FEDECOM Replication Playbook

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Executive summary

The FEDECOM Replication Playbook is a practical guide for organisations seeking to adopt the forecasting, optimisation, federation, and trading functionalities developed by the FEDECOM project ("FEDErated -system of systems- approach for flexible and interoperable energy COMmunities"). It offers tailored guidance and self-assessments for four replicator profiles and outlines three replication pathways. Whether readers aim to optimise a single site or coordinate a multi-actor federation, this Playbook provides an entry point and decision-support tools to turn interest into implementation.

Table of contents

Glossary of terms and acronyms

Term	Definition
Aggregator	A market actor that pools flexibility or energy resources across sites and enables participation in electricity markets.
API (Application Programming Interface)	A set of tools enabling communication between software applications, including the FEDECOM platform.
BMS (Building Management System)	A control system used to manage building energy systems such as lighting, HVAC, and energy metering.
Blockchain	A distributed ledger technology used in FEDECOM to record energy trades and enable transparency and trust.
CAPEX (Capital Expenditure)	The upfront cost of purchasing or installing equipment and infrastructure.
CHP (Combined Heat and Power)	A technology that simultaneously generates electricity and useful heat from the same energy source.
DPIA (Data Protection Impact Assessment)	A structured process used to identify and minimise data protection risks in projects that involve high-risk personal data processing, as required by Article 35 of the GDPR.
DSO (Distribution System Operator)	The entity responsible for operating the electrical distribution grid.
Energy Community	A group of actors (e.g. citizens, local authorities) who share and/or trade energy.
ESCO (Energy Services Company)	A company that delivers energy savings projects and services, often via performance contracts.
EV (Electric Vehicle)	A vehicle powered entirely or partially by electricity, increasingly relevant for energy flexibility.
FEDECOM	FEDErated system-of-systems approach for flexible and interoperable energy communities.
Flexibility	The ability to adjust energy production, storage, or consumption in response to market or grid signals.
Forecasting	Predicting energy consumption or generation using historical data and predictive models.
GDPR (General Data Protection Regulation)	General Data Protection Regulation, the EU regulation (EU) 2016/679 that governs the collection, processing, and protection of personal data.

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GSY DEX	Grid Singularity (GSY)'s decentralised energy exchange, a blockchain-powered marketplace for trading energy and flexibility (GSY DEX v.1 has been developed upon GSY toolstack and co-financed by the FEDECOM project)
Interoperability	The ability of systems and devices to work together across organisations and platforms.
KPI (Key Performance Indicator)	A measurable value used to evaluate replication success, such as self-consumption rate or grid import reduction.
MoU (Memorandum of Understanding)	A non-binding agreement outlining shared intentions or collaboration terms between parties.
OPEX (Operational Expenditure)	Ongoing costs related to running and maintaining equipment, services, and systems.
FEDECOM Platform	A set of complementary software solutions that enables interoperable data management, forecasting, asset optimisation, and trading functionalities advanced in the FEDECOM project.
Replication Pathway	A structured approach (Minimal, Intermediate, Full) indicating the level of adoption of FEDECOM functionalities.
Replicator Profile	A classification of actors (e.g., site owner, aggregator, policy enabler) intending to adopt FEDECOM.
ROI (Return on Investment)	A measure of the expected gain from an investment relative to its cost. While traditionally financial, ROI in FEDECOM contexts may also refer to environmental or social value delivered over time.
Sector Coupling	The integration of different energy vectors (electricity, heat, transport) for improved efficiency.
Site	A building, facility, or local energy system (e.g. a school, municipal building, campus, or housing cooperative) managed by a single entity. A site may operate as a standalone energy system or as part of an energy community and can contain multiple subsystems (e.g. generation, storage, EV charging, HVAC). Sites are the primary physical units considered for FEDECOM replication.
Trading	The process of buying and selling energy or flexibility across actors or communities.
TSO (Transmission System Operator)	The entity responsible for managing the high-voltage electricity transmission network.

1. Introduction

The FEDECOM Replication Playbook is a practical tool to support the uptake and deployment of FEDECOM results by organisations beyond the original pilots. Its purpose is to help diverse actors — such as site owners and managers, integrators, aggregators, and public authorities — understand what is required to enable interoperable data management, forecasting, asset optimisation, and trading functionalities — all aimed at enabling more efficient, decentralised energy management across multiple actors and infrastructures. To do this, the Playbook offers three flexible replication pathways: Minimal, Intermediate, and Full. These allow users to choose only the components that match their current needs and capabilities. It also introduces four replicator profiles, each with its own self-assessment and guidance: Site Owners / Energy Communities, Technical Integrators, Aggregators / Market Operators, and Public Sector / Policy Enablers. Each profile is supported by a dedicated annex that uses terminology and scoring logic adapted to that audience. This Playbook therefore empowers organisations to unlock operational efficiencies, participate in emerging energy markets, and contribute to the transition toward a more decentralised and resilient energy system.

This Playbook supports a wide range of replicators. Chapter 2 presents the main replicator profiles and explains the three replication pathways. Chapter 3 introduces the self-assessment logic and scoring method, with Annexes A–D providing profile-specific questionnaires. Chapter 4 outlines the technical components of FEDECOM that can be replicated. Chapter 5 explores the enabling conditions that support uptake. Chapter 6 provides guidance on designing a tailored replication strategy, while Chapter 7 presents an overview of relevant EU and national policy frameworks. Country-specific examples are in Annexes E–H. To get started, identify the replicator profile that best matches your organisation in Chapter 2. Then use the corresponding self-assessment in the annexes to determine your replication readiness and the most appropriate pathway. Whether you are exploring feasibility or planning implementation, this Playbook is designed to help you take actionable first steps.

2. Replication pathways and replicator profiles

FEDECOM solutions can be replicated integrally or in part, depending on the needs and capabilities of each organisation. Chapter 2 describes three replication pathways (2.1) and four replicator profiles (2.2).

This structure recognises that organisations differ in what they manage and control — some operate physical infrastructure, others provide integration services, coordinate energy flows, or shape the policy environment. The combination of profiles and pathways allows each type of actor to understand what kind of replication is feasible in their context. Once readers identify their profile, they can use the corresponding self-assessment annex to determine which replication pathway best fits their goals and current capacity.

At the end of the chapter, users should have a clear sense of where they fit. Each profile is linked to a dedicated annex (Annexes A–D), containing a multiple-choice self-assessment with weighted scoring. This helps determine whether a Minimal, Intermediate, or Full pathway is most appropriate, and guides the reader toward next steps that are technically and organisationally realistic.

2.1. Replication pathways

To support a wide range of sites, replicators, and national contexts, FEDECOM replication is organised into three practical adoption pathways ranging from basic forecasting and optimisation to full,

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blockchain-based trading and flexibility markets. Each pathway reflects increasing levels of technical integration, operational complexity, and business opportunity. The pathways are cumulative: replicators qualifying for higher pathways also meet the requirements of lower levels. This structure allows each organisation to adopt only the components most relevant to their strategic needs and internal capabilities.

Minimal Replication — Forecasting & optimisation Focus: This entry-level pathway enables energy communities or sites to adopt FEDECOM's forecasting, scheduling, and local optimisation functionalities for internal site management. It requires:

- Forecasting of generation, consumption, and flexibility
- Local asset control optimisation (cost, emissions, self-consumption)
- Basic data acquisition from site assets
- Internal operational control (no federation or external integration)

Target replicators: Campuses, municipal buildings, small energy communities, initial pilots.

Intermediate Replication — Federation & Interoperability Focus: This pathway builds on Minimal Replication by adding cross-site federation capabilities. It enables multiple energy communities or sites to coordinate, share data, and exchange flexibility services within a federated system. It requires:

- Technical interoperability via standardised data models (ontologies, APIs)
- Secure data sharing across multiple sites
- Coordinated forecasting and flexibility pooling
- Federation-level optimisation services

Target replicators: Multi-site operators, regional clusters, DSOs, cooperative networks.

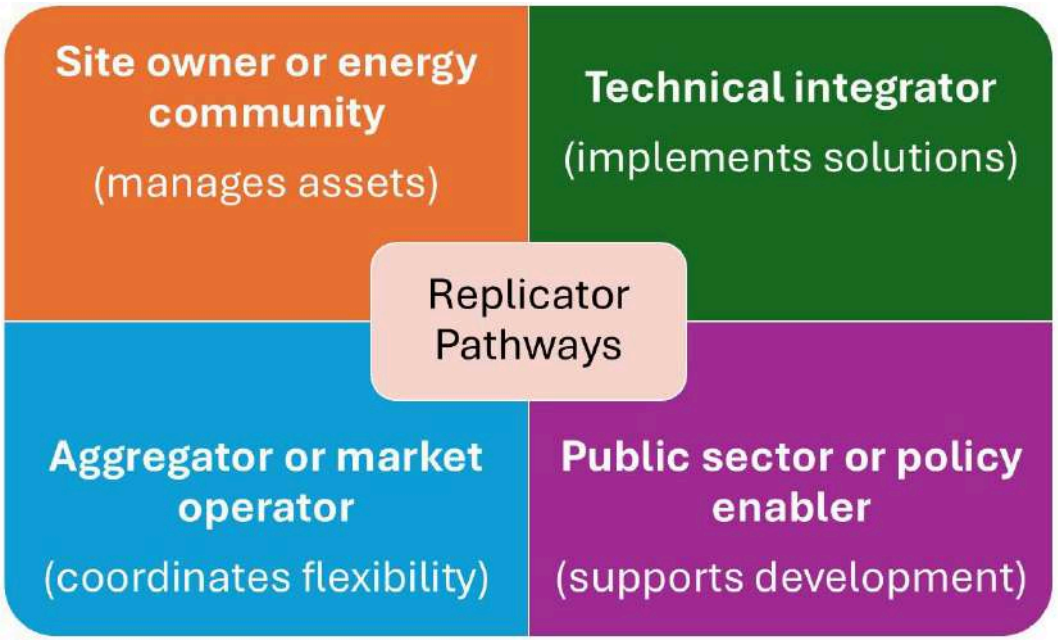
Full Replication — Trading & Market Participation Focus: This most advanced pathway adds full market participation via FEDECOM's decentralised marketplace and blockchain-based trading platform. It allows energy communities to trade flexibility services with external actors, participate in markets, and operate peer-to-peer or peer-to-market exchanges. It requires:

- Activation of decentralised energy exchange
- Integration with trading, remuneration, and settlement functions
- Regulatory alignment for market participation
- Operational governance for market operations and dispute resolution

Target replicators: Aggregators, TSOs, market operators, fully-integrated federation networks.

