border participation. In addition, the integration of procurement platforms within national oversight and judicial systems limits the feasibility of introducing uniform approaches across Member States.
- **Digital Ecosystem Fragmentation and Integration Constraints**
The procurement landscape is characterised by a multiplicity of national, third-party and internally developed platforms, often tightly integrated with enterprise systems and public administration infrastructures. This results in limited interoperability, restricted data portability and challenges in integrating new tools or systems. Such fragmentation reduces efficiency for both DSOs and suppliers operating across multiple jurisdictions.

- Administrative Burden and Duplication of Requirements**

Extensive documentation requirements and repeated submission of similar information across tenders and systems contribute to significant administrative burden. This challenge is particularly pronounced in multi-jurisdictional participation and in complex procurement processes requiring detailed technical, financial and organisational evidence. The absence of systematic data reuse mechanisms further exacerbates inefficiencies.
- Divergence in Qualification Systems and Data Requirements**

Pre-qualification systems differ widely in scope, structure and data requirements. While core elements such as legal, financial and technical capacity are commonly assessed, additional requirements—such as sustainability, cybersecurity or supply chain transparency—are applied inconsistently. This variability limits comparability and increases compliance effort for suppliers, particularly those active in multiple markets.
- Market Access Barriers and Supplier Participation Constraints**

Language requirements, national platform access conditions, certification equivalence issues and the need for country-specific digital credentials create practical barriers for non-domestic suppliers. These constraints may disproportionately affect smaller suppliers and reduce participation in procurement procedures, thereby limiting competition in certain market segments.
- Risks Associated with Pre-Qualification and Market Structure**

While pre-qualification systems enhance efficiency, they may also introduce risks such as reduced competition, supplier lock-in and barriers to entry for new participants. These risks are more pronounced in markets with limited supplier bases or high entry barriers, where qualification systems may reinforce existing market concentration.
- Operational Complexity and Resource Constraints**

Procurement processes often require significant expertise, technical capacity and organisational resources, particularly in relation to qualification procedures, audits and compliance checks. This complexity can create operational bottlenecks and limit scalability, especially for smaller organisations or highly specialised procurement categories.

Mitigation Measures and Enabling Approaches

- Further Assessment of Common Baselines Requirements**

Mitigation efforts should focus on understanding baseline requirements, necessary minimum documentation and the impact on current structures considering that in the future mutual recognition of financial, legal and technical evidence across jurisdictions, at least to a certain extent. Exploring a level of alignment for supplier qualification, complemented by DSO-specific requirements where necessary, could improve comparability while preserving flexibility.
- Enhancing Interoperability of Digital Systems**

Rather than pursuing full centralisation, priority should be given to developing interoperable digital standards and interfaces that enable system-to-system communication. Federated or interconnected solutions can facilitate data exchange across platforms while maintaining compatibility and proper security standards (again cybersecurity threats) with national systems and existing IT infrastructures.

- **Enabling Data Reuse and Reducing Administrative Duplication**
The implementation of “once-only” data submission principles should be prioritised, allowing suppliers to provide standard documentation a single time for reuse across multiple procedures. This can be supported by shared repositories, secure data-sharing mechanisms and automated verification tools leveraging publicly available information.
- **Facilitating Cross-Border Participation**
Improving market access requires proportionate language flexibility, clearer recognition of equivalent certifications and simplification of platform access requirements. These measures can reduce entry barriers for non-domestic suppliers without compromising compliance with legal and technical standards.
- **Ensuring Proportionate and Open Qualification Systems**
Qualification systems should be designed using risk-based and proportionate approaches to avoid unnecessary barriers to entry. Regular review mechanisms and transparent criteria can help ensure that such systems remain open to new entrants and do not unintentionally overly restrict competition or innovation.
- **Supporting Operational Efficiency through Standardisation and Digitalisation**
Efficiency gains can be achieved through the standardisation of templates, processes and data formats, combined with the use of digital tools and automation. Improved internal coordination and governance structures can further reduce complexity and enhance procurement performance.
- **Maintaining Flexibility in EU-Level Initiatives**
EU-level initiatives should remain flexible, optional and complementary to national systems, avoiding the introduction of rigid or overly centralised solutions. A gradual, interoperability-driven approach is more likely to deliver practical benefits while respecting existing legal and operational constraints.

