

Policy Brief

# Power to the People

Scaling Energy Communities by Removing Friction



By Katarzyna Szkuta and Anna Pizzamiglio



### **About the EDDIE consortium**

This policy brief builds on the research carried out for the European Distributed Data Infrastructure for Energy (EDDIE), an 18-partner consortium co-financed by the European Union. EDDIE introduces a decentralised, distributed and open-source data space in alignment with the efforts of the European Union smart grids task force, the implementing acts on interoperability and other European initiatives. It has received co-funding by the European Union's Horizon Europe programme under grant agreement No. 101069510. For more, visit <https://eddie.energy/>.

## Policy Brief

# Power to the People

## Scaling Energy Communities by Removing Friction

By Katarzyna Szkuta and Anna Pizzamiglio



### About the authors

**Katarzyna Szkuta** is director of strategy at the Lisbon Council. **Anna Pizzamiglio** is community lead and policy analyst at the Lisbon Council.

The views expressed in this policy brief are those of the authors alone and do not necessarily represent the views of the members of the European Distributed Data Infrastructure for Energy (EDDIE) consortium, the European Commission or any of their associates.

The ongoing 2026 Iran war has reinforced a critical political lesson: the energy transition was never solely an environmental objective, but also a strategic necessity for Europe’s geopolitical survival and economic competitiveness. By accelerating the move towards domestic renewable energy – including community-owned – the European Union can reduce its exposure to volatile global fossil fuel markets. However, while energy communities can strengthen physical resilience and local empowerment, as demonstrated by the growth of solar and wind energy in Ukraine,<sup>1</sup> they are not a silver bullet for the energy crisis. Rather,

---

***‘Green energy must become a social utility rather than a luxury for the few.’***

---

they represent a vital and scalable component of a broader strategy that must also include sustained investment in physical grid infrastructure.

To date, participation in energy communities has largely been limited to energy transition enthusiasts. These are predominantly middle-class

consumers with the financial resources and professional-grade patience needed to navigate opaque bureaucracy. The current system imposes significant participation costs in terms of time, legal complexity and bureaucratic effort. For many households, navigating extensive paperwork in exchange for modest annual savings is simply not worthwhile.

Expanding community energy initiatives across the European Union is constrained by three systematic policy challenges: delayed access to data, which prevents communities from actively managing their grid impact; fragmented and complex national data systems; and the systemic exclusion of renters and low-income families from clean energy investments.

To overcome these barriers, the European Union must move towards a “layered community experience” supported by a standardised digital architecture. While enthusiasts can drive the initial uptake, the pragmatic majority requires a set-and-forget experience where automation handles the technical heavy lifting. At the same time, the community energy model must shift to solidarity-by-design to benefit vulnerable groups, using public assets like social housing to ensure that green energy is a social utility rather than a luxury for the few.

---

<sup>1</sup> Tetiana Vasyliieva and others, “From Energy Dependency to Energy Security: How the War in Ukraine Accelerated Renewable Deployment in Europe,” *Economics and Sociology*, 18:3, 2025, pp.229–253; International Energy Agency, *Empowering Ukraine Through a Decentralised Electricity System: A Roadmap for Ukraine’s Increased Use of Distributed Energy Resources Towards 2030* (International Energy Agency, 2025).

This report proposes a framework that prioritises digital efficiency, accessibility and social inclusion:

<b>Pillar I: Digitalising the Single Market for Energy</b>		<b>Pillar II: Solidarity-by-Design</b>	
<b>Core policy recommendation</b>	<b>Target/action</b>	<b>Core policy recommendation</b>	<b>Target/action</b>
<b>Enforce near real-time data access</b>	Replace the current 48-hour data lag with open near-real-time API access.	<b>Mandate solidarity-by-design for public assets</b>	Require at least 10% of energy generated on public property to be allocated to vulnerable households.
<b>Standardise data access for onsite generation</b>	Adopt a single-click authorisation standard based on the common information model (CIM).	<b>Fund trusted community intermediaries</b>	Establish a European fund to support local non-governmental organisations (NGOs), social workers, and schools as energy coaches.
<b>Enforce cross-border technical interoperability</b>	Require all independent energy management platforms to use interoperable registration systems.	<b>Expand definitions of vulnerable group definitions</b>	Formally include renters and young people to unlock targeted financial and legal support frameworks.
<b>Classify community storage as core infrastructure</b>	Prioritise public funding for neighbourhood-scale batteries to manage peak grid demand.		

By replacing manual processes with automated digital services and expanding participation beyond property owners, the European Union can make community energy more accessible and inclusive. This would lower barriers to entry and broaden access to all the benefits of the new energy economy.

# Stalling Transition: Realising the Social and Economic Potential of Energy Communities

The policy support for energy communities marks a significant shift in the European energy system – and more broadly, in the European social contract. Energy is gradually being reframed from a centralised commodity controlled by distant monopolies to a local asset owned and produced by citizens themselves. This transformation reflects a wider global trend towards “prosumerism,” where the distinction between the producers and consumers of energy becomes increasingly blurred. By empowering households, small and medium-sized local enterprises, and municipalities to share resources, energy communities can move the European Union away from the fragile supermarket model of global supply chains.

Despite this promise, the economic and social potential of this transition remains largely underexploited due to the persistent implementation gap of energy communities and, more generally, of renewable energy. The European Union’s recast renewable energy directive set an overall binding target of at least 42.5% renewable energy in the energy mix by 2030 (up from 25.4% in 2024). Yet progress towards this goal remains uneven. While studies suggest

---

***‘The current system is structured around latent potential while being constrained by active friction.’***

---

that citizens are prepared to invest up to €176 billion in energy cooperatives by 2030, the actual implementation of these initiatives is lagging.<sup>2</sup>

As of 2025, the European Union had reached only 27% of its target of having one energy community per municipality

of 10,000 inhabitants or more.<sup>3</sup> Moreover, the European Court of Auditors warns that without a change in policy, energy communities in the Netherlands – considered as one of the frontrunners – could account for only 4% of solar and wind energy generation capacity by 2030. This is four times lower than projected in the 2016 impact assessment of the recast renewable energy directive.

Slow implementation stems not only from financial and bureaucratic hurdles, but also from technical delays that limit effective management of local energy demand. As a result, energy communities are currently underperforming and failing to deliver the full financial benefits to interested citizens.

