



ENCLUDE project has received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement No 101022791



ENCLUDE
Energy Citizens for Inclusive
Decarbonization

Energy Citizenship is for everyone!

Dr Niall Dunphy / University College Cork

Dr Michael Brenner-Fließer / Joanneum Research



Th!nk E

slido

Please download and install the
Slido app on all computers you use



**Do you consider yourself an
energy citizen?**

① Start presenting to display the poll results on this slide.



**Which words come to mind
when you hear the term ‘Energy
Citizenship’?**

① Start presenting to display the poll results on this slide.

Envisioning an 'Energy Citizen'



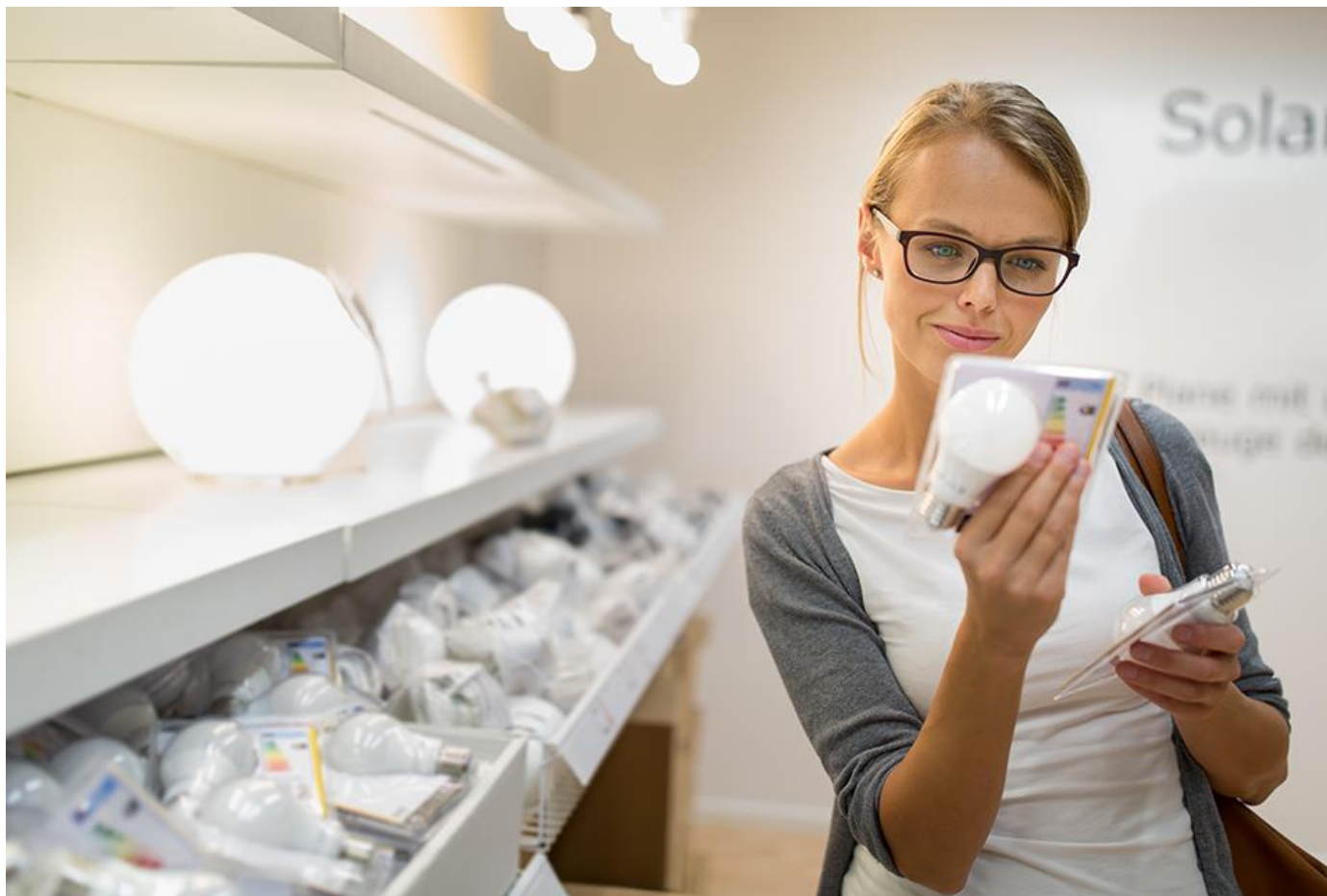
Envisioning an 'Energy Citizen'



Envisioning an 'Energy Citizen'



Envisioning an 'Energy Citizen'



Envisioning an 'Energy Citizen'



Envisioning an 'Energy Citizen'





- If we conceive of energy systems as functional socio-technical systems, what exactly is the space for citizenship?
- The idea of ‘energy citizen’ is increasingly appearing in policy discourse signifying expansion beyond traditional role as ‘energy consumer’.



- It can be said that neologisms such as *prosumers*, *active consumers* and *energy citizens* act as place holders for new roles and responsibilities.
- Although the precise contours of what this might involve are often left open.

Citizenship as belonging



- Traditional ideas of citizenship tend to be associated with formal membership of a polity.
- Such membership, is typically predicated on belonging to a particular people.
- In effect such citizenship defines who “belongs” to the political community (and who doesn’t) and the status that confers.



“inclusion and exclusion represent the two sides of citizenship’s coin.”

