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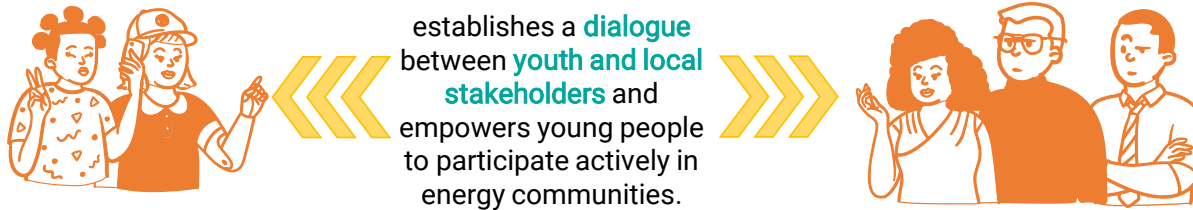
POWERYOUTH

Empowering Youth for Energy Community Actions

What is POWERYOUTH?

Aim: Empower young people to play an active role in the energy transition.

Concept: Participatory Approach



Tools: Development of three tools

'PARTICIPATE' tool

'DECISION' tool

'FINANCE' tool

Capacity Building Programme: Create a cohort of Youth Energy Community Leaders that will act as multipliers towards the replication of POWERYOUTH approach across the EU.

5 Pilot Countries

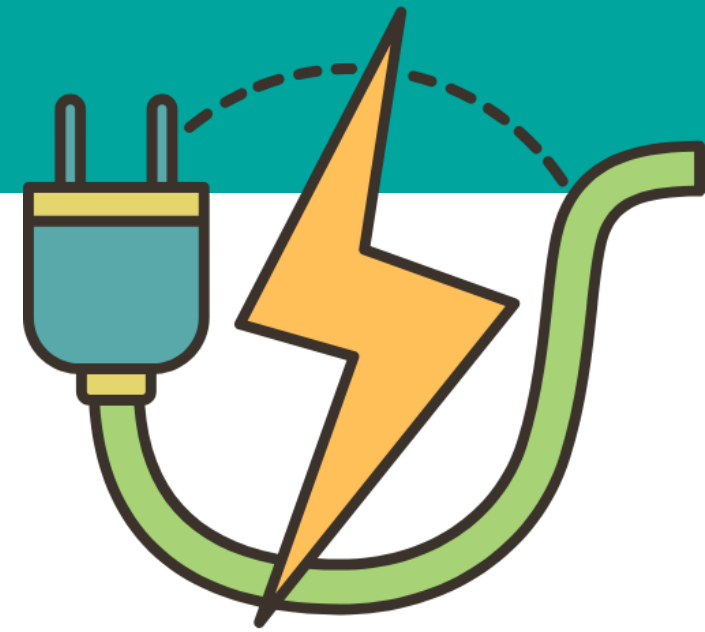


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Benchmark Survey



Mentimeter QR code



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Training Curriculum



Part I: What is an Energy Community?



Part II: The Youth Element in Energy Communities



Part III: Energy Community Modules

-Module 1: Generation and Supply

-Module 2: Energy Efficiency

-Module 3: Electro-Mobility



Part IV: Energy Communities Monitoring and Evaluation Process



Part V: Becoming an Energy Community Initiator and/or Youth Energy Ambassador



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Learning Objectives



Introduce the concept of Energy Communities



Present the main characteristics of Energy Communities



Present the preparation stages for developing an Energy Community



Highlight the importance of youth engagement in Energy Communities



Description of the Energy Community modules:

M1: Introduce the Energy Communities focused on “Generation and Supply”

M2: Introduce the Energy Communities focused on “Energy Efficiency”

M3: Introduce the Energy Communities focused on “Electro-mobility”



How to monitor and evaluate an Energy Community



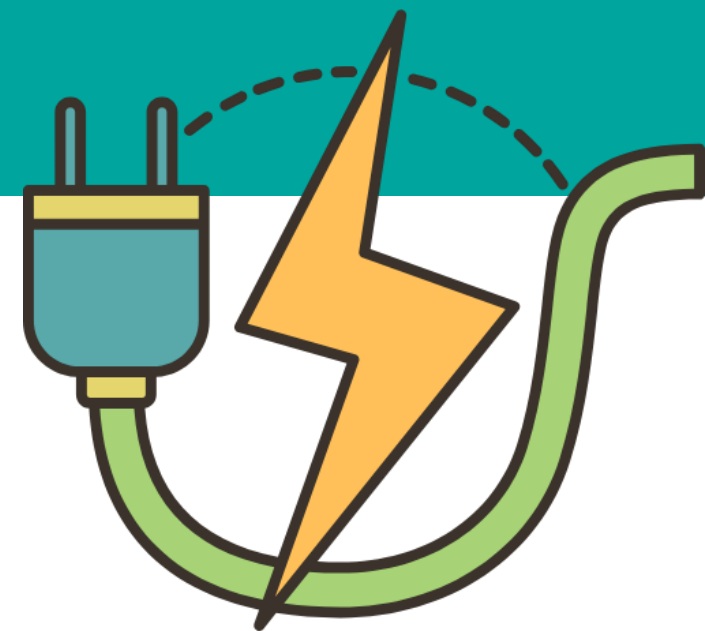
How to become an initiator of an Energy Community /a Youth Energy Ambassador



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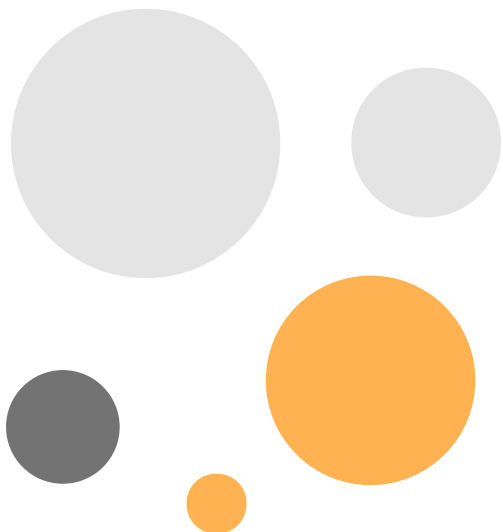
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Part I

The Concept of Energy Communities Key characteristics & Preparation stages



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The Concept of Energy Communities

Key characteristics & Preparation stages



An Energy Community is an autonomous legal entity that operates based on open and voluntary participation of people, SMEs or local authorities based in their majority, in the same region the community is established. Those members of the Energy Community are the ones controlling its operation.

The main purpose of an Energy Community is to provide environmental, economic or social community benefits.

An Energy Community may engage in activities like energy generation, distribution, supply, consumption, aggregation, storage, energy efficiency services or charging services for electric vehicles or provide other energy services to its members or shareholders.



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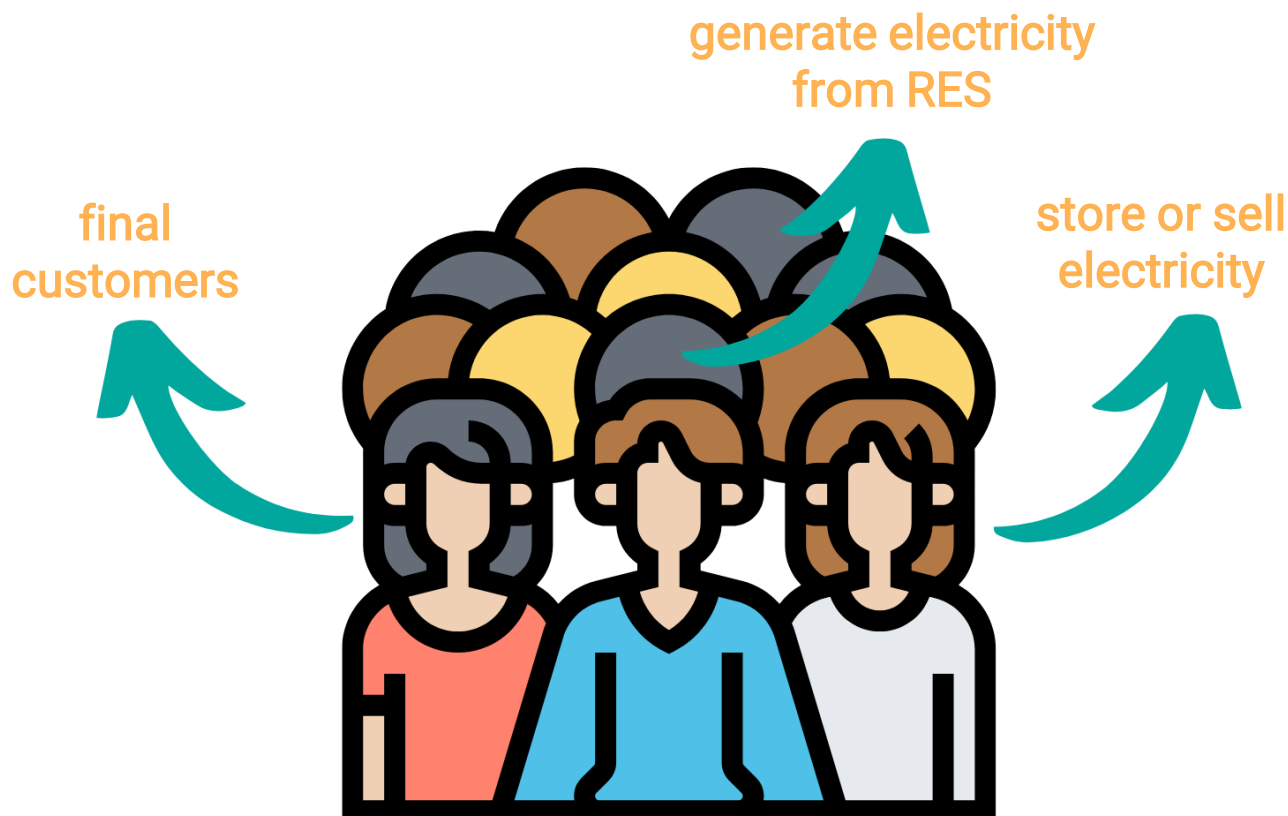
The Concept of Energy Communities

Key characteristics & Preparation stages

The role of citizens in Energy Communities

The citizens in Energy Communities are the **final customers** and at the same time they can be the ones **generating electricity from RES** for self-consumption, or the ones storing or selling self-generated electricity.

In case of selling this self-generated electricity, this activity cannot be the primary commercial or professional activity of the citizen within the Energy Community.



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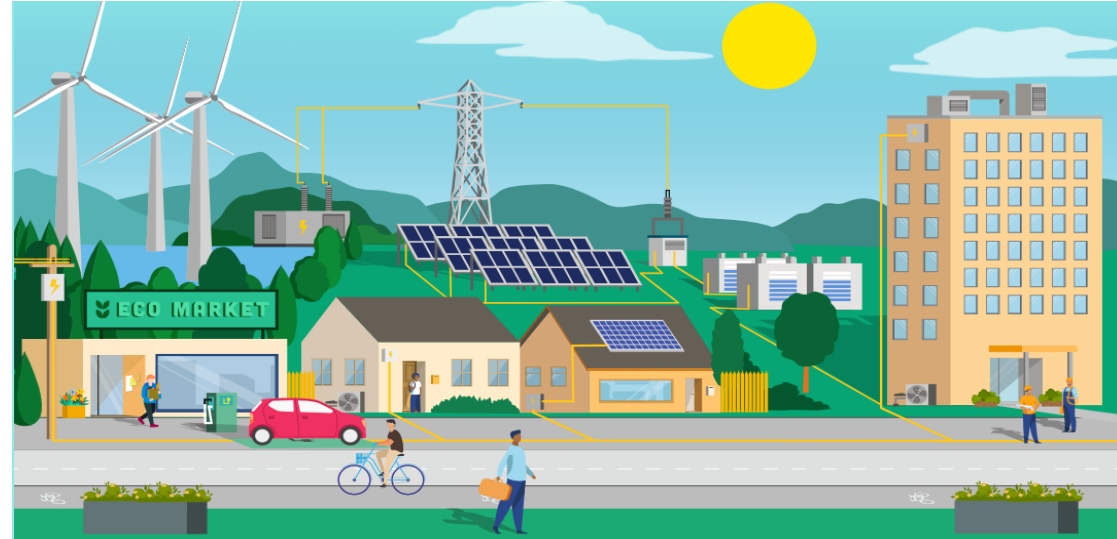
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The Concept of Energy Communities

Key characteristics & Preparation stages

Here's a depiction of how the EU sees a "greentown".
A town based on Renewable Energy.

Source:
https://energy.ec.europa.eu/energy-explained/interactive-infographics/infographic-renewables_en



GREENER BUSINESSES	CITIZEN INVOLVEMENT	ENERGY SECURITY	ENERGY STORAGE	JOB CREATION
Renewables help reduce emissions from industry by reducing the use of polluting fossil fuels. By generating renewable energy or buying it directly from producers, businesses can play an active role in the energy transition.	Europe encourages communities and consumers to play an active role in the energy market by becoming producers themselves (prosumers) or to take shares in energy cooperatives.	With Greentown's grid connected to its neighbours, they can share their surplus renewable energy with each other and be less likely to face blackouts.	Wind and solar production naturally vary, so batteries help Greentown store electricity and stabilise its energy supply. Large aquifers can store renewable heat underground. Renewable hydrogen and pumped hydropower are other options.	From electricians to environmental engineers, from builders and project managers to IT and transport specialists: renewable energy brings skilled jobs to Greentown folks!



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The Concept of Energy Communities

Key characteristics & Preparation stages

Here's a description of what Energy Communities are, by the StartSun Project.



