

SUSTAINABLE PLACES 2023



Technologies, Services, and Regulations



Citizen and Consumer Engagement



Energy Communities

Energy Communities Track

15th June, 2023 - Madrid, Spain

sustainableplaces.eu



POLITÉCNICA



reschool

Strategies and tOOls for Incentivization and management of flexibility in Energy Communities with distributed Resources

Sustainable Places 2023

WORKSHOP – “*Energy Communities Track Part 2: Citizen and
Consumer Engagement*” (14-17:30)

June 15th, 2023 (Madrid- Spain)

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Funded by
the European Union

Data sheet



Title	RESCHOOOL- Strategies and tOOLs for Incentivization and management of flexibility in Energy Communities with distributed Resources
Call: Destination: Topic:	HORIZON-CL5-2022-D3-01 Sustainable, secure and competitive energy supply HORIZON-CL5-2022-D3-01-08 Supporting the action of consumers in the energy market and guide them to act as prosumers, communities and other active forms of active participation in the energy activities
Type of action	Horizon IA
Responsible Unit	CINEA
Project Officer	Ioannis Retsoululis
Reference	101096490
Duration	42M (01/01/2023 – 30/06/2026)
Partners	16 (3 Uni / 5 SME / 2 PE / 2 RTD / 2 NP / 1 CC / 1 LARGE)
Countries	7 :: ES(4), NL(3), SE(3), GR(2), NO(1), BE(1), DE(1)
Pilots	4 (ES, NL, SE, GR)
Efforts	673PM
Total costs	6,118,594.00 €
Grant amount	5,593,570.00 € (91.42 % total costs)

3 funded projects

RESCHOOOL

COMMUNITAS

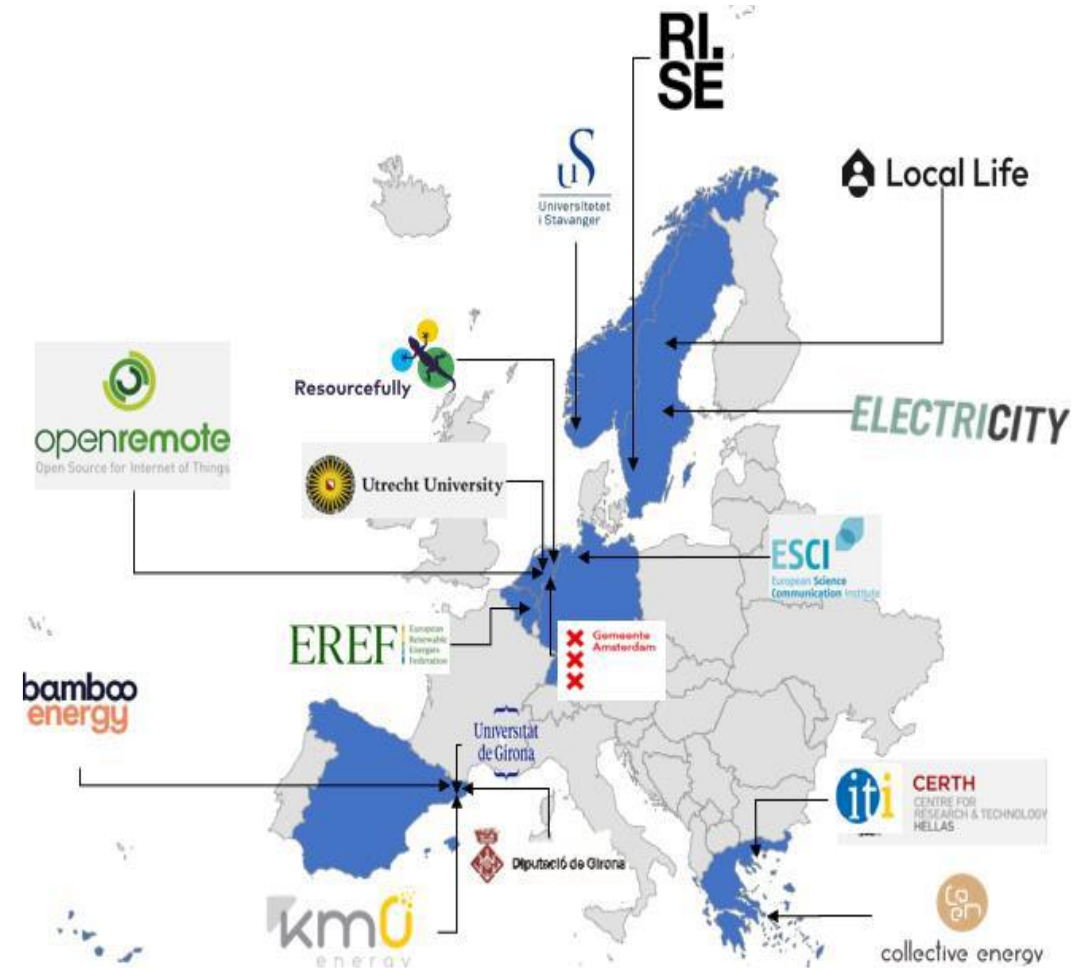
MASTERPIECE



Consortium



PARTICIPANT NUMBER & NAME	EU	TYPE
1 (Coo) – UdG (Universitat de Girona)	ES	UNI
2 – UiS (University of Stavanger – Universitetet i Stavanger)	NO	UNI
3 – UU (Utrecht University)	NL	UNI
4 – BBEN (Bamboo Energy Tech)	ES	SME
5 – RISE (Research Institute of Sweden AB)	SE	RTD
6 – EREF (European Renewable Energies Federation)	BE	NP
7 – ESCI (European Science and Communication Institute)	DE	NP
8 – KMo (Kmo Energy)	ES	LARGE
9 – RESF (Resourcefully Consulting)	NL	SME
10 – ELEC (ElectriCITY)	SE	CC
11 – COEN (Collective Energy)	GR	SME
12 – CERTH (Centre for Research & Technology HELLAS)	GR	RTD
13 – OR (Open Remote)	NL	SME
14 – AMS (City of Amsterdam)	NL	PE
15 – DdG (Diputació de Girona)	ES	PE
16 – LCLF (Local Life)	SE	SME



This project has received funding from the European Union research and innovation programme under grant agreement 101019719





*"to catalyse the **creation, growth and management of energy communities** by leveraging the **engagement** of participants, facilitating the **cooperation** in collaborative initiatives within communities, and **co-producing tools for the efficient management of energy and trading** at individual and aggregated levels.*

*RESCHOOL aims to **increase the active participation of communities in energy markets** (broadly understood), enhancing and facilitating the **management and trading of flexibility** in cooperation with sectoral players, like **DSOs and aggregators**"*

Tech

OBJ 3
(T)

Interoperable architecture supported by a **data model** for the management of energy communities with **aggregated interaction with flexibility markets**

OBJ 4
(T)

To develop a suite of **services to support energy management and trading** in energy communities, ready for integration and **interoperation with third party** solutions.