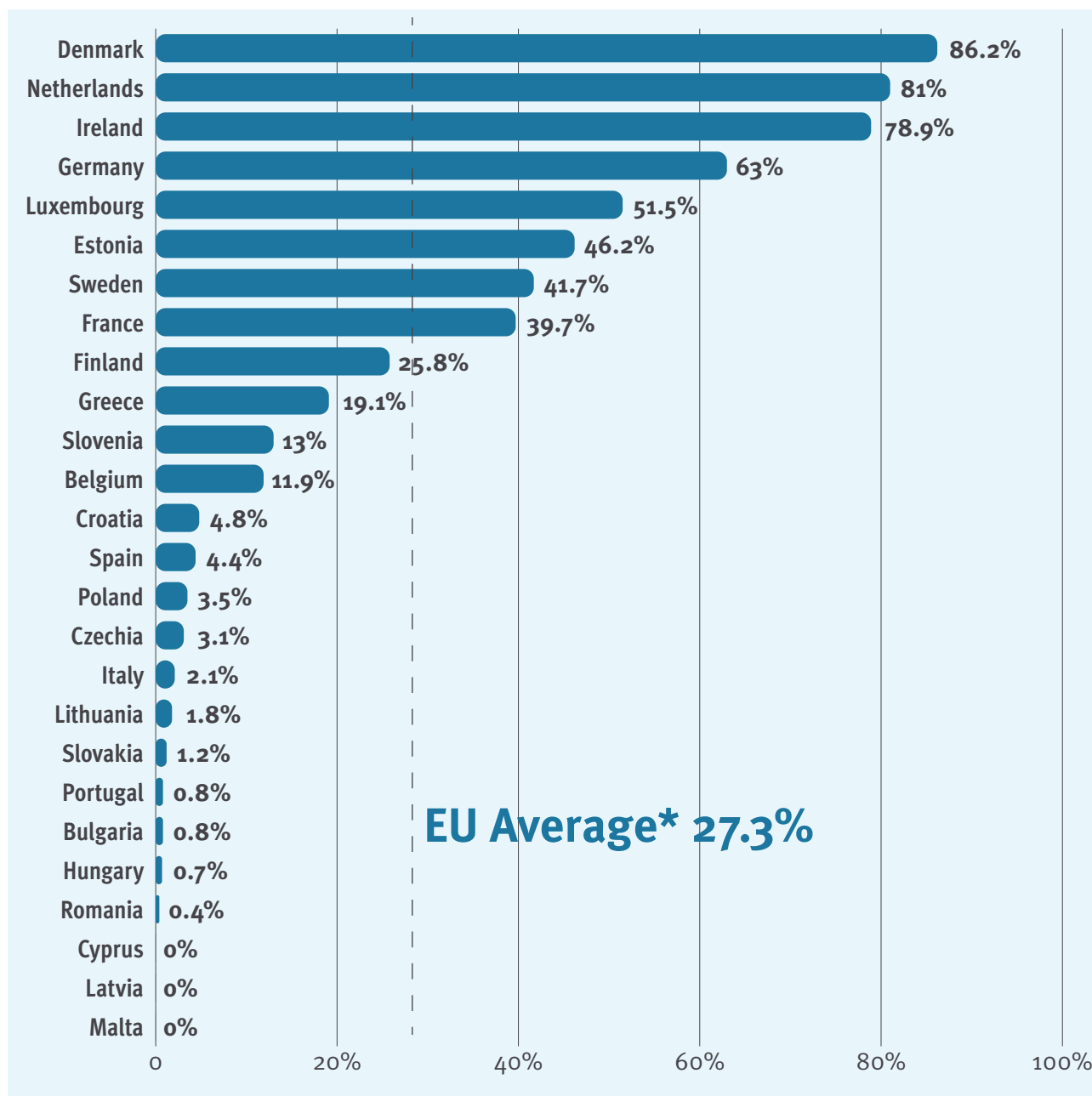
---

<sup>2</sup> Cristian Pons-Seres de Brauwer and Jed Cohen, “Analysing the Potential of Citizen-Financed Community Renewable Energy to Drive Europe’s Low-Carbon Energy Transition,” *Renewable and Sustainable Energy Reviews*, 133, 2020.

<sup>3</sup> European Court of Auditors, *Energy Communities: Potential Yet to Be Fulfilled – Special Report 10/2026* (European Court of Auditors, 2026).

## Figure 1. Share of Municipalities (above 10,000 inhabitants) with Renewable Energy Communities

Percentage of municipalities above 10,000 inhabitants with at least one renewables-based energy community



Source: Court of Auditors, 2026

\*Note: EU average excludes Austria due to specific data formatting/availability in original strategy documentation.

This disconnect arises because the current system is structured around latent potential while being constrained by active friction. The estimated savings of €260–550 per year for individual households and €440–930 per year for communities, as mentioned in the citizen energy package proposal,<sup>4</sup> are often eroded by the administrative burdens required to access them. Studies nevertheless suggest that the underlying economic and environmental

<sup>4</sup> European Commission, *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Citizens Energy Package*, COM(2026) 115 final, 10 March 2026.

potential of energy communities is significant, with the potential to reduce costs by 10%–26% and emissions by 5%–13% compared to a baseline without energy communities.<sup>5</sup> According to REScoop, energy produced locally generates at least twice the economic return to the community compared to externally developed projects.<sup>6</sup> Yet these returns are inaccessible to many citizens due to bureaucratic complexity.

Beyond their economic function, energy communities are a key tool for building trust and knowledge about energy systems among citizens. When designed effectively, they can transform residents from passive bystanders into active stakeholders, drastically reducing “not-in-my-back-yard” (NIMBY) resistance and accelerating the transition.

Realising these social benefits at scale, however, requires a significant reduction in both the administrative and technological burdens placed on participants. Energy communities are not monolithic; they range from small, trust-driven communities of place to larger, return-on-investment-focused communities of interest.<sup>7</sup> Despite their differing individual objectives, energy communities are shown to generate mutual value for both profit-driven and eco-conscious members.<sup>8</sup>

### **Benefits of energy communities:**

- Contribute to European Union renewable energy target
- Enable decentralised energy production
- Attract private investment
- Reduce energy poverty
- Support vulnerable households
- Allow all citizens, including tenants, low-income families and apartment residents, to drive the energy transition locally
- Increase social acceptance of projects
- Provide flexibility services to stabilise grids

Based on Nicolò Rossetto, Stefano F. Verde and Thomas Bauwens, “A Taxonomy of Energy Communities in Liberalised Energy Systems”, 2022.