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The Concept of Energy Communities

Key characteristics & Preparation stages

Differences in the definitions at the EU level

Renewable Energy Community (REC)	Citizen Energy Community (CEC)
<ul style="list-style-type: none">• All forms of renewable energy• Proximity of RE projects• Individuals, local authorities and micro/small/medium enterprises• Autonomous from individual members and traditional market actors• Effective control by individuals, local authorities and micro/small enterprises	<ul style="list-style-type: none">• Technology-neutral (only electricity)• No geographic limits• Any participant• Undefined degree of autonomy• Effective control includes medium-sized enterprises



The Concept of Energy Communities

Key characteristics & Preparation stages

Key characteristics – Legal forms

Legal Structure	Description
Energy cooperatives	The most common and fast-growing form of energy communities. This type of ownership primarily benefits its members and is popular where renewables and community energy are advanced.
Limited partnerships	Allows individuals to share responsibilities and profits through community energy participation. Governance is often based on the value of each partner's share, which may not guarantee one member - one vote.
Community trusts and foundations	Focuses on generating social value and local development, using profits for the community as a whole, even when citizens cannot invest directly (e.g., for-the-public-good companies).
Housing associations	Non-profit organizations that can provide benefits to social housing tenants, although tenants may not have direct decision-making roles. Ideal for addressing energy poverty.
Non-profit customer-owned enterprises	Used by communities for managing independent grid networks, including community district heating networks, common in countries such as Denmark.
Public-private partnerships	Local authorities collaborate with citizen groups and businesses to ensure energy provision and other community benefits.
Public utility company	Run by municipalities to manage utilities on behalf of taxpayers and citizens, suitable for rural or isolated areas.







The Concept of Energy Communities

Key characteristics & Preparation stages

Energy cooperatives

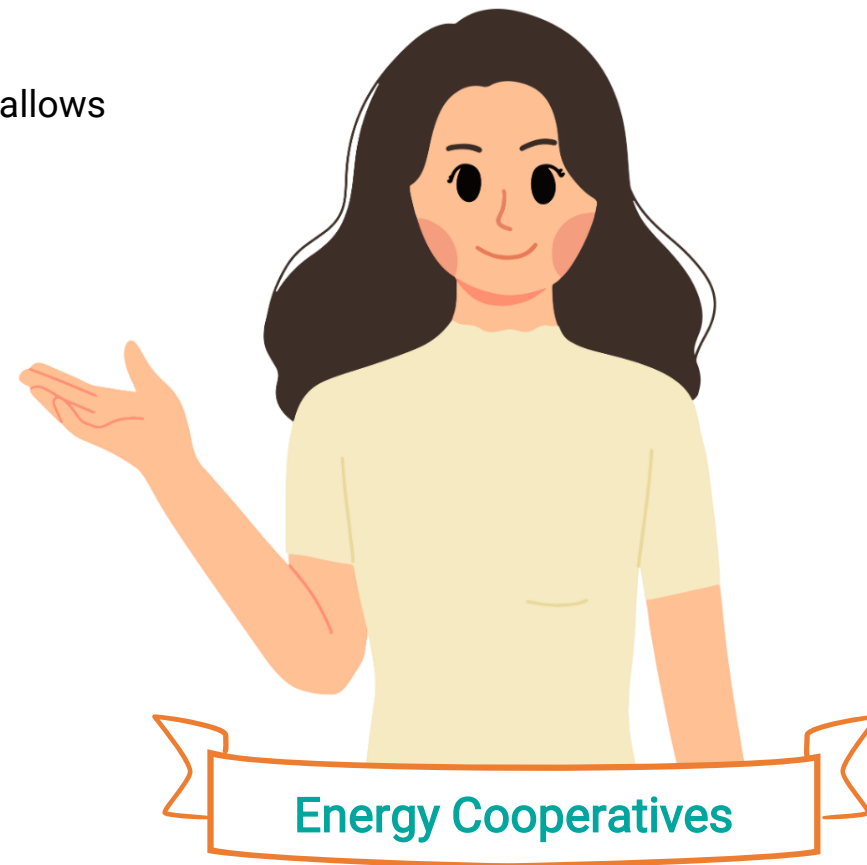
Energy cooperatives are types of social and economic enterprises. This legal form allows citizens to collectively own and manage energy-related projects and services

Their key elements:

-  Democratic governance (1 member – 1 vote)
-  Citizens can consume and share energy from RES
-  People can invest by buying shares or financing projects
-  Surpluses are reinvested to support the members and/or the community

Their key principles:

1. Voluntary and open membership
2. Democratic member control
3. Member economic participation
4. Autonomy and independence
5. Education, training and information
6. Cooperation among cooperatives
7. Concern for community



The Concept of Energy Communities

Key characteristics & Preparation stages

Key characteristics – Consumer's comfort & ease

Energy communities enhance consumers' comfort and ease by:

- Personalized/community-based energy solutions
- Cost savings and energy security

Key benefits

- ✓ Stable and reliable energy supply
- ✓ Community-based demand management
- ✓ Social and Economic Inclusion
- ✓ Education and Awareness



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The Concept of Energy Communities

Key characteristics & Preparation stages

Key characteristics – Consumer's challenges & opportunities

CHALLENGES

- **Regulatory barriers** and complex market rules can hinder energy community development and operations.
- Initial investment and funding requirements are often **very high**.
- Participating in an energy community may **require access to technical expertise** and technology for the members.

OPPORTUNITIES

- Energy communities often receive **support** from the EU and national governments, with **access to innovative financing solutions** like crowdfunding and grants.
- These communities boost citizen **awareness and public support** for green initiatives.

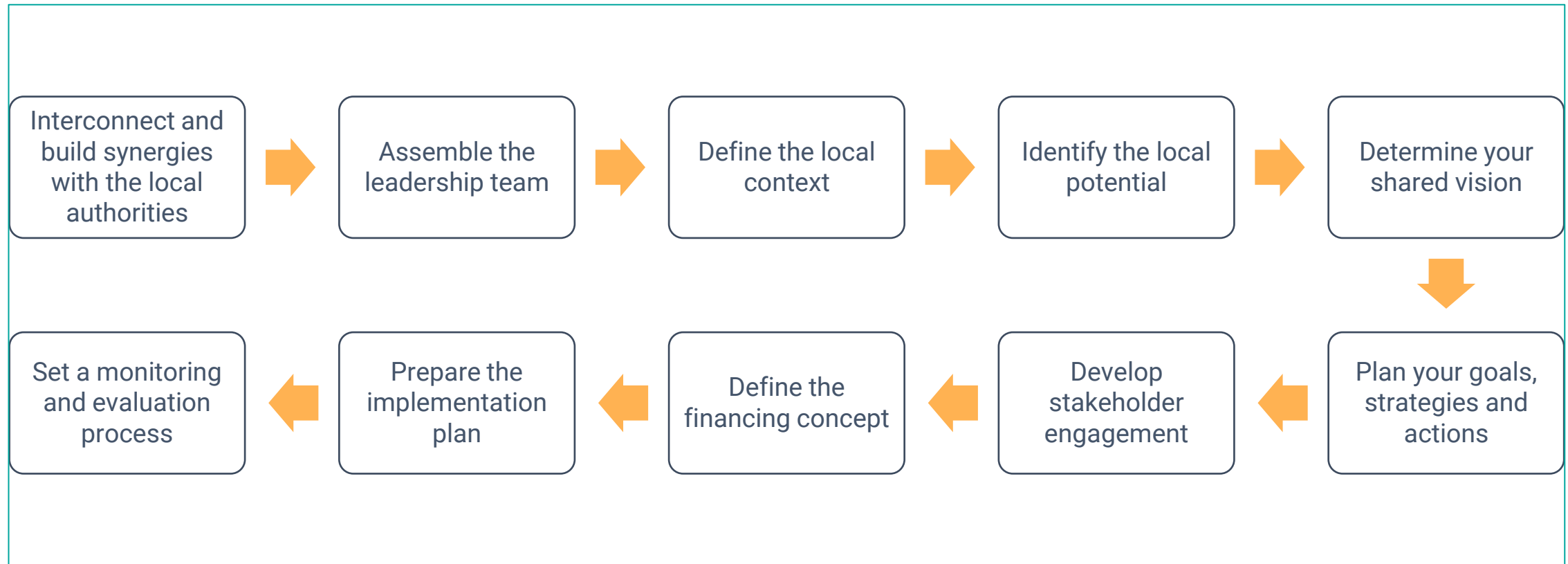


The Concept of Energy Communities

Key characteristics & Preparation stages

Preparation stages

General timeline/steps to follow as a roadmap

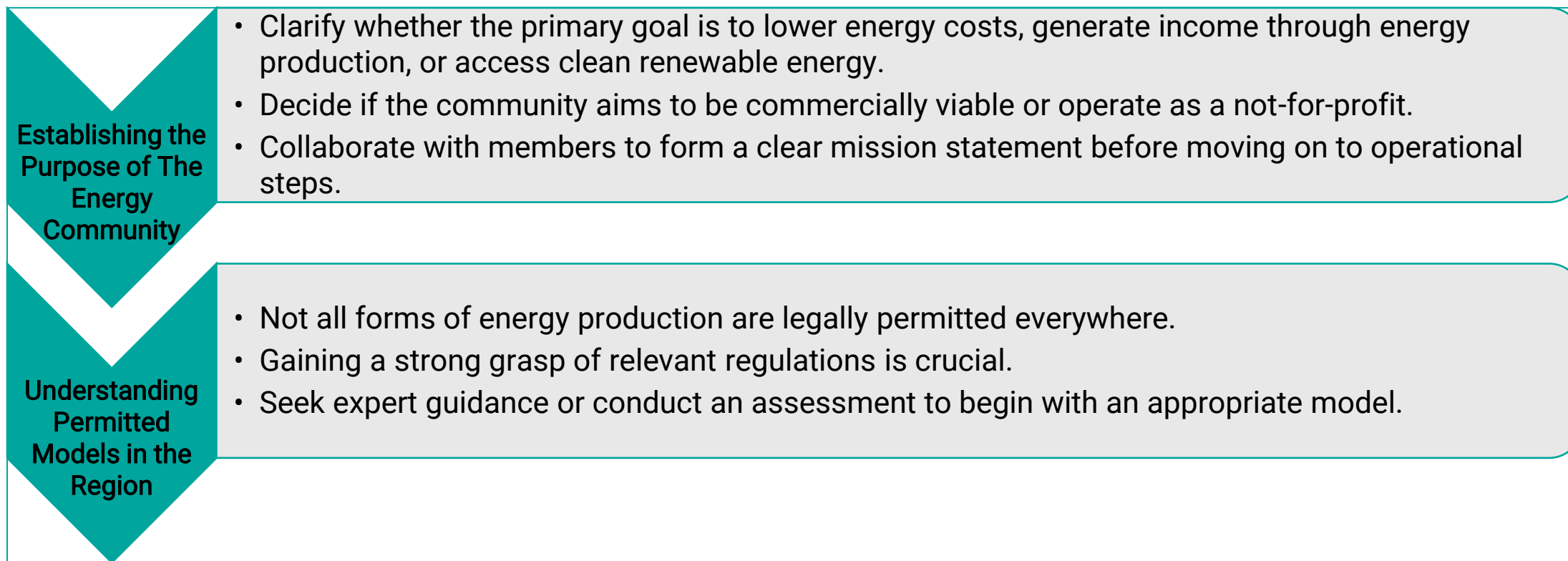


The Concept of Energy Communities

Key characteristics & Preparation stages

Preparation stages – Business Plan

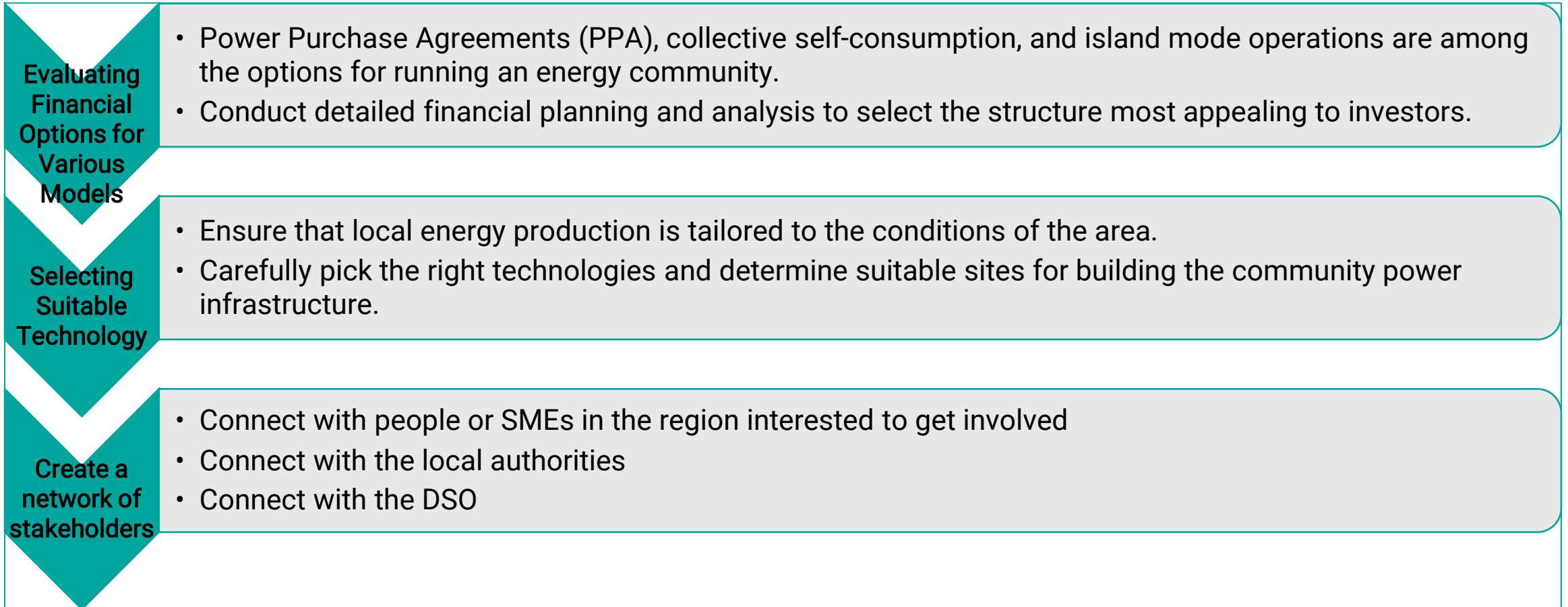
A business plan for an Energy Community should include (at least) the following steps:



The Concept of Energy Communities

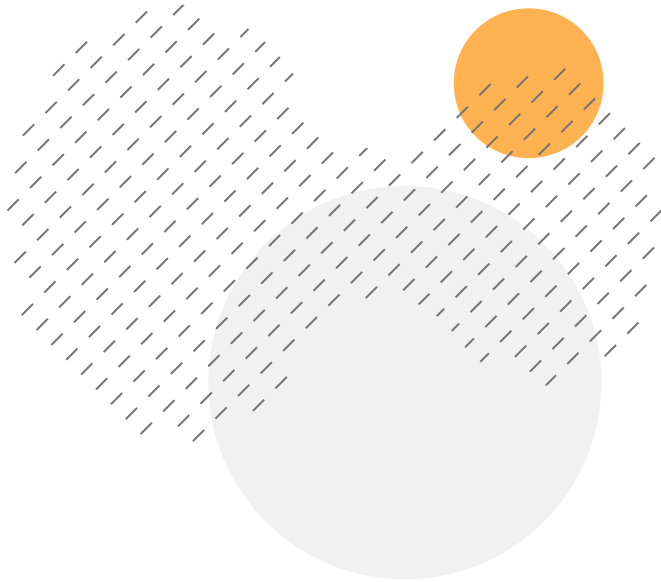
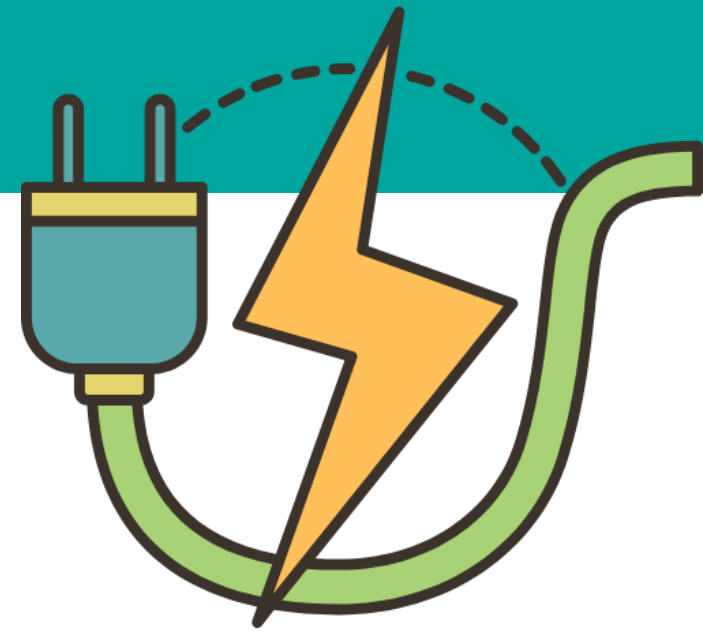
Key characteristics & Preparation stages

Preparation stages – Business Plan



Game in Energy Communities (20 min)

Activity I: Reschool Community Game



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What is the Reschool Community Game?

Definition: A fun card game where players compare values on their cards to win.

Goal: To collect all the cards by winning individual rounds, by having the highest stat each round.

Number of Players: 2-5

Game Components: 32+ cards; Instruction card, Icon explanation card

Playing Time: 5-10 minutes

Why RESCHOOL Energy Community Card Game?

- Engaging and competitive.
- Easy to learn and play.
- Introduces energy communities and their goals (developed in collaboration with schools, experts, and energy communities).
- Promotes strategic thinking and knowledge about clean energy and community action.







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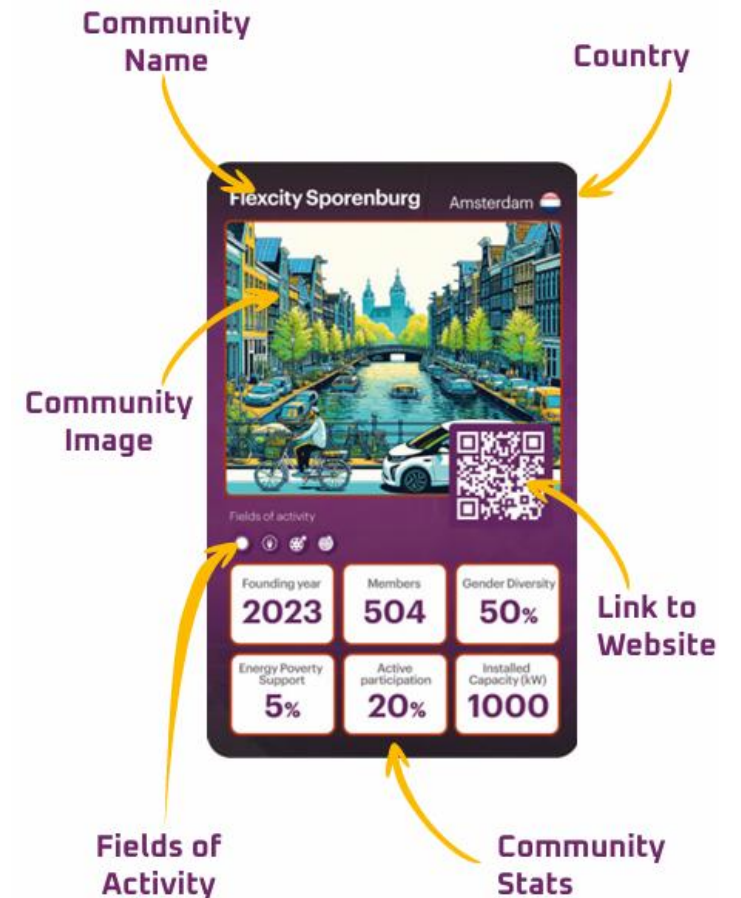
The Cards and Set Up

What's on a Card?

-  A title or name of an **Energy Community**.
-  Categories with numerical values (e.g. **installed capacity, gender balance, etc.**)
-  An image for context or appeal.
-  Each card features **six attributes and additional icons representing their activities.**

How to Set Up

-  Shuffle the cards thoroughly.
-  Deal them equally among players.
-  Keep your cards face down; no peeking!
-  Tip: If players are uneven, form small groups and share decision-making.



How to Play a Round

Starting Player:



The player to the left of the dealer (or choose randomly).

Choose a Category:



The starting/acting player picks one category from the top card.

Compare Values:



"All players reveal the value of the same category from their top card. The highest value wins the round, except in the case of 'Gender Diversity,' where the value closest to 50% wins, and 'Founding Year,' where the furthest value wins."

Collect Cards:



The winner takes all the cards and places them at the bottom of their deck.




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Special Situations and Winning the Game

Tie:


 In case of a tie, the acting player picks another attribute to compare among the tying players.

OR


 All tied cards are placed in the center.

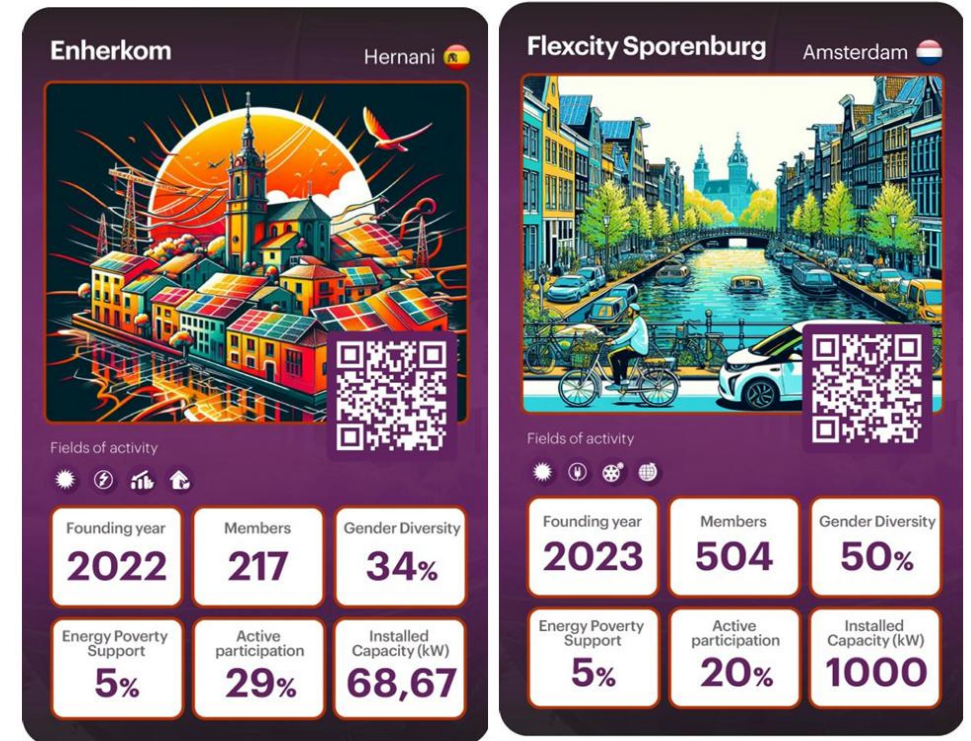
 The winner of the next round takes the center pile too.

Out of Cards:

 If a player runs out of cards, they are out of the game.

Pro Tip: Use strategy when choosing categories!

 The game ends when one player collects all the cards.



Reflection

Real-Life Applications and Takeaways:



Decision-making.



Assessing strengths and weaknesses in different situations.



Strategic thinking and teamwork in action.



Enhancing community engagement in energy markets,



Encouraging household participation in energy communities,



Promoting the transition to clean energy through greater use of renewables and improved energy efficiency.

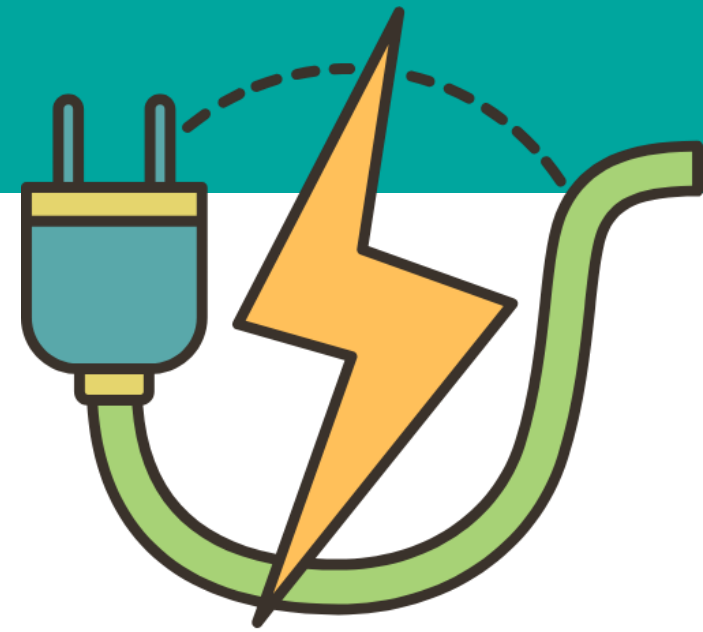


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Part II

The role of youth in the development of Energy Communities



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The role of youth in the development of Energy Communities



Youth should be seen as critical drivers of **energy innovation**.

Research has shown a **strong relationship** between **youth energy literacy** and **energy security**.

RES projects in rural communities can improve energy security, e.g., because of the geographical isolation of several rural areas.

This can lead to improved socio-economic and educational opportunities for young people, as well as the mitigation of the disproportionate and intergenerational effects of climate change on youth.

Scholars often highlight that energy transition is among the scopes that enable youth to **discover** their potential, build new skills, and eventually become meaningful actors in the energy transition process.



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The role of youth in the development of Energy Communities



Source: <https://asiango.org/magazine/post-magazine/article/article-detail/142/6-opportunities-to-empower-the-youth>

Why are young people important for Energy Communities?

1. Youth understands renewable energy
2. Youth is a group of energy intensive consumers
3. Youth is a group more climate-aware than others
4. Youth can be agents of change by influencing members in their social networks with energy-saving behavior.



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The role of youth in the development of Energy Communities



Source: <https://www.yoac-erasmus.eu/youth-movements-eu-shaping-the-future/>

*Examples:

Social media campaigns advocating for green policies or startups focused on clean tech innovations.

Youth as drivers of change in Energy Communities



Fresh perspectives



Sustainability mindset



Innovation and experimentation



Source: <https://trellis.net/article/why-youth-climate-movement-bright-light-during-troubled-times/>



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The role of youth in the development of Energy Communities

Youth as long-term stakeholders and sustainability advocates

Why Youth Matter for the Long Term

Youth participation ensures continuity in energy community efforts, as they have a vested interest in creating a sustainable future. Building strong foundations with youth today ensures that energy communities continue thriving into future generations.