OBJ 4.1
(T)

To provide an **open collaborative solution** with access to individual and **aggregated energy data** and capabilities to **interact with legacy systems and third party solutions** in a secure and safe way.

technical (T), operational (OP) , socio-economic (S)



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Engagement

OBJ 1
(S)

To define, implement and validate a set of **intergenerational training, transfers and engagement programmes** for the dynamisation (creation, awareness, participation, management) of local energy communities.

OBJ 2
(S,T)

To increase the individual **awareness and responsiveness** of energy uses at household and community level **through gamification** strategies

technical (T), operational (OP), socio-economic (S)

Objectives



*"to catalyse the **creation, growth and management of energy communities** by leveraging the **engagement** of participants, facilitating the **cooperation** in collaborative initiatives within communities, and **co-producing tools for the efficient management of energy and trading** at individual and aggregated levels.*

*RESCHOOL aims to **increase the active participation of communities in energy markets** (broadly understood), enhancing and facilitating the **management and trading of flexibility** in cooperation with sectoral players, like **DSOs and aggregators**"*

Validation

OBJ 5
(S,T,Op)

To **validate a complete** solution for the management of energy communities **ready to operate with both, flexibility markets and behind the meter** (legacy) systems.

OBJ 5.1
(S,Op)

To elaborate a **blueprint for the creation, development and sustainable management** of energy communities including **flexibility services**.

OBJ 5.2
(S)

To elaborate the **guidelines and recommendations for the further replicability and exploitation** of the developed tools and citizen engagement strategies.

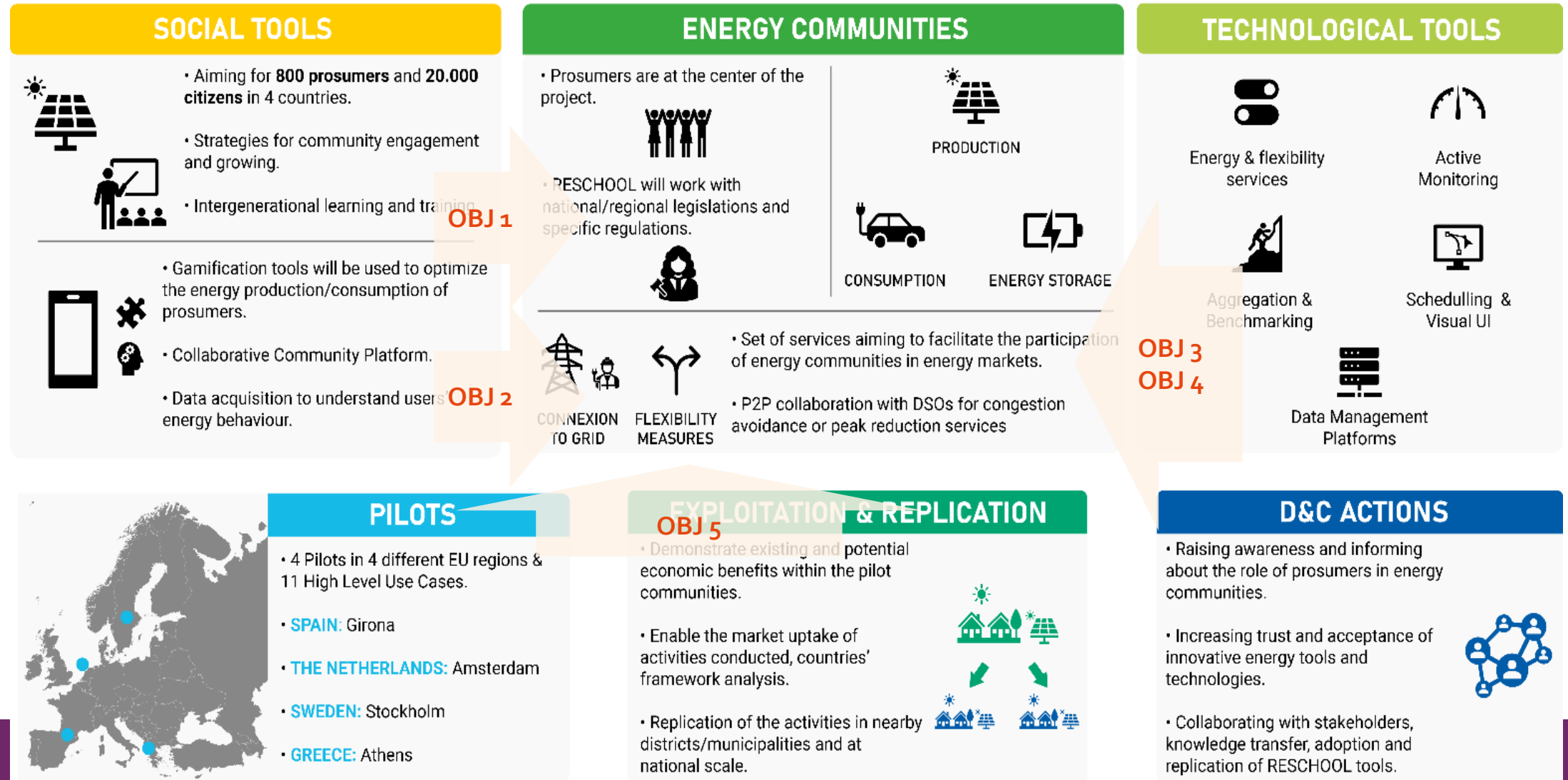
technical (T), operational (OP), socio-economic (S)



