

# Implementing EU Laws

A guide to activate demand-side flexibility  
in the EU 27 Member States



# smartEn

SMART ENERGY EUROPE

smartEn is the European business association integrating the consumer-driven solutions of the clean energy transition. We aim to create opportunities for every company, building and car to support an increasingly renewable energy system.

For further information please visit: [www.smarten.eu](http://www.smarten.eu)



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# Introduction

Over the past 6 years, EU policymakers managed to shape a comprehensive regulatory framework to empower consumers to play a key role in the clean energy transition, and be rewarded for their pivotal role.

6 EU legislative files, including around 70 provisions, enable buildings, vehicles and industries to consume, store, and generate renewable electricity in a time-dependent way, in reaction to external signals received from the energy system they are connected to.

This capability of energy consumers is called demand-side flexibility. Far more than just a technical concept, demand-side flexibility represents a paradigm shift in how energy systems operate, transforming passive consumers into game changers.

Demand-side flexibility (DSF) refers to the capability of any active customer to react to external signals and adjust their energy generation and consumption in a dynamic, time-dependent way, individually as well as through the support of energy service companies (aggregators). Demand-side flexibility can be provided by smart decentralised energy resources (DERs). DERs can be demand management, energy storage, smart and bidirectional electric vehicles and distributed renewable generation. These DERs can support a more reliable, sustainable, and efficient energy system.

The strategic relevance of an urgent activation of flexible demand is due to pressing systemic challenges, including:

- Raising congestions in distribution grids,
- Troubles in integrating abundant renewables,
- Increasing peaks in energy demand,
- Extreme (high and negative) fluctuations in wholesale electricity prices,
- Major upsurges in daily system flexibility needs,
- Decreasing EU industrial competitiveness and increasing energy vulnerability of citizens.

The Flexible Demand Management Industry (FDMI), represented by smartEn and covering a broad ecosystem of technology and service providers dedicated to harnessing demand-side flexibility, can help tackle these systemic challenges by deploying flexible assets among consumers and activating their flexibility.

For instance, the full activation of the flexibility from end-use sectors, thanks to business models offered by the FDMI, will lead to major systemic benefits in the EU in 2030<sup>1</sup>, including savings:

- between €11.1 and €29.1 billion per year in distribution grid reinforcements through a smart and active management of flexible consumers,
- of 15.5 TWh in renewable energy curtailment,
- of €2.7 billion per year due to 60 GW of avoided peak generation capacity, equivalent to 137 gas peaking plants.

<sup>1</sup> · [https://smarten.eu/wp-content/uploads/2022/09/SmartEN-DSF-benefits-2030-Report\\_DIGITAL.pdf](https://smarten.eu/wp-content/uploads/2022/09/SmartEN-DSF-benefits-2030-Report_DIGITAL.pdf)

Additionally consumers directly activating the flexibility with their assets could save more than €71 billion on their electricity bills every year by 2030.

Now, this potential is largely untapped and the FDML still faces 7 main barriers in most EU Member States:

- 1 Limited market-based procurement from all decentralised energy resources (DERs) by System Operators,
- 2 Restrictions to the participation of all DERs to all markets and mechanisms,
- 3 Limited deployment of DERs to transform vehicles, buildings, and industries into flexible assets,
- 4 Limited access to signal to end-users,
- 5 Lack of framework to innovative services,
- 6 Limited access and exchange of data to support digital energy services,
- 7 No valorisation of demand-side flexibility in planning and system-wide assessment.

Fortunately, these barriers have already been addressed within the EU legislative framework. The challenge now lies in implementing these solutions with urgency and ambition across all Member States, leaving no room for delay.

“Implementing EU Laws. A guide to enable demand-side flexibility in the EU27” by smartEn aims to support this effort as it:

- groups all existing EU regulatory provisions to clarify their contribution in addressing all barriers faced by the FDML. We opted for this approach instead of addressing each EU provision by laws, to outline the direct impact in tackling specific barriers;
- highlights and explains relevant EU provisions;
- suggests possible ways for implementation, directly addressing relevant national policy and decision makers, including ministries in Member States, National Regulatory Authorities, Transmission System Operators and Distribution System Operators. This approach aims at facilitating the navigation of this text by responsible parties involved in implementation efforts, clearly identifying roles, responsibilities, and relevant actions.

As some provisions date back to the 2019 Electricity Market Design and others stem from the recently adopted Fit for 55 package, we added references to the implementation timeframe, notably to highlight if specific provisions:

- Should have been implemented and were applicable by 2023,
- Are becoming applicable in 2024, or
- Will be applicable from 2025.

While this publication is published in December 2024, it will be regularly updated to clarify eventual recommendations and reflect experience gained across EU Member States.

**Enjoy the read and have a good implementation experience!**

**Michael Villa**  
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**smartEn – Smart Energy Europe**

## Foreword

The European electricity system is undergoing a major transition to meet the EU's decarbonisation and electrification objectives. The trend of growing shares of renewables, increased electrification of end users, and connection of distributed resources is clear. Already today and even more in the future, system operators will need to connect growing amounts of distributed resources. To cope with fluctuating electricity generation and price volatility, these resources need to be managed well and be fully part of the European internal energy market.

The development of non-fossil flexibility such as demand-side response and storage is a necessary element of a cost efficient and smooth transition. In fact, the need for system flexibility will increase significantly in the coming years, for all timeframes, from daily to seasonal.

This has been reflected in different EU legislative provisions such as the Electricity Regulation and Directive, the Renewable Energy Directive, Alternative Fuels Infrastructure Regulation, the Energy Efficiency Directive, the Energy Performance of Buildings Directive

The Electricity Directive includes key principles and accelerates the deployment of demand-side flexibility and tasks system operators to use flexibility services. It empowers customers to create value from their flexibility and to contract with aggregators. The Alternative Fuels Infrastructure Regulation improves the quality of electric charging infrastructure and the user experience, paving the way to full interoperability.

The Energy Efficiency Directive reinforces the energy efficiency first principle, also encompassing demand side flexibility, in policy, infrastructure planning and investments. The Energy Performance of Buildings Directive highlights the potential that buildings have towards demand-side flexibility and supports its deployment in new and renovated buildings through a series of provisions e.g. promoting renewable energy storage, supporting the roll-out of recharging infrastructure for electric vehicles, introducing new requirements for buildings to have the capacity to react to external signals and adjust energy consumption. The Renewable Energy Directive facilitates demand-side flexibility and energy system integration, accelerates the uptake of smart and bi-directional charging of electric vehicles, takes into account potential flexibility services from district heating and cooling, and provides incentives for upgrades of smart grids.

When transposed, these provisions will enable flexibility services to participate in all wholesale electricity markets and empower consumers to support the energy transition. This will help to reduce the volatility in the wholesale electricity market, reduce renewables curtailment as well as reliance on fossil fuel power plants. As such, it will keep costs down, contributing to affordable electricity bills.

I would like to commend smartEn for preparing this guide, putting together all the information and identifying best practices that will help speed up implementation of all the provisions and accelerate the deployment of demand-side flexibility across the Union.

**Lukasz Kolinski**  
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**Directorate C – Green Transition and Energy System Integration, DG ENER**  
**European Commission**

# OVERVIEW

# 70 key EU provisions driving demand-side flexibility

70 provisions over 6 EU legislations already provide a comprehensive regulatory framework to activate demand-side flexibility across Europe.

## ● ELECTRICITY REGULATION (ER)

- Art 6:** Balancing markets
- Art 7:** Day-ahead and intraday markets
- Art 7a:** Peak shaving product
- Art 7b:** Dedicated measurement devices
- Art 8:** Trade on day-ahead and intraday markets
- Art 12:** Dispatching of generation and demand response
- Art 13:** Redispatching
- Art 18:** Charges for access to networks and use of networks and reinforcement
- Art 19e:** Assessment of flexibility needs
- Art 19f:** Indicative national objective for non-fossil flexibility
- Art 19g:** Non-fossil flexibility support schemes
- Art 19h:** Design principles for non-fossil flexibility support schemes
- Art 20:** Resource adequacy in the internal market for electricity
- Art 21:** General principles for capacity mechanisms
- Art 22:** Design principles for capacity mechanisms
- Art 50:** Provision of information
- Art 57:** Cooperation between DSOs and TSOs

## ● ELECTRICITY DIRECTIVE (ED)

- Art 4:** Free choice of supplier
- Art 6a:** Flexible connection agreement
- Art 11:** Entitlement to a fixed term, fixed price electricity supply contract & dynamic electricity price contract
- Art 13:** Aggregation framework
- Art 15:** Active customers
- Art 15a:** Right to energy sharing
- Art 16:** Citizens Energy Communities
- Art 17:** DR through aggregation
- Art 19:** Smart metering systems
- Art 20:** Functionalities of smart metering systems
- Art 23:** Data management
- Art 24:** interoperability for access to data
- Art 31:** Tasks of DSOs
- Art 32:** Incentives for the use of flexibility by DSOs
- Art 33:** Integration of electromobility into electricity networks
- Art 34:** Tasks of DSOs in data management
- Art 36:** Ownership of storage facilities by DSOs
- Art 40:** Tasks of TSOs
- Art 51:** Network development
- Art 54:** Ownership of storage facilities by TSOs

## ● RENEWABLE ENERGY DIRECTIVE (RED)

- Art 15:** Administrative procedures, regulation and codes
- Art 15a:** Mainstreaming renewables in buildings
- Art 15b:** Mapping of areas necessary for national contributions towards the overall Union renewable energy target for 2030
- Art 18:** Information and Training & Annex IV
- Art 20a:** Facilitating system integration of renewable electricity
- Art 22:** Renewable Energy Communities
- Art 22a:** Mainstreaming renewable electricity in industry



## ● ENERGY EFFICIENCY DIRECTIVE (EED)

- |                                                                     |                                                                                                                 |
|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| <b>Art 3:</b> Energy Efficiency First principle                     | <b>Art 29:</b> Energy services                                                                                  |
| <b>Art 11:</b> Energy management systems and energy audits          | <b>Annex XIII:</b> Energy efficiency criteria for energy network regulation and for electricity network tariffs |
| <b>Art 22:</b> Information and awareness raising                    |                                                                                                                 |
| <b>Art 27:</b> Energy transformation, transmission and distribution |                                                                                                                 |

## ● ENERGY PERFORMANCE OF BUILDINGS DIRECTIVE (EPBD)

- |                                                            |                                                          |
|------------------------------------------------------------|----------------------------------------------------------|
| <b>Art 3:</b> National building renovation plan & Annex II | <b>Art 15:</b> Smart Readiness Indicator & Annex IV      |
| <b>Art 10:</b> Solar Energy in Buildings                   | <b>Art 16:</b> Data exchange                             |
| <b>Art 11:</b> Zero-emission buildings                     | <b>Art 19:</b> Energy Performance certificates & Annex V |
| <b>Art 12:</b> Renovation passport & Annex VIII            | <b>Art 25:</b> Independent experts                       |
| <b>Art 13:</b> Technical building systems                  | <b>Art 26:</b> Certification of building professionals   |
| <b>Art 14:</b> Infrastructure for sustainable mobility     |                                                          |

## ● ALTERNATIVE FUEL INFRASTRUCTURE REGULATION (AFIR)

- |                                           |                                   |
|-------------------------------------------|-----------------------------------|
| <b>Art 5:</b> Recharging infrastructure   | <b>Art 15:</b> National reporting |
| <b>Art 14:</b> National Policy Frameworks | <b>Art 20:</b> Data provisions    |

# Demand-side flexibility EU provisions: A timeline tracker for implementation

The existing 70 EU provisions on demand-side flexibility need to be implemented across Member States according to different timelines. Actions towards some of the most crucial ones are well overdue.

## • ELECTRICITY REGULATION



**APPLICABLE  
BEFORE 2023**

- Balancing Markets (art 6)
- Day-ahead and Intraday Markets (art 7)
- Trade on day-ahead and intraday markets (art 8)
- Dispatching of generation and demand response (art 12)
- Redispatching (art 13)
- Charges for access to networks and use of networks and reinforcement (art 18)
- Resource adequacy in the internal market for electricity (art 20)
- General principles for capacity mechanisms (art 21)
- Design principles for capacity mechanisms (art 22)
- Provision of information (art 50)
- Cooperation between DSOs and TSOs (art 57)



**APPLICABLE  
IN 2024**

- Day-ahead and Intraday Markets (art 7) §1, §2 (c), (ca), (f)
- Trade on day-ahead and intraday markets (art 8) §1, §3
- Peak shaving product (art 7a)
- Dedicated measurement device (art 7b)
- Charges for access to networks and use of networks and reinforcement (art 18) §2, §3, §8, §9
- Non-fossil flexibility support schemes (art 19g)
- Design principles for non-fossil flexibility support schemes (art 19h)
- General principles for capacity mechanisms (art 21) §1
- Design principles for capacity mechanisms (art 22) §1 (a)
- Provision of information (art 50) §4a
- Cooperation between DSOs and TSOs (art 57) §3



**APPLICABLE  
FROM 2025**

- Assessment of flexibility needs (art 19e)
- Indicative national objective for non-fossil flexibility (art 19f)

## ● ELECTRICITY DIRECTIVE



**APPLICABLE  
BEFORE 2023**

- Entitlement to a fixed term, fixed price electricity supply contract & dynamic electricity price contract (art 11)
- Aggregation framework (art 13)
- Active customers (art 15)
- Citizens energy communities (art 16)
- Demand response through aggregation (art 17)
- Smart metering systems (art 19)
- Functionalities of smart metering systems (art 20)
- Data management (art 23)
- Interoperability requirements and procedures for access to data (art 24)
- Tasks of DSOs (art 31)
- Incentives for the use of flexibility in distribution networks (art 32)
- Integration of electromobility into the electricity network (art 33)
- Tasks of distribution system operators in data management (art 34)
- Ownership of storage facilities by DSOs (art 36)
- Tasks of TSOs (art 40)
- Network development and powers to make investment decisions (art 51)
- Ownership of storage facilities by TSOs (art 54)



**APPLICABLE  
FROM 2025**

- Free choice of supplier (art 4)
- Flexible connection agreement (art 6a)
- Entitlement to a fixed term, fixed price electricity supply contract & dynamic electricity price contract (art 11)
- Right to energy sharing (art 15a)
- Tasks of DSOs (art 31) §2, §3, §3a, §3b
- Integration of electromobility into the electricity network (art 33) §1

## ● RENEWABLE ENERGY DIRECTIVE



**APPLICABLE  
BEFORE 2023**

- Renewable energy communities (art 22)



**APPLICABLE  
FROM 2025**

- Administrative procedures, regulations and codes (art 15)
- Mainstreaming renewables in buildings (art 15a)
- Mapping of areas necessary for national contributions towards the overall Union renewable energy target for 2030 (art 15b)
- Information and Training (art 18)
- Facilitating system integration of renewable electricity (art 20a)
- Mainstreaming renewable electricity in industry (art 22a)

## ● ENERGY EFFICIENCY DIRECTIVE



APPLICABLE  
FROM 2025

- Energy Efficiency First Principle (art 3)
- Energy management systems and energy audits (art 11)
- Information and awareness raising (art 22)
- Energy transformation, transmission and distribution (art 27)
- Energy services (art 29)

## ● ENERGY PERFORMANCE OF BUILDINGS DIRECTIVE



APPLICABLE  
IN 2024

- Technical building systems (art 13) §9 (a)



APPLICABLE  
FROM 2025

- National building renovation plan (art 3)
- Solar energy in buildings (art 10)
- Zero emission buildings (art 11)
- Renovation passport (art 12)
- Technical building systems (art 13)
- Infrastructure for sustainable mobility (art 14)
- Smart readiness of buildings (art 15)
- Data exchange (art 16)
- Energy performance certificates (art 19)
- Independent experts (art 25)
- Certification of building professionals (art 26)

## ● ALTERNATIVE FUELS INFRASTRUCTURE REGULATION



APPLICABLE  
IN 2024

- Recharging infrastructure (art 5) §7
- National policy frameworks (art 14) §1
- National reporting (art 15) §3, §4
- Data provisions (art 20) §4

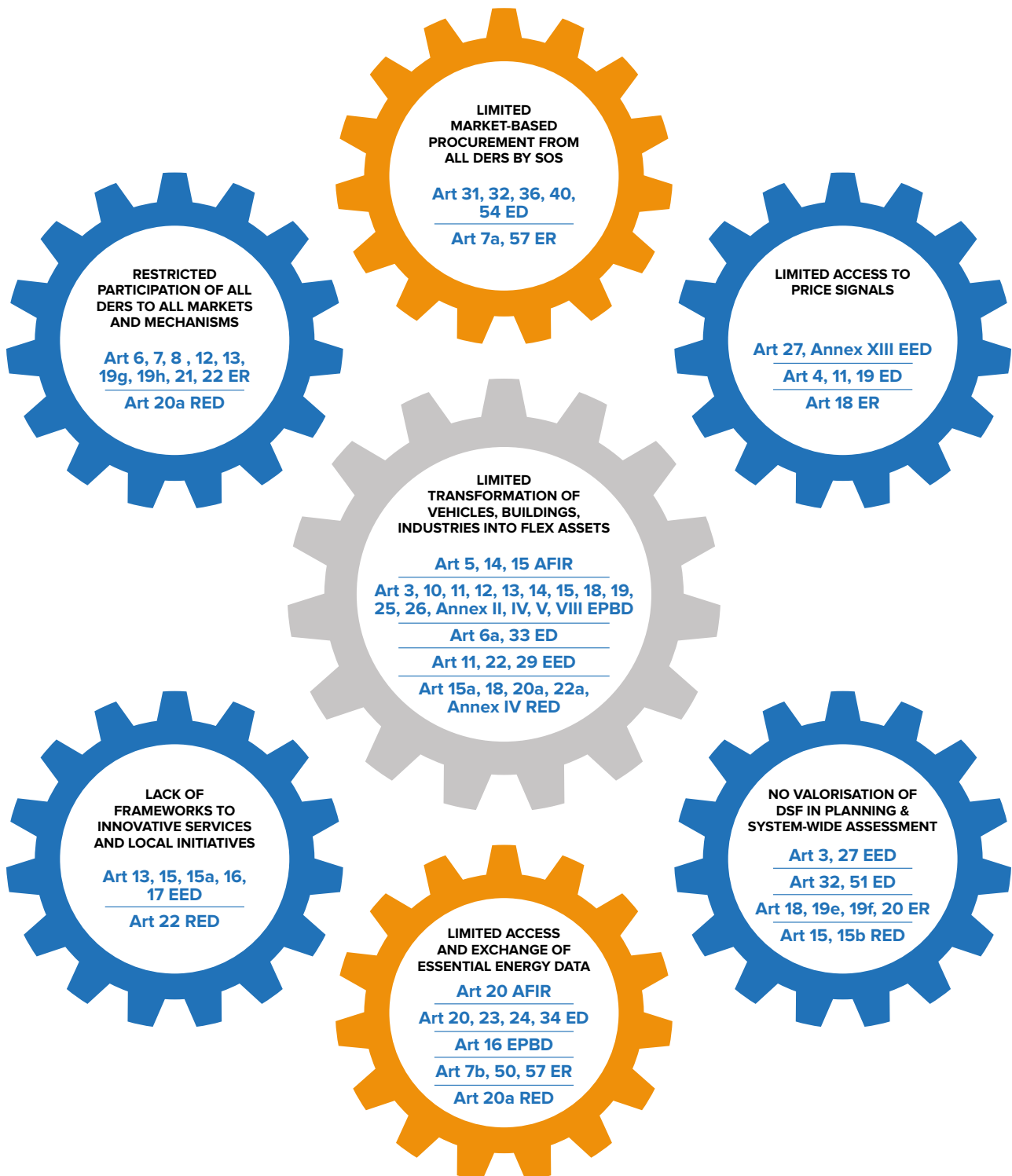


APPLICABLE  
FROM 2025

- National policy framework (art 14) §11
- National reporting (art 15)
- Data provisions (art 20)

# Barriers to demand-side flexibility: EU provisions paving the way forward

The existing 70 EU provisions already address the 7 main barriers to demand-side flexibility.



# HOW TO IMPLEMENT EU LAWS TO ADDRESS EXISTING BARRIERS TO DEMAND-SIDE FLEXIBILITY.

HOW TO IMPLEMENT EU LAWS  
TO ADDRESS BARRIER

**#1**

**Limited market-  
based procurement  
from all decentralised  
energy resources by  
system operators**

## • In this chapter...

# #1

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- Procurement of flexibility services by DSOs  
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- Peak shaving product in electricity price crisis situation  
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- Coordinated access to decentralised resources  
between TSO and DSO  
(Articles, 31, 32 and 40 Electricity Directive and  
article 57 Electricity Regulation) 31
- Ownership of energy storage by TSOs and DSOs  
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## Introduction

With an increasing share of variable renewable energy sources being integrated into the power system, there is a growing need for a more flexible and resilient grid. Transmission System Operators (TSOs) and Distribution System Operators (DSOs) must adapt the operation of their networks to manage variability and ensure stability.

A key component of this adaptation is the ability by System Operators to use the flexibility potential from decentralised energy resources, such as distributed generation, energy storage and demand response.

The current lack of market-based procurement of the flexibility from all decentralised energy resources by System Operators in most Member States presents a significant barrier to unlocking the full potential of demand-side flexibility, leading to suboptimal grid management, delayed integration of flexible resources, and missed opportunities to defer costly infrastructure investments. While the Electricity Market Design sets out rules to incentivise TSOs and DSOs to act as neu-

tral market facilitators by procuring flexibility services through competitive, market-based processes, including during emergency situations, the current practices often fall short of these principles in many Member States.

To achieve a truly efficient energy system, it is crucial that System Operators fully embrace a non-discriminatory and market-based procurement from all decentralised energy resources both in times of normal market operation and during electricity price crisis situations. This approach ensures that decentralised energy resources can compete on an equal footing, maximising their potential to contribute to grid stability and support a cost-effective energy transition.

This chapter is addressed to **NRAs and System Operators**. It presents recommendations for implementing the **Electricity Directive and Electricity Regulation**, which mandate the following:

- **Market-based Procurement by Transmission System Operators (TSOs):** TSOs must procure ancillary services in a non-discriminatory, market-based manner from all decentralised energy resources and allow independent aggregators to participate (Article 40 of the Electricity Directive).
- **Flexibility Procurement by Distribution System Operators (DSOs):** DSOs are required to procure flexibility services to manage local congestion and ensure efficient grid operation through non-discriminatory, market-based procedures and to set up Local Flexibility Markets (Articles 31 and 32 of the Electricity Directive).
- **Market-based Procurement of the Peak Shaving Product in emergency situations:** System Operators must develop and use the peak shaving product in a market-based way to reduce electricity demand during peak hours through demand response, in times of electricity price crises (Article 7a of the Electricity Regulation).
- **Coordinated Access to Decentralised Energy Resources:** Both TSOs and DSOs should coordinate to facilitate access to decentralised energy resources, enabling consumers and market participants to offer flexibility services to System Operators (Articles 31 and 32 of the Electricity Directive, and Article 57 of the Electricity Regulation).
- **Ownership and Market-based Use of Storage Facilities:** System Operators cannot own storage facilities and must effectively use them through market-based, competitive energy services, ensuring fair access to all markets (Articles 36 and 54 of the Electricity Directive).

These recommendations are essential to ensure that System Operators operate as neutral market facilitators, enabling a more flexible, efficient, and resilient energy system.

## Procurement of ancillary services by TSOs (Article 40 Electricity Directive)



NO TIME TO LOSE!

**APPLICABLE BY:**  
31 December 2020



**OBJECTIVE:** Ensure market-based procurement of ancillary services that allow all decentralised energy resources (DERs) and aggregators to participate.

### WHAT DOES THE LEGISLATION SAY?

- TSOs must procure ancillary services (both frequency and non-frequency) to ensure operational security through transparent, non-discriminatory, market-based procedures that allow all decentralised energy resources (DERs) and aggregators to participate.
- TSOs shall not own assets that provide ancillary services.
- Regulatory authorities and TSOs, in cooperation with all market participants, shall establish technical requirements for market participation based on the market's technical characteristics.



### HOW SHOULD TSOs IMPLEMENT THE PROVISION?

#### 1 TSOs shall procure ancillary services through a market-based process

TSO shall procure ancillary services in a market-based way with clearly and transparently defined rules. Potential revenues should be made possible for both availability and activation in order to foster the participation of demand side resources.

This approach ensures transparency, promotes competition, and guarantees the best price and value for these essential services. Competitive bidding processes for the procurement of ancillary services ensures cost-effectiveness and optimal value.

Ancillary services can be contracted via long-term products or short-term products.

Long-term products, which cover availability services over extended periods (e.g., several months to years), may be procured through an open tender process to ensure transparency and allow multiple service providers to compete for the contract, thus ensuring the best value. This procurement method should be used instead of opaque bilateral agreements or mandatory provisions, which can limit competition and hinder fair access to the market.

For short-term products, which cover immediate or short-term activation of capacities (e.g., hours, days, or weeks), services should be procured only in a competitive market with clearly defined rules. This ensures fair competition between service providers that have already contracted a capacity agreement and other providers with available capacity (free bids) to be activated. Allowing broader participation can help to further reduce activation costs.

The implementation of these short-term markets should not depend on having pre-contracted resources in place, as the market should naturally encourage the availability of resources. This is especially important for utilising existing DERs, like heat pumps or batteries, which can be quickly activated when needed. The flexibility offered by these DERs can help lower the overall costs of ancillary services and improve grid stability.

## 2 TSO shall remove entry barriers faced by independent aggregators

Some European TSOs allow participation in ancillary services only by suppliers and Balance Responsible Parties (BRP), while in some countries, direct participation of Balance Service Providers (BSP) is allowed but is subordinated to the permission of the consumer's supplier. This creates entry barriers to BSPs from offering balancing services to TSOs.

TSOs shall allow BSPs, including independent aggregators, to participate in ancillary services without requiring agreement from the consumers' BRP or supplier.

In general, Member states should ensure that suppliers and aggregators have equivalent access to Ancillary Services, Balancing Services and wholesale markets.

## 3 TSOs shall allow asymmetrical products

In some markets, TSOs require symmetrical products (i.e. equal capacity for upward and downward adjustments). This is limiting for certain technologies due to operational and technical constraints, such as heat pumps, electric boilers, EVs with smart charging etc. Asymmetric bids should be allowed by default for all products – as it is the case in Sweden and Finland.

Allowing these technologies to participate through asymmetric bids can contribute to more liquidity in the market and lower costs. An exception to this general rule should only be accepted in the case where the TSO can provide a reasoned justification, including a cost-benefit analysis demonstrating the need for symmetric products that clearly demonstrates that such approach will benefit liquidity.

## 4 TSO shall align minimum bid sizes with the wholesale markets ones

The Electricity Market Design mandates a minimum bid size of 100kW or less for wholesale markets. However, it does not specify the size for ancillary services. Bid sizes for ancillary services should be aligned with other markets, as high thresholds are a significant barrier to the participation of demand-side flexibility.

## 5 TSO shall simplify the prequalification process

Several TSOs require a lengthy prequalification process, such as a repetition of the prequalification process for already prequalified assets and pools in case of changes in their composition. It causes loss of revenue and unnecessary delays for both the aggregator and TSO. Type approvals - which streamline this process by recognising previously approved assets without repeated evaluations - should be easily obtained and the prequalification should not have to be repeated. In this light, the use of digital identities with verifiable credentials could be used to simplify the prequalification process.

## 6 TSO shall procure ancillary services close to real time

Services should be procured as close to real-time as possible to maximise the participation of demand response, while avoiding excessively stringent accuracy requirements. While precise service provision may be optimal for system operators, allowing some degree of over- or under-delivery opens the door to a wider range of loads to participate, resulting in more efficient system operation overall.

Restrictions on over delivery should only be applied to the extent that over-delivery would cause significant issues.

Furthermore, the reliability of service delivery can be reflected in the prices paid, ensuring that any penalties for over-delivery imposed to aggregators acting as balance responsible do not exceed the typical costs associated with managing its impact.

## 7 TSOs shall update the necessary IT infrastructure to effectively use flexibility from smaller resources

Skip rates refer to the frequency at which smaller, aggregated energy resources, such as DERs, are bypassed or skipped in favour of dispatching larger units, because the current IT infrastructure cannot efficiently handle the increased volume of smaller bids.

TSOs must take steps to minimise skip rates by implementing the necessary digital and IT infrastructure to effectively integrate larger amounts of flexibility from smaller DERs; this included upgrading their IT infrastructure to manage and respond to a higher number of bids from smaller DERs.

Reducing skip rates is essential to ensure that resources are dispatched based on merit order, supporting a cost-effective energy system and advancing decarbonisation targets. In fact, where fast decisions are needed, control rooms require advanced IT systems capable of handling these smaller volumes efficiently so that flexibility options, that are cheaper than procuring energy from larger assets, are not overlooked. Additionally, making skip rates publicly available will promote transparency and ensure that the most cost-effective resources are prioritized.

## HOW SHOULD NRAs IMPLEMENT THE PROVISION?

1

### NRA to oversee the definition of technical requirements by TSO for participations in ancillary services

TSO shall develop a proper impact assessment and submit to NRA comprehensive and transparent documentation to explain technical requirements for procuring market-based ancillary services. The NRA shall ensure that the technical requirements allow a technology-agnostic and market-based procurement of ancillary services, from all decentralised energy sources and aggregators.

Documentation should also include a comprehensive and transparent explanation of how stakeholder feedback has been taken into consideration during the public consultation phase. The NRA may decide to bilaterally consult stakeholders after the consultation phase by the TSO to ensure the consultation process went well and opinions were properly taken into account and understood.

The NRA shall ensure that the implementation of technical requirements for the procurement of ancillary services is respected and market participants are duly involved in the drafting process by the TSO.

2

### Remove administrative barriers

Persisting administrative barriers prevent all decentralised energy resources and aggregators from participating in ancillary services. The NRA shall ensure that the following barriers are lifted:

- **Licencing obligation:** especially if a Flexibility Service Provider is already active in another Member State;
- **Participation fees:** there are cases whereby indirect fees need to be paid to regulator and data hub operator;
- **Language barrier:** often all the relevant documentation (including agreements) are available in national language only.

# Procurement of flexibility services by DSOs

## (Article 31 and 32 Electricity Directive)



NO TIME TO LOSE!