Lister (2002, p. 98)

Citizenship as belonging (and not belonging)





Terms like citizenship and citizen are powerful, with connotations

- ... of status and standing,
- ... of belonging and connection,
- ... of responsibilities and duties.

Civic republican tradition



- Draws from from the experiences of Athenian democracy, Republican Rome, medieval Italian city-states, *etc.*
- Citizenship is seen as a “practice”. It is based on duties and responsibilities and emphasises political agency.
- Active participation is defining feature. In the words of Rousseau, *“obedience to the law one has prescribed for oneself is freedom”*.

Liberal tradition



- Constructs citizenship as a “status”, focuses on fundamental rights.
- Within the Roman Empire, citizenship came to mean being protected by the law rather than participation.
- Status as a citizen is important primarily in so much as it protects freedoms from interference from others and from the state.

Cosmopolitanism



- Acknowledgement of a shared humanity, the idea we owe a duty above all to the global community of people.
- Dobson's idea of post-cosmopolitan citizenship adds a perceived obligation of justice to the idea of common humanity .

Energy Citizenship Typology



“All forms of participation – whether invited or uninvited, insider or outsider – are always orchestrated and framed in powerful and highly partial ways, and are thus subject to exclusions”

(Pallet *et al.* 2017, p. 607)

Energy citizenship



- We start from the position that an energy citizen is not something one becomes, it is not something one earns
- It is something that inherently exists by virtue of people's existing close relations with energy and the energy system

Energy citizenship



- We posit that energy citizenship can be expressed in multiple, overlapping, and sometimes transitory ways.
- We note that an individual's expression of citizenship(s) in the energy sphere is strongly influenced by their socio-economic privilege and life experience.

Energy citizenship



- Energy citizenship comprises a hybrid of civic republican & liberal traditions of citizenship. It involves a combination of rights and responsibilities.
- Depending on a particular expression it is underpinned by key sustainability and social justice principles reflecting attributes of cosmopolitanism and post-cosmopolitan citizenship.



‘Energy citizenship’

“the map is not the territory
no map represents all of 'its' presumed territory
maps are self-reflexive, i.e., we can map our maps
indefinitely.”

Alfred Korzybski

Similarly, we cannot capture all representations of
energy citizenship

Access to energy



- Those who find themselves expressing energy citizenship in this framing are marginalised, by the energy system by the economic system and possibly by wider society.
- They either operate outside of existing energy system structures or are negatively impacted by these structures.

Expressions of energy citizenship: Access



Excluded



Dispossessed



Energy Poor



EnergyCitizenship.eu

Energy Consumption



- The second way in which energy citizenship can be expressed is through the traditional relationship citizens have with the energy system, as a consumer.

Expressions of energy citizenship: Consumption



Active consumer



Digital native



Energy champion



Collectivist-consumer



EnergyCitizenship.eu

Energy Production



- The third mode of participation, and perhaps the most prominent in people's mind, is production-orientated.
- It encompasses the various ways in which citizens produce energy individually or with others.
- Hybrid configurations, *e.g.*, prosumption, offer potential for greater personal energy security.

Expressions of energy citizenship: Production



Prosumer



Self-consumer



Collectivist-producer



Citizen-investor

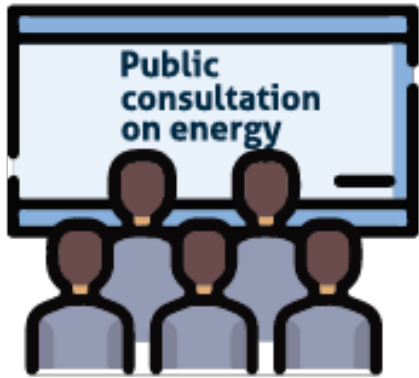


EnergyCitizenship.eu



- The fourth mode of citizenship participation around energy is in the (socio-)political arena.
- The highly regulated (almost quasi-public) nature of energy governance lends itself to this mode of involvement.
- This mode of participation is centred on decision-making processes, practices and outcomes.