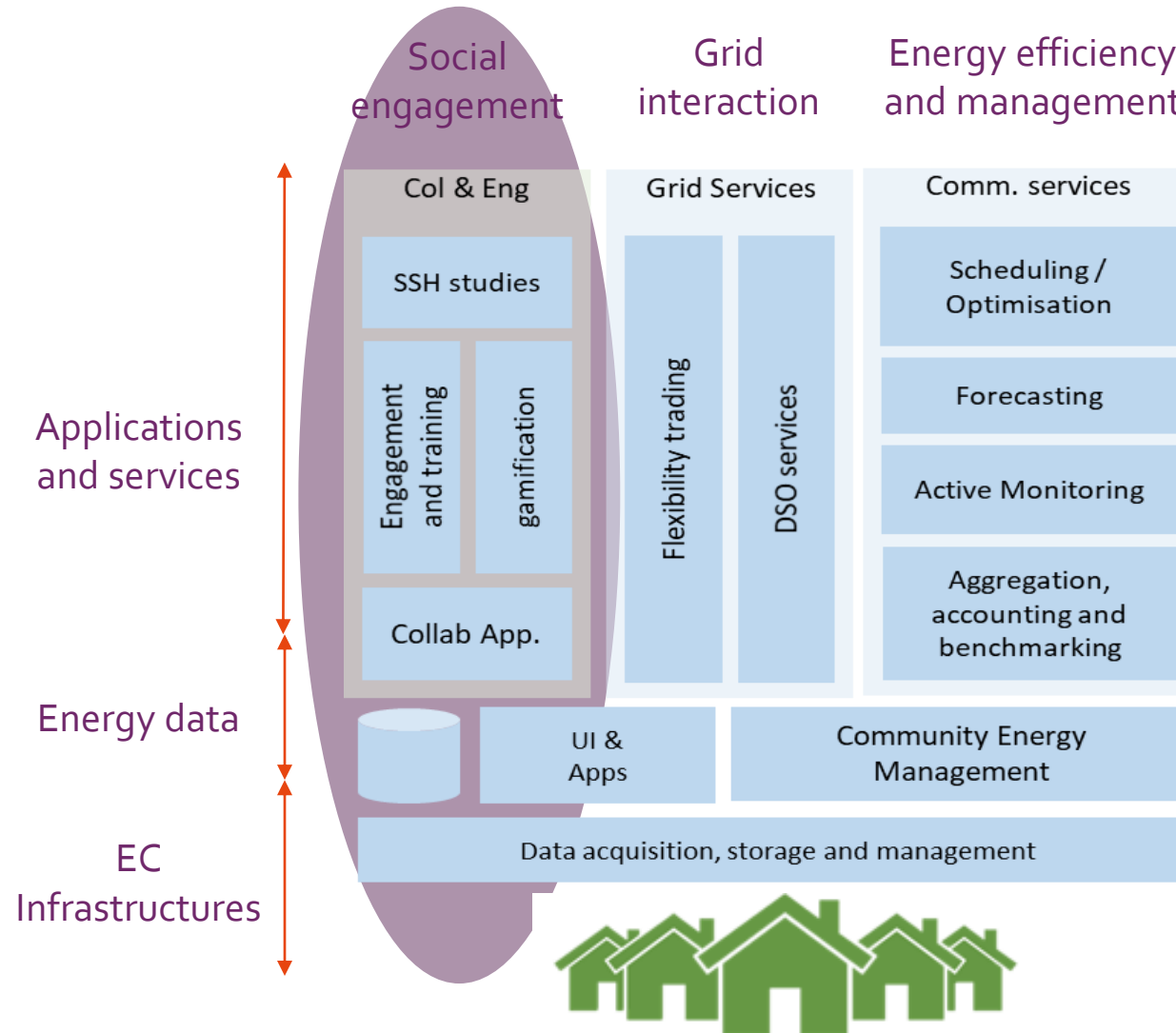
RESCHOOL concept (I): general view



RESCHOOL aims to develop tools that enhance and facilitate the collective participation (energy communities) of citizens in the energy system and the relationship with other stakeholders like DSOs, aggregators, or other energy communities.



Overall Concept (II): Proposed solution for energy communities. Growing and management



Validation: 4 pilots

PILOT 1: LOCAL ENERGY COMMUNITIES LED BY MUNICIPALITY
(Diputació de Girona – 4 municipalities)



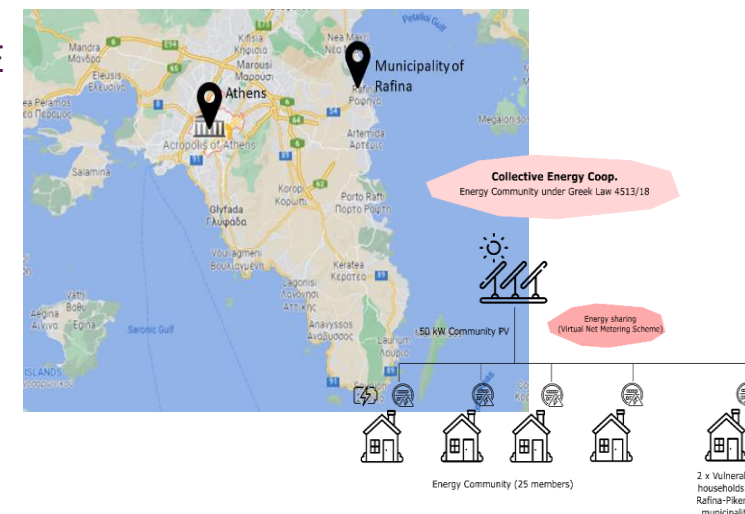
PILOT 2: AMSTERDAM EASTERN DOCKLANDS ENERGY-FLEX COMMUNITY, THE FLEX-CITY PILOT
(Amsterdam-neighbourhood)



PILOT 3: HAMMARBY SJÖSTAD 2.0, MICROGRID PROJECT
(Stockholm - neighbourhood)