**APPLICABLE BY:**  
31 December 2020



**OBJECTIVE:** Incentivise the use and ensure market-based procurement of flexible demand by DSOs.

## WHAT DOES THE LEGISLATION SAY?

**Member States to provide incentives to DSOs to procure flexibility services:**

- Each DSO shall act as a neutral market facilitator in procuring the energy it uses to cover energy losses in its system according to transparent, non-discriminatory and market-based procedures.
- DSOs' procurement of non-frequency ancillary services (NFAS) shall also be market-based, unless NRA granted a derogation because it has assessed that is not economically efficient.
- DSOs shall procure flexibility services when such services cost-effectively supplant the need to upgrade or replace electricity capacity and support the efficient and secure operation of the distribution system.
- These services include congestion management, according to transparent, non-discriminatory and market-based procedures that allow participation of all decentralised energy resources and aggregation.
- Derogation to procurement if NRAs have established that the procurement of such services is economically not efficient or if this leads to severe market distortions or to higher congestions.
- DSOs shall define, in a transparent and participatory process with system users and TSOs, the specifications for the flexibility services procured, and, where appropriate, standardized market products for such services at least at national level. These specifications shall be approved by the NRA.
- DSOs to be adequately remunerated for the procurement of such services in order to recover at least the corresponding reasonable costs, including the necessary information and communication technologies expenses and infrastructure costs



## HOW SHOULD DSOs IMPLEMENT THE PROVISION?

1

### Procure a trading platform for flexibility to support the establishment of Local Flexibility Markets

Local flexibility markets are the most efficient way of matching supply and demand to respond to local needs. They reduce market entry barriers and allow optimal use of resources and standardization of products and processes while at the same time leaving sufficient room for adaptation to local constraints and specificities.

DSO should rely on trading platforms for flexibility set up by independent market operators through a competitive tendering process that takes into account functionality and costs. The use of a third party platform allows for neutrality and for harmonisation of market rules and processes, in particular in countries with numerous System Operators.

Each DSO should be allowed to choose its preferred trading platform and arrangements independently and without waiting for national terms and conditions for local flexibility markets to be approved in the context of the implementation of the forthcoming Network Code for Demand Response. This will allow local markets to emerge and system operators to gather experience for the drafting of national terms and conditions, avoiding that such national terms and conditions are not compatible with designated trading platforms.

In Member States where multiple competitive platforms for local markets exist, measures such as setting up a single interface for Flexibility Service Providers to access multiple platforms should be considered as this would allow coordination between markets and enable value stacking. It is, however, important to keep open possibilities for innovation both for platforms and products at this early stage.

Any derogations from market-based DSOs procurement of non-frequency ancillary services (NFAS) granted by NRAs shall be justified, limited in time and submitted to public consultation.

2

### DSOs to set out clear flexibility services remuneration levels in market-based procedures

Prices in Local Flexibility Markets should be market-based and not set by the DSO directly.

As for TSO' products, remunerations should be made possible for both availability and activation in order to foster the participation of demand side resources and strengthen the reliability of Flexibility Service Providers towards DSOs.

Where long term products are procured, these shall be activated in competition with short term products. This allows further participation and competition, enabling lower prices for the DSO, higher liquidity and further income possibilities for FSPs including those to which long term contracts have not been rewarded.

Visibility on potential revenues is necessary for market participants to elaborate solid business plans, tailor proposals to needs and ensure efficient participation in procurement processes.

To maximise participation in such markets and provide visibility to market participants, DSO shall set out clear flexibility services remuneration levels as far as possible, for example by indicating the ceiling prices they are willing to pay. This gives flexibility providers an understanding of whether it is economic for them to bid in these local flexibility markets (or conversely, whether it is more economic for the DSO to upgrade the network).

The ceiling prices are set by the DSOs and calculated as the cost of avoiding grid reinforcement. Such calculation should be transparent and available to third parties.

### 3 Guarantee value stacking opportunities between markets

To ensure flexibility is used where it is most needed, coordination with different markets is important. Participation in DSOs flexibility markets, TSOs services (including balancing) and other wholesale markets should be allowed and any undue barriers removed. This requires strong cooperation between market operators, TSOs and DSOs notably for coordinated procurement of flexibility and open interoperability across markets, and across Flexibility Service Providers and decentralised energy resources. Interoperability across markets should rely on the existing IEC 62352 model or other relevant standards, to allow market parties to participate in these different markets<sup>2</sup>. This also enables smaller flexibility providers to access several buyers and thus increase available volumes of flexibility to system operators.

With this approach flexibility providers can benefit from value stacking (i.e. the possibility of bundling multiple value streams from different grid services). The principle is simple: non-activated bids in local congestion management markets are forwarded to or made accessible to TSO markets with similar requirements (e.g., mFRR and RR) as long as their activation do not create additional congestions in the local grid and the concerned FSP has opted for such a service. The coordination can be cascading (i.e. bids being forwarded after gate closure of the first market) or simultaneous (i.e. bids being accessible in multiple markets in parallel, disappearing when selected in one of them). The TSO shall have the responsibility for allowing coordination of its markets with all relevant local markets.

Value stacking should also be possible across different types of services so long as they are compatible (either through temporal separation, or through energy and non-energy products, or allowing 'splitting' of volumes from a single unit - e.g. a 100MW unit should be able to do 50MW in one service, and 50MW in another).

### 4 DSOs to ensure a level playing field for the participation from all DERS in Local Flexibility Markets and ensure stakeholder consultation for terms and conditions

All market participants connected to DSOs shall be allowed to take part in procurement processes of all products and services that they can technically deliver. There should not be restrictions to the participation of decentralised energy resources, including from the increasing number of electric vehicles or heat pumps in buildings<sup>3</sup>.

Before their adoption, and on a regular basis, rules for the procurement shall be submitted by the DSO to stakeholder consultation, and the results as well as the reason for taking into account or not taking into account the suggestions shall be published by the DSO. Member States with several DSOs shall strive towards harmonised terms and conditions at least on a national level.

2 · More Information on [smartEn paper on data exchange for the system integration of consumers: assessment of available standards and protocols](#)

3 · See chapter 2 of the Implementation Guidebook for recommendations on how to support the open and non-discriminatory participation of all decentralised energy resources to all markets and mechanisms.



## HOW SHOULD DSOs IMPLEMENT THE PROVISION?

1

### Set up clear mechanisms for recovery of flexibility procurement expenditure by DSO within network price controls by implementing TOTEX regimes

Many network operators today benefit from financial incentives that encourage them to invest in new cables or other physical assets rather than procuring flexibility services from connected parties in a market-based way, due to prevailing CAPEX remuneration. NRA shall allow for the efficient remuneration of system operators following a TOTEX approach that considers capital expenditure (CAPEX) and operational expenditure (OPEX) costs equally as eligible costs to be recovered.

OPEX associated with the establishment of DSO's Local Flexibility Markets should be accounted for in the regulated asset base to allow system operators to receive a return on these OPEX. Such OPEX include inter alia the costs associated with procuring flexibility on trading platforms set up by independent market operators, communication infrastructure and system upgrades, data analytics tools and compliance systems and reporting costs. This will incentivise and ensure appropriate compensation of DSO for the procurement of flexibility services.

2

### Ensure that market based procurement is at least as much incentivised as non-market based alternatives

Other procurement methods, in particular implicit flexibility through tariffs or flexible connection agreements (if free for System Operator), will not impact OPEX costs in the same way as market based procurement of flexibility services. In particular, when cost reflective tariffs enable lower tariffs for some system users, these costs will often be automatically covered through higher tariffs for other users, the sum of income remaining the same for the system operator.

NRA, or, where applicable, Member States, should ensure, through the national remuneration and cost recovery framework, that system operators are not less incentivised to procure market based flexibility than using other tools.

# Peak shaving product in electricity price crisis situations *(Article 7a Electricity Regulation)*



ACT  
NOW!

**APPLICABLE BY:**  
16 July 2024



**OBJECTIVE:** Develop a market-based peak shaving product to achieve a reduction of electricity demand during peak hours, when there is an electricity price crisis situation

## WHAT DOES THE LEGISLATION SAY?



- 'Peak shaving' is defined as the ability of market participants to reduce electricity consumption from the grid at peak hours at the request of the system operator; and 'peak shaving product' is defined as a market-based product through which market participants can provide peak shaving to system operators.
- Where a regional or Union-wide electricity price crisis is declared, Member States may request system operators to propose the procurement of peak shaving products to achieve a reduction of electricity demand during peak hours, limited to the duration of electricity price crisis situations.
- System Operators (TSO & DSO) shall consult stakeholders before submitting a proposal to NRAs regarding the dimensioning and conditions for the procurement and activation of the peak shaving product.

## HOW SHOULD NRAs IMPLEMENT THE PROVISION?

### Set a clear deadline by which System Operators need to submit their proposal for a peak shaving product

During the winter 2022/2023 Member States were urged to rapidly shape a market-based product in line with the emergency Council Regulation to reduce peak electricity prices. The lack of time in a pretty chaotic setting led to poor products, mostly not market-based, with limited numbers of activated volumes<sup>4</sup>. To avoid the same scenario from happening, NRAs should request System Operators to prepare in advance and submit their comprehensive proposal, including technical specifications for the peak shaving product and the consultation phase with stakeholders, within 1 year. This will ensure that the rules are ready when the peak shaving product is called and provide sufficient visibility to market actors.

## WHAT DOES THE LEGISLATION SAY?



The peak shaving product shall comply with the following requirements:

- Dimensioning shall:
  - be based on an analysis of the need for an additional service to ensure security of supply without risking grid stability, considering its market impact, costs, and benefits;
  - consider demand forecasts, electricity generated from renewable sources, other flexibility sources (such as storage), and the wholesale price impact of avoided dispatch.
- The procurement shall:
  - be based on transparent, market-based, non-discriminatory criteria;
  - be limited to demand-response;
  - not exclude participating assets to access other markets;
  - take place using competitive bidding, which can be continuous, with selection based on the lowest cost of meeting pre-defined technical and environmental criteria;
  - allow the effective participation of consumers, directly or through aggregation.
- The minimum bid size shall not be higher than 100 kW, including through aggregation.
- Contracts for a peak shaving product shall not be concluded more than a week before its activation.
- The activation of the peak shaving product shall:
  - not reduce cross-zonal capacity;
  - take place before or within the day-ahead market and may be based on a predefined electricity price;
  - not imply starting fossil fuel-based generation located behind the metering point.

The actual reduction of consumption resulting from the activation of a peak shaving product shall be measured against a baseline, reflecting the expected electricity consumption without the activation of the peak shaving product. The baseline methodology shall be developed by System Operators following consultation with market participants.

## HOW SHOULD SYSTEM OPERATORS IMPLEMENT THE PROVISION?

### System operators to set up non-discriminatory, market-based design features

The design of the peak shaving product should define in advance the following features to support participation of demand-response:

- **Technical requirements to allow all types of consumers (residential, commercial and industrial) and technologies to participate**

As the peak shaving product is a last resort market tool in case of emergency crises, System Operators shall ensure that technical requirements, notably for the activation of (individual/pooled) assets are proportionate to the needs of the peak shaving product and not restrictive to specific technologies. For example, System Operators shall not require the installation of inappropriately costly dedicated metering devices or systems that allow direct load disconnection by System Operators as this will significantly reduce participation of smaller decentralised energy resources.

- **Appropriate baseline**

Similarly to the previous point, to measure the reduction of consumption resulting from the activation of a peak shaving product, the baseline should rely on data from the boundary smart meter or any other certified sub-meter and dedicated measurement device under the conditions specified in article 7b of the Electricity Regulation. An ex-post verification of delivery is performed by comparing actual consumption to the baseline. This verification can attest the activation during the relevant peak periods.

- **Stackability of products**

The peak shaving product should be added to other (non-emergency) markets and System Operators shall ensure that the remuneration for the peak shaving product is stackable with the remuneration of other market products. Otherwise resources that are already participating in other markets (i.e. balancing markets or local flexibility markets) and are technically capable of providing a peak shaving product, will not have enough incentives to do so.

- **Remuneration**

System Operators shall ensure that both availability and activations are remunerated. Availability payments guarantee capacity is available when needed while activation should be paid as cleared. Remuneration could be foreseen in the state budget (through specific taxes or ad hoc envelope) and delivered by System Operators. System Operators would be paying for this product the same way they would pay for emergency generation.

## HOW SHOULD NRAs IMPLEMENT THE PROVISION?

### **NRAs shall ensure value stacking on other markets, supported by adequate baseline methodologies**

In order to avoid a redirection of demand-side resources towards peak shaving products that would undermine the functioning and liquidity of other markets, NRA shall ensure that the proposal for peak shaving product allows not only participation of the same assets on other markets (wholesale, balancing markets and ancillary services), but also value stacking on those markets. To do so, the following measures are necessary:

- Explicit exclusions of demand-side resources from participating in other markets and mechanisms must be prohibited in the design of peak shaving product;
- NRA must ensure that baseline methodologies for the peak shaving product take into account activation of demand-side resources on other markets. For example, the activation on a balancing or wholesale market prior to activation of the peak shaving product shall not deteriorate the baseline used for the activation of the same asset on the peak shaving product.

## WHAT DOES THE LEGISLATION SAY?



- NRAs shall assess and approve the peak shaving product proposal for its effectiveness in reducing electricity demand and its impact on wholesale electricity prices during peak hours.
- NRA shall consider the need to:
  - Avoid any undue distortion in the functioning of electricity markets;
  - Not cause a redirection of demand response services towards peak shaving products.
- NRAs shall also assess and approve the baseline methodology proposed by System Operators.
- Following this assessment, NRAs may ask the System Operators to amend their proposal.

## HOW SHOULD NRAs IMPLEMENT THE PROVISION?

1

### Set out clear rules for assessment of potential undesirable side-effects of a peak shaving product

Participation of demand-side flexibility in wholesale and balancing markets provides long-term perspective to providers of demand-side flexibility, whereas peak-shaving products risk creating a “start and stop” effect on the market due to their limited use to electricity price crisis situations as defined in article 66a of the Electricity Regulation.

The NRA's assessment of the peak shaving product proposal should consider the likely redirection of demand response services from wholesale and balancing markets towards peak shaving.

As a result, this assessment must take into account the additional costs market participants may incur in adapting their services to meet the specific requirements of the peak shaving product, as these costs could increase overall system operation expenses.

Moreover, the assessment should consider the “avoided profits” (i.e. opportunity cost) of a market participant moving from balancing and wholesale to “peak shaving”. This means that the peak shaving remuneration must also consider and include what a participant could have earned if it would have remained in the wholesale and/or balancing markets.

2

**When assessing the System Operators' proposal for the peak shaving product and baseline methodology, the NRA shall take the utmost account of the stakeholder's consultation**

When System Operators are requested to propose the procurement of peak-shaving products they must submit a proposal to the NRA following a stakeholder consultation. The NRA should be able to access the result of this stakeholder consultation and use the feedback therein to assess, amend or approve the proposal. This will ensure stakeholders' inputs are properly considered. The NRA should also request the system operators to justify whether or not the feedback given by stakeholders was taken into account.

## Coordinated access to decentralised resources between TSO and DSO *(Articles, 31, 32 and 40 Electricity Directive and Article 57 Electricity Regulation)*



NO TIME TO LOSE!

### APPLICABLE BY:

31 December 2020 for the Electricity Directive



Except §2 about no discrimination from DSO between system users, including CECs and RECs in article 31 which is applicable by 17 January 2025.



### OBJECTIVE:

Facilitate access to consumers and market parties offering flexibility to System Operators.



NO TIME TO LOSE!

### APPLICABLE BY:

1 January 2020 for the Electricity Regulation



Except §3 where DSOs and TSOs need to cooperate to publish information on capacity for new connections, applicable by 16 July 2024.

## WHAT DOES THE LEGISLATION SAY?

- TSOs and DSOs shall exchange information and cooperate with each other in order to achieve coordinated access to resources such as distributed generation, energy storage or demand response that may support particular needs of both the Distribution and Transmission System Operators.
- They shall cooperate for the effective participation of market participants connected to their grid in retail, wholesale and balancing markets.
- Delivery of balancing services stemming from resources located in the distribution system shall be agreed with the relevant transmission system operator.



## HOW SHOULD SYSTEM OPERATORS IMPLEMENT THE PROVISION?

### 1 Exchange information on flexibility resources

Information on flexibility resources that are either pre-qualified or aiming to participate in congestion management, local flexibility markets and balancing should be accessible to both TSO and DSO through a Flexibility Resources Register which serves as a platform storing information on registration, service provider qualification, product prequalification and grid prequalification for the provision of local flexibility.

### 2 Coordinate product designs between TSOs and DSOs

It is crucial to avoid an excessive variety of products. Several non-harmonised products would require many IT and commercial developments and hinder the participation of decentralised energy resources. Harmonisation of products and market rules at least on national level should be the aim. NRA, system operators and market operators should work together to ensure product standardisation and harmonisation across platforms and across system operators.

The design of products should also involve a dialogue with stakeholders to evaluate possibilities and needs, ideally on a national scale.

### 3 Ensure value stacking and avoid exclusive activation of demand-side assets by TSO or DSO

TSO and DSO should not limit activation of flexible assets to their specific products. This would limit value stacking, the provision of different services by the same demand-side assets and participation to different markets (e.g. DSOs' local flex markets, balancing and ancillary services to TSO and wholesale markets). To avoid this scenario, System Operators should not have privileged rights to exercise control over connected assets, but should instead permit assets to be used for different services to support efficient dispatch and revenue stacking. This would strengthen the principle of System Operators as neutral market facilitators and ensure DER participation is based upon choice for customers, not obligation.



## Ownership of energy storage by TSOs and DSOs (Article 54 and article 36 Electricity Directive)



NO TIME TO LOSE!

**APPLICABLE BY:**  
31 December 2020



**OBJECTIVE:** Ensure effective use of storage facilities through market-based and competitive energy storage services with fair access to all market participants, and avoid cross-subsidisation between energy storage as a commercial activity and the regulated functions of the TSO and the DSO.

### WHAT DOES THE LEGISLATION SAY?

- Clear general principle that TSO and DSO shall not own, develop, operate or manage energy storage facilities.
- Derogations possible:
  - if storage facilities are fully integrated network components that are used for ensuring reliable operations of the grids and not for balancing or for congestion management and NRA has granted its approval;
  - or if ALL listed conditions are fulfilled:
    - No other parties awarded a right to own, develop, manage, operate storage facilities, or could not deliver those services at a reasonable costs and in a timely manner, following open, transparent and non-discriminatory tendering procedure. The NRA may draw up guidelines or procurement clauses to help TSOs ensure a fair tendering procedure;
    - Storage facilities are necessary for TSOs and DSOs and are not used to buy or sell electricity in markets;
    - NRA has assessed the necessity of such a derogation and has assessed the tendering procedure, its conditions and has granted its approval.



### HOW SHOULD SYSTEM OPERATORS IMPLEMENT THE PROVISION?

1

**System Operators to perform first a thorough assessment of all the decentralised energy technologies available to fulfil its system needs.**

System Operators, together with the NRA and in consultation with market parties, shall perform a compre-

hensive and publicly available analysis to assess, as part of the assessment of flexibility needs required by article 19e of the Electricity Regulation 2024/1747, which technologies (including behind-the-meter storage and demand response) can fulfil the identified system flexibility needs. NRA shall allow setting up a tendering procedure for grid-scale storage facilities only if proven necessary by such assessment and if the flexibility needs cannot be fulfilled at a lower costs by distributed energy storage facilities, including electric vehicles, or other decentralised energy resources.

2

## **System Operators to set out clear requirements for an open, transparent and non-discriminatory tendering procedure to own, develop, manage, operate storage facilities by market parties.**

The tendering procedure set up by System Operators shall:

- Ensure sufficient visibility and publicity of the tendering procedures towards market parties to avoid a lack of participation;
- Set participation requirements not limited to only meeting the needs of a single System Operator, but shall allow market parties owning, developing, operating and managing storage facilities to participate in all electricity markets;
- Not be replaced by market survey or pre-screening of the market by System Operators;
- Such requirements for the tendering procedures will provide clarity to third parties and facilitate the assessment of the tendering procedure by the NRA to grant its approval.

HOW TO IMPLEMENT EU LAWS  
TO ADDRESS BARRIER

# #2

**Restricted  
participation of  
all decentralised  
energy resources  
to all markets and  
mechanisms**

## • In this chapter...

# #2

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## Introduction

As decentralised energy resources, including renewable energy, energy storage, and demand response, continue to grow across Europe, their flexible use remains significantly underutilised. This is not due to a lack of market interest, but rather due to inadequate rules that prevent these resources from fully participating in key electricity markets and mechanisms. These include day-ahead and intraday electricity markets, congestion management, balancing and flexibility services, capacity mechanisms, and non-fossil flexibility support schemes.

Ensuring non-discriminatory and open access for all decentralised energy resources is essential for enabling consumers—from households and electric vehicle owners to small businesses and large industries—to actively contribute to the energy system’s efficiency, stability, and decarbonization goals while being appropriately rewarded for it. This also fosters the development of robust business models that promote demand-side flexibility. By opening markets, viable business models for the Flexible Demand Management Industry can thrive, allowing consumers to be compensated for their contributions to enhancing the energy system, either directly or through the support of flexibility service providers.

Despite clear rules laid out in the EU Electricity Market Design already back in 2019, many EU Member States still impose barriers that limit decentralised energy resources to access these markets. These restrictions diminish the economic benefits of consumer flexibility and increase system costs. To break down these barriers, Member States must ensure open and non-discriminatory market access for all participants, allowing flexible energy resources to compete equally and deliver their full potential.

This chapter is directed at **Member States, National Regulatory Authorities (NRAs), and System Operators offering recommendations for implementing the Electricity Regulation and the Renewable Energy Directive**. These frameworks mandate the participation of all decentralised energy resources, including small (both static and mobile) assets, in all electricity markets and mechanisms. This chapter covers the following key areas:

- **General requirements to ensure effective and non-discriminatory access for all decentralized energy resources to electricity markets:** Articles 6, 7, and 8 of the Electricity Regulation, and Article 20a of the Renewable Energy Directive
- **Participation in day-ahead and intraday markets:** Articles 7 and 8 of the Electricity Regulation
- **Access to balancing markets** Article 6 of the Electricity Regulation
- **Dispatching of generation and demand response:** Article 12 of the Electricity Regulation
- **Redispatching:** Article 13 of the Electricity Regulation
- **Capacity mechanisms:** Articles 19g, 21, 22 of the Electricity Regulation
- **Non-fossil flexibility support schemes:** Articles 19g and 19f of the Electricity Regulation

These measures are critical for fostering an efficient, competitive, and decarbonised energy system that fully leverages the potential of decentralised energy resources.

## Open and non-discriminatory participation of all Decentralised Energy Resources in all markets (Article 20a Renewable Energy Directive; articles 6, 7, 8 Electricity Regulation)



NO TIME  
TO LOSE!

### APPLICABLE BY:

1 January 2020  
for the Electricity Regulation



**OBJECTIVE:** Ensure the participation of all decentralised energy resources, including small (static and mobile) assets, in all electricity markets



ON YOUR  
RADAR!

### APPLICABLE BY:

21 May 2025  
for the Renewable Energy Directive

## WHAT DOES THE LEGISLATION SAY?

- Member States shall ensure the non-discriminatory participation of small or mobile systems such as domestic batteries and electric vehicles and other small, decentralised energy sources to participate in all electricity markets, including day-ahead and intraday markets, congestion management and the provision of flexibility and balancing services, individually or through aggregation.
- Member States shall, in close cooperation with market participants and NRA, establish technical requirements for participation of decentralised energy resources in the electricity markets, taking into account different technical needs of the system and technical characteristics of those resources.



## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

1

### Member States should ensure that rules do not hinder the participation of all decentralised energy resources

Member States should work with industry and system operators to identify barriers and potential solutions. At a minimum, they should set the following requirements to guarantee the effective and non-discriminatory access to all electricity markets for all decentralised energy resources:

- **Ensure aligned minimum bid size of 100kW in all electricity markets**

Article 8 of the Electricity Regulation requires a minimum bid size of 100kW or less for day-ahead and intraday markets. Aligned bid sizes in other markets is crucial, as high thresholds currently hinder demand-side flexibility participation, and it will increase value stacking opportunities for flexibility service providers across markets.

- **Avoid excessively burdensome administrative requirements**

Lengthy and multiple prequalification processes, onerous activation/communication testing and unnecessary re-testing, important financial guarantee to access the market or lengthy payment delays are barriers to flexibility service providers that should be lifted. To ease prequalification processes, type approvals and the use of digital identities with verifiable credentials could be used.

- **Allow also asymmetric bids for all products**

On top of symmetric bids (i.e. equal capacity for upward and downward adjustments), asymmetric bids should be allowed too. In fact, symmetrical bids can be limiting for certain technologies due to operational and technical constraints, such as heat pumps, electric boilers, EVs with smart charging etc. Asymmetric bids, where market participants can submit different offers for upward and downward adjustments, allows the service to be procured from different technologies according to their strengths and technical capabilities. This contributes to more liquidity in the market and lower costs.

- **Ensure value stacking and avoid exclusive activation of demand-side assets by TSO or DSO**

The provision of different services by the same demand-side assets participating to different markets (e.g. DSOs' local flex markets, balancing and ancillary services to TSO and wholesale – day-ahead and intraday - markets) should be allowed. Splitting a single aggregated unit should also be permitted (for instance a 100kW service could bid 50kW in one market, and 50kW into another). These approaches will enable flexibility service providers to bundle multiple value streams from different services.

- **Allow the use of dedicated measurement devices**

When they are available, under the conditions set by article 7b of the Electricity Regulation, they should be used to measure the change in consumption resulting from the activation of flexibility, as small systems may be part of a bigger unit that may affect the observation and baseline. An ex-post verification of delivery is performed by comparing actual consumption to the baseline. Market settlement can occur entirely using meter data collected ex-post, with no need for near-real-time telemetry. This will minimise the complexity and costs of measurement. Near real-time telemetry blocks participation of DER where the DER only uses the boundary meter.

- **Enable the participation through independent aggregators<sup>5</sup>**

Consumers should have the possibility to engage with multiple aggregators, as different small and mobile systems located on the same premises (EVs, heat pumps, stationary storage) may be operated by different aggregators. Restrictions allowing aggregation only through a supplier or limitations to aggregated participation only for dispatchable production should be removed without delay.

## 2

**Member States should make sure that the consumers give their explicit consent for the participation of their flexible assets to the markets**

Given the distributed nature of the assets involved and in order to avoid any abuse or fraud, Member States should set rules for consumers to give their explicit consent to the flexibility service provider that controls their flexible device for the participation to the markets and for data sharing between the flexibility service provider and the flexibility market operator to remove and resolve any duplication of flexibility provision for the same product and time period by multiple providers.

The consumer's consent shall be renewed on a regular basis.

Flexibility service providers shall at any time be able to justify to the NRAs and System Operators having the valid consent from the end-consumer both for the use of the relevant asset and the relevant metering data, whether these are provided from the main meter, a sub-meter or a dedicated measurement device.

<sup>5</sup> · More details on how to implement the aggregation framework can be found in chapter 5 “Lack of frameworks to innovative services and local initiatives”.



## Day-Ahead and Intraday electricity markets (Articles 7, 8 Electricity Regulation)



NO TIME  
TO LOSE!

### APPLICABLE BY:

1 January 2020



Except for the minimum bid size and trade time intervals which are applicable by 16 July 202



And (art 7 ER) §1, §2 (c), (ca), (f) (organisation of day-ahead intraday markets by TSOs and NEMOs) of the Electricity Regulation which shall apply by 16 July 2024



**OBJECTIVE:** Ensure the trading of energy by all market participants as close to real time as possible.

## WHAT DOES THE LEGISLATION SAY?

- Day-ahead and intraday markets shall be non-discriminatory and ensure all markets participants are able to access the market individually or through aggregation.



## HOW SHOULD TSOs IMPLEMENT THE PROVISION?

1

**NRA to set up guidelines to explain the process of allowing all decentralised energy resources, alone or through aggregation, to access day-ahead and intraday markets**

NRA shall define guidelines to explain the requirements set out in the previous section of this Chapter that TSOs and NEMOs must set to allow the non-discriminatory participation of decentralised energy resources in day-ahead and intraday markets, including the necessary IT requirements and infrastructure changes. This shall include the participation through coordination of these markets with local flexibility markets, allowing bids from local flexibility markets to participate in wholesale markets, where the products and timeframes allow for this.

NRA should consult stakeholders on these guidelines to ensure they are clear and fit for purpose.

2

**NRAs shall monitor the participation of decentralised energy resources in day-ahead and intraday markets**

NRA shall issue a yearly report on barriers for decentralised energy resources in day-ahead and intraday

markets, to identify new barriers and to monitor the removal of previously identified barriers and publish recommendations on how to remove them. This report should also include data on market access for decentralised energy resources and how much demand-side flexibility is procured and activated.

## WHAT DOES THE LEGISLATION SAY?



- TSO to jointly organise with NEMO the management of the integrated day-ahead and intraday markets.
- NEMO shall allow market participants to trade energy as close to real time as possible and at least up to the intraday cross-zonal gate closure time.
- From 1 January 2026, the intraday cross-zonal gate closure time shall not be more than 30 minutes ahead of real time.
- At the request of the TSO, a derogation can be granted by NRA until 1 January 2029 – possible extension by 2.5 years - following an impact assessment consulting NEMO and market participants. The request from the TSO should be accompanied by an action plan to shorten gate closure time to 30 minutes by the date of the extension requested.
- Minimum bid size is 100kW or less to allow for the effective participation of decentralised energy resources, directly or through aggregation.
- Market participants to trade energy in time intervals at least as short as the imbalance in both day-ahead and intraday markets.
- Trade time intervals/Imbalance Settlement Period (ISP) shall be 15 minutes in all scheduling areas by 2021, unless NRAs have granted derogations or exemptions:
  - Derogations may only be granted until 1.1.2025;
  - Exemption is for ISP to be no greater than 30 minutes by 2025.

## HOW SHOULD NRAs IMPLEMENT THE PROVISION?

### Scrutinise derogations and exemptions and incentivise respect of established deadlines

NRA should require TSOs to provide a comprehensive impact assessment justifying their request for a dero-

gation to reduce the intraday cross-zonal gate closure time, specifically demonstrating how such a measure could negatively impact the security of supply within the electricity system.

While acknowledging that system updates or replacements, such as enhanced forecasting tools or upgraded IT infrastructure to manage larger data volumes, may be necessary, these should not be accepted as valid reasons for delay. Instead, the NRA should ensure that TSOs have adequate funding to complete the necessary work promptly, rather than granting derogations or exemptions.

## Balancing markets

### (Article 6 Electricity Regulation)



NO TIME  
TO LOSE!

