



**Multidisciplinary Approaches and Software Technologies for  
Engagement, Recruitment and Participation in Innovative Energy  
Communities in Europe**

## **Project overview**

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This project has received funding from the European Union's Horizon 2020 Framework Programme for Research and Innovation under grant agreement no 101096836.

- ❖ Consortium formed by 19 participants
- ❖ Project starts on the 1<sup>st</sup> of January 2023 and will last until the 30<sup>th</sup> of June 2026
- ❖ Grant agreement ID: 101096836 (to be used on future acknowledge work)
- ❖ MASTERPIECE will build a modular platform to help on the creation and operation of energy communities. The platform will contain social and technological innovations



## Project Objectives (1 of 5)

KO1: To develop **technical and social innovations** to empower traditional energy consumers and to make them active agents of collaborative energy communities, paving the way towards a new energy market paradigm [addressed by WP3, WP5]

The energy system is changing rapidly, and to achieve a European Union where there is energy affordable and resilient for all citizens the roles of the systems must change. The proliferation of renewable energy generation at the microscale made some consumers also prosumers, and now the situation allows to make the citizens even more involved. Now they can modify their demand, participate on the investments of the energy infrastructure and even we consider on our project to make them developers of the services.

Relevant results: the assessment of the 4 hubs of energy communities will produce new evidence on how to nudge on-boarding of more citizens in energy communities and how to boost adherence to the vision and mission of the communities. Qualitative insights will frame the modelling of energy communities' resources and tools to foster participation, agency, literacy and social entrepreneurship. The tools will be launched in the Pilot sites through a dedicated Intervention Program.

Main targets: consumers, prosumers, innovators

KPI: 30% increase of adherence to the ECs after the Intervention Program



## Project Objectives (2 of 5)

KO2: To create user-centric solutions that based on participatory approaches such as **co-creation and naturally accelerate citizens' involvement** [addressed by WP3, WP5]

MASTERPIECE will create a digital counterpart of the energy community and the actors with whom it interacts. The digital platform will contain a series of building blocks that will allow the seamless creation of new services allowing the developers but also the users to create user-centric solutions. The members of the communities are the most suitable to solve local problems developing new services. For this, this project will take into consideration the developments of all agents involved.

Relevant results: Federated services will spark genuine collaboration among the members of the community. Early assessment of community maturity and aspirations will pave the way to participatory sessions of service design and innovative concepts. Personalized services for community members will be designed, localized and launched at each Pilot site.

Main targets: aggregators, innovators, service providers

KPI: Master Plan of services and Services Blueprints



## Project Objectives (3 of 5)

KO3: To propose **new business strategies and incentive mechanisms** that activate the reactions of market participants craving for business opportunities that imply energy use and cost reduction [addressed by WP2, WP4]

Multi-dimensional incentive models will offer access to measures that can motivate and enable consumers to afford investment and changes necessary to join an Energy Community and become a prosumer. New services and business models will be self-maintained only if they can feed on revenue streams that on the ideal case come from new commodities of the citizens or on the savings due to the elimination of inefficiencies. One of the objectives of this project is to develop the new business models that will allow for the creation of companies that help in the reduction of energy use and on the better management of the energy infrastructure.

Relevant results: clear membership mechanisms will be designed to ensure that new citizens can enter in the energy communities and acquire membership rights, ownership rights and benefits. New ways to simplify the purchase and sharing of clean energy will be tested in the marketplace launched at the pilot sites. The community experience will be made possible by automated on-boarding mechanisms. The levels of membership of the communities and the relative Journeys will be co-designed in the participatory planning sessions. Among the economic incentives, loyalty mechanisms will be tested, and benefits will grow with the demonstrated ability to coherently manage community services for energy efficiency. A spillover effect is expected.

Main targets: community members

KPI: Spill over effect: 20% increase of federated services in each EC





## Project Objectives (4 of 5)

KO4: To configure a standardised and sound **cyber-security infrastructure** so the active citizens are protected against cyber-attacks, at the same time that privacy is defended in accordance with the revised EPBD and the GDPR law [addressed by WP2, WP4].