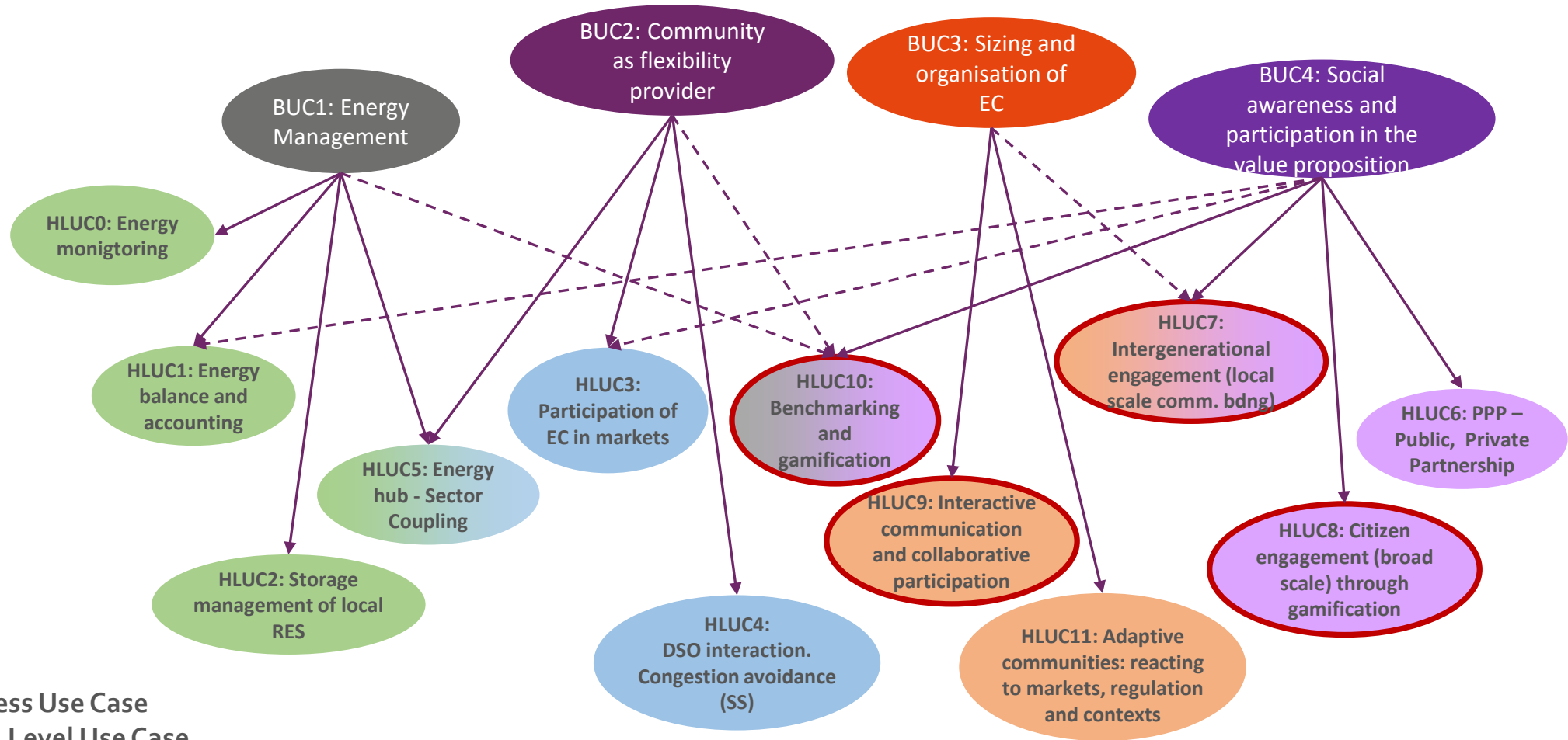


PILOT 4: COLLECTIVE ENERGY COOPERATIVE
(Athens/Rafina – 2 cooperatives)



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Implementation: use cases



BUC: Business Use Case
HLUC: High Level Use Case

Engagement
UC

Tech requirements and specifications

Viability of EC & exploitation strategies

Engagement & training strategies
Codesign / cocreation (gaming)

Technology

Economics

Social



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PUBLIC

High Level Use cases (HLUC): Tech



UC	Title	Objective	BUC	Pilot
HLUC1	Energy balance and accounting for communities	Facilitate energy sharing at intra community level.	BUC1	ALL
HLUC2	Storage management for optimal consumption of locally generated RES.	Maximise the consumption of locally generated energy.	BUC1	GR, SE, (ES)
HLUC3	Automated participation of energy communities in energy markets	Identify and design flexibility products at community level to be offered to third parties through either implicit or explicit demand response mechanisms.	BUC2	NL, SE, ES
HLUC4	DSO interaction: Avoidance of congestions at secondary substations	Collaboration of energy communities with DSO aims to improve the operational safety of distribution grids at the secondary substation level.	BUC2	NL, ES
HLUC5	Energy hubs and sector coupling	Design specific services for optimal management of multi-vector energy assets in the community under different criteria.	BUC1 BUC2	SE



High Level Use cases (HLUC): policies and regulation



HLUC6	Public-Private collaboration	Identify and implement collaborative schemas with participation of administrations aiming to increase citizen empowerment.	BUC ₄	ES, NL
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HLUC11	Adaptive communities: reacting to evolution of markets, regulations and contexts.	Include the need for continuous change and adaptation as a design requirement from the beginning and assess it.	BUC ₃	ALL
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High Level Use cases (HLUC): Social engagement



HLUC7	Intergenerational engagement for community building at local scale.	Study and assess importance of intergenerational relationships in accelerating the development of energy communities. Special emphasis is put on the importance of schools / education as clustering and communication driver.	BUC3 BUC4	ALL
HLUC8	Citizen engagement for community building at broad scale through gamification and rewarding.	Increase awareness on the efficient use of energy and benefits of collaborative schemas by generating incentives through gamification of exemplars and access to real data from running communities.	BUC4	ALL
HLUC9	Interactive communication and collaborative participation oriented to foster joint initiatives and investments.	Design and implementation of a collaborative platform to facilitate interaction among participants in the community, access to both individual and community energy data and facilitate the decisions about investments at individual or community level in RES or demand response assets.	BUC3	ALL
HLUC10	Benchmarking and gamification with the inclusion of rewards/ incentives.	Increase individual awareness and cooperation to reach community goals through benchmarking and gamification. Different energy-related external signals will be modified as incentives to assess the reaction and adaption of participants to the system.	BUC1, BUC2, BUC4	ALL

