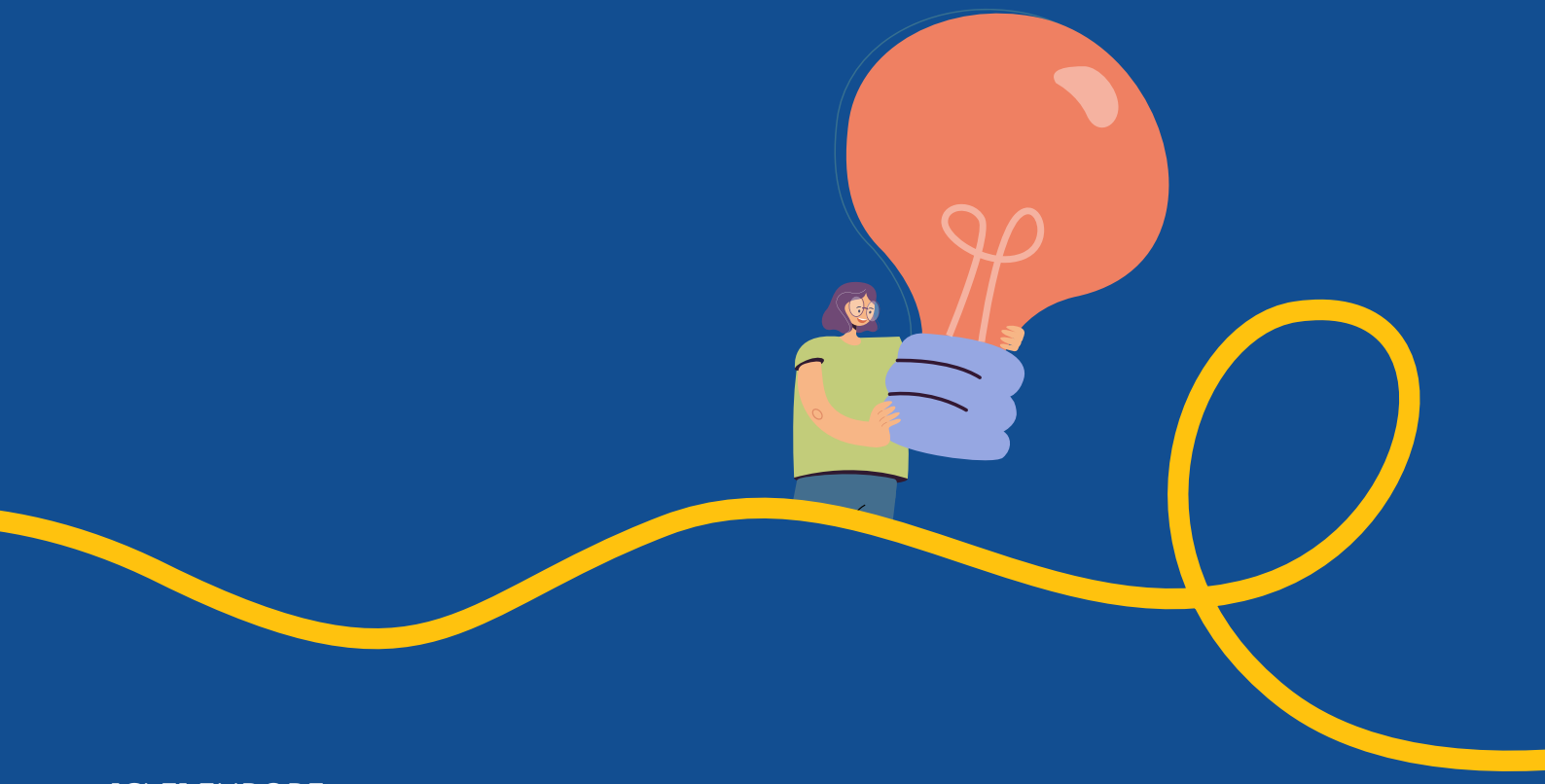
ENPOWER
POWER IN OUR HANDS

Playbook

for Data-Driven Energy Communities and a Consumer-Centric Energy Market



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01
Introduction

1.1 ENPOWER Overview

The European Union's (EU) Horizon Europe research and innovation program funded project "Energy Activated Citizens and Data-Driven Energy-Secure Communities for a Consumer-Centric Energy System" (ENPOWER) strives to **transform** traditional passive **energy consumers** into **active energy citizens,** enabling them to take full control of their energy usage. The project engages with the principal actors of the energy value chain, to **achieve energy savings,** increase their energy efficiency, and self-consumption optimisation. It also aims to help energy consumers and communities **adopt digital solutions** to become **better connected to the grid.**

Another key differentiator of the project is the inclusion of social sciences and humanities methodologies. ENPOWER employs a comprehensive methodology integrating social, technological, and business aspects to ENPOWER communities. At its core, the project aims to **create a consumer-centred and socially responsible energy landscape.**

1.2 What is the ENPOWER Playbook?

The **ENPOWER Playbook** consists of **definitions on key topics**, a set of **general guidelines** to establish data-driven energy-secure Energy Communities, and a **step-by-step guide with examples** to assist Energy Communities in successfully integrating social engagement approaches and digital solutions. The Playbook also covers **case studies** from pilots in Ireland and Austria, with success stories and best practices. It also proposes a **checklist** for the replication of ENPOWER activities and framework, as well as a **Glossary of Key Terms** to determine a common linguistic framing to support the replication phase of the project.

1.3 Why was the Playbook developed?

The Playbook has been developed within the context of the **ENPOWER Data-Driven Energy Communities Leadership Programme**, which consist of a structured capacity-building initiative that provides training through EU level online webinars and national trainings, equipping diverse stakeholders with the ideas, knowledge and tools to replicate data-driven energy communities. The playbook aims to **provide a practical guide** that explains how to create data-driven energy communities.

1.4 Who is it for?

The Playbook is primarily designed for initiators and facilitators of (already existing) energy communities, local governments interested in promoting energy communities, energy companies who can provide services to energy communities and social organisations already providing services to their communities and would like to engage in community energy.

The central idea is to provide them with the steps needed to adopt the most suitable existing digital solutions for their interests and needs (such as those developed in the ENPOWER project). However, this material can also benefit communities intending to develop or customise their own digital and data-driven tools.