Overall efforts in this area should focus on documentation equivalence, interoperability and proportionality. Structural consolidation of platforms is neither widely supported nor operationally necessary. **The priority lies in making existing systems work together more effectively** to support accelerated grid deployment.

4. Procuring Technological Innovations

Innovation procurement refers to procurement processes through which contracting entities acquire solutions that are not yet fully available on the market or where technical specifications cannot be fully defined in advance. In the electricity distribution sector, such procurement often relates to emerging technologies required to support the energy transition, digitalisation of networks, and the decarbonisation of grid infrastructure.

For Distribution System Operators (DSOs), innovation procurement typically concerns technologies at varying levels of maturity, including:

- Advanced smart metering systems and digital network management solutions;
- SF₆-free switchgear and alternative insulating technologies supporting decarbonisation of grid equipment;
- Automation and remote-control devices for network operation;
- Remote inspection technologies, such as drones for overhead line monitoring;
- Advanced metering or remote measurement solutions integrated into transformer stations;
- Smart IT and digital solutions, where functional outcomes are specified rather than detailed technical architecture.

In addition, innovation procurement is increasingly used to support digitalisation strategies, data-driven network management, and, in certain cases, process or organisational innovation within DSOs.

In such contexts, DSOs frequently work with suppliers to refine technical specifications during the procurement process or through pilot deployments. Innovation procurement therefore plays a complementary role to traditional procurement approaches, **allowing utilities to test emerging processes and technologies** while **managing operational and financial risks**.

In practice, the scale of such procurement remains more limited compared to standard equipment procurement, although some DSOs report a gradual increase in its use, particularly in areas linked to digitalisation and smart grid deployment. Innovative solutions are typically tested through **pilot projects** or **proof-of-concept deployments** before broader rollout across the network.

4.1 Use of Innovation Instruments

EU public procurement legislation provides several procedures designed to facilitate the acquisition of innovative solutions. Distribution system operators use a range of these mechanisms when procuring technologies with uncertain technical maturity.

- **Negotiated procedures** are among the most commonly used instruments. These procedures allow contracting entities to discuss technical specifications and contractual conditions with suppliers before finalising offers. This flexibility is particularly relevant where the technological solution is evolving or where multiple technical approaches are possible. They are particularly relevant where requirements evolve during the process or where risk-sharing arrangements need to be clarified.

- **Competitive dialogue** is also used for complex procurement projects requiring iterative discussion with suppliers before finalising the procurement specifications. This approach allows contracting entities to refine requirements based on market capabilities and technological feasibility.
- **Innovation partnerships**, as defined under Article 49 of Directive 2014/25/EU, enable the joint development and subsequent procurement of innovative solutions. One example concerns the development of advanced smart metering systems through structured collaboration between the contracting entity and technology providers. Similar approaches have also been used in the development of advanced network management solutions.
- In certain cases, **market consultations and requests for information** are conducted prior to the launch of formal tenders in order to assess technological maturity and identify potential suppliers. Such early engagement is increasingly seen as a critical step in reducing uncertainty and aligning procurement strategies with market capabilities.
- Although the **R&D exemption** is available within the EU procurement framework, its use appears limited among respondents. Where innovation-related procurement occurs, it is more commonly integrated into standard procurement procedures rather than structured as formal research and development contracts.

Overall, while the legal tools are available, their **practical use remains uneven**, particularly for more complex phases such as contract negotiation, execution, and scaling-up of innovative solutions.