---

5 Bernadette Fina, David Ribo-Perez and Alvaro Manso-Burgos, “Quantifying the Regulatory Impact on Renewable Energy Community Performance in Austria and Spain,” *Energy Policy*, 212, 2026, pp.1–19.

6 REScoop.eu, *Community Energy: A Practical Guide to Reclaiming Power* (REScoop.eu, 2024).

7 Bauwens, Thomas. “Analysing the Determinants of the Size of Investments by Community Renewable Energy Members: Findings and Policy Implications from Flanders,” *Energy Policy*, 129, 2019, pp.841–852.

8 Perger, Theresia and others. “PV sharing in local communities: Peer-to-peer trading under consideration of the prosumers’ willingness-to-pay”, *Sustainable Cities and Society*, 66, 2021.

## Legislation on community energy

The European Union's clean energy for all Europeans package introduces two distinct legal frameworks for community energy: citizen energy communities (CECs), governed by the electricity market directive (directive (EU) 2019/944), and renewable energy communities (RECs), established under the renewable energy directive (directive (EU) 2018/2001). This baseline was further developed through the 2023–2024 electricity market design reforms, including directive (EU) 2024/1711. These reforms strengthened the legal framework for renewable energy sharing and clarified the role of energy communities in more flexible and decentralised electricity systems, including through participation in local flexibility markets where national rules and market arrangements permit.<sup>9</sup>

Both frameworks define energy communities as not-profit-oriented organisational entities. They require open, voluntary participation and grant communities the right to generate, consume, store, share, and market their energy assets. Their overarching objective is to deliver localised economic, environmental, or social benefits to their members and surrounding communities.

Despite these shared foundations, the two frameworks diverge across three critical dimensions:

- **Technology:** RECs are technologically broader, encompassing all renewable energy sectors including electricity, thermal heating and green gas. CECs, on the other hand, are confined strictly to the electricity sector but may utilise conventional power generation.
- **Geographic proximity:** RECs enforce strict proximity rules, concentrating decision-making power among stakeholders located geographically close to where the energy is physically generated. There are no geographic limitations for CECs, allowing them to operate across broad networks.
- **Corporate involvement:** Large enterprises cannot participate in RECs, while medium-sized enterprises can hold voting control if they meet local proximity requirements. Conversely, CECs allow large and medium-sized enterprises to participate as members, but legally restrict voting control to citizens, small businesses and local public authorities.<sup>10</sup>

Because these frameworks are established via European Union directives rather than uniformly applicable regulations, member states have significant discretion in defining what constitutes geographical proximity, establishing network fee incentives, and structuring the enabling regulations required for communities to effectively integrate with distribution grids. In practice, this has resulted in uneven and often delayed implementation. Despite official European Commission guidance, three out of four audited member states have yet to fully implement the relevant provisions, leaving widespread confusion over the different energy community models.<sup>11</sup>

9 Nicolò Rossetto, "Beyond Individual Active Customers: Citizen and Renewable Energy Communities in the European Union," *IEEE Power and Energy Magazine*, 21:4, 2023, pp.36–44; Lucile de Almeida and others, *Mapping Law and Regulation in Energy Sharing and P2P Trading Within Energy Communities* (U2Demo, 2025).

10 For a detailed analysis of the different governance arrangements, see Lucile de Almeida and others, 2025, pp.37–48.

11 European Court of Auditors, *Energy Communities: Potential Yet to Be Fulfilled – Special Report 10/2026* (European Court of Auditors, 2026) pp.7, 27.

## Beyond the Enthusiast: Scaling Through Low-Friction Energy Services

The primary barrier to scaling energy communities is a fundamental flaw in system design: the failure to recognise participants as rational actors that make decisions based on logical evaluation, calculated outcomes and self-interest. Currently, for a household to join an energy community, the transaction costs of participation – which can be measured in time, legal complexity, and administrative effort – often exceed the actual economic return.

Existing frameworks have been designed by experts, for enthusiasts. They cater to highly motivated early adopters who are willing to navigate fragmented grid operator interfaces and technical hurdles. Participation, therefore, demands a degree of energy literacy and persistence that cannot be expected from the average household. This creates a scalability problem. For energy communities to move from a small percentage of the energy mix to a more mainstream solution for a larger portion of households, they must become low-friction services.

---

*‘Existing frameworks have been designed by experts, for enthusiasts.’*

---

The establishment phase of an energy community is particularly prone to participant drop-off. Prospective members or their proxy must navigate a series of challenges: non-user-friendly digital interfaces (which also differ across network operators); repeated requests for third-party data access and power of attorney; and confusing technical and legal boundaries between energy suppliers and grid operators.

### BOX 1: The transaction cost bottleneck (Ötzi, Italy)

In the Italian Alpine region, the Ötzi community illustrates how heavy administrative burdens can stall local energy projects. Although the region’s geography and abundant hydropower resources are ideal for clean energy generation, rigid regulations create an unintended barrier for participants.

Unlike Austria’s model, which automatically calculates and delivers financial rewards to individual households, the Italian framework requires collective profit-sharing. This lack of automation forces community members to manually navigate complex paperwork and internal negotiations just to split their energy revenues. When financial returns are modest, this administrative burden quickly outweighs the perceived benefits, undermining willingness to participate and slowing community growth.

**Policy takeaway:** Scaling community energy cannot rely on manual coordination. Without regulatory and digital systems that support automated, individualised benefit distribution, the social friction of collective negotiation will remain a structural bottleneck.

This administrative burden represents the single most persistent operational challenge facing energy communities. The complexity of preparing technical submissions and managing legal signatures has made the intervention of digital third-party intermediaries increasingly necessary. Without these platforms to automate the journey from initial savings estimation to final contract signature, many prospective members drop out. This type of automation is also crucial for scaling: without it, the total administrative cost increases linearly with membership, preventing communities from benefiting from economies of scale.

While these administrative frictions are universal, their intensity and character depend heavily on how individual member states have translated European Union directives into national law. This dynamic is best illustrated by the contrasting regimes of Italy, Austria and Spain.

## **BOX 2: Austria's plug-and-play model (enixi, Austria)**

Austria's Energy Data Exchange (EDA) is a shared, non-profit national data network run collectively by grid operators. It is based on unified communication standards to ensure secure interoperability among all market participants, thereby preventing single software vendors from monopolising the market.