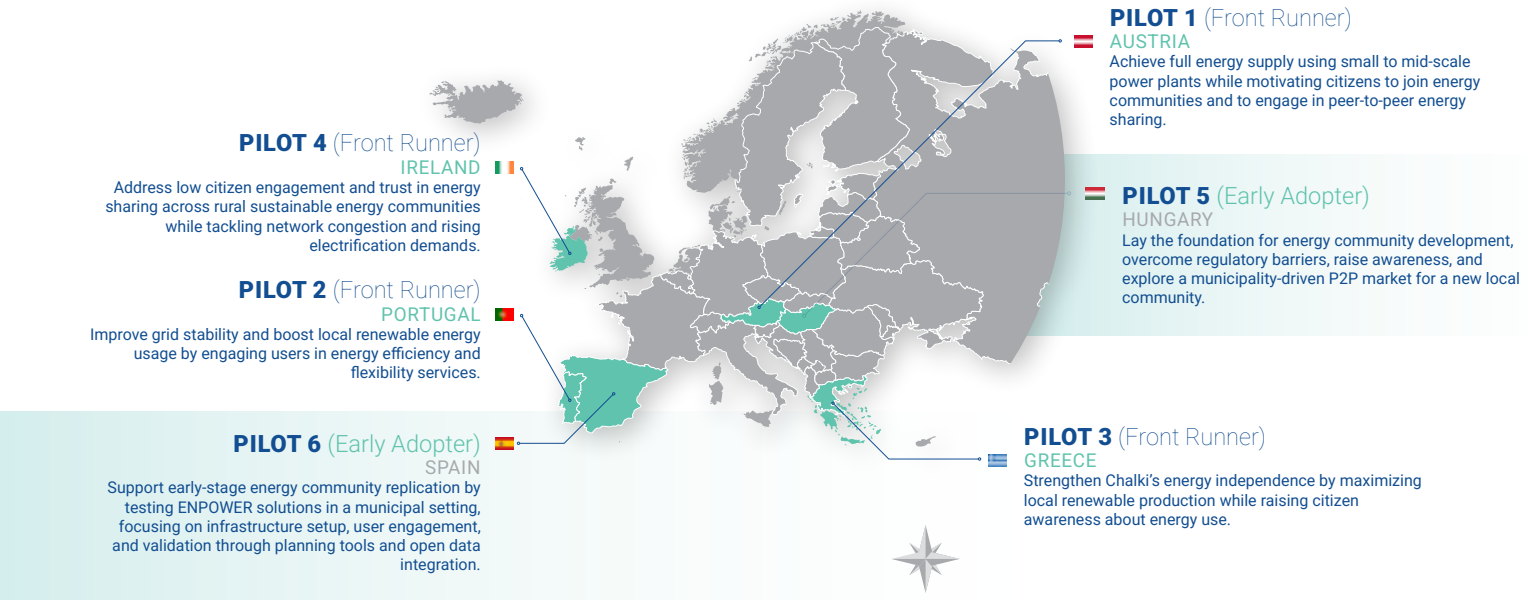
1.5 ENPOWER Pilots

ENPOWER is being deployed in four Front Runner energy communities' pilots in Austria, Portugal, Greece, and Ireland, and will be replicated in two Early Adopters in Hungary, and Spain.

- **Front Runners** are energy communities that already have some level of maturity in terms of their organisational structure, technological deployment, social engagement or regulatory framework in their national context.

- **Early Adopters** are energy communities that are less mature compared to Front Runners and are in earlier stages of development.

ENPOWER takes this approach to address different levels of maturity of energy communities and bring support where needed.



Front Runners

Austria

OurPower operates a cooperative-based peer-to-peer (P2P) marketplace matching renewable electricity from its members with consumers nationwide. The association gathers 13 energy communities, with two of them participating as ENPOWER pilots: Energiegemeinschaft Spörbichl-Dreißgen in combination with REGIOS in Mühlviertel, Upper Austria, and Energiegemeinschaft Poysdorf in Weinviertel, Lower Austria.

Portugal

Portugal has a rich tradition of energy cooperatives, in this pilot there will be an involvement of 33 members from CEVE and 50 to 100 members from COOPERNICO, exploring various contexts and geographical scope. The pilots will be working with models for collective self-consumption, flexibility services, and emobility integration with the goal of enhancing local energy resilience and self sufficiency.

Greece

A community called ChalkiON has been set up in Chalki Island which is not connected to the mainland grid, only with the island of Rhodes. The energy community aims to manage local energy production and consumption more efficiently, in order to make the island completely more green and sustainable, transitioning from diesel dependence to renewables, integrating smart energy management and Demand Response solutions to balance tourism-driven peaks.

Ireland

The Dingle peninsula is a rural area with challenges for grid operators and planners such as grid congestion on the medium voltage (MV) network; the pilot will approach this through flexibility service trials for managing increased electrification, involving residential, agricultural, and transport sectors. These trials will be designed and implemented through ESB's National Network; Local Connections program. Another aim of the pilot is to increase participation of the local agricultural sector, involving partners such as the Dingle Hub, which will provide community engagement activities through its network and presence in the region.

Early Adopters

Hungary

Békéscsaba municipality, a municipality-led initiative aiming to create an energy community and enhance community engagement. Leveraging smart metering infrastructure (It aims to be the first Hungarian city to have a full electricity smart meter deployment), a P2P marketplace and Nudging app. This pilot will replicate solutions developed in Austrian and Greek pilots in collaboration with Austrian OurPower and Hungarian ENASCO.

Spain

CUERVA, a small DSO, acting as an Energy Community Developer, using digitalisation and local PV plants to create a "Green Community" in Fornes, Granada, by leveraging full digitalisation with real-time data from sensors and devices. In collaboration with the town council and working closely with VERGY, responsible for the Living Lab community, they will implement activities to enhance prosumer engagement. Aiming to replicate services from Portuguese and Irish pilots.

1.6 What is an "Energy Community" in ENPOWER?

Energy Communities represent a transformative paradigm in energy systems, enabling collective participation in energy production, distribution, consumption, and management. Understanding how these communities are defined and regulated across different EU member states is essential for enabling knowledge transfer and collaboration.