4.2 Current Practices Across the Innovation Procurement Lifecycle

DSOs have adopted a number of operational practices to integrate innovation into procurement processes while maintaining compliance with procurement rules and operational reliability requirements.

- **Early-stage market engagement and needs definition**
A growing number of DSOs engage with suppliers prior to launching formal procurement procedures. This includes market consultations, workshops, and bilateral exchanges aimed at understanding technological maturity, identifying potential barriers, and refining needs. Portugal provides an example of structured supplier engagement through workshops and one-to-one discussions to prepare the introduction of new procurement requirements.
- **Pilot-based procurement models**
A common approach consists of deploying innovative technologies initially through limited field trials or proof-of-concept projects. Following successful validation, technical specifications are refined and procurement volumes increased. This staged approach reduces technical risk and allows DSOs to evaluate operational performance under real network conditions. Austria and Greece illustrate this approach through real-network pilot environments and targeted deployment of smart grid technologies to assess operational performance before scaling.
- **Collaborative development with suppliers**
In certain cases, suppliers and DSOs work together to adapt existing technologies to specific network requirements. This may involve customised equipment design or software configuration tailored to national grid standards. Spain and Italy highlight the importance of co-development,

particularly where existing market solutions require adaptation to specific grid standards or operational constraints.

- **Functional specifications rather than detailed technical requirements**
For emerging digital technologies, DSOs may specify functional outcomes rather than prescriptive technical specifications. This allows suppliers to propose innovative technical architectures or solutions. This approach is particularly relevant for digitalisation and data-driven solutions, where multiple technical architectures may fulfil the same operational objective.
- **Innovation governance structures**
Some organisations have established internal governance mechanisms, such as innovation boards or dedicated review processes, to assess innovative procurement proposals and ensure alignment with strategic objectives. DSOs in Belgium and Greece emphasise the importance of cross-functional collaboration between technical, procurement, and legal teams to ensure both compliance and flexibility.
- **Simplified qualification procedures for innovative suppliers**
To facilitate the participation of new technology providers, certain DSOs apply simplified qualification procedures or specific technical conformity assessments for innovative solutions. Italian DSOs report the use of adapted qualification and conformity assessment procedures to enable participation of innovative suppliers.
- **Contractual and risk-allocation practices**
Innovation procurement often requires specific contractual arrangements addressing intellectual property rights, risk-sharing, and performance uncertainty. Several DSOs underline the importance of clearly defining ownership of results, performance indicators, and liability provisions. Italy highlights the need to ensure ownership of intellectual property generated during contract execution.
- **Scaling and replication strategies**
The transition from pilot projects to large-scale deployment is a critical phase. DSOs report that this step may require adjustments to procurement strategies, contractual conditions, and regulatory compliance. Barriers to scaling include legal constraints, increased volumes, and the need to modify contracts while maintaining compliance with procurement rules.

These practices demonstrate that DSOs are actively exploring ways to integrate innovation into procurement while maintaining transparency and operational reliability. Nonetheless, innovation-focused procurement remains uneven across organisations, with many DSOs engaging only occasionally, while a smaller number report more regular use, particularly in digital and smart grid domains.

Most DSOs reported engaging in such procurement **rarely or occasionally**, reflecting the fact that core network equipment procurement remains dominated by mature technologies with well-established technical specifications. Whilst, few other DSOs reported **more regular engagement with innovative procurement processes**, particularly in areas linked to digitalisation and smart grid deployment.