Building on this national infrastructure, the platform enixi serves as the consumer-facing interface. enixi handles the full set of legal and administrative processes required for participation, offering energy communities a ready-to-use service. By outsourcing this complexity to a specialised provider, joining a local energy group becomes as simple and frictionless for a citizen as signing up with a conventional energy supplier.

**Policy takeaway:** Transforming the management of energy communities into a ready-to-use product delivered by a provider lowers the barrier to entry and enables rapid deployment at scale.

In Italy, energy communities operate through private-law agreements, giving members flexibility in how they share energy. The original framework relied on a virtual model, whereby the value of shared energy was recognised through financial incentives rather than deducted directly from participants' energy bills. As a result, energy communities themselves were responsible for calculating and distributing revenue among members, creating a significant administrative burden. However, the recent transposition of energy-sharing provisions has begun to address this issue. Legislative decree 3/2026 introduces a right for active customers to have the value of shared energy deducted directly from their bills. The next step is for Italy's Regulatory Authority for Energy, Networks and Environment (ARERA) to adapt the regulatory framework accordingly, so this new right can become operational in practice (see box 3).<sup>12</sup>

---

<sup>12</sup> Daniela Patrucco, "Comunità Energetica e Lo Scorporo in Bolletta," QualEnergia.it, 30 December 2025; "Scorporo in Bolletta Per i Membri Delle CER," QualEnergia.it, 12 December 2025.

Austria has taken a more institutionalised approach that reduces friction for community members. The 2025 electricity market act (ElWG) defines the role of the “energy sharing organiser.”<sup>13</sup> This legal entity acts as a central facilitator for energy communities, managing the distribution of benefits to individual members. By formalising this role, Austria has provided the clarity that was previously missing from national regulation, effectively lowering the technical hurdle for new communities.<sup>14</sup>

Spain illustrates a different pathway. Despite the transposition of the provisions of the recast renewable energy directive in 2023, uncertainty surrounding the regulation, organisation and establishment of energy communities persisted for years. This created a period of legal ambiguity that was only addressed in light of the 2026 energy crisis. Under royal decree-law 7/2026, the Spanish government finally committed to approving comprehensive energy

community regulations by June 2026, spurred by the urgent need for domestic energy security.<sup>15</sup>

---

***‘Successful scaling occurs when processes move at the speed of software rather than the friction of manual coordination.’***

---

The cases of Austria and Spain demonstrate how technical design can either resolve complexity for the user or force them to absorb it.

In Austria, complexity is largely managed via smart system design. Through the national Energy Data Exchange (EDA) and private services enabled through it, like enixi (see box 1), the system leverages standardised data protocols and institutional intermediaries. In this setup, grid operators are legally obliged to manage energy allocation. The community simply selects a sharing method (static or dynamic), and the platform automatically calculates allocations using fifteen-minute smart meter data, requiring no manual input from households.

In Spain, private intermediaries are bridging the regulatory gaps created by the absence of a unified national platform. Companies like Electra Caldense (see box 2) operate as both grid managers and service providers, using digital tools to oversee energy communities from start to finish. Their main innovation is dynamic energy sharing: instead of relying on rigid upfront estimates, they adjust energy distribution hourly to match actual consumption. This shows how specialised market actors can effectively shield citizens from technical complexities, even within outdated regulatory frameworks.

Ultimately, these national models suggest that scaling up energy communities requires a transition to a service-based infrastructure. As demonstrated by the contrast between the more manual Italian model and Austria’s highly automated system, successful scaling occurs when processes move at the speed of software rather than the friction of manual coordination.

---

<sup>13</sup> Österreichische Koordinationsstelle für Energiegemeinschaften. “Neue Rechtliche Grundlagen,” n.d.

<sup>14</sup> European Commission: Directorate-General for Energy and European Climate, Infrastructure and Environment Executive Agency. *Report on Energy Sharing* (Publications Office of the European Union, 2025), p.18.

<sup>15</sup> European Commission: Directorate-General for Energy and European Climate, Infrastructure and Environment Executive Agency, *Report on Energy Sharing* (Publications Office of the European Union, 2025); Ernst & Young Abogados, “Royal Decree-Law 7/2026: Measures Regarding Renewables and Storage,” March 2026; Osborne Clarke, “Royal Decree-Law 7/2026: A New Regulatory and Fiscal Framework for Energy in Spain,” 24 March 2026.

### **BOX 3: Intermediaries in action (Electra Caldense, Spain)**

In more complex regulatory environments like Spain, specialised private actors need to step in to shield consumers from grid complexities. The energy supplier Electra Caldense (via its Elecsum unit) acts as a digital intermediary, automating the setup, enrolment and contracting phases of energy communities to reduce the high dropout rates typical of manual processes.

Because Spain lacks Austria's centralised, automated data hub, Electra Caldense's key innovation is the use of dynamic energy sharing. Instead of relying on rigid, upfront estimates, the platform tracks consumption patterns and instructs the grid operator on how to allocate shared solar power on an hour-by-hour basis to match actual household use. This optimisation layer significantly increases both system efficiency and financial returns for members.

**Policy takeaway:** In the absence of unified national data systems, independent intermediaries can enable scaling by providing the digital management layer needed to manage complex energy distribution.

## **From Consumers to Prosumers: Operationalising Flexibility in the Distributed Grid**

As Europe transitions towards a decentralised energy system, energy communities must evolve from passive legal entities into active participants in the grid. This evolution requires balancing two distinct goals: maximising the use of locally generated and consumed power, and supporting broader grid stability.

Central to this shift is smart demand management, which helps bridge the gap between peak midday solar production and high evening household use. By shifting heavy electricity loads, such as scheduling electric vehicle charging to match hours of peak solar supply, communities can operate far more efficiently. This local optimisation reduces reliance on the main grid, allowing members to avoid external fees and taxes, directly lower their energy bills, and increase their overall self-sufficiency.

This potential is best exemplified by EnergyFamily in Austria (see box 4), where an integrated interface provides deep insights into behavioural patterns. By deploying machine learning to forecast both generation and demand, communities can manage capacity in real time, turning consumption data from a monitoring tool to an instrument for active grid optimisation. In one municipality, for example, analysing usage patterns for the management of water pumps resulted in self-consumption increasing from 12% to 35%.<sup>16</sup>

---

<sup>16</sup> Lukas Prenner, Founder and chief executive officer, EnergyFamily GmbH, interview by authors, 5 January 2026.