#### APPLICABLE BY:

1 January 2020



**OBJECTIVE:** Provide the possibility for all market participants to trade energy as closely as possible to real time to ensure efficient balancing energy markets

## WHAT DOES THE LEGISLATION SAY?



- Balancing market, including pre-qualification, shall ensure:
  - effective non-discrimination between all market participants;
  - participation is allowed individually or through + aggregation;
  - transparent and technology neutral definition of services.
- Price of balancing energy not predetermined in balancing capacity contracts. Settlement of balancing energy for standard and specific balancing products shall be based on marginal pricing (pay-as-cleared), unless all NRAs set an alternative pricing method.
- Bid are set as close to real time as possible and gate closure time not before the intraday cross-zonal gate closure time to allow market participants to adjust their supply and demand to align with the most up-to-date information.
- Imbalances are settled at price that reflects the real time value of energy.
- TSO shall perform the dimensioning of reserve capacity which shall be facilitated at regional level.
- TSO shall perform the procurement of balancing capacity and may be facilitated at regional level.
- The procurement of balancing capacity shall be market-based (on primary markets unless NRA approved other forms of market-based procurement and reviews its decision every 3 years) and non-discriminatory in the prequalification process, whether market participants participate individually or through aggregation.
- Separate procurement of upward balancing capacity and downward balancing capacity, but derogation if NRA considers this would result in higher economic efficiency as demonstrated by an evaluation performed by the TSO.

## HOW SHOULD NRAs IMPLEMENT THE PROVISION?

1

### NRA to ensure a non-discriminatory participation of all resources in TSO's balancing markets

In order to ensure the development of non-discriminatory and open balancing markets, the NRA shall:

- Require TSOs to monitor and report the participation of decentralised energy resources in balancing markets, making the information publicly available. TSOs should evaluate potential operational, software, and hardware changes that could boost the involvement of decentralized energy resources. In doing so, they should carefully weigh the costs of implementing these changes against the benefits of increased competition in the balancing markets;
- Ensure the prequalification process is open to all assets, directly or aggregated. Prequalification should allow to check the ability of the BSP to operate on balancing markets, but should not be linked to a specific capacity unit;
- Guarantee that TSOs allow demand-response to provide balancing capacities and energy in both directions in an asymmetric way (downward and upward) and foresee the adequate framework to foster such participation;
- Require the TSO to facilitate participation through coordination of balancing markets with local flexibility markets, allowing bids from local flexibility markets to participate in balancing markets (subject to the agreement of the Flexibility Service Provider), where the products and timeframes allow for this;
- Provide a list of accepted verification and baseline methodologies for balancing and local congestion markets. This list should be exhaustive and created in collaboration with stakeholders, with the possibility for them to suggest new baseline methodologies as technologies evolve.

In order to reflect these provisions and ensure an harmonised implementation across the EU, the Electricity Balancing Guidelines need to be revised, involving market participants and both TSOs and DSOs, as DSOs will be affected, if assets connected to the distribution grid are participating in balancing markets.

2

### NRA to set up permanent stakeholder fora for cooperation between parties

NRA shall set up platforms gathering all relevant stakeholders interested in the process of setting up non-discriminatory rules for balancing markets and coordination with other markets. This aims at gathering stakeholders' views in a collaborative setting, including TSO, DSO, BRPs, BSPs and other Flexible Demand Management Industry representatives, including operators of local flexibility markets.

## WHAT DOES THE LEGISLATION SAY?

### Conclusion of contracts for capacity and contractual period:

- General rule: the contracting of balancing capacity shall be performed for not longer than 1 day before the provision of the balancing capacity and the contracting period shall have a maximum of 1 day.

- Derogation on both contract durations and procurement periods if NRA approves for security of supply or improve economic efficiency.

- But for at least 40% of the standard products and a minimum of 30% of all products used for balancing capacity, the contracts for balancing capacity shall be concluded for no longer than 1 day before the provision of the balancing capacity and the contracting period shall have a maximum of 1 day;

- For the remaining part of the balancing capacity, the contracting shall be performed for a maximum of 1 month in advance of the provision of balancing capacity and the contracting period shall have a maximum period of 1 month;

- Exemption: If justified by the TSO, the NRA may extend the contracting period of the remaining part of balancing capacity to a maximum period of 12 months. After 31 December 2025, contracting periods shall not extend to periods longer than 6 months.



- NRA to report on the share of contract durations and procurement periods longer than one day.

## HOW SHOULD NRAs IMPLEMENT THE PROVISION?

### **NRA, in collaboration with TSO, to run an analysis on balancing capacity contractual periods to ensure compliance with EU law**

The NRA, in collaboration with the TSO, shall conduct an analysis of the contractual periods for balancing capacity procurement.

Balancing capacity contracts should ideally have a duration not longer than a day or less. Contractual periods of one day or shorter are more suitable for the provision of demand-side flexibility because availability of most resources cannot be guaranteed for longer periods of time as opposed to conventional generation.

Contractual periods for balancing capacity longer than one day should be scrutinised and justified and the NRA shall analyse costs and consequences for security of supply to procure balancing capacity for longer periods. This analysis should be used to draw conclusions and to monitor the mitigation actions taken by the TSO on a regular basis.

The analysis should investigate:

- The necessary volumes of such capacities, aiming at minimising the longer term contracted volume;
- The potential use of capacities contracted by DSOs, and the opportunities for DSOs to activate volumes contracted by TSOs, to avoid capacity hoarding, reduce costs, and maximise value stacking and the efficient use of available flexibility.

While balancing capacity should ideally be contracted a day or less before its provision, it is important to note that, in some instances, contracting capacity earlier than one day before the provision (e.g., one week

or even seasonal contracts) may be granted, as an exception, to give consumers, industrial ones for example, sufficient time to adjust processes, production schedules, and inventory management, thereby enabling them to provide greater flexibility. The NRA should assess the impact of contracting capacity earlier than one day on both industrial and other forms of demand-side flexibility.

In all cases, contractual periods exceeding one day should only be applied when there is a clear and well-justified need.

## WHAT DOES THE LEGISLATION SAY?

- TSO to publish information on the current system balance, the estimated imbalance prices and the estimated balancing energy prices, as close to real time as possible but not later than 30min after real-time.



## HOW SHOULD TSOs IMPLEMENT THE PROVISION?

### TSO to publish information on balancing markets and RES curtailments

TSO shall publish information on prices and volumes of balancing energy and capacity, as close to real time as possible and for each balancing product. Moreover, TSO shall publish information related to curtailment, especially of renewable generation.

This will support flexibility service providers in making informed decisions based on actual system needs, and demand and supply dynamics, about when to offer their services or tailor their bids according to the specific needs and rewards of different products. Knowing the volumes of balancing energy bought or sold, and the capacity needed for maintaining grid balance, allows providers to gauge the market's depth and liquidity and encourage their market participation. It enables more effective operational decisions while supporting the efficient integration of renewable energy resources into the grid.

## Dispatching of generation and demand-response (Article 12 Electricity Regulation)



NO TIME  
TO LOSE!

**APPLICABLE BY:**  
1 January 2020



**OBJECTIVE:** Ensure market-based dispatching of demand-response and power-generating facilities by system operators.

### WHAT DOES THE LEGISLATION SAY?



- Dispatching refers to the process of determining which power plants (generation units) or demand-response resources should produce or reduce power to meet the electricity demand at any given moment.
- Non-discriminatory, transparent and market-based dispatching of demand-response and power-generating facilities by system-operators.
- Priority shall be given to power-generating facilities using renewable energy sources and may be given to high-efficiency cogeneration.
- Derogations to mandatory priority for RES-generation over other types of generation and demand-response can be granted by Member States, provided inter alia that:
  - Intraday and other wholesale and balancing markets are well-functioning, fully accessible to all market participants;
  - Redispatching rules and congestion management are transparent to all market participants.

This article should be read having in mind article 3 of the Electricity Directive which sets the principles regarding the operation of electricity systems, including that market rules shall enable the efficient dispatch of generation assets, energy storage and demand response.



## HOW SHOULD TSOs IMPLEMENT THE PROVISION?

### Set out features of a market-based dispatch of demand-response and generation

To drive a lowest cost electricity system, dispatch should be determined by a merit order of generation and demand response, taking into account grid constraints. Features of a market-based dispatch of demand-response shall include clear roles and responsibilities for all market parties and a range of robust baselining options to assess delivery. Existing markets shall be reinforced through an increase in short term price signals (ISP and MTU 15') so as to improve overall system efficiency.

Priority dispatch for renewables helps promote the use of clean energy and should not be limited to large renewable generation units, but include decentralised renewable generation, including demand-response, from prosumers.

In any case, it must be complemented by well-functioning markets and market-based congestion management to ensure overall grid efficiency and stability and avoid grid bottlenecks. Markets like intraday and balancing markets play critical roles in matching supply with demand in the short term and managing real-time imbalances: relying solely on priority dispatch for renewables without robust market mechanisms can lead to inefficiencies and reliability issues. For instance, if renewables are given absolute priority without consideration of grid conditions, it might cause congestion or imbalance problems.

# Redispatching

## (Article 13 Electricity Regulation)



NO TIME  
TO LOSE!

**APPLICABLE BY:**  
1 January 2020



**OBJECTIVE:** Ensure market-based redispatching of demand-response and generation by system operators.

## WHAT DOES THE LEGISLATION SAY?



- Redispatching refers to a measure, including curtailment, initiated by the transmission or distribution system operators to modify the generation or load patterns, or both, in order to alter physical flows in the electricity system and alleviate physical congestion and ensure system security.
- Redispatching shall be open to all Decentralised Energy Resources and shall be market-based, based on objective, transparent and non-discriminatory criteria.
- Redispatched resources shall be financially compensated. Balancing energy bids used for redispatching shall not set the balancing energy price.
- Derogation from market-based redispatching may be used only if:
  - No-market based alternative available;
  - All market-based resources already used;
  - No effective competition due to low number of available decentralised energy resources;
  - the current grid situation leads to congestion in a predictable way and market-based redispatch would not help and lead to strategic bidding, thus increasing the level of internal congestion.
- System Operators shall report once per year to NRA on:
  - level of development and effectiveness of market-based redispatching mechanisms for decentralised energy resources;
  - reasons/volumes/type of generation sources subject to redispatching;
  - measures taken to reduce the need for downward redispatching (i.e. curtailment of RES-generating facilities), including investments in digitalisation of the grid infrastructure and in services that increase flexibility.
- Principles are set to limit non-market-based redispatching and ensure financial compensation:

- System Operators to ensure financial compensation when non-market based redispatch of demand-response is used except in the case of non-firm connection agreement;
- Financial compensation to be at least equal to the higher of the following elements, or a combination of both in case applying only the higher would lead to unjustifiably low or high compensation:
  - Additional operating cost caused by the redispatching;
  - Net revenues from the sale of electricity on the day-ahead market and/or financial support based on electricity volume activated that would have been generated by demand-response without the redispatching request.

## HOW SHOULD TSOs AND DSOs IMPLEMENT THE PROVISION?

### 1 System operators to strictly apply the requirement of market-based redispatching

In many Member States, market based redispatching is not applied. Where a reason is given, it is often the absence of a re-dispatching market. Therefore, each individual TSO or DSO should have the individual responsibility of setting up such a market – by themselves or by procuring a market platform from a third party – the latter being a preferred solution, due to neutrality and harmonisation reasons. Cooperation between several system operators for a common market (not necessarily at national level) should be encouraged, but not be strictly necessary.

For a transitional period only, not exceeding three years, and if difficulties persist to establish market-based redispatch, the system operator, in alignment with the NRA, may procure a quota of the total amount of redispatch through a market open to all – but not limited to - decentralised energy resources. The quota should be gradually increased over time leading to a fully market-based redispatch at the end of the transitional period. The initiative aims at building confidence of system operators and market parties about the redispatch system as well as implement mitigation strategies in case of suspicious market participations.

### 2 System operators to report on volumes and cost for non market-based redispatching

As part of the yearly report on the level of development and effectiveness of market-based redispatching mechanisms for decentralised energy resources, the system operators shall individually report to NRA on the costs of non market-based re-dispatching and the technologies that have used.

If redispatching is not market-based and no NRA decision has been made on this, the system operator shall also report on:

- the reasons for not applying market-based redispatching;
- the volumes of non market-based redispatching;
- the dispatched technologies;
- the products for non market-based redispatching (time of year/day, capacity or energy products, time of activation...);
- measures to implement market-based redispatching.

### 3 Allow value stacking

Market participants providing flexibility may be involved in both redispatching (to manage localised grid congestion) and in balancing markets (to maintain overall system balance).

To maximise the amount of flexibility provided and drive operational efficiency, demand-side assets, including aggregators, should be able to participate in ancillary services, redispatch and other market combinations, as long as they meet the market requirements and system needs. This approach can unlock significant untapped flexibility potential, thereby enhancing the overall responsiveness and stability of the electricity grid.

## HOW SHOULD NRAs IMPLEMENT THE PROVISION?

### NRAs to consult and decide on exemption from market-based redispatching

NRAs should assess whether the conditions for not applying market-based redispatching are fulfilled. The assessment should include an analysis of the effect of a market on the available flexibility volumes, the evolution of this over years, and the different characteristics of available flexibility in different voltage levels and geographical regions/network areas. This should allow for different conclusions for different regions and voltage levels. The conclusion should address clearly which of the listed reasons that apply (e.g. why, who?) and which mitigating measures to implement. The assessment should be submitted to stakeholder consultation before a formal decision is taken. Where the NRA decides to allow non market-based for one or several regions and/or voltage levels, the exemption should only apply for a maximum of three years. In the absence of a new assessment, the regulation should apply.

# Capacity Mechanisms

## (Article 19g, 21 and 22 Electricity Regulation)



NO TIME  
TO LOSE!

**APPLICABLE BY:**  
1 January 2020



**OBJECTIVE:** Design capacity mechanisms in a way to efficiently address adequacy concerns through the participation of Decentralised Energy Resources.

## WHAT DOES THE LEGISLATION SAY?

- Member States have the possibility to introduce capacity mechanisms only when resource adequacy concerns have been identified.
- Capacity mechanisms shall meet these principles:
  - not create undue market distortions and not limit cross-zonal trade;
  - select capacity providers by means of a transparent, non-discriminatory and competitive process;
  - provide incentives for capacity providers to be available in times of expected system stress;
  - ensure that the remuneration is determined through the competitive process;
  - set out the technical conditions for the participation of capacity providers in advance of the selection process;
  - be open to participation of all resources that are capable of providing the required technical performance, including energy storage and demand side management. By 16 July 2024, Member States that apply a capacity mechanism shall consider making the necessary adaptations in the design of the capacity mechanisms to promote the participation of non-fossil flexibility such as demand side response and energy storage;
  - apply appropriate penalties to capacity providers that are not available in times of system stress.
- Capacity mechanisms shall:
  - remunerate the participating resources only for their availability;
  - ensure that capacity obligations are transferable between eligible capacity providers.



## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

### 1 Member States shall choose the best market-based model

When setting up a market-based capacity mechanism, Member States may choose:

- a centralised model with a single buyer, typically a system operator, which conducts auctions or tenders to procure the required capacity. The tendering method can be price-based, where a specific threshold price is indicated by the system operator, or volume-based, where a specific amount is procured; or
- a decentralised model where capacity operators (generators and demand-side units) certify their capacity to the system operator, and obtain capacity guarantees that can be sold to obligated parties (suppliers).

In both cases, Member States shall ensure that capacity obligations are transferable between eligible capacity providers and to do so, they should provide a secondary market for over-the-counter trades.

### 2 Member States shall set participation requirements that are truly technology-inclusive

The participation of decentralised flexible resources in capacity mechanisms should be safeguarded as it is an environmentally responsible and cost-effective allocation of public resources for resource adequacy reasons. This principle was further strengthened in the most recent revision of the Electricity Market Design.

Restrictive participation requirements are currently the main cause for hindering the participation of demand-side resources in capacity mechanisms.

Member States shall ensure capacity mechanisms are technology-neutral and do not discriminate against or in favour of particular technologies. Their features shall be consistent with decentralised energy resources characteristics to allow demand-response and storage, including from EVs, to compete, including through aggregators, on an equal playing field with other technologies.

In this light, the following requirements should govern an open and non-discriminatory capacity market:

#### ● Testing requirements

Member States should not impose prequalification tests where full activation must be maintained for periods longer than specified during the certification process as this is designed for generation unit, and is not viable for demand-side assets. Member States should consider remunerating these tests, which can be very costly for aggregators that have to compensate their customers for the opportunity costs they incur in this forced downtime.

#### ● Contract duration

Since demand-side units typically require much lower investment costs than generators, they often struggle to secure long-term contracts when these contracts are conditional on a particular level of capital expenditures. This requirement puts demand-side resources at a disadvantage relative to generation units. Such conditions should be avoided as they are likely to result in discrimination against demand-side resources. Yet, long-

term contracts are key to provide visibility to invest in demand-side assets for both CAPEX and OPEX. As a result, long-term contracts should not be limited to assets involving high capital expenditures and should also consider operational expenditures.

#### ● Aggregation of assets

They should be designed to enable aggregators to adjust their portfolios by substituting customers as needed. This allows for consistent and reliable performance even as individual customers' capabilities evolve or if consumers change service providers. Importantly, this should be achieved without disrupting the participation of existing customers who remain unchanged or requiring these customers to undergo requalification.

#### ● Minimum bid sizes

Member States should seek to align the bid sizes with those of day-ahead and intraday markets (100kW or less).

#### ● Availability requirements and derating factors

They should properly value demand-side assets and not create a bias towards one specific type of resources. In particular, time intervals, within which consumers are anticipated to shift their consumption, must be aligned with the capabilities of demand-side resources and with the observed market use cases. The calculation of derating factors might take into account the use of historic performance data to help inform fair factor setting.

#### ● Participation in other markets

This should be allowed as forcing DERs to choose between capacity mechanisms and other markets would increase system costs. On the contrary, flexibility providers can stack services and revenues to guarantee a diversified profitable activity portfolio, attracting more consumers to participate.

#### ● Activation time

It must be compatible with demand-side resources capabilities and be aligned with system needs.

Long activation times might limit participation of units with a limited energy reservoir, such as storage. Should longer total activation times be required, these can be covered by multiple auctions or activations with a variety of assets.

#### ● Telemetry and measuring requirements

Flexibility providers should be allowed to prove the reduction in consumption from their clients, including by dedicated measurement devices, under the conditions set in article 7b of the Electricity Regulation. They should not be subject to excessive metering requirements (like SCADA data readings). Any ongoing testing should also fairly treat all asset types considering how those services are procured and delivered by service providers, i.e. where service providers are delivering across a portfolio, they should test that portfolio with no harsher/more stringent notice period than is given in the event of system stress events where they will be used. Such requirements should be harmonised in line with the Network Code on Demand Response, without any additional requirements.

### 3

## **As capacity mechanisms shall be approved by the Commission, Member States should anticipate at best the notification to the European Commission before the expected beginning of the mechanism at national level**

Such notification should take place following a thorough consultation of relevant stakeholders impacted by the proposed capacity mechanism. Their views should be taken into account for the finalization of the mechanism.

## Non-fossil flexibility support schemes (Article 19g, 19h Electricity Regulation)



ACT  
NOW!

**APPLICABLE BY:**  
16 July 2024



**OBJECTIVE:** Introduce and design non-fossil flexibility support schemes to efficiently meet the indicative national objective for non-fossil flexibility.

### WHAT DOES THE LEGISLATION SAY?



- Where investments in non-fossil flexibility and the removal of market barriers are insufficient to achieve the indicative national objective for non-fossil flexibility required by article 19f of the Electricity Regulation, Member States may apply non-fossil flexibility support schemes consisting of payments for the available capacity of non-fossil flexibility such as demand-response and storage.
- Member States with capacity mechanisms have the possibility to use non-fossil flexibility support schemes.
- Non-fossil flexibility support schemes shall have the following design principles:
  - Not go beyond what is necessary to achieve the indicative national objective for non-fossil flexibility;
  - Be limited to new investments in non-fossil flexibility resources such as demand side response and energy storage;
  - Take into consideration locational criteria to ensure that investments in new capacity take place in optimal locations;
  - Select capacity providers through an open, transparent, competitive, voluntary, non-discriminatory and cost-effective process;
  - Prevent undue distortions to the efficient functioning of the electricity markets;
  - Provide incentives for market-based integration in the electricity market, taking into account possible system integration costs and grid congestion and stability;
  - Preserve price signals and efficient operation incentives. Penalties should apply to capacity providers if this is not followed;
  - Set out a minimum level of participation in the market in terms of activated volumes, which takes into account the technical specificities of the asset delivering the flexibility. Penalties shall be applied to capacity providers if this minimum level of participation in terms of activated energy is not respected.



## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

1

### Member States to adequately identify resources that could benefit from Flexibility Support Schemes based on the identified national system flexibility needs

An adequate assessment of national system flexibility needs as per article 19e of the Electricity Regulation is the starting point.

Based on this assessment and the quantification of needs for each duration (daily, weekly, seasonal flexibility needs), Member States shall design their Flexibility Support Scheme to support the deployment of those flexible assets that can support addressing the specific identified systemic need.

This should also form the foundation of the national objective of non-fossil flexibility, including the respective specific contributions of demand-response and storage.

Decentralised energy resources are particularly cost-effective to support short duration flexibility, from daily to weekly. This will ensure an optimised use of public resources.

Several decentralised energy resources should be considered eligible for Flexible Support Schemes, as per this non-exhaustive list:

- Heat pumps in buildings and industrial sites
- Grid-integrated Energy Management System
- Electric vehicles if charged in a smart and bidirectional way
- Smart and bidirectional charging infrastructures
- Smart electrification of industrial processes
- Local energy communities that self-balance their energy needs
- Investments incurred by System Operators for procuring flexibility on local flexibility markets through market platforms set up by independent market operators.

Member States should consider:

- the cost and speed at which the different flexibility solutions can be implemented;
- the benefits brought to the system and to all end-users (cost and energy savings).

The Flexibility Support Schemes should cover new investment in flexibility resources, but they should also include investment in existing assets, aimed at transforming them into smart flexible assets, in line with recital 47 of the Electricity Regulation 2024/1747.

2

**Member States shall ensure an open, transparent, competitive and cost-effective selection process, after public consultation of stakeholders**

When designing non-fossil flexibility support schemes, Member States should not impose burdensome requirements that would hamper the access to the schemes from demand-side resources, following the same recommendations as for Capacity Mechanisms.

Member States should consult the appropriate stakeholders and take the utmost account of their answers.

Member States may also delegate the design of non-fossil flexibility support schemes to the NRA or foresee the approval by the NRA of the design.

3

**When applying non-fossil flexibility support schemes, Member States shall establish schemes lasting over several years to provide long-term security for investments**

Members States shall establish non-fossil flexibility support schemes that either give multi-year contracts and/or are renewed over a certain period of time with certainty and on equal terms, in order to provide visibility for investments.

4

**Member States with capacity mechanisms could establish flexibility support schemes, especially when system flexibility needs are not being met**

Capacity mechanisms are defined as a measure to ensure the achievement of the necessary level of resource adequacy by remunerating resources for their availability. Their focus is to ensure resource adequacy and excludes measures relating to ancillary services or congestion management.

If relying solely on capacity mechanisms, Member States may not adequately meet the flexibility needs required to cost-effectively achieve effective security and reliability of the electricity supply and the integration of renewable energy sources. This is particularly true if flexibility needs are not being met due to persistent market barriers and insufficient investments in flexibility resources.

In this case, Member States must complement capacity mechanisms with targeted flexibility support schemes to fill the gap in their system flexibility needs, as identified by Member States in the context of the assessment of national system flexibility needs as per article 19e of the Electricity Regulation.

5

**Requirements for activation of energy should be consistent with market price signals**

Non-fossil flexibility support schemes are introduced as availability payments for deploying enough flexible capacity to support system flexibility needs (as identified by Member States in the context of the assessment of national system flexibility needs as per article 19e of the Electricity Regulation) and this capacity shall be activated in that light, by replying to market-based signals.

When setting minimum level of participation in the available markets in terms of activated energy, Member States should:

- enable assets covered by flexibility support schemes that can provide multiple services to participate

in all different underlying markets (i.e. balancing markets, local flexibility markets, wholesale markets);

- promote the activation of flexible assets during periods of system stress (peak times, high congestion and high curtailment levels) and align this activation with market price signals;
- not impose activation on markets in scenarios where it would result in financial losses for the market participants (for instance where the compensation would not cover the operating costs of an industrial end-user engaged in demand-response), but simply follow market-based rules.

When activated, Flexibility Service Providers should also bear responsibility for any penalties. Their remuneration from the Flexibility Support Scheme would be reduced if activations are not delivered up to the volumes committed. It is then up to the FSP to decide whether or not to pass these penalties on to consumers. However, penalties should only be applied if there are no barriers to the participation of flexibility in open and non-discriminatory markets.

## HOW SHOULD DSOs IMPLEMENT THE PROVISION?

### DSO should provide information to Member States to support the introduction of locational criteria in order to address local system flexibility needs

Member States should facilitate the implementation of diverse flexibility support schemes tailored to the specific needs they address: whether for alleviating local system flexibility needs with targeted resources or for enhancing system-wide flexibility.

Locational criteria may not be suitable for system-wide schemes, but to solve local system flexibility needs, as grid congestions, they may be appropriate.

This requires DSO to provide information to Member States on the specific locations or areas that experience local system flexibility needs when designing flexibility support schemes.

Such locational information should also be provided to market participants and, independently from the design of the Flexibility Support Scheme, shall be adjusted in real-time or near real-time to reflect current grid conditions. Information on these locational conditions support market players in developing offers to contribute to reducing congestions, including district self-balancing initiatives and local flexibility markets.

HOW TO IMPLEMENT EU LAWS  
TO ADDRESS BARRIER

**#3**

**Limited  
transformation of  
vehicles, buildings,  
industries into  
flexible assets**

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## Introduction

Direct and clean electrification of buildings, transport, and industry is essential for replacing fossil fuels and reducing emissions. However, electrification alone is not enough. The rapid and simultaneous increase in electricity consumption from all these end-use sectors will lead to grid congestions and higher system costs if not properly managed.

To avoid this, smart electrification is needed, scaling up the flexibility of buildings, EVs, and industries by enabling them to adjust energy use in response to external signals.

For these end-use sectors to fully unlock their flexibility potential, it is crucial to have both decentralised energy resources (like smart energy management systems, distributed energy storage and distributed renewable generation) and business models to activate the flexibility of the distributed resources.

The Fit for 55 package introduced for the first time sector-specific requirements for buildings, road transports and industries to complement the Electricity Market Design on flexibility markets and functioning.

This chapter is aimed at **Member States, National Regulatory Authorities, System Operators, local authorities, charging point operators, and Original Equipment Manufacturers (OEMs)**. It offers recommendations for implementing key directives and regulations, including the **Electricity Directive, Renewable Energy Directive, Energy Performance of Buildings Directive, Energy Efficiency Directive, and the Alternative Fuel Infrastructure Regulation**. The chapter covers the following areas:

### BUILDINGS

- **Zero Emissions Buildings:** Support the transition to zero-emission buildings through smart and flexible decentralised energy resources (Article 11 of the Energy Performance of Buildings Directive).
- **Smart Electrification and Time-dependent use of renewable Energy:** Promote the smart electrification of buildings and ensure the flexible use of renewable energy (Articles 10 and 13 of the Energy Performance of Buildings Directive; Article 15a of the Renewable Energy Directive).
- **Building Renovation:** Ensure that building renovations transform buildings into flexible assets integrated into the energy system (Article 3 and Annex II of the Energy Performance of Buildings Directive).
- **Energy Performance:** Improve the energy performance of buildings by providing information on their flexible capacity and real-time energy performance, showing actual energy patterns in consumption, generation, and storage. This can drive uptake of digital solutions (Articles 12, 19, and Annexes V and VI of the Energy Performance of Buildings Directive).
- **Consumer Awareness:** Inform and raise consumer awareness about efficient and flexible energy solutions (Article 22 of the Energy Efficiency Directive).
- **Energy Services for SMEs and Public Bodies:** Support the deployment of energy services for SMEs and public bodies (Article 29 of the Energy Efficiency Directive).

## ELECTROMOBILITY

- **Smart and Bidirectional Charging:** Deploy smart and bidirectional charging infrastructure (Article 5 of the Alternative Fuel Infrastructure Directive; Article 20a of the Renewable Energy Directive).
- **EV Integration:** Integrate electric vehicles into the electricity system (Article 33, Electricity Directive; Articles 14 and 15 of the Alternative Fuels Infrastructure Regulation).

## INDUSTRIES

- **Smart Electrification of Industry:** Early provisions to support the smart electrification of industrial processes (Article 22a, Renewable Energy Directive) and the valorisation of their flexibility through energy management systems and energy audits (Article 11 of the Energy Efficiency Directive).

## FLEXIBLE CONNECTION AGREEMENTS

- Facilitate the connection of flexible end-use sectors using flexible connection agreements as a solution to address limited grid capacity (Article 6a of the Electricity Directive).

## TRAINING AND CERTIFICATION

- Promote the training and certification of installers and designers for renewable energy installations to accelerate the rollout of smart and flexible assets and enhance the provision of flexibility services (Article 18 and Annex IV of the Renewable Energy Directive).

These recommendations aim to ensure a smooth and efficient transition to a flexible, decentralised energy system, by driving the adoption of smart technologies across sectors.



## Zero emission buildings

(Article 11 Energy Performance of Buildings Directive)



ON YOUR  
RADAR!

**APPLICABLE BY:**  
29 May 2026



**OBJECTIVE:** Establish a methodology to define zero emission buildings.

### WHAT DOES THE LEGISLATION SAY?

- A zero-emission building is defined as one that does not cause any on-site carbon emissions from fossil fuels. It shall, where feasible, offer the capacity to react to external signals and adapt its energy use, generation or storage.
- Member states shall establish a maximum energy demand threshold and a maximum threshold for greenhouse gas emissions.
- Member states shall ensure that the total annual energy use is covered by:
  - energy from renewable energy sources generated onsite or nearby;
  - energy from renewable sources generated by a renewable energy community;
  - energy from efficient district heating and cooling systems;
  - energy from carbon-free sources;
  - or, where this is not technical or economically feasible, by energy from the grid complying with criteria established at the national level.



### HOW SHOULD MEMBER STATES AND LOCAL AUTHORITIES IMPLEMENT THE PROVISION?

1

**Member States should ensure that zero emission buildings are capable to react to external signals and adapt their energy use, generation or storage**

With increasing electricity demand and greater variability in the energy system, the need for more flexibility in buildings will also grow in the future. It is paramount to require that decentralised energy resources (DERs)

installed in zero-emission buildings are flexible-ready. This will ensure that buildings are capable of consuming and generating renewable electricity in a time-dependent way that benefits both the system and end-users.

DERs installed in buildings<sup>6</sup>, whether homes or commercial buildings, such as heat pumps, solar panels, HVAC or EVs should be either flexible by design or have system-integrated control and management tools, such as Building Automation and Control Systems (BACS) or Energy Management Systems (EMS) or sub-meters and dedicated measurement devices, to activate and measure their flexibility.

For new built, failing to install flexible decentralised energy resources from the start would mean that building owners may face costly equipment replacements in the future if they wish to take advantage of the opportunities available to electricity market participants.