Moreover, examining Member States legislative frameworks can provide energy community stakeholders with the opportunity to learn from successful examples and identify potential barriers. Within the EU's legislative framework, two primary models of energy communities are recognized: Renewable Energy Communities (RECs) and Citizen Energy Communities (CECs).

Both aim to **foster local energy autonomy and community engagement**, but they differ in scope and operational focus. RECs prioritize **renewable energy production** and local sustainability, while CECs have a broader mandate, including energy supply, **aggregation**, and **market participation.**

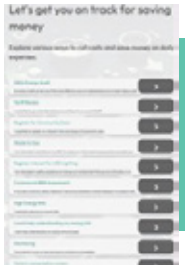
1.7 What are the Digital Tools and Services developed for Energy Communities in ENPOWER? Why are these needed?

The Digital Tools developed within the ENPOWER project are essential for data-driven energy communities because they **provide a user-friendly** and inclusive **solution** that enhances **data transparency**, supports **informed decision-making, enhances flexibility** and **improves** Energy Community **economic viability**. Broadly speaking, they aim to support Energy Communities digitalisation.

One key goal of the project services and tools is to help Energy Communities **better manage** their operations and **interactions with the energy system**, which can be achieved using the "Consumers clustering and segmentation tools" to group their members based on their consumption patterns. Another goal is to optimise how these communities interact with the overall energy system by **modelling** their **energy flows** and **suggesting** a range of **flexibility services** to save costs, ensure a reliable energy supply and thereby increase resilience.

An additional aspect of ENPOWER digital tools is **integrating Energy Communities into national electricity markets** (where possible), making sure they can effectively participate, as this will help them optimize renewable energy use, reduce costs, and support grid stability. For that purpose, a blockchain-based flexibility marketplace was proposed, enabled by the "Blockchain-based hybrid coalition-based flexibility aggregation tool", the "P2P digital tools and platforms for consumer activation and social engagement" and the "P2P energy markets designs and algorithms". These digital tools are designed to be **user-centric** making them accessible and **practical for communities** of all sizes. Two examples are shown below:

The "Interactive Decision Support Tool for Energy Community Planning" is designed to be user-friendly and accessible, with two distinct interfaces catering to both citizens and value chain energy stakeholders.



The "CRP social engagement management platform" is cloud-managed, accessible as a web app on any device, and prioritizes privacy, data security, and GDPR compliance.

ENPOWER has a **strong focus on data sovereignty**, ensuring that communities have control over their data and can use it in a secure and transparent way. Importantly, the **solutions are built to be scalable and replicable**, allowing expansion beyond pilot countries and adaptation to different regulatory conditions.

The following table presents the grouping into the following four categories: “Consumer Engagement and Nudging”, “Flexibility Management and Consumption Optimization”, “Energy Community Planning and Management”, “Energy trading and flexibility trading places”, these categories were defined by examining the key functionalities of the tools and services [reported as **Technology Enablers** within the project] and the value they bring to the communities it serves, thus ensuring thematic coherence. Overall, each grouping has the aim to reflect a distinct but also complementary part of the overarching vision of enabling smore efficient and smarter energy communities.

Category	TE #	Service/Tool Description	Partner
TE-4 Energy Data Space compliant tools for sovereign data management, sematic interoperability and exploitation			**ED, DST**
1. Consumer Engagement and Nudging	TE-3	CRP social engagement management platform	DCsix, EPRI
	TE-7	Consumers clustering and segmentation tools	NTUA
	TE-14	Nudging Apps for near real time closed loop consumers activation	OurPower, BLUEPRINT
2. Flexibility Management and Consumption Optimization	TE-6	Digital Twins for consumer activation	INESC TEC, DST
	TE-8	FATEC - Flexibility Assessment tool for Energy Communities	INESC TEC
	TE-9	Self-consumption optimisation tool	NTUA, GEARS
	TE-10	Closed-loop optimal load control and intelligent monitoring of electric appliances for residential users	NTUA, COMS
	TE-11	V2G-based flexibility management platform for providing incentives to communities of EV drivers	PARITY
	TE-13	AI-Powered Virtual Energy Manager (WIS4Households)	WATT-IS
	TE-15	Blockchain-based hybrid coalition-based flexibility aggregation tool	DST, COMS
	TE-18	Privacy preserving tools for automated interoperable DR	EPRI, DCSix, UCC, COMS
3. Energy Community Planning and Management	TE-1	Interactive decision support tool for Energy Community planning	CARTIF, INESC TEC
	TE-2	SITEC-Sizing tool for Energy Communities	INESC TEC
	TE-12	OSTEC-Optimised Scheduling Tool for Energy Communities	INESC TEC
4. Energy trading and flexibility trading places.	TE-5	DLT/Blockchain/smart contracts multi-purpose marketplace for increased Trust & Sovereignty and for P2P tokenised assets sharing and compensation	DST
	TE-16	P2P digital tools and platforms for consumer activation and social engagement	OurPower, BLUEPRINT
	TE-17	P2P energy markets designs and algorithms	INESC TEC

02
Becoming a Data-Driven Energy Secure Community

2.1 General Guideline for Transitioning to Data-Driven Energy Communities

The requirements and steps to become an energy community have been already covered in previous reports and guides such as the guide How cities can back renewable energy communities (Energy Cities, 2019), or the Community Energy Handbook (Friends of the Earth Europe, 2020), and the Enabling Energy Communities in Just Transition Regions toolkit (Directorate-General for Regional and Urban Policy and Hinsch, 2023).

However, ENPOWER focuses on optimising and enhancing already established Energy Communities by integrating advanced data-driven service and social engagement strategies. With that in mind we have crafted, based on the work developed by the project partners, the following guide, divided by four phases:

Figure 2: Four Phases to move towards data-driven energy secure communities.

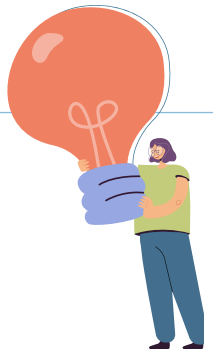
(1) Preparation & Vision – Defines objectives, address local energy challenges, aligns community's plans with national regulations.

(2) Organisational Setup – Establishes governance, stakeholder roles, and inclusive business models that ensure transparency, viability, and community benefit.

(3) Digital Infrastructure & Data Strategy – Selects and integrate digital tools and data systems that balance functionality, security, GDPR compliance, and continuous improvement.