Beyond local grid balancing, advanced energy communities can extend their impact by participating directly in regional energy markets. By pooling the small, flexible energy capacities of hundreds of individual households, communities effectively operate as collective virtual power plants. This scale allows them to sell grid-stabilising services back to network operators or commercial buyers by modifying electricity use in real time to relieve grid stress or capitalise on shifting prices. As shown by platforms like backbone.one, this market integration shifts citizen groups from purely social initiatives into active economic players, blending community values with tangible financial incentives.

However, a critical equality risk remains: grid-responsive systems often overlook the human cost and diversity of consumers. Shifting daily routines, such as laundry or childcare, to match volatile price signals requires highly flexible lifestyles. For households with fixed work schedules or caregiving responsibilities, poorly designed dynamic tariffs act as a financial penalty rather than an incentive, effectively forcing less-flexible consumers to subsidise those who have the time and resources to adapt.<sup>17</sup>

#### **BOX 4: Innovating to absorb system complexity (EnergyFamily, Austria and backbone.one)**

Across many European Union countries, grid operators report smart meter data with a 24-to-48-hour delay, making real-time energy sharing nearly impossible. To bypass this lag, the Austrian platform EnergyFamily uses artificial intelligence-driven forecasting to predict generation and consumption patterns. This digital workaround allows households, small businesses and local governments to coordinate their collective energy use via a single dashboard. By turning lagging reports into active planning tools, it proves that predictive software can successfully offset slow physical infrastructure.

Peak solar production happens at midday, when most residents are at work. This often leads to wasted renewable energy and missed financial opportunities for households. Backbone.one addresses this by acting as a digital broker for clean energy. The platform automatically pools small energy surpluses from hundreds of homes and bundles them for corporate buyers seeking traceable, local green energy to meet sustainability targets. By treating excess power as a currency, it links household solar generation directly to commercial markets, financially rewarding families while giving grid operators the balancing capacity to maintain stability.

**Policy takeaway:** These models demonstrate that scaling requires digital intermediaries capable of absorbing system complexity. However, for such solutions to move beyond isolated pilots, they require the kind of standardised data foundation that Austria provides at national level.

---

<sup>17</sup> European Union Agency for the Cooperation of Energy Regulators and Council of European Energy Regulators. *Rewarding Flexibility: How Retail Contract Choice Can Help Unlock Consumer Flexibility – 2025 Monitoring Report* (European Union Agency for the Cooperation of Energy Regulators, 2025).

To mitigate this risk and ensure grid viability, large-scale community storage must be treated as core public infrastructure rather than a secondary luxury. Energy experts, such as Xavier Bou Torrent from Electra Caldense, argue that neighbourhood-scale batteries serve as an essential bridge between local consumer needs and wider grid demands. They capture daytime solar surpluses for evening use while providing the rapid response times needed to stabilise the grid during sudden disruptions and manage peak demand. Without this shared infrastructure, advanced demand management remains physically constrained by local networks that are already pushed to their limits by the rapid expansion of wind and solar power.

---

***‘Energy communities must evolve from passive legal entities into active participants in the grid.’***

---

Ultimately, the success of this model depends on eliminating data delays and adopting integrated digital platforms. While the standard 24-to-48-hour data lag provided by grid operators suffices for basic billing, it paralyses advanced operations like real-time battery storage management and automated grid balancing, even when supported by predictive algorithms.

Regulatory frameworks are beginning to adapt. For instance, Austria’s recent legislative updates require grid operators to reduce data delivery windows to 12 hours. However, near-real-time data access remains an absolute prerequisite for a flexible network. In fact, under the European Union’s electricity directive, consumers are already legally entitled to free, near-real-time access to their consumption data via standardised smart-metering interfaces (the validated data though are provided with a lag by the operators to ensure the data is accurate before it can be used for financial transactions).

While digital tools and machine learning increasingly empower non-technical energy communities to forecast generation and actively manage local capacity, software alone cannot overcome infrastructure bottlenecks. Digital modernisation must ultimately be matched by sustained capital investment in the physical grid to fully realise the potential of decentralised flexibility.

## EDDIE: Operationalising energy communities through a common European data space

The European Distributed Data Infrastructure for Energy (EDDIE) is a Horizon Europe-funded initiative designed to turn the European Union's clean energy targets into reality. While current European Union legislation grants consumers the legal right to share their energy data, the lack of standardised procedures across member states creates a fragmented compliance landscape. This fragmentation inflates cross-border operating costs, locking out startups and preventing innovative energy services from scaling.

To eliminate this barrier, EDDIE introduces a decentralised, distributed and open-source data space. This shared infrastructure layer connects existing national networks securely and seamlessly, eliminating the need for companies to develop costly, country-specific solutions for each market they operate in.

By standardising data access, formats and consent management, EDDIE lays the groundwork for a competitive, pan-European market for data-driven energy services. A core component of this network is its specialised data interface, AIIDA. This interface enables secure, real-time access to household generation and consumption data, including solar panels, electric vehicles, and home batteries, while keeping consumers in full control of their data privacy.

### EUROPEAN / CROSS-BORDER

Interoperable markets, cross-border services, scaling across member states

### NATIONAL

DSOs, national data spaces, consent and market processes

### MUNICIPAL / REGIONAL

Community platforms, cooperatives, local flexibility services

### LOCAL

Households, buildings, social housing, local energy communities



Standardised data exchange	Consent management	Near-real-time visibility	Lower integration costs	Access to flexibility markets
A common language across systems and borders	User control, privacy and trust by design	Better decisions through timely, high-quality data	Reusable building blocks reduce time and expense	More opportunities for communities to participate and generate value

## Energy as a Social Utility

Trust is the invisible infrastructure of the energy transition. While external projects frequently trigger “not-in-my-back-yard” (NIMBY) resistance, energy communities can leverage local social capital to transform opposition into collective ownership. When citizens are treated as stakeholders rather than passive consumers, permitting processes accelerate and the soft costs of customer acquisition – often a major barrier to scale – effectively vanish.

However, the transition faces a structural obstacle related to ownership and the ability to invest. If joining an energy community requires upfront capital, technical literacy and spare time, energy communities risk becoming private clubs for the middle class. To scale, the process must shift from accidental inclusion to solidarity-by-design.

Currently, 32% of EU citizens live in rented housing and 48% in apartments – groups that are often legally or financially excluded from traditional community ownership – while 9% of the population is unable to keep their home adequately warm.<sup>18</sup> The groups most vulnerable to price shocks – renters and low-income households – are also often the least likely to engage with digital energy tools and therefore risk being excluded from the benefits of the energy transition. For struggling households, smart tools like apps and meters can even feel like a liability, with the fear that shared energy data could be used by authorities for monitoring or penalisation rather than support.<sup>19</sup> To scale, the model must shift from treating energy not as a market luxury, but as a social utility.