## 2

## When zero emission buildings consume electricity from the grid, Member States should ensure they rely on real-time information on the renewable electricity available in the grid

In light of the rooftop PV mandate introduced in the 2023 EPBD revision (see below when addressing article 10 EPBD), buildings should become prosumers, i.e. they should be able to generate renewable energy, without necessarily covering the entire energy demand from a building. In these cases, and also when no on-site renewable generation is installed at all, buildings should be capable of consuming clean electricity from the connected grid.

To ensure that the electricity taken from the grid used in zero emission buildings is clean, Member States shall require TSO, and if data is available, DSO, to make available data on the share of clean electricity supplied in each bidding zone, as accurately as possible, in line with the requirement of article 20a of the Renewable Energy Directive. System Operators should make this data easily accessible to stakeholders, market participants, and the public as further detailed in Chapter 6 of the Implementation Guidebook. This will provide the necessary signal for market players to offer services to allow occupants and/or building managers to adjust their electricity usage to times when the share of clean energy is high.

Member States should enable building operators, if they wish to do so, to make use of 24/7 Guarantees of Origin, when available, to ensure that the electricity used in the building is coming from renewables or carbon-free sources.

## 3

## Member States should set and monitor maximum thresholds on energy demand and greenhouse gas emissions

In order to comply with the maximum thresholds established in the NECP, Member States should establish a tool for national, regional, and local authorities to monitor and report operational energy demand and greenhouse gas emissions of zero-emission buildings. This operational monitoring should be underpinned by the quantification of the energy and carbon performance of each building (as recommended below in the section on Assessment of buildings' energy performance and recommendations for its improvement).

6 · Smart assets should not only be considered within the building stricto sensu but also located nearby (e.g., EVs parked in a place adjacent to a building).

## Technical building systems

(Article 13 of the Energy Performance of Buildings Directive)



ACT  
NOW!

### APPLICABLE BY:

By 31 December 2024 for BACS requirements for non-residential buildings with an effective rated output of over 290 kW



### OBJECTIVE:

Promote technical building systems and building automation and control systems in some buildings, with specific flexibility functionalities.



ON YOUR  
RADAR!

### APPLICABLE BY:

From 29 May 2026 for new residential buildings and residential buildings undergoing major renovations able to react to external signals and adjust energy consumption.



ON YOUR  
RADAR!

### APPLICABLE BY:

By 31 December 2029 for BACS requirements for non-residential buildings with an effective rated output of over 70 kW

## WHAT DOES THE LEGISLATION SAY?



- Member States shall ensure that non-residential buildings are equipped with Building Automation and Control Systems (BACS), as follows:
  - by 31 December 2024, non-residential buildings with an effective rated output of over 290 kW;
  - by 31 December 2029, non-residential buildings with an effective rated output of over 70 kW.
- Among others, BACS shall be capable of continuously monitoring, logging, analysing and allowing for adjusting energy use, and allowing communication with connected technical building systems and other appliances inside the building, and being interoperable with all technical building systems (TBS).
- Member States shall ensure that from 29 May 2026 new residential buildings and residential buildings undergoing major renovations are able to react to external signals and adjust the energy consumption. Member States may exclude single-family houses undergoing major renovations.

## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

1

### Member States should encourage the flexibility readiness of all non-residential buildings with an effective rated output of over 70 kW by 2029

As foreseen by this provision, by 2029 all non-residential buildings with an effective rated output of over 70 kW shall be equipped with BACS.

Member States should encourage that the continuous capability of BACS to adjust energy use of all connected TBS is also in reaction to external signals, to unleash the demand-side flexibility potential of non-residential buildings.

When TBS are not controlled by BACS, installed TBS should be allowed to react to external signals with the support of market players (such as energy suppliers and aggregators) that can activate the flexibility potential of a single or a group of TBS.

In order to support the deployment of flex-ready decentralised energy assets (i.e. both TBS and BACS), Member States should consider the introduction of Flexibility Support Schemes (see dedicated section for more information), provided that when public resources are utilised to finance the uptake of these smart devices, their flexibility is then activated.

2

### Member States should ensure the flexibility readiness of residential buildings (new and undergoing major renovations) from May 2026

As foreseen by this provision, from 29 May 2026 new residential buildings and residential buildings undergoing major renovations shall be able to activate their demand-side flexibility.

TBS (including HVAC systems and energy storage facilities, also from electric vehicles charged in buildings) have long lifetimes (over 10-15 years). When installed in new buildings or as part of major renovations, Member States shall ensure these resources are smart by design and/or capable of activating their flexibility, to allow building owners and occupants to achieve significant savings on their energy bills and support the cost-effective clean energy transition of the entire energy system.

It would be a missed opportunity both for the grids and for buildings' owners and occupants if, when these products are installed, even in existing buildings, they are not capable of reacting to external signals, also with the support of market players (such as suppliers and aggregators) that can activate the flexibility potential of a single or a group of TBS.

If Home Energy Management Systems are installed, including in existing buildings, Member States should encourage they are capable of reacting to external signals, in particular for residential buildings with relevant loads.

In order to support the deployment of flex-ready decentralised energy assets (i.e. both TBS and HEMS), Member States should consider the introduction of Flexibility Support Schemes (see dedicated section for more information), provided that when public resources are utilised to finance the uptake of these smart devices, their flexibility is then activated.

## Promotion of smart electrification and renewable energy in buildings

*(Article 15a Renewable Energy Directive and Article 10 of the Energy Performance of Buildings Directive)*



ON YOUR  
RADAR!

### APPLICABLE BY:

21 May 2025 for the  
Renewable Energy Directive



**OBJECTIVE:** Promote the smart  
electrification of buildings to ensure the  
flexible use of renewable energy.



ON YOUR  
RADAR!

### APPLICABLE BY:

Between 31 December 2026 and 31 December 2030, depending on the  
size and type of buildings, for the Energy Performance of Buildings Directive

## WHAT DOES THE LEGISLATION SAY?

- Member States should set an indicative national share of renewable energy produced on-site or nearby or taken from the grid in final energy consumption in their building sector in 2030, which is consistent with the EU indicative target of at least a 49% share of renewable energy in the EU final energy consumption in buildings by 2030.
- To achieve the indicative national share, Member States shall promote the use of renewable heating and cooling systems and equipment and may promote smart and renewable-based electrified heating and cooling.
- They shall also set a minimum level of renewable energy use for new buildings, buildings undergoing major renovations or buildings whose heating system is being renewed.
- Member States shall introduce support schemes to increase the share of electricity from renewable sources produced on-site or nearby taken from the grid in the building stock. Such measures can include promoting self-consumption, renewable energy communities, local energy storage, smart recharging, bi-directional recharging, and other flexibility services such as demand response.



- Member States shall ensure the installation of solar energy technologies in new and existing buildings, with different deadlines on the basis of the size of the building or whether they are publicly or privately owned or whether they are residential or non-residential buildings.
- In order to achieve the objectives of article 10 of the Energy Performance of Buildings Directive and to take into account the issues linked to the stability of the electricity network, Member States shall include relevant stakeholders in the establishment of the criteria for the practical implementation of the solar deployment obligations.

## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

1

### **Member States should consult stakeholders on the solar mandate and eventually recommend the combined deployment with smart consumption and storage assets**

Member States should hold a public consultation with key stakeholders, such as industry representatives, flexibility service providers, citizens, and local authorities, to establish national criteria for implementing the obligations outlined in Article 10 of the EPBD, the solar mandate, to ensure a smooth consumption of the increasing on-site renewable generation. The consultation should explore strategies for mitigating grid congestion risks, such as promoting energy sharing schemes, increasing self-consumption, creating markets that reward demand-side flexibility, and offering financial incentives to building owners.

Based on these consultations, Member States may recommend the integration of solar energy technologies with other smart assets that enhance self-consumption and integration of solar energy into the grid through demand-side flexibility, such as BEMS, bidirectional EV charging points, smart heat pumps, and electricity storage assets.

Flexibility Support Schemes, as described in Chapter 2 of this Implementation Guidebook, should be contemplated for this specific purpose: support consumers to deploy a combination of flexible decentralised assets that should be used also to address systemic challenges.

Conversely, support schemes such as net metering, fixed subsidised feed-in tariffs, or taxes and levies on self-consumption should be removed as they deter the flexible use of renewables in buildings.

2

### **Member States should not discriminate buildings with no on-site renewable generation and foster their flexible consumption of clean electricity**

When it is not possible to install on-site renewables in existing buildings, Member States should encourage their consumption of clean electricity from the grid, supported by innovative business models.

For instance, this can be possible by allowing participation of buildings to citizens and renewable energy communities, energy sharing schemes, or other mechanisms, provided there is an accurate tracking and quantification of the clean consumption of electricity from the network.

Recent EU rules set in the Electricity Regulation and Renewables Directive to share data on the renewable and carbon content in grids would help this effort (for more information, please see Chapter 6).

## National building renovation plans

(Article 3 and Annex II Energy Performance of Buildings Directive)



ON YOUR  
RADAR!

### APPLICABLE BY:

29 May 2026 but first draft to be transmitted to the Commission by 31 December 2025



**OBJECTIVE:** Develop national building renovation plans in order to decarbonise the building stock.

## WHAT DOES THE LEGISLATION SAY?

- Each Member State must create a national building renovation plan to transform their building stock into highly energy-efficient, decarbonized buildings by 2050, aiming for zero-emission buildings.
- These plans should include:
  - an overview of the building stock (types, share, construction periods, etc.);
  - roadmap with targets and indicators to transform the building stock into zero emission buildings by 2050;
  - details of current and planned policies and measures supporting the roadmap;
  - national trajectory for the renovation of the residential building stock, including the 2030 and 2035 milestones for average primary energy use in kWh
- Member States must submit a draft renovation plan to the Commission every five years. Public consultation is required before submission to the Commission.



## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

1

**Member States should draw national building renovation plans prioritising cost-effective renovation measures, involving all relevant stakeholders**

When drawing their building renovation plans, Member States should prioritise measures leading to cost-effective decarbonisation strategies for their buildings with annual targets to achieve a zero-emission building stock by 2050.



This means that Member States should promote both energy efficiency solutions to reduce energy needs at the maximum and the uptake of flexible assets that increase the flexibility potential of buildings, including the generation and consumption of clean energy.

To support the latter, a broad spectrum of assets should be contemplated, with varying upfront costs, including smart demand management systems, decentralised renewable generation, on-site batteries as well as flexibility enabling devices, such as smart meters, dedicated measurement devices or sub-meters.

The mere deployment of these assets is not enough. Their flexibility needs to be activated to integrate intermittent renewables from the grid, mitigate risks of local congestion or shift consumption in period of low electricity prices.

For these reasons, smart and flexible buildings are cost-effective in driving down emissions and running costs and a particular attention should be paid in national building renovation plans.

Provided flexibility assets are installed in buildings, their (automated) flexible activation does not depend only on building occupants, but on (implicit and explicit) business offers that market players can offer, if the market design where a building is located allows them to exist.

In this light, when developing their plans, including milestones and targets notably for the flexibility dimension of building renovations, Member States should coordinate with local authorities, System Operators (DSOs in particular) and flexibility service providers, among others. This will ensure the parallel deployment of flexible resources and flexibility business models to activate the flexibility from buildings.

## 2

### Member States shall develop district approaches in renovation and urban development plans

Building renovations must be addressed also in their district dimension.

Smart local energy systems operated by market players can support the financing, setting up, management and operation of building renovations, or parts of it. This requires a support by Member States of local initiatives that can target multiple buildings to be renovated.

Also, where municipalities develop heating and cooling plans in line with Article 25 of the Energy Efficiency Directive ((EU) 2024/1275), Member States should align their national renovation plans, as well as any urban development plans, with their heating and cooling plans and with DSO network development planning. Consistency across all planning exercises will ensure that network development plans acknowledge and valorise the role that flexible buildings can play in addressing grid issues such as congestions. Consistency across all planning exercises will also make system operators aware of the current and future availability of flexibility from buildings. This will encourage them to establish market-based flexibility schemes rather than over-relying on grid reinforcements or grid scale storage solutions, which are more costly.

## 3

### Member States should clearly define the building area in their national renovation plans

In light of the system integration strategy, renovation plans should not only consider buildings: renewable installations and electric vehicle chargers might be installed nearby, but impact the overall energy and carbon performance of a building.

For instance, it is worth considering and defining building areas that comprise parking lots, where many DERs can be located such as solar canopies, smart and bidirectional charging stations, or ground pipes for heat pumps.

## Smart readiness of buildings (Article 15 and Annex IV of the Energy Performance of Buildings Directive)



ON YOUR  
RADAR!

**APPLICABLE BY:**

30 June 2026 for §2  
(Report from the Commission)



**OBJECTIVE:** Introduce a common Union scheme for rating the smart readiness of buildings.



ON YOUR  
RADAR!

**APPLICABLE BY:**

30 June 2027 for §2  
(Delegated Act)



ON YOUR  
RADAR!

**APPLICABLE BY:**

29 May 2026 for §3  
(Implementing Act)



ON YOUR  
RADAR!

**APPLICABLE BY:**

30 May 2026 for §4  
(Implementing Act)

### WHAT DOES THE LEGISLATION SAY?

- The Commission shall adopt delegated acts for the definition of a common Union scheme for rating the smart readiness of buildings, including the methodology by which it is to be calculated.
- The rating shall be based on an assessment of the capabilities of a building or building unit to adapt its operation to the needs of the occupant, the grid and to improve its energy efficiency and overall performance.
- Based on a report on the national testing of the SRI in 2026, the Commission shall, by 30 June 2027, adopt a delegated and implementing acts for the application of the SRI to non-residential buildings with an effective rated output of over 290 kW.



## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

### 1 Member States shall test the Smart Readiness Indicator for buildings

After a few years to develop at EU level a solid common definition and methodology for the SRI, at the time of writing (November 2024), 14 Member States are officially testing the SRI and others are testing through the active SRI LIFE EU funded project. This is a good development and all Member States should engage in SRI testing efforts, otherwise the report on the national testing that the Commission shall publish in 2026 will be limited in scope.

Member States should implement the common EU definition and methodology to ensure an harmonised implementation of the SRI across Europe.

The demand-side flexibility readiness is of the 3 functionalities scored by the SRI, i.e. the capability of a building to react to external signals. This is the only common indicator in the EU to value the flexibility of buildings. Although it is a quantitative score, it can provide valuable information to occupants, building owners and managers, as well as market players such as aggregators.

### 2 Member States shall ensure proper training of SRI auditors to properly evaluate the flexibility of buildings

In particular for non-residential buildings, Member States should establish a proper training of certified SRI auditors at national level.

Whether the training is provided by the same entities that train EPC auditors or not, Member States shall ensure the adequate understanding and assessment of buildings' flexibility. In particular, SRI auditors should not limit the flex-readiness assessment to the presence or absence of smart meters.

SRI auditors should assess both the presence of smart technical building systems and their capability to react to (implicit and explicit) external signals, i.e. the capability of buildings and (some of their) behind the meter assets to adapt their consumption, storage and on-site renewable generation in light of dynamic electricity price contracts and/or incentives provided by aggregators and other market players.

# Assessment of buildings' energy performance and recommendations for its improvement

(Art 19, Article 12, Annex V and Annex VIII Energy Performance of Buildings Directive)



ON YOUR  
RADAR!

## APPLICABLE BY:

29 May 2026



**OBJECTIVE:** Mandate the accurate assessment of buildings' energy performance as well as recommendations for improvement.

## WHAT DOES THE LEGISLATION SAY?



- Member States shall create a system of certification of the energy performance of buildings.
- Energy Performance Certificates shall include elements such as:
  - the energy performance class;
  - the calculated annual primary and final energy use on a closed scale using only letters from A to G;
  - the renewable energy produced on-site in % of energy use and, importantly;
  - a yes/no indication whether the building has a capacity to react to external signals and adjust the energy consumption.
- In addition, the energy performance certificate may include the following indicators:
  - energy use, peak load, size of generator or system, main energy carrier and main type of element for each of the uses: heating, cooling, domestic hot water, ventilation and in-built lighting;
  - number and type of recharging points for electric vehicles;
  - metered energy consumption;
  - a yes/no indication whether a smart readiness assessment has been carried out for the building;
  - a yes/no indication whether a Digital Building Logbook is available for the building.
- Member States should also create a scheme establishing Building Renovation Passports (BRP). BRPs are a document – in electronic or paper format – outlining a long-term (up to 15-20 years) step-by-step renovation roadmap to achieve deep renovation for a specific building.
- The renovation passports may also include information on how the renovation steps and additional measures could improve the smart readiness of a building and on how to access a digital version of the passport.

- The scheme is voluntary unless Member States decides to make BRPs mandatory. Member States may recommend or require BRPs to be issued with Energy Performance Certificates.
- Member States shall ensure that the renovation passport is stored in, or can be accessed via, where available, the Digital Building Logbook (DBL).

## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

### 1 Member States should exploit synergies between different buildings schemes, such as Energy Performance Certificates (EPCs), Building Renovation Passports (BRPs) and Smart Readiness Indicator (SRI)

Member States should ensure buildings have the capacity to react to external signals and adjust their energy consumption, storage and generation patterns accordingly.

To measure and stimulate that, Member States should exploit the synergies between EPC, BRP and SRI assessments to coherently support this objective, save costs and improve effectiveness, starting with non-residential buildings (with a capacity above 290kW).

For instance, it is recommended to integrate the SRI score in the EPC/BRP and not remain a stand-alone indicator.

The SRI can provide valuable information about the flexibility readiness of a building, which is both relevant to depict an important feature of a building's energy performance in the EPC and might be also crucial to guide building owners/occupants to improve their smartness in the BRP.

To maximise their efficiency, they should be issued at the same time, provided that professional(s) carrying out an adequate energy audit for their release are trained properly.

### 2 Member States should ensure owners/occupants have an accurate measurement of the energy and carbon performance of their buildings

Building on the previous recommendation and in order to increase trust and reliability of certificates/indicators/passports assessing the energy and carbon performance of buildings or their improvement, it is important to provide actual measured metrics instead of estimates.

This requires adequate energy audits and/or the use of smart meters and dedicated measurement devices in buildings that should provide metered values for:

- annual energy consumption,
- produced renewable energy,

- 3 ● flexibility potential which should be measured in KW of flexible capacity and kWh of energy that can be dispatched by the buildings as a result of its participation in flexibility schemes. These metrics should be in addition to the yes/no indicator on whether the building is capable of reacting to grid signals, which is too vague to provide information to building owners or to the system,
- 4 ● operational greenhouse gas emissions.

## 3

**Member States should require BRPs to provide information about financing options to support a smart and flexible building**

As BRPs should guide the cost-optimal renovation of buildings, they should provide information about financing options that building owners can rely on.

Among these financing options, it is crucial to include all markets and mechanisms that can reward the installation of flexible assets, the smart renovation of buildings and the activation of the decentralised energy resources in buildings.

Such financing options should be specific to the location of a building and should contemplate, among others:

- Capacity Mechanism and/or Flexibility Support Schemes targeted to small DERs,
- Local Flexibility Markets by DSOs, Ancillary Services and Balancing Markets by TSO open to small DERs,
- Wholesales markets open to aggregators.

Energy Performance Contracting should be also used to foster smart building renovations, in combination with the financing options listed above.

## Information and Awareness Raising (Article 22 Energy Efficiency Directive)



ON YOUR  
RADAR!

**APPLICABLE BY:**  
11 October 2025



**OBJECTIVE:** Inform and raise awareness among consumers on efficient and flexible energy solutions.

### WHAT DOES THE LEGISLATION SAY?

- Member States, together with local authorities, shall take appropriate measures to promote and facilitate an efficient use of energy by final customers, including financial and legal frameworks. This includes:
  - the creation of one-stop shops;
  - support the cooperation among private actors that provide relevant services;
  - communication of cost-effective and easy ways to achieve changes in energy use.



### HOW SHOULD MEMBER STATES AND LOCAL AUTHORITIES IMPLEMENT THE PROVISION?

#### One stop shops shall also raise awareness on the benefits of smart and active buildings

Smart and flexible buildings should be prioritised in any renovation, also in light of their positive contributions to solve systemic challenges, such as local congestions.

One stop shops should consist of informative hubs where any stakeholder can find information on a range of topics related to buildings renovations. They should in particular raise awareness on the flexibility potential of:

- combined renewables (photovoltaics) and storage,
- all assets that are described as “non-dedicated” to provide flexibility in both residential and commercial buildings. Such assets are devices whose primary purpose is to provide a service else than flexibility such as, electric heating or air conditioning, but could become flexible resources if adequate activation/

measurement devices are installed (smart meters, sub-meters, dedicated measurement devices and flex-capable BACS) and market offers (for both implicit and explicit activations) are available,

- buildings part of energy communities and energy sharing schemes that can self-balance the energy consumption, storage and generation of all involved parties.

It is important that one stop shops provide consumers with information about available demand-side flexibility schemes and mechanisms in their region/nation to activate their flexibility with the support of market players and the related rewards, e.g. cost reductions and carbon footprint.



## Energy services for public bodies (Article 29 Energy Efficiency Directive)



ON YOUR  
RADAR!

**APPLICABLE BY:**  
11 October 2025



**OBJECTIVE:** Promote energy services  
and make it accessible to third parties.

### WHAT DOES THE LEGISLATION SAY?

- Member States may encourage public bodies to combine Energy Performance Contracts with expanded energy services, including demand response and storage.



### HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

#### Member States should require flexibility improvements when using Energy Performance Contracts

At the moment, most Energy Performance Contracts aim at financing the deployment of assets that reduce the energy consumption/costs of buildings. This results in the financial return that would compensate the market player setting up this Contracts.

In particular, when using these Contracts for the renovation of buildings owned/operated by public bodies, Member States should support the inclusion of flexible assets and their activation when stipulating them with competent providers.

The activation of flexible assets in buildings can also contribute to reduce energy costs and might even provide remunerations, based on the available flexibility mechanisms in each Member State, which will further strengthen the business model of Energy Performance Contracts.

## Deployment of smart and bidirectional charging *(Article 5, Alternative Fuel Infrastructure Regulation; Article 14, Energy Performance of Buildings Directive, Article 20a, Renewable Energy Directive)*



ACT  
NOW!

### APPLICABLE BY:

AFIR: 13 April 2024 for newly built charging points, 14 October 2024 for renovated ones



### OBJECTIVE:

Mandate smart charging and, if appropriate, bidirectional charging of electric vehicles.



ON YOUR  
RADAR!

### APPLICABLE BY:

EPBD: 29 May 2026



Except for charging points in non-residential buildings of more than 20 parking spaces applicable by 1 January 2027  
RED: 21 May 2025

## WHAT DOES THE LEGISLATION SAY?

- ‘Smart recharging’ means a recharging operation in which the intensity of electricity delivered to the battery is adjusted in real-time, based on information received through electronic communication (art 2 AFIR).
- The EU legislation mandates smart charging for publicly-accessible charging points (AFIR), non-publicly accessible charging points (RED), and charging points in buildings (EPBD). These requirements shall apply to new and renovated points.
- ‘Bidirectional charging’ means a smart recharging operation where the direction of the electricity flow can be reversed, allowing that electricity flows from the battery to the recharging point it is connected to.
- Bidirectional charging shall be mandated ‘if appropriate’ (EPBD), or following the assessment conducted in the national reporting in AFIR article 15 (RED).



## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

### 1 Review all public support schemes in light of the need for smart charging readiness

EVs can become key assets for consumers and the grid if they are charged smartly. Otherwise, they risk accentuating issues already observed in some countries such as distribution grid congestion and increased price volatility. Against the backdrop of an increase in EV sales, smart charging of EVs is becoming a priority.

Member States shall update policies that were in place before smart charging capability became mandatory and shall condition support schemes only when there are flexibility functionalities. This may also require updating VAT rebates for charging points, capacity remuneration mechanisms, and adopting flexibility support schemes for smart (and bidirectional) charging, when needed.

### 2 Ensure that smart recharging requirements triggers future requirements for bidirectional charging in specific use-cases

Mandating smart recharging capability is a first step in activating flexibility from EVs. This should pave the way for requirements on bidirectional charging capability, based on the assessment in the National Policy Framework and the National Progress Report (articles 14 and 15 of AFIR). As AFIR tackles publicly-accessible recharging, bidirectional charging should be considered for long-time duration parking and slow charging points, as this is where it would be the most relevant.

For private charging points, bidirectional charging should be mandated for buildings with on-site renewable energy systems. Bidirectional charging, through technologies like Vehicle-to-Home (V2H) or Vehicle-to-Building (V2B), allows electric vehicle (EV) owners to use their vehicle's battery to power their home or building. When combined with on-site renewable generation, such as solar panels, bidirectional charging offers significant advantages: the building can be powered by solar energy, while excess renewable power can be stored in the EV battery. This approach optimises on-site energy use, eliminating the need for additional storage assets.

Finally, to trigger mass-deployment of bidirectional charging, public electric fleets (from local to governmental entities) should be mandated to use the technology. This would show public authorities as first movers, and such a public procurement would create sufficient volumes for the industry to realise economies of scale.

## HOW SHOULD CPOs and OEMs IMPLEMENT THE PROVISION?

### 1 Ensure a user-centric approach for smart charging

The mandate of smart charging shall not be perceived as a burden to customers, who should remain free to have their vehicles smartly charged or not. Imposition from any third party (such as the System Operator or the Charging Point Operator) to modulate the charging of the vehicle should not be allowed unless prior consent is provided.

On the other hand, customers should be given financial incentives to charge their vehicles smartly. These should include time-varying tariffs and automated charging methods to shift charging times.

## 2 Deploy open and interoperable charging infrastructure

Ensuring interoperability between devices and service providers is crucial. If charging stations and/or EVs of one manufacturer cannot be used for smart and bidirectional charging purposes by other players, it would significantly hinder their widespread adoption. Companies with charging stations and/or EVs from multiple manufacturers (for example from three (or more!)) could find themselves managing separate incompatible systems, complicating the charging operations. This lack of integration could ultimately lead to companies abandoning their flexible charging goals, as managing multiple stand-alone systems would likely be inefficient and impractical.

# Integration of electric vehicle recharging points into the electricity system

(Article 33, the Electricity Directive; Article 14, 15, Alternative Fuels Infrastructure Regulation)



NO TIME  
TO LOSE!

## APPLICABLE BY:

31 December 2020 for the Electricity Directive



Except §1 of article 33 on the integration of smart and bidirectional charging points which shall apply by 17 January 2025



## OBJECTIVE:

Facilitate the connection of recharging points to the distribution grids and ensure they contribute to the flexibility of the energy system.



ACT  
NOW!

## APPLICABLE BY:

1 January 2020 for the Electricity Regulation, but:



Article 14: by 31 December 2024 for draft national policy framework,



31 December 2025 for final national policy framework



Article 15: by 31 December 2027,



§3, §4 by 30 June 2024

## WHAT DOES THE LEGISLATION SAY?

- DSOs shall not own, develop, manage or operate recharging points for electric vehicles (exemption for their own use).
- Derogations are possible only if unsuccessful tender open to third parties, following open, transparent and non-discriminatory tendering procedure, approved by the NRA.
- Member States shall facilitate the connection of publicly accessible and private recharging points providing smart and bidirectional charging functionalities to the distribution networks.
- The DSO shall cooperate on a non-discriminatory basis with any undertaking that owns, develops, operates or manages recharging points for electric vehicles, including with regard to connection to the grid.



## HOW SHOULD DSOs IMPLEMENT THE PROVISION?

1

### DSOs should set out clear requirements for an open, transparent and non-discriminatory tendering procedure, for market players to own, develop, manage, operate recharging points for EVs

In line with legislation, DSOs are prohibited from directly owning, developing or operating EV charging infrastructure. Derogations are only possible if no third party can be selected following an open tendering process. To ensure fair and successful tendering for market players, the procedure set up by DSOs shall:

- Ensure sufficient visibility and publicity of the tendering procedures towards market parties to attract broad participation from market parties and avoid low engagement;
- Include participation requirements that go beyond meeting the needs of the System Operators, allowing market players involved in owning, developing, operating and managing EV recharging points to participate in all electricity markets;
- Not be replaced by market survey or pre-screening of the market by DSOs.

Such requirements for the tendering procedures will provide clarity to third parties and enable the assessment of the tendering procedure by the NRA to grant its approval.

2

### DSOs should adopt a future-proof approach to integrate electromobility into the electricity network, through smart charging

The tendering procedure set up by the DSO shall account for growing system flexibility needs and should rely of the national assessment of flexibility needs as required by article 19e of the Electricity Regulation 2024/1747.

As EV penetration increases, the most basic form of recharging – such as simply plugging an EV when arriving at home or at the workplace – may rapidly prove inadequate. To address it, mandated smart EV charging control and piloting should be incorporated into both the equipment specifications and the technical criteria governing DSOs tenders for developing recharging points. This ensures that charging systems are not only efficient today but can also adapt to future grid demands, promoting flexibility and grid stability.

3

### DSOs should prioritise the grid connection of flexible EVs over non-flexible ones

With smart and bidirectional charging, EVs can be a solution rather than a burden to the grid, especially at distribution level. DSOs should prioritise the connection of flexible EVs, as they would require less additional grid capacity and can offer valuable flexibility services to the grid, especially if reacting to signals from system operators.

DSO should expedite the connection of any bidirectional charging infrastructure with zero-export capability, as it would not impact the grid unless the area faces reactive power issues due to an imbalance between (low) local production from rotating machines and (high) consumption. In such cases, flexible connection agreement can be put in place until full firm connection is available, and the grid can accommodate exports. No extra paper work should be required for bidirectional charging infrastructure if a zero export device or software prevents electricity from being exported to the grid.

## WHAT DOES THE LEGISLATION SAY?



- A draft National Policy Framework (NPF) shall be prepared by Member States and submitted to the Commission by 31 December 2024, including *inter alia* measures necessary to ensure that the deployment of charging points contributes to the flexibility of the energy system and to the penetration of renewables in the electricity system. This shall consider the geographical distribution of bidirectional charging points in the territory.
- Member States shall make their draft national policy framework publicly available and ensure public can participate in its preparation.
- The final NPF shall be transmitted to the Commission by 31 December 2025. By 31 December 2027, Member States shall draft a national progress report to the Commission on the implementation of the National Policy Framework (NPF).

## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

### 1 Ensure the NPF makes a joint assessment of energy and transport needs

Charging stations should enhance the energy system's flexibility while meeting the transportation requirements of EV owners (e.g. availability of recharging stations): NPF present a vital opportunity for integrated planning, which is essential for addressing the need for flexibility services.

As such, NPF shall identify grid congestion areas and likely locations for public charging station deployment, which can help define priority zones for flexibility services. It shall also include an assessment of where vehicles are parked most of the time to uncover zones that could provide flexibility to the power systems (e.g., streets in residential areas without off-street parking, long term parking (park-and-ride, airports, stations, workplace parking, etc.) This holistic approach ensures that the expansion of EV charging infrastructure simultaneously supports the broader goals of energy system stability and efficiency.