2.2. Replicator profiles

The FEDECOM Replication Playbook is designed to support a wide range of potential replicators, from local community energy operators to technical integrators and market actors. To accommodate the different levels of responsibility, technical familiarity, and decision-making influence across these groups, the Playbook uses a profile-based approach. Each profile represents a distinct type of actor involved in replication, and is supported by a tailored self-assessment annex with terminology, priorities, and scoring logic adapted to that group's context. Each profile is linked to a dedicated annex (Annexes A–D) with a self-assessment designed specifically for that type of actor.



The following replicator profiles are defined in FEDECOM:

- **Annex A: Site Owners / Energy Communities —** Organisations that own or manage physical infrastructure (e.g. campuses, districts, municipal buildings, housing cooperatives). This category also includes energy community managers who act on behalf of such organisations to oversee operations, governance, and coordination with service providers or technical partners. Their replication priorities include asset readiness, data access, and governance structures that enable community participation and service integration.
- **Annex B: Technical Integrators / Solution Providers —** Engineering firms, consultants, or internal tech teams responsible for implementing forecasting, optimisation, or federation systems. They require detailed technical visibility and strong platform alignment.
- **Annex C: Aggregators / Market Operators —** Actors responsible for participating in or managing energy or flexibility markets, including blockchain-based trading. Their focus is on interoperability, market integration, and financial flows.
- **Annex D: Public Sector / Policy Enablers —** Municipalities, regulators, and national agencies involved in enabling or approving replication efforts. Their role often includes legal alignment, funding, regulatory readiness, and governance enablement.

To reflect these diverse needs, the replicability self-assessment in Annexes A–D is broken out by profile, each using the same scoring scale and pathway logic but adapted in language and weighting.

3. Replication readiness self-assessment

This Playbook provides four short self-assessments — one for each replicator profile. These are included in Annexes A–D and consist of 8 to 11 multiple-choice questions. Each question reflects a different aspect of readiness (e.g. infrastructure, data, legal, operational), and each answer is scored from 0 to 3 based on current capability. To reflect the priorities of each profile, every question is also weighted: 1 for low-priority topics, 2 for medium, and 3 for high. This means that even if two profiles answer the same question similarly, the final score may differ depending on what matters most to that profile. Users are asked to multiply the answer score by the question weight and sum the results to calculate a final weighted score. The total score is used not only to recommend a replication pathway but also to highlight strengths and gaps, enabling better planning and prioritisation.

Instructions are provided at the start of each annex. The same scoring logic applies across all profiles, but the questions, their priorities, and interpretation are tailored to each profile. These assessments are not exhaustive but serve as a practical starting point for reflection, discussion, or seeking funding.

Next step → Once you've identified which replicator profile in Section 2.2 best describes your organisation, please complete the related self-assessment in Annex A-D, and then return to Chapter 4 to explore which FEDECOM components are most relevant for replication.

4. Technical replication

FEDECOM combines technical functionalities that can be adopted either individually or as a system. Chapter 4 is a high-level overview of those components, helping replicators identify which elements are relevant to their context. While the FEDECOM pilots deployed the full suite of functionalities in an integrated way, many replicators may choose to adopt only a subset, depending on their capabilities and objectives. These components are designed to operate independently or in combination, are supported by open-source tools and standardised APIs wherever possible, and are based on widely used energy standards (e.g., OpenADR, IEC 61850), and modular microservice architectures.

Key replicable components include:

- **Forecasting:** Local forecasting of generation, consumption, and flexibility using real-time and historical data.
- **Energy Asset Optimisation / Demand response:** Site-level or community-level energy asset optimisation, based on forecasted conditions and operational constraints.
- **Performance Verification:** Measurement and validation of outcomes (e.g. energy savings, flexibility provision) using standardised KPIs and service models.
- **Remuneration Service**: Functionality to calculate and distribute payments or rewards for energy and flexibility trading within and/or across energy communities, based on validated KPIs and agreed terms.
- **Trading:** Market-based interaction within and/or across energy communities, using decentralised or centralised mechanisms for energy exchange.
- **Blockchain Integration:** Distributed ledger functionality to enable secure, traceable, and automated transactions (required for trading at scale).
- **Federation:** Logic that enables two or more systems (e.g. two or more buildings/campuses that form one energy community, or two or more communities) to exchange data and align energy actions based on shared objectives — such as balancing supply and demand or reducing grid impact. In FEDECOM, this is typically supported by a digital platform operated by a technical partner (e.g. demand response and/or local energy trading service provider and/or flexibility aggregator) that facilitates data exchange, control signals, and optimisation logic across the federated systems.

Some components are interdependent — for example, decentralised trading relies on accurate forecasting and data interoperability. Chapter 6 provides guidance on how to design a tailored replication strategy by combining one or more of these components based on the selected pathway. Each of these components may be adopted individually or in sequence depending on replicator needs and readiness.

Adopting FEDECOM Components — Adopting FEDECOM functionalities (forecasting, optimisation, federation, trading) involves both technical and operational effort. This may include accessing/licensing the open-source FEDECOM backend code, integrating it with multiple data

sources, developing or customising a user interface (e.g. dashboards, alerts), and adapting control strategies to site-specific infrastructure, all while respecting the relevant IPR. Depending on replicator capacity, this process may be managed in-house or through a technical partner. Financially, organisations should plan for integration costs and potentially ongoing service fees, depending on how the FEDECOM solution is packaged or offered by its developers.

Note on Practical Limitations: While federation and decentralised trading represent core FEDECOM concepts, real-world implementation is bound by national regulatory conditions. At present, most countries do not allow inter-community energy trading, and GDPR considerations limit cross-entity data sharing. For this reason, replication in practice may focus on intra-community energy asset optimisation, demand response, or energy trading using peer-to-pool mechanisms based on coefficient allocation. In nearly all countries, energy communities must provide such coefficients to the DSO, and different methodologies are permitted depending on the national context:

- Static: A fixed share of generation is allocated to each participant, regardless of consumption;
- Proportional: Allocation reflects each participant's consumption during every time step;
- Dynamic: The community manager actively adjusts allocations at each time step. This method enables intra-community peer-to-peer trading within a peer-to-pool framework.

Other critical considerations include when coefficients must be communicated to the DSO (ex ante or ex post) and how often they can be updated. In some countries, like Spain, coefficient updates are limited to four times per year. Others allow monthly ex-post updates, which support near-real-time market operation and enable physical validation of trade execution. This flexibility ensures that estimated revenues under FEDECOM remain closely aligned with DSO-calculated outcomes. Federation functionality, demonstrated in FEDECOM, has occurred in controlled proof-of-concept environments and will require broader regulatory enablement for full-scale deployment.

5. Operational replication

FEDECOM replication depends on how components are operated, managed, and governed. Chapter 5 outlines operational considerations to support day-to-day performance and long-term sustainability. Replicators should define or adapt their operational model based on the replication pathway they pursue. At minimum, this may involve setting internal procedures for forecasting and optimisation. At intermediate or full levels, coordination across multiple sites and actors introduces additional responsibilities such as data governance, compliance, and shared decision-making.

Key elements of operational replication include:

- **Federation Models:** These define how multiple systems (buildings or campuses) interact within a community (or how communities interact with each other) in order to coordinate their flexibility and other energy-related actions. Models can be centralised (e.g. a single authority optimises for all sites), or decentralised (multiple, individually managed communities interact) or hybrid. Likewise, applied trading mechanisms can be diverse - either fully peer-to-peer with direct exchanges between participating energy assets or community participants, or peer-to-pool, with exchanges occurring at the level of community or a group of communities and generated saving/revenue allocated based on some type of coefficient sharing mechanism . The selected model influences both data flows and decision-making processes — but is often shaped by the applicable regulation for trading or operational coordination mechanisms, including billing procedures. For example, a centralised model could involve a municipal authority coordinating optimisation across several public buildings

within a community. A peer-to-peer or peer-to-pool energy trading model might involve energy trading or sharing among participants within the same community, such as residential buildings or local businesses, or among communities.. While inter-community federation remains a mid-term ambition, most current implementations focus on intra-community coordination due to regulatory constraints. In all cases, federation logic must align with the valid rules of the trading, billing and other operational mechanisms at the location.

- **Stakeholder Roles and Responsibilities:** Clear definition of who operates which functional components (e.g. forecasting, asset optimisation, performance verification, etc.) and who manages governance, contracts, billing, and other types of operational coordination.
- **Data Management:** Rules for collecting, storing, sharing, and protecting data, especially in multi-actor settings. This includes aligning with GDPR and ensuring data access and quality for forecasting and trading.
- **Intellectual Property Management:** Rules for using diverse FEDECOM solutions depend on the type of applicable IP rights. For instance the GSY DEX components may be used to develop services that continue to be open source and free to use and otherwise require a subscription or another type of license agreement and accompanying payment.
- **Operational Processes:** Day-to-day routines for application of optimisation algorithms, matching and executing trades, verifying performance, billing and otherwise managing system events.
- **Compliance and Liability:** Ensuring that responsibilities are clearly defined in contracts and that liability is understood and shared appropriately.

Operational replication does not require all sites or actors to be equal in capacity. The Playbook assumes flexibility in how tasks are distributed — for example, a site owner may rely on a technical partner for forecasting or use a third-party service for trading. Chapter 6 provides guidance on how to structure this division of labour. Smaller replicators may adopt lightweight coordination models and grow capacity over time. Additionally, it's important to note that operational replication does not require all actors to have equal capacity — roles can be shared or delegated depending on readiness.

6. Business replication

Replicating FEDECOM involves more than deploying technologies — it requires a basic understanding of where value is created, how costs are managed, and which actors are involved in delivering and maintaining the system. This chapter introduces core business considerations that replicators should reflect on when designing a viable implementation approach. The business logic will vary depending on the selected pathway and the replicator's role. For example, a site owner focused on local optimisation may only need to account for investment costs and internal savings. An aggregator enabling decentralised trading will require a clear service or revenue model. Roles defined during operational planning (see Chapter 5) influence who delivers which activities, who benefits, and how financial responsibilities are distributed.

<u>At a minimum, replicators should consider:</u>

- **Value Propositions:** What outcomes does the system deliver — such as energy savings, grid flexibility, resilience, or emissions reduction — and who benefits from them?
- **Key Activities and Resources:** What needs to be done to operate the system (e.g. data collection, forecasting, control), and what technical or human resources are needed?
- **Partnerships and Roles:** Which functions can be delivered internally, and which should be supported by external actors (e.g. integrators, aggregators, or utilities)?