---

***‘Trust is the invisible infrastructure of the energy transition.’***

---

More inclusive models appear to rely on community-based approaches, co-creation processes, collaboration with social workers and active involvement of municipalities. These localised elements help build institutional trust and enable participation, particularly among households that are unlikely to engage with purely digital or market-based solutions. To bridge existing gaps, the energy community model must be reconceptualised as a vital social utility. A strong example of this paradigm shift is the ASTER initiative in Belgium (see box 5), which pools investments from social housing organisations to ensure energy savings remain within the neighbourhood. This framework effectively shields low-income residents from the capital-intensive costs of the green transition by not requiring upfront individual investment.

European frameworks increasingly reinforce this social mandate. The European Union’s renewable energy directive requires member states to ensure that energy communities are accessible to low-income and vulnerable groups, a provision currently being transposed across Italy, Austria and Spain. A concrete example of this regulatory enforcement can be found in Austria: from 01 October 2026, public authorities participating in energy sharing through their own installations must actively include vulnerable households and allocate at least 10% of their annual generated electricity volume to them, either directly or through social housing networks.<sup>20</sup>

---

18 Eurostat, “Housing in Europe – 2025 Edition,” 27 November 2025. Eurostat, “9.2% of EU population struggled to keep their home warm,” 2 February 2026.

19 REScoop.eu, *Community Energy: A Practical Guide to Reclaiming Power* (REScoop.eu, 2024).

20 Österreichische Koordinationsstelle für Energiegemeinschaften, “Neue Rechtliche Grundlagen,” n.d.

Achieving success requires two human-centric policy shifts. First, local governments must use public assets, such as school roofs and social housing, to allow low-income residents to benefit from clean energy without the prohibitive upfront costs of personal installations. Second, the underlying technical infrastructure must be paired with trusted local actors, including social workers, NGOs and schools, to overcome trust deficits around data sharing.

To resolve privacy concerns, decentralised data architecture ensures that individual household consumption patterns remain inaccessible to central authorities. Keeping data under community control provides essential privacy guarantees for households wary of institutional oversight. Under this framework, social housing providers manage the technical backend through automated systems that completely conceal operational complexities from the user. As a result, tenants do not need to use sophisticated applications or costly internet connectivity to benefit, as energy savings are structurally integrated into the building itself. Finally, while third-party platforms manage data flows, local social organisations can be upskilled as energy coaches, helping households optimise their consumption and maximise financial benefits without imposing an administrative burden.

The energy transition will succeed only if it is perceived as a neighbourhood gain rather than a household burden. By coupling public assets, such as social housing, with a secure, standardised digital backbone, Europe can move beyond early adopter enthusiasm towards a truly inclusive, high-performance energy system.

### **BOX 5: Solidarity-by-design (ASTER, Belgium)**

For renters, the clean energy transition has historically been blocked by mismatched financial incentives: landlords lack the motivation to install solar panels because they do not pay the energy bills themselves, while low-income tenants lack the capital to invest in property they do not own. The Access to Sustainability Through Energy Resilience (ASTER) initiative in Belgium was designed to address this. By pooling more than 40 social housing providers into a single cooperative, ASTER finances, installs and maintains solar installations on social housing roofs at no cost to residents.

Tenants benefit from access to clean electricity at a guaranteed rate that is 10% below the state-subsidised social rate and up to 30% below standard market rates. This delivers immediate utility savings without requiring lifestyle adjustments or exposing households to personal financial risk. Any surplus energy is sold back to the national grid, creating a revolving revenue stream that is reinvested in additional solar installations and energy-efficiency upgrades across the social housing network.

To protect the 32% of European Union citizens living in rented accommodation, energy policy must shift its focus from individual asset ownership to collective service delivery. ASTER demonstrates that when clean energy is treated as an essential social utility, the green transition becomes an engine for poverty reduction rather than an exclusive benefit for those in a position to invest.

# The Strategy to Scale: Orchestrating a Layered Community Experience

To unlock the full potential of the energy transition, policymakers must move away from viewing energy communities as monolithic blocks. Instead, they should be understood as a layered ecosystem that accommodates different levels of energy literacy, motivation and socio-economic capacity.

Legacy frameworks have largely been designed by experts for enthusiasts. To scale successfully, the energy system must evolve to support three distinct layers of participation:

## Layer 1: The Enthusiasts (The Foundation)

The inner core consists of early adopters who have high levels of energy literacy and are willing to tolerate high transaction costs. These participants navigate fragmented interfaces and regulatory complexity out of a commitment to shared values. While they provide the initial spark for establishing communities, relying solely on pro-social motivation limits growth, as these drivers rarely reach the broader population.<sup>21</sup>

## Layer 2: The Pragmatic Majority (The Scale)

Scaling requires moving beyond the enthusiast core to reach the pragmatic majority. For this layer, the primary barrier is the transaction cost of participation. If the administrative effort required to join outweighs the economic return – for example, navigating a year of bureaucracy to save €200) – the pragmatic user will simply opt out. Introducing standardised communication protocols removes complexity for the end-user and embeds it directly into the system design. This enables a set-and-forget experience where data intermediaries handle the legal and technical heavy lifting, transforming community energy into a low-friction service.

## Layer 3: The Vulnerable (The Resilience)

Scaling through convenience alone, however, introduces a new risk: the transactional trap. A model optimised exclusively for digitally engaged users risks creating new forms of exclusion. Vulnerable households, as demonstrated by the ASTER model, require a human-centric approach. For these users, the value proposition needs to be protective rather than purely economic. A decentralised data architecture ensures that automation does not result in surveillance, while enabling mediated access through trusted intermediaries. This allows social housing associations or local NGOs to absorb the technical burden on behalf of households.

A truly resilient energy system requires a layered service architecture that balances near-real-time flexibility with deep-rooted community support. Within this framework, enthusiasts provide momentum, the pragmatic majority drives scale through automation, and the vulnerable are supported through trusted intermediaries. Together, these layers form the dynamic and inclusive ecosystem required for European energy autonomy.

---

<sup>21</sup> Thomas Bauwens, “Analysing the Determinants of the Size of Investments by Community Renewable Energy Members: Findings and Policy Implications from Flanders,” *Energy Policy*, 129, 2019, pp.841–852.