### 2 Align the NPF with the assessment of the system flexibility needs

When assessing how charging points contribute to the flexibility of the system, the NPF should align with the assessment of system flexibility needs described in article 19e of the Electricity Regulation. In practice, this means that NRAs should consider in the assessment of flexibility needs, the measures put forward in the NPF to ensure that the deployment of charging points contributes to the flexibility of the energy system and to the

penetration of renewables in the electricity system. This includes considering the number of charging points, whether they are equipped with smart or bidirectional technology, and the frequency of their use. Such an approach ensures a comprehensive assessment of how effectively charging infrastructure can support grid stability and energy management.

## WHAT DOES THE LEGISLATION SAY?



- By 30 June 2024 and every three years thereafter, Member States shall assess how the deployment and operation of recharging points enable EVs to contribute to the flexibility of the energy system, their participation in the balancing markets, and the absorption of renewables in the system. All types of recharging points shall be considered, including smart and bidirectional charging ones, from all power outputs, whether public or private.
- Such an assessment should provide recommendations on the type of recharging point, geographical distribution, or supporting technology to integrate EVs in the system.
- The assessment shall identify concrete measures to be implemented to ensure consistency between infrastructure planning and grid infrastructure. Such an assessment shall take into account inputs from all stakeholders and be made publicly available.

Member States shall then take appropriate measures for the deployment of recharging points, and include them in the national progress report.

Based on inputs from DSOs and TSOs, the NRA shall assess every three years the potential of bidirectional charging to reduce system and user costs and increase the share of renewables in the electricity system. Member States shall if necessary take appropriate measures to adjust the availability and geographical distribution of bidirectional recharging points in private areas, and include such measures in the national progress report.

## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

1

**Member States to assess the full benefits of smart and bidirectional charging to the system and to users**



Assessments of the contribution of EVs to the flexibility of the system should not be limited to the participation in balancing markets or to the integration of renewables, as prescribed by EU law. It should consider benefits associated with grid resilience, mitigation of grid reinforcement needs, and cost savings for consumers. The contribution of both smart and bidirectional charging must be thoroughly assessed.

In particular, bidirectional charging’s upfront cost should not be an argument not to develop the technology, which should be considered as an investment that can in many cases be recouped by the benefits. A systemic approach should be considered, as well as all benefits – social, environmental – to all stakeholders – consumers, system operators, businesses.

To ensure the rollout of bidirectional charging in all of the relevant use cases, Member States should duly consider the following list of parameters and set specific targets, based on their national contexts:\*

<p style="text-align: center;"><b>1</b></p> <p style="text-align: center;"><b>Integration of variable renewables and decentralised energy resources in the system</b></p>	<p style="text-align: center;"><b>2</b></p> <p style="text-align: center;"><b>Stability and resilience of the grid</b></p>	<p style="text-align: center;"><b>3</b></p> <p style="text-align: center;"><b>Financial benefits for consumers and the energy system</b></p>
<p><b>1.1 Volume of curtailed energy and redispatch</b></p> <ul style="list-style-type: none"> <li>the curtailed renewable electricity per year is equal or higher than XX GWh.</li> <li>the amount of curtailed renewable electricity represents X% of overall annual renewable electricity production.</li> <li>redispatch costs exceed the total cost of flexibility from bidirectionally charged vehicles</li> </ul>	<p><b>2.1. The contribution of bidirectional charging to reduce the electricity peak demand</b></p> <ul style="list-style-type: none"> <li>more than XXX electricity peak prices above YYY (Euro/MWh) occurs in a week.</li> </ul>	<p><b>3.1 Price volatility</b></p> <ul style="list-style-type: none"> <li>the spread between weekly peak prices and off-peak prices is superior or equal to X%.</li> </ul>
<p><b>1.2 Share of variable renewables per country</b></p> <ul style="list-style-type: none"> <li>share of renewable electricity production in a Member State is above XX%</li> </ul>	<p><b>2.2 Status of local congestion</b></p> <ul style="list-style-type: none"> <li>more than XX% of low-voltage cables supplying consumers at grid edge could experience congestion</li> <li>the planned investment in distribution grid expansion (at local, regional or national scale) is above XX€ without cost-efficient alternative having been properly taken into account</li> <li>a Member State uses mandatory peak shaving for EVs</li> </ul>	<p><b>3.2 Financial benefits of bidirectional charging compared to other flexible assets</b></p> <ul style="list-style-type: none"> <li>the premium all-in cost of bidirectional charger compared to non-smart charger is less than XX% compared to the cost of a stationary battery.</li> <li>the return on investment of a bidirectional charger is shorter than the return on investment of stationary batteries</li> </ul>
<p><b>1.3 Presence of on-site renewable generation in buildings or consumption of certified renewable electricity by the building V2X mandated if the building:</b></p> <ul style="list-style-type: none"> <li>has on-site renewable generation</li> <li>or is part of an energy sharing, citizen or renewable energy community</li> <li>or consumes clean electricity coming from the grid certified by 24/7 Guarantees of Origins</li> </ul>	<p><b>2.3 Duration of grid connection request for charging infrastructure and decentralised energy resources</b></p> <ul style="list-style-type: none"> <li>the share of connection request rejected or where a lower power capacity was granted exceeds XX%.</li> </ul>	<p><b>3.3 Financial benefits of bidirectional charging compared to unidirectional charging</b></p> <ul style="list-style-type: none"> <li>the return on investment of an EV with bidirectional charging is less than XX years compared to an EV with unidirectional charging</li> </ul>

\* smartEn does not propose specific percentages or thresholds as it is up to the Member States or responsible stakeholders to define those, based on national circumstances.

<p><b>1.4 Projected need for energy storage to meet renewable targets</b></p> <ul style="list-style-type: none"> <li>● X% of the foreseen needed short-term storage capacity by the year XXXX can be provided by bidirectional EVs in a more cost-effective manner than other sources of flexibility.</li> </ul>	<p><b>2.4 Use of power system’s digital twin to evaluate the benefits of bidirectional charging</b></p> <ul style="list-style-type: none"> <li>● the majority of scenarios modelled in the energy system digital twin shows positive socio-economic benefits from the use of bidirectional charging</li> </ul>	<p><b>3.4 Electricity prices with and without EVs participating in markets and grid services</b></p> <ul style="list-style-type: none"> <li>● the difference between the prices with EVs participating in energy markets or grid services (peak shaving, congestion management etc.) and a counterfactual where no EVs are participating in markets or grid services</li> </ul>
	<p><b>2.5 Load profile with and without EVs in Resource Adequacy Assessments</b></p> <ul style="list-style-type: none"> <li>● the difference between the load profile with EVs in Resource Adequacy Assessments is higher by XX% compared to a load profile without EVs.</li> </ul>	

## 2 Member States shall set strategies for the deployment of smart and bidirectional charging in their recommendations

Member States should include in their recommendations clear strategies for smart and bidirectional charging deployment. These strategies should encompass a range of approaches, from simple measures like peak/off-peak pricing, visibility and incentives to manufacturers of bidirectional chargers or vehicles to reach volumes that reduce costs, to more complex approaches such as Local Flexibility Markets. Member States, along with regulators, and system operators should facilitate these pathways, ensuring that clear and accessible information about these current and future opportunities is readily available to all stakeholders. This will ensure the successful grid integration of electromobility and support a cost-effective energy transition.

## 3 Member States to align reporting obligations, in consultation with relevant stakeholders

To avoid bureaucratic and burdensome administrative procedures, the assessment of the contribution of EVs to the flexibility of the system and the assessment of the potential of bidirectional charging should be aligned, as they pursue the same goals. The inputs from all relevant stakeholders such as flexibility service providers and charging point operators should be considered, not only those of TSOs and DSOs.

## Smart Electrification of industries (Article 22a Renewable Energy Directive)



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**APPLICABLE BY:**  
21 May 2025



**OBJECTIVE:** Support renewable-based electrification of industries.

### WHAT DOES THE LEGISLATION SAY?

- When electrification is considered to be a cost-effective option, Member States shall adopt policies and measures that promote the renewable-based electrification of industrial processes, ensuring conducive market condition for the availability of economically viable and technically feasible renewable energy alternatives to replace fossil fuel used for industrial heating where the temperature is below 200°C.
- When adopting those policies and measures, Member States shall take into account the energy efficiency first principle and the need to tackle regulatory, administrative and economic barriers.



### HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

1

**When assessing if electrification for industries is “a cost-effective” option, Member States shall consider the flexible activation of electrified industrial processes**

Member States should not limit the evaluation of the electrification option to the mere cost of the electrification process. They shall also take into account:

- the benefits that industries with electrified processes can derive from participating in flexibility services. This includes cost reductions and remunerations by providing flexibility to electricity markets and mechanisms. The running costs will be reduced if electrified processes are flexibly activated;

- The benefits generated for the system thanks to industrial flexibility, such as meeting the system flexibility needs. This reduces the costs associated with integrating renewable electricity, ultimately contributing to increased system efficiency and resilience;
- The GHG emission reductions thanks to increased renewable installations on-site or flexible consumption of clean electricity from the grid, ultimately reducing the carbon footprint of the industry, and increasing their self-consumption and flexibility potential.

Such an approach will ensure consistency with the energy efficiency first principle<sup>7</sup>.

## 2

## Member States shall enable a market-based remuneration to industries willing to activate their demand-side flexibility

Whether industrial flexibility relies already on an available capacity or requires some up-front investments (eventually supported by Capacity Mechanisms or Flexibility Support Schemes, see below), their activation should be market-based and remunerated.

Imposing targets to industries to activate their flexibility is not recommended, notably in countries where market-based flexibility schemes are limited due to regulatory barriers.

On the opposite, Member States should rapidly require NRAs, System Operators, suppliers and other relevant decision-makers to lift existing barriers and ensure an open, non-discriminatory participation of industries to implicit and explicit flexibility offers.

<sup>7</sup> · See Chapter 7 for recommendations on the Energy Efficiency First Principle.

## Energy management systems and energy audits (Article 11, Energy Efficiency Directive)



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### APPLICABLE BY:

11 October 2027 for enterprises deciding to implement EMS



**OBJECTIVE:** Deploy energy management systems in industries.



ON YOUR  
RADAR!

### APPLICABLE BY:

1 October 2026 for enterprises which carry out an energy audit instead

## WHAT DOES THE LEGISLATION SAY?

- Enterprises with an average annual energy consumption higher than 85TJ of energy over the previous three years shall:
  - implement an energy management system, which must be certified by an independent body;
  - carry out a first energy audit and at least every four years after the first one.
- Enterprises with an average annual consumption higher than 10TJ of energy over the previous three years and which do not implement an energy management system, are subject to an energy audit.
- Enterprises shall carry out an Action Plan with measures to implement the recommendations arising from those energy audits. The Action Plan shall be made publicly available.
- Member States can implement incentives and support schemes for the implementation of the recommendations arising from energy audits.



## HOW SHOULD INDUSTRIES IMPLEMENT THE PROVISION?

1

### When conducting energy audits, industries should also assess their flexibility potential

Energy audits that are conducted by industries should include flexibility audits to assess their flexibility potential. To this end, Member States shall develop terms and standards for the execution of flexibility audits within energy audits.

When a flexibility potential is being identified, the recommendation stemming from the audit must be implemented within a specific timeframe to ensure the completion of all necessary related investments. Such investments can be supported by Capacity Remuneration Mechanisms or Flexibility Support Schemes.

When public support is provided for the smart electrification of industrial processes, Member States shall require efficient flexibility activations, provided there are open and non-discriminatory markets for their remuneration and flexibility activations are not undermining industrial processes.

2

### Industries shall implement energy management system capable of interacting with the grid

Energy management systems implemented by industries should not be limited to on-site optimisation of energy consumption. They should also be capable of reacting to external signals and be able to activate, in response to those signals, demand-side flexibility from the different flexible assets of the enterprise. This will support the participation of industries in flexibility mechanisms and be rewarded for that.

## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

1

### Member States shall issue documentation to inform industries on flexibility services

At present, most industries limit their flexibility to interruptability schemes.

However, if barriers are lifted, industries, as all other consumers, might benefit from the participation to a broad spectrum of flexibility business models and subsequent remunerations.

Member States shall run communication campaigns on flexibility services and the potential benefits available in their country/region for them in increasing their competitiveness, reducing energy costs, carbon footprint while supporting the clean energy transition. Member States shall in particular issue advice to explain the functioning of those services and the existing markets and operators. They shall also encourage industries to undertake audits to assess their flexibility potential, if not already mandated by EU law.

2

### Member States shall create a database collecting experiences from flexible industries

In relation to the above recommendation, Member States should create a comprehensive database that gathers all experiences from flexible electrified industrial processes. Without disclosing sensitive information, this database should compile information on the flexibility schemes at the disposal for industries and benefits obtained by participating industries.

## Flexible Connection Agreements (Article 6a, Electricity Directive)



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**APPLICABLE BY:**  
17 January 2025



**OBJECTIVE:** Offer the possibility to System Operators to set up Flexible Connection Agreements (FCAs) in order to connect assets when network capacity is scarce or not available.

### WHAT DOES THE LEGISLATION SAY?

- Flexible connection agreement is a set of agreed conditions for connecting electrical capacity to the grid that includes conditions to limit and control the electricity injection to and withdrawal from the transmission or distribution network.
- NRAs shall define a framework for TSOs and DSOs to offer flexible connection agreements in areas where there is limited or no network capacity availability for new connections, ensuring that:
  - network reinforcements are not delayed;
  - switching to firm connections once the network reinforced is ensured;
  - in specific areas defined where the NRA deems that network reinforcement is not the most efficient option, consider flexible connection agreements as a permanent solution, including for storage.
- The framework may require flexible connection agreements to specify:
  - the maximum firm injection and withdrawal from and to the grid, as well as the flexible injection and withdrawal capacity to be connected and differentiated in time blocks during the year;
  - the network charges applicable to both the firm and flexible injection and withdrawal capacities;
  - the duration of the flexible connection agreement and the date for a firm connection, that the system user must install a certified power control system.



## HOW SHOULD SYSTEM OPERATORS IMPLEMENT THE PROVISION?

### 1 Ensure that FCAs do not undermine market-based flexibility

System Operators should not treat FCAs as a free source of flexibility. Customers incur direct and/or opportunity costs when constrained, which are as important as any direct costs to the system operator.

The limit on the electricity injection and withdrawal set in FCAs should be activated only when there is already a Local Flexibility Market in place or a LFM is required within a year, unless the relevant SO can prove the absence of other resources and received a derogation from the NRA based on this (e.g. radial connection with no other user being the reason for FCA).

The activation of the flexibility of the connected consumers through an FCA should be remunerated at price set competitively through the market, and not predetermined by the FCA itself.

The relevant system operator should include in the FCA that if market-based flexibility is activated instead of the FCA, the costs are to be covered by the flexibly connected grid user. This would incentivise the flexibly connected grid user to participate in the local flexibility market with realistic prices, and ensure the absence of market distortion, so that the lowest price flexibility is always activated first.

### 2 Monitor and make public the number of FCAs

Monitoring the volume and evolution of capacities and activated volumes under FCAs would help Member States/NRAs to assess the need for markets, and ensure that FCAs do not cannibalise demand-response.

## HOW SHOULD NRAs IMPLEMENT THE PROVISION?

### 1 Require evidence of the need for FCAs in a clearly defined part of the network

Before it can offer an FCA, TSOs and DSOs shall be required to make a public submission to the NRA's satisfaction with the following elements:

- a) identifying the network elements that are constrained, or that they reasonably expect to be constrained within 18 months, hence delimiting the affected part of the network;
- b) showing why they cannot manage the constraint using market-based flexibility services in accordance with Article 32 of the Electricity Directive;
- c) setting out a plan for a local flexibility market in a constrained area, allowing other potential flexibility resources to compete on providing the required flexibility, or alternatively provide a derogation if the relevant system operator proves that there is not, and cannot be, any market-based flexibility resources available at this stage;
- d) setting out a plan, with a firm end date, for alleviating the constraint, such that all the FCAs for which it is seeking permission will become firm.

The NRA should consult stakeholders before taking its decision.



## 2 Implement ongoing monitoring of the need for FCAs and activities in constrained areas and the setting up of local flexibility markets

Where FCAs are in place (including anything similar to an FCA entered into before the implementation of these rules), NRAs should reassess the factors set out in the recommendation above at least every two years.

If the conditions are no longer met, the NRA should require that the FCAs be replaced with firm connection agreements. If the plan for alleviation is behind schedule, the NRA should require the system operator to compensate the affected customers for not being able to have a firm connection. The NRA should assess the annual social welfare losses experienced by grid users as a result of FCA.

## 3 Ensure FCAs do not prevent participation in market-based flexibility

NRAs should ensure that customers with FCAs have the same rights of access to any flexibility market as customers without an FCA. NRAs should assess the design of each product procured in each market for needlessly detrimental interactions with FCAs, and require design changes where necessary to avoid these.

## 4 Make the terms and conditions of FCAs public and clear and align them with traditional grid connections

In France, terms and conditions of “regular” connection agreements are approved by the NRA and made public, but this is not currently the case for all FCAs. The TSO and DSOs state that they can offer agreements with temporary limitations to the grid on a case-by case basis but there is no template of such agreement nor public rules governing those limitations. The TSO may also offer contracts with flexible requirements but with special terms of contracts and without a standard template.

If not made public, such requirements could risk that FCAs cannibalise demand response, if they are not compatible with the participation into flexibility services.

## Training and certification of installers and designers of renewable energy installations

*(Article 18, Annex IV, Renewable Energy Directive and Articles 25, 26 of the Energy Performance of Buildings Directive)*



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### APPLICABLE BY:

21 May 2025



**OBJECTIVE:** Train and deliver certification schemes to installers and designers of renewable energy and related technologies.

## WHAT DOES THE LEGISLATION SAY?

- Member States shall ensure that their certification schemes or equivalent qualification schemes are available for installers and designers of all forms of renewable heating and cooling systems in buildings, industry and, for installers of solar photovoltaic systems, including energy storage, and for recharging points enabling demand response.
- Member States shall ensure that sufficient training programmes leading to certification or qualification covering renewable heating and cooling technology, solar photovoltaic systems, including energy storage, recharging points enabling demand response.
- The training course leading to a certification shall end with an examination leading to a certificate or qualification. The examination shall include a practical assessment of successfully installing inter alia, heat pumps, solar photovoltaic or solar thermal installations, including energy storage, and of recharging points, enabling demand-response.



## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

1

### Ensure that training programmes seek to enhance the provisions of flexibility services

To optimise the participation of DERs in flexibility markets, it is essential to prioritise training programmes that equip professionals with the necessary skills and knowledge. Training should emphasise the role of DERs in enhancing grid flexibility and supporting the integration of renewable energy sources.

One key aspect of training should focus on understanding the technical capabilities of different renewable energy systems, such as solar photovoltaic installations, energy storage solutions, and demand response technologies. Professionals should be trained to assess the potential of these systems to provide flexibility services to the grid, including frequency regulation, peak shaving, and voltage support as well the benefits to consumers owning them.

Training programmes should highlight the importance of data analytics and communication technologies in enabling DERs to participate effectively in flexibility markets. Professionals need to be proficient in leveraging advanced monitoring and control systems to optimise the performance of renewable energy installations and respond to market signals in real-time.

To ensure consistencies between legislations, this recommendation should be replicated and aligned with article 25 (Independent Experts) and article 26 (Certification of Building Professionals) in the EPBD.

2

### Ensure parity of qualifications

Member States shall consider the formal recognition and equivalency of training and qualifications for professionals working with renewable energy installations. This recognition, akin to a credentialing system, would validate the expertise and skills of installers and designers in the renewable energy sector, providing them with the necessary credibility and acknowledgment within the industry.

It is essential to collaborate with existing training providers specialising in renewable energy technologies to ensure that the certification schemes align with industry standards and best practices. By leveraging the expertise of these established training providers, Member States can enhance the quality and relevance of the training programmes offered to professionals in the field.

Driving the integration of energy flexibility into the grid is paramount for advancing renewable energy technologies. By emphasising the importance of energy flexibility in the certification schemes, professionals can contribute to a more resilient and sustainable energy grid.

HOW TO IMPLEMENT EU LAWS  
TO ADDRESS BARRIER

# #4

Limited access  
to price signals

## • In this chapter...

# #4

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## Introduction

Limited access to price signals – on both electricity and network costs - is a significant barrier to unlocking demand-side flexibility.

As price volatility increases, with frequent price spikes and even negative prices in the spot markets, it becomes crucial to send clear signals to consumers about when and where they should adjust their energy demand or consume locally produced renewable energy.

Similarly, with network constraints becoming more relevant as electrification of end-uses progresses, it is critical to send consumers price signals indicating the status of the grid for an optimal use of available grid capacity.

These signals allow consumers to actively participate in balancing the grid, responding to fluctuations in supply and demand and alleviating network constraints.

However, many end-users do not receive proper price signals that reflect the value and cost of electricity, or the transportation and distribution costs across different time periods. Without these price signals, consumers are disconnected from the real costs of their energy usage and miss opportunities to support the energy system during times of strain and be rewarded for it. This prevents consumers from optimising their energy use, activating their implicit flexibility.

This chapter is directed at **Member States, National Regulatory Authorities (NRAs), and energy suppliers, offering recommendations for the implementation of the Electricity Directive, Electricity Regulation, and the Energy Efficiency Directive** which require the following:

- **Rollout of Smart Metering Systems:** Smart meters are crucial for providing consumers access to real-time price signals, enabling innovative business models that automatically adjust energy consumption based on external signals. They are a foundation for the development of dynamic electricity price contracts. (Article 19 of the Electricity Directive).
- **Dynamic Electricity Price Contracts:** Consumers must have the option to choose dynamic electricity price contracts, allowing them to benefit from prices that reflects wholesale market fluctuations and to have greater control over their energy consumption.(Article 11 of the Electricity Directive).
- **Multiple Supply Contracts:** Consumers should be allowed to hold more than one electricity supply contract or participate in multiple energy-sharing agreements simultaneously. This gives consumers more choice and control over how they source and manage their energy consumption. (Article 4 of the Electricity Directive).
- **Cost-Reflective Network Tariffs:** All consumers connected to the grid must receive price signals that reflect the true costs of their network usage and reward their contributions to grid stability. Cost-reflective network tariffs encourage more efficient grid operation by incentivizing flexibility and reducing the need for costly grid reinforcements. These tariffs can also help reduce network peak loads—the primary driver of network investments—by sending economic signals to users to adjust consumption or generation during periods of network congestion. (Article 27 and annex III of the Electricity Efficiency Directive and article 18 of the Electricity Regulation).

## Smart metering systems (Art 19 Electricity Directive)



NO TIME  
TO LOSE!

**APPLICABLE BY:**  
31 December 2020



**OBJECTIVE:** Roll out smart meters.

### WHAT DOES THE LEGISLATION SAY?

- Member States shall ensure the deployment in their territories of smart metering systems, which may be subject to a cost-benefit assessment (CBA).

Where the CBA gave a negative assessment, Member States shall ensure that this assessment is revised at least every four years, or more

- frequently, in response to significant changes in the underlying assumptions and in response to technological and market developments.

- 

Where smart metering systems have already been installed they may remain in operation over their lifetime, unless they are not able to provide near real-time data and historical consumption data, data of electricity injected into the grid, at the same resolution as the imbalance settlement period. In this case, they shall not remain in operation after 5 July 2031.



### HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

1

**Member States should ensure a thorough and transparent cost-benefit assessment (CBA) is conducted to evaluate the feasibility and advantages of deploying smart metering systems.**

Smart metering systems benefit both consumers and distribution grids. For consumers, they are essential to access price signals and a prerequisite for dynamic electric price offers, enabling better consumption man-

agement, participation in demand response programs, and lower electricity bills. For DSO, smart meters offer improved network visibility, reducing operation and maintenance costs, which can result in lower distribution tariffs for consumers.

Member States should run a CBA that takes into account:

- How the value of smart meters may change based on future market designs (e.g. shorter settlement periods, market-wide half-hourly settlement);
- How roll-out costs are likely to change (i.e. reduce) over time;
- Both current and future benefits for both consumers and the system that demand side flexibility activation from implicit signals can offer in an increasingly variable energy system aiming to decarbonise;
- Financial impacts of a lack of implicit demand-side flexibility activation and network visibility on consumers and the energy system.

Where the assessment is negative, it should detail why the Member State differs from other positive CBAs carried out by other Member States, comparing inter alia wholesale electricity price volatility, levels of electrification, impact on grids and generation if future electrification is not operated in a smart manner.



## Dynamic electricity price contracts (Article 11 Electricity Directive)



NO TIME  
TO LOSE!

**APPLICABLE BY:**  
31 December 2020



**OBJECTIVE:** Ensuring that consumers can opt for dynamic electricity price contracts and fixed-term, fixed price contracts including flexibility features and opportunities.



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But fixed price contracts  
by 17 January 2025

### WHAT DOES THE LEGISLATION SAY?



- Suppliers shall offer fixed-term, fixed price electricity supply contracts and dynamic electricity price contracts.
- Under fixed-term, fixed-price contracts, the price remains unchanged but it may include within a fixed price, a flexible element with for example peak and off-peak variations, and where changes in the bill can only result from elements not determined by suppliers (e.g. taxes and levies).
- A dynamic electricity price contract reflects the price variation in the spot markets, including in the day-ahead and intraday markets, at intervals at least equal to the market settlement frequency.

**Member States shall ensure that:**

- Customers who have a smart meter installed can sign up for a dynamic price contract with at least one supplier and with all suppliers with more than 200 000 final customers
- Customers can sign up for a fixed-term, fixed-price electricity supply contract with at least one supplier and with all suppliers with more than 200 000 final customers. Customers with fixed-term, fixed-price electricity supply contracts are not excluded from their participation in demand response and energy sharing and from actively contributing to the achievement of the national electricity system flexibility needs.

## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

- 1 Where a customer wishes to sign up for a dynamic contract, but does not have a smart meter, Member States shall ensure that the customer is able to have a smart meter installed without undue delay, and without unduly high costs**

Dynamic price contracts can enable customers to both support the electricity system and reduce their own total cost of electricity consumption (even if the volume consumed does not change). The two benefits are important, but only realisable if consumers have smart meters.

Where they do not have a smart meter, Member States should ensure that there is a process for the customer to have a smart meter installed in line with article 21 of the Electricity Directive (Entitlement to a smart meter), and for the cost of the smart meter borne by the customer (or the component in network tariffs linked to such cost) to be reduced to account for the external benefits the customer will provide to the electricity system.

For households in multi-apartment buildings that do not have individual connection nor metering points for their flats, if they request, system operator should provide a separate smart meter or allow market players to deploy sub-meters.

- 2 Member States should ensure that consumers with a dynamic electricity price contract can sign up for an aggregation contract and/or an energy sharing agreement on the side of their supply contract**

As required by Article 4 and Article 13 of the Electricity Directive, Member States shall ensure that customers who sign a fixed and/or a dynamic electricity price contract (implicit flexibility) maintain the right to also sign up for an aggregation contract (explicit flexibility) or can enter an energy sharing agreement on the side of their electricity supply contract. Member States shall require suppliers not to discriminate their customers who wish to enter such agreements.

- 3 Member States should ensure that suppliers managing flexible decentralised assets minimise the total cost of consumption**

In order to ensure cost-effective use of renewable energy, smart devices such as heat pumps or EVs should charge when wholesale prices are low or negative (so long as they take into account the network situation, and any other market trade-offs). Hence, Member States should ensure that where consumers have a contract where they delegate the control of a flexible asset to their supplier, the supplier shifts the consumption to off-peak times, inducing cost benefits for consumers.

## HOW SHOULD SUPPLIERS IMPLEMENT THE PROVISION?

- 1 Inform consumers on the benefits and potential risks of dynamic price contracts**

The price consumers pay with dynamic price contracts is directly linked to evolutions in spot markets. This means that consumers directly see in their bill the consequence of volatility in wholesale markets, which, if very pronounced, can lead to bills that are significantly lower or higher than what they are used to. To support

consumer decision making on the choice of their electricity contract, also in line with what foreseen by Article 11 of the Electricity Directive, National Regulatory Authorities should assess and communicate to consumers the potential benefits and potential risks if choosing a dynamic price contract.

## 2 Offer innovative contracts, using both smart meters and sub-meters

Whereas EU legislation only foresees that suppliers should offer dynamic price contracts and fixed price contracts (either fixed or time of use contracts), suppliers should also explore other options and offer innovative contracts. For example, they can offer critical peak pricing offers, where the consumer pays the same price throughout the entire duration of the contract, except for some timeslots.

To increase consumer choice and engage in multiple implicit price offers, suppliers should also relate dynamic price offers to individual assets and eventually deploy sub-meters for adequate billing.

## WHAT DOES THE LEGISLATION SAY?

- Member States shall also ensure that customers receive easy to understand information on the key features of the electricity offer before signing the contract.



## HOW SHOULD NRAs IMPLEMENT THE PROVISION?

- 1 National Regulatory Authorities should require comparison tools to offer consumers to upload their smart meter data and use demand profiles that would show the monetary benefits of flexible electricity consumption with dynamic price contracts in the estimation of the monthly bill

Demand curves used by price comparison tools are not always representative of consumers' hourly demand profiles, which means that the estimation of future bills provided by comparison tools are often inaccurate and penalises dynamic electricity price contracts. National Regulatory Authorities should require price comparison tools to offer customers the possibility to upload their smart meter data or to authorise the price comparison tool to remotely access it. To complement the smart meter data, or to replace it when not available, comparison tools should also include a function allowing consumers to indicate what flexible assets they have in their homes, so that the tool can estimate flexibility benefits.

## Multiple supply contracts (Article 4 Electricity Directive)



ON YOUR  
RADAR!

**APPLICABLE BY:**  
7 June 2026



**OBJECTIVE:** Allow customers to have more than one electricity supply contract or energy sharing agreement at the same time.

### WHAT DOES THE LEGISLATION SAY?

- Member States shall ensure that all customers can:
  - freely choose their electricity supplier;
  - have more than one electricity supply contract at the same time (e.g. one contract for the charging of their electric vehicle or their heat pumps and one contract for the rest of the house's electricity consumption);
  - have one (or more) energy sharing agreement on the side of their electricity supply contract.
- Should customers decide to have more than one electricity supply contract, they should have the right to have more than one metering and billing point under the same electricity meter or to have one smart metering system that is able to send adequate metering information to the different suppliers.



### HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

#### 1 Allow suppliers to use sub-meters

It might be more cost-effective to use sub-meters for multiple supply contracts for specific assets behind the meter. Member States should allow suppliers offering (dynamic) tariffs for specific assets to use sub-meters, to be deployed by market players, ensuring adequate billing and reliability of energy data.