New digital tools acquiring data from the physical world and citizen behaviour could turn into an entry bypass for threads such as cyber-attacks. This is particularly true when the solution is also created to develop local marketplaces and actuation over devices and sub-grids. For this reason, the cyber-security of the solution is one of the key objectives of this project. The consortium includes experts in this field and will use the most robust technologies to increase the strength of the solution.

Relevant results: Privacy-Preserving Identity Management mechanisms will be integrated and extended in tandem with an advanced access control system that enables policy-based authentication and authorisation evaluation for data sharing and access while preserving privacy. These mechanisms will increase the trust of all stakeholders for using the MASTERPIECE technological innovations that require sharing private information or personal data.

Main targets: consumers, prosumers, innovators, service providers

KPI: Secure data management of stakeholder private information = 100%



## Project Objectives (5 of 5)

KO5: To **demonstrate the applicability and replicability** of methodological, technical, and business innovations in a variety of real-life pilots in different geographical locations, with heterogeneous social and economic environments and different regulatory/administrative frameworks [addressed by WP2, WP4].

Project MASTERPIECE is aware of the difficulty of the creation of Energy Communities and other forms of active citizen participation in the current energy paradigm. There will be many barriers that will need to be overcome, and the best way to assess the validity of the knowledge generated in the project is to carry out demonstration initiatives. For this, the project includes a program of transformative interventions in four different climatic locations, which also have different regulatory scenarios

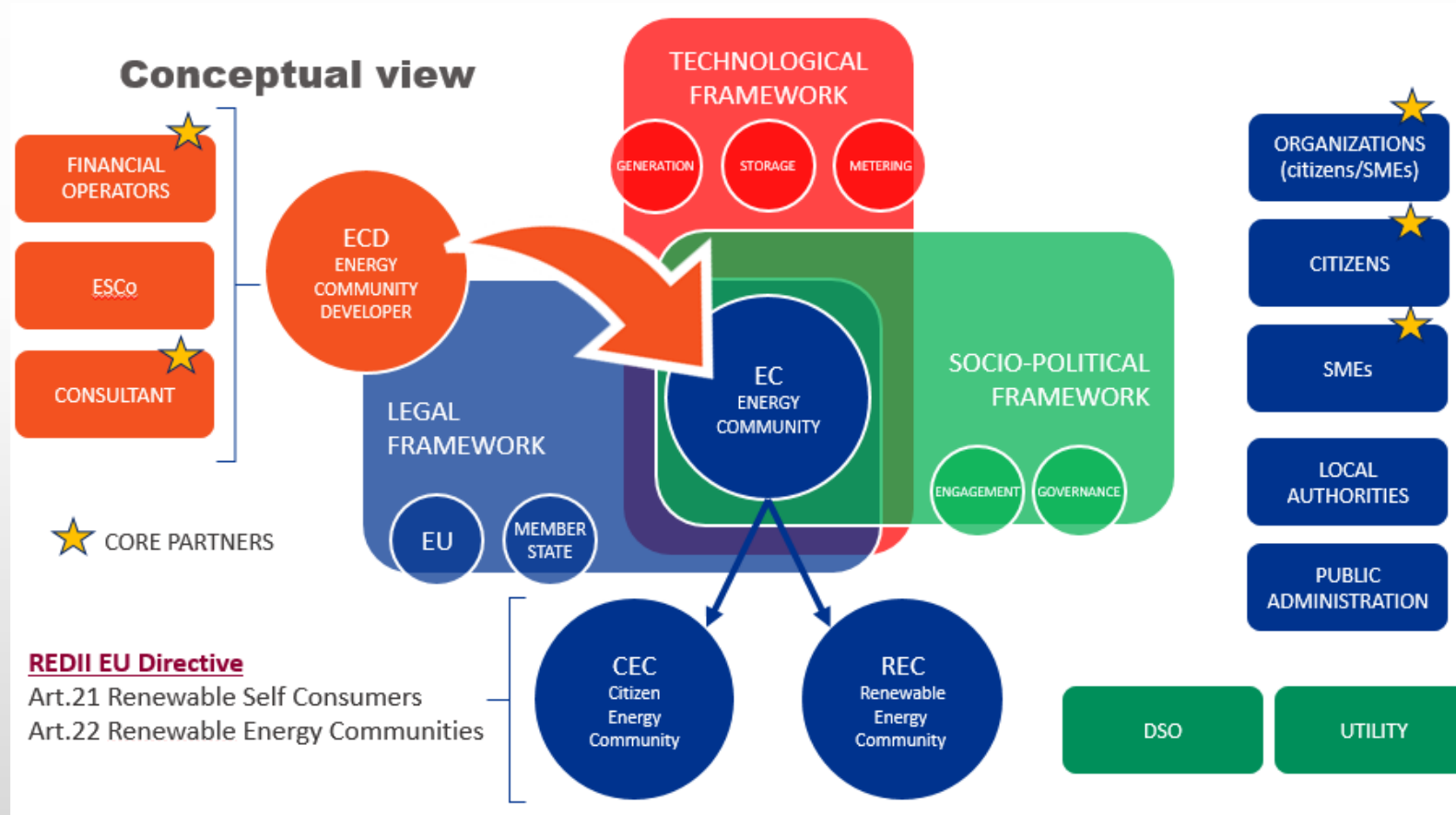
Relevant results: the goal of making energy communities grow like wildfire to reach the target of more than 250 million clean energy producers in 2050 can be achieved with a methodological and experimental approach on a large scale, such as the one configured and tested by MASTERPIECE. The Intervention Program, designed with the participants of the energy communities of the pilot sites, constitutes a project asset laying the foundations for the validation of intervention and acceleration models on a very large scale (up to 1000 and more energy communities).