(4) Engagement & Activation – Foster citizen participation with awareness campaigns, co-creation, and incentives that build trust and drive adoption of energy-sharing models.

This guide captures the relevant actions to consider when transitioning from "traditional" or "conventional" Energy Communities into a Data-Driven Energy Communities. The primary actions are outlined in the following sections. We tried to provide as detailed explanations as possible to demonstrate how to carry out the actions. For more complex and detailed information, please refer to the public deliverables (referred to in the text), which will be available on the project website.



Phase 01

Preparation & Vision

Identify the specific goals of the Energy Community for incorporating digital tools. It may include short-term objectives (such as reducing electricity costs or increasing self-consumption), and long-term ones (such as increased local energy resilience e.g. supplying power during outages). Based on ENPOWER's experience, the following can be recommended:

- **Address local challenges** e.g., congestion on distribution grids (including Medium Voltage (MV) and Low Voltage (LV), where Energy Communities are usually connected); or reducing reliance on fossil fuels by switching to RES; or tackling inefficiencies in households/communities' electricity self-consumption.
- **Learning from past** community energy **initiatives** and leveraging existing tools and best practices.
- Provide a space to **perform stakeholder consultations**, workshops and/or meetings together with local authorities, DSOs, and community members to **jointly define the priorities**. A **co-design approach** is essential in this process, ensuring meaningful interaction fostering **inclusive decision-making. Stakeholder engagement strategies** play a crucial role at this stage (Section 2.2 explores this further)

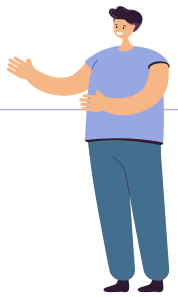
Understand the **regulatory framework** and **market conditions** for Energy Community digitalization. It is mandatory to understand the regulations and the electricity market design at the EU and the national level, when trying to implement ENPOWER's digital solutions. Here are some suggestions based on experience of project pilots:

- **Monitor** any **changes** to **regulations** that impact the digitalisation of energy communities. Regulations related to the digitalization of Energy Communities at the EU level include the Energy Market Regulations (**Regulation (EU) 2019/943**), Renewable Energy Regulations (**Directive (EU) 2018/2001**), Energy Efficiency Regulations (**Directive 2012/27/EU**), Cybersecurity & Digital Infrastructure Regulations (**Directive (EU) 2016/1148**), Artificial Intelligence Regulations (**Regulation (EU) 2024/1689**), the Electric Vehicle (EV) & Smart Charging Regulations (**Directive 2014/94/EU**), among others.

The Clean Energy Package and the Fit for 55 Package policies are key EU regulations impacting energy communities.

- Energy Communities **seeking** a more in-depth **understanding** of **their national electricity market and corresponding national regulations** should engage with national energy regulators, transmission system operators (TSOs), and distribution system operators (DSOs) to access reports on market rules, pricing mechanisms, and participation requirements. These stakeholders often provide open-access publications and reports detailing market operations and consumer roles.

For a comprehensive summary on the current state of energy systems, flexibility mechanisms, EU-level market platforms, and control schemes, we highly recommend looking at Deliverable 2.5, section 2 Gap analysis on Market Design for complete information.



Phase 02

Organisational Setup

Build your **Business Model** with a **Consumer-Centric approach** driving **social** inclusion, **economic** sustainability, and **environmental** resilience. ENPOWER's approach fosters citizen empowerment and stronger community ties, while enabling cost savings and new revenue streams through **decentralized energy** transactions.
To develop improved business models that can do this, the project used an **inclusive methodology** that focused on **capturing the needs and preferences** of each community. For an energy community wanting to develop such Business Models, its relevant to consider the following:

- **Expected Impact;** ensure the Energy Community provides social, economic, and environmental benefits to its community
- **Local Energy Market;** map the complex connections within each Energy Community (prosumers, local authorities, regulatory bodies and technology providers)
- **Financial structure;** analyse revenue streams (energy sales, community memberships, etc.) and cost structures (operational and maintenance costs, including cost-saving and energy efficiency measures)
- **Innovation and Unique Selling Point (USP);** capture strengths and unique selling points of the Energy Community, leveraging local innovations

ENPOWER used a combination of semi-structured interviews and detailed quantitative and qualitative data collection. The project developed the **Enhanced Business Model Canvas (BMC)** (available in Deliverable D2.3 - ENPOWER Business Sandbox) to better represent how energy communities operate. Unlike the traditional BMC, this version highlights the role of citizens in energy and financial transactions, making their involvement **more visible.**

This updated Business Model Canvas helps map out:

- **How different stakeholders interact**, including individuals, energy producers, and service providers.
- **The flow of energy, data, and money** within the community.
- **Community participation**, showing how citizens influence decision-making and operations.

The goal is to make it easier for energy communities to understand their structure and create business models that truly reflect their **community-driven nature**. For a full explanation of the previous points, see Deliverable D2.3 - ENPOWER Business Sandbox and Deliverable 2.5, Section 6: Business Sandbox.

Establish **Governance** for the Energy Community (Roles & Decision-Making Structure). In ENPOWER, governance defines **who makes decisions and how stakeholders interact** within an Energy Community. To ensure fair and effective decision-making, consider the following key points:

- Clearly **define who is involved** (citizens, local authorities, businesses) and ensure all stakeholders have a **voice in decision-making** through **voting systems or advisory roles**. For that it is recommended to:

  • Identify key stakeholders (citizens, municipalities, businesses, grid operators).
  • Create a member registry to track participation.
  • Assign roles (e.g., decision-makers, advisors, facilitators, etc.).

- Establish **transparent decision-making rules**, ensuring **fair representation** of all community members and avoiding dominance by a single group (Energy Democracy). A way to ensure it would be to:

  - **Define** how decisions are made (majority vote, consensus, expert panels).
  - **Establish** a **clear voting system** (digital tools, in-person meetings, representative councils)
  - **Ensure** transparency & accountability, this can be done by:

    - **Set up a legal entity** which conforms with Renewable Energy Community or Citizen Energy Community EU definitions
    - **Publishing** governance decisions in a **publicly accessible format** (community platform, website, meeting minutes, etc.)
    - Developing **conflict resolution mechanisms** to handle disagreements fairly.
    - **Reviewing governance processes** and adapt them based on feedback.