Sustainable Living Models

Youth can advocate for and model eco-friendly living, encouraging the adoption of sustainable practices on a wider scale.

Leadership and Ownership Opportunities

Youth-led initiatives can focus on inclusive decision-making processes. Creating leadership roles within energy communities ensures representation and accountability.



Source: <https://givingcompass.org/article/8-lessons-for-todays-youth-led-movements-from-a-decade-of-youth-climate-organizing>



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The role of youth in the development of Energy Communities



Source: <https://techjournal.org/reasons-why-is-technology-important-to-teenagers>

Youth as technology & innovation leaders

Adopting digital tools and platforms

Youth are often at the forefront of digital transformation, using software and apps to improve energy efficiency, storage, and distribution within communities.

Promoting smart energy systems

Involvement in smart grids, decentralized energy management, and innovative data analytics tools to optimize energy usage.

Renewable energy projects

Hands-on involvement in installing solar panels, wind turbines, or exploring new sustainable tech options.

Collaborative Projects

Collaborative innovations involving universities, startups, and energy communities for technology transfer and R&D.



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The role of youth in the development of Energy Communities

Youth as awareness and advocacy champions

Role of Awareness Campaigns

Youth play a central role in raising awareness within communities, schools, and even among policymakers about the importance of RES.

Community engagement

Organizing workshops, webinars, and community forums to educate on clean energy practices.

Initiating door-to-door campaigns and using social media platforms to spread awareness.

***Global Examples:** Greta Thunberg's global youth-led climate strikes illustrate the power of youth advocacy. Youth energy forums or networks for sharing best practices and knowledge.



Source: <https://hrws.pk/product/climate-change-education-awareness-programs-to-youth/>



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The role of youth in the development of Energy Communities



Source: <https://www.cypnow.co.uk/content/analysis/the-decline-of-open-access-youth-work-and-how-to-turn-it-around/>

*Examples:

Youth energy clubs, eco-friendly neighborhood groups, etc.

Youth as community mobilizers

Engagement with peers

Youth mobilize their peers and other community members to adopt sustainable practices and join energy communities.

Community projects

Encouraging participation in community energy initiatives such as setting up solar energy cooperatives.

Volunteerism & social impact initiatives

Participating in tree-planting, recycling, or clean-energy educational drives to create awareness and foster action.

Creating a shared vision

Building a community vision that centers around sustainable energy and inclusivity, spearheaded by youth leaders.



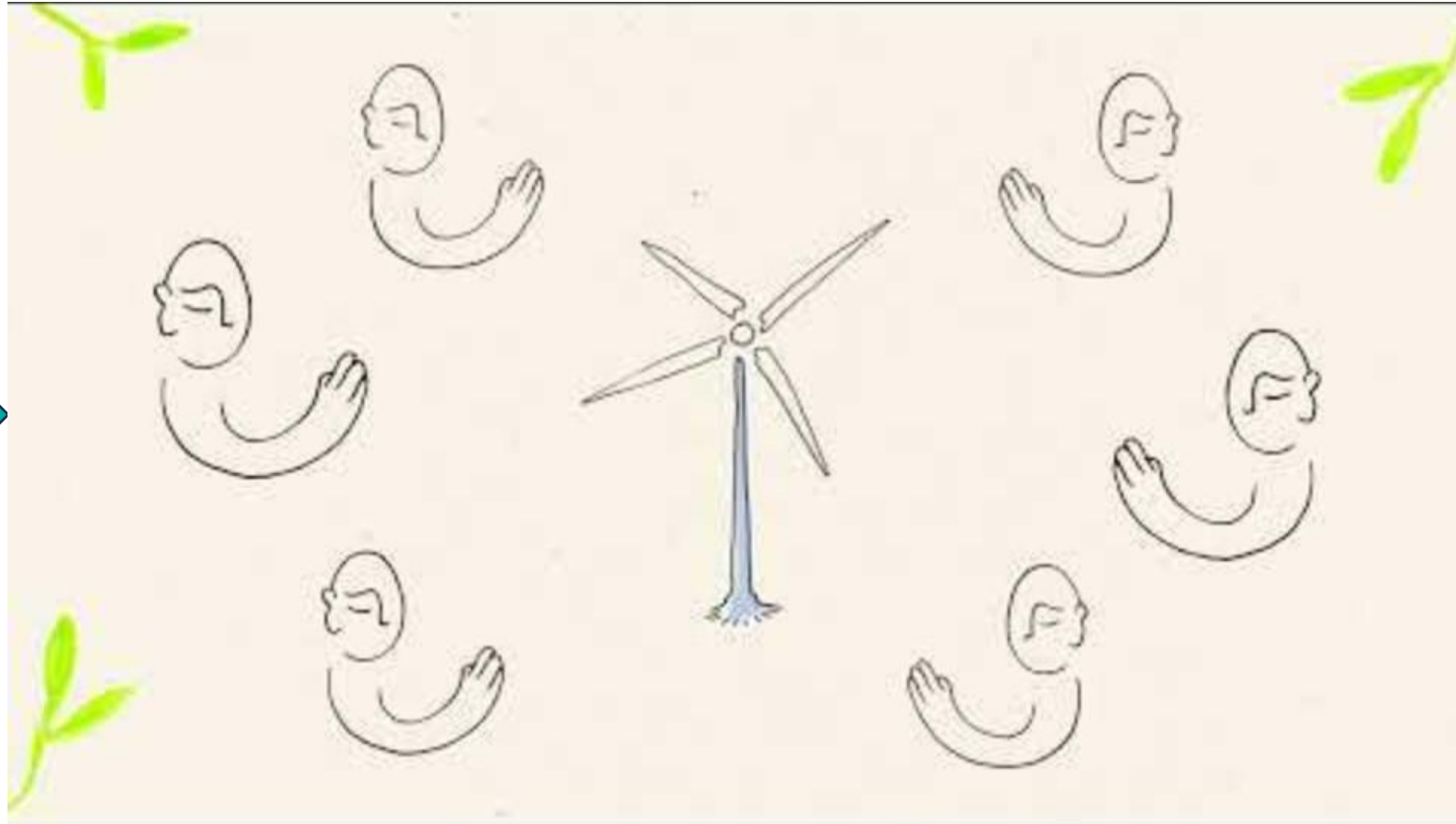
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The role of youth in the development of Energy Communities

*The video provides examples of Energy Communities in Greece

Here's a description of how Energy Communities and citizenship participation can transform the energy system, by Electra Energy Cooperative.



Based on all the reasons explaining why you, young people, are extremely important for such a transformation...

Can you realize the power you have as community shapers?

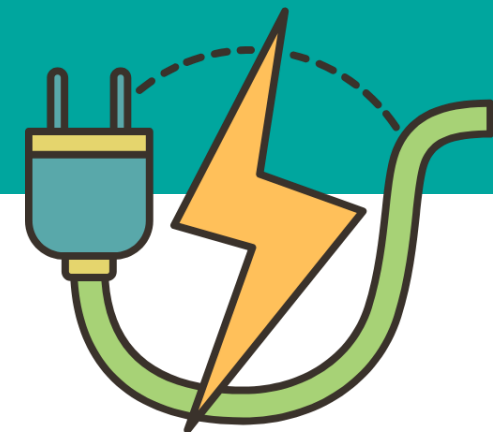


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The role of youth in the development of Energy Communities



Interaction/Participatory exercise

The participants will be divided in groups of 2 and discuss between them on the question:

“What was your motivation to participate in this training today; and after what you've heard so far, how motivated are you to act as a young change-maker?” (10 mins)

After a short exchange of insights, the duos will present their key takeaways in the plenary. (10 mins)



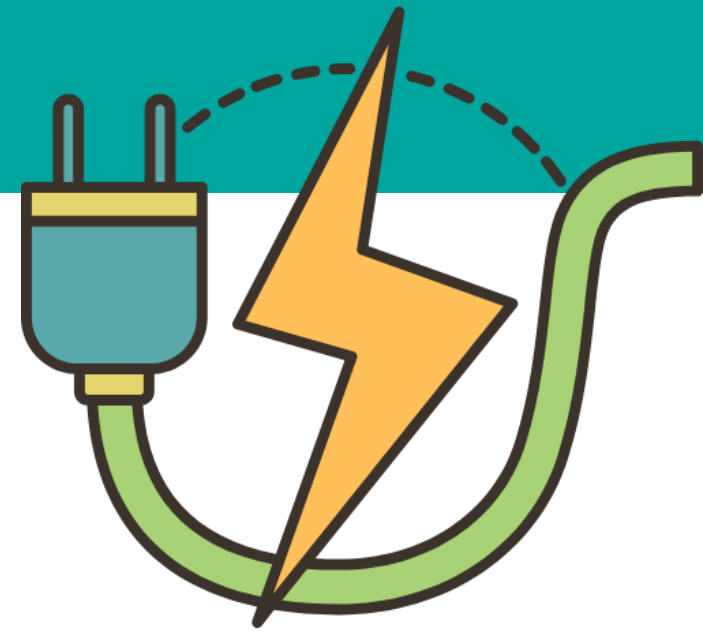
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Part III

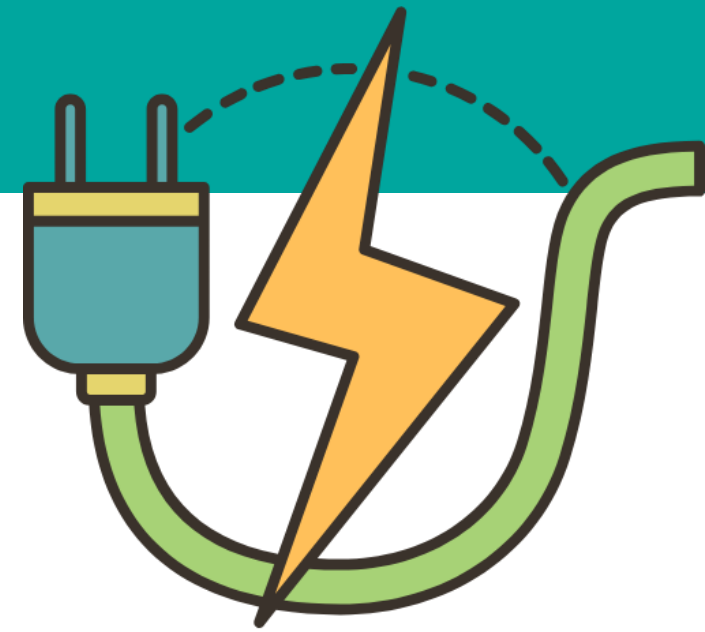
Energy Community Modules



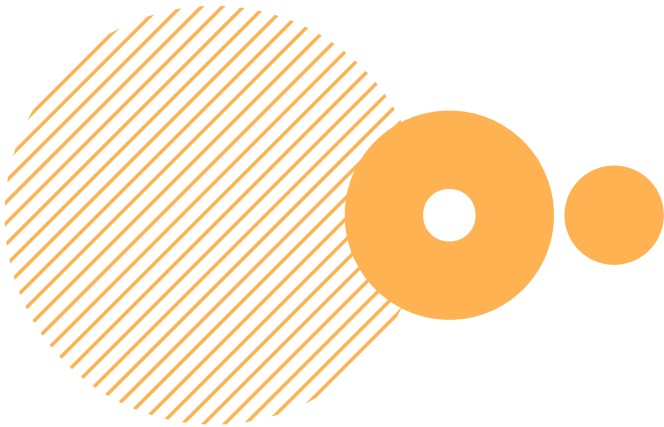
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M1: Energy Communities focused on “Generation and Supply”



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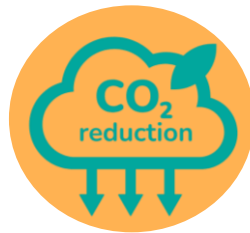
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M1: Energy Communities focused on “Generation and Supply”

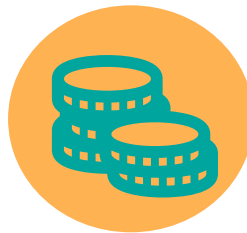
What are the main elements of the Energy Communities focused on Generation and Supply, and why are they important?