Main targets: aggregators

KPI: validation of guidelines for large scale acceleration programs



## Methodology



MASTERPIECE considers the three dimensions of the energy community:

- Legal
- Socio-political
- Technological

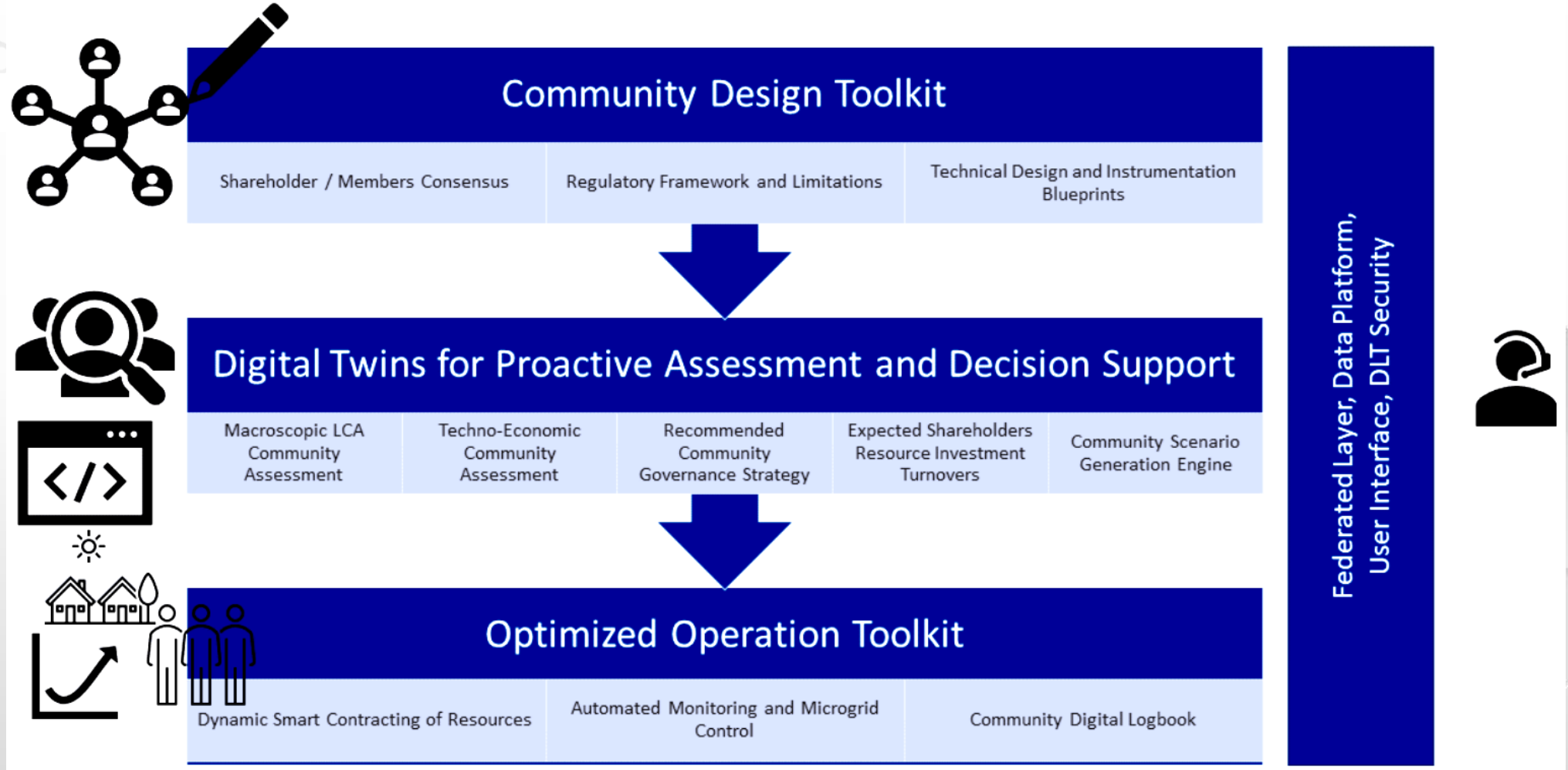
The developed platform will host services and tools on the three dimensions