# Policy Recommendations

## Pillar I: Digitalising the Single Market for Energy

*To scale successfully, the European energy system must operate with the agility of modern digital software rather than the delays of manual administration.*

- **Enforce near real-time data access:** Accelerate the transition from a 48-hour data lag to open near-real-time data access from grid operators. Such access is essential for automated grid balancing and efficient demand management. To protect consumers, the costs of these digital upgrades should be covered by European digital funds rather than passed on through consumer bills.
- **Standardise data access for onsite generation:** Adopt a unified European standard for data consent based on the common information model (CIM). Implementing a simple, single-click authorisation process removes the primary administrative hurdle to joining an energy community, eliminating high dropout rates caused by complex red tape.
- **Enforce cross-border technical interoperability:** Require all independent energy management platforms to use interoperable registration systems. This ensures that digital solutions developed in one member state (such as Austria or Spain) can be deployed across the European Union without costly technical re-coding or legal modifications.
- **Classify community storage as core infrastructure:** Treat neighbourhood-scale batteries as essential public infrastructure. Public funding should prioritise shared community storage to capture daytime solar surpluses for evening use. This strengthens local grid stability while ensuring that families with fixed schedules are not penalised by volatile real-time energy prices.

## Pillar II: Solidarity-by-Design

*Social justice is an absolute prerequisite for public acceptance and overall system stability.*

- **Mandate solidarity-by-design for public assets:** Require any energy community using public property, such as social housing or municipal roofs, to allocate at least 10% of its annual electricity generation to households experiencing energy poverty. This follows progressive examples in several member states.
- **Fund trusted community intermediaries:** Establish a dedicated European fund to support local social intermediaries, including NGOs, social workers, and schools. Properly recognised and funded, these actors serve as the vital human interface for vulnerable groups, guiding them through digital systems and building the trust necessary for community data sharing.
- **Expand definitions of vulnerable groups to include renters and young people:** Formally expand policy definitions of vulnerable energy consumers to include tenants and young citizens. Because these demographics typically lack the capital or legal rights to install individual assets like solar panels or heat pumps, this reclassification will unlock targeted funding and protective frameworks for shared community energy.

# Conclusion

Transforming energy communities from niche pilot projects into a scalable pillar of Europe's energy mix requires a layered participation model that prioritises both digital automation and social inclusion. This approach provides a clear pathway to achieving European energy autonomy and driving economic competitiveness.

To engage the pragmatic majority, the European Union must eliminate administrative friction by shifting the participation burden from individual citizens to a modern digital infrastructure. This transition requires a move towards near-real-time data access and a standardised, single-click authorisation for sharing local energy data. Rather than remaining passive associations, energy communities must be empowered to pool small local energy surpluses into valuable market assets. Specialised digital platforms and AI-driven forecasting are essential for absorbing technical complexities, ensuring that grid-balancing services do not place an operational or time burden on households.

Furthermore, to include the 32% of EU citizens who rent and those facing energy poverty, the transition must treat community energy as a vital social utility rather than a market luxury. Utilising public assets, such as social housing and school roofs, combined with targeted support for local community intermediaries, ensures that the financial benefits of green energy are accessible to those with the least capital to invest.

Finally, scaling at the speed of software requires cross-border technical compatibility so that successful digital tools

can be deployed across the European Union without costly technical re-coding or legal modifications. Initiatives like the EDDIE project demonstrate how a common data space can streamline access and foster innovation in data-driven energy services. By replacing manual coordination with a high-performance digital framework and inclusive social design, the European Union can move beyond early-adopter enthusiasm to build a resilient and autonomous energy future.

---

***‘By replacing manual coordination with a high-performance digital framework and inclusive social design, the European Union can move beyond early-adopter enthusiasm.’***

---

# References

- Almeida, Lucile de and others. *Mapping Law and Regulation in Energy Sharing and P2P Trading Within Energy Communities* (U2Demo, 2025) <https://hdl.handle.net/1814/94401> [accessed 04 June 2026]
- Bauwens, Thomas. “Analysing the Determinants of the Size of Investments by Community Renewable Energy Members: Findings and Policy Implications from Flanders,” *Energy Policy*, 129, 2019, pp.841–852, <https://doi.org/10.1016/j.enpol.2019.02.067> [accessed 04 June 2026]
- DSO Entity and ENTSO-E. “Repository of National Practices, Electricity Data Interoperability,” 2025, <https://www.data-interoperability.eu/repository-national-practices> [accessed 04 June 2026]
- Ernst & Young Abogados. “Royal Decree-Law 7/2026: Measures Regarding Renewables and Storage,” March 2026, <https://www.ey.com/content/dam/ey-unified-site/ey-com/es-es/technical/alertas-fiscal-legal/ey-26-03-23-alert-rdl-7-2026-renewables-and-storage-.pdf> [accessed 04 June 2026]
- European Commission. *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Citizens Energy Package*, COM(2026) 115 final, 10 March 2026 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52026DC0115> [accessed 04 June 2026]
- European Commission: Directorate-General for Energy and European Climate, Infrastructure and Environment Executive Agency. *Report on Energy Sharing* (Publications Office of the European Union, 2025) <https://data.europa.eu/doi/10.2926/8653694> [accessed 04 June 2026]
- European Court of Auditors. *Energy Communities: Potential Yet to Be Fulfilled – Special Report 10/2026* (Luxembourg: European Court of Auditors, 2026) [https://www.eca.europa.eu/ECAPublications/SR-2026-10/SR-2026-10\\_EN.pdf](https://www.eca.europa.eu/ECAPublications/SR-2026-10/SR-2026-10_EN.pdf) [accessed 04 June 2026]
- European Investment Bank. *Investment Report 2024/2025: Innovation, Integration and Simplification in Europe* (European Investment Bank, 2025) <https://doi.org/10.2867/8065730> [accessed 04 June 2026]
- European Union Agency for the Cooperation of Energy Regulators and Council of European Energy Regulators. *Rewarding Flexibility: How Retail Contract Choice Can Help Unlock Consumer Flexibility – 2025 Monitoring Report* (European Union Agency for the Cooperation of Energy Regulators, 2025) <https://www.ceer.eu/wp-content/uploads/2025/11/ACER-CEER-2025-Retail-monitoring-1.pdf> [accessed 04 June 2026]
- Eurostat. “Housing in Europe – 2025 Edition,” 27 November 2025, <https://ec.europa.eu/eurostat/web/interactive-publications/housing-2025> [accessed 04 June 2026]
- Eurostat. “9.2% of EU population struggled to keep their home warm,” 2 February 2026, <https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20260202-2> [accessed 04 June 2026]
- Felice, Alex and others. “Renewable Energy Communities: Do They Have a Business Case in Flanders?” arXiv, 10 February 2022, <https://doi.org/10.48550/arXiv.2202.05151> [accessed 04 June 2026]