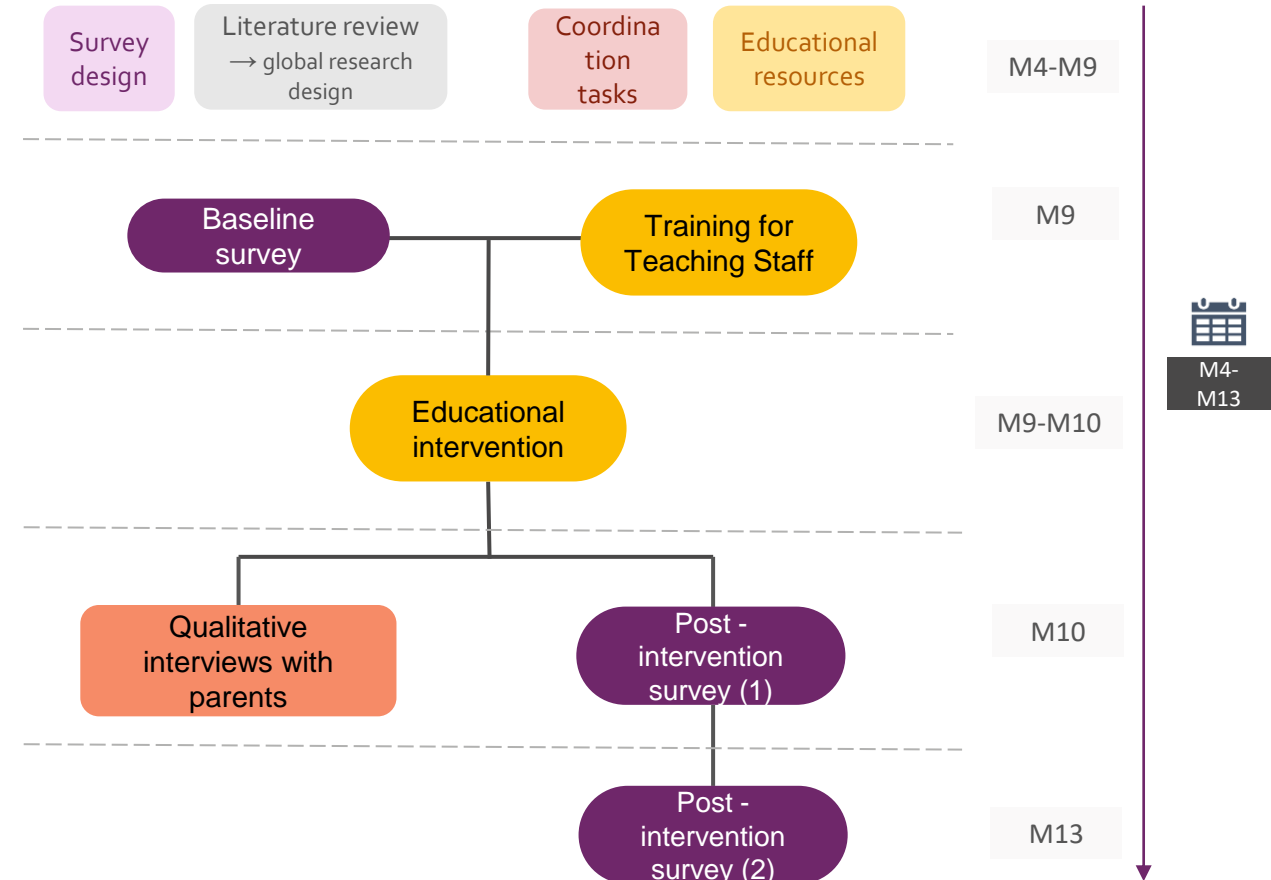




HLUC7: Intergenerational engagement for community building at local scale.

Intergenerational program to leverage **social contagion effects and learning processes** between older and younger generations through schools to influence individuals' energy behaviour and participation in energy communities.

Target group: schools in the neighbourhood and influence area of the energy community



HLUC7: Intergenerational engagement for community building at local scale.



Methods and requirements:

- Schools from all the pilots are expected to participate, although each pilot may participate with varying levels of intensity depending on how many schools are able to incorporate the program.
- The actors involved in this Use Case are predominantly social actors. Schools and Family Schools Association are key to reach the maximum number of families

Expected impacts and outcomes:

- Quantitative data will be used to measure the impacts of the intergenerational program.
- Qualitative data will provide a comprehensive perspective on the dynamics and processes involved in intergenerational learning.
- Educational resources will be created and disseminated to schools to promote community engagement in energy communities.



HLUC8: Citizen engagement for community building at broad scale through gamification and rewarding.