Energy communities developers and citizens becoming members are at the core of this project

The demonstration activities will look at all dimensions of the EC



## Architecture



## MASTERPIECE Components (1 of 2)

Name	TRL transition	Owner	WP
Innovative engagement mechanisms to enable the communities' expansion and better literacy	6 -> 8	EXP	3
LIBRA ER (Energy R.Evolution) CE (COMMUNITY EDITION)	6 -> 8	ALWA	4
Development of new demand response mechanisms for energy communities maximized turnover	4 -> 7	UMU / CERTH	4/5
Developing new Multilevel policy frameworks for the management of energy communities	6 -> 7	EXP	6
FIWARE IoT platform with by-design security & privacy features for data collection and elaboration	6 -> 8	OdinS	4
Developing of minimal sensors/actuators sets to enter to the community	6 -> 7	OdinS	5
SRI and/or LEVEL(S) based module for providing recommendations based on good practises to support the creation, growth and capacity building of energy communities	5 -> 7	CERTH	3

## MASTERPIECE Components (2 of 2)

Name	TRL transition	Owner	WP
Micro-grid load control maximizing the available flexibility to support the incentivized engagement of distributed active consumers energy communities	5 -> 7	CERTH	4
Developing artificial intelligence mechanisms to support community management	6 -> 7	UMU	4
Proposition and investigating incentivized consumer-engagement mechanisms	4 -> 6	R2M	3
Innovative market mechanisms for incentivising green and resilient energy use	5 -> 7	UMU	3
Blockchain-based energy flows monitoring and measuring platform	7 -> 8	GRID	4
MEET Personalised APP to facilitate consumer in joining and living the energy community	4 -> 6	R2M	4

## MASTERPIECE Pilots



Spain – UMU PoC



ITALY – GRID / BM



TURKEY – TROYA /  
UEDAS



FRANCE – ALEC /  
Nouvelle Aquitaine



SWEDEN – SUST /  
Uppsala Kommun

## MASTERPIECE Simplified Gantt

Work Package	Year 1	Year 2	Year 3	Year 4
1. Project Management and Consortium Coordination	WP1			
2. Energy community requirements at national and EU levels for different stake/share-holders	WP2			
3. Social and sustainable innovations modelling for energy communities	WP3			
4. Digital platforms and tools for energy communities	WP4			
5. Integration, demonstration & evaluation		WP5		
6. Exploitation, dissemination, engagement and impact assessment	WP6			





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**Any Questions?**

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