- Fina, Bernadette, David Ribo-Perez and Alvaro Manso-Burgos. “Quantifying the Regulatory Impact on Renewable Energy Community Performance in Austria and Spain,” *Energy Policy*, 212, 2026, pp.1–19, <https://doi.org/10.1016/j.enpol.2026.115187> [accessed 04 June 2026]
- International Energy Agency. *Empowering Ukraine Through a Decentralised Electricity System: A Roadmap for Ukraine’s Increased Use of Distributed Energy Resources Towards 2030* (International Energy Agency, 2025) <https://www.iea.org/reports/empowering-ukraine-through-a-decentralised-electricity-system> [accessed 04 June 2026]
- Menegatti, Emma Solène and others. *How Comprehensive Is EU Electricity Market Design Reform? Exploring the Full Scope of Measures, Objectives and Future Directions* (Florence School of Regulation, 2025), <https://hdl.handle.net/1814/93030> [accessed 04 June 2026]
- Österreichische Koordinationsstelle für Energiegemeinschaften. “Neue Rechtliche Grundlagen,” n.d., <https://energiegemeinschaften.gv.at/rechtliche-grundlagen-elwg/> [accessed 04 June 2026]
- Osborne Clarke. “Royal Decree-Law 7/2026: A New Regulatory and Fiscal Framework for Energy in Spain,” 24 March 2026, <https://www.osborneclarke.com/insights/royal-decree-law-72026-new-regulatory-and-fiscal-framework-energy-spain> [accessed 04 June 2026]
- Patrucco, Daniela. “Comunità Energetica e Lo Scorporo in Bolletta,” QualEnergia.it, 30 December 2025, <https://www.qualenergia.it/articoli/comunita-energetiche-e-scorporo-in-bolletta-un-confronto-con-il-politecnico-di-milano/> [accessed 04 June 2026]
- . “Scorporo in Bolletta Per i Membri Delle CER,” QualEnergia.it, 12 December 2025, <https://www.qualenergia.it/articoli/scorporo-bolletta-per-membri-cer-traino-energia-comunita/> [accessed 04 June 2026]
- Perger, Theresia and others. “PV sharing in local communities: Peer-to-peer trading under consideration of the prosumers’ willingness-to-pay”, *Sustainable Cities and Society*, 66, 2021, <https://doi.org/10.1016/j.scs.2020.102634> [accessed 05 June 2026]
- Pons-Seres de Brauwer, Cristian and Jed Cohen. “Analysing the Potential of Citizen-Financed Community Renewable Energy to Drive Europe’s Low-Carbon Energy Transition,” *Renewable and Sustainable Energy Reviews*, 133, 2020, <https://doi.org/10.1016/j.rser.2020.110300> [accessed 04 June 2026]
- REScoop.eu. *Community Energy: A Practical Guide to Reclaiming Power* (REScoop.eu, 2024)
- Rossetto, Nicolò. “Beyond Individual Active Customers: Citizen and Renewable Energy Communities in the European Union,” *IEEE Power and Energy Magazine*, 21:4, 2023, pp.36–44, <https://doi.org/10.1109/MPE.2023.3269541> [accessed 04 June 2026]
- Rossetto, Nicolò, Stefano F. Verde and Thomas Bauwens. “A Taxonomy of Energy Communities in Liberalised Energy Systems,” in *Energy Communities: Customer-Centered, Market-Driven, Welfare-Enhancing?* pp.3–23 (Academic Press, 2022)
- Vasylieva, Tetiana and others. “From Energy Dependency to Energy Security: How the War in Ukraine Accelerated Renewable Deployment in Europe,” *Economics and Sociology*, 18:3, 2025, pp.229–253, <https://doi.org/10.14254/2071-789X.2025/18-3/13> [accessed 04 June 2026]

# Acknowledgements

The authors would like to thank Luis Cilimingras, Xavier Bou Torrent, Peter Mayrhofer, Lukas Prenner, Matthias Nadrag, Asko Rienzner and Heleen Schockaert for taking the time to meet and share their knowledge and experience. Special thanks go to David Osimo and to Max Munchmeyer and Nicolò Rossetto from the Florence School of Regulation at the European University Institute for their thoughtful input and guidance. All errors of fact or judgement are the authors' sole responsibility.

## List of interviewees

<b>Name</b>	<b>Organisation</b>	<b>Role</b>	<b>Date of interview</b>
<b>Asko Rienzner</b>	Oetzi Energy	Chief operating officer	01 December 2025
<b>Matthias Nadrag</b>	enixi GmbH	Chief executive officer	15 January 2026
<b>Xavier Bou Torrent</b>	Electra Caldense / Elecsum	Director of business development; director of digitalisation and energy communities	09 January 2026
<b>Peter Mayrhofer</b>	backbone.one	Chief operating officer	14 January 2026
<b>Lukas Prenner</b>	EnergyFamily / energyfamily GmbH	Founder and chief executive officer	05 January 2026
<b>Heleen Schockaert</b>	REScoop.eu	Senior expert energy poverty	10 February 2026

## About EDDIE

EDDIE introduces a decentralised, distributed, open-source Data Space, in alignment with the efforts of the EU smart grids task force on implementing acts on interoperability and other European initiatives. The European Distributed Data Infrastructure for Energy (EDDIE) significantly reduces data integration costs, allowing energy service companies to operate and compete seamlessly in a unified European market. Additionally, an Administrative Interface for In-house Data Access (AIIDA) ensures secure and reliable access to valuable real-time data based on customer consent.

This project has received co-funding by the European Union's Horizon Europe under grant agreement No. 101069510.

Copyright © The Lisbon Council 2026



This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International Licence

**The Lisbon Council asbl**

IPC-Résidence Palace  
155 Rue de la Loi  
1040 Brussels, Belgium  
T +32 2 647 9575  
[www.lisboncouncil.net](http://www.lisboncouncil.net)  
[info@lisboncouncil.net](mailto:info@lisboncouncil.net)

**theLisboncouncil**  
think tank for the 21<sup>st</sup> century