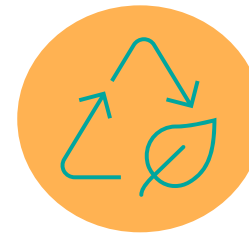
Energy security and
resilience



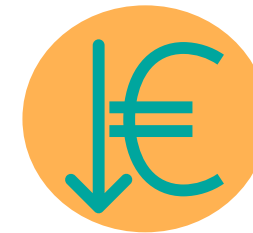
Decarbonization
efforts



Benefits in the local
economy



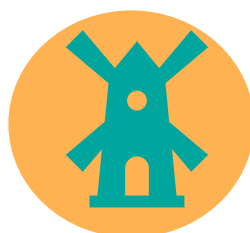
Democratic participation
in the energy transition



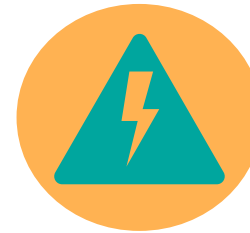
Lower energy costs



Ownership and control



Local production and
distribution



Energy sharing
mechanisms



Non-profit orientation



Collective investment and
infrastructure sharing



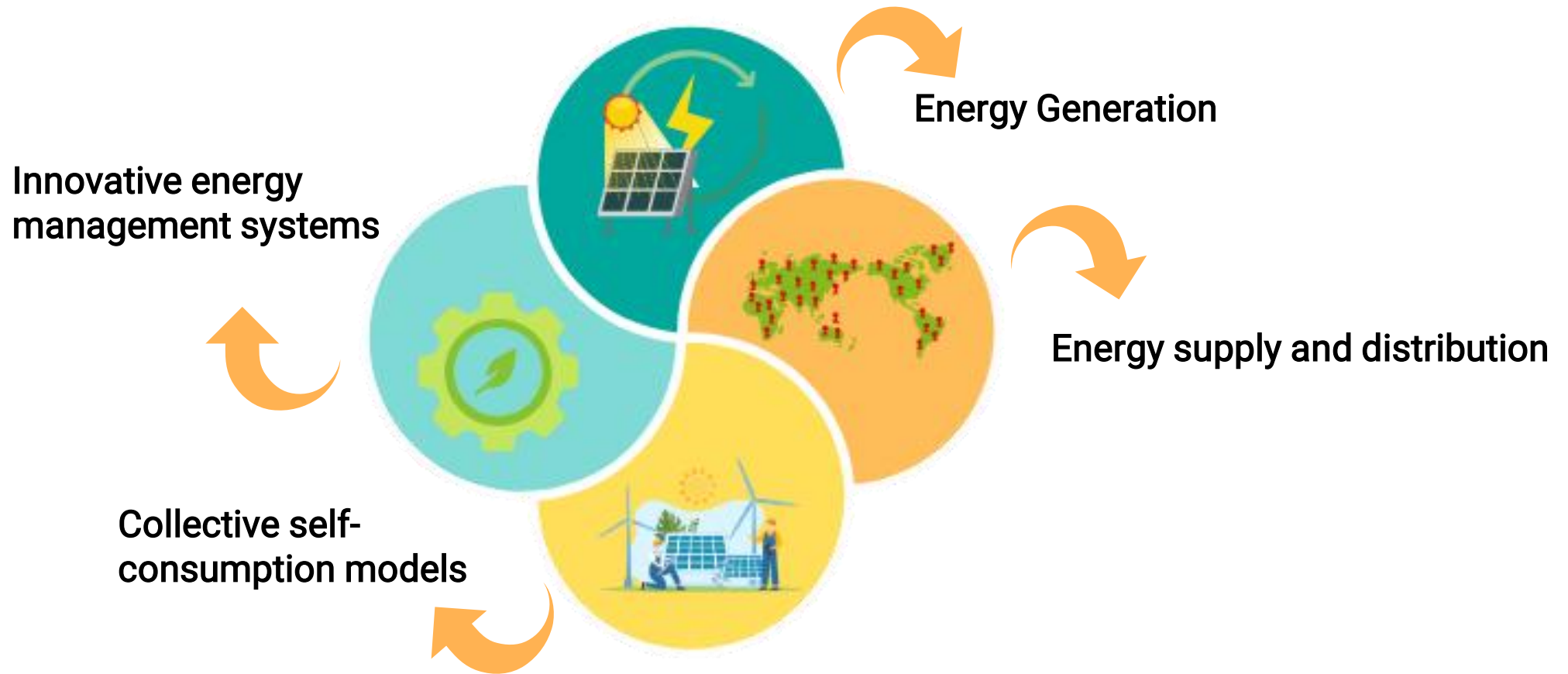
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M1: Energy Communities focused on “Generation and Supply”

Activities of energy generation and supply in energy communities:



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M1: Energy Communities focused on “Generation and Supply”

Case Studies

OurPower Energy Cooperative (Austria)

OurPower is an energy cooperative, founded in Vienna in 2018, aiming at engaging citizens in the electricity market.

It has around **900 members** and 1100 clients, and it operates a platform connecting more than 300 private electricity producers with consumers.

OurPower uniquely **combines the functions of an energy community and a supplier**, including households with solar PV systems, SMEs, and small-scale renewable energy producers like farmers with PV, wind, hydro, and bioenergy installations.



Source: [Case Study #8: OurPower \(Austria\) - Interreg Baltic Sea Region](#)

OurPower promotes various RE technologies, including small wind farms, hydropower plants, and solar panels.

Solar panels are installed both on rooftops and ground mounted. Rooftop installations, ranging from small-scale (10 kW, 20 kW) to large-scale (up to 4 MW), are connected individually to the grid. Ground-mounted solar panels are also connected to the distribution system. **This decentralized approach maximizes renewable energy usage and grid resilience.**

OurPower highlights the necessity of **inclusive representation** in the energy transition and focuses on engaging women and young people.



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Case StudiesM1: Energy Communities focused on “Generation and Supply”

OurPower Energy Cooperative (Austria) – Activities

OurPower’s business model is based on **crowdfunding and community engagement**. Main energy consumers include households and SMEs.

The cooperative operates a peer-to-peer marketplace for RES electricity generated by its members and an empowerment platform for citizen energy. The market place software allows for P2P matching on energy basis, i.e. kWh/a, and provides detailed kWh-precise accounting and billing, while taking care of all energy business services such as balancing, clearing grid costs for customers.

Agreements on cost and revenue sharing exist among cooperative members, ensuring fair distribution.

Additional activities:

OurPower is **developing and testing the serve-U app**. An app that **optimizes electricity consumption** by providing real-time weather and generation data to its users. This app is expected to enable members to visualize their energy production and consumption. This way, they will be able to adjust their energy consumption accordingly.

In addition, as the billing process involves data exchange through OurPower’s digital platform, improvements in it may allow the incorporation of additional smart devices to further enhance energy efficiency and data monitoring.



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M1: Energy Communities focused on “Generation and Supply”

Case Studies

Coopérnico (Portugal)

Coopérnico is Portugal’s first renewable energy cooperative, established to promote renewable energy production and cooperative energy supply.

It started “with the aim of harnessing solar power for the benefit of local communities [...] Coopernico rents roof-space for its PV panels from socially minded institutions, providing them with extra income”.

Coopernico started with sixteen people from different areas of Portugal representing different sectors such as academia, NGOs and the private sector.

An important step in the scaling journey of Coopernico was when the community became an electricity supplier in 2019.

Formalizing this responsibility signifies that the community took on responsibilities traditionally sitting with incumbents. The electricity produced by it is 100% renewable, produced through small plants, and is financed by the cooperative itself, which ensures a local guarantee of origin.



Source: <https://www.coopernico.org/projeto/28>



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M1: Energy Communities focused on “Generation and Supply”

Case Studies

Coopérnico (Portugal) – Activities

Coopérnico develops solar projects, allowing citizens to invest in and benefit from renewable energy. **Energy generated is sold to the grid, and revenues are reinvested in social and environmental initiatives.**

Taking the production and supplying activities together, **the energy community has 1,772 members**, investments of €1.8 million, 2 MW production capacity and 1,179 contracts as of 2022.

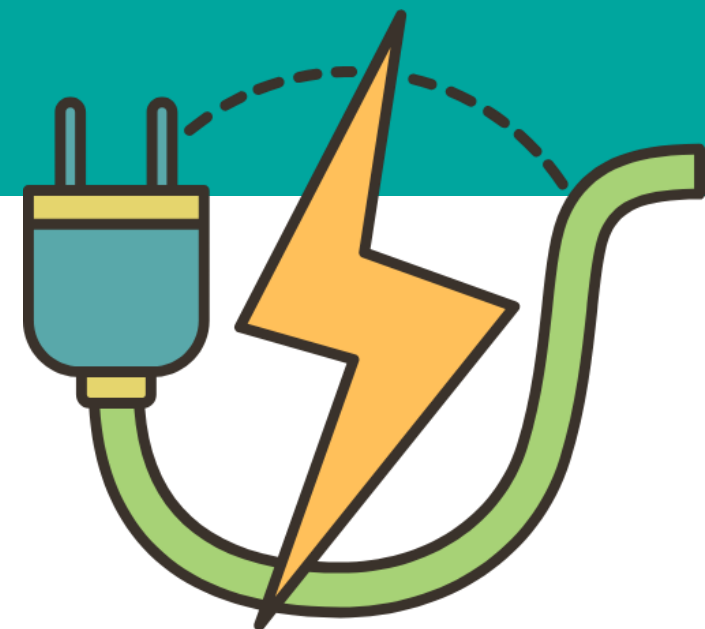
Additional activities:

At the local level, groups are active in **promoting several topics such as “electric vehicles or solar production”** at the community level.

As a national player it has several advantages for its scaling, such as:

- The cooperative had the opportunity to work directly with various legislators and to lobby for institutional changes to varying degrees of success,
- The partnerships of the model depend on how they could best be built by having higher-scale legitimacy in the eyes of established institutions.





M2: Energy Communities focused on “Energy Efficiency”







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M2: Energy Communities focused on “Energy Efficiency”

Energy efficiency is a key focus area for energy communities that aims at:

- 
Cost Savings
- 
Environmental Benefits
- 
Energy Security
- 
Community Benefits

What are the main elements of energy communities focused on energy efficiency?

- 
Participatory Governance
- 
Energy Audits and Efficiency Measures
- 
Demand Response Programs
- 
Education and Awareness Campaigns



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M2: Energy Communities focused on “Energy Efficiency”

Activities and benefits of energy efficiency within energy communities

ACTIVITIES

Building Improvements and Renovations

Upgrading insulation, installing energy-efficient windows, and other retrofitting measures to improve the energy performance of the buildings involved in the energy community.

Energy Management Systems

Use of smart technologies to monitor and optimize energy consumption in real-time

Collective Energy Purchasing

Aggregated purchasing power to buy energy-efficient appliances and devices at reduced costs for the members of the community.

BENEFITS

Economic Savings

Collective savings on energy bills and access to subsidies, even more important for the vulnerable households benefited by the energy communities

Reduced GHG Emissions

Energy efficiency focused energy communities support national and international climate goals and improve the environmental impact of their members' energy consumption.

Social Cohesion

Engagement of community members in shared goals, fostering a sense of ownership and collaboration.



M2: Energy Communities focused on “Energy Efficiency”

The concept of Net Zero Energy Communities (NZE)

What is NZEC?

Groups of buildings or regions that collectively produce as much renewable energy as they consume over the course of a year.

What is the main goal?

Achieve net-zero energy by optimizing efficiency and generating local renewables to reduce GHG emissions and support climate goals.

Benefits

- ✓ Reducing the overall energy demand
- ✓ Contributing to energy independence
- ✓ Minimizing environmental impact
- ✓ Supporting local economies by creating green jobs
- ✓ Fostering community collaboration
- ✓ Decreasing energy costs for their members



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M2: Energy Communities focused on “Energy Efficiency”

Case Studies

Spółdzielnia Energetyczna Eisall (Poland)

Spółdzielnia Energetyczna Eisall is the first energy cooperative in Poland, registered in 2021, and operating in the Mazowieckie Province in the area of the neighboring municipalities of Raszyn-Nadarzyn-Michałowice.

Its production capacity: 2 PV micro-installations of 10 kW each.

The cooperative aims at offering comprehensive support in the creation and management of the Energy Cooperative; **ensuring energy independence; increasing the use of energy from RES; reducing energy costs; as well as at ensuring stability of energy supply.**

The activities of the cooperative include: electricity generation, electricity trading, electricity distribution, electricity transmission, business and management consultancy, engineering activities and related technical consultancy.

Eisall also:

- **conducts an analysis and recommend the optimal combination of energy sources.** Making it, thus, possible to increase energy self-sufficiency and optimize costs.
- **provides the participants of the cooperative with energy security and reduction of energy purchase costs while increasing the revenues of its producers.**
- **provides innovative energy storage solutions for commercial and industrial applications (with Neo Energy Group).**



Source: <https://heliosstrategia.pl/spoldzielnie-energetyczne-czym-sa-czy-warto-w-nie-inwestowac/>



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M2: Energy Communities focused on “Energy Efficiency” Case Studies

Claremorris and Western District Energy Co-Op (Ireland)

Claremorris and Western District Energy Co-Operative was founded in 2015 by a group of local people, at Claremorris of Ireland, and is located on the Ballyhaunis Road.

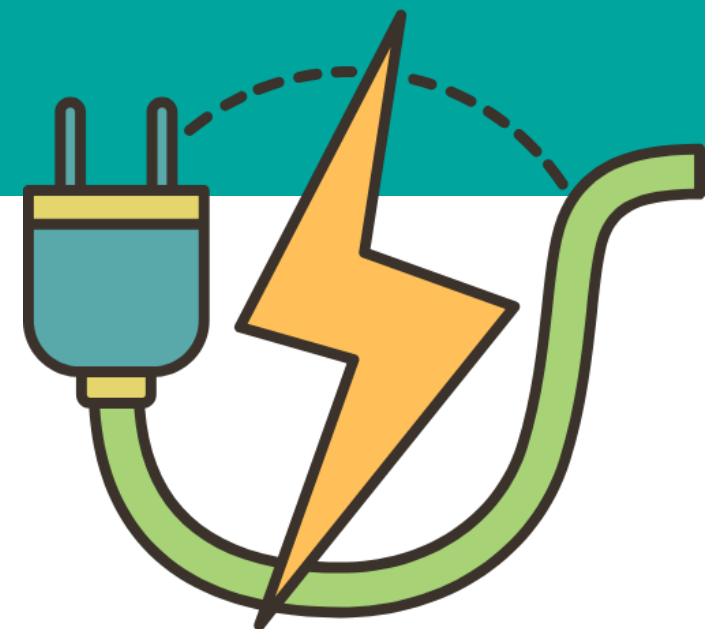
The cooperative counts over 50 members, that are currently engaged on a voluntary basis to support communities in the transition to the low carbon economy.

The co-op supports energy self-sufficiency by producing renewable energy that serves local buildings, including schools, public facilities, and local businesses, on which energy efficiency interventions are also taking place.