2

## Encourage both dedicated and residual suppliers to share data in national data platforms

Consumers shall be allowed to sign a dedicated electricity supply contract for their specific assets (with a dedicated supplier) while having at the same time a contract (with a residual supplier) to cover the remaining energy needs. For settlement purposes, Member States should require that all suppliers, including dedicated and residual suppliers, share relevant data in national data platforms, in line with art. 23 and 24 of the Electricity Directive on data management and interoperability requirements (see Chapter 6 for further information).

Having access to this data would also support suppliers in avoiding over-procurement of electricity on the market.

## HOW SHOULD SUPPLIERS IMPLEMENT THE PROVISION?

1

### Suppliers providing electricity only for a device should ensure they are capable of relying on telemetry data from the device to accurately bill customers

Suppliers providing electricity for single assets should develop robust data integration and management systems that can securely handle telemetry data from multiple devices within the household. This includes ensuring compliance with data privacy regulations and obtaining customer consent for data sharing. In cases where device control is necessary, appropriate security measures must protect against unauthorised access.

2

### Suppliers providing electricity only for a single asset should provide user-friendly platforms or apps to allow customers to monitor their consumption for each device and override controls if needed

Suppliers should create user-friendly apps and experiences that allow customers to easily understand their tariffs, including clear information on energy consumption and data sharing requirements. For tariffs involving device controls, the customer interface should provide straightforward instructions on how to override control settings and allow users to set preferences, such as specifying a “ready-by” time for state-of-charge requirements.

The asset-specific supplier is responsible for managing any customer overrides or boosts, as well as any resulting over or under-consumption of electricity associated with that device. Once the reference profile is transferred to the asset-specific supplier, they assume full responsibility for all supply risks and imbalances related to the device.

## Efficient, cost-reflective network tariffs (Art 18 Electricity Regulation and Art 27, Annex XIII Energy Efficiency Directive)



NO TIME  
TO LOSE!

### APPLICABLE BY:

1 January 2020 for the  
Electricity Regulation



**OBJECTIVE:** Ensure that networks are operated efficiently, providing consumers with the right price signals through efficient, cost-reflective network tariffs.



ON YOUR  
RADAR!

### APPLICABLE BY:

11 October 2025 for the  
Energy Efficiency Directive

## WHAT DOES THE LEGISLATION SAY?



- National energy regulatory authorities shall apply the energy efficiency first principle in their decisions on the operation of electricity infrastructure, including their decisions on network tariffs. These should support system efficiency through price signals to customers and producers.
- Network charges shall be cost-reflective, transparent, take into account the need for flexibility and be non-discriminatory.
- The network charges shall not discriminate either positively or negatively against energy storage or aggregation and shall not create disincentives for self-generation, self-consumption or for participation in demand response.
- Distribution tariffs shall be cost-reflective taking into account the use of the distribution network by system users including active customers.
- Distribution tariffs may contain network connection capacity elements and may be differentiated based on system users' consumption or generation profiles.
- Network tariffs shall be cost-reflective of cost-savings in networks achieved from demand-side and demand-response measures and distributed generation, including savings from lowering the cost of delivery or of network investment and a more

optimal operation of the network. They shall not prevent demand-response through dynamic retail prices and independent aggregators.

- Network or retail tariffs may support dynamic pricing for demand response measures by final customers, such as time-of-use tariffs, critical peak pricing, real time pricing and peak time rebates.
- Where Member States have implemented the deployment of smart metering systems, time differentiated network tariffs shall be considered by NRAs and where appropriate, time-differentiated network tariffs may be introduced to reflect the use of the network, in a transparent, cost efficient and foreseeable way for the final customer.

## HOW SHOULD NRA IMPLEMENT THE PROVISION?

### 1 National Regulatory Authorities should incentivise System Operators to develop cost-reflective network tariffs

NRAs have the responsibility to optimise the use of grids and reduce the total system costs, with the active contribution from consumers. They need to incentivise System Operators, notably DSOs, to introduce cost-reflective network tariffs which can have different types of complexity. NRAs should also ensure that, once cost-reflective network tariffs are introduced by DSOs, they should not provide distortive signals to consumers opting for dynamic electricity price contracts.

### 2 National Regulatory Authorities should ensure that network tariffs can work hand in hand with local flexibility markets

Cost-reflective network tariffs may be a very good tool to incentivise grid users to control and limit their peaks, all the time or during given hours. However, when it comes to structural local congestions, other efficient tools could be used in addition to cost-reflective network tariffs, such as Local Flexibility Markets. Therefore, the NRA and DSOs should as a default introduce LFM that may be more efficient in addressing local congestion in the short term and adequately assess their seamless interaction with cost-reflective network charges.

HOW TO IMPLEMENT EU LAWS  
TO ADDRESS BARRIER

# #5

Lack of frameworks  
to innovative  
services and local  
initiatives



## • In this chapter...

# #5

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## Introduction

The clean energy transition relies heavily on the active participation of consumers in the energy system. The 2019 Electricity Directive marked a major milestone by promoting innovative, data-driven energy services through the establishment of a framework for demand response aggregation and encouraging active customer engagement. This framework empowers new market entrants, small players, independent demand response aggregators, and energy communities to unlock the demand-side flexibility potential of all end-users, contributing to both consumer empowerment and the overall efficiency of the energy system.

The revised 2024 Electricity Directive further advanced the move towards a decentralised energy system by introducing the right to share energy. Local initiatives, such as energy communities and energy sharing schemes, play a vital role in empowering consumers at the grassroots level. This development complements ongoing efforts to shield consumers from extreme price fluctuations while optimising energy usage.

Despite these progressive steps, many Member States have yet to fully implement the necessary provisions. This hampers the growth of innovative energy services and local initiatives, posing a serious barrier to demand-side flexibility. This leads to inefficiencies, such as higher consumer costs and underutilised decentralized energy resources, limiting their potential to reduce grid congestion and enhance resilience.

To fully realize the benefits of the clean energy transition, it is crucial to address these regulatory gaps.

This chapter is directed toward **Member States, National Regulatory Authorities, System Operators, and Aggregators, providing key recommendations for implementing the Electricity Directive and the Renewable Energy Directive.** These Directives outline the following mandates:

- **Active customers:** Consumers must be empowered to actively engage in the energy system by having the ability to adjust their energy consumption, generation and storage in response to external signals. The activation of their demand-side flexibility should be incentivised and rewarded, ensuring they benefit from their contributions to a cost-effective clean energy transition (Article 15 of the Electricity Directive).
- **Demand response aggregation:** Demand response aggregation must be permitted, and all markets — wholesale, balancing, ancillary services and local flexibility markets — must be open to demand-response participation through aggregation. The Electricity Directive mandates that independent aggregators are recognised as separate market actors, allowing final customers to purchase flexibility services independently of their electricity supplier, increasing consumer choice (Articles 13, 17 of the Electricity Directive).
- **Energy sharing and local initiatives:** Consumers and market participants must have the right to establish and participate in energy sharing schemes, both within and outside of Renewable Energy Communities and Citizen Energy Communities. This fosters local energy initiatives that support the decentralised generation and consumption of energy, enabling communities to pool resources and optimise energy usage (Article 15a and 16 of the Electricity Directive, Article 22 of the Renewable Energy Directive).

By empowering consumers and promoting flexibility services through a clear and supportive framework, these measures drive innovation and contribute to the development of a more resilient, decentralised, efficient and consumer-centric energy system.

## Active customers (Article 15 Electricity Directive)



NO TIME  
TO LOSE!

**APPLICABLE BY:**  
31 December 2020



**OBJECTIVE:** Enable consumers to become active and participate in flexibility schemes.

### WHAT DOES THE LEGISLATION SAY?

An active customer is a final customer who consumes or stores or generates electricity on-site and participates in flexibility schemes, provided that these activities do not constitute their primary commercial or professional activity.



- Member States shall ensure final customers are entitled to act as active customers, without being subject to disproportionate or discriminatory technical and administrative requirements, procedures and charges.
- Active customers are entitled, directly or through aggregation, to participate in flexibility.
- Active customers are subject to cost reflective, transparent and non-discriminatory network charges, accounting separately for the electricity fed into the grid and the electricity consumed from the grid.
- Active customers are financially responsible for imbalances they cause, but can delegate their balancing responsibility.
- Net metering is phased out: new rights cannot be granted after 31 December 2023. All customers subject to existing schemes must at any time have the possibility to opt for a new scheme accounting separately.
- Active customers owning a storage facility:
  - have right to grid connection within a reasonable timeframe, provided that balancing responsibility and adequate metering are fulfilled;
  - are not subject to any double network charges for stored electricity remaining within their premises and when providing flexibility services to system operators;
  - are allowed to provide several services simultaneously, if technically feasible.

## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

### 1 Member States should set a level-playing field enabling all types of consumers to become active

Member States shall ensure that all consumers have the ability to become active by unleashing their demand-side flexibility through participation in both price-driven (implicit, e.g. via dynamic electricity tariffs) and incentives-driven (explicit, e.g. via an aggregator to bid into electricity markets) flexibility schemes.

This provision should apply to all types of energy consumers, from buildings to vehicles and large energy intensive industries.

To facilitate the activation of flexibility from all consumers, Member States should establish uniform approaches, reducing complexity and facilitating the participation of a diverse range of decentralised energy resources in supporting the increasing system flexibility needs.

### 2 Raise awareness among consumers about the benefits of becoming active

Member States should implement consumer awareness communication campaigns that inform consumers about the opportunities to become active via their distributed flexibility, while emphasizing the associated systemic benefits to support the cost-effective transition. Leveraging media and social platforms can broaden the reach, raising awareness of the benefits of automated, time-sensitive energy usage adjustments. These public campaigns would stimulate consumer interest in participating in flexibility schemes, providing a strong foundation for market players to engage with their existing or potential customers and to develop customised flexibility offerings tailored to individual consumption profiles.

### 3 Remove all double charges for energy storage: both network charges and taxation

In addition to removing double network charges of electricity (i.e. when withdrawn from and when injected to the grid) as foreseen by this provision, Member States should also remove double taxation, including excise duties. These charges discourage the participation of storage facilities – such as vehicle-to-grid and domestic batteries – in providing flexibility services to the electricity system, and constitutes a barrier to prosumers business models.

By creating a supportive regulatory framework for storage facility owners, Member States can incentivise investment in energy storage technologies, enhance grid flexibility, and promote the efficient use of renewable energy resources. This approach can contribute to a more resilient and sustainable energy system while encouraging the growth of decentralised energy resources and energy storage solutions.

## HOW SHOULD NRAs IMPLEMENT THE PROVISION?

### Ensure cost-reflective network tariffs

In line with article 27 and Annex XIII of the Energy Efficiency Directive and Article 18 of the Electricity Regulation, Member States should implement transparent and non-discriminatory network charges that accurately

reflect the costs associated with electricity transactions. By developing cost-reflective pricing mechanisms and ensuring transparency in how network charges are calculated, policymakers can promote fairness and efficiency in the energy market. Practical steps could include conducting regular reviews of network charges to ensure they align with actual costs, supporting fair and open market mechanisms, and ensuring grid operators provide clear guidance to stakeholders on how charges are determined. Recommendations to implement cost-reflective network tariffs are described in chapter 4 of this Implementation Guidebook.

## Aggregation of demand response (Articles 13, 17 of the Electricity Directive)



NO TIME  
TO LOSE!

**APPLICABLE BY:**  
31 December 2020



**OBJECTIVE:** Enable independent aggregation of demand-response and ensure that all electricity markets are open to demand response through aggregation.

### WHAT DOES THE LEGISLATION SAY?



- Aggregation of demand response can occur independently of an electricity supply contract and without the need for consent from the final customer's electricity provider or other market participants. This ensures that market participants engaged in aggregation, including independent aggregators, can enter electricity markets without requiring approval from other market participants.
- Aggregators shall fully inform customers of the terms and conditions of the contracts that they offer to them.
- Consumers are entitled to receive all relevant demand response data or data on supplied and sold electricity free of charge at least once every billing period if requested by the consumer.
- Consumers are not subject to discriminatory technical and administrative requirements, procedures and charges from their supplier on the basis of whether they have a contract with an aggregator.

### HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

1

**Set a regulatory framework for aggregation, consulting all relevant stakeholders**

The lack of regulatory frameworks for aggregation is one of the main reasons for the very low development of

this business model across Europe. Aggregation is simply not contemplated in some Member States, hence the lack of explicit flexibility activations. When shaping this specific rule, all relevant stakeholders should be consulted, including aggregators operating in other Member States, citizens organisations and not for profit groups. The consultation should not be limited to national System Operators and incumbent energy suppliers only.

While the Network Code for Demand Response further details provisions set in this article, the principles described below are essential features that must be contemplated, so the definition of an aggregation framework should not be put in standby until the finalisation of a Network Code.

2

## Ensure that any consumer can enter an aggregation contract in a way that is fully independent from their supply contract(s), with no strings attached

Given that a consumer's electricity supplier may be a potential competitor to demand response independent aggregators, this provision ensures that the consumer can enter a contract with any aggregator of their choice, be it with their electricity supplier also operating as a demand response aggregator, or with any other aggregator (also called independent aggregator). Such a consumer should have all the usual consumer rights and protections in place. In particular, no agreement should be required by the consumer's supplier nor their Balance Responsible Party (as resulting from article 17-3-a of the Electricity Directive).

Member States shall ensure that entering such a contract with an independent aggregator does not entail obligations for the customer vis-à-vis their supplier, given that the two contracts should remain independent. For instance, there should not be any obligation for the customer to provide information to their supplier that they entered a demand response contract.

## HOW SHOULD AGGREGATORS IMPLEMENT THE PROVISION?

### Make terms and conditions clear for consumers and have equal treatment

The independent aggregator should:

- clearly disclose to consumers, especially residential ones, the terms and conditions alongside any other quote or offer. The terms and conditions should at least include a short description of the services and the resources subject to the agreement, the pricing and payment, as well as the usual contractual clauses (liability, confidentiality, warranty, termination etc.);
- not require the supplier's consent before engaging with consumers nor share any commercially sensitive information, as mirrored in art. 17.3.c of the Electricity Directive;
- share aggregated volumes of activations through data platforms accessible by all parties, in line with art. 23 and 24 of the Electricity Directive on data management and interoperability requirements (see Chapter 6 for more information);
- have equal requirements with suppliers for accessing the metering data through Metering Data Administrator (e.g., national data platforms) as well as for managing customers' consents.

## WHAT DOES THE LEGISLATION SAY?



- Member States shall allow and foster participation of demand response through aggregation, to participate alongside generators in all electricity markets.
- NRA, System Operators and market participants shall define technical characteristics for demand response participation to all electricity markets, also through aggregation.
- When procuring ancillary services, system operators shall treat market participants engaged in the aggregation of demand response in a non-discriminatory manner, alongside generators.

## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

1

### All markets should be open to demand response through aggregation as an alternative to generation

Member States shall require and ensure that, first of all, the wholesale markets (particularly the day-ahead market, as well as the intraday market if any), are open to demand response, on similar terms as generation. It also applies to balancing markets and other ancillary services to Transmission System Operators, Local Flexibility Markets to solve congestions in a market-based way as well as capacity markets or mechanisms if any. This applies to the demand response coming from all consumers, including when through independent aggregators.

Member States must not only allow aggregated demand response, but foster it – i.e. help, champion, and encourage its development. So the intent is not just to make it theoretically possible for aggregated demand response to participate in all electricity markets, but to make extra effort to facilitate and remove barriers to its participation, following the recommendations set out in chapter 2 of this Implementation Guidebook.

2

### Consider the cost implications of telemetry and metering requirements in all markets

Demand response resources are typically much smaller than traditional resources such as centralised generators or grid-scale storage. As a result, telemetry or metering requirements that are reasonable for grid-scale resources can become a barrier for smaller, aggregated resources to participate in markets. These requirements can lead to significant fixed costs per site, which exceed the potential revenues from participation in markets for some customers.



In general, single-asset requirements for resources participating in aggregation are unjustified for small (and micro) resources, as they result in excessive costs. Instead, all of these processes and requirements should be allowed to be fulfilled at the portfolio level.

Applying the same requirements uniformly to all resources is likely to be discriminatory. Instead, each aspect of metering and telemetry requirements should be carefully considered, especially in terms of how the data is used for volume allocation and its financial impacts on different parties (e.g. supplier - aggregator) who have a right to require minimum levels of telemetry and metering quality. Such requirements should only be imposed when the system benefit justifies the costs for participants. In cases where granular, near real-time data submission is required, alternative approaches should be allowed, such as sub-metering, dedicated measurement devices or main meters with real-time capabilities, or estimated behaviour of prequalified flexible devices, rather than direct SCADA connections.

For example, for frequency products requiring very fast response times (e.g. FCR with <30s response time), it makes sense that the TSO requires sophisticated metering standards. However, for services with slower activation times, such as mFRR with a 12.5-minute response window, TSOs should consider relaxing metering standards to make sure they are not unnecessarily onerous. For example, by allowing the use of device telemetry instead of real-time data transfer and verifying performance through ex-post analysis, more volume through smaller assets will be able to participate, which will help bring down costs of the service.

Finally, TSOs and flexibility service providers should be encouraged to actively engage with OEMs to work on improving device telemetry and designing service requirements that are appropriate for smaller assets.

Such a process is likely to lead to simpler metering requirements on smaller sites, and ensure smaller sites focus on those markets where they can provide system value. Where near-real-time telemetry is necessary, it is unlikely that low latencies (e.g. <30 seconds) will be justifiable for smaller sites, as these can be particularly expensive to implement.

## HOW SHOULD SYSTEM OPERATORS IMPLEMENT THE PROVISION?

### Accommodate the technical capabilities of aggregated demand response

Historically, technical requirements for most ancillary services have been based on the technical capabilities of conventional generators. More recently, new ancillary services have been designed around the technical capabilities of grid-scale batteries. However, both these approaches fail to meet the need for non-discriminatory participation and do not let to the most economically efficient outcomes, as demand side resources are often the most cost-effective providers.

Both TSOs and DSOs must procure flexibility services, directly from consumers and through aggregation, in:

- A market-based way as detailed in chapter 1 of this Implementation Guidebook;
- A non-discriminatory way as detailed in chapter 2 of this Implementation Guidebook.

## WHAT DOES THE LEGISLATION SAY?



- Aggregators are financially responsible for imbalances they cause in the electricity system, but can delegate.
- Electricity undertakings or participating final customers may be required to pay financial compensation to other market participants or to the market participants' balance responsible parties, if they are directly affected by the demand response activation.
- Both corrected and uncorrected models (with perimeter corrections) are allowed to tackle the balance responsibility of the suppliers of participating consumers (as stated in recital 39 of the directive 2019/944).
- If a compensation is set, it shall be strictly limited to cover the resulting costs incurred by the suppliers of participating customers or their balance responsible party during activation of demand-response.
- Financial compensation shall not create a barrier for market participants engaged in aggregation or a barrier to flexibility.
- The calculation method for compensation may take account of the benefits induced by the independent aggregators to other market participants and in such a case, aggregators or participating consumers may contribute to such compensation only if ever and insofar as the benefits for all suppliers, customers and their balance responsible parties do not exceed the direct costs they incurred (net benefit approach). The calculations method shall be subject to approval by the NRA or other national competent authority.

## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

1

### Balancing responsibilities should be properly defined in the model chosen by the Member State

The balancing responsibility of a demand response aggregator, similar to that of a generator, is clearly defined in the EU legislation<sup>8</sup>: all market participants should be financially responsible for imbalances they cause in the electricity system.

8 · As per article 17-3-d of the Electricity directive referring to article 5 of the Electricity regulation, and further clarified by its recital 15).

The **corrected model with perimeter corrections** and the **uncorrected model** refer to two different ways of handling the imbalances caused by demand response actions in the electricity market. Both models are equally contemplated in EU laws and Member States can choose the model that fits best with their needs.

- Under the corrected model, the supplier is not financially responsible for any imbalances caused by demand response actions initiated by an aggregator. Instead, the aggregator takes full responsibility for the imbalances resulting from the demand response activation.

The supplier retains full balancing responsibility for the connection point, except during demand response activation periods. During these periods, the supplier's balance is calculated using the baseline consumption and the aggregator is responsible for the difference between the actual consumption (non-corrected measurements) and the baseline. This ensures that imbalances caused by demand response actions are assigned to the aggregator, while the supplier's balance is adjusted through perimeter corrections to account for the effects of demand response on the suppliers' balance responsibility.

This process is called "perimeter correction" (to distinguish it from imbalance adjustments, as defined in the network code on balancing, and from any changes to meter readings used by suppliers for billing customers in the retail market).

- In the uncorrected model, no adjustments or perimeter corrections are made to remove the impact of the demand response activation from the supplier's balance sheet. Imbalances are settled through the regular balancing mechanism. In this model, the electricity supplier of a consumer participating in demand response remains responsible for any imbalances caused by the activation of demand response, even though they did not trigger the action. The supplier retains full balancing responsibility for the connection point, meaning demand response activation will result in an imbalance for the supplier/BRP.

As outlined above, these two models are strictly dealing with imbalances.

Once a Member State has identified its model, they can decide if and how to compensate any market party.

## 2

### Should a financial compensation mechanism be implemented, it should be proven not to create a barrier for demand response

There are various types of barriers that could result from a compensation mechanism, and which should be thoroughly assessed by Member States:

- **Anti-competitive requirements:**

Barriers may occur if the mechanism requires participating consumers or their aggregators to hand over sensitive information to their supplier (infringing article 17-3-C which requires to protect such information), or to have financial or information flows entangled with the supply contract (breaching article 13 which requires aggregation contract to be independent from supply contracts).

- **Unnecessary financial burdens on aggregators or suppliers**

Member States must ensure that any compensation mechanism they decide to implement does not create barriers to demand response, including through aggregation, in any market.

The compensation calculation method must be approved by NRA to ensure that the approach is transparent, fair, and consistent with market regulations.

If aggregators are expected to cover the costs incurred by the suppliers/BRPs of participating customers during demand response activation the compensation may factor in all systemic benefits induced by demand response, such as reduced system stress during peak times, improved grid stability, or lower generation costs. This ensures that the compensation only covers the actual net costs—the costs minus the benefits—incurred by the affected parties (net benefit approach).

## Energy sharing and local initiative (Articles 15a, 16 Electricity Directive; Art 22 Renewable Energy Directive)



NO TIME TO LOSE!

### APPLICABLE BY:

31 December 2020 (Citizen Energy Community) for the Electricity Directive



NO TIME TO LOSE!

### APPLICABLE BY:

30 June 2021 (Renewable Energy Community) for the Renewable Energy Directive



ON YOUR RADAR!

### APPLICABLE BY:

7 January 2025 (energy sharing) for the Electricity Directive



### OBJECTIVE:

Allow market participants to set up and engage in energy sharing schemes both inside and outside renewable and citizen energy communities.

## WHAT DOES THE LEGISLATION SAY?

- Energy sharing is defined as the self-consumption by active customers of renewable energy either generated or stored offsite or on sites between them by a facility they own, lease or rent in whole or in part, or the right to which has been transferred to them by another active customer for a price or free of charge.
- Member States shall ensure that all households, small enterprises and medium-sized enterprises, public bodies and, where a Member State has so decided, other categories of final customer have the right to participate in energy sharing as active customers in a non-discriminatory manner, within the same bidding zone or a more limited geographical area. Participation in energy sharing shall not constitute the primary commercial or professional activity of active customers engaged in energy sharing.
- Where other categories of final customer participating in energy sharing schemes are larger than small and medium-sized enterprises, the size of the installed capacity of the generation facility associated with the energy sharing scheme is to be a maximum of 6 MW and the energy sharing takes place within a local or limited geographical area.



## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

### 1 Member States to stimulate innovation in local energy initiatives, while clarifying overlaps and differences

With EU provisions set in 2019 and expanded in 2024, Member States have a large spectrum of opportunities to incentivise local energy initiatives, including:

- Citizens Energy Communities are bottom-up initiatives, similar to cooperatives, where citizens are the initiators and require the establishment of a legal entity;
- Renewable Energy Communities are local initiatives, with legal entity, that aim at generating renewable energy at local level to the benefit of the members of the community;
- Energy Sharing is a new right introduced in the latest revision of the Electricity Market Design, which can be applied either inside the context of Renewable Energy Communities or Citizen Energy Communities, or outside this legal construct, between two or more customers that decide to engage in this activity through a private agreement.

In light of its horizontal feature, this Implementation Guidebook will focus on the right of energy sharing.

### 2 Member States to prohibit clauses in electricity supply contracts foreseeing charges, fees or compensation mechanisms for consumers engaging in energy sharing

Member States must ban any financial penalty imposed by suppliers onto their customers who engage in energy sharing, as such penalties would discourage customers to engage in energy sharing. Suppliers might claim that such a penalty is justified on the grounds that consumers with energy sharing purchase less electricity that they would otherwise, which would lead to over-procurement. However, over-procurement can be avoided if suppliers are informed that their customers are engaging in energy schemes.

### 3 Member States should allow producers in energy sharing schemes to rely on 24/7 guarantees of origin to demonstrate that the electricity shared is renewable

As energy sharing requires that the electricity that is shared is coming from renewables, it is key to allow mechanisms guaranteeing that this is the case.

24/7 guarantees of origin are a tool that was developed and has proven to be successful to achieve this goal, hence Member States should allow energy sharing participants to rely on it when it is available. Reliance on this tool would also have an important information role for consumers, as it would allow them to understand where their energy is coming from. This, in turn, would grant more confidence in, and knowledge of, the electricity system as a whole.

Alternative mechanisms, such as meter-matching local generation with demand volumes, should be also contemplated.

## 4

**Where energy sharing takes place outside energy communities, Member States should allow participation of companies larger than small and medium enterprises**

Participation in energy sharing agreements concluded outside the legal framework of energy communities should be open to:

- households, including customers engaged in fixed-term, fixed price electricity contract;
- small and medium companies;
- companies larger than small and medium enterprises in energy sharing agreements.

Ensuring that large companies can engage in energy sharing would lead to higher potential for flexible electricity consumption that would reduce injection of excess generation into the grid – as electricity consumers with a higher peak load, such as commercial buildings, would be involved in the scheme. This would also reduce generation costs and hence consumer prices, because the installation of renewable energy technologies on larger premises is more efficient – as it is for example more efficient to install many solar panels on the rooftop of a warehouse than it is to install many solar panels scattered across many roofs.

This of course is without prejudice to the obligations set out by the Directive:

- Energy sharing does not constitute the primary commercial or professional activity of the companies larger than small and medium enterprises engaged in the energy sharing scheme;
- The size of the installed capacity of the generation facility associated with the energy sharing scheme is of a maximum of 6 MW;
- Energy sharing takes place within a local or limited geographical area, as defined by the Member State.

## WHAT DOES THE LEGISLATION SAY?

- Active customers may appoint a third party as an energy sharing organiser to provide support for managing and balancing behind-the-meter flexible loads, distributed renewable energy generation and storage facilities that are part of the relevant energy sharing arrangement.



## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

- 1 **Member States should allow customers in an energy sharing agreement, as well as renewable and citizen energy communities, to appoint an energy sharing organiser tasked to balance demand and supply within the scheme and to valorise the flexibility potential of the energy sharing schemes**

Member States, and in case NRAs defining technical specificities, should allow customers engaged in energy sharing schemes to appoint a market party as an energy sharing organiser.

Member States shall:

- Clearly define the role of the energy sharing organiser, which is to self-balance the behind the meter loads, distributed generation and storage assets in a flexible way. This will ensure that energy sharing truly empowers consumers and prosumers and optimises the use of deployed Decentralised Energy Resources to mitigate risks of local congestion, to the benefit of DSOs. The energy sharing organiser should be allowed to valorise the flexibility potential of those engaged in the energy sharing schemes by providing services to the grid, notably by being rewarded for offering the DSO a market-based solution to solve system flexibility challenges;
- Identify the market actors that can become energy sharing organisers. Given the above-role of valorising the flexibility potential of those engaged in energy sharing schemes, flexibility service providers, suppliers or third parties should be explicitly allowed to perform the role of an energy sharing organiser. Spin-off entities of System Operators shall not be allowed to perform this task.

- 2 **When applying geographic limitations to energy sharing, Member States should ensure that such limitations are not arbitrary, but related to the actual grid topology and constraints**

Some Member States impose geographical limitations to the participation of consumers to local initiatives. In Spain, for example, collective self-consumption can happen within a radius of 500 meters. This narrow geographic scope can make it challenging to establish an energy sharing scheme significantly benefits the local grid in solving congestion issues and/or in improving the operation of existing grids. While some geographic limitations may be necessary, these should be based on what makes sense in the context of the local grid topology, as opposed to an arbitrary limitation.

DSO should be required to provide information to identify relevant areas where energy sharing scheme would need to be set-up to solve identified local congestions within their distribution area.

- 3 **Member States should grant energy sharing organisers fair access to all electricity markets, so that they can stimulate and better reward consumers' flexibility**

Energy sharing organisers can act as aggregators of a pool of local assets that could be activated in different markets.



While NRAs should incentivise system operators to procure flexibility through market-based mechanisms, they should also ensure that energy sharing organisers can access these markets to valorise the flexibility of energy sharing schemes. This would allow them to provide benefits to the entire energy system by engaging in all available markets, including DSO's and TSO's markets and ancillary services, as well as wholesale markets.

## 4

**Member States should allow energy communities to delegate balancing responsibility to third parties**

As the level of complexity to act as a BRP may hinder the creation of energy communities, Member States should allow them to delegate the role of BRP to third parties, such as the energy sharing organiser if in place, participants' suppliers, aggregators, or other entities.

**WHAT DOES THE LEGISLATION SAY?**

- Active customers participating in energy sharing are entitled to have the shared electricity injected into the grid deducted from their total metered consumption within a time interval no longer than the imbalance settlement period and without prejudice to applicable non-discriminatory taxes, levies and cost-reflective network charges.
- Member States shall ensure that relevant transmission system operators or distribution system operators or other designated bodies monitor, collect, validate and communicate metering data related to the shared electricity with relevant final customers and market participants at least every month and put in place the appropriate IT systems.

**HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?**

## 1

**Member States should allow the validation and settlement of energy sharing agreements through data from dedicated measurement devices**

Data from dedicated measurement devices, such as those integrated into solar inverters (for generation) and heat pumps or electric vehicle charging stations (for consumption), provides greater granularity than smart meters data for settling services such as demand side flexibility and energy sharing. Member States and/or National Regulatory Authorities should require system operators to use this data for the settlement of energy sharing agreement, provided these devices meet the minimum metering requirements outlined in the Electricity Market Design, in particular article 7b of the Electricity Regulation. This approach avoids the need for consumers engaging in such schemes to request the installation of a sub-meter simply for this purpose, which would increase their network tariffs and reduce the benefits of participating into energy sharing.