Expressions of energy citizenship: socio-political



Citizen-litigator



Citizen-challenger



Citizen-activist



Disenfranchised

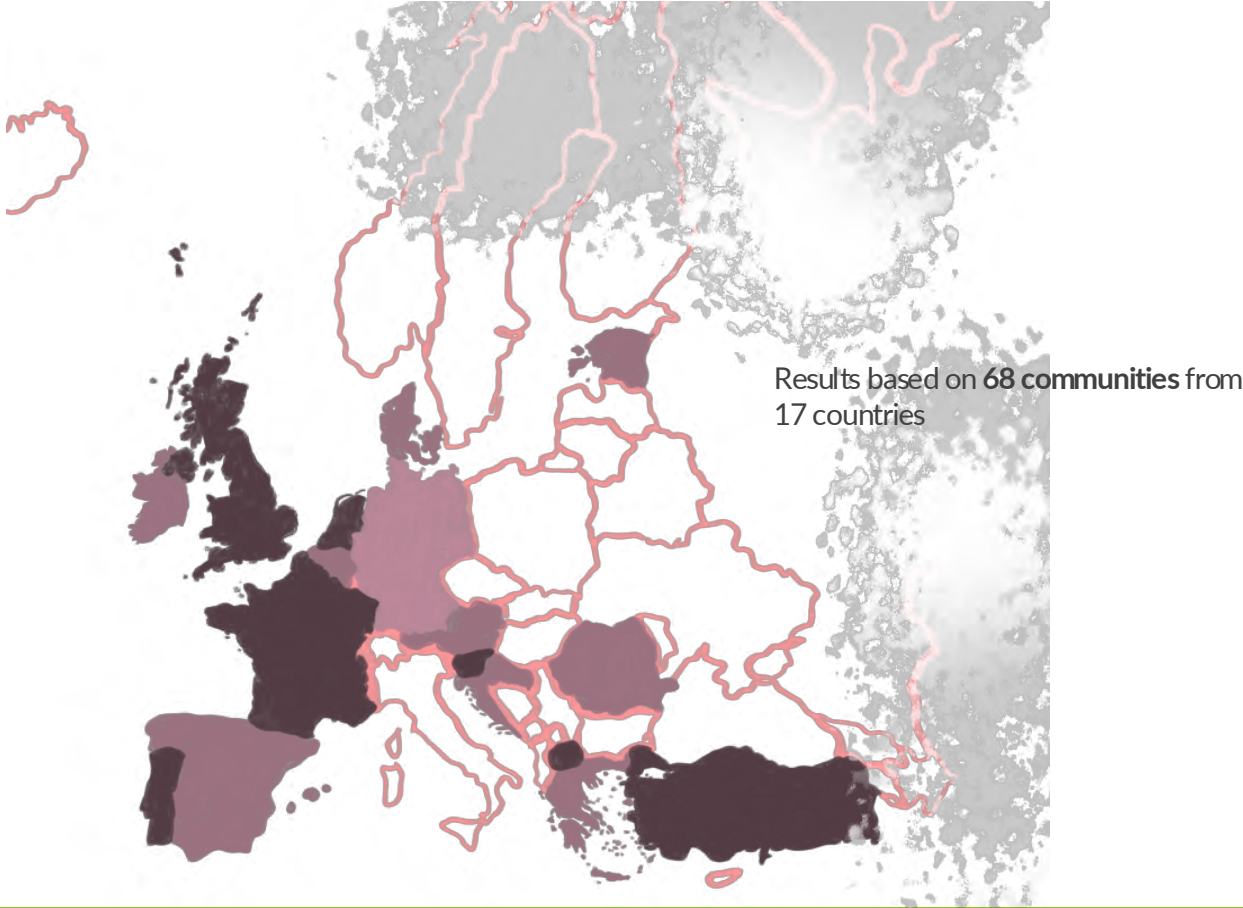


EnergyCitizenship.eu

Looking at energy citizens from a collective lens

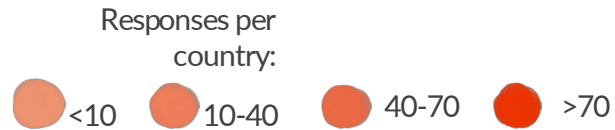
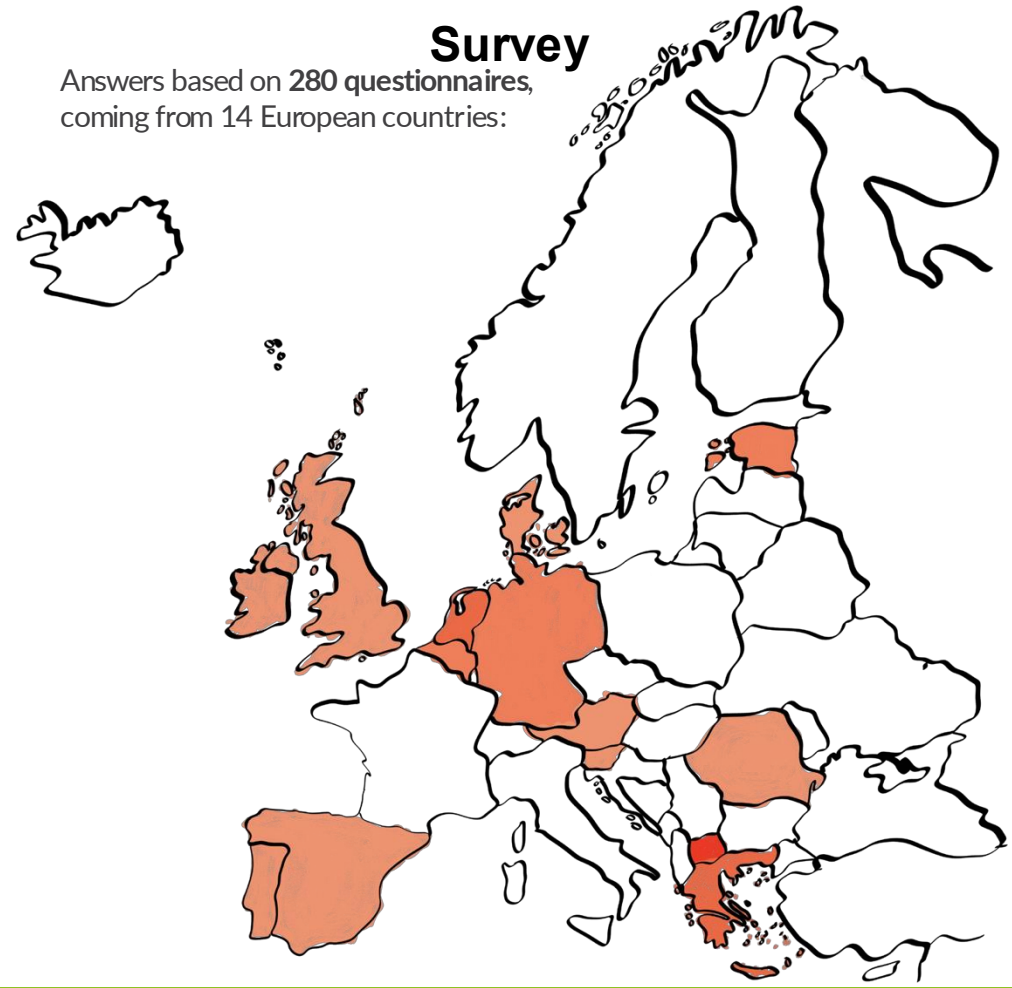