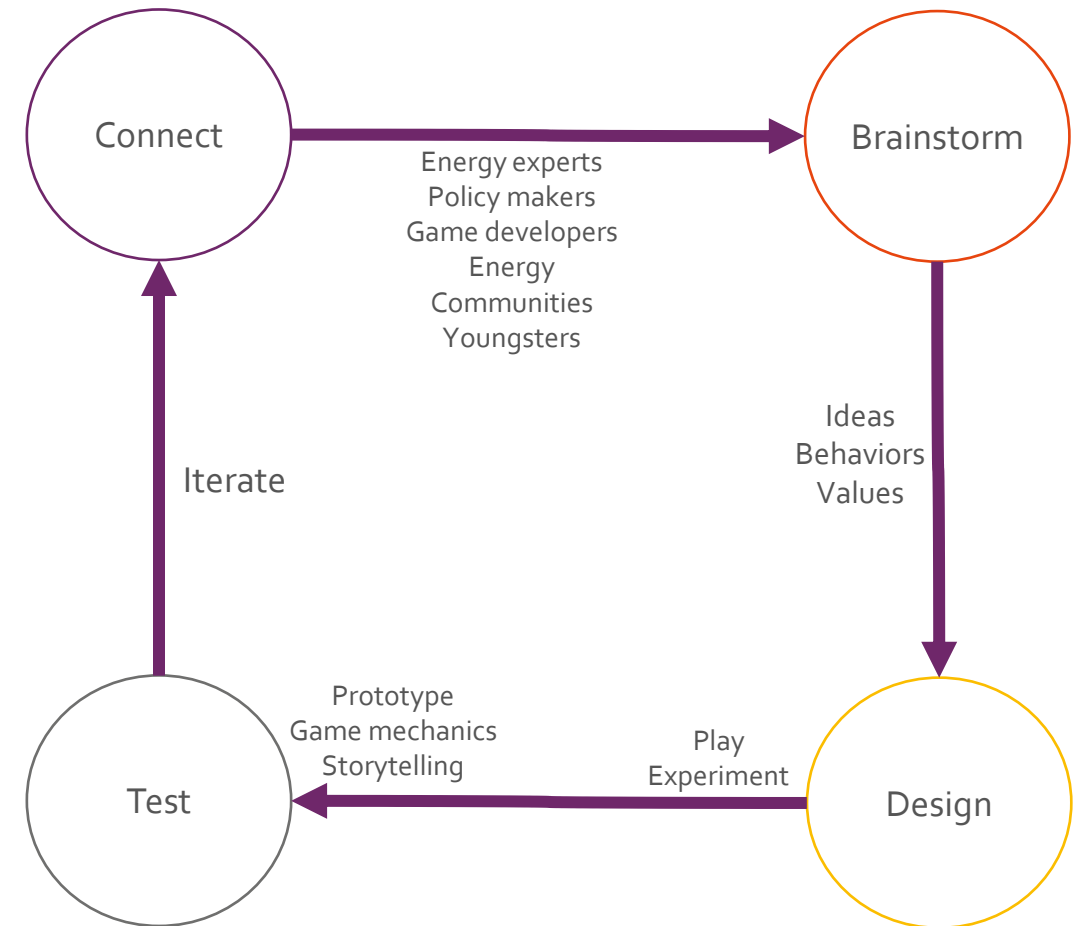
The co-creation of a serious game designed for individuals aged 10 and above can lead to increased awareness and motivation regarding the establishment or involvement in energy communities.

Target group:

- Co-creation process: with energy community members and stakeholders.
- Players: broad scale

Co-creation at two levels:

- The game will be created through a series of co-creation workshops a diverse range of stakeholders (game designers, policy experts, energy professionals, etc.)
- Pilot Participants: members of the 4 RESCHOOL pilots and students 10-12 years old living in the pilot areas.



HLUC8: Citizen engagement for community building at broad scale through gamification and rewarding.



Expected impact:

- Citizens co-creating, or playing ,the game will be able to:
 - recognize and compare household energy behaviors
 - outline the production and storage options for energy communities
 - identify the energy system structure, market, policies and stakeholders
 - discuss and plan actions for the creation and everyday function of an energy community
 - explain the individual and collective benefits of the participation in an energy community
- The impact of the game on players will be measured qualitatively throughout the co-creation workshops as well as after the completion of the game through surveys, semi-structured interviews and questionnaires (local scale: community)
- The impact of the game will also be measured quantitatively at broad scale by the number of participants, players, downloads of the created game (broad scale)



HLUCg: Interactive communication and collaborative participation oriented to foster joint initiatives and investments.



Oden Life is a simple but powerful tool that helps to inspire, educate and motivate housing associations to understand their energy use, identify efficiency measures and collaborate with neighbouring properties for a more balanced electricity grid.

Interactive tool designed to engage under three basic principles:

1. **Come** for your simulated energy savings
2. **Stay** for your benefits from the community
3. **Engage** more over time through monthly energy nudges

Target group: Energy community (focus on building associations, SE pilot)



HLUCg: Interactive communication and collaborative participation oriented to foster joint initiatives and investments.



Implementation :

- 01 Identified our **key actors** and their tasks
We mapped the **key tasks** of the **key players**
- 02 "**jobs - pains - gains**":
We identified their **responsibilities**, **concerns**, as well as their **goals and ambitions**
- 03 **Solution exploration**
We brainstormed potential features that could help them with their tasks, remove pain, and help them achieve their desires
- 04 **Concept development**
Based on this, we have sketched out an early concept that we now need to validate and break down into 1-3 parts that can then be tested

Erik's Jobs, Pains and Gains Energy manager in HOA board



Jobs	Job Enabler	Pains	Pain reliever	Gains	Gain creator
Choosing and investing in the right technology for Brf	1. EC has a cookbook and system (handbook, all in one place) 2. Eco-Drives 3. Competence networks exist in the EC 4. The EC carries out joint procurements 5. We do it together - Show digitally what other housing associations have already done, Best practices, test beds	Difficult to get board acceptance	1. We do it together - Show digitally what other housing associations have already done, Best practices, test beds 2. Very simple communicable concept that everyone understands 3. Competence networks exist in the EC 4. EC has a cookbook and system (handbook, all in one place) 5. Eco-Drives 6.	Successful technology choices that just work	1. We do it together - Show digitally what other housing associations have already done, Best practices, test beds 2. The EC has routines and processes for quality assuring selected suppliers 3. Simple tool for follow-up of impact goals 4.
Evaluate and report results to the board and members, including air quality and indoor temperature	1. Energy meetings 2. Digital: Inspire, Reporting, Feedback, Educate, Maps 3. Eco-drives, inventories, feasibility studies	Technology and subcontracting problems	1. The EC has routines and processes for quality assuring selected suppliers 2. We do it together - Show digitally what other housing associations have already done, Best practices, test beds	Improved household finances for the residents of the property	1. Simple tool for follow-up of impact goals 2. The EC has joint procurements
Strengthen the property's finances, and valuation	1. The EC carries out joint procurements 2. Simple tool for follow-up of impact goals	The fear of making mistakes	1. We do it together - Show digitally what other housing associations have already done, Best practices, test beds 2. Competence networks exist in the EC 3. EC has a cookbook and system (handbook, all in one place)	Done something good for the planet	1. Simple tool for follow-up of impact goals 2. Dissemination