- **Cost Structure:** What are the expected capital (CAPEX) and operational (OPEX) costs? Are there opportunity costs to delaying or not replicating? What are the subscription costs?
- **Revenue or Recovery Mechanisms:** How will the system be financed or sustained — through savings, tariffs, flexibility payments, grants, or shared services? Consider multiple revenue streams such as grid service payments, capacity market participation, energy arbitrage, carbon credits, or shared savings models.

This Playbook does not prescribe standardised business models. Instead, it offers a structure for thinking through feasibility and value creation. Profiles such as aggregators (Annex C) and public sector enablers (Annex D) offer context-specific considerations for funding, coordination, and business alignment. Crucially, replication does not require all roles to be fulfilled in-house. Many activities — such as optimisation or market interfacing — can be delivered by partners. The chosen replication pathway can help determine which technical components are essential and which actors need to be involved. Annexes A–D support this by assessing a replicator's readiness and role.

7. Regulatory replication

Regulation shapes how (and if) FEDECOM concepts can be implemented. Chapter 7 introduces key policy and legal considerations without requiring readers to be legal experts.

At EU level, several frameworks underpin the emergence of decentralised energy systems. These include the Clean Energy for All Europeans Package, the revised Renewable Energy Directive (RED II), the Electricity Directive, and the Data Act. Together, they promote energy community models, open market participation, and digital interoperability — all foundational to FEDECOM's approach.

However, national implementation of these frameworks varies. Country-specific laws affect, and generally further restrict, who and how can participate in energy exchange, act as an aggregator, access data, and monetise flexibility. Replicators should therefore assess local regulatory conditions early in their planning.

Because conditions evolve rapidly, readers are encouraged to consult national authorities or legal experts to ensure alignment with current rules — particularly when planning advanced functionalities such as trading or blockchain-based settlement. Navigating national regulatory frameworks and identifying the relevant information can be challenging for energy communities. To support this process, FEDECOM has developed a list of regulatory requirements that can help assess the feasibility and level of implementation of the FEDECOM solution: Annex E - National Regulatory Requirements. However, this list should be considered as a set of general recommendations, which may not be directly applicable to all European regulatory contexts. Moreover, country-specific regulatory snapshots are provided in: Annex F – Portugal, Annex G – Austria, Annex H – France, and Annex I – Scotland. These annexes were developed in collaboration with FEDECOM partner SmartEn (SEN) and are intended as starting points — not substitutes — for tailored legal due diligence. Finally, public actors such as municipalities and regulators (see Annex D) have a critical role in enabling replication by shaping legal frameworks, de-risking early investments, and facilitating governance.

8. Organisational processes

Successful replication of FEDECOM also depends on getting the organisational processes right. This means ensuring that the necessary legal, administrative, and procurement arrangements are in place to support technical deployment and cross-actor coordination. Replicators — especially those

following intermediate or full pathways — will need to formalise roles, responsibilities, and flows of information, money, and risk. These processes do not need to be complex, but they must be clear.

Key areas to address include:

- **Contracts and Agreements:** Define the terms of implementing different FEDECOM solutions (e.g. forecasting, energy asset optimisation, trading) with appropriate solution IP owners, including how data management, liability, and revenue sharing are handled. This may involve the use of templates (e.g., MoUs, service-level agreements, or multi-party contracts which can be adapted from existing projects or requested from peer organisations.
- **Procurement Models:** Determine how services and tools will be further developed in fully market-ready applications — for example, whether additional technical components are developed in collaboration with service IP owners, and/or internally, procured off-the-shelf, or delivered through long-term partnerships, or through a combination of these.
- **Legal and Financial Administration:** Clarify which entity will manage finances, own the assets, or represent the group in market or regulatory interactions. This may require creating or assigning an operating entity for the replicated system.
- **Onboarding and Coordination:** Establish lightweight governance processes for onboarding new actors, resolving disputes, and adjusting operations over time.

Annexes A–D help identify relevant processes based on the replicator's profile and pathway. Often, replicators can build on existing administrative structures, adapting them only where necessary. Replicators should begin by documenting their current governance and administrative structures to identify what can be reused or adapted.

Data Protection Support Tool

To help replicators assess and align with data protection obligations under the General Data Protection Regulation (GDPR), the Playbook includes a Data Protection Checklist in Annex I. This checklist is especially useful for deployments involving forecasting, federation, or trading across multiple actors or jurisdictions. It supports early planning by helping organisations:

- Identify whether personal data is involved;
- Clarify controller–processor roles;
- Apply privacy-by-design principles (e.g. access control, encryption);
- Prepare for Data Protection Impact Assessments (DPIAs), if needed.

The checklist complements the operational guidance in this chapter and can be used by technical integrators, site owners, aggregators, or public sector actors involved in FEDECOM replication.

9. Risk management

Replication efforts often face risks — technical, organisational, financial, or regulatory — that can delay or derail implementation. Chapter 9 outlines common barriers encountered in FEDECOM pilot deployments and offers suggestions for how to anticipate and manage them. The goal is not to eliminate risk, but to help replicators plan confidently and avoid avoidable disruptions. Proactive planning is key. Many risks can be prevented or mitigated through early stakeholder engagement and scenario testing.

Common replication risks include:

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- **Technical Complexity:** Underestimating the effort needed to integrate forecasting, optimisation, trading or other functionalities. → Mitigation: Choose a suitable pathway and start with minimal replication before scaling up.
- **Lack of Internal Capacity:** Missing skills in data management, control systems, or market engagement. → Mitigation: Identify early which functions to outsource or delegate to trusted partners.
- **Regulatory Uncertainty:** Legal ambiguity around energy and flexibility trading, data access, or multi-party settlements. → Mitigation: Use national assessments (Annexes E–H) to understand the landscape and engage local regulators where needed.
- **Misaligned Expectations:** Partners or stakeholders not agreeing on objectives, timelines, or outcomes. → Mitigation: Establish shared governance and clear role definitions early (see Chapter 5 and 8).
- **Sustainability Gaps:** Lack of long-term funding or unclear business model. → Mitigation: Assess CAPEX/OPEX early and explore revenue or recovery options (see Chapter 6).

Risk profiles vary depending on the replicator's role and chosen pathway. Annexes A–D can help identify which categories of risk are most relevant to each profile. Taking time to surface and discuss these risks early can improve alignment, increase confidence, and smooth implementation. A simple matrix mapping likelihood vs. impact can help prioritise which risks to address first. For high-impact risks, replicators should also consider defining contingency plans or fallback strategies.

10. Conclusion

This Playbook helps organisations take the first steps toward replicating FEDECOM concepts in real-world settings. It provides a flexible framework that recognises not every replicator will follow the same path or play the same role. By identifying their profile, completing a short self-assessment, and reviewing the relevant guidance, users can determine whether a Minimal, Intermediate, or Full replication pathway is right for them. From there, the Playbook supports planning across technical, operational, business, regulatory, and organisational dimensions — always scaled to what is realistically achievable. The annexes provide profile-specific tools (Annexes A–D) and national context (Annexes E–H) to support deeper insight and localisation. An optional online version of the self-assessment tool is also available on the FEDECOM project website to support broader uptake.

What's next after the Playbook? Replicators can use their self-assessment to begin engaging partners, explore national annexes, and prepare funding or governance models. The FEDECOM project team is available to advise or share further resources. Replicating FEDECOM is not just a technical choice, it's a chance to help shape the future of collaborative decentralised energy systems!

For questions or to share feedback, please feel free to contact: zia.lennard@r2msolution.com

Annex A. Site owner / energy community self-assessment

This self-assessment is intended for **organisations that own or manage physical infrastructure**, such as university campuses, housing cooperatives, municipal buildings, or district energy systems. It helps evaluate how ready your site is to replicate FEDECOM concepts and tools — especially forecasting, local optimisation, and coordination with other communities. The questions are written in practical terms for non-specialist users and focus on infrastructure, data, governance, and collaboration.

Instructions: Each question has four answer options scored from 0 to 3. Questions are weighted according to importance: 1 for low-priority topics, 2 for medium, and 3 for high. To complete the self-assessment, choose the answer that best fits your current situation, record the answer score, and multiply it by the weight assigned to the question. Then sum all weighted answer scores to calculate your final score and determine your replication readiness.

Energy Infrastructure Readiness

1. What kinds of energy systems are already in place at your site? (weight = 3)

- ☐ Only basic energy supply (e.g. grid electricity, gas) — score: 0
- ☐ Some on-site generation (e.g. solar panels), without energy storage or controllable loads — score: 1
- ☐ On-site generation plus basic storage or flexible loads (battery / heat pump with storage, EV charging) — score: 2
- ☐ Full mix of systems (distributed generation, battery storage and other flexibility options such as EV charging) — score: 3

Record your weighted answer score for Q1 (score × weight): _____

Data Acquisition & Monitoring

2. What is the current level of energy data collection at your site? (weight = 3)

- ☐ No monitoring or metering beyond utility bills — score: 0
- ☐ Basic meters (e.g. smart meters) for measuring consumption and billing — score: 1
- ☐ Some near real-time data from key systems — score: 2
- ☐ 15-min resolution near real-time data from most or all generation and storage assets in addition to consumption metering — score: 3

Record your weighted answer score for Q2 (score × weight): _____

Historical Data Availability

3. Do you have access to past energy data? (weight = 2)

- ☐ No access to historical energy data — score: 0
- ☐ Less than one year of records — score: 1

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- ☐ At least one year of complete data — score: 2
- ☐ Several years of detailed data (ideally with intervals) — score: 3

Record your weighted answer score for Q3 (score × weight): _____

Interoperability & Data Sharing

4. Can your site connect or share energy information with others? (weight = 2)

- ☐ No ability or plans to connect with other sites — score: 0
- ☐ Technical potential exists, but no systems in place — score: 1
- ☐ Some data sharing or federation systems in early use — score: 2
- ☐ Equipped with a portal for sharing energy consumption and production data securely — score: 3

Record your weighted answer score for Q4 (score × weight): _____

Energy Management Capability

5. How are energy assets currently managed? (weight = 3)

- ☐ Passive — no optimisation or smart controls — score: 0
- ☐ Some manual efforts (e.g. timers, monthly reviews) — score: 1
- ☐ Partial automation (e.g. thermostats, simple controllers) — score: 2
- ☐ An automated system actively adjusts energy use based on real-time conditions (e.g. demand, price signals, or solar generation) — score: 3

Record your weighted answer score for Q5 (score × weight): _____

Legal and Market Conditions

6. What is the level of regulatory and market enablement for your energy community's operations? (weight = 1)

- ☐ Individual[1] self-consumption only — score: 0
- ☐ Coefficient allocation only — score: 1
- ☐ Intra-community trading with diverse mechanisms possible including P2P trading based on market conditions rather than coefficient allocation — score: 2
- ☐ Full trading scope allowed including among different communities — score: 3

Record your weighted answer score for Q6 (score × weight): _____

Internal Roles and Governance

7. How well-defined are your internal roles for managing energy? (weight = 1)

[1] "Individual" here means self-consumption without sharing among multiple participants — e.g., single-user PV without collective allocation.