Phase 03

Digital Infrastructure & Data Strategy

Communities should select digital tools based on their specific needs and integrate data systems that balance functionality, security, and compliance. From the project's experience, the following is recommended:

Assess current **data** and **infrastructure**. It is important to collect information and assess the performance of the existing data sources and available technology, as this data can be used to make recommendations for acquiring new technologies that are needed or for improving the performance of the existing ones.

- Data collection on **available data sources**, includes details such as:
  - Data Formats (CSV, Excel, JSON, Databases, etc.),
  - Data Frequency (Real-time, Daily, Weekly, Monthly, etc.),
  - Data Volume (Approximate size of current available data per day),
  - Data Collection Methodology, Data Access Restrictions or Data Limitations,
  - Data Privacy and Security Measures (GDPR),
  - Data Sharing and Integration Capabilities.

- Data collection on **infrastructure**, includes details such as:
  - Location, Building Type, Energy Carriers, Building Operator, ICT Company, DR Aggregator, Dwellings, Commercial Premises, Data Samples Sources
  - Installed Equipment (Expected date, Number of Units, Mapping with corresponding data gathering source,)
  - New Equipment (Expected date, Number of Units, Mapping with corresponding data gathering source,)

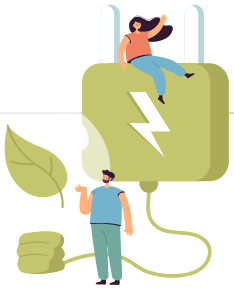
- For **assets** that are **flexible**, i.e. can adjust how and when they use, store or supply electricity according to the needs of the system, such as solar PV panels, wind turbines, HVAC (heating, ventilation and air conditioning) systems, EVs (electric vehicles) and smart plugs, it is important to gather information on how these assets can provide useful data and control options to make this flexibility work, either through:
  - providing real-time or near real-time data collection,
  - requiring access from an external party (e.g., DSOs – Distribution System Operators),
  - or simply by providing historical data.

We recommend looking at Deliverable 6.1, section 3.1 Data collection process includes a set of templates that can help to register this information.

- Choose the **right data solutions**. To ensure communities select the most suitable digital solutions based on their size, goals, and infrastructure, follow a structured approach:
  - After identifying what the community wants to achieve and assessing existing infrastructures, then select and implement the Data Collection Tools:
  - If **real-time consumption tracking** is needed ▸ Install smart meters and IoT sensors.
  - If **environmental factors** impact energy use ▸ Integrate APIs for weather data and geographic specifics.
  - If **advanced analysis** is required ▸ Deploy AI and Machine Learning models for data processing.

- After implementation, set up a **secure data management system** to protect user information. Implement General Data Protection Regulation (GDPR)-compliant measures to regulate data access, consent, and security.

- **Commit to continuous improvement**. Regularly review and adapt data solutions based on Community **feedback** to ensure they remain relevant and effective. This approach contributes to continuous improvement and responsiveness to community's dynamic energy needs.



Phase 04

Engagement & Activation

In the engagement and activation phase, (which is crucial during the whole process of building any kind of energy community, not just Data-Driven ones, the distinctive elements proved in ENPOWER are shown as follows:

- Results coming from a series of 'Workshops' carried out by ENPOWER partners in different countries and communities indicate a crucial point that sometimes is overlooked:

  - It can be **very difficult** to motivate people to take part in an Energy Community in the first place. It is important to raise awareness regarding this crucial point as efforts need to be put there at the beginning and throughout the consolidation of it.

There are several ways people can get activated, to mention a few:

- Set up citizen awareness programs. The exact way to set up will depend on your local context, it is recommended to research your local community preferred ways of getting communications. Various communication channels can be used such as like social media, events, traditional media, a letter from the mayor/local leader, etc.
- Engage citizens and build capacity. ENPOWER experience shows this is enhanced by the use of co-creation activities, making people feel included in the process.

Use of **incentives** for participation in the Energy Communities such as:

- Cost reductions from energy savings (monetary),
- Potential revenues from selling excess energy (monetary),
- Environmental benefits from the use of Renewable Energy coming from Solar PV/Windmills (non-monetary),
- Increased energy autonomy that is gained through decentralised energy systems (non-monetary).

This phase is further explored in the step-by-step guide in the following section 2.2 “Step-by-step Guide for integrating Social Engagement approaches and ENPOWER’s Digital Solutions”.

2.2 Step-by-step Guide for integrating Social Engagement approaches and ENPOWER’s Digital Solutions

Building on section 2.1, all phases of the process are crucial – especially those related to technical and regulatory elements. However, successful implementation also requires strong community engagement. While Phase 4 introduced this aspect, this section provides a detailed step-by-step guide on integrating **social engagement approaches** into the transition process, ensuring that citizens actively participate.

ENPOWER’s approach of integrating **social approaches** with the digital tools is crucial for the success of data-driven energy communities. Active societal participation fosters **transparency, inclusivity, and social acceptance**, ensuring that digital solutions align with citizens’ needs and motivations, making data-driven solutions **truly sustainable and impactful**. Without considering the social dimension, energy communities **risk low adoption rates**, and resistance.

Drawing from ENPOWER’s previous work with community engagement strategies and tools (Deliverable D2.2 – Active Societal Participation), and the ongoing efforts of the pilots, we developed a **step-by-step guide**, for **integrating social engagement approaches and the digital solutions**. The examples and social approaches mentioned in the following points are not exhaustive but are drawn from real project experiences.

Step1:

Understand the Community Context

Energy Communities are diverse in their needs and characteristics (social, geographic, demographic, etc.), but also in their interests and focus, which in the end influences the direction they take and the type of digital tools that are integrated.

For that reason, it is very important to **understand the social context** requiring Energy Community leadership to be open and listen to their community's main motivations.

How?

- A social engagement approach that would facilitate the identification of needs and context-specific barriers. Using multiple methods is crucial for achieving comprehensive, inclusive, and effective stakeholder participation. This would include performing surveys, conducting interviews (structured, semi-structured or unstructured), and/or delivering workshops and guided discussions.
- First, a kick-off meeting is needed, one way of doing this is to design and facilitate a workshop with the citizens in a municipal building that is well known by the citizens.
- Secondly, building trust is essential, this requires a longer period of time. To ensure this, using a continuous two-way communication such as participatory communication tools (Town Hall Meetings, Community Newsletters, Digital Platforms, etc.) is essential.
- Building on other development work that is already happening in the region is another way of doing this. This work looks at the social and economic challenges faced by local people, such as the decline of the rural economy or housing issues.