## 2

**Member States should assess and implement cost-reflective network tariffs for energy sharing schemes**

While National Regulatory Authorities should implement cost-reflective network tariffs in general, as mandated already by the Electricity Market Design in 2019, Member States should ensure its application also for energy sharing schemes to reflect the actual impact on the grid, thus encouraging behaviours that optimise grid efficiency.

For instance, NRAs should assess both the costs and benefits of energy sharing, including related to congestion and renewable electricity curtailment. While energy benefits, such as avoided curtailment of renewables, are reflected in the reduced cost of supply, network benefits (e.g., reduced congestion) should also be captured in network tariffs. Based on this assessment, NRAs should design cost-reflective network tariffs, including when electricity is exported to the grid, and allow for the impact and benefits of energy sharing schemes on grid efficiency to be taken into account.

HOW TO IMPLEMENT EU LAWS  
TO ADDRESS BARRIER

# #6

Limited access  
and exchange of  
essential energy  
data

## • In this chapter...

# #6

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## Introduction

Demand-side flexibility relies heavily on data access and sharing as well as data-driven solutions.

As the energy system becomes increasingly decentralised and consumer-centric, the availability of real-time grid, market, and consumer data is crucial for consumers to adjust their consumption and generation patterns based on signals such as price fluctuations, grid conditions, or energy demand.

Facilitating the flow of data across the entire energy system—from system operators to the grid edge—supports new business models and flexibility-driven services, helping consumers to play an active role in the clean energy transition while enhancing system efficiency and reliability.

Yet, the currently limited framework for access and exchange of essential energy data presents a major obstacle to the seamless activation of demand-side flexibility.

This chapter is addressed to Member States, NRA, System Operators, Operators of market platforms, Administrators of metered data, Charging Point Operators and Manufacturers of decentralised energy resources.

It outlines recommendations for implementing the **Electricity Directive, the Electricity Regulation, the Renewable Energy Directive, the Energy Performance of Buildings Directive, and the Alternative Fuel Infrastructure Regulation**. These legislations set out requirements to enhance interoperable access and sharing of data across the energy system, which is crucial for enabling demand-side flexibility. The main provisions include:

- **Access and sharing of data by System Operators:** Transmission and Distribution System Operators (TSOs and DSOs) must provide third parties with data on network conditions, the share of renewable electricity, and the greenhouse gas content of electricity in their networks. This data supports demand-side flexibility business models by allowing consumers and aggregators to make informed choices and promotes efficient grid operation (Articles 50 and 57 of the Electricity Regulation and Article 20a of the Renewable Energy Directive).
- **Non-discriminatory and interoperable access to smart meter data:** If needed, third parties must have fair and secure access to smart meter data, ensuring that consumers can participate in flexibility services and energy markets (Articles 20, 23, 24, and 34 of the Electricity Directive).
- **Access to data from dedicated measurement devices:** The use of data from dedicated measurement devices enables consumers to activate their flexibility and participate in electricity markets by providing near real-time information into their energy use. This empowers consumers to offer flexibility through specific assets behind the meter such as storage facilities, EVs or heat pumps (Article 7b of the Electricity Regulation).
- **Access to data from building systems:** Building owners, tenants, and managers must have direct access to data from their building systems which include at least data related to energy performance, data related to heating systems, meters and measuring devices, building automation control systems and recharging points for EVs. They must have the ability to share this data with third parties, giving users full control over their energy usage and unlocking new opportunities for demand-side flexibility (Article 16 of the Energy Performance of Buildings Directive).
- **Access to electric vehicle (EV) data:** Transparent, relevant, and secure access to data from EVs is critical to realising the full potential of smart and bidirectional charging, enabling consumers to optimise their vehicle charging, while also supporting the energy system (Article 20 of the Alternative Fuel Infrastructure Regulation and Article 20a of the Renewable Energy Directive).

By implementing these provisions, the EU can foster a more flexible, consumer-driven energy system that maximizes the benefits of digitalization and supports the transition to a decarbonized future.

## Accessing and sharing transmission and distribution system operators' data (Art 50 and Art 57 Electricity Regulation, Art 20a Renewable Energy Directive)



NO TIME TO LOSE!

### APPLICABLE BY:

1 January 2020 for articles 50 and 57 of the Electricity Regulation, but by



### OBJECTIVE:

Set requirements on System Operators for open data exchange.



ACT NOW!

16 July 2024 for art 50 §4a (TSOs to inform on possibility of flexible connection agreements) and art 57 §3 (TSO-DSO cooperation on new capacity available)



ON YOUR RADAR!

### APPLICABLE BY:

21 May 2025 for the Renewable Energy Directive

## WHAT DOES THE LEGISLATION SAY?

- TSOs shall publish relevant data on aggregated forecast and actual demand, on availability and actual use of generation and load assets, on availability and use of the networks and interconnections, on balancing power and reserve capacity and on the availability of flexibility. For the availability and actual use of small generation and load assets, aggregated estimate data may be used.
- Market participants concerned shall provide the transmission system operators with the relevant data.
- Distribution system operators and transmission system operators shall cooperate with each other and exchange all necessary information and data:
  - regarding the performance of generation assets and demand side response;
  - regarding the daily operation of their networks;
  - with the view to ensure the cost-efficient, secure and reliable development and operation of their networks.
- If technically available, distribution system operators shall also make available to



market participants, anonymised and aggregated data on the potential for demand response and the renewable electricity generated and injected to the grid by self-consumers and renewable energy communities.

## HOW SHOULD SYSTEM OPERATORS IMPLEMENT THE PROVISION?

- 1 System Operators should strive towards using a single harmonised set of market interfaces for all their available wholesale, balancing and congestion markets, notably relying on the IEC 62325 series standards (CIM market model)**

Flexibility service providers and system operators need to exchange near real-time data, for example for the submission of flexibility bids. The use of a multitude of different data formats and market interfaces across Europe represents a significant barrier, as costs of complying with different formats to access different markets are high.

The adoption of the IEC 62325 series standards (CIM market model) is an example of a pragmatic solution to address this issue. It has been proven fit for purpose in several countries, as a commonly agreed standard to exchange information, targeting core business processes of electricity markets. For this reason Member States should recommend its adoption to system operators in their territories as the most appropriate standard. This is also in line with the recommendations on the implementation of article 20a of the Renewable Energy Directive, issued by the European Commission.<sup>9</sup> The standard should be used to cover market participant registration and prequalification, grid capacity allocation, forecasting, bidding and contracting, activation, clearing and settlement.

This data sharing requirement is linked to the essential interoperability requirements defined in the Data Act, facilitating participation in a European Data Space to develop new products and services (Article 33 Data Act, guidelines on RED III application).

The use of that standard should not hamper innovation for flexibility markets, notably for smaller companies that sell local flex without being active in other energy or flexibility markets and prefer a simpler API.

- 2 TSO and DSOs should rely on data from the flexibility register to comply with requirements on publication and sharing flexibility related data**

The upcoming network code on demand response prescribes the creation of Flexibility Registers or Flexibility Information Systems, which are data platforms having the purpose of storing information on registration, service provider qualification, product prequalification, product verification and grid prequalification for the provision of balancing and local services and to make available to entitled actors data for such participation.

<sup>9</sup> · Communication from the European Commission, Guidance on Article 20a on sector integration of renewable electricity of Directive (EU) 2018/2001 on the promotion of energy from renewable sources, as amended by Directive (EU) 2023/2413, available online at: [https://energy.ec.europa.eu/document/download/efcd200c-b9ae-4a9c-98ab-73b2fd281fcc\\_en?filename=C\\_2024\\_5041\\_1\\_EN\\_ACT\\_part1\\_v10.pdf](https://energy.ec.europa.eu/document/download/efcd200c-b9ae-4a9c-98ab-73b2fd281fcc_en?filename=C_2024_5041_1_EN_ACT_part1_v10.pdf)

TSOs and DSOs should rely on aggregated data from the flexibility register to comply with requirements in this Regulation on publication of flexibility related data and on sharing this data between TSOs and DSOs.

Until a flexibility register is available, DSOs should rely on data they collect at the moment they receive a request if it contains information about the connection load, or a notification of connection of renewable generation or flexible loads such as heat pumps or electric vehicle charging points.

## HOW SHOULD OPERATORS OF MARKET PLATFORMS IMPLEMENT THIS PROVISION?

**Operators of market platforms should provide TSOs and DSOs aggregated information on successful bids by flexibility service providers so that TSOs and DSOs can comply with requirements on publication and sharing of flexibility related data**

Operators of market platforms accessed by flexibility service providers have information of successful bids that would allow TSOs and DSOs to comply with requirements in article 50 and 57 on publication of data on actual use of decentralised assets and on their performance. To this end, they should share – according to data rights and cybersecurity standards - with TSOs and DSOs aggregated data on successful bids by flexibility service providers, so that they can comply with the requirements in legislation.

## HOW SHOULD NATIONAL REGULATORY AUTHORITIES IMPLEMENT THIS PROVISION?

**NRAs should develop guidelines for DSOs on collecting anonymised and aggregated data on DR and RES potential**

NRAs, in consultation with competent stakeholders, including data protection authorities, should adopt guidelines for DSOs on collecting the anonymised and aggregated data on the potential for demand response potential and renewable electricity generated and injected into the grid by self-consumers and renewable energy communities, and on making it available via digital means to the relevant actors.

## WHAT DOES THE LEGISLATION SAY?

- Member States shall require transmission system operators and, if data is available, distribution system operators to make available data on the share of renewable electricity and the greenhouse gas emissions content of the electricity supplied in each bidding zone, as accurately as possible in intervals equal to the market settlement frequency but of no more than one hour, with forecasting where available.
- This data shall be made available digitally and in a manner that ensures interoperability on the basis of harmonised data formats and standardised data





sets so that it can be used in a non-discriminatory manner by electricity market participants, aggregators, consumers and end-users, and that it can be read by electronic communication devices such as smart metering systems, electric vehicle recharging points, heating and cooling systems and building energy management systems.

## HOW SHOULD SYSTEM OPERATORS IMPLEMENT THIS PROVISION?

**TSO and DSO should make non-sensitive RES and GHG energy data easily accessible to stakeholders, market participants, and the public through a dedicated portal or through integration with existing information platforms**

The purpose of this provision is to provide real-time access to information on the GHG and renewable electricity available in the grid, allowing consumers to adjust their electricity usage to times when the share of renewable energy is high and clean.

Some TSOs already publish data on the share of renewable electricity used in each bidding zone, or even in smaller areas<sup>10</sup>, which is used by initiatives such as Electricity Maps<sup>11</sup>. DSOs should make the same data available for their area of operations.

TSOs and DSOs should integrate this data through dedicated portals or with their existing information platforms and ensure they can be accessed in a simple manner by market participants, using APIs.

Member States should encourage system operators to cooperate across Member States in the collaboration framework of the European Network of Systems Operators for electricity (ENTSO-E) and the association of European distribution system operators (EU DSO Entity) to ensure that cross-border flows are accounted for consistently across bidding zones.

This approach should be extended to include data on:

- Network constraints: this includes both historical and real-time data at primary and secondary substations, which will help flexibility providers identify opportunities, without undermining the security of network operations;
- System operators' ceiling price for paying for flexibility services, if set by System Operators for specific cases. If System Operators decide to set ceiling prices, this information should be public. This transparency allows potential market players to assess their appetite in engaging or not in some markets set by T/DSOs and allow them to evaluate the cost-effectiveness of their bids.

10 · See for example <https://energieopwek.nl/en/>

11 · Link: <https://app.electricitymaps.com/>

## Data management and interoperability requirements *Articles 23 and 24, Electricity Directive)*



NO TIME TO LOSE!

**APPLICABLE BY:**  
31 December 2020



**OBJECTIVE:** Establish data management and interoperability requirements on consumers' data.

### WHAT DOES THE LEGISLATION SAY?



- Member States shall specify the rules for management and access by third parties of data of the final customer, including metering and consumption data as well as data required for customer switching, demand response and other services. For this purpose, the Commission shall adopt Implementing Acts.
- Independently of the data management model applied in each Member State, the parties responsible for data management shall provide access to the data of the final customer to any eligible party, respecting security and privacy.
- Member States shall facilitate the full interoperability of energy services within the EU, based on upcoming Commission regulations on interoperability requirements and non-discriminatory and transparent procedures for access to data. Member States shall ensure that electricity undertakings apply the interoperability requirements and procedures for access to data. Those requirements and procedures shall be based on existing national practices.

### HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

**Member States should enable the development of interoperable data platforms in view of the establishment of a common European energy data space, to facilitate the provision of services in several countries at once**

Member States should implement in an harmonised way the Implementing Acts that have already been

finalised (i.e. on metering and consumption data) or will be drafted soon (i.e. on data for demand response).

In particular, where DSOs, TSOs or metered data administrators (where the DSO does not operate smart meters) have not yet developed platforms allowing consumers and third parties to access data that they store, Member States should require the creation of such data platforms. Although Member States should remain agnostic on the data management model adopted in each country (centralised vs decentralised), they should establish minimum requirements on what data should be included with which requirements (e.g. near real-time electricity consumption data from smart meters and from dedicated measurement devices, or data on congestion, wholesale and balancing markets) and on data quality.

To facilitate a single market for flexibility services across Europe, Member States should require that national data platforms are technically able to connect to a common European energy data space and, once the latter has been created, that they connect to it thanks to specific technical requirements for digital data exchange infrastructure, compliant with the EU Data Protection Regulation and allowing selective disclosure of information (to ensure compliance with the data minimisation principle, while ensuring protection of private data and privacy of data subjects).

The COSEM format should be used, which is specified by the IEC 62056 series of standards, as it can guarantee consistency between the data of the sub-meters and the data from the main meters. Furthermore, DLMS UA offers a certification program, which ensures the correct implementation of the standard.

## Smart meter data

(Articles 20, 23, 24 and 34 Electricity Directive)



NO TIME  
TO LOSE!

### APPLICABLE BY:

31 December 2020



**OBJECTIVE:** Establish functionalities of smart meters and regulating third party access to smart meter data.

## WHAT DOES THE LEGISLATION SAY?

- Member States shall ensure that all eligible parties have non-discriminatory access to smart meter data under clear and equal terms.
- Member States or the designated competent authorities shall specify the rules on the access to data of the final customer by eligible parties. Eligible parties shall have the requested data at their disposal in a non-discriminatory manner and simultaneously.
- No additional costs shall be charged to final customers for access to their data or for a request to make their data available. Member States or, where a Member State has so provided, the designated competent authorities shall ensure that any charges imposed by regulated entities that provide data services are reasonable and duly justified.



## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

1

Member States should ensure that eligible third parties have access to final customers' data under the final customers' explicit consent and in line with rules outlined in the Commission Implementing Regulation ((EU) 2023/1162) on interoperability requirements and non-discriminatory and transparent procedures for access to metering and consumption data

For the provision of their services, several actors in the electricity sector require access to data from their customers or their potential customers. This includes not only flexibility service providers, but also suppliers, comparison tools and a range of other actors. Member States should create a scheme in line with Regulation (EU) 2023/1162, creating clear roles and responsibilities for all stakeholders involved in the data access process (which include amongst others data access providers, metered data administrators), through which interested third parties should be able to request and obtain the final customer's explicit consent to access to their data.

## 2 Member States should consider requiring meter operators to ensure that data can be accessed by eligible parties through eIDAS credentials

In order to guarantee the identity of eligible parties in a cost-effective way, Member States should consider requiring that meter operators accept eIDAS 2.0 credentials. eIDAS is a EU initiative that supported the creation of a digital identity for citizens and business that is accepted in all EU countries. If a harmonised approach across the EU is adopted, eIDAS can reduce administrative and transaction burden for companies, by allowing companies to create one single digital identity which is recognised across the entire EU.

For this reason, Member States should consider requiring meter operators to accept this form of authentication.

## 3 Member States should support the security of data exchange by implementing the Network Code on Cybersecurity and by recommending the adoption of appropriate standards

To promote the resilience of electricity networks it is critical that exchanges among all assets, including distributed energy resources, are secured. The Network Code on Cybersecurity includes measures to address risks of cyberattacks, which Member States should require system operators to comply in relation with metering data. In addition, Member States should recommend the application of standards (such as ITU-T X.509, IEC 62443, IEC 62351, IETF RFC 8446) for end to end security of data exchanges.

The Common Energy Data Space should take into consideration the use of these standards to make the exchange of this information cybersecure.

# HOW SHOULD METERED DATA ADMINISTRATORS IMPLEMENT THIS PROVISION?

## 1 Member States should require metered data administrators to provide access to third parties to validated metered data by using a default CENELEC standard

Flexibility Service Providers need to be able to manage their customers' energy demand in line with the settlement periods in intraday markets. In the EU, this means that they need access to validated metered data in near-real time with the consumer consent (from 2" to 15min).

Validated metered data refers to the energy consumption or production data collected from meters (such as electricity, gas, or water meters) according to the 2014 Measuring Instruments Directive (MID) to ensure its accuracy, reliability and compliance.. The validation process checks for errors, inconsistencies, or anomalies in the raw data and corrects or flags any issues. Such validation processes should be harmonised across the EU.

To reduce compliance burden and costs to market participants active in several countries, Member States should consider requiring metered data administrators to rely on default CENELEC standards, such as EN

50491-11, EN 62056 series, EN 13757 series and EN16836, as referenced in the Commission Implementing Regulation (EU) 2023/1162 on interoperability requirements and non-discriminatory and transparent procedures for access to metering and consumption data.

## 2

**Member States should also ensure that smart meters allow consumers to access non-validated near-real time data**

Non-validated near-real-time data refers to energy consumption or production data that is collected and transmitted with minimal delay (often within seconds or minutes) but has not yet undergone the formal validation process. This type of data provides immediate insights into current energy usage but might contain errors, inconsistencies, or missing values because it hasn't been checked for accuracy or compliance with standards.

To facilitate consumers' engagement with flexibility and to support behind-the-meter self-optimisation, in line with recital 55 of the Electricity Directive, Member States should ensure that smart meters allow consumers to have near real-time access to their consumption data.

## Data from dedicated measurement devices (Article 7b Electricity Regulation)



ACT  
NOW!

**APPLICABLE BY:**  
16 July 2024



**OBJECTIVE:** Allow electricity undertakings to use data from dedicated measurement devices for settlement of demand response and flexibility services.

### WHAT DOES THE LEGISLATION SAY?

- In addition to other approaches to demonstrate flexibility activation, such as statistical approaches, sampling, virtual meters, etc, System Operators and relevant market participants, including independent aggregators, may use, upon the consent of the final customer, data from dedicated measurement devices for the observability and settlement of demand response and flexibility services.
- Where a final customer does not have a smart meter installed or where the smart meter of a final customer does not deliver the necessary data to provide demand response or flexibility services, System Operators shall accept the data from a dedicated measurement device for the settlement of demand response and flexibility services, and shall not discriminate against that final customer in their procurement of flexibility services.



### HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

1

**Member States should recommend TSOs and DSOs to accept data from dedicated measurement devices for the settlement of flexibility**

Dedicated measurement devices are related to a flexibility asset deployed by market parties - not by system operators - and they can empower consumers to provide flexibility through specific assets behind the meter, while also delivering a more precise and detailed measurement of consumers' flexibility.

DMDs can provide clean measurements of consumption and generation for a single metered asset, such as an EV, heat pump, etc. This contrasts with the view from the boundary smart meter, where the responses from separately metered assets are aggregated and hidden amongst other activities on the customer's site. Data from DMDs need to be proved of sufficient accuracy and reliability suitable for settlement as part of flexibility services.

Member States should recommend to accept data from approved DMDs as a way of harnessing consumers' flexibility, if the end consumer agrees. This eliminates the need to install separate additional meters, which would inevitably increase costs for consumers. The framework for utilization of DMDs should be implemented in an harmonised manner across the EU and in line with the Network Code on Demand Response.

## 2

**Member States should require data platforms to accept data also from DMDs**

It is crucial that necessary parties involved in flexibility transaction have access to data demonstrating that flexibility activation took place. To this end, data platforms should include both validated metered data from smart meters (at the same granularity as intraday market units) and, with the consent of the customer, also data from dedicated measurement devices.



## Exchange of buildings' data (Article 16 Energy Performance of Buildings Directive)



**APPLICABLE BY:**  
29 May 2026

ON YOUR  
RADAR!



Except §5 (implementing acts for interoperability)  
applicable by 31 December 2025



**OBJECTIVE:** Set requirements on access to data from building systems.

### WHAT DOES THE LEGISLATION SAY?

- Member States shall ensure that the building owners, tenants and managers have direct access to their building systems' data and can consent to making such data available to a third party, subject to the existing applicable rules and agreements.
- Among others, building systems' data shall include all readily available data related to the energy performance of building elements, the energy performance of building services and, where available, building automation and control systems, meters, measuring and control devices and recharging points for e-mobility.
- Where available, this data should be linked to the Digital Building Logbook.



### HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

- 1 **If smart meters and dedicated measurement devices are installed in buildings, Member States should foster the actual quantifications of buildings' energy and flexibility performance and share this data in interoperable digital platforms**

Both Energy Performance Certificates and Smart Readiness Indicators primarily include information based on estimates or qualitative assessments, rather than information based on the actual quantification of the buildings' energy performance.

Provided consumer's consent, data generated by smart meters and DMDs can be used to develop accurate quantifications of the energy and flexibility performance of a building.

Member States should enable, where smart meters and DMD are available, actual energy performance quantifications and data storage in future-proof digital platforms or Digital Building Logbooks, which can be local or national, but always capable of communicating with other platforms as part of a common European Energy Data Space.

## 2

## Member States should ensure third party access of measured buildings' data, if consent is given by the end customer and confidential data is excluded

Access to measured energy data from buildings, subject to relevant EU data protection and privacy legislation, is valuable for different stakeholders, including:

- **Consumers and Building Industry Stakeholders:** measured energy and flexibility performance of buildings would help consumers and prosumers make informed decisions about their building's energy use and smartness. This also applies to building owners, operators, developers, architects, consultants or energy managers;
- **System Operators and Flexibility Service Providers:** Accurate data on the flexibility of buildings will help these parties understand the flexibility potential of connected buildings which could be activated to provide system services, including congestion management and balancing;
- **Financial institutions:** Actual performance measurements allow better tracking of improvements in building renovations and easier linking with financial incentives.

## Electromobility Data (Article 20 Alternative Fuel Infrastructure Regulation and Article 20a Renewable Energy Directive)



ON YOUR  
RADAR!

### APPLICABLE BY:

14 April 2025 for the Alternative Fuel Infrastructure Regulation



Except §4 (data to be open and non-discriminatory) by 31 December 2024



Except 5 (establishment of a common European data point) by 31 December 2026



ON YOUR  
RADAR!

### APPLICABLE BY:

21 May 2025 for the Renewable Energy Directive



**OBJECTIVE:** Ensure access to data from publicly accessible recharging points and EVs.

## WHAT DOES THE LEGISLATION SAY?



- Charging Point Operators (CPOs) of publicly accessible recharging points should set up a common Application
- Programme Interface (API) to provide free and unrestricted access to data, including the geographic location of recharging points, type of current, maximum power output of the station and the point, vehicle type compatibility, bidirectional capability. It would also include dynamic data, such as the ad hoc price, and whether the energy supplied is 100% renewable.
- Member States shall adopt measures to require car manufactures to make available to third parties, in real-time, in-vehicle data related to the battery, including:
  - battery state of health;
  - battery state of charge;
  - battery power set point;
  - battery capacity;
  - where appropriate, the EV's location.
- Such data should be made available to EV owners and users and third parties acting on their behalf including electricity market participants and e-mobility service providers. This should be done under non-discriminatory terms and at no cost, in line with data protection rules.

## HOW SHOULD MEMBER STATES IMPLEMENT THIS PROVISION?

### 1 Member States shall set data access requirements differentiating between essential and secondary data

Flexibility service providers cannot conduct their businesses and activate a vehicle's flexibility without access to vehicle data from the manufacturers. However, data sharing can represent an additional cost for vehicle manufacturers. It is therefore necessary to differentiate between essential data, which is necessary for flexibility services, and secondary data, which may be beneficial for additional use cases but is not required for mandated flexibility functionality. Examples of secondary data include battery voltage, battery temperature, odometer reading, or the vehicle's location.

Such a differentiation can be informed by data included in the standard ISO 15118-20 which lists a set of data relevant for flexibility. Additionally, the German government shaped, together with stakeholders, two lists of data (technically essential data to provide bidirectional charging to customers and data necessary for the overall success of bidirectional charging), including responsible parties. Such lists (see below) can be used as a reference.

### • LIST 1: TECHNICAL DATA POINTS

Max. possible charging/discharging power of EV (AC and DC) when connected to the charging point [W]	EV
Max. possible charging/discharging current of the EV (AC and DC) when connected to the charging point [A]	EV
Min. possible charging/discharging current of the EV (AC and DC) when connected to the charging point [A]	EVSE
Min. possible charging/discharging power of the EV (AC and DC) when connected to the charging point [W]	EVSE
Present charging/discharging power [W]	EV
Present charging/discharging current [A]	EV
Max. charging/discharging power of the EVSE (AC and DC) when connected to the charging point [VA]	EVSE
Max. charging/discharging current of the EVSE (AC and DC) when connected to the charging point [A]	EVSE
DC + AC continuous/actual Power [W]	EVSE
DC + AC continuous/actual current [A]	EVSE
Time of planned departure [hh:mm]	EV/User

Current SoC [%]	EV
Available/chargeable energy till customer-defined minimum SoC [Wh]	EV
Available/chargeable energy till customer-defined maximum SoC [Wh]	EV
Available energy till battery min SoC of the EV [Wh] (from actual SoC till min SoC of battery)	EVSE
Required energy till target SoC [Wh]	EVSE
Energy till max. battery SoC [Wh]	EV
Location [address or GPS]	EV
Smart charging/bidirectional charging enabled [yes/no]	EVSE
EV is connected and available for bidirectional (dis-)charging	EVSE
UC-Mode [V2H/V2G] - static information (knowledge if there could be an injection into the grid)	EVSE
Specifications on limitations on bidirectional charging (e.g., virtual mileage)	EV
Current limitations on bidirectional charging (e.g., virtual mileage)	EV
Vehicle ID	EV
State of the grid from DSO for local grid congestion and from the necessity to redispatch with TSO	DSO/MPO
DSO grid tariffs	DSO
Flexibility service activation signal	FSP/DSO/TSO
Meter-ID/MaLo	User/DSO
Commodity price	User/Energy supplier

## • LIST 2: DATA POINTS FOR IMPROVED SERVICES

Current driving range of the EV [km]/[miles]	EV
Current location of the EV	EV
Available EV charging power over time [W]	EV
SoH [%]	EV
Steps in which charging can be controlled [A]	EV/EVSE
Start-up time of EV + reaction time of EVSE/HEMS/Aggregator	Learned/Provided
TSO Grid Tariffs	TSO

## HOW SHOULD CPOs AND MANUFACTURERS IMPLEMENT THIS PROVISION?

1

### Link the renewable energy supplied with the obligation for system operators to make available data on the share of renewable electricity in their network

CPOs should ensure that the data “100% renewable energy supplied” is based on actual proof that the energy is generated from renewable sources. CPOs shall then be able to access and rely on the data provided by system operators on the real-time share of renewable electricity available in the grid, as provided for in article 20a of the Renewable Energy Directive. Such data shall be made easily accessible to CPOs as recommended in the dedicated Chapter of this Implementation Guidebook.

When in place, 24/7 Guarantees of Origins should be used to also serve this goal.

2

### Ensure interoperability of data

Data should be interoperable and shared through an API . In this sense, data should rely on standards aligned with the SAREF (Smart Appliances Reference) ontology which ensures a common language for communication between distributed assets, including smart and bidirectional chargers.

In addition, shared data should preferably rely on best performing standards, for example:

- IEEE2030.5 and IEC 61850-7, Zigbee, EEBUS, KNX for the data flow between the charger and other distributed asset;
- IEEE 2030.5/IEC 61850-7/IEC 61850-90-8, IEC 62056 (DLMS/COSEM), OCPP for the data flow between the charger and System Operators;
- OpenADR for the data flow between the charger and the flexibility Service Provider.

This data sharing requirement is linked to the essential interoperability requirements defined in the Data Act, facilitating participation in a European Data Space to develop new products and services (Article 33).

HOW TO IMPLEMENT EU LAWS  
TO ADDRESS BARRIER

**#7**

**Poor valorisation  
of demand-side  
flexibility in planning  
and system-wide  
assessment**

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# #7

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## Introduction

Methodologies for cost-benefit analyses, energy and network planning must properly account for the benefits to the system of flexible consumers, prosumers and local energy initiatives.

At the moment, the lack of proper valuation of the benefits of demand-side flexibility in energy system planning, including network development plans, and system-wide assessments creates significant barriers to the effective use of decentralised energy resources and risks to omit or delay the establishment of market-based mechanisms to activate the flexibility from consumers.

An adequate valorisation of demand-side flexibility would contribute to a reduced total cost for the clean energy transition by offsetting unnecessary investments in stranded assets.

This chapter is addressed to **Member States, NRAs and System Operators**. It provides recommendations for implementing the **Electricity Directive, the Electricity Regulation and the Energy Efficiency Directive**. These legislations set out requirements to ensure the adequate valorisation of demand-side flexibility in system-wide assessment and planning. The main provisions address:

- **The application of the Energy Efficiency First principle:** This overarching principle ensures that investment, planning and policy decisions are contemplating demand-side solutions and prioritising the most cost-effective solutions that offer wider benefits to both the system and energy users (Articles 3 and 27 of the Energy Efficiency Directive).
- **Network planning and operation:** System operators are incentivised to operate their networks more efficiently by considering demand-side flexibility as an alternative to grid expansion. This approach can enhance congestion management and optimise existing grid resources (Article 18 of the Electricity Regulation, articles 32 and 51 of the Electricity Directive and article 27 of the Energy Efficiency Directive).
- **Resource adequacy assessment:** This assessment is critical for determining whether sufficient generation capacity exist to meet future electricity demand across Europe. It identifies concerns about potential scarcity of supply,. Robust resource adequacy assessments must fully account for all resources, including from the demand side (Article 20 of the Electricity Regulation).
- **Assessment of flexibility needs and the national objective for demand-response and storage:** This plays a key role for promoting demand-side flexibility to achieve security and resilience while supporting decarbonisation and the integration of variable renewable energy sources (Articles 19e and 19f of the Electricity Regulation).
- **Coordination between local and regional authorities with system operators:** Effective coordination between local authorities and network operators is key to creating an integrated energy system that enhances overall efficiency (Article 15 of the Renewable Energy Directive).
- **Mapping of areas for the deployment of renewable energy areas:** Considering the contribution of demand-side flexibility when mapping areas for the deployment of renewable energy can support their cost-effective integration into the energy system (Article 15b Renewable Energy Directive).

These recommendations are essential for advancing the energy transition and ultimately creating a more cost-effective energy system.