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- ☐ No clear responsibility or dedicated staff — score: 0
- ☐ A general facility or maintenance person manages energy — score: 1
- ☐ An energy manager or external expert supports the site — score: 2
- ☐ Well-defined roles and procedures for energy management — score: 3

Record your weighted answer score for Q7 (score × weight): _____

Planning and Financial Readiness

8. Does your organisation have a plan or budget for energy improvements? (weight = 2)

- ☐ No plans or budget available — score: 0
- ☐ Energy is on our radar, but no dedicated resources yet — score: 1
- ☐ Some budget or grants secured — score: 2
- ☐ Budget and strategy are in place for upgrades or new systems — score: 3

Record your weighted answer score for Q8 (score × weight): _____

Final score (sum of all weighted answer scores): _____

Important Note: While your final score indicates a recommended replication pathway, certain minimum technical conditions must also be met. For example, even if you reach the threshold for Minimal Replication, you will still need basic digital infrastructure (e.g. access to real-time energy data and system control capability). These minimum requirements are described in Chapter 4 and should be confirmed before initiating replication.

Interpreting your final score — After you have completed all 8 questions and calculated your total score, use the following table to identify your recommended replication pathway:

Total score	Recommended Replication Pathway	Description
0–18	**Minimal Replication Pathway**	You are ready to adopt FEDECOM forecasting and energy asset optimisation (demand response) functionalities for improved internal site management.
19–35	**Intermediate Replication Pathway**	You are ready to join federated networks and share flexibility across multiple sites. This pathway includes data interoperability, f and cross-site asset optimisation (demand response) but does not yet facilitate full participation in energy trading with other communities (self-consumption scheme or coefficient-based trading within a community may be possible).
36–51	**Full Replication Pathway**	You are ready for full FEDECOM replication, including decentralised trading secured by blockchain and federation-wide optimisation. This pathway requires strong data integration capabilities, clear operational responsibility, financial ability to adopt platform services, and sufficient, clear regulatory permissions. Replication at

		this level enables value capture across community boundaries and unlocks the full benefits of a federated trading ecosystem.

Annex B. Technical integrator / solution provider self-assessment

This self-assessment is intended for **technical partners, solution providers, consultants, or IT teams** who would be responsible for integrating FEDECOM functionalities — such as forecasting, optimisation, interoperability, federation logic, or trading infrastructure. It assesses your technical and organisational readiness to support a site or group of sites in replicating FEDECOM solutions.

Instructions: Each question has four answer options scored from 0 to 3. Questions are weighted according to importance: 1 for low-priority topics, 2 for medium, and 3 for high. To complete the self-assessment, choose the answer that best fits your current situation, record the answer score, and multiply it by the weight assigned to the question. Then sum all weighted answer scores to calculate your final score and determine your replication readiness.

Energy Infrastructure Readiness

Q1. What is the current level of energy data collection at the site(s) you support? (weight = 3)

- ☐ No energy data currently available — score: 0
- ☐ Basic metering or static load data only — score: 1
- ☐ Real-time data available from most major assets — score: 2
- ☐ High-resolution data from all energy assets is available and technically easily accessible — score: 3

Record your weighted answer score for Q1 (score × weight): _____

Forecasting Capability

Q2. How advanced is the forecasting capability at the site(s)? (weight = 3)

- ☐ No forecasting tools used — score: 0
- ☐ Simple rule-based forecasts or manual input — score: 1
- ☐ Basic forecasting using external tools (e.g. PV forecast APIs) — score: 2
- ☐ Integrated, data-driven forecasting with multiple energy vectors — score: 3

Record your weighted answer score for Q2 (score × weight): _____

Historical Data Availability

Q3. How much historical data is available for training or calibration? (weight = 2)

- ☐ None or less than 3 months — score: 0
- ☐ At least 6 months — score: 1
- ☐ 1–2 years of usable time-series data — score: 2
- ☐ Over 2 years of complete historical data — score: 3

Record your weighted answer score for Q3 (score × weight): _____

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Interoperability

Q4. What level of interoperability and data exchange capability exists between energy subsystems within the site or group of assets you support (e.g. BMS, EVs, HVAC), including reliable connectivity in case of remote or distributed setups? (weight = 3)

- ☐ Systems are fully siloed — score: 0
- ☐ Minimal integration (manual exports or isolated APIs) — score: 1
- ☐ Several systems are interoperable via middleware — score: 2
- ☐ Site or multi-asset environment is interoperable and prepared for federation (i.e. secure data exchange and shared control logic with other locations or participants) — score: 3

Record your weighted answer score for Q4 (score × weight): _____

Optimisation & Control

Q5. What level of automated control or optimisation is in place? (weight = 3)

- ☐ No automation — score: 0
- ☐ Time-based or simple rules — score: 1
- ☐ Basic site-wide optimisation (e.g. self-consumption, cost) — score: 2
- ☐ Multi-vector optimisation using dynamic inputs (e.g. forecasts, prices) — score: 3

Record your weighted answer score for Q5 (score × weight): _____

Flexibility Management

Q6. How is local energy flexibility identified or managed? (weight = 2)

- ☐ No flexibility characterisation done — score: 0
- ☐ Some flexible assets known, but not quantified — score: 1
- ☐ Flexibility is estimated with basic models — score: 2
- ☐ Site has quantified flexibility and triggers defined — score: 3

Record your weighted answer score for Q6 (score × weight): _____

Federation Capability

Q7. How prepared are you to enable intra-community or cross-site coordination using FEDECOM's federation logic? (weight = 2)

This includes the technical and procedural capacity to exchange energy-related data securely and coordinate optimisation across multiple buildings, campuses, or participant locations. Note that full inter-community federation may be limited by national regulations and data privacy laws, and in many cases is only demonstrated in proof-of-concept environments.

- ☐ No ability or plans to connect with other assets or participants — score: 0

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- ☐ Technical potential exists, but no federation systems in place — score: 1
- ☐ Some secure data exchange or coordination already happening within your asset group or community — score: 2
- ☐ Fully prepared or already coordinating across multiple buildings, campuses, or participants with proper safeguards — score: 3

Record your weighted answer score for Q7 (score × weight): _____

Marketplace Readiness

Q8. How prepared are you to integrate with decentralised energy trading platforms (i.e., local marketplaces for flexibility or energy exchange, using smart contracts or interoperable APIs)? (weight = 3)

- ☐ No capability or plans to support integration with any energy trading system — score: 0
- ☐ Considering marketplace integration, but no systems or capacity in place — score: 1
- ☐ Some interface or data exchange capability exists to support internal trading within a site or community — score: 2
- ☐ Fully capable of integrating with third-party trading platforms or deploying a custom decentralised marketplace, including for inter-community trading once regulation permits — score: 3

Record your weighted answer score for Q8 (score × weight): _____

Blockchain Enablement

Q9. Are you technically prepared to support systems that use blockchain-based trading or traceability? (weight = 1)

Note that this is not a barrier, as the service provider can also perform this service for the energy sites or communities you support.

- ☐ No capacity or intention to support blockchain functionality — score: 0
- ☐ Basic awareness of blockchain, but no technical preparation — score: 1
- ☐ Can interface with blockchain APIs or support limited functionality — score: 2
- ☐ Fully capable of supporting blockchain-based settlement or auditing in a production setting — score: 3

Record your weighted answer score for Q9 (score × weight): _____

Liability & Compliance Planning

Q10. What level of planning is in place to address compliance (e.g. GDPR, IPR, contractual risk)? (weight = 1)

- ☐ No discussion of liability or compliance issues yet — score: 0
- ☐ Informal review of regulatory/legal implications — score: 1

- ☐ Risk and compliance planning analysis is underway (e.g. GDPR, IPR, liability sharing) — score: 2
- ☐ Formal processes are in place to ensure compliance and manage responsibilities — score: 3

Record your weighted answer score for Q10 (score × weight): _____

Final score (sum of all weighted answer scores): _____

Important note: While your total score indicates a recommended replication pathway, some minimum conditions must still be met. For example, adequate access to energy data, digital interoperability, or legal authority may be required depending on your role. Please refer to Chapters 4–7 for key technical, operational, and regulatory considerations relevant to your pathway.

Interpreting your final score — After you have completed all 10 questions and calculated your total score, use the following table to identify your recommended replication pathway:

Total score	Recommended Replication Pathway	Description
0–22	**Minimal Replication Pathway**	You are ready to support asset optimisation and facilitate interoperable data acquisition for one or more sites. Federation and more advanced market-related functionality is not yet in focus, and replication will require support from external service providers.
23–44	**Intermediate Replication Pathway**	You are prepared to enable federation-wide coordination and support key FEDECOM components such as interoperability, data sharing, and platform integration — though marketplace interaction beyond limited peer-to-pool community self-consumption and trading schemes may still be a challenge.
45–66	**Full Replication Pathway**	You are ready to deliver or fully support decentralised trading and engage in trading with other communities, with performance verification, and blockchain-enabled settlement — whether through licensed internal development or service contracts.

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Annex C. Aggregator / market operator self-assessment

This self-assessment is for **aggregators, market operators, ESCOs, or other flexibility market actors** responsible for enabling multi-site energy coordination, demand aggregation, flexibility valorisation, or decentralised trading. It supports assessment of your organisation's readiness to replicate FEDECOM's trading, blockchain, and federation-enabling functionality — including market, legal, and operational perspectives.

Scoring Instructions: Each question has four answer options scored from 0 to 3. Questions are weighted based on importance: 1 for low-priority topics, 2 for medium, and 3 for high. To complete the self-assessment, choose the answer that best matches your current situation, record the answer score, and multiply it by the assigned weight. Sum all weighted answer scores to calculate your final score and determine your replication pathway.