Case-Study Pool



Survey

Answers based on 280 questionnaires, coming from 14 European countries:



Looking at energy citizens from a collective lens



Energy Communities and Eco-farms



Collective Targeted Actions



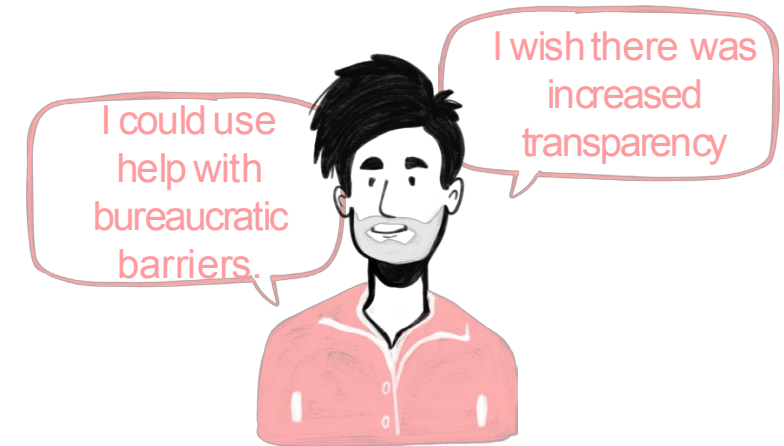
Looking at energy citizens from a collective lens



Political Collectives



Looking at energy citizens from a collective lens

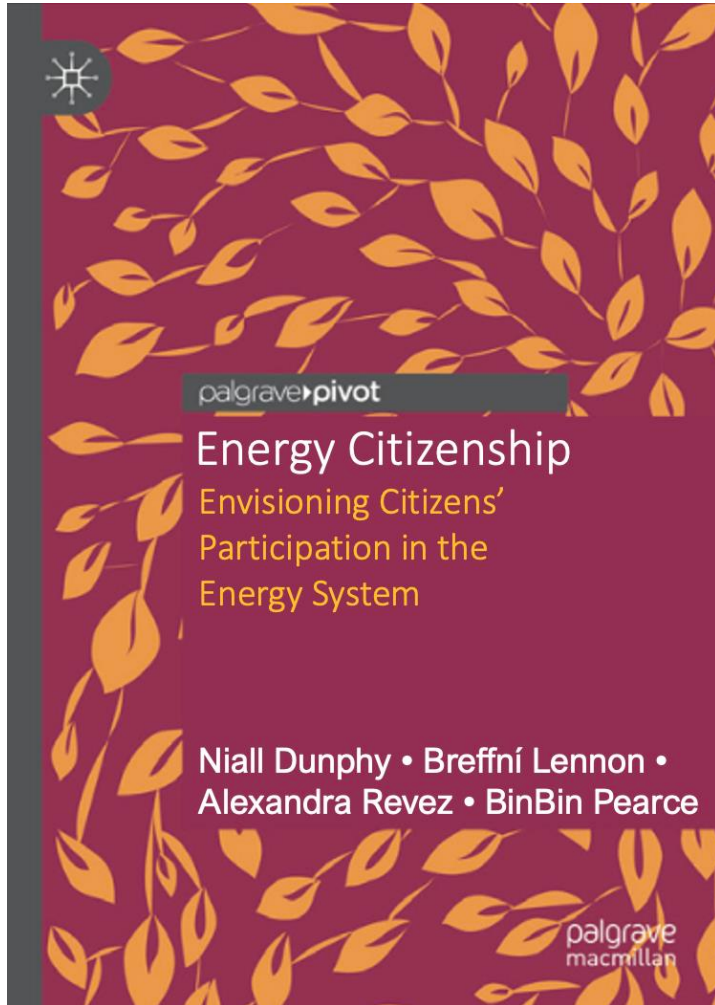


Conclusion



*To encourage more active participation in the energy system,
authorities and organizations must recognize and support the
diverse forms of active energy citizenships*

Forthcoming book



Energy Citizenship: Envisioning Citizens' Participation in the Energy System

Expected publication November 2024



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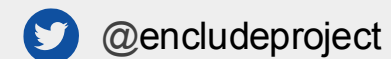
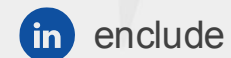
Thank you!