# Energy Efficiency First Principle

## (Articles 3 and 27 of the Energy Efficiency Directive)



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**APPLICABLE BY:**  
11 October 2025



**OBJECTIVE:** Take into account energy efficiency and demand-side solutions when taking investment decisions.

## WHAT DOES THE LEGISLATION SAY?



- 'Energy efficiency first' means taking utmost account in energy planning, in policy and investment decisions of alternative cost-efficient energy efficiency measures to make energy demand and energy supply more efficient, in particular by means of cost-effective end-use energy savings, demand response initiatives and more efficient conversion, transmission and distribution of energy.
- The energy efficiency first principle needs to be consistently applied by national, regional, local and sectoral decision makers in all relevant scenarios and policy, planning and major investment decisions – that is to say large-scale investments with a value of more than EUR 100 000 000 each or EUR 175 000 000 for transport infrastructure projects – affecting energy consumption or supply.
- The principle is horizontal and needs to be applied across the energy system including building and transport sectors.
- Member States shall ensure that the competent authorities monitor the application of the energy efficiency first principle. Member States shall identify such competent authorities.
- When applying the Energy Efficiency First principle, Member States shall:
  - make publicly available cost-benefit methodologies to assess the wider benefits of energy efficiency solutions, where cost-benefit analyses are required;
  - report to the Commission as part of their National Energy and Climate Plans, on how the principle has been taken into account. It shall include a list of actions taken to remove any types of barriers to the implementation of the this principle and of demand-side solutions, including the identification of legislation and measures contrary to the principle.
- NRA shall apply the energy efficiency first principle, regarding their decisions on the operation of electricity infrastructure, including their decisions on network tariffs. Member States shall ensure that System Operators apply the Energy Efficiency First principle in their network planning, network development and investment decisions.

## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

1

### Member States shall define a robust CBA to apply the Energy Efficiency First principle systematically and duly assess the benefits from flexible demand

A robust application of the Energy Efficiency First principle requires running a cost-benefit analysis (CBA) to decide which planning, policy and investment decisions can support best a cost-efficient energy system.

As suggested by the Commission guidance on the Energy Efficiency First principle, Member States shall develop CBA or request publicly owned or regulated entities such as system operators to run CBA that look into wider economic, social and environmental impact of the different solutions, including energy efficiency and demand-side flexibility solutions:

- Economic benefits should include, among others, enhanced energy security, energy savings, reduction in grid expenditures, energy system integration, job creation and stimulation of business innovation and industrial competitiveness;
- Social benefits should include, among other, savings on energy bills, improved indoor comfort or alleviation of energy poverty;
- Environmental benefits should include, among other, reductions in greenhouse gas emissions, by either reducing demand which in turn reduces the need for energy production by fossil fuel generation or by shifting demand, allowing more renewables to be integrated in the system.

As such, the CBA should ensure that the Energy Efficiency First principle help increase the efficiency of both individual end-use sectors and of the whole energy system.

In line with the Commission guidance on the Energy Efficiency First principle, the CBA should give priority to demand-side flexibility solutions that are more cost-effective than investments in energy supply and infrastructure in meeting policy objectives.

Provided existing barriers, as described in the previous Chapters, are lifted, demand-side flexibility delivers broader economic, environmental, and societal benefits, including increased efficiency of the energy system, reduced system operation costs, decreased need for grid reinforcement, lower energy market prices, improved energy security, and lower greenhouse gas emissions—all contributing to reduced costs for consumers<sup>12</sup>. Member States should ensure these benefits are fully considered in the CBA and contemplate smart solutions to enhance the efficiency of the integrated energy system.

The CBA methodology should be made publicly available and created in consultation with stakeholders. The CBA process must be conducted transparently, ensuring that all stakeholders have access to relevant information about the options considered and can actively participate in decision-making.

2

### Member States shall explicitly designate an independent authority to monitor the application of the Energy Efficiency First principle

This authority could be the NRA or a cross-ministerial entity, provided it is given similar guarantees of independence. The designated authority must have a specific and explicit mandate to carry out a monitoring role on the application of the principle and the adequate use of a solid CBA before any investment decision,

<sup>12</sup> · smartEn quantified the benefits of full activation of flexible demand in the EU in 20230, available here <https://smarten.eu/demand-side-flexibility-quantification-of-benefits-in-the-eu/>

along with sufficient powers (such as the ability to conduct investigations and audits) and resources (including adequate staff and budget) to fulfil its responsibilities effectively.

This authority should also be responsible for reviewing CBA regularly to adjust and improve its application in line with the Energy Efficiency First principle.

### **3 Member States shall pay particular attention that system operators apply the Energy Efficiency First principle in their network development and investment decisions**

The designated authority for the monitoring of the principle shall verify that system operators take in due account non-wire alternatives in the long-term network development plans and in any investment decision, as further described in the recommendations set out in this chapter related to Network Planning.

### **4 Member States should ensure the horizontal application of the Energy Efficiency First principle across sectors**

In light of the EU system integration strategy and the forthcoming Electrification Action Plan, Member States should apply the Energy Efficiency First principle across sectors, where there is a use of energy and where a flexible use of that energy would contribute to an efficient operation of the energy system.

As mentioned in the Commission Guidance, the following demand-side flexibility options should be considered as they contribute to increase the overall system efficiency:

- Smart electrification of industries through the flexible operation of their industrial processes;
- Grid-integrated Energy Management Systems in buildings or flex-ready assets behind the meter to increase the flex-readiness of buildings;
- Smart and bidirectional charging of electric vehicles to transform light and heavy duty vehicles in smart energy assets.

### **5 Member States shall incentivise the application of the Energy Efficiency First Principle in investment decisions made by private entities**

The application of the Energy Efficiency First principle should extend beyond publicly owned entities and regulated sectors like networks. Member States must provide appropriate incentives to encourage its adoption by private entities, both in energy sectors (e.g. generators, suppliers, aggregators) and non-energy sectors that consume and depend on energy for their operations (e.g. buildings, EVs, industries). This will motivate private entities, which typically focus on their financial interests, to consider cost-efficient alternative measures in their investment decisions, taking into account the broader societal, economic, and environmental benefits.

### **6 Member States shall not limit the implementation of the Energy Efficiency First principle to large-scale investments**

The application of the Energy Efficiency First principle should not be limited only to major investment decisions as in the prescribed thresholds. Alternative demand-side solutions should be considered for any type of planning, policy and investment decisions to unlock the potential of small-scale assets and decentralised energy resources to make energy demand and energy supply more cost-efficient, as recommended in the Commission guidance on the application of the Energy Efficiency First principle<sup>13</sup>.

## Network planning and operation *(Article 18 of the Electricity Regulation, articles 32 and 51 of the Electricity Directive and article 27 of the Energy Efficiency Directive)*



NO TIME  
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**APPLICABLE BY:**

1 December 2020  
for the Electricity Directive



ACT  
NOW!

**APPLICABLE BY:**

6 July 2024  
for the Electricity Regulation



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**APPLICABLE BY:**

11 October 2025  
for the Energy Efficiency Directive



**OBJECTIVE:** Incentivise system operators to operate their network more efficiently and ensure demand-side flexibility is considered as an alternative to grid expansion in network planning.

## WHAT DOES THE LEGISLATION SAY?

- NRAs shall verify that methodologies used by System Operators assess alternatives in the cost-benefit analysis and take into account the wider benefits of energy efficiency solutions, demand-side flexibility and investment into assets that contribute to climate change mitigation.
- NRAs may provide methodologies and guidance on how to assess alternatives in the cost-benefit analysis.
- Member States shall ensure that system operators improve energy efficiency in infrastructure design and operation, especially in terms of smart grid deployment. Innovative solutions shall be sought to improve the efficiency of the network through notably incentive-based solutions.
- Transmission and distribution tariff methodologies shall provide incentives to system operators for the most cost-efficient operation and development of their networks including through the procurement of services.



- Tariff methodologies shall reflect the fixed costs of system operators and shall consider both capital and operational expenditure to provide appropriate incentives to system operators to increase efficiencies.
- NRAs shall recognise relevant costs as eligible for cost recovery, including costs related to anticipatory investment, and shall, where appropriate, introduce performance targets in order to provide incentives to transmission system operators and distribution system operators to increase overall system efficiency in their networks, including through energy efficiency, the use of flexibility services and the development of smart grids and intelligent metering systems.

**At transmission level:**

- At least every 2 years, TSO shall publish on their website and submit to the NRA a ten-year network development plan based on existing and forecast supply and demand, including investment decisions, after having consulted all the relevant stakeholders.
- When developing the ten-year network development plan, the TSO shall take into account the potential use of demand response, storage or other resources as alternative to grid expansion.
- NRA to monitor and evaluate the implementation of the ten-year network development plan.

**At distribution level:**

- DSO shall submit to the NRA at least every two years their network development plan, after consulting TSOs and all relevant system users.
- Distribution network development plan shall:
  - provide transparency on the medium and long-term flexibility services needed and shall set out the planned investments for the next five to ten years, with particular emphasis on the main distribution infrastructure which is required in order to connect new generation capacity and new loads, including recharging points for electric vehicles;
  - include the use of demand response, energy efficiency, energy storage facilities or other resources that the distribution system operator is to use as an alternative to system expansion.

## HOW SHOULD NRA IMPLEMENT THE PROVISION?

- 1 NRAs should approve network development plans only if a comprehensive cost-benefit analysis (CBA) has been conducted, explicitly considering demand-side flexibility as an alternative to grid expansion**

NRAs should be responsible for ensuring that the system operators' proposals for network development plan follow a thorough CBA that considers demand-side flexibility as an alternative to grid expansion. No approval should be granted if the CBA has not been completed and incorporated into the final draft of the network development plan. Additionally, NRAs must consult stakeholders on the proposed network development plans and integrate their feedback accordingly.

- 2 NRA to ensure that the remuneration of system operators incentivises the adoption of non-wire alternatives.**

Currently, many network operators benefit from a cost-recovery structure that favours capital investments, such as building new infrastructure, over procuring flexibility services. This bias toward CAPEX-based remuneration often drives system operators to prioritise grid expansion in their network planning. To promote a more balanced and cost-effective approach, NRA should implement a Total Expenditure (TOTEX) model that considers equally both capital (CAPEX) and operational (OPEX) costs as eligible for recovery, even for anticipatory investments.

Under the TOTEX model, OPEX costs should include costs associated with the smart and efficient operation of the grid, such as digitalisation, data processing, and flexibility procurement, including the establishment of local flexibility markets. This encourages network operators to consider non-wire alternatives like demand-side flexibility and energy storage, rather than defaulting to costly infrastructure expansion when this can be cost-effectively replaced by non-wire alternatives.

The TOTEX approach should be complemented by performance targets set by the NRA and linked to financial incentives. These incentives should encourage system operators to prioritise cost-effective solutions and improve efficiency of their operations. Incentive-based remuneration should be tied to specific performance metrics, such as increased efficiency, greater integration of renewables, adoption of flexibility services, and reduced overall system costs, rather than simply rewarding higher capital spending. This ensures that grid planning incorporates smarter, more efficient solutions rather than relying solely on conventional grid expansion.

## HOW SHOULD SYSTEM OPERATORS IMPLEMENT THE PROVISION?

- When planning their network, system operators should run a thorough CBA that assesses non-wire alternatives**

Current assessments conducted by system operators for their network planning tend to have conservative calculations of the flexibility that could be provided by consumers connected to both TSO and DSO networks as an alternative to grid expansion. This leads to an overestimation of the necessity for grid reinforcement.

In line with the Energy Efficiency First principle, system operators should consider and evaluate alternatives to grid expansion, including the procurement of flexibility services. This approach should be clearly defined and understood as a viable option and integrated into network planning as an essential part of the process.

As such, system operators should perform a CBA to decide on which investments are needed in the short-,

medium- and long-term, weighing equally the utilisation of non-wire solutions (OPEX) and grid reinforcement (CAPEX). This CBA should take into account the wider economic, social and environmental benefits, in line with the recommendations set forth in the initial pages of this chapter.

The CBA should take into account the speed at which each solution can be implemented, the value of keeping options open longer, and the potential impact of additional costs on consumers. Having a CBA would require system operators to duly justify when grid expansion is chosen over non-wire alternatives.

The CBA should be carried out in a transparent way, allowing all stakeholders to have access to relevant and non-confidential information about current and forecasted grid congestions as well as assumptions made on demand, generation and expected flexibilities, and be made aware of all options contemplated and be able to propose alternatives to grid expansion.

## HOW SHOULD TSO IMPLEMENT THE PROVISION?

### 1 TSO to establish clear metrics and performance targets in their ten-year network development plan

In addition to the recommendation to establish a thorough CBA, TSOs must establish clear metrics to benchmark the correct implementation of the ten-year network development plan. They should establish KPIs to ensure that their ten-year network development plan support a more cost-efficient energy system. The following metrics should be used:

- Integration of demand-side resources and percentage of flexibility services used;
- Impacts of flexibility services on grid reliability, operational efficiency and cost-efficiency, looking in particular at avoided grid investments and reductions in congestion costs;
- Carbon reduction to align infrastructure projects with the EU's decarbonisation objectives.

These metrics will promote transparency, accountability, and alignment with both cost-efficiency and sustainability goals.

### 2 TSO to regularly report on progress

TSOs should provide regular progress reports on the integration of demand-side flexibility resources into network development plans, including data on carbon savings, cost savings, and reliability improvements.

## HOW SHOULD DSO IMPLEMENT THE PROVISION?

### 1 When planning their network development, DSOs shall consider the use of demand-side flexibility for meeting the needs of their networks

DSO must consider using demand-side flexibility in the following situations if it is cost-effective for system users and maintains secure and efficient system operation:

- To alleviate or delay the need for grid reinforcement or expansion;
- To address congestion or voltage issues until a planned grid reinforcement is completed.



Regarding the use of demand-side flexibility, Distribution Network Development Plan (DNDP) must include:

- An assessment by the DSO of current and future needs for demand-side flexibility to address congestion or voltage issues;
- A description of how the cost-effectiveness of demand-side flexibility is evaluated, including the methodology, criteria, data, assumptions, and results;
- Information on the medium- and long-term need for demand-side flexibility based on the above assessments and the proposed system development. This information should be as detailed as possible, in terms of location and timing, to help system users understand if these needs are relevant to them;
- Information on the planned construction of new buildings or renovation of existing ones as well as deployment of electric vehicle (EV) charging infrastructure in their network development plans, in accordance with Articles 14 and 15 of the Alternative Fuel Infrastructure Regulation. This integration will ensure that the necessary infrastructure to support the increasing use of EVs is effectively planned and aligned with the overall network strategy, including their role as potential flexibility resources.

When considering demand-side flexibility as an alternative to grid expansion, DSOs should ensure that such services are procured through a market-based approach, in line with chapter 1 of this Implementation Guidebook. This increases transparency, competition, and fairness while avoiding “out-of-market” flexibility arrangements, such as proprietary Active Network Management systems that can limit the use of flexibility at all voltage levels.

Additionally, Flexible connection agreements should only be utilised as an alternative to grid expansion only if market-based procurement fails to meet the system needs. These agreements must be implemented as a last resort<sup>14</sup>.

## 2 DSOs to consult stakeholders on the network development plans

Some DSOs are not used at interacting with other stakeholders in a collaborative facet. DSOs must consult early in the process the local authorities affected by their distribution area and all relevant system users, including energy consumers, demand response providers, and energy storage operators, when developing their network plans. They should also consult neighbouring DSOs and TSOs as flexible resources could be shared, when needed, following market-based activations.

This ensures transparency and takes into account the perspectives of those directly affected by grid development decisions.

<sup>14</sup> - More detailed recommendations on the implementation of Flexible Connection Agreements can be found in chapter 3 of the Implementation Guidebook.

## Resource adequacy assessment (Article 20 of the Electricity Regulation)



NO TIME  
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### APPLICABLE BY:

1 January 2020



**OBJECTIVE:** ensure appropriate resource adequacy assessment that consider and incentivise the contribution of demand-side flexibility.

## WHAT DOES THE LEGISLATION SAY?

- Member States shall monitor resource adequacy in their territory based on the European Resource Adequacy Assessment (ERAA). Member States may also carry out national resource adequacy assessments.
- Where a resource adequacy concern has been identified, Member States shall identify any market failure or regulatory distortion that caused it.



Member States with identified resource adequacy concerns shall develop and publish an implementation plan with a timeline for adopting measures to eliminate any identified regulatory distortions or market failures as a part of the State aid process. Member States shall particularly consider, inter alia:

- removing price caps;
  - removing regulatory distortion;s
  - enabling self-generation, energy storage, demand side measures and energy efficiency by adopting measures to eliminate any identified regulatory distortions;
  - removing regulated prices;
  - ensuring cost-efficient and market-based procurement of balancing and ancillary services;
  - introducing a shortage pricing function for balancing energy.
- Member States concerned shall submit their implementation plans to the Commission for review.

## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

1

### Member States shall complement the European Resource Adequacy Assessment to fully account for Demand-Side Flexibility

Resource Adequacy Assessments are critical for determining whether there is sufficient generation capacity to meet future electricity demand across Europe. To ensure robust resource adequacy assessments, it is necessary to fully account for all resources, including demand-side flexibility.

The European Resource Adequacy Assessment (ERAA) identifies potential concerns about electricity resource adequacy across the EU and provides an objective framework for assessing the need for additional national measures (e.g. capacity mechanisms) to ensure resource adequacy.

Member States should complement ERAA, which currently underrepresents the contribution of demand-side flexibility in ensuring resource adequacy, although progress has been achieved since the first ERAA effort in 2022. This requires accurately quantifying the contributions of demand management solutions, distributed generation, and decentralised energy storage in the resource adequacy methodologies, by taking into consideration the following features:

- **Incorporate All Flexibility Assets and Market Participants:** National assessments should consider distributed flexibility assets from all end-use sectors. Current modelling efforts tend to focus on industrial flexibility, while the significant potential in the building and transport sectors is often underestimated. Proper evaluation of these sectors is essential to unlocking the highest potential for distributed flexibility;
- **Assess the Full Range of Flexibility Services and value streams accessible for demand-side flexibility:** The adequacy assessment should include all forms of demand-side flexibility, such as load reduction, load shifting, peak shaving, and ancillary services, all of which contribute to system adequacy. Failure to consider these services in modelling excludes a significant incentive for consumers and prosumers to invest in and provide flexibility;
- **Evaluate the Impact of Market Expansion:** Member States should examine the effects of allowing demand-side flexibility to participate in all electricity markets by removing existing barriers, as outlined in chapter 2 of the implementation guidebook. This would incentivise the adoption of measures to activate demand-side resources and support their integration into the energy system;
- **Recognise Benefits to All End-Users:** demand-side flexibility can bring value not only to the overall system but also to individual end-users, whether they actively participate or not. Methodologies and resource adequacy assessment should take into account the benefits to all end-users as a driver for demand-side flexibility activation.

By considering these aspects in the definition of Resource Adequacy Assessments, Member States will duly valorise the contribution of decentralised energy resources and their market-based activation to strengthen national resource adequacy in a cost-effective way, in line with the application of Energy Efficiency First principle.

2

### Member States shall undertake proper consultations of stakeholders when carrying out their national resource adequacy assessment

Before issuing their national resource adequacy assessment, Member States shall consult stakeholders on the underlying assumptions of the model. Stakeholders feedback must be duly taken into consideration and the final national resource adequacy assessment shall be made public with data made easily accessible.

# Assessment of flexibility needs and national objective for demand-response and storage

(Articles 19e and 19f of the Electricity Regulation)



ON YOUR  
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**APPLICABLE BY:**

17 July 2026 for the national assessment of flexibility needs



ON YOUR  
RADAR!

**APPLICABLE BY:**

17 January 2027 for the indicative national objective for demand-response and storage



**OBJECTIVE:** Assess the flexibility needs of the electricity system and foster flexibility solutions by setting an indicative national target for non-fossil flexibility, including demand-response and storage.

## WHAT DOES THE LEGISLATION SAY?

- Every two years, the NRA shall adopt a report on the estimated flexibility needs for a period of at least the next 5 to 10 years at national level, to cost effectively achieve security and reliability of supply and decarbonise the electricity system, taking into account the integration of variable renewable energy sources, and the different sectors, as well as the interconnected nature of the electricity market, including interconnection targets and potential availability of cross-border flexibility.
- The report shall:
  - be consistent with the European Resource Adequacy Assessment;
  - be based on data from national system operators.
- Member States can decide to designate the TSO or another entity to adopt the report, but the NRA shall approve or amend the report.
- The national report shall at least:
  - evaluate the different types of flexibility needs, at least on a seasonal, daily and hourly basis, to integrate electricity generated from renewable sources in the electricity system and, inter alia, different assumptions in respect to electricity market prices, generation and demand;
  - consider the potential of non-fossil flexibility resources such as demand response and energy storage, including aggregation and interconnection, to fulfil the flexibility needs, both at transmission and distribution levels;
  - evaluate the barriers for flexibility in the market and propose relevant mitigation measures



and incentives, including the removal of regulatory barriers and possible improvements to markets and system operation services or products;

- evaluate the contribution of digitalisation of electricity transmission and distribution networks;
- take into account sources of flexibility that are expected to be available in other Member States.

- The methodology and data used for the assessment of flexibility needs is defined at European level by ENTSO-E and EUDSO and is approved by ACER. Where duly justified, the NRA may request system operators to provide additional input to the report.

## HOW SHOULD NRA IMPLEMENT THE PROVISION?

### 1 NRA shall ensure that the system flexibility assessment addresses all systemic challenges

While the methodology and the type of data and format needed for assessing the national flexibility needs are defined at European level, NRA should ensure that such assessment covers all systemic challenges related to the increased variability in the system, including at generation, infrastructures and demand side to cost-effectively achieve security and reliability of supply and decarbonise the electricity system, taking into account the integration of variable renewable energy sources and the different sectors.

It should not be limited to assessing flexibility needs as occurring only when the power system is not able to cover variability and availability, as it would limit flexibility assessments only for last resort situations.

The assessment should be specific, quantifiable and covering all durations (from daily to seasonal system flexibility needs).

### 2 NRA shall consider the contribution of all distributed flexibility assets from all end-use sectors

When assessing the contribution of flexibility resources to meet the system flexibility needs, NRA should consult stakeholders to ensure it takes into account all distributed flexibility from all end-use sectors such as EVs, heat pumps, batteries, decentralised renewable energy resources, district self-balancing and other energy smart devices and energy management system in buildings and industries.

The assessment should take into consideration the flexibility already on the ground. It should not only consider what needs to be installed to deal with future constraints for the next 5 to 10 years.

### 3 NRA shall incentivise demand-side flexibility to meet the identified system flexibility needs in line with the Energy Efficiency First Principle

Based on the identified system flexibility needs, investment decision can be justified.

The NRA report should be used to determine which investments should be prioritised to address the system flexibility needs. In line with the Energy Efficiency First principle, priority should be given to demand-side flexibility solutions when they are more cost-effective for meeting the flexibility needs (than investments in energy supply and grid infrastructure), notably to support daily and weekly system flexibility needs.

In their report, NRA shall evaluate the barriers for demand-side flexibility in the market and propose relevant mitigation measures and incentives, including the removal of regulatory barriers and possible improvements to markets and system operation services or products<sup>15</sup>. The lifting of this barriers should be linked to the activation of specific volumes of flexible demand resources, which should form the foundation of the national objective for demand response and storage.

## HOW SHOULD SYSTEM OPERATORS IMPLEMENT THE PROVISION?

### 1 System operators should make data used for the national flexibility assessment of flexibility needs accessible and consult stakeholders

This transparency will enable more accurate modelling of flexibility needs, foster collaboration among stakeholders, and help identify and address flexibility challenges, ultimately leading to more effective solutions.

By consulting stakeholders, transmission system operators (TSOs) and distribution system operators (DSOs) can improve the data submitted to the national regulatory authority (NRA) for the assessment of flexibility needs. Given that system operators lack full visibility into all flexibility resources and their potential—especially as many barriers to procuring these resources still exist—input from market actors is essential for a comprehensive and informed assessment that accurately assesses the potential of demand-side flexibility resources to fulfil the flexibility needs.

### 2 Enhance synergies between the assessment of system flexibility needs, network development plans and resource adequacy assessments

System operators should ensure that flexibility needs assessments are closely integrated with network development plans and resource adequacy assessments. This alignment will help identify opportunities where flexibility solutions can reduce or defer infrastructure investments, optimise grid performance, and enhance system resilience. By considering both flexibility requirements and grid development in a coordinated manner, system operators can achieve a more cost-effective and efficient energy system.

## WHAT DOES THE LEGISLATION SAY?

- Based on the report on national flexibility needs from NRAs, each Member State shall define an indicative national objective for non-fossil flexibility, including the contribution of energy storage and demand response. This objective may be achieved via the removal of identified market barriers or via the non-fossil flexibility support schemes.
- Such an objective shall be reflected in the Member States' National Energy and Climate Plans and their affiliated progress reports.



<sup>15</sup> · or example, this would require the removal of barriers to the market-based procurement of flexibility by system operators and to the non-discriminatory participation of all decentralised energy resources in all electricity markets and mechanisms, as outlined in chapters 1 and 2 of this implementation guidebook respectively.

## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

### 1 Member States shall clearly define national objectives for demand response and distributed storage

In their national objective, Member States should clearly define non-fossil flexibility and specify the types of resources covered. The definition must at least include:

- Energy storage from all technologies, including behind-the-meter storage such as stationary batteries and electric vehicles offering both smart and bidirectional charging;
- Demand response from all types of assets (e.g., HVAC systems, heat pumps, smart appliances) and across all sectors (industry, buildings, transport, etc.).

The national objective for non-fossil flexibility should prioritise demand-side flexibility solutions that have been identified as more cost-effective by the NRA, in particular for meeting the flexibility needs across the different timeframe: seasonal, daily and hourly basis<sup>16</sup>. As one of the largest increase in system flexibility needs will likely occur in the daily timeframe, where decentralised energy resources can play a crucial role, the national objectives for demand response and distributed storage should be particularly to support this urgent systemic challenge, but involving, empowering and rewording consumers.

### 2 Operationalise the national objective through concrete measures

The national objective for non-fossil flexibility, including distributed energy storage and demand response, should be accompanied by concrete measures to ensure its delivery.

To include cost-efficient flexibilities from often overlooked solutions, Member States should take specific actions to promote the development and investment in demand-side flexibility solutions such as:

- Removing market and regulatory barriers to demand-side flexibility. This should be prioritized as the primary approach to achieving the national objective for non-fossil flexibility, regardless of whether flexibility support schemes are in place. The existence of support schemes should not hinder efforts to remove these barriers.
- Developing incentives for demand-side flexibility solutions. This can include flexibility support schemes, tax incentives, or support for research and development to encourage investment in these technologies.

### 3 Member States should report on the progress toward achieving the non-fossil flexibility objective and consult stakeholders regarding both the successes and challenges encountered.

If the national objective for non-fossil flexibility is not met, Member States should consult stakeholders on the barriers demand-side flexibility faces. If not met, following this consultation, Member States should publish a report outlining these barriers and present an action plan for their removal.

16 · By 2030, Europe's electricity system will require more than double the current level of flexibility resources to meet evolving demands. The need for flexibility is projected to rise significantly—2.4 times on a daily basis, 1.8 times on a weekly basis, and 1.3 times annually—compared to 2021 levels, source: [ACER/EEA, Flexibility solutions to support a decarbonised and secure EU electricity system, October 2023](#)

## Coordination between local and regional authorities and system operators

(Article 15 of the Renewable Energy Directive)



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### APPLICABLE BY:

21 May 2025



**OBJECTIVE:** Improve coordination between local and regional administrative bodies and network operators when planning demand-response programmes, self-consumption and renewable energy communities.

## WHAT DOES THE LEGISLATION SAY?

- Member States shall encourage local and regional authorities to consult with network operators when planning demand response programs and developing provisions for renewable self-consumption and renewable energy communities. This consultation should ensure that the impact of such plans is accurately reflected in the network operators' infrastructure development plans.



## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

1

### Member States shall establish communication procedures between local and regional authorities and system operators

To facilitate this, Member States should mandate both local and regional authorities and system operators to designate a specific correspondent responsible for communicating on local energy developments (including both generation and consumption) that might impact the stability of the grid and the reduction of greenhouse gas emissions.

This communication should cover both generation and demand projects, including construction of new buildings, electrification of fleets, establishment of energy communities.

All involved parties should ensure that these developments aim at increasing the flexibility of consumers and offer opportunities for system operators to support the efficient operation of the grid, instead of creating bottlenecks, congestions and unexpected new loads.



2

## Member States to provide trainings to local and regional authorities on demand-side flexibility to positively affect public procurements

Public procurement of new or renovated assets might be a major driver for the update of smart buildings and flexible electric fleets. It is crucial to provide technical assistance to public authorities drafting public procurement calls and selecting optimal options in order to duly valorise these assets.

This should be done in cooperation with system operators, notably DSOS, in order to consider the systemic impact and contribution of new/refurbished flexible assets to the local grid.

## HOW SHOULD SYSTEM OPERATORS IMPLEMENT THE PROVISION?

### System operators to regularly exchange with local and regional authorities

System operators should designate a specific correspondent responsible for communicating with local and regional authorities, notably to share information and plans about grid congestion and network developments that could affect their areas, particularly at the distribution level. This communication should also cover plans to develop non-wire alternatives, such as the procurement of demand-side flexibility, which can foster the creation of local energy initiatives and demand-response programs capable of providing valuable grid services.

# Mapping of areas for the deployment of renewable energy areas

(Article 15b Renewable Energy Directive)



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## APPLICABLE BY:

21 May 2025



**OBJECTIVE:** Ensure flexible demand is considered when mapping areas for renewable energy.

## WHAT DOES THE LEGISLATION SAY?

- Member States shall perform a coordinated mapping of areas for the deployment of renewable energy in their territory. When identifying these areas, Member States shall consider:
  - the projected energy demand, taking into account the potential flexibility of the active demand response and expected efficiency gains and energy system integration;
  - the availability of relevant energy infrastructure, including grids, storage and other flexibility tools, or the potential to upgrade grid infrastructure.



## HOW SHOULD MEMBER STATES IMPLEMENT THE PROVISION?

- 1 Member States shall consider the impact of both upward and downward flexibility for the integration of renewables**

When mapping areas for the deployment of renewable energy, Member States shall apply the Energy Efficiency First principle by taking into account the role of both upward and downward flexibility to integrate renewable energy in a cost-effective way.

- 2 Member States shall consult stakeholders when mapping areas for the deployment of renewable energy projects**

Member States shall consult stakeholders when defining areas for renewable energy deployment.

The consultation should involve key stakeholders, including system operators, flexibility service providers, energy suppliers, energy communities, industries and local authorities in the area. These stakeholders should be able to provide data, ensuring a well-informed mapping process. This engagement will help facilitate the coordinated deployment of renewable energy projects and their cost-effective integration into the energy system.



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