4.3 Key Challenges

DSOs highlight several challenges encountered when procuring innovative or under-defined technologies:

- **Legal uncertainty**
Procurement teams may face uncertainty regarding the appropriate use of innovation-oriented procedures and the boundaries of negotiation with suppliers. Particularly in relation to contract modification, intellectual property rights, and the use of negotiated or flexible procedures.
- **Technical risk**
Innovative technologies may not yet be fully proven in operational environments. This raises concerns regarding reliability, maintenance requirements and long-term performance.
- **Supplier readiness and market maturity**
In certain technology areas, suppliers may not yet be able to provide solutions at industrial scale or may face difficulties complying with standard contractual conditions applied in utility procurement.
- **Internal expertise constraints**
Procurement teams may require specialised technical knowledge in order to assess emerging technologies and manage innovation-focused procurement processes.
- **Budgeting and financial risk**
Innovation projects may involve uncertain costs and benefits, which can complicate budget approval processes within regulated utilities.
- **Scaling-up constraints**
The transition from pilot to full deployment remains a key challenge, due to regulatory, contractual, and financial constraints.

In addition, the transition from pilot deployments to large-scale procurement can be challenging due to regulatory or procedural constraints.

4.4 Replicability and Success Factors

Despite these challenges, several factors can support the effective use of innovation procurement across the DSO sector.

- **Early market engagement**
Structured market consultations allow DSOs to understand technological maturity and supplier capabilities before launching formal procurement procedures.
- **Functional specifications**
Defining performance outcomes rather than detailed technical designs can allow suppliers greater flexibility to propose innovative solutions.
- **Pilot-based deployment strategies**
Testing technologies through limited field trials before large-scale rollout allows DSOs to manage technical and operational risks.

- **Internal governance structures**
Dedicated innovation review boards or cross-functional committees can ensure that innovative procurement initiatives are aligned with operational priorities and regulatory obligations.
- **Clear contractual frameworks**
Well-defined approaches to intellectual property, risk-sharing, and performance management support wider adoption and replication.
- **Support through standardisation and guidance**
The availability of standard templates, model clauses, and practical guidance can facilitate wider and more consistent use of innovation procurement across DSOs.
- **Knowledge exchange among DSOs**
Peer exchange of experiences and best practices could significantly reduce duplication of effort and accelerate the adoption of proven innovations.

5. Framework Agreements & Supplier Resilience

5.1 Role and Structure of Framework Agreements

Framework agreements refer to arrangements between one or more contracting entities and one or more economic operators, the purpose of which is to establish the terms governing contracts to be awarded during a given period, in particular with regard to price and, where appropriate, the quantity envisaged, in accordance with Directive 2014/25/EU. In the electricity distribution sector, such procurement often relates to emerging technologies required to support the energy transition, digitalisation of networks, and the decarbonisation of grid infrastructure.

Framework agreements constitute a central procurement instrument for DSOs, supporting both operational efficiency and supply chain resilience in the context of accelerated grid investment. Their use is widespread across Member States and applies to a broad range of procurement categories, including materials, services and works. They are also increasingly used as strategic tools to secure long-term supply capacity, support market development, and enable predictable investment planning in constrained supply environments.

Frameworks may be concluded with either a **single supplier or multiple suppliers**, depending on the nature of the market, the strategic importance of the category and regulatory considerations. While multi-supplier frameworks are commonly used to enhance resilience, single-supplier frameworks may be applied where market structure or technical constraints limit the number of viable providers.

Multi-supplier frameworks are typically structured through a variety of allocation mechanisms, including:

- **Cascade ranking systems**, where suppliers are ranked at award stage and call-offs are prioritised accordingly (Romania, Denmark and Ireland);
- **Preferred supplier models**, combining ranking with conditional allocation depending on availability and performance (Austria);
- **Mini-competition mechanisms**, allowing re-opening of competition among framework suppliers for specific contracts (Hungary and Ireland);
- **Percentage-based allocation models**, ensuring a predefined distribution of volumes across multiple suppliers (Denmark, Greece and Ireland);
- **Dual or multi-sourcing strategies**, ensuring redundancy for critical supply categories (Belgium and Ireland).

Supplier selection within frameworks is generally based on **most economically advantageous tender (MEAT) criteria**, combining price with technical, environmental and performance-related factors (Finland, Spain, Greece and Ireland).