Market Access and Role Definition

Q1. What is your organisation's current legal or contractual role in energy or flexibility markets? (weight = 3)

- ☐ Currently lack a formal legal basis to operate in energy markets — score: 0
- ☐ Exploring or piloting aggregator activities — score: 1
- ☐ Recognised as market participant, but not active — score: 2
- ☐ Fully active in national/regional energy or flexibility markets — score: 3

Record your weighted answer score for Q1 (score × weight): _____

Regulatory Navigation

Q2. How familiar is your organisation with the relevant national and EU regulatory frameworks for flexibility or trading? (weight = 2)

- ☐ No familiarity or access to policy resources — score: 0
- ☐ Awareness of some applicable policies — score: 1
- ☐ Well-informed and tracking regulatory changes — score: 2
- ☐ Active engagement with policymakers or regulators — score: 3

Record your weighted answer score for Q2 (score × weight): _____

Site Flexibility Aggregation

Q3. To what extent do you currently aggregate or coordinate flexibility from multiple sites or customers? (weight = 3)

- ☐ No aggregation activity — score: 0
- ☐ Pilot project or single-site aggregation — score: 1
- ☐ Aggregation of multiple customers/sites in one region — score: 2

- ☐ Cross-region, multi-vector aggregation operational — score: 3

Record your weighted answer score for Q3 (score × weight): _____

Forecasting and Load Prediction

Q4. Do you have the capability to forecast aggregated load, generation, or flexibility? (weight = 2)

- ☐ No forecasting tools used — score: 0
- ☐ Use of third-party forecasts only — score: 1
- ☐ In-house tools used for load prediction or balancing — score: 2
- ☐ Advanced multi-site forecasting with calibration — score: 3

Record your weighted answer score for Q4 (score × weight): _____

Trading Infrastructure Readiness

Q5. What level of decentralised trading or settlement infrastructure do you operate? (weight = 3)

- ☐ No trading functionality deployed — score: 0
- ☐ Internal trading concept under development — score: 1
- ☐ Operates trading pilot or bilateral flexibility platform — score: 2
- ☐ Actively operates or connects to decentralised flexibility markets — score: 3

Record your weighted answer score for Q5 (score × weight): _____

Blockchain Integration

Q6. Is blockchain technology integrated into any part of your market operation? (weight = 2)

- ☐ No blockchain technology used or considered — score: 0
- ☐ Conceptual or simulated testing only — score: 1
- ☐ Pilots or sandboxed deployments in use — score: 2
- ☐ Production-grade blockchain infrastructure integrated — score: 3

Record your weighted answer score for Q6 (score × weight): _____

Interoperability and Data Exchange

Q7. How interoperable are your market platforms with third-party tools or systems? (weight = 2)

- ☐ Fully closed or bespoke tools — score: 0
- ☐ Open to integration, but limited APIs — score: 1
- ☐ Standardised APIs used with select partners — score: 2
- ☐ Full interoperability based on industry-standard interfaces — score: 3

Record your weighted answer score for Q7 (score × weight): _____

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Contractual and Liability Structures

Q8. What is your readiness to implement the required contractual frameworks for flexibility or trading operations? (weight = 1)

- ☐ No planning yet for the contractual arrangements needed — score: 0
- ☐ Basic templates or informal agreements considered — score: 1
- ☐ Legal review completed and model contracts drafted — score: 2
- ☐ Fully operational contractual frameworks in place or ready for adoption — score: 3

Record your weighted answer score for Q8 (score × weight): _____

Partnerships and Ecosystem Readiness

Q9. How well-developed is your network of partners and collaborators for delivering or scaling flexibility services? (weight = 2)

- ☐ No active partnerships or ecosystem actors identified — score: 0
- ☐ Some initial discussions or informal contacts underway — score: 1
- ☐ Active partnerships at local or national level (e.g. DSO, tech, legal) — score: 2
- ☐ Established International network with proven delivery track record — score: 3

Record your weighted answer score for Q9 (score × weight): _____

Final score (sum of all weighted answer scores): _____

Important note: While your total score indicates a recommended replication pathway, some minimum conditions must still be met. For example, adequate access to energy data, digital interoperability, or legal authority may be required depending on your role. Please refer to Chapters 4–7 for key technical, operational, and regulatory considerations relevant to your pathway.

Interpreting your final score — After you have completed all 9 questions and calculated your total score, use the following table to identify your recommended replication pathway:

Total score	Recommended Replication Pathway	Description
0–11	**Minimal Replication Pathway**	You are ready to explore FEDECOM integration through local aggregation or simplified forecasting
12–22	**Intermediate Replication Pathway**	You are equipped to coordinate across sites and interact with the FEDECOM federation logic, but full market operation (e.g. peer-to-peer blockchain-based settlement for intra- and inter-community trading) is still under development.
23–33	**Full Replication**	You are fully capable of delivering a decentralised trading service

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	Pathway	at scale, with a mature blockchain-secure platform, ecosystem, and in compliance with local trading regulation, GDPR and IPR relating to FEDECOM solutions such as the GSY DEX.

Annex D. Public sector / policy enabler self-assessment

This self-assessment is for **municipalities, regional agencies, regulators, or public authorities** involved in enabling, funding, or approving the replication of FEDECOM results. These actors play a critical role in shaping the regulatory, financial, and institutional conditions needed for community-scale replication.

Scoring Instructions: Each question has four answer options scored from 0 to 3. Questions are weighted based on importance: 1 for low-priority topics, 2 for medium, and 3 for high. To complete the self-assessment, select the answer that best reflects your current context, multiply it by the question's weight, and record your weighted answer score. Then sum all weighted answer scores to calculate your total and determine your replication pathway.

Policy Awareness & Alignment

Q1. How well does your organisation understand EU and national energy community policies (See Chapter 7 for a short overview of relevant EU frameworks and Annexes E-H for national examples)? (weight = 3)

- ☐ Limited awareness of national and EU energy community policies — score: 0
- ☐ Some familiarity with Clean Energy Package and directives — score: 1
- ☐ Good knowledge of national transposition and emerging frameworks — score: 2
- ☐ Actively tracks, contributes to, or aligns with policy developments — score: 3

Record your weighted answer score for Q1 (score × weight): _____

Regulatory Scope for Trading

Q2. What is the current regulatory scope for energy trading in your country or region (for background, see Chapter 7 and national assessments in Annexes E–H)? (weight = 3)

- ☐ Trading not permitted — only individual self-consumption is allowed — score: 0
- ☐ Limited sharing or pooling permitted within energy communities (e.g. coefficient-based) — score: 1
- ☐ Peer-to-peer or peer-to-pool trading models permitted but not yet mainstream — score: 2
- ☐ Trading between communities is explicitly allowed and operational — score: 3

Record your weighted answer score for Q1 (score × weight): _____

Local Strategic Prioritisation

Q3. Are energy communities or flexibility markets part of your local or regional strategy? (weight = 3)

- ☐ Not included in local policy agendas — score: 0
- ☐ Mentioned in broad terms but no dedicated planning — score: 1
- ☐ Specific measures or targets included — score: 2

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- ☐ Priority area with strategic actions or budget — score: 3

Record your weighted answer score for Q2 (score × weight): _____

Funding & Investment Support

Q4. Are there public funding mechanisms available to support local FEDECOM replication efforts? (weight = 2)

- ☐ No mechanisms known or planned — score: 0
- ☐ Early-stage planning or discussion of instruments — score: 1
- ☐ Active schemes exist (e.g. green bonds, local grants) — score: 2
- ☐ Proven funding track record with replicable models — score: 3

Record your weighted answer score for Q3 (score × weight): _____

Legal Enabling Conditions

Q5. Are there clear national or local legal pathways for energy sharing, aggregation, or trading? (weight = 3)

- ☐ Significant legal barriers currently restrict key functionalities (e.g. trading, data access, interoperability) — score: 0
- ☐ Uncertain or evolving legal landscape — score: 1
- ☐ Enabling conditions exist but underutilised — score: 2
- ☐ Clear legal framework supports implementation — score: 3

Record your weighted answer score for Q4 (score × weight): _____

Administrative Capability

Q6. Can your organisation assist with permitting, licensing, or institutional coordination? (weight = 2)

- ☐ No capability or mandate — score: 0
- ☐ Case-by-case involvement only — score: 1
- ☐ Institutional channels available — score: 2
- ☐ Proven facilitator of multi-actor coordination — score: 3

Record your weighted answer score for Q5 (score × weight): _____

Governance and Replication Models

Q7. Are local governance models or playbooks available to support replication of FEDECOM-like initiatives? (weight = 2)

- ☐ No templates, examples, or reference models — score: 0
- ☐ Informal or non-standardised approaches — score: 1

- ☐ Some reference models or pilot-based lessons exist — score: 2
- ☐ Formalised playbooks or guidelines with stakeholder buy-in — score: 3

Record your weighted answer score for Q6 (score × weight): _____

Capacity Building & Awareness

Q8. Does your organisation promote capacity building around flexibility, energy communities, or digitalisation? (weight = 1)

- ☐ No training, events, or education offered — score: 0
- ☐ Occasional awareness activities — score: 1
- ☐ Regular inclusion in local programmes — score: 2
- ☐ Ongoing capacity-building strategy or partnership — score: 3

Record your weighted answer score for Q7 (score × weight): _____

Stakeholder Engagement

Q9. Are you able to coordinate or convene key stakeholders (e.g. DSOs, citizen groups, tech providers)? (weight = 2)

- ☐ Not involved in such coordination — score: 0
- ☐ Ad hoc engagement only — score: 1
- ☐ Some formal structures in place (e.g. platforms) — score: 2
- ☐ Proactive coordination through recognised channels — score: 3

Record your weighted answer score for Q8 (score × weight): _____

Evaluation and Impact Monitoring

Q10. Do you have processes in place to monitor or evaluate community energy or flexibility initiatives? (weight = 2)

- ☐ No tracking or reporting — score: 0
- ☐ Monitoring exists but not systematic — score: 1
- ☐ Evaluation frameworks used in specific cases — score: 2
- ☐ Institutionalised monitoring or KPI-based systems in use — score: 3

Record your weighted answer score for Q9 (score × weight): _____

Final score (sum of all weighted answer scores): _____

Important note: While your total score indicates a recommended replication pathway, some minimum conditions must still be met. For example, adequate access to energy data, digital interoperability, or legal authority may be required depending on your role. Please refer to Chapters 4–7 for key technical, operational, and regulatory considerations relevant to your pathway.