In some cases, energy communities can be established within existing movements, with the aim of reclaiming land, attracting investment, and ensuring that people can continue living in their hometowns.

Examples from the ENPOWER pilots that illustrate these options:

- Dingle's Energy Community (Ireland) focus is on fostering social cohesion and local engagement; their goal is to unite the community through the Energy Community and digitalisation.
- Poysdorf's Energy Community (Austria) emphasises financial motivations and economic benefits as key drivers for participation and growth, however, the community is also focussed strongly on regionality and independence besides financial aspects.

- Portugal has large range of energy communities that differ in their interests and focus depending on their specific context. In e.g.,
  - Energy Communities in rural areas, use the energy community model to resist the decline of their towns, to create economic benefits with the inclusion of the energy assets and the digital tools, and ultimately to bring hope to the region.
  - Small islands facing housing decline are also experiencing a weakening sense of community identity. In response, residents have embraced the Energy Community model not only as a means of achieving energy resilience but also to reaffirm their presence, maintain social cohesion, and preserve their collective identity in the face of demographic and economic challenges.
- In all pilots, the use of deliberative workshops was an opportunity to include co-creation methodologies and interactive tools e.g., Slido or Mentimeter for engaging diverse stakeholders and collecting diverse opinions. These tools facilitated balanced participation by addressing dominant or disengaged behaviour during the activities.

Step2:

Find and Empower Local Champions to promote Digital Solutions

Enlisting a local voice that endorses the digital solutions promoted in this project or ideally that has already started using some of the digital solutions, proved to be an effective way to **build trust** in the digital tools, data requirements, and complex regulations.

How?

- Identify respected local leaders in the communities
- IOffer capacity-building workshops and other training for these champions
- IProvide them with clear messaging and materials to engage others

Examples from the ENPOWER pilots that illustrate these options:

- In Ireland, Dingle Hub energy community relied on a trusted local farmer to explain the benefits of real-time energy monitoring, which increased engagement.
- According to OurPower's experience, **local champions** are essential for the success of an energy community in Austria, as they acknowledge how hard it is to motivate the local population. OurPower has successfully leveraged these local champions in its energy communities in Poysdorf and Spörbichl/REGIOS.

- Portugal's Deliberative workshops (interactive meetings where diverse stakeholders discuss and collaboratively decide, ensuring inclusive and informed decision-making) also highlighted the need for local /national champions to build hope and overcome distrust.

Step3:

Education and Awareness in Digital Solutions

Not only Local Champions and Decision-makers need to be informed, education and awareness to all community members ensure that citizens, and other stakeholders are fully equipped to leverage the digital solutions effectively. For an energy community to be successful, its participants (individual households, businesses and other stakeholders) need to understand how digital solutions work.

How?

- Start with interviews to uncover knowledge gaps, such as a limited understanding of key data-driven energy concepts.
- Use focus groups to test educational content with local citizens and refine messaging where needed.
- Use of workshops (in different formats) as educational platforms to increase awareness about energy data sharing regulatory landscape.

Examples from the ENPOWER pilots that illustrate these options:

- Semi-structured interviews with citizens from Dingle peninsula revealed a limited understanding of how energy data sharing translates to financial savings.
- In addition, Dingle Hub ran a workshop to explain technical concepts to community members such as flexibility and its potential impacts on the energy community, decentralised energy resources (DER) operation optimization to maximize self-consumption, and the importance of data access to take advantage of such actions. This not only increased members' education and awareness but also made them more open to sharing data with the technical team.
- Focus groups in Poysdorf revealed the importance of real-time energy monitoring and digital solutions (like the Power Seller Nudging App) in optimising energy use.

Step4:

Address common concerns

Addressing concerns is crucial for building trust and ensuring active participation. Without addressing community concerns, participants may be reluctant to engage, adopt digital solutions, or share the necessary data for optimisation.

How?

- Utilising **surveys** or community **consultations** to identify citizen concerns, if possible, conduct interviews or even workshops such as focus groups for a deeper understanding.
- Provide clear information, **establish communication channels** and keep citizens updated.
- Use of **Deliberative Workshops** can be used to test prototypes and integrate social priorities into digital solutions.

Examples from the ENPOWER pilots that illustrate these options:

- During the **focus group** sessions, common themes emerged, including transparency in communication and decision-making, inclusivity in energy solutions to prevent exclusion, relevance in addressing real community needs, and ownership through active participation in energy data and management.
- Privacy was one of the most frequently recurring themes in many of the discussions at different Energy Communities, reflecting the need for tools and frameworks to ensure transparency and trust.
  - Throughout the project, **deliberative workshops played a crucial role in addressing these concerns** by actively engaging local communities and explaining how the developed tools preserve privacy, it helped participants understand the data protection measures in place to protect their data and reinforce the commitment to transparency and trust.
  - Some of the key best practices for data protection that were recommended for incorporation were **encryption, anonymisation, and strict access controls, to enhance privacy safeguard.**

2.3 Digital Services and Tools for Non-Technical Audiences: Selected Case Studies from pilots

This section brings together practical insights from ENPOWER pilots, showing how the combination of digital services, tools, and social engagement strategies have helped other Energy Communities successfully involve their members in energy management.

2.3.1 Dingle (Ireland)

Tool(s): Citizen Renewable Platform - Engaged

Dingle Peninsula is a **rural region** that faces significant congestion issues on the Medium Voltage (MV) network. It has a well-established and vibrant EnC, primarily driven by two key sectors: **agriculture and tourism**. The Dingle Hub is a key organisation deeply embedded in the community; it actively supports the growth of the energy initiative by organising regular meetings, workshops, and campaigns that resonate with the community's needs.

One of the goals of the pilot in Dingle is **increasing local energy system flexibility** through the agricultural sector, aiming to apply the Citizen Renewable Platform (CRP) and social engagement approaches to **increase the active participation of farmers in the energy transition** with the goal of increasing the capacity of renewable generation and flexible technologies available for Demand Response (DR) and grid services locally and upstream, while enhancing energy efficiency, reducing costs and carbon emissions.

