Implementation gaps
& national practices emerging to address them

Regulatory frameworks that reward capital investment more than operational flexibility spending push DSOs toward grid reinforcement, disregarding flexibility, thereby weakening local flexibility markets.	
Germany	Enables market-based DSO flexibility procurement
Heating and cooling plans and electricity-grid plans are still treated separately, limiting their use as coordination tools for flexibility, electrification and congestion management.	
Germany	Mandatory municipal heat planning links future heat demand and infrastructure
Restricted metering-data access, complex procedures and narrow proximity rules prevent energy sharing and collective self-consumption from scaling beyond single buildings or small groups.	
Belgium	Brussels has implemented the energy-sharing organiser role, though data-exchange automation is still needed
Spain	Collective self-consumption is permitted up to two kilometres between energy community participants and their buildings.
Unclear or administratively heavy licensing, settlement, aggregation and compensation rules limit household and community participation in flexibility markets.	
Austria	Citizen energy communities can apply for the aggregator market role
Germany	Enacts a more advanced flexibility aggregation framework

EU-level policy recommendations

To realise the potential of smart grid-ready buildings as effective assets for energy flexibility, Member States should fully transpose and implement the relevant EU provisions from EMD, EPBD, EED, and RED III, in coordinated and easy frameworks that enable households, communities and service providers to participate effectively. Besides, the Commission should consider, notably in setting the post-2030 framework on EED and RED, to:

- Provide EU-level implementation support to align national provisions across the EMD, RED III, EPBD and EED into a coherent pathway, from smart readiness to flexibility service delivery.
- Clarify the interaction between citizen energy communities (EMD Art. 2, 15a), renewable energy communities (RED Art. 2), collective self-consumption (RED Art. 2), energy-sharing organisers (EMD Art. 2, 4, 15a) and aggregation (EMD Art. 2), including their roles, possible combinations and implications for market access, data access, settlement and value allocation.

- Develop EU-level methodological guidance enabling DSOs, regulators and public authorities to compare flexibility procurement, demand response, storage, energy communities and building-side measures with conventional grid reinforcement, making the energy efficiency first principle and network-planning provisions operational (EED Art.27).

- Provide support under EED Article 25 to help municipalities, DSOs, heat-network operators and national authorities assess how local heat planning — including electrification, thermal storage and cooling demand — interacts with electricity demand, distribution-grid capacity, renewable generation and flexibility potential.

Directives

We reviewed selected provisions of the following Directives, focusing only on those relevant to demand-side flexibility in buildings.

Acronym	Common Name	Link	Transposition time
EMD	Energy Market Design Directive	Directives EU 2024/1711 and 2019/944	17.01.2025, 17.07.2026
EPBD	Energy Performance of Buildings Directive	Directive EU 2024/1275	01.01.2025, 29.05.2026
REDIII	Renewable Energy Directive	Directive EU 2023/2413	01.07.2024, 21.05.2025
EED	Energy Efficiency Directive	Directive EU 2023/1791	11.10.2025

*Technical Annex

The detailed analysis underpinning this policy brief is provided in BlueBird Deliverable D7.1, "Regulatory background for smart grid-ready buildings and the energy network", which analyses the implementation of relevant EU provisions across the BlueBird pilot countries and regions, available on https://zenodo.org/communities/bluebird/records.

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BPIE is a leading independent think tank focused on achieving climate neutrality in buildings. Our vision is a net-zero carbon built environment, aligned with the ambition of the Paris Agreement, and in support of a fair and sustainable society. We provide data-driven and actionable policy analysis, advice, and implementation support to decision-makers in Europe and globally. www.bpie.eu

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BLUE BIRD

building-integrated user-empowered flexibility trading

BPIE

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From Passive to Active:

How the EU and Member States enable buildings' demand side flexibility for a more resilient, renewable energy system

The need for demand-side energy flexibility from buildings

Buildings can play an active role in the energy system by providing demand-side flexibility. By shifting, reducing, or optimising electricity demand, they can help match demand and supply, manage peaks and reduce pressure on local networks. This role is becoming increasingly important as electrification accelerates, grid constraints intensify and the need to expand and intensify renewable energy grows.

To understand how far the existing EU regulatory framework enables buildings to act as active assets in maintaining a balanced energy system, research conducted as part of the BlueBird project* reviewed selected key provisions from the Electricity Market Design, the Renewable Energy Directive (RED III), the Energy Performance of Buildings Directive (EPBD) recast and the Energy Efficiency Directve (EED), with attention to how their provisions interact across markets, buildings, renewable energy, energy efficiency, data access and planning. The review examined policy implementation in the context of the BlueBird pilots in Spain, Austria, Germany, Poland and Belgium (Brussels and Wallonia), incorporating desk research and structured input from on-site project partners.