- Two 5MWe 100% community owned solar site
- Winning RESS1 as the first of one 100% community owned sites in Ireland.
- Partnership with Mayo county council for one of the solar sites which was previously a brown field landfill site.
- Cooperation with 13 other counties in Ireland to promote renewable energy through solar.
- Has supported another 9 energy co-op through the connection to grid process.



Source: <https://claremorris-energy-coop.com/about-us/>



M3: Energy Communities focused on “Electro-mobility”



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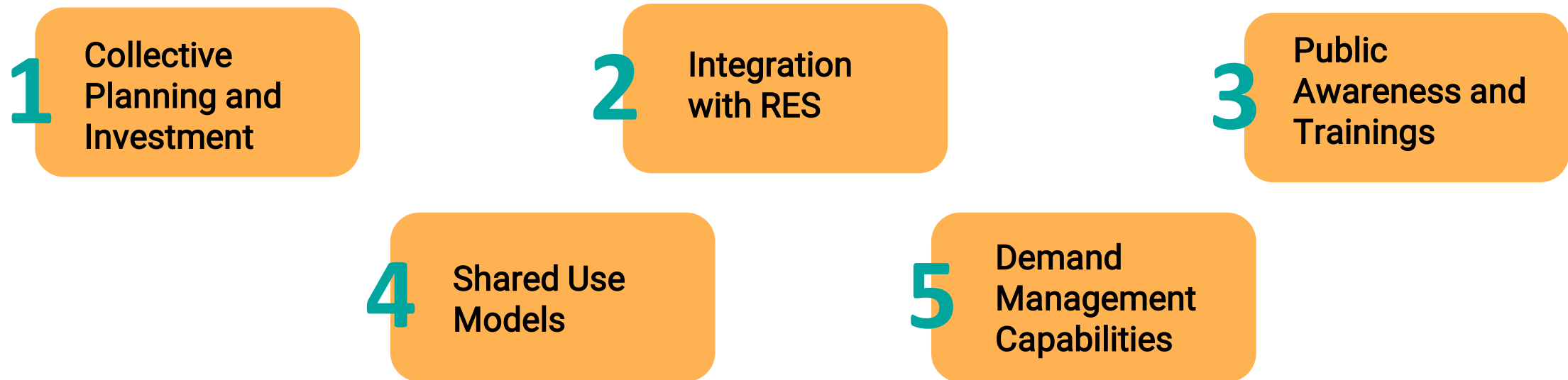
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M3: Energy Communities focused on “Electro-mobility”

What does the term “electro-mobility” mean?

It is the use of **electric-powered vehicles (EVs)** and the respective supporting infrastructure (e.g. charging stations) and energy communities can play a key role in developing, managing, and expanding EV infrastructure and promoting the adoption of EVs among members.

What are the main elements of energy communities focused on electro-mobility?



M3: Energy Communities focused on “Electro-mobility”

Activities of electromobility in energy communities

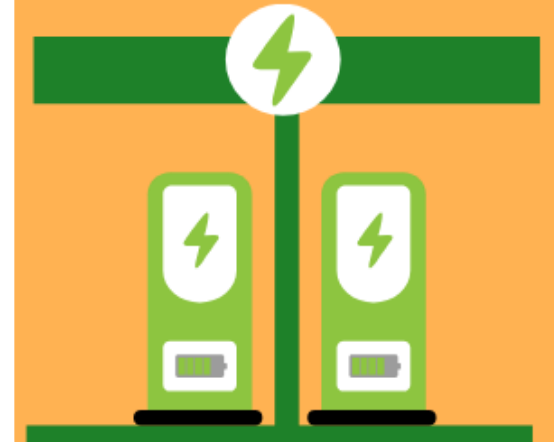
Implementing a system of **EVs** where people can **book and use** - the cars are owned by the **community** instead of individuals



Collective models of **sharing**



Establishment of several **EVs charging stations** within the facilities of the members of the energy community



Innovative energy **management systems**



Educational **activities** to raise awareness on electro-mobility



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M3: Energy Communities focused on “Electro-mobility”

Why is electro-mobility important for the energy communities and vice versa?

EVs can increasingly use RES if deployed within energy communities

1

2

To reduce the emissions of the transport sector

A cooperative can invest in a system of EVs where people can book and use

3

4

Car sharing is a more communal experience, allowing people to break with the individualist mentality

Use of a European platform enabling energy communities across Europe to share e-cars within their communities

5

6

Enhance community inclusion in the respective decision-making processes



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M3: Energy Communities focused on “Electro-mobility”

Why is electro-mobility important for the energy communities and vice versa?

Decarbonization of the mobility sector is driving electro-mobility and has important potential to increase the flexibility of the power system substantially.

7

8

To reduce the emissions of the transport sector

The main sources of flexibility in these cases are **the car batteries**

9

10

PV generation potentially generating a large portion of the energy required to charge EV batteries.

Additional load of millions of charging vehicles could **increase peak loads on the grid infrastructure**

11

12

EVs flexibility can also reduce the need for new power generation and lower the grid infrastructure costs eventually



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M3: Energy Communities focused on “Electro-mobility”

EVs integration and grid stability

Rising EV usage

As EVs grow in popularity, new complexities to building energy systems that integrate RES arise.

Energy demand considerations

Traditional energy demands in buildings are supplemented by the need to charge EVs, increasing overall energy demand. The integration of EVs creates new restrictions on building energy infrastructure, making careful demand management necessary.

EV charging load challenges

Accurate EV charging load prediction and management is critical. Without effective management, peak-hour electricity demand surges could compromise the stability and safety of the grid.

Optimization methods

Efficient energy management systems and strategies, including rule-based strategies and optimization algorithms, are key to managing energy systems in a holistic way.

Approach comparison

While rule-based strategies depend on expert knowledge, optimization algorithms seek optimal solutions using mathematical programming techniques. A combination of both methods can offer better overall optimization, addressing both energy scheduling needs and practical constraints.



M3: Energy Communities focused on “Electro-mobility”

Case Studies

Tilos Island Energy Community (Greece)

- Tilos, as part of the Dodecanese group of islands, lies in the mid sea between Kos and Rhodes.
- The award-winning energy community on Tilos focuses on renewable energy generation and supply through a hybrid system of wind and solar power with battery storage.
- Tilos became a model for energy independence and has contributed to a more stable and clean local energy supply.



Source: <https://ecopress.gr/gr-eco-islands-i-technologie-tis-tilou-odigos-gia-t/>



Source: <https://www.visitgreece.gr/el/islands/dodecanese/tilos/>

Activities:

- The project supports **community-scale wind and solar, battery energy storage, and advanced energy management and metering through Demand Side Management (DSM) strategies.**
- The local Hybrid Power Plant comprises an 800 kW wind turbine; 160 kW of photovoltaic power, and a Zebra (NaNiCl₂) battery storage system of 800 kW/2.88 MWh.
- The island extends its efforts to the directions of **e-mobility and renewable-driven EVs charging infrastructure.**

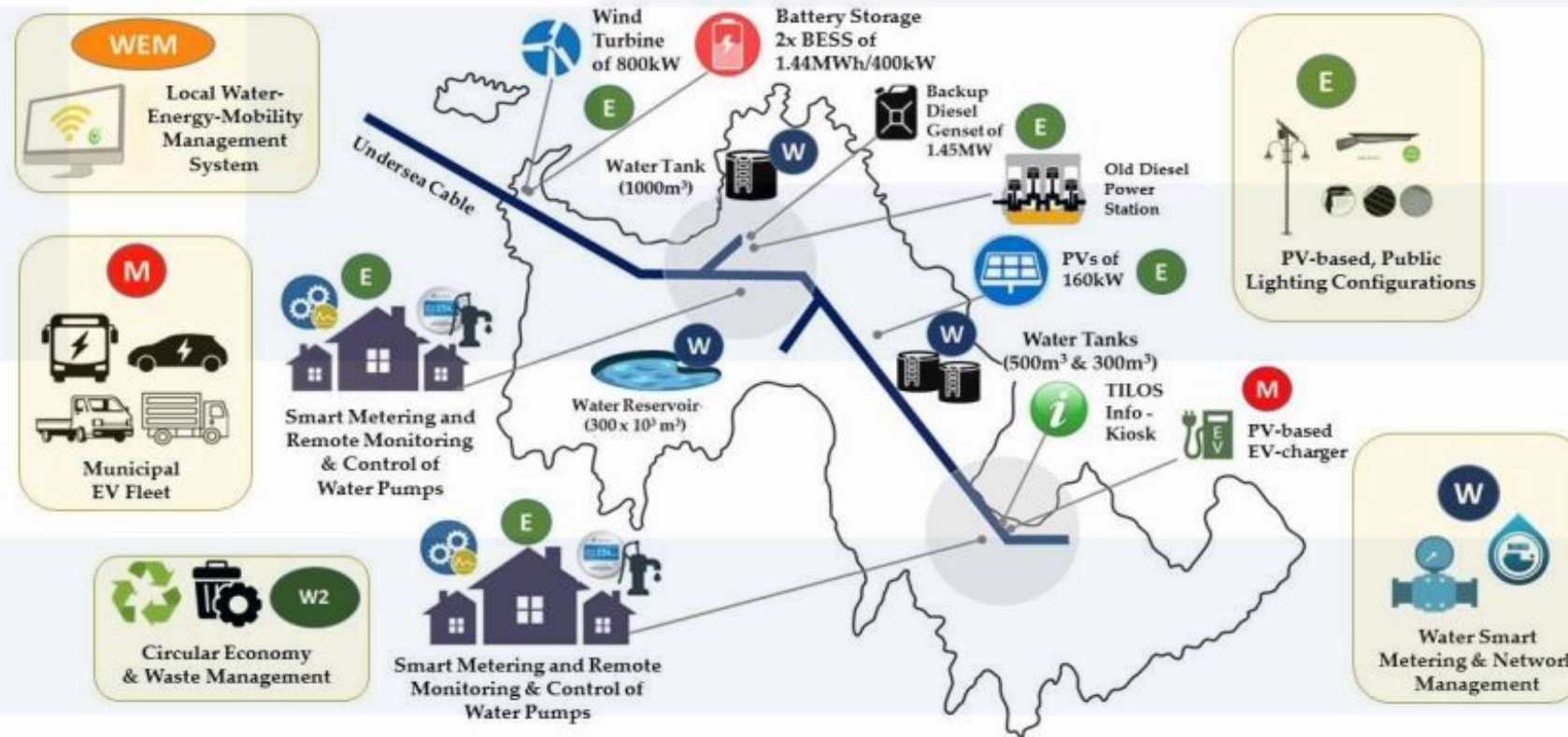


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M3: Energy Communities focused on “Electro-mobility” Case Studies

Tilos' microgrid layout



Source: Katsaprakakis, D.A.; Proka, A.; Zafirakis, D.; Damasiotis, M.; Kotsampopoulos, P.; Hatziargyriou, N.; Dakanali, E.; Arnaoutakis, G.; Xevgenos, D. Greek Islands' Energy Transition: From Lighthouse Projects to the Emergence of Energy Communities. *Energies* 2022, 15, 5996. <https://doi.org/10.3390/en15165996>



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M3: Energy Communities focused on “Electro-mobility”

Case Studies

Tilos Island Energy Community (Greece) - Role and importance of Electric Vehicles (EVs) in the Tilos Energy Community

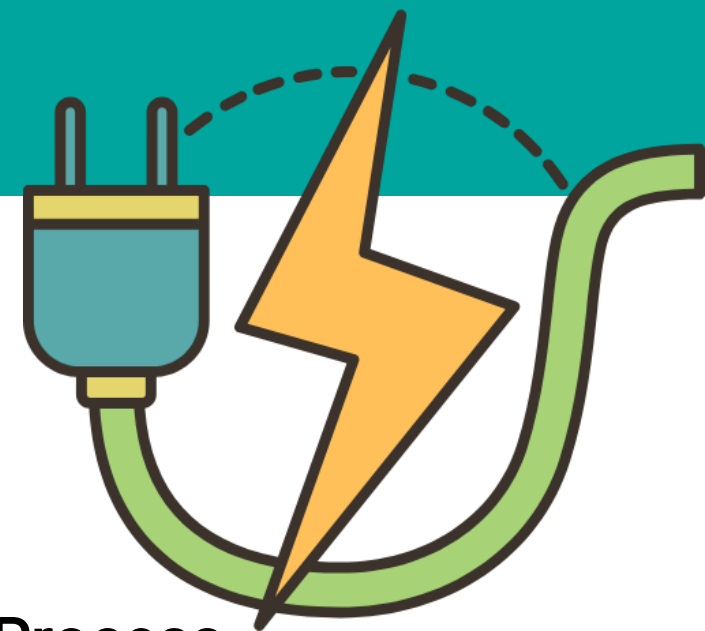
A municipal EV-fleet including different types of EVs and a 52-seat electric bus, solar-powered EV charging infrastructure, introduction of solar-powered street lighting systems and a smart metering platform engaging different types of distributed loads are some of the innovative elements advancing the existing infrastructure of the island.

- EVs in the Energy System
- Sustainable Mobility: EVs play a central role in promoting zero-emission transportation on the island.
- Grid Balancing: EVs act as flexible storage devices that can interact with the renewable energy system. By charging during periods of excess renewable generation and feeding back energy when demand spikes, EVs contribute to grid stability and ensure efficient RES deployment.
- Support for RES integration: Tilos relies on solar and wind power and EVs help mitigate the intermittency of renewable sources.