The CRP is an AI-powered Community Energy portal developed by DCSix Technologies that allow its users to participate in cost reductions and energy efficiency projects. It is a cloud-based service that offers a variety of tailored approaches, including conducting energy audits and finding energy efficiency measures.

2.3.1.1 Social Engagement approaches: Deliberative Workshops in Dingle

The pilot strongly emphasizes community engagement, facilitated by Dingle Hub through **Deliberative Workshops**. Unlike standard workshops that primarily inform or train participants, deliberative workshops foster in-depth discussion, collective decision-making, and scenario-based analysis.

In Dingle, these workshops focused on energy data sharing, with two consecutive sessions ensuring continuity. The first encouraged brainstorming on opportunities and concerns, while the second explored real-world applications, such as grid flexibility and energy monitoring for local farms. Key themes included financial benefits, privacy, and community education, with strong support for local ambassadors and accessible information platforms. By structuring discussions this way, Dingle Hub ensured an inclusive, insightful approach to integrating ENPOWER's digital tools.

2.3.1.2 Real-world example of the CRP platform

During the workshops in Dingle, the CRP platform was introduced, showcasing how it could assist users in transitioning to more energy-efficient homes and businesses. DCsix provided an expert perspective on "energy data monitoring" using a dairy farm as a real-world example:

The presentation offered valuable insights into how energy data is collected, why it is gathered, and how the information is presented to the farm owner. Participants gained a deeper understanding of the importance **of energy data monitoring**, including how tracking consumption patterns can optimise efficiency, **reduce costs**, and support investment in renewable energy solutions.

A key focus was on the platform's ability to **translate raw data into actionable insights**. The discussion highlighted tools for analysing **return on investment** (ROI) of different energy investments and initiatives for businesses and conducting **on-site audits** to provide tailored recommendations.

A l**ocal farmer** who had already made investments in energy-efficient **technologies gave a testimonial**; he shared his experience with integrating them into his operations and how he has become a role model for others. His story sparked a lively discussion among participants, encouraging reflections on **the role of individual action** in collective energy transformation. The conversation expanded beyond his personal experience, leading to a broader dialogue on **community development** and how **sustainable energy investments** can benefit local businesses.

2.3.2 OurPower (Austria)

Tool(s): Power Seller Nudging App, P2P Energy Trading Platform and Energy Community Management Platform

Energiegemeinschaft Spörbichl-Dreißgen in Mühlviertel, Upper Austria, faced some challenges with the energy service provider of the community-financed wind farm during the start-up phase; for that reason, there has not been an official launch of the EnC. As a solution the wind farm also participates in energy co-operative REGIOS, a regional Peer-to-Peer Energy Trading Platform based on the OurPower marketplace.

Energiegemeinschaft Poysdorf in Weinviertel, Lower Austria, joined the project in June 2024. In August 2024, a kick-off event took place in Poysdorf with over 100 participants. The same day, the second in a series of **Deliberative Workshops** took place. The first workshop had been held earlier in July. The Energy Community consists of 5 producers with 700 kWp of photovoltaic (rooftop) production and 60 consumers, with plans for expansion as community engagement progresses.

A digital solution tested within the pilots in Austria is the Power Seller Nudging App, which is built to improve energy engagement and efficiency among community members. This app focuses on providing local Energy Communities with recommendations on optimal energy consumption based on predictive data and local energy availability, primarily sourced from weather-dependent renewable energy production.

Another goal of these pilots is to start using, at a later stage, the OurPower energy marketplace, a peer-to-peer (P2P) business platform designed to transform how small and medium-sized energy producers interact with consumers. It will serve as the central hub for Energy Communities, empowering participants within the Energy Communities to play an active role, by monitoring and managing their energy usage efficiently.

2.3.2.1 Social Engagement approaches: Focus Groups, Presentations and Workshops

Much like the approach taken in Dingle, the Poysdorf pilot emphasised **Deliberative Workshops** to engage the community meaningfully. These workshops went beyond informing participants — they structured inclusive, scenario-based discussions focused on building shared understanding and exploring opportunities for collective action.

The ServeU-App (basis for ENPOWER Power Seller Nudging App) was evaluated through two online focus groups aimed at gathering feedback. Focus Group 1 was composed of participants who tested the prototype and had prior knowledge of energy management. Focus Group 2 comprised of non-users with varying levels of familiarity with energy communities. Their insights helped refine the app's functionalities.

In Poysdorf, workshops presented the OurPower energy marketplace platform to community members, helping them understand its functionality and the benefits of energy communities and peer-to-peer (P2P) energy trading. Participants explored how producers and consumers could interact, and the platform's benefits were discussed in an interactive setting.

2.3.2.2 Real-world example of the Power Seller Nudging App

The Power Seller Nudging App, tested with community members, provided predictive analytics and tailored recommendations to help users optimize their energy consumption based on local renewable energy availability. Feedback from both focus groups shaped the app's ongoing development, ensuring it meets community needs.

2.3.2.3 Real-world example of the OurPower energy marketplace

The OurPower energy marketplace is being prepared for implementation in Poysdorf, following an introduction event attended by over 100 community members. Currently, local producers with a total of 700 kWp of rooftop solar are already supplying electricity to consumers through the platform. The marketplace is designed to facilitate transparent, peer-to-peer (P2P) energy trading, empowering local energy producers to sell directly to consumers. As part of the initial rollout, the "Family & Friends" feature was tested, allowing producers to set personalized tariffs for selected buyers.
This approach has been particularly effective in engaging early adopters

03
Practical Guidance and Tools

3.1 Checklist: Setting Up a Data-Driven Energy Community

The goal of this Checklist is to help newly established energy communities assess their readiness for transitioning into Data-Driven Energy Communities. It serves as a practical tool to ensure that key elements—such as governance structures, digital infrastructure, regulatory compliance, and community engagement—are in place.

This Checklist is directly linked to the 2.1 General Guidelines, providing a structured approach to evaluating preparedness and identifying any gaps that need to be addressed for a successful transition.