Interpreting your final score — After you have completed all 9 questions and calculated your total score, use the following table to identify your recommended replication pathway:

Total score	Recommended Replication Pathway	Description
0–23	**Minimal Replication Pathway**	You are beginning to explore energy communities or local flexibility but require further alignment with legal, policy, and funding frameworks to support FEDECOM replication.
24–47	**Intermediate Replication Pathway**	You are positioned to support federation, digitalisation, and multi-stakeholder governance, though full deployment of FEDECOM may require strengthened legal or financial mechanisms.
48–72	**Full Replication Pathway**	You are fully capable of enabling FEDECOM replication through clear regulatory support, strategic prioritisation, optional local investment tools, and governance leadership.

Annex E. National Regulatory Requirements

The national regulatory analysis should particularly examine several key elements. An incremental approach based on the regulatory requirements for implementing the different stages of replication is needed. These stages correspond to the Minimal, Intermediate, and Full replication pathways described in Chapter 2. We identified five steps that enable the replication of FEDECOM solutions:

1. Ability to perform individual self-consumption
2. Ability to create an energy community
3. Ability to engage in Energy Sharing
4. Ability to create an inner-community P2P market
5. Ability to enable inter-community energy exchange

Step 1. Ability to perform individual self-consumption

The analysis should investigate whether national frameworks allow individuals or legal entities to generate and consume electricity from their own installations (e.g. rooftop solar PV), including the conditions for grid access, metering, and settlement.

Step 2. Ability to create an energy community

The administrative procedures, legal structures, and limitations for establishing energy communities should be reviewed. This includes:

- Structures aligned with the EU definition of Renewable Energy Communities (RECs)
- Structures aligned with the EU definition of Citizen Energy Communities (CECs)
- The registration of an arrangement that allows collective self-consumption (CSC) (also called energy sharing) without the creation of a formal structure but may differ from EU definitions
    - In some countries, CSC can be done without the creation of a REC or a CEC. However, this structure will not be able to develop additional services to its members. Moreover, the governance requirements for RECs and CECs restrict energy service companies from participating. In such cases, a CSC collective cant be created to enable energy sharing.

Step 3. Ability to engage in energy sharing (CSC)

Replicators should investigate the conditions that enable CSC or energy sharing, particularly those supporting more complex and scalable solutions.

In most countries, CSC is implemented through the following steps:

- Registering the scheme, including its participants, with the DSO that manages the grid where the participants are located.
- Communicating a sharing coefficient (also called an allocation key) to the DSO. Based on this information, the DSO calculates the shared energy using smart meter data and performs the

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financial settlement including grid charges and taxes (if applicable under the national framework) .

Energy sharing allows the distribution of energy generated by community-owned and participant-owned assets to other participants who are unable to install distributed energy resources (DERs) themselves. The allocation of energy generated by these DERs is commonly based on a sharing coefficient methodology.

These methodologies are described below:

- The most common sharing coefficient:

Static (or fixed) coefficient
Each participant receives a predetermined share of the generation, regardless of real-time consumption.

Proportional coefficient
Energy is shared based on each participant's consumption during the relevant market time unit. Higher consumers receive a larger share. This method ensures that all electricity is allocated in one round but may be perceived as unfair, as large consumers benefit most.

- More developed sharing coefficients allowing more complex schemes:

Hybrid allocation
Allocation is done in multiple rounds. The first round can use the fixed method. Any unconsumed (residual) energy is redistributed in a second round using the proportional method, ensuring full allocation of generated energy.

Dynamic allocation

The community manager can adjust the allocation of generation from each asset to each consumer for every time step. This allocation method differs from the traditional coefficient approach, as it allows changes to be made for each market time step (e.g., hourly). This flexibility directly supports the development of the core FEDECOM solution, the intermediate replication pathway creating an intra-community P2P market.

Hierarchical allocation

This approach allows energy sharing schemes to be organized into sub-groups, each with its own internal allocation key, either fixed or proportional. Energy is first distributed within each sub-group, and any unused energy can then be passed on to other sub-groups in subsequent rounds. Depending on the national rule on the limit to form energy communities, it can act as a direct enabler for the creation of an energy community federation as considered by FEDECOM.

Step 4. Ability to create an inner-community P2P market

FEDECOM implementation enables the creation of an inner-community P2P market, operating in parallel with the settlement and billing processes managed by the DSO. To ensure minimal discrepancies between the outcomes of the P2P market (i.e., the results of the auction and the corresponding producer and consumer actions) and the settlement calculations performed by the

DSO, certain regulatory requirements must be fulfilled. This alignment is essential to guarantee that both production and consumption activities are consistent with the auction results generated by the FEDECOM solutions.

Four regulatory requirements can be considered as needed to ensure that FEDECOM solutions can be fully implemented within a community:

a. Price differentiation within the community

b. The recognition of the dynamic sharing coefficient

c. The ability to communicate the coefficient ex-post

d. Alignment between the frequency of sharing coefficient communication and the timing of ex-post communication

a. Price differentiation within the community

The energy sharing process must include a form of compensation for the party generating the energy. Parties interested in implementing the FEDECOM solutions should verify whether their national framework permits compensation from the consuming party to the generating party within an energy sharing scheme.

In some countries, the compensation price is regulated or set by public authorities. The FEDECOM solutions rely on the ability to place bids and can only be fully implemented if the national framework allows for price differentiation in compensation. This price differentiation may take the form of real-time bidding or pre-agreed rates between participants, depending on the operational model. From a regulatory standpoint, both approaches are generally treated equivalently.

To be economically meaningful, the compensation should be higher than the feed-in tariff received by the generating party from their electricity supplier, but lower than the retail electricity price paid by the consuming party to their supplier. However, some generating parties may choose to share their energy at a price below their feed-in tariff. For example, a municipality providing energy at a discounted rate to energy-vulnerable households.

b. The recognition of the dynamic sharing coefficient

The dynamic sharing coefficient[2] allows the energy community manager to adjust, at each time step (typically hourly), the share of energy generated by a specific asset allocated to individual consumers. This mechanism enables a precise reflection of the auction results to the DSO. The dynamic sharing coefficient is, at the time of writing, available in France, Portugal and Spain.

c. The ability to communicate the coefficient ex-post

The timing of the sharing coefficient communication is also crucial for the full replication of the FEDECOM solutions. This communication can occur in two ways:

· Ex-ante (before the physical delivery of shared energy)

[2] The terminology can differ depending on your country

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· Ex-post (after the physical delivery of shared energy)

Ex-post communication of the sharing coefficient serves as a key enabler of the FEDECOM solutions for several reasons:

- It allows for more accurate generation forecasts, benefiting from updated weather data.
- It improves consumption forecasts, enabling participants to better assess their capacity to consume the energy (e.g., for EV charging, heating, or cooling).
- It enhances control and verification, allowing the FEDECOM solutions to confirm whether the energy exchanges occurred as planned and to identify any deviations that may affect compensation.

These advantages help ensure that the forecasted revenues and savings from energy sharing schemes by FEDECOM solutions closely match the actual values settled by the DSO, thereby increasing trust and participation.

d. Alignment between the frequency of sharing coefficient communication and the timing of ex-post communication

Some countries may place limits on how often the sharing coefficient can be communicated to the DSO. Such restrictions can significantly affect the performance of the FEDECOM solutions in delivering accurate forecasts of revenues and savings.

To ensure forecast accuracy, there must be alignment between:

- the frequency at which sharing coefficients can be communicated, and
- the timing allowed for ex-post communication.

For example, in countries such as Portugal or France, where dynamic sharing coefficients and ex-post communication are allowed, the sharing coefficient for a billing period (e.g., February) may be submitted by the following month (e.g., March 1st). In such cases, the permitted frequency of communication should be at least monthly to maintain forecast accuracy..

Ensuring the consistency between the two elements acts as a direct enabler to the replication of FEDECOM solutions.

Step 5. Ability to enable inter-community energy exchange

The creation of a federation of energy communities enabling the exchange of energy between themselves and across borders is one of the core objectives of FEDECOM. While ambitious, this objective has not been achieved at the time of writing.

We have assessed the regulatory requirements for enabling the development of this objective from a theoretical perspective. If any community outside the consortium, while attempting to implement these features, encounters regulatory barriers or identifies implementation pathways not addressed in this replication guidebook, please provide feedback on the FEDECOM website.

To implement this feature, three regulatory requirements are needed in your national framework:

a. The ability to create a structure covering several energy communities

b. Consistency between these requirements and collective-self consumption rules

c. Recognition of the hierarchical allocation method

a. The ability to create a structure covering several energy communities

One of the main barriers to the development of energy communities is geographical restrictions. Such restrictions are mentioned in EU law for Renewable Energy Communities[3], which may limit their scope to a local area.

These geographical requirements are less stringent for Citizen Energy Communities (CECs). Depending on national implementation, however, the boundaries and conditions for operation may still be unclear.

Among the different structures considered in this Playbook as forms of energy communities, only those implementing the European definition of a Citizen Energy Community (CEC) are not subject to strict geographical limitations. Furthermore, EU law allows for CEC projects to be established across neighbouring countries, supporting cross-border collaboration. However, this feature is not mandatory and, to date, only a few countries have implemented it.

Without stringent conditions, it should be possible to join communities under a common umbrella. Replicators and policymakers should assess the governance implications of creating federated energy community structures, including decision-making complexity, legal liability, and coordination.

b. Consistency between these requirements and CSC rules

Not only must energy communities meet specific regulatory requirements, but they should also be aligned with CSC frameworks. Most countries apply one of two main approaches to CSC:

- Countries that impose geographical constraints and allow for cost-reflective network charges (typically meaning a reduction in network charges, often limited to distribution-level costs).

- Countries that do not impose strict geographical limitations but do not offer reductions in network charges.

The latter group of countries, those without stringent geographical restrictions, are the ones that could more feasibly support the development of a federation of energy communities.

c. Recognition of the hierarchical allocation method

As mentioned in the explanation of the sharing coefficient, the hierarchical coefficient can act as a direct enabler for energy exchange between energy communities. This method is currently implemented in Portugal; however, strict geographical proximity requirements significantly limit its applicability for federated communities. By allowing for multiple rounds of allocation, it enables the

[3] The Renewable Energy Directive II mentions that REC members must be located in proximity to the renewable energy project they develop.

matching of linked communities with complementary profiles, for example, some with higher generation and others with higher consumption.

In the final allocation rounds, residual energy from one community can be allocated to another community whose internal generation does not cover its consumption needs. This ensures that energy exchange occurs only when a community cannot fully self-consume its generated energy, thereby maximizing local self-consumption before enabling inter-community exchange.