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www.encludeproject.eu





ENCLUDE

Energy Citizens for Inclusive
Decarbonization

Energy citizenship for inclusive and just transition

*Topic #2 – “What have we learned about Energy Citizenship that
can be implemented by others?”*

Dr. Vassilis Stavrakas, Prof. Dr. Alexandros Flamos

Technoeconomics of Energy Systems laboratory (TEESlab)
University of Piraeus Research Center (UPRC)

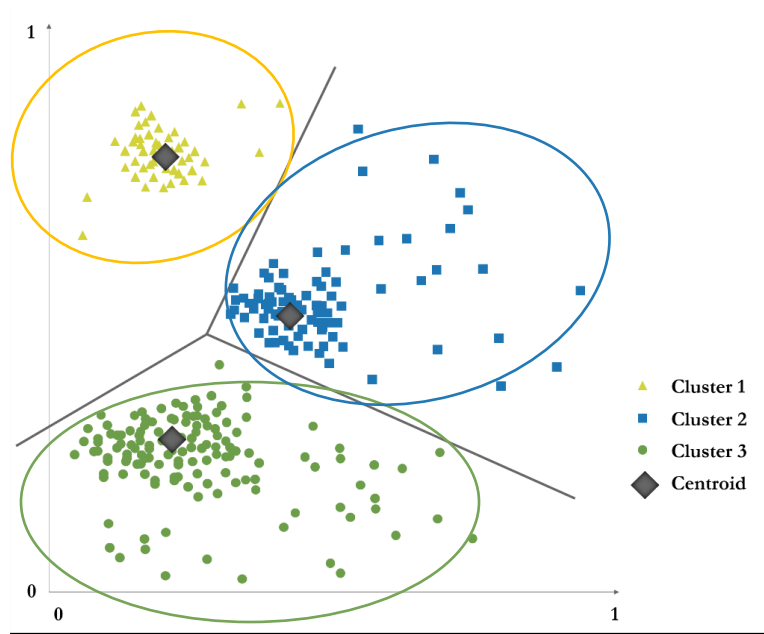
Dr. Sobhan Naderian, Prof. Gioia Falcone

University of Glasgow (UoG)

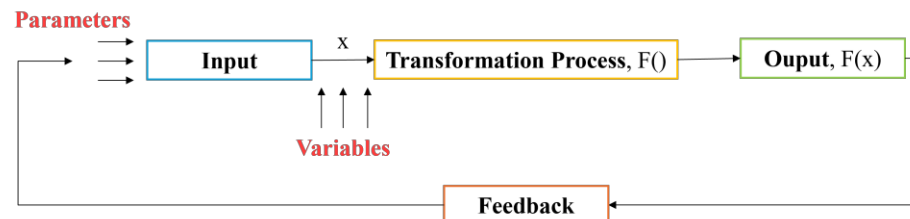
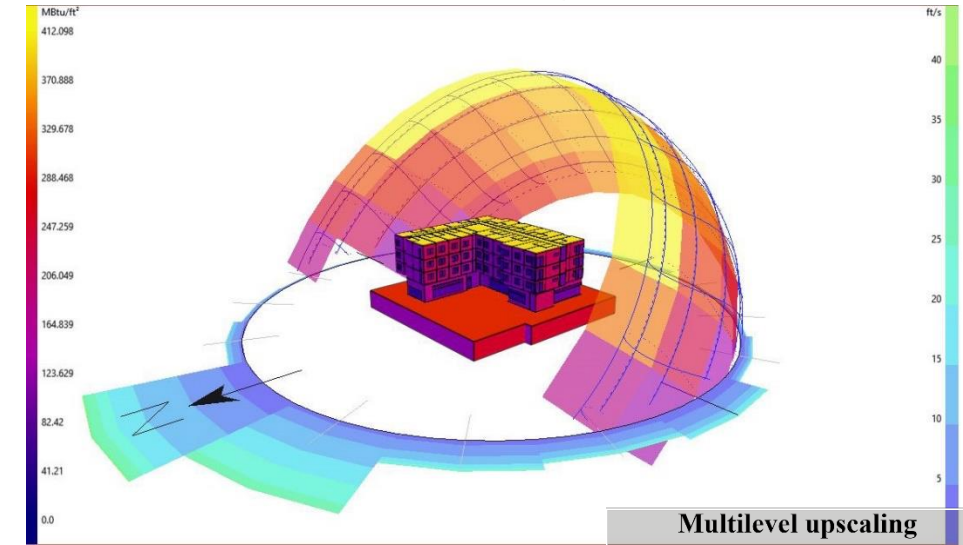
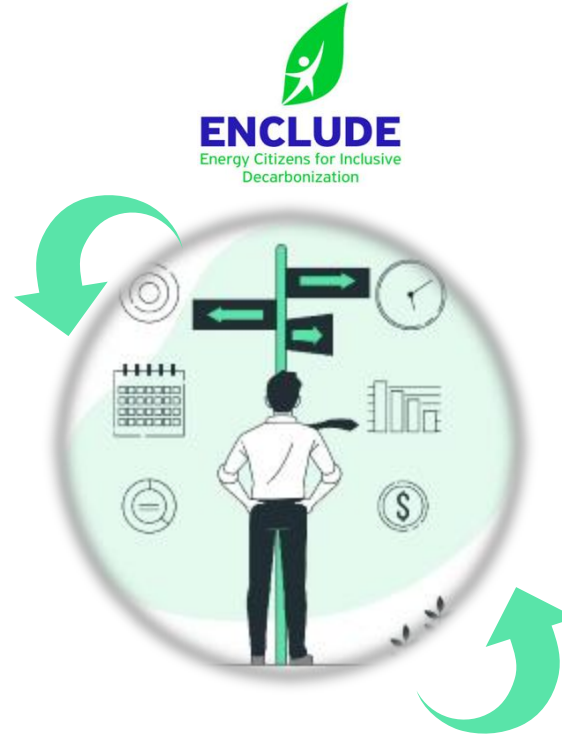
25 September 2024, Brussels