Overall, framework agreements enable DSOs to secure supply capacity, reduce procurement lead times and structure long-term supplier relationships in markets characterised by increasing demand and constrained manufacturing capacity.

In addition, some DSOs complement framework agreements with qualification systems or dynamic purchasing approaches to facilitate the integration of new suppliers over time and maintain competitive tension.

5.2 Supplier Resilience Assessment

Supplier resilience is increasingly assessed through multi-dimensional evaluation frameworks combining financial, operational, technical and ESG-related criteria, reflecting growing exposure to global supply chain risks and geopolitical uncertainty.

Across DSOs, resilience assessment typically includes financial health, delivery performance, redundancy, geographic diversification, supply chain transparency, technical capacity, sustainability criteria, and business continuity capabilities. DSOs confirm that financial health and delivery performance are the most consistently applied criteria, while more advanced dimensions such as supply chain transparency, ESG performance, and sovereignty considerations are applied in a more differentiated manner.

In several countries, resilience assessment is embedded in broader supplier qualification systems and may include production capacity analysis and dependency limitations to avoid over-reliance on individual suppliers. While these criteria are widely applied, their relative weighting and formal integration into award methodologies vary between DSOs.

5.3 Monitoring, Incentives and Performance Management

There is a clear trend towards more dynamic and structured contract management approaches, recognising that resilience must be actively maintained throughout the lifecycle of framework agreements. Practices in this area show increasing maturity across DSOs.

Performance monitoring systems

Many DSOs track supplier performance through structured **key performance indicators (KPIs)**, including:

- On-time delivery rates;
- Lead time adherence;
- Product quality and failure rates;
- Responsiveness and service levels;
- Continuous improvement indicators and corrective action tracking.

These indicators are often integrated into **contract management systems or ERP platforms**, enabling real-time monitoring and data-driven decision-making.

Supply chain disruption tracking

Supply disruptions are increasingly monitored through:

- Contractual reporting obligations;
- Dedicated contract management teams;
- Digital dashboards tracking delivery performance and deviations.

In some cases, contractual provisions allow for **fallback mechanisms**, such as activating secondary suppliers within a framework where the primary supplier fails to deliver.

Incentive mechanisms

To enhance supplier performance and responsiveness, DSOs apply a range of incentive structures, including:

- Bonus/malus schemes linked to performance outcomes;
- Service level agreements (SLAs) with defined penalties for non-performance;
- Gain-sharing mechanisms, particularly where suppliers contribute to efficiency improvements or increased production capacity;
- Performance-based KPIs linked to contract renewal or allocation within frameworks.

Continuous reassessment practices

While some DSOs conduct resilience assessments primarily at award stage, others have introduced **ongoing reassessment mechanisms**, including:

- Periodic supplier evaluations (annual or biannual);
- Production site audits and capacity reviews;
- Continuous financial monitoring.

This evolution reflects a shift towards more dynamic supplier management approaches, aligned with the increasing complexity and volatility of supply chains.

5.4 Regulatory and Structural Constraints

Despite their widespread use, DSOs report several regulatory and structural constraints affecting the effectiveness of framework agreements.

Limitations on framework structure

In certain jurisdictions, legal frameworks impose restrictions on the number of suppliers or require the use of specific allocation methods, such as cascade-only models. Such constraints may limit the ability of DSOs to design frameworks optimised for resilience.

Duration limits

Long-term agreements may create rigidity where contractual mechanisms do not allow sufficient flexibility to adapt to evolving market conditions or supplier performance.

Restricted flexibility for contract amendments

Framework agreements may lack sufficient flexibility to adapt to:

- Technological evolution;
- Changes in technical specifications;
- Shifts in market conditions or supply chain risks.

In practice, DSOs report challenges in adapting frameworks to inflation, raw material price volatility, and technological evolution without triggering new procurement procedures.