Key takeaways

National implementation of regulatory foundations for energy sharing, aggregation and citizen participation is emerging but uneven. National progress to secure buildings as energy flexibility assets occurs at different speeds and on different elements, while remaining incomplete.

Energy communities, collective self-consumption and aggregation can support building-level and neighbourhood-level flexibility, but their practical uptake is still limited by implementation gaps, legal complexity, administrative burdens, restrictive proximity rules and insufficient clarity on the interaction between different frameworks.

Several enabling practices already exist across the analysed countries, including clearer Renewable Energy Community (RED: EED Art. 2) and Citizen Energy Community (CEC: EMD Art. 2, 15a) frameworks, broader possibilities for collective self-consumption, stronger data-access arrangements, and more advanced Smart Readiness Indicator (SRI: EPBD Art.15) testing and implementation support. However, **to be effective, these elements must be combined systematically into coherent national frameworks.**

Data availability from Distribution System Operators (DSOs) remains a key bottleneck. Even where access rights exist, limited scope, delays, manual procedures or insufficient interoperability continue to restrict energy sharing, storage optimisation and flexibility services.

The EPBD provides an important enabling layer through the Smart Readiness Indicator, zero-emission buildings and EV-ready infrastructure, but these provisions will only translate into system value where they are linked to incentives, digital infrastructure and access to flexibility markets.

Under the EED, flexibility and energy efficiency are still not systematically treated as alternatives to grid expansion in planning and investment decisions. Capital Expenditure (CapEx)-biased incentives, weak coordination and insufficient integration of energy communities into local heating and cooling planning continue to limit progress.

1. Enable flexibility

Energy Community

P1 P2 P3 P4 P9

SMART METER
HEATPUMP
FLEX CONTROL (MONITOR & FORECAST)
PV SELF-CONSUMPTION
73%
BATTERY STORAGE
BOILER
GEOTHERMAL HEATPUMP
SCHOOL
DOCTOR

No smart meter – weak readiness / enablement

Data exchange between energy consumers / community, aggregator / trading manager, DSO and TSO - weak flexibility forecast

2. Activate and valorise flexibility

Forecast and system intelligence (15 minute intervals)

DEMAND (Consumption) — GW — 00 06 12 18 24
SUPPLY (PV production) — GW — 00 06 12 18 24
GENERATION GAP (Surplus+ / Deficit) — GW — 00 06 12 18 24
GRID BOTTLENECKS (Transmission Map)
WEATHER

P5

Benefits

FOR END USERS
- Lower bills
- Protection against price spikes and long-term energy cost increase
- Higher self-consumption
- Flexibility reward

FOR THE ENERGY SYSTEM
- Optimise grid reinforcement
- Expanded renewable energy integration
- Energy security and system resilience

P6 P8

AGGREGATOR / TRADING MANAGER

FLEXIBILITY TRADE

TSO / DSO (OPERATOR)

No remuneration* – weak value capture

No data access – weak forecasting

MARKETS

ELECTRICITY DAY-AHEAD MARKET
Price (€/Mwh) — 150 100 50 0 — 00 06 12 18 24

Time	00	06	12	18	24
Price	64	72	112	98	68

FLEX CAPACITY MARKET
Flex Price (€/Mwh) — 150 100 50 0 — 00 06 12 18 24

Time	00	06	12	18	24
Price	64	72	112	98	68

3. Coordinate and plan the energy system

P7

REVIEWED EU DIRECTIVE PROVISIONS

- **P1** Electricity Market Design Directive (EMD) 2019/944 Article 2, 2024/1711 Article 15 a, Recital 23; RED Article 2
- **P2** Renewable Energy Directive (RED 2023/2413) Article 15c
- **P3** EMD 2019/944 Article 5, 2024/1711Article 4, Article 11
- **P4** Energy Performance of Buildings Directive (EPBD 2024/1275) Recital 56,Article 15, Recital 23,Article 2, Article 11
- **P5** EMD 2019/944 Article 2, 2024/1711 Article 15a
- **P6** RED Article 20a
- **P7** Energy Efficiency Directive (EED, 2023/1791) Article 3, 25
- **P8** EED Article 27
- **P9** EPBD Recital 50, 51; Article 14

ENABLERS (or barriers if absent)

- Data exchange between Aggregator / Trading Manager and energy consumers / community and TSO / DSO
- No market access – weak activation
- No remuneration – weak value capture

ACRONYMS

TSO = Transmission System Operator
DSO = Distribution System Operator
EMD = Electricity Market Design Directive
RED = Renewable Energy Directive
EPBD = Energy Performance of Buildings Directive
EDD = Energy Efficiency Directive