Individual info



Community info

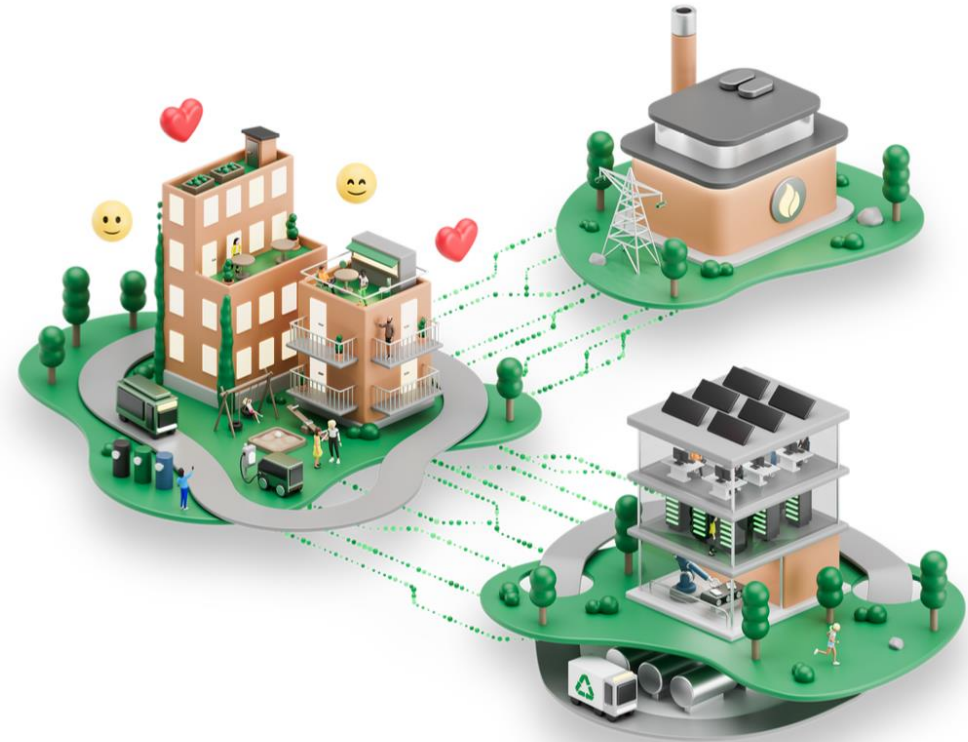




HLUC9: Interactive communication and collaborative participation oriented to foster joint initiatives and investments.

Expected impact :

- 20 % energy savings
- 50 % of buildings engaged
- 1-3 joint Energy Community procurements per year



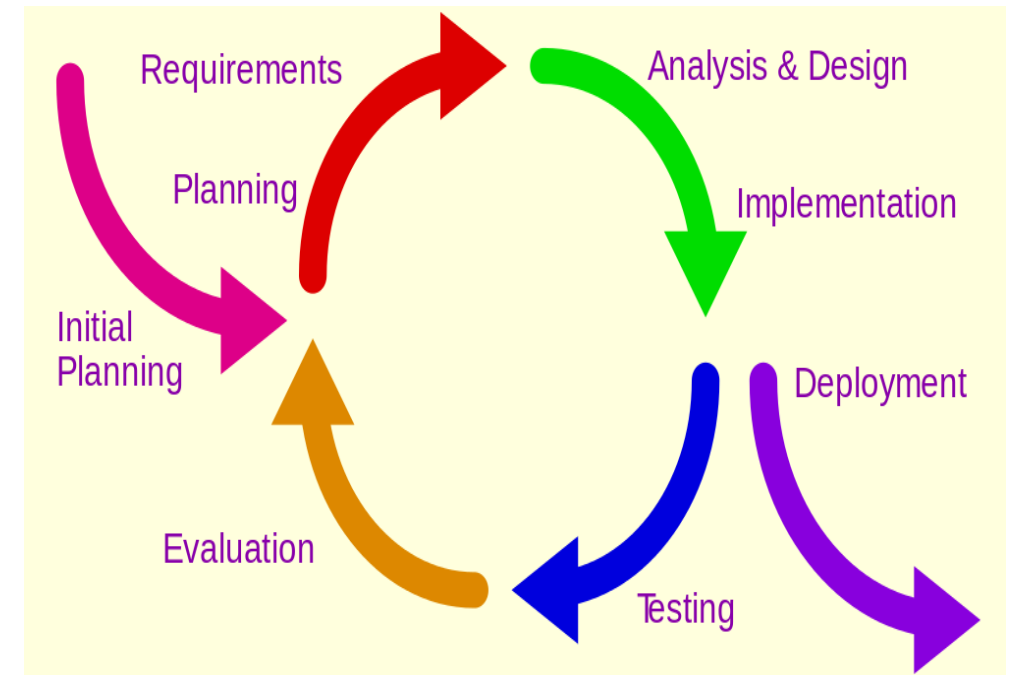
HLUC10: Benchmarking and gamification with the inclusion of rewards/ incentives.



Serious game involving energy data acquired from smart meters. Achievement of mission will impact on energy bill.

Co-design with community members of an **energy conservation game** can foster **engagement** and **community building** by **actively involving end users**

Sense of ownership and responsibility towards energy saving practices, and ultimately promoting a communal culture of sustainability.



Target group: Energy community



HLUC10: Benchmarking and gamification with the inclusion of rewards/ incentives.