Data-driven clustering algorithms & Simulation models



Different (energy) citizen clusters

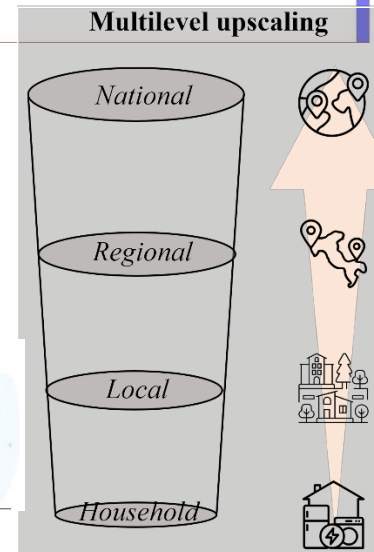


Decarbonization potential

Economic benefits



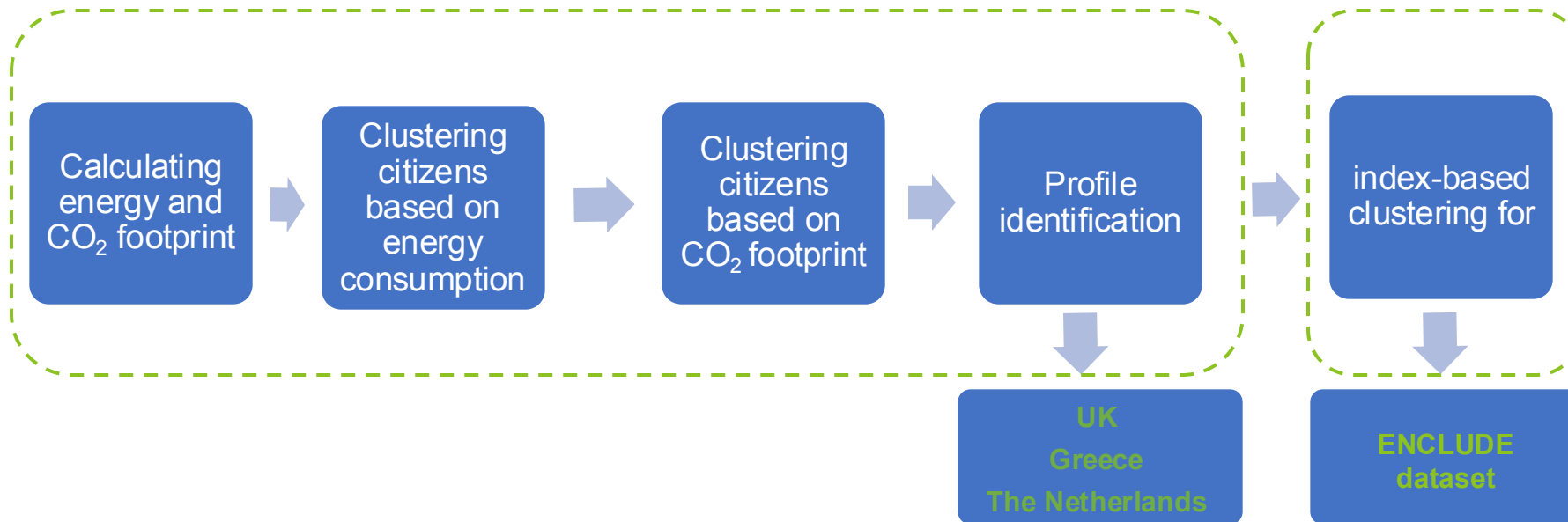
Social benefits



Data framework for clustering citizens – overview



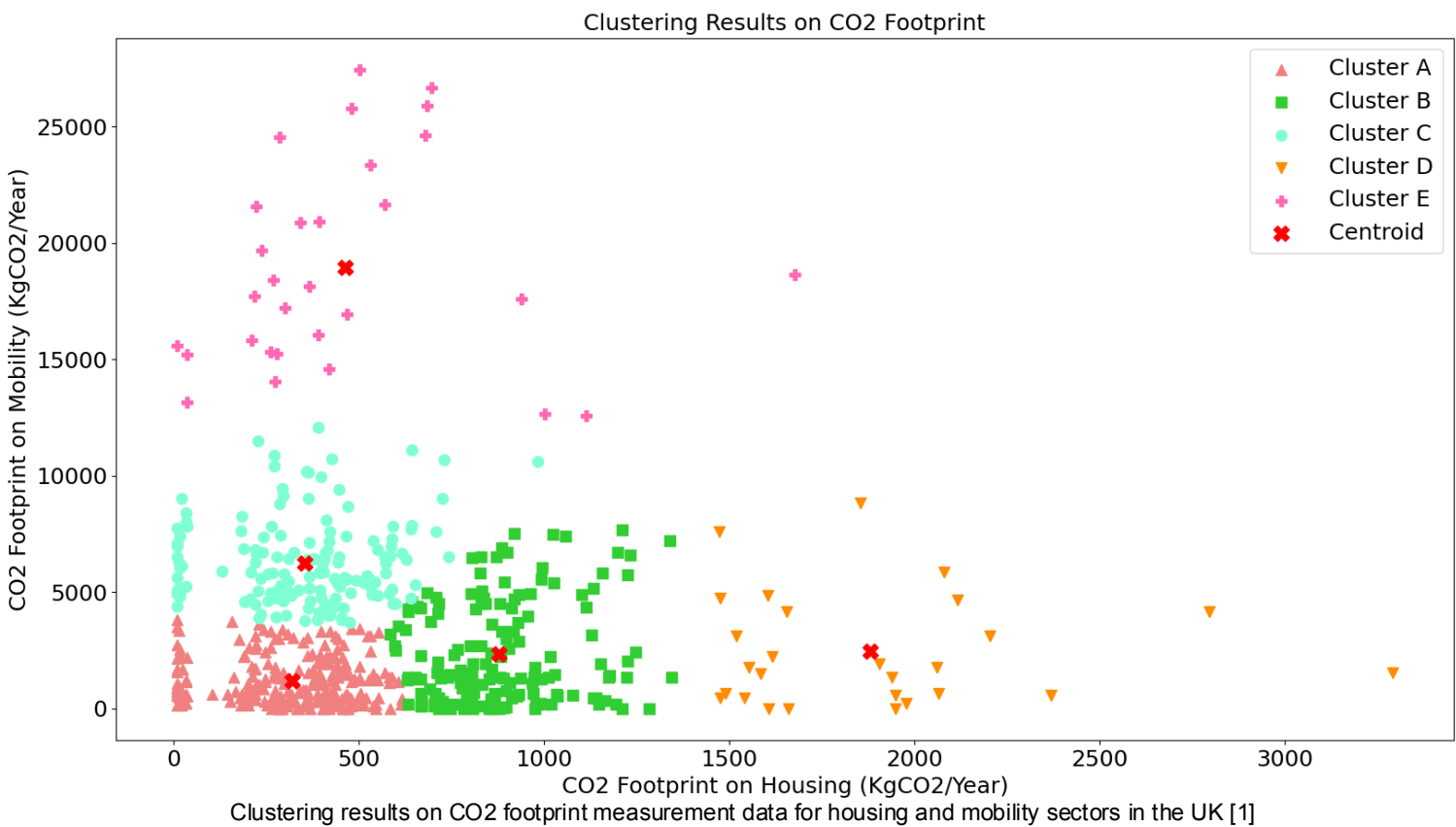
ECHOES dataset



K-means clustering method for clustering citizens based on carbon footprint – Results for ECHOES dataset – UK



Clusters result for CO2 footprint measurement data for the housing and mobility sectors in the UK [1]



Cluster	Population	Centroid location on housing CO ₂ footprint (kgCO ₂ /year)	Centroid location on mobility CO ₂ footprint (kgCO ₂ /year)