Annex F. Portugal: national replication context

This annex summarises key national regulatory and market conditions relevant to replicating FEDECOM in Portugal. It complements Chapter 7 by providing country-specific details on legal and regulatory frameworks impacting FEDECOM solution implementation. This information is current as of August 2025 and is intended as guidance only — users should consult local experts and authorities to confirm regulatory feasibility.

Step 1. Ability to perform individual self-consumption 

1.1 Individual self-consumption framework in place

- Framework in place : Yes
- Legal framework : Decree-Law 15/2022
- Comment: Portuguese citizens are allowed to consume electricity generated by their own installations, whether located behind the meter or nearby.

Step 2. Ability to create an energy community 

2.1 Creation of a Renewable Energy Community

- Framework in place : Yes
- Legal framework : Decree-Law 15/2022 (article 189)
- Comment: It is possible to create a REC in Portugal. However, only a few projects have been implemented (9 as of May 2025).

2.2 Creation of a Citizen Energy Community

- Framework in place : Not fully implemented
- Legal framework : Decree-Law 15/2022 (article 191)
- Comment: Although CECs are present in Portuguese law, we could not identify any real-life implementation of a CEC project in Portugal.

2.3 Creation of a CSC arrangement

- Framework in place: Yes
- Legal framework: Decree-Law 15/2022 and Regulation 815/2023
- Comment: Portugal has implemented a comprehensive framework for the creation of CSC arrangement, administered by a manager known as the *Entidade Gestora do Autoconsumo Coletivo* (EGAC).

Step 3. Ability to engage in energy sharing (CSC) 

3.1 Process to register an energy sharing scheme

- Framework in place: Yes

- Legal framework: Decree-law 15/2022 (article 86) and Regulation 815/2023
- Comment: Yes, clear rules are in place in Portugal. No major barriers have been identified.

3.2 Energy sharing coefficient available

- Framework in place: Yes
- Legal framework: Regulation 815/2023 (article 29 to 32)
- Comment: Portugal recognises multiple sharing coefficients (fixed, proportional, hierarchical, and dynamic).

Step 4. Ability to create an inner-community P2P market 

4.1 Price differentiation within the community

- Framework in place: Yes
- Legal Framework: Decree-Law 15/2022 (article 86) and
- Comment: The CSC manager is responsible for defining the commercial relationship policy, which can include a price differentiation. They can therefore reflect and communicate the outcomes of the internal peer-to-peer market to the DSO

4.2 Availability of the dynamic sharing coefficient

- Framework in place: Yes
- Legal Framework: Regulation 815/2023 (article 32)
- Comment: The dynamic sharing coefficient is available in Portugal.

4.3 Ability to communicate the coefficient ex-post

- Framework in place: Yes
- Legal Framework: Regulation 815/2023 (article 32)
- Comment: The CSC is able to communicate the dynamic sharing coefficient ex-post

4.4 Alignment between the frequency of sharing coefficient communication and the timing of ex-post communication

- Framework in place: Yes
- Legal Framework: Regulation 815/2023 (article 32)
- Comment: The regulation states that the communication of dynamic sharing coefficients must be defined by the DSO, while ensuring compatibility with the billing cycle and enabling the CSC manager to access official metering data from smart meters.

Step 5. Ability to enable inter-community energy exchange 

5.1 The ability to create a structure covering several energy communities

- Framework in place: No
- Legal Framework: Decree-Law 15/2022 (article 191)

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- Comment: While CECs are recognized under Portuguese law, we could not identify any real-life implementations of this concept. Moreover, they are defined as being governed by the same provisions as RECs, with only two exceptions. Proximity requirements are not among these exceptions.

5.2 Consistency between these requirements and CSC rules

- Framework in place: No
- Legal Framework: Regulation 99/2024 (article 83)
- Comment: Proximity requirements for energy sharing are a limitation for inter-community energy sharing. The generation and consumption partners must be located within the following distances: No more than 2 km if connected to the low-voltage (LV) network; 4 km for the medium-voltage (MV) network; 10 km for the high-voltage (HV) network; 20 km for the extra-high-voltage (EHV) network

5.3 Recognition of the hierarchical allocation method

- Framework in place: Yes
- Legal Framework: Regulation 815/2023 (article 31)
- Comment: The hierarchical allocation method is recognised in Portugal.

This content is provided as a contribution from SmartEn (SEN) to the FEDECOM project. It does not constitute legal advice.

Annex G. Austria: national replication context

This annex summarises key national regulatory and market conditions relevant to replicating FEDECOM in Austria. It complements Chapter 7 by providing country-specific details on legal and regulatory frameworks impacting FEDECOM solution implementation. This information is current as of August 2025 and is intended as guidance only — users should consult local experts and authorities to confirm regulatory feasibility.

Step 1. Ability to perform individual self-consumption 

1.1 Individual self-consumption framework in place

- Framework in place : Yes
- Legal framework : EAG §82
- Comment: Austrian citizens are allowed to consume electricity generated by their own installations located behind-the-meter

Step 2. Ability to create an energy community 

2.1 Creation of a Renewable Energy Community

- Framework in place : Yes
- Legal framework : ElWOG 16 (c)
- Comment: Yes, it is possible to create a REC in Austria.

2.2 Creation of a Citizen Energy Community

- Framework in place : Yes
- Legal framework : ElWOG 16 (b)
- Comment: Yes, it is possible to create a CEC in Austria

2.3 Creation of a CSC arrangement

- Framework in place: Yes
- Legal framework: ElWOG 16a,16b, 16c
- Comment: Yes, collective self-consumption in Austria can be established through the regulation on community generation installations (*Gemeinschaftliche Erzeugungsanlagen*). However, this is only possible if generation and consumption take place within a single multi-apartment building, or via the grid in the case of RECs and CECs.

Step 3. Ability to engage in energy sharing (CSC)

3.1 Process to register an energy sharing scheme 

- Framework in place: Yes
- Legal framework: ElWOG 16a,16b, 16c

Funded by the European Union

- Comment: As mentioned previously, an energy-sharing scheme is possible within a single building in the case of community generation installations, or via the grid in the case of REC and CEC.

3.2 Energy sharing coefficient available

- Framework in place: Yes
- Legal framework: ElWOG 16e (3)
- Comment: Two sharing coefficients are recognized: static and proportional. Please note that the official terminology used is dynamic coefficient, but in practice it functions as a proportional coefficient (based on consumption at each time step)..

Step 4. Ability to create an inner-community P2P market

4.1 Price differentiation within the community

- Framework in place: Yes
- Legal Framework: Österreichische Koordinationsstelle für Energiegemeinschaften 7.14
- Comment: It is possible to differentiate the compensation paid by participants in a CSC in Austria. Communities may apply differentiated internal tariffs, for example based on members' financial contributions to community-owned assets or on socioeconomic status (e.g., preferential rates for energy-vulnerable households). In this way, the arrangement could reflect the outcome of an inter-community market.

4.2 Availability of the dynamic sharing coefficient

- Framework in place: Yes
- Legal Framework: ElWOG 16e (3)
- Comment: No, the dynamic coefficient is not available in Austria. Only the static and proportional coefficients are.

4.3 Ability to communicate the coefficient ex-post

- Framework in place: No
- Legal Framework: ElWOG 16d
- Comment: No, the sharing coefficient cannot be communicated ex-post in Austria.

4.4 Alignment between the frequency of sharing coefficient communication and the timing of ex-post communication

- Framework in place: Yes
- Legal Framework: ElWOG 16d
- Comment: There are no clear requirements in the regulation regarding how often the sharing coefficient can be updated.

Step 5. Ability to enable inter-community energy exchange

5.1 The ability to create a structure covering several energy communities

- Framework in place: Yes, but not fully
- Legal Framework: ElWOG 111 (8)
- Comment: A producer or a consumer can participate in several energy communities (up to five). Moreover, CECs have no geographical limitation. It is therefore possible to allocate electricity first within one community and then assign the residual electricity to another community. However, only the residual electricity from a single asset engaged in both communities can be traded, rather than the entire surplus of electricity (for example, when a community operates several generation assets).

5.2 Consistency between these requirements and CSC rules

- Framework in place: Yes
- Legal Framework: ElWOG 16b
- Comment: Yes, there is no geographical limitation on CSC for CECs. However, geographical proximity is linked to reduced network tariffs, which incentivises models where the producer and the consumer are located close to each other.

5.3 Recognition of the hierarchical allocation method

- Framework in place: No
- Legal Framework: ElWOG 16e (3)
- Comment: No, the hierarchical allocation key is not recognised in Austria.

This content is provided as a contribution from Smart Energy Europe (SEN) to the FEDECOM project. It does not constitute legal advice.

Annex H. France: national replication context

This annex summarises key national regulatory and market conditions relevant to replicating FEDECOM in France. It complements Chapter 7 by providing country-specific details on legal and regulatory frameworks impacting FEDECOM solution implementation. This information is current as of August 2025 and is intended as guidance only — users should consult local experts and authorities to confirm regulatory feasibility.

Step 1. Ability to perform individual self-consumption 

1.1 Individual self-consumption framework in place

- Framework in place : Yes
- Legal framework : Energy Code – Articles L315-1 and D315-1
- Comment: Prosumers can consume electricity from their generation assets either directly or after storage, if they are equipped with a storage system.

Step 2. Ability to create an energy community 

2.1 Creation of a Renewable Energy Community

- Framework in place : Yes
- Legal framework : Energy Code – Articles L291, L293, R291, R293
- Comment: Yes, it is possible to create a REC in France.

2.2 Creation of a Citizen Energy Community

- Framework in place : Yes
- Legal framework : Energy Code – L292, L293,R292, R293.
- Comment: Yes, it is possible to create a CEC in France.

2.3 Creation of a CSC arrangement

- Framework in place: Yes
- Legal framework: Energy Code – Articles L315-2 and D315-2
- Comment: Yes, it is possible to create a CSC arrangement in France.

Step 3. Ability to engage in energy sharing (CSC) 

3.1 Process to register an energy sharing scheme

- Framework in place: Yes
- Legal framework: Energy Code – Articles L315-4 and D315-2, complemented by ECOR2502794A.
- Comment: The process to register a CSC arrangement is clear: it requires nominating an energy sharing organiser (*Personne Morale Organisatrice*) to the DSO and providing a sharing

coefficient to ensure the correct allocation of electricity among participants. The different participants must be located within a radius of two kilometers, and the total capacity of the generators must be below 5 MW. In June 2025, 1111 collective self-consumption projects were active in France.