Administrative burden

Complex procedures for contract modification and re-opening of competition may reduce the operational efficiency benefits of frameworks.

Market constraints

In certain strategic equipment markets, resilience is constrained not by procurement design but by **limited supplier availability and production capacity**. These constraints highlight the need for a balanced regulatory approach that preserves transparency and competition while enabling operational flexibility.

In addition, long-term frameworks may, in certain cases, reduce competitive pressure during execution and limit the ability to replace underperforming suppliers due to strict legal conditions.

5.5 Operational Practices for Framework Effectiveness and Supplier Resilience

DSOs have developed a range of practical approaches to enhance the effectiveness and resilience of framework agreements within existing regulatory frameworks.

- **Strategic Sourcing and Multi-Supplier Structuring**

DSOs widely apply multi-supplier framework strategies to enhance supply security and reduce dependency risks. These approaches include dual or multi-sourcing models and the deliberate expansion of framework participation to ensure redundancy in critical supply categories. In countries such as Belgium, Greece, Ireland and Italy, increasing the number of qualified suppliers and maintaining alternative sourcing channels is a key resilience mechanism.

In parallel, allocation mechanisms such as cascade systems, preferred supplier models or percentage-based distribution are used to balance efficiency with resilience, ensuring both competition and continuity of supply.

- **Demand Planning and Market Engagement**

Demand planning has emerged as a critical tool for improving supplier resilience. DSOs increasingly engage in forward-looking forecasting, capacity planning and early procurement strategies to provide suppliers with greater visibility on future demand. Belgium and Spain illustrate the use of demand forecasting and forward commitments, particularly for long lead-time components. Luxembourg similarly highlights anticipation of long lead-time materials as a key practice.

In addition, several countries report adjusting technical specifications to better align with market capabilities, thereby increasing supplier participation and reducing supply constraints (Ireland). Long-term contractual relationships and early market engagement further support supplier investment and capacity development (Spain).

- **Contractual Structuring and Flexibility Mechanisms**

Contractual frameworks increasingly incorporate flexibility mechanisms to address market volatility and long-term uncertainty. These include price adjustment formulas linked to raw material indices (Romania, Croatia and Ireland), renegotiation or review clauses (Sweden), and business continuity provisions (Greece).

At the same time, DSOs emphasise the importance of clear and balanced contractual conditions to ensure enforceability and fairness (Czech Republic). However, DSOs also highlight tensions

between long-term contractual stability and limited legal flexibility, particularly in highly regulated environments where contract modification remains constrained.

- **Supplier Development, Qualification and Market Expansion**

Expanding and diversifying the supplier base is a central resilience strategy. DSOs report accelerating supplier onboarding processes, simplifying qualification procedures and pre-identifying alternative suppliers to ensure rapid response to disruptions (Ireland, Greece).

In some cases, supplier qualification systems include detailed assessments of production capacity and limitations on economic dependency to prevent over-reliance on individual suppliers (Italy). These practices are complemented by market-facing specifications and pre-market engagement aimed at increasing the number of compliant and competitive suppliers.

- **Performance Management and Continuous Improvement**

DSOs are increasingly adopting structured supplier management approaches, including dedicated key account management, regular performance review meetings and annual supplier evaluation systems (France, Greece). Performance data is used not only for monitoring but also to influence future allocation decisions within frameworks, creating dynamic incentives for continuous improvement.

In several cases, continuous improvement programmes involve dedicated teams and structured feedback loops with suppliers, supporting long-term performance enhancement and operational stability.

- **Digital Integration and Data-Driven Supply Chain Management**

Digitalisation plays a growing role in strengthening framework effectiveness. Integration of supplier systems with DSO ERP platforms improves ordering efficiency, transparency and data exchange (France).

In addition, digital dashboards and monitoring tools are increasingly used to track supply chain performance, identify risks and support proactive decision-making (Spain, Finland).