A	247	320.63	1180.30
B	161	878.96	2343.67
C	157	352.97	6234.85
D	27	1881.56	2475.36
E	30	463.25	18935.05

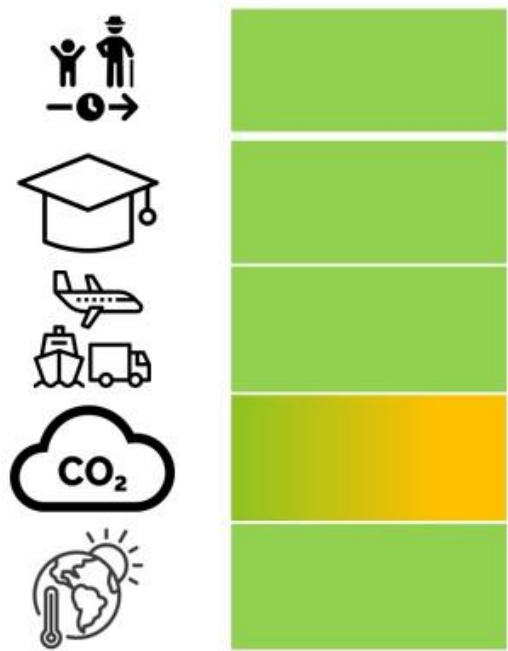
Profile results for CO2 footprint clustering based on within-cluster statistics for the UK [2]

	Profile #1	Profile #2	Profile #3
Age range	19-34	>65	35-49
Education	College	College	College
Population %	64.95%	30.22%	4.82%
Energy on Mobility	Low	Low to medium	High
CO2 Emissions (housing and mobility)	Low	Medium to high	High
Climate Change Perception	positive	Neutral to positive	Neutral to positive

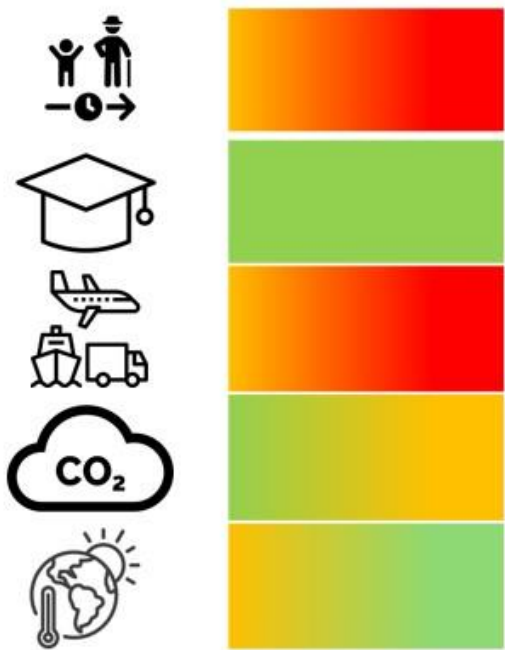
Profile development for citizens based on clustering results of CO2 emission for ECHOES dataset – UK