3.2 Energy sharing coefficient available

- Framework in place: Yes
- Legal framework: Energy Code – Articles L315-4 complemented by Enedis note (*Modalités de mise en oeuvre d'une opération d'autoconsommation collective*) part 4.2.
- Comment: Four sharing coefficients are recognized: Static, Proportional, Simplified Dynamic (the same sharing coefficient applies to every production unit per time step), and Fully Dynamic (the coefficient can differ for each production unit per time step).

Step 4. Ability to create an inner-community P2P market

4.1 Price differentiation within the community

- Framework in place: Yes
- Legal Framework: Energy Code – Article L315-4 complemented by Enedis note (Autoconsommation Collective: Guide pédagogique)
- Comment: In France, it is possible to differentiate the compensation paid by participants in a CSC scheme.

4.2 Availability of the dynamic sharing coefficient

- Framework in place: Yes
- Legal Framework: Energy Code – Article L315-4 complemented by Enedis note (Modalités de mise en oeuvre d'une opération d'autoconsommation collective) part 4.2.
- Comment: Yes, the dynamic sharing coefficient is available in France.

4.3 Ability to communicate the coefficient ex-post

- Framework in place: Yes
- Legal Framework: Energy Code – Article L315 complemented by SéQuélec note (*Modalités de mise en oeuvre d'une opération d'autoconsommation collective*).
- Comment: Yes, the dynamic sharing coefficient can be communicated ex-post to DSO. However, this option is only available for the Full Dynamic dynamic coefficient.

4.4 Alignment between the frequency of sharing coefficient communication and the timing of ex-post communication

- Framework in place: Yes
- Legal Framework: Energy Code – Article L315 complemented by SéQuélec note (*Modalités de mise en oeuvre d'une opération d'autoconsommation collective*).
- Comment: Yes, CSC schemes are billed on a monthly basis in France. For each billing period, the CSC manager can communicate the Full Dynamic Sharing coefficient up to four days after the start of the following billing period (e.g. the CSC manager may communicate by February 4th the sharing coefficient used to frame the exchange of energy during the month of January).

Step 5. Ability to enable inter-community energy exchange

5.1 The ability to create a structure covering several energy communities

- Framework in place: No
- Legal Framework: Energy Code – Article L292 and R292
- Comment: While CECs do not entail geographical constraints for their creation, they must act as a single entity rather than as a collection of different energy communities."

5.2 Consistency between these requirements and CSC rules

- Framework in place: No
- Legal Framework: Energy Code – Articles L315-4 and D315-2, complemented by ECOR2502794A.
- Comment: No, CSCs entail clear geographical restrictions. Participants in a CSC arrangement must be located within a maximum radius of two kilometers.

5.3 Recognition of the hierarchical allocation method

- Framework in place: No
- Legal Framework: Energy Code – Articles L315-4 complemented by Enedis note (*Modalités de mise en oeuvre d'une opération d'autoconsommation collective*) part 4.2.
- Comment: No, the hierarchical allocation key is not recognised in France.

This content is provided as a contribution from Smart Energy Europe (SEN) to the FEDECOM project. It does not constitute legal advice.

Annex I. Great Britain: national replication context

This annex summarises key national regulatory and market conditions relevant to replicating FEDECOM in Great Britain. It complements Chapter 7 by providing country-specific details on legal and regulatory frameworks impacting FEDECOM solution implementation. This information is current as of August 2025 and is intended as guidance only — users should consult local experts and authorities to confirm regulatory feasibility.

Step 1. Ability to perform individual self-consumption

1.1 Individual self-consumption framework in place

- Framework in place : Yes
- Legal framework : Electricity Act, Exemptions from section 4(1)(a), and Exemptions from section 4(1)(c)
- Comment: Yes, British citizens can self-consume electricity generated by their own installations located behind-the-meter.

Step 2. Ability to create an energy community

2.1 Creation of a Renewable Energy Community

- Framework in place : No
- Comment: As not covered by EU Law, GB did not create a legal status equivalent to REC.

2.2 Creation of a Citizen Energy Community

- Framework in place : No
- Comment: As not covered by EU Law, GB did not create a legal status equivalent to CEC

2.3 Creation of a CSC arrangement

- Framework in place: Yes
- Legal framework: Electricity Act, Exemptions from section 4(1)(a), and Exemptions from section 4(1)(c)
- Comment: Yes, an arrangement comparable to collective self-consumption can be implemented in Great Britain. To qualify, two or more consumers must form a “qualifying group,” which must be located within a single building or across two buildings connected via a private wire. The generation assets must be situated on the premises of these buildings, and electricity may not be transported through the public distribution grid.

Specific to GB

- Energy Community-driven structures can be used to implement energy projects. An initial review indicates that the main legal forms available for establishing community-led energy initiatives in Great Britain include:

- Private Limited Companies
- Community Interest Companies (CICs)
- Community Benefit Societies (BenComs)
- Co-operative Societies Charitable Incorporated Organisations (CIOs)

Step 3. Ability to engage in energy sharing (CSC)

3.1 Process to register an energy sharing scheme

- Framework in place: No
- Legal framework: Electricity Act, Exemptions from section 4(1)(a), and Exemptions from section 4(1)(c)
- Comment: As mentioned previously, an energy-sharing scheme is possible within a single building, or across several buildings linked by a private wire. There is no dedicated legal framework for energy sharing across the distribution grid. Within such private-wire schemes, consumers use electricity as it is generated, and allocation between participants is not predetermined.

  Any exchange of electricity outside this scope requires obtaining an electricity supply licence, after which energy can be shared according to a commercial arrangement. In practice, community-led energy projects most often take the form of selling electricity to a licensed supplier under an agreed tariff or power purchase agreement. However, certain suppliers also offer commercial services in which community generators can match their output with participating consumers through a special community tariff.

3.2 Energy sharing coefficient available

- Framework in place: No
- Legal framework: Electricity Act, Exemptions from section 4(1)(a), and Exemptions from section 4(1)(c)
- Comment: As previously mentioned, CSC is not allowed in the regulated field. Therefore, sharing coefficients are not available. Potential commercial arrangements made by suppliers can exist but are not covered by specific regulation.

Step 4. Ability to create an inner-community P2P market

4.1 Price differentiation within the community

- Framework in place: No
- Legal Framework: Electricity Act, Exemptions from section 4(1)(a), and Exemptions from section 4(1)(c)
- Comment: As previously mentioned, CSC is not allowed in the regulated field. Potential commercial arrangements made by suppliers can exist but not covered by specific regulation.

4.2 Availability of the dynamic sharing coefficient

- Framework in place: No
- Legal Framework: Electricity Act, Exemptions from section 4(1)(a), and Exemptions from section 4(1)(c)

- Comment: As previously mentioned, CSC is not allowed in the regulated field. Potential commercial arrangements made by suppliers can exist but not covered by specific regulation.

4.3 Ability to communicate the coefficient ex-post

- Framework in place: No
- Legal Framework: Electricity Act, Exemptions from section 4(1)(a), and Exemptions from section 4(1)(c)
- Comment: As previously mentioned, CSC is not allowed in the regulated field. Potential commercial arrangements made by suppliers can exist but not covered by specific regulation.

4.4 Alignment between the frequency of sharing coefficient communication and the timing of ex-post communication

- Framework in place: No
- Legal Framework: Electricity Act, Exemptions from section 4(1)(a), and Exemptions from section 4(1)(c)
- Comment: As previously mentioned, CSC is not allowed in the regulated field. Potential commercial arrangements made by suppliers can exist but not covered by specific regulation.

Step 5. Ability to enable inter-community energy exchange 

5.1 The ability to create a structure covering several energy communities

- Framework in place: No,
- Legal Framework: Electricity Act, Exemptions from section 4(1)(a), and Exemptions from section 4(1)(c)
- Comment: Energy communities, as defined under EU law, are not formally recognised in Great Britain.

5.2 Consistency between these requirements and CSC rules

- Framework in place: No
- Legal Framework: Electricity Act, Exemptions from section 4(1)(a), and Exemptions from section 4(1)(c)
- Comment: As previously mentioned, CSC is not allowed in the regulated field. Potential commercial arrangements made by suppliers can exist but not covered by specific regulation.

5.3 Recognition of the hierarchical allocation method

- Framework in place: No
- Legal Framework: Electricity Act, Exemptions from section 4(1)(a), and Exemptions from section 4(1)(c)
- Comment: As previously mentioned, CSC is not allowed in the regulated field. Potential commercial arrangements made by suppliers can exist but not covered by specific regulation.

This content is provided as a contribution from Smart Energy Europe (SEN) to the FEDECOM project. It does not constitute legal advice.

Annex J. Data Protection Checklist

This checklist is designed to help organisations assess whether their deployment of FEDECOM components complies with the General Data Protection Regulation (GDPR)[4]. It supports both pilot validation and long-term replication, particularly in scenarios involving energy data sharing, forecasting, or peer-to-peer trading. For each question, indicate Yes, No, or Not Applicable in the corresponding column. Use the "Comments / Actions" column to: (i) Explain your answer (e.g. "personal data includes smart meter ID" or "no data shared outside site"); (ii) Note actions required to ensure compliance (e.g. "DPIA to be completed before onboarding new partner"); (iii) Reference internal documents (e.g. "see DPA signed with DSO, March 2025"). The checklist should be reviewed at the start of any replication process and updated as roles, systems, or data flows evolve. It can also be used for onboarding discussions between federated actors or as part of internal audits and DPIAs.

Category	Question	Yes / No / N/A	Comments / Actions
Data Identification	Does your replication scenario involve personal data (e.g. household-level consumption)?		
Legal Basis	Is there a documented legal basis for data processing (e.g. contract, consent, legitimate interest)?		
Data Minimisation	Are only the necessary data points collected for forecasting, trading, etc.?		
Purpose Limitation	Are data used strictly for their stated purposes, without repurposing?		
Role Definition	Have roles (controller, processor, joint controller) been assigned for each actor?		
Access Control	Are access rights restricted based on defined roles and use cases?		
Encryption & Security	Is data encrypted both in transit and at rest?		
Traceability & Auditability	Are logs and timestamps implemented to track data exchanges and modifications?		
Cross-Border Data Exchange	Are there mechanisms in place to comply with national privacy laws in case of cross-border flows?		
Transparency & Communication	Have data subjects been informed of how their data is used and stored?		

[4] For additional guidance on GDPR obligations, see: https://gdpr.eu/checklist/

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