- **Sustainability, ESG and Strategic Supply Considerations**

Sustainability and ESG criteria are increasingly embedded in framework agreements, including environmental requirements (e.g. recyclability), social clauses and health and safety obligations (Poland, Bulgaria, Portugal).

These criteria are complemented by broader resilience measures such as safety stock provisions and contractual buffers to mitigate short-term disruptions (Belgium). In addition, some DSOs integrate ESG and resilience criteria into both supplier evaluation and contract execution, supporting responsible and sustainable supply chains (Greece).

These practices demonstrate that resilience can be significantly enhanced through a combination of strategic framework design, active market engagement, robust contractual structuring, and continuous supplier management throughout the contract lifecycle.

5.6 Key Challenges and Mitigation Measures

Key Challenges

- **Legal and Regulatory Constraints**

A primary challenge relates to limited flexibility within existing regulatory frameworks. DSOs report difficulties in adapting long-term framework agreements to evolving market conditions,

technological changes and supply chain disruptions. Legal constraints also limit the ability to replace underperforming suppliers or modify contractual conditions without triggering new procurement procedures. DSOs highlight divergent national rules, including restrictions on supplier numbers or allocation methods, which may limit optimal framework design. In addition, challenges in recognising equivalent supplier documentation across Member States create administrative barriers to cross-border participation.

- **Market Structure and Supplier Base Limitations**

In several strategic equipment markets, resilience is constrained by a limited supplier base and insufficient production capacity. This structural limitation reduces competition and increases dependency risks. DSOs also highlight challenges related to supplier readiness, including the ability to meet technical specifications, scale production and comply with contractual requirements. Differences in national technical standards and specifications further complicate supplier participation and increase costs for manufacturers.

- **Contractual Rigidity and Long-Term Uncertainty**

Long-term framework agreements, while supporting planning stability, may reduce flexibility and create lock-in effects. DSOs indicate that underperforming suppliers may be difficult to replace due to strict legal conditions, while evolving technical needs may not be easily accommodated within existing contracts. Inflation, raw material price volatility and global supply disruptions further exacerbate these challenges, particularly where contracts lack adequate adjustment mechanisms.

- **Operational and Administrative Burden**

DSOs report significant administrative complexity associated with framework management, including contract modification procedures, monitoring requirements and compliance obligations. In addition, inconsistent approaches to resilience assessment and performance monitoring across organisations may limit comparability and reduce overall effectiveness.

Mitigation Approaches and Enabling Measures

- To address these challenges, DSOs increasingly implement contractual **flexibility mechanisms, including price indexation, review clauses and business continuity provisions**. Strengthening market engagement and supplier development is also a key mitigation strategy, aimed at expanding the supplier base and improving competition.
- **Greater flexibility in framework design**, including the use of multiple allocation mechanisms and resilience-based award criteria, is seen as critical to enhancing adaptability. Continuous supplier monitoring, digital performance tracking and structured contract management approaches further support resilience throughout the contract lifecycle.
- Finally, increase the understanding of baseline requirements of supplier documentation, along with enhanced knowledge exchange across DSOs, could significantly reduce administrative burden and support more consistent practices.

5.7 European Collaboration

At European level, there is scope to enhance the effectiveness of framework agreements through targeted, non-intrusive measures that respect national legal frameworks and DSO autonomy. Potential areas for collaboration include:

- Development of practical EU guidance on framework agreement design, including allocation models and resilience criteria;
- **Standardised templates and model clauses**, particularly for performance monitoring, price adjustment and resilience provisions;
- Clarification of permissible flexibility under EU procurement directives, including amendment thresholds and duration considerations;
- Facilitation of cross-border comparability of supplier documentation, reducing administrative barriers;
- **Exchange of best practices among DSOs**, supporting convergence in supplier management approaches.
- Support harmonisation and interoperability of technical standards and documentation, reducing administrative burden and facilitating cross-border participation.
- Enhance flexibility provisions within EU procurement directives for critical infrastructure procurement, particularly regarding framework modification and supplier allocation mechanisms.