Integration into the energy system

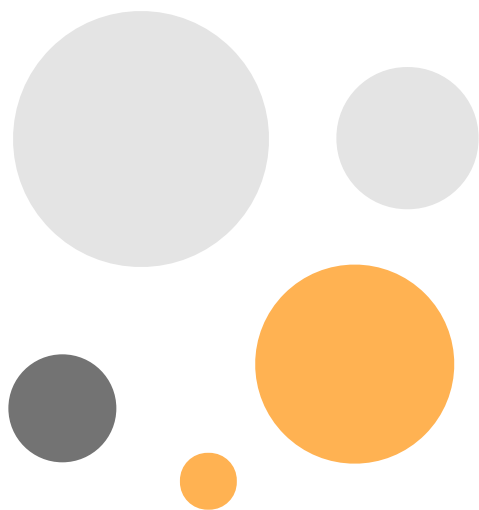
- Smart charging strategies: EVs on Tilos operate within a smart energy management system that optimizes their charging and discharging schedules based on the island’s energy production and demand patterns.
- Vehicle-to-Grid (V2G) capabilities: **In some cases, EVs act as dynamic energy storage units, contributing energy back to the grid during peak demand periods, further enhancing grid flexibility.**





Part IV

Energy Communities Monitoring and Evaluation Process



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Monitoring and Evaluation of an Energy Community

Monitoring and Evaluation (M&E) in Energy Communities – Why is it important and how it can happen?

The key factors on why monitoring and evaluation is important for energy communities rely on the following concepts:

- ✓ **Performance Assessment**
M&E helps measure progress towards achieving the energy community's goals, such as emission reductions, cost savings, or energy efficiency improvements.
- ✓ **Accountability**
M&E Provides transparency and builds trust among community members and stakeholders by demonstrating the community's achievements and areas for improvement.
- ✓ **Continuous Improvement**
M&E identifies challenges, successes, and lessons learned, facilitating the improvement of energy initiatives and optimizing resource use.
- ✓ **Regulatory Compliance**
M&E helps ensure the community's compliance with national and EU regulations and supports reporting obligations to regulatory bodies.

Key Focus Areas for M&E

- ✓ Environmental impact
- ✓ Economic outcomes
- ✓ Social benefits

Monitoring and Evaluation of an Energy Community

Monitoring methods

Data collection and analysis

- Smart Meters: To track energy consumption and production in real-time, providing critical data for performance analysis.
- Carbon Footprint Measurement: To calculate the community's carbon emissions reduction compared to baseline data.
- Surveys and Community Feedback: Regular surveys to monitor members' satisfaction, engagement levels, and perceived benefits.

Environmental metrics

- Energy Efficiency Metrics: To assess the reduction in energy consumption due to implemented measures.

Economic metrics

- Cost-Benefit Analysis (CBA): To track the financial performance of energy projects and evaluate profitability.
- Payback Periods: To measure how long it takes for energy investments to become profitable.

Social impact metrics

- Community Participation Rates: To monitor the levels of engagement in meetings, initiatives, and programs.
- Equity and Inclusion Assessments: To evaluate whether all community segments benefit from energy projects.



Monitoring and Evaluation of an Energy Community

Evaluation methods

Baseline and benchmarking analysis

- Baseline Setting: To establish initial data points for comparison over time.
- Benchmarking: To compare energy community performance with similar communities or regulatory targets.

Key Performance Indicators (KPIs)

- Environmental KPIs: To evaluate the reduction in carbon emissions, the increase on the RES shares, and the waste reduction.
- Economic KPIs: To evaluate the revenue generated, the operational savings, and the energy cost reductions for members.
- Social KPIs: To evaluate the membership growth, to collect satisfaction surveys, and to assess the benefits distribution across community members.

Qualitative evaluation methods

- Focus Groups and Interviews: To collect insights on member experiences, challenges faced, and recommendations for improvement.



Monitoring and Evaluation of an Energy Community

Recommendations on more effective M&E

Clear objectives and metrics

- Important to have specific, measurable, achievable, relevant, and time-bound (SMART) goals.
- Need to develop customized KPIs aligned with these objectives, covering environmental, economic, and social outcomes.

Utilize technology and digital tools

- Smart Grids and IoT Devices: Necessary to use advanced digital tools for automated and real-time data collection.
- Data Analytics Platforms: Important to analyze collected data to generate insights, identify trends, and detect potential issues early.

Ensure community participation

- Significant to involve all community stakeholders in defining evaluation criteria and processes.
- Crucial to foster transparency by regularly sharing monitoring results with community members and exchanging insights and feedback.

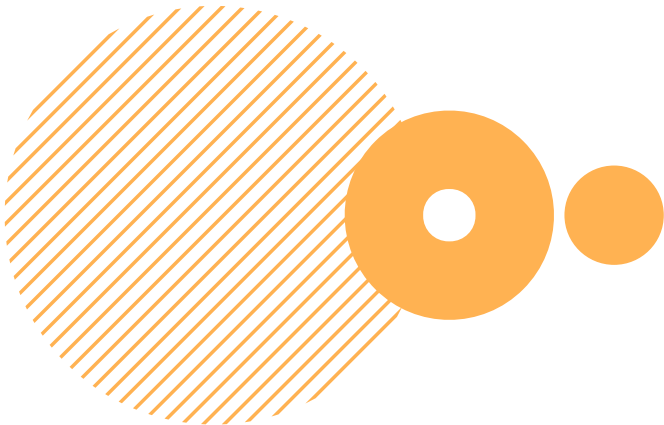
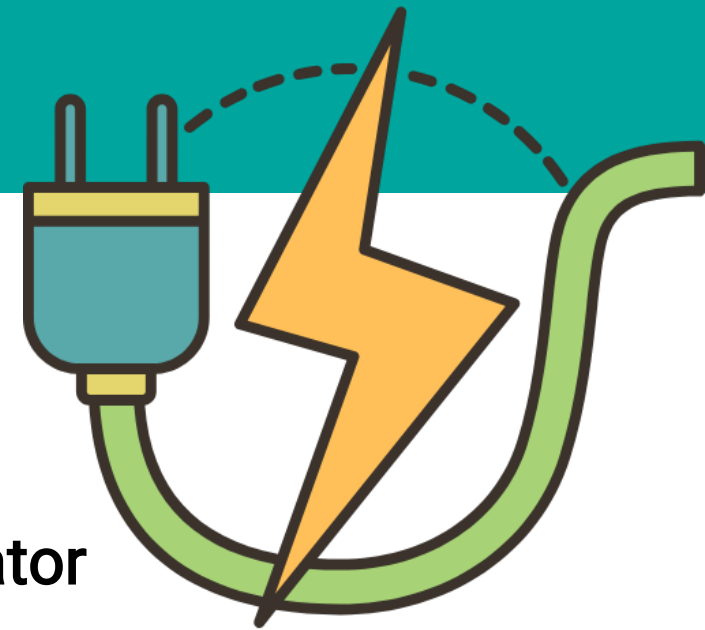
Engage with experts and policymakers

- Useful to work with energy experts to design effective M&E frameworks.
- Important to collaborate with policymakers to ensure that the community remains aligned with evolving regulations and goals.



Part V

How to become an Energy Community Initiator and/or Young Energy Ambassador



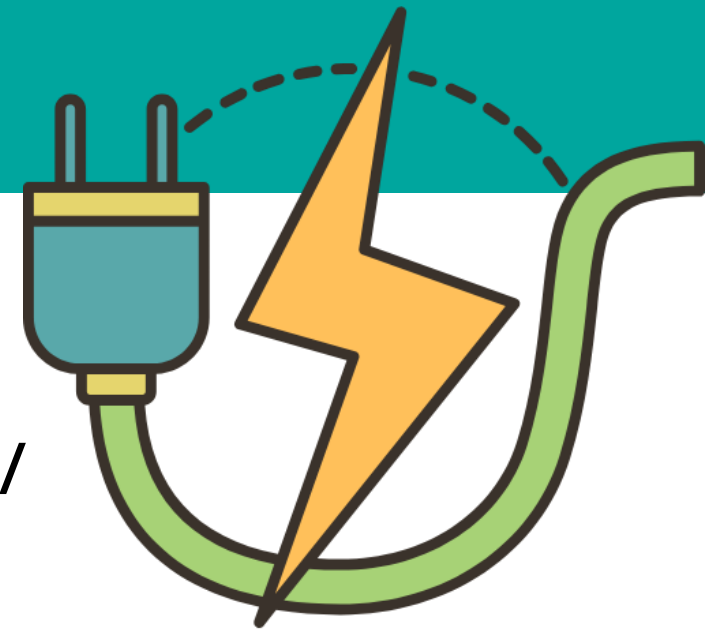
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Becoming an Energy Community Initiator / Young Energy Ambassador

Activity II: Preparing Your Energy Community – Do it first



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Preparing Your Energy Community – Do it first. How to play:

Objective

Be the first team to correctly assemble the timeline for establishing an Energy Community (EC).

Setup

- Participants are divided into **two teams** (4 players per team).
- Each team receives:
 - An empty timeline with 10 steps** to be filled in.
 - A set of 10 shuffled step cards**, each describing a key step in forming an EC.

Instructions

- Each team has **5 minutes** to arrange the step cards in the correct order on the timeline.
- Teams must collaborate and think critically about the **logical sequence** of steps.
Example: (1) "Assemble the leadership team."
- The team that **correctly completes the timeline in the shortest time** wins.



Please order the preparation stages for the timeline to establish an Energy Community:



Cards available:



Preparing Your Energy Community – Do it first. How to play:

Winning Criteria

- The first team to complete the timeline correctly **OR** the team with the most correct steps when time runs out is the winner.

💡 **Tip:** Think strategically—some steps naturally come before others!

Wrap-Up (10 minutes)

- Mentors and mentees discuss the reasoning behind the correct timeline.
- Teams reflect on challenges they faced and key takeaways.

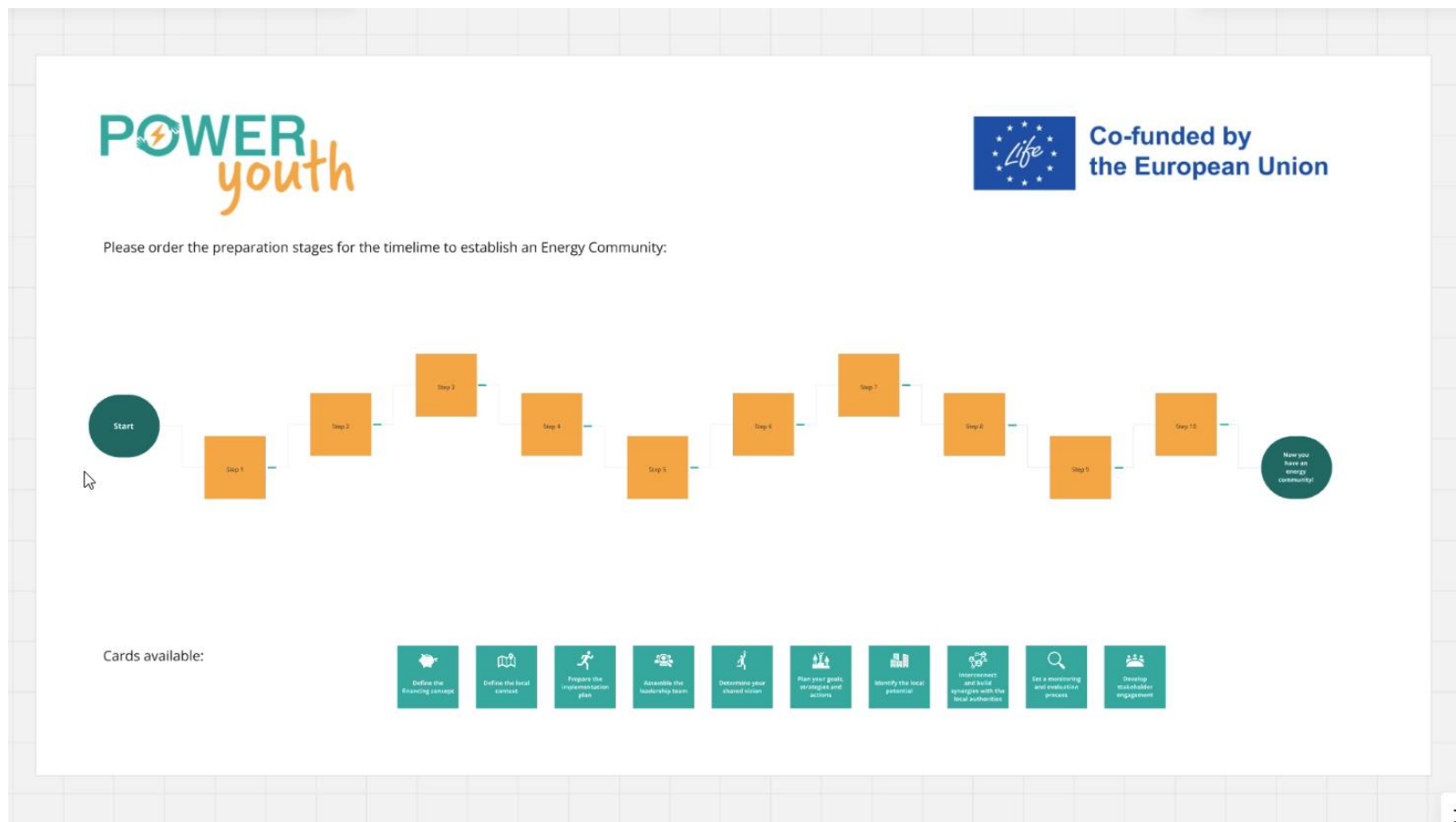


Please order the preparation stages for the timeline to establish an Energy Community:



Cards available:

Preparing Your Energy Community – Do it first. How to play:



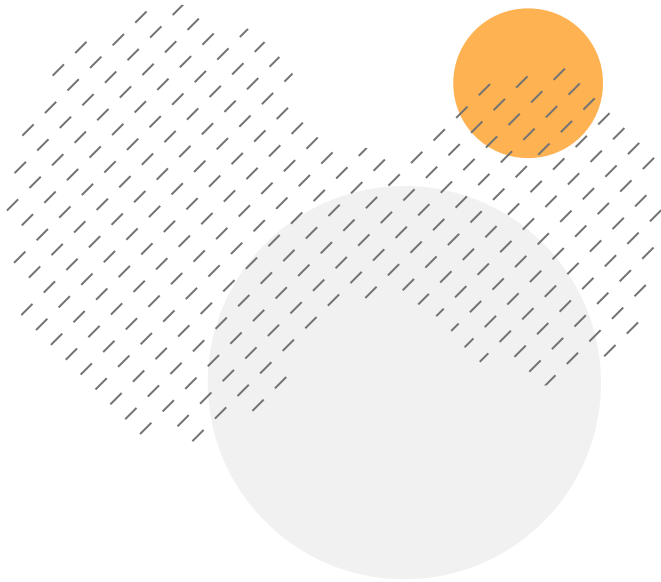
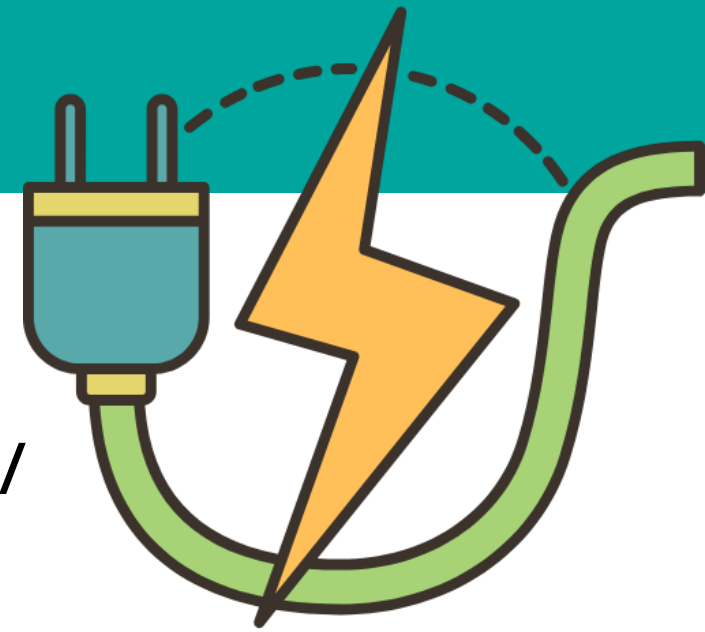
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Becoming an Energy Community Initiator / Young Energy Ambassador

Activity III: Building Your Energy Community



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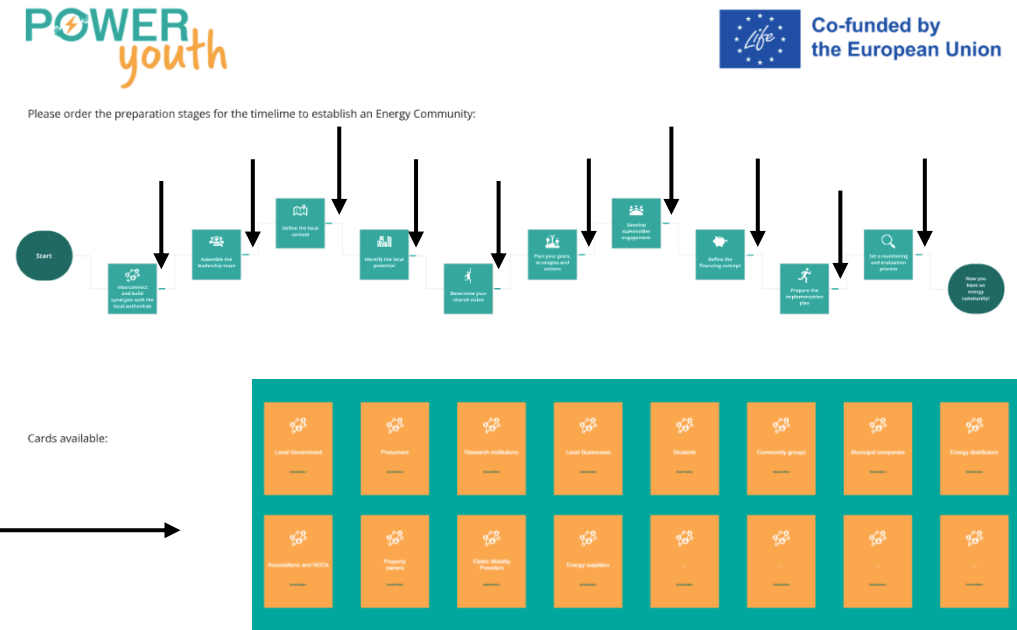
Building Your Energy Community. How to play:

Objective

Use the timeline from Activity ii to start designing your own Energy Community.

Setup

- Participants form **pairs (redistributed from the last exercise)**.
- Each pair has to go deeper and discover:
 - A “canvas” divided into **10 steps** (some steps include sub-steps).
 - **Color-coded cards** for each step/sub-step, including pre-written options and blank cards for custom ideas.



Building Your Energy Community. How to play:

Instructions

1. Follow the timeline from Activity 2 to **build your Energy Community plan** step by step.
2. For each step, select the **most relevant** cards and place them on the canvas.
Example for **Step 1: Identify Stakeholders & Partnerships**
Who can help you deliver value to beneficiaries?
Which key stakeholders are involved?
Pick the most suitable cards OR create your own using blank cards.
3. You have **30 minutes** to complete your canvas.

Wrap-Up: Present & Discuss (15 minutes)

- Each pair presents their Energy Community concept to the group.
- Mentors and fellow mentees provide feedback and discuss different approaches.



Step 1	Stakeholders & Partnerships <i>Who can help you to deliver the proposed value to the beneficiaries? Which are the key stakeholders?</i>	
Step 2	Lead Members & Roles <i>Determine the lead members among the stakeholders. If you are able to, define their roles and responsibilities in driving the project forward.</i>	

Building Your Energy Community. How to play:

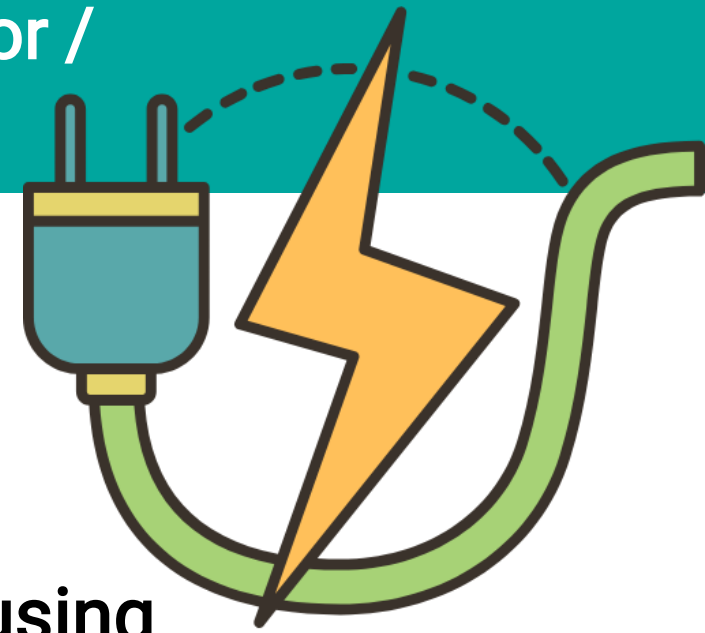


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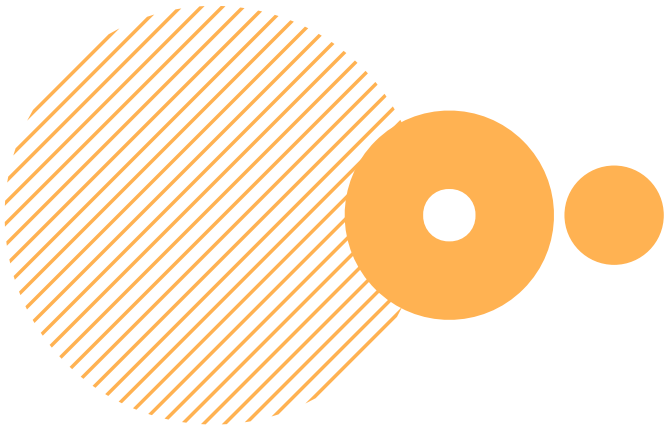
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Becoming an Energy Community Initiator / Young Energy Ambassador



**Work further on the real initiation case using
the POWERYOUTH toolkit
(in pairs-1,5 hour)**

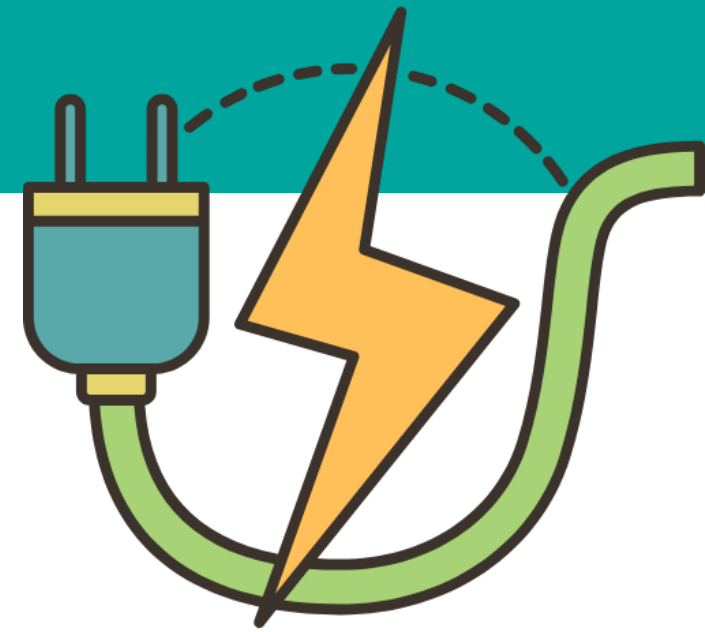


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Participants' Feedback



Complete the evaluation questionnaire



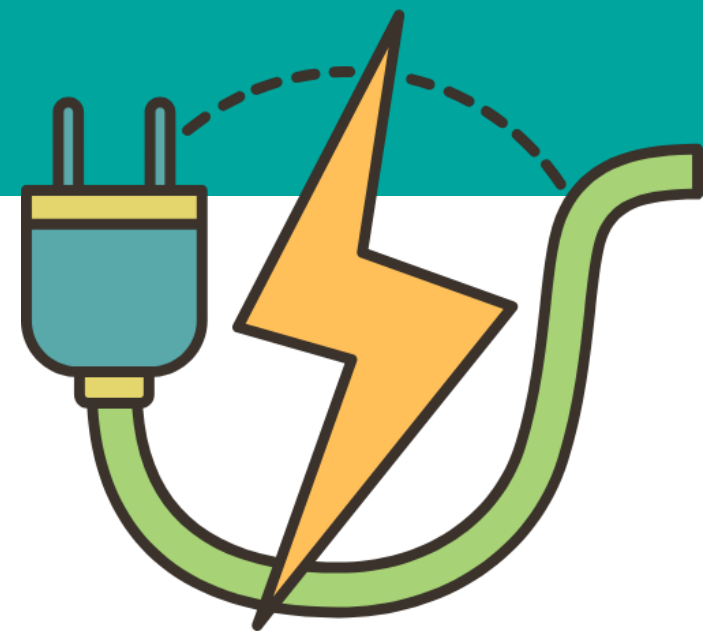
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Q & A



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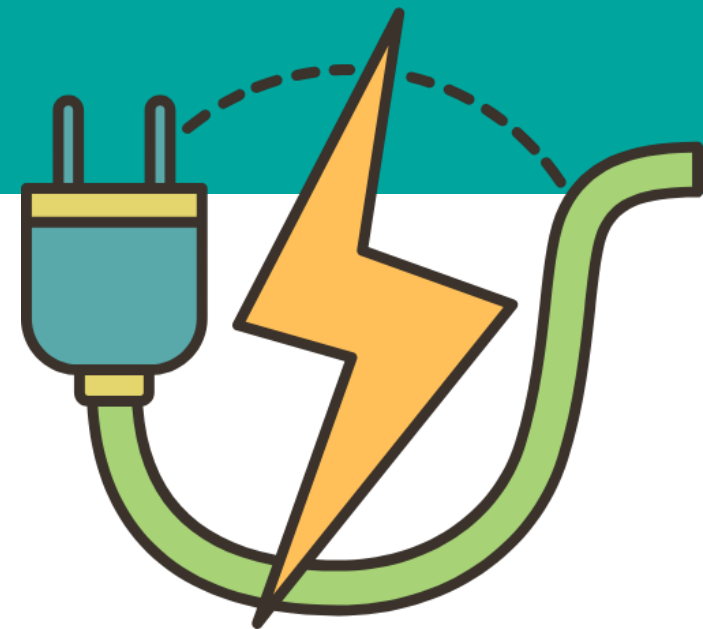
Next Steps

After completing this training, do not forget to:

- Progress your initiative and keep us in the loop
 - Spread the word to your network
 - Bring more young people on board
 - Support the initiation of new endeavors

AND ALWAYS REMEMBER...!

**"You are never too small to make a difference."
- Greta Thunberg**



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THANK YOU!