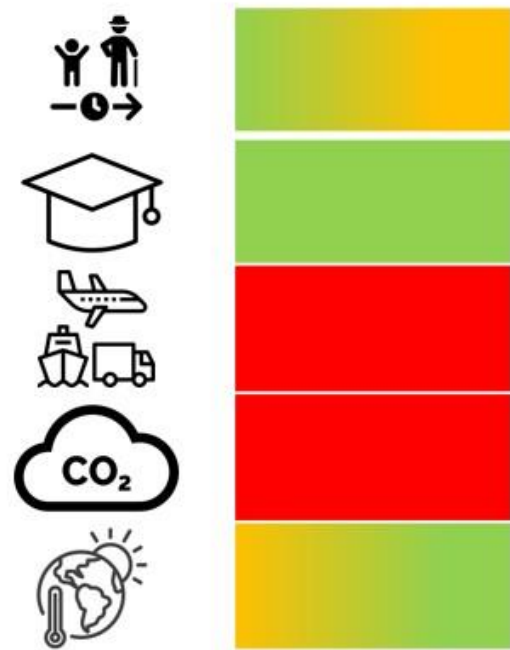
Profile #1



Profile #2

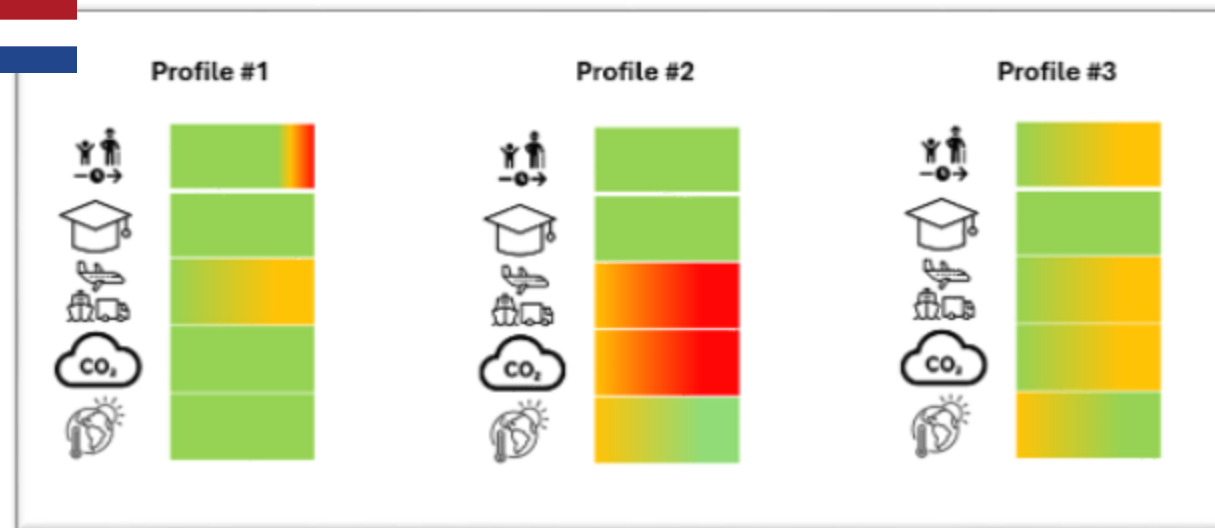
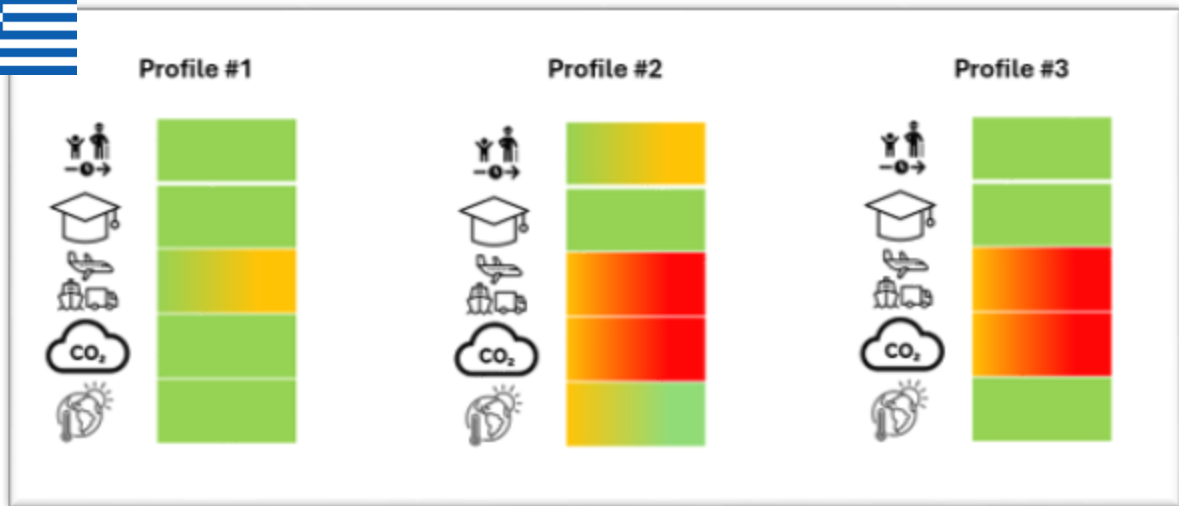


Profile #3