Such measures would support a more consistent and resilient procurement landscape across the European DSO sector, without requiring structural harmonisation of national procurement systems.

6. Key Findings and Strategic Directions

6.1 Key Findings

- **Procurement maturity is consistently high across jurisdictions**
DSOs have developed mature and structured procurement frameworks, characterised by increasing use of digital tools, framework agreements and supplier management systems.
- **Legal fragmentation is the principal structural barrier**
Legal and regulatory fragmentation across Member States remains the most significant structural constraint, affecting documentation requirements, certification recognition and procurement procedures.
- **Digital systems are advanced but insufficiently interoperable**
While digital procurement systems are widely implemented, their lack of interoperability and data portability creates inefficiencies for cross-border participation and multi-market suppliers.
- **Framework agreements serve as the primary resilience instrument**
Framework agreements play a central role in ensuring supply continuity, enabling long-term planning and strengthening supplier relationships, particularly in constrained markets.
- **Sustainability integration is progressing but not harmonised**
Sustainability and ESG criteria are increasingly integrated into procurement practices but remain inconsistently applied across jurisdictions and procurement categories.
- **Innovation procurement remains cautious and underutilised**
Procurement of innovative solutions remains relatively limited in scale and frequency, reflecting legal uncertainty, technical risks and organisational constraints.

Across all thematic areas, a common pattern emerges: efficiency gains are primarily achieved through incremental optimisation of existing systems rather than through structural transformation.

6.2 Supporting Grid Deployment through Resilient Supply Chains: Strategic Directions for DSOs

Based on the findings, the following strategic directions are identified to enhance procurement efficiency and supply chain resilience across the European DSO sector:

At EU Level

- Develop harmonised sustainability standards for core grid components;
- Provide documentation equivalence guidance;
- Increase flexibility within procurement directives for infrastructure frameworks;
- Offer model templates for innovation and joint tendering.

At National Level

- Avoid overly restrictive transposition of EU directives;
- Facilitate justified contract amendment flexibility;
- Facilitate recognition of equivalent certifications and -if possible- documentation across jurisdictions.

At DSO Level

- Expand structured resilience monitoring, further developing supplier data management, digital integration and performance monitoring systems;
- Increase use of early market engagement and demand planning to support supplier readiness;
- Promote knowledge sharing and convergence of best practices across organisations.

Overall, these strategic directions emphasise alignment, interoperability and proportionality as key enablers, while preserving the decentralised and flexible nature of procurement systems in the utilities sector.

7. Conclusions

This report highlights that European DSOs are operating within increasingly complex procurement and supply chain environments, driven by the scale and urgency of the energy transition. Procurement systems are **generally robust, mature and capable of supporting large-scale infrastructure deployment**. However, their **effectiveness is constrained by structural factors** that extend beyond individual organisational practices. The main limitations identified relate not to the absence of procurement tools or capabilities, but to fragmentation - legal, technical and administrative - across the European landscape.

The analysis confirms that structural centralisation of procurement systems is neither necessary nor supported by stakeholders. Instead, targeted improvements focusing on **interoperability, harmonisation** of key elements and reduction of administrative burden offer the most effective pathway forward. In particular, **enhancing documentation equivalence, enabling data reuse, improving digital interoperability and introducing proportionate regulatory flexibility** would significantly improve procurement efficiency without disrupting existing systems.

At the same time, it is essential to recognise that **procurement reform alone cannot address all supply chain challenges**. Structural market constraints, including **limited manufacturing capacity and global supply dependencies**, require complementary industrial and policy responses at European level.

Ultimately, strengthening supply chain resilience in the electricity distribution sector will depend on a balanced approach that combines regulatory refinement, operational improvements and strategic coordination, while preserving the flexibility required to address diverse national and market conditions.