CHECKLIST: SETTING UP A DATA-DRIVEN ENERGY COMMUNITY

01 Establish Leadership & Local Support

- **Identify your Local Point (Local Champion)**
  A trusted **local leader** coordinates the initiative, he/she acts as a liaison between residents, authorities, and service providers, engages the community, builds trust in digital solutions, and facilitates decision-making. Represents the Energy Community in regulatory discussions and funding opportunities.

- **Build a Team of Trusted Local Partners**
  - **Technical Specialist** ▸ Implements smart meters, digital tools, and grid integration solutions.
  - **Legal Expert** ▸ Ensures compliance, governance, and energy-sharing agreements.
  - **Energy Management Expert** ▸ Develops self-consumption, demand response, and flexibility strategies.
  - **Financial Advisor** ▸ Secures funding, manages subsidies, and ensures financial sustainability.
  - **Institutional Support** ▸ Engages policymakers, and academic partners.
  - **Engage with Local Organizations and Authorities**
  - Establish partnerships with **municipalities, local governments, DSOs, ESCOs, regulators, and cooperatives.**
  - Participate in **regional and national Energy Community networks** for knowledge exchange.

02 Governance structures

- **Define Roles & Responsibilities**
  Assign clear responsibilities for decision-making (e.g., advisory boards, citizen committees).
- **Establish Decision-Making Processes**
  Use transparent, democratic decision-making (e.g., voting systems, participatory budgeting).
- **Set Up a Legal Entity (if required)**
  Choose the best legal framework (cooperative, association, municipal initiative).
- **Implement Monitoring & Accountability Mechanisms**
  Regularly review and update governance rules to reflect community needs.

03 Address Country-Specific Considerations

- **Understand National & EU Regulations**
  - Research **energy-sharing frameworks, consumer rights, and data protection laws (GDPR).**
  - Monitor policy updates on **flexibility markets, subsidies, and energy trading.**
- **Define the EnC's Legal & Administrative Structure**
  - Choose the best **legal framework** (cooperative, association, municipal initiative).
  - Ensure compliance with **licensing, permitting, and reporting obligations.**
- **Identify Financial Incentives & Support Mechanisms**
  - Secure funding through **grants, subsidies, and investment programs.**
  - Explore potential revenue streams (**P2P energy trading, flexibility services**).
- **Engage with Key Stakeholders**
  - Connect with **energy agencies, DSOs, and policymakers** to streamline compliance.
  - Align with national energy transition programs for long-term sustainability.

04 Community engagement

- **Raise Awareness & Educate the Community**
  - Use accessible communication materials (flyers, videos, social media).
  - Organize workshops, town halls, and online campaigns to explain Energy Community benefits.
- **Use Participatory approaches**
  Involve community members in shaping the Energy Communities goals, business models, and governance activities through interactive workshops.
- **Leverage Incentives for Participation and trust**
  - Offer incentives (cost savings, revenue-sharing) and benefits (energy security, environmental sustainability).
  - Recognize community contributions through leadership roles and participation rewards.
  - Address concerns about privacy, data ownership, and transparency.

Importantly, many of these elements must be developed **in parallel**. For example, setting up the technical or legal aspects without securing community interest can result in wasted time and resources. Conversely, mobilising a motivated community without the necessary technical support or legal clarity can hinder progress. This Checklist is therefore designed to help Energy Communities move forward in a **balanced and coordinated way**.

Glossary of Key Terms

This section provides a list of key terms used in ENPOWER. The aim is to standardise these terms ensuring that the terminology is used consistently across pilots when referring to the same approaches, tools and services.

Term	Short Description
Energy Community	A collective of individuals, businesses, or local organizations that generate, share, and manage energy collaboratively.
Active energy citizens	Individuals or communities that actively manage their energy consumption and production, often by participating in renewable energy generation, storage, or flexibility services.

Consumer-Centric Energy System	An approach where energy users play an active role in managing their consumption, production, and flexibility, rather than being passive consumers.
Social Sciences and Humanities methodologies	Social Sciences and Humanities approaches used to understand and improve community engagement, behaviour, and decision-making in energy transitions.
Grid congestion	A situation where parts of the electricity network become overloaded due to excessive demand or generation, requiring intervention to maintain stability.
Flexibility services	Energy solutions that adjust electricity consumption or generation in response to grid needs, helping to balance supply and demand.
Demand Response (DR) solutions	Programs or technologies that encourage energy users to shift their electricity consumption during peak periods to reduce strain on the grid.
Aggregator	An entity that pools energy resources from multiple users to participate in energy markets or provide flexibility services.
Local Energy Market	A marketplace where energy is traded at a regional level, allowing for better integration of renewable energy.
Peer-to-Peer (P2P) Marketplace	A digital platform that allows individuals or energy communities to buy and sell electricity directly to each other, without relying on traditional energy suppliers.
Deliberative Workshops	Interactive meetings where diverse stakeholders discuss and collaboratively decide on energy-related topics, ensuring inclusive and informed decision-making.
Energy Data Space	A secure and interoperable environment for sharing energy-related data among stakeholders, enabling a decentralized energy system.
Social Acceptance	The willingness of individuals and communities to adopt new energy technologies, policies, or market models based on perceived benefits and trust.
Energy Autonomy	The ability of a community to generate, store, and consume its own energy independently.

Collective self-consumption	A model where multiple users within an energy community share locally produced energy.
Prosumer	A consumer who also produces energy and may sell or share it within an EnC.
Smart Meters	Digital devices enabling real-time energy monitoring and management.
Data Sovereignty	The right of energy communities to control and manage their own data.
Energy Literacy	The level of understanding among community members about energy systems and market dynamics.
Energy Poverty	Energy poverty can be defined as a situation where a household or an individual is unable to afford basic energy services (cooling, lighting, mobility and power) to guarantee a decent standard of living due to a combination of low-income, high-energy expenditure and low energy efficiency of their home.

Conclusions

The ENPOWER Playbook lays the foundation for the next phases of 'Replication, Integration and Scale Up' activities. The Playbook acts as a comprehensive guideline for the replication of the ENPOWER approach, ensuring structured and scalable implementation of the project's outcomes.

Building upon the Playbook's framework, general trainings and training materials, including presentation slides, were developed from a European perspective and further adapted by each Pilot Country to align with their regional needs and policy contexts. This localised adaptation will strengthen the practical applicability of ENPOWER strategies across diverse regions.

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