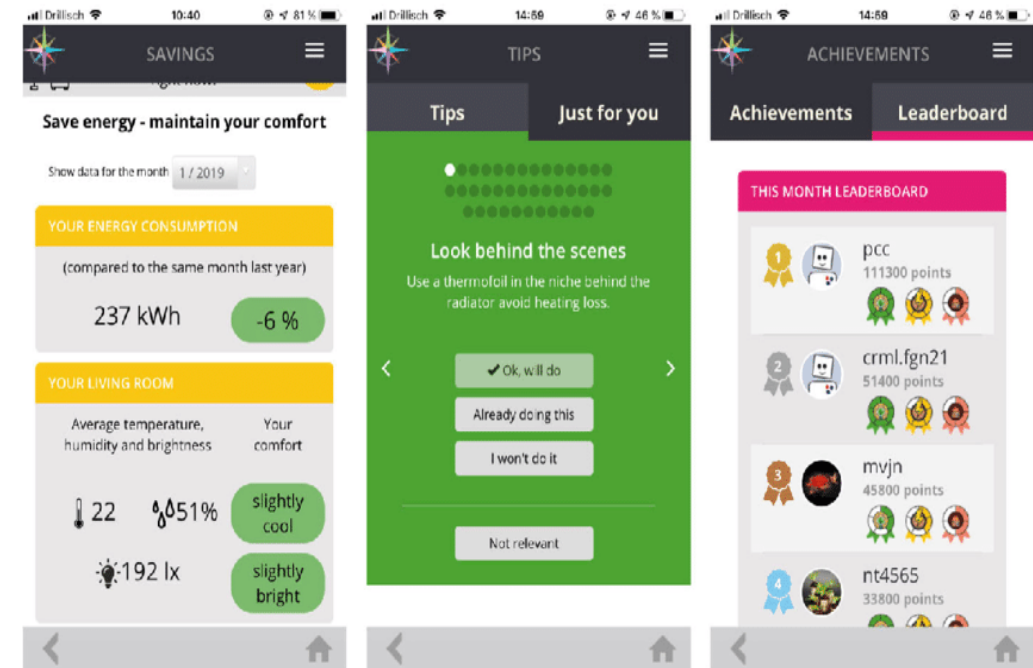


Implementation :

- Serious game to motivate **behavior change towards energy conservation**, and foster a sense of camaraderie and **healthy competition around sustainable practices** inside the community
- App with elements like **leaderboards, rewards, and challenges** based on **real energy consumption data**.

Expected impact:

- **Increased Engagement:** Game elements such as rewards and leaderboards motivate interaction with smart meters, fostering conscious energy usage.
- **Education Through Entertainment:** Funny learning about energy management. Better understanding and retaining and adoption of sustainable habits.
- **Behavior Change and Positive Habits:** Visible impact through energy data (smart meter). Continuous improvement



Koroleva, K., Melenhorst, M., Novak, J., Herrera Gonzalez, S. L., Fraternali, P., & Rizzoli, A. E. (2019). Designing an integrated socio-technical behaviour change system for energy saving. *Energy Informatics*, 2(S1). <https://doi.org/10.1186/s42162-019-0088-9>



RESCHOOL's support to implement EU policies



Clean Energy Package (CEP) – Renewable Energy Directive & Internal Electricity Market Directive:

- Expansion and upscaling in urban areas, where energy community potential is mostly untapped
- New revenue streams & business models, offering services to the grid, energy efficiency, energy management, making ECs become acting on EU energy markets.
- Policy advice on transposing EU rules into national laws in Greece, Spain, Sweden & the Netherlands



Green Deal and REPowerEU

- Contribution to increased EU climate and energy ambition, in response to climate emergency, Europe's energy & cost-of-living crisis and the need to rapidly phase-out (Russian) fossil fuel imports
- RESCHOOL helps achieving the new targets on RES (42,5% by 2030) and energy efficiency (11,7% less final consumption by 2030, compared to 2020)



EU Energy Market Design Reform

- RESCHOOL supports the implementation of stronger EU (currently being negotiated among EU institutions) on energy sharing, facilitated & increasing system flexibility through solutions that involve storage, demand response and aggregation



RESCHOOL's Impact through Exploitation of Key Results



Wide range of environmental, economic, social and systemic benefits to society

- **Climate change mitigation**, through decarbonisation, decentralisation and digitalisation
- **Empowering consumers** to take ownership of the energy transition
- Stronger democratic processes, **social cohesion** and transparent governance models
- **Reduce energy costs** & alleviate risks of social unrest and poverty, less economic pressure on businesses and industry
- More resilience in cities like **Athens, Girona and surroundings, Stockholm and Amsterdam** - incl. through shorter supply & value chains, and improved labour markets and the advancement of skills among citizens and workforces
- Trust and acceptance **for local renewable energy projects** through inclusion and collective ownership (e.g. for addressing environmental concerns)
- **Improve energy autonomy and energy security**, incl. through independence from fossil imports, and on the other hand provide requisite flexibility for balancing local supply and demand.
- **Increased system flexibility & smart solutions** that can reduce infrastructure costs, e.g. by avoiding investments in conventional electricity network extension.



RESCHOOL's Impact through Exploitation of Key Results



Guidelines, best practices and social indicators

- Policy advice to improve EU and national regulatory framework for energy communities
- Driving forces for increased participation in creation of energy communities
- Transfer and replication of project results and good practices to other cities and neighbourhoods
- Intergenerational educational and training tools
- Insights from using new value measures, such as SROI – Social Return on Investment
- Guidance through standardisation roadmaps for energy communities

Technological results

- Data driven energy services, modules & toolbox that allow benefitting from monitoring, forecasting and flexibility scheduling capabilities
- RESCHOOL Collaborative Community Platform
- 100% Open Source Energy Management System
- New gamifications methods and tools for engagement and empowerment of energy community members
- AI-powered gamification framework
- Visualisation toolbox for enhanced user interaction and visual presentation of energy data and performance indicators



Project Impact: Target Groups



Conclusions



- Early stage of the project (M6)
- Technical Use Cases focus on the exploitation of both individual (to increase community self-sufficiency) and aggregated flexibility (market participation).
- SSH use cases focus on engagement at four levels:
 - Intergenerational transfer (school training and assessment at different levels)
 - Increase of individual awareness (serious game involving real challenges)
 - Community engagement (collaborative and participative approaches)
 - Broad scale (game)
- Co creation and co- design process are being carried out with stakeholders and involving pilots with an enthusiastic participation
- Support to implement EU policies and expected impact in 16 target groups.



Thank you!

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The project RESCHOOL, “*Strategies and tOOls for Incentivization and management of flexibility in Energy Communities with distributed Resources*”, receives funding from Horizon Europe programme under the grant agreement n°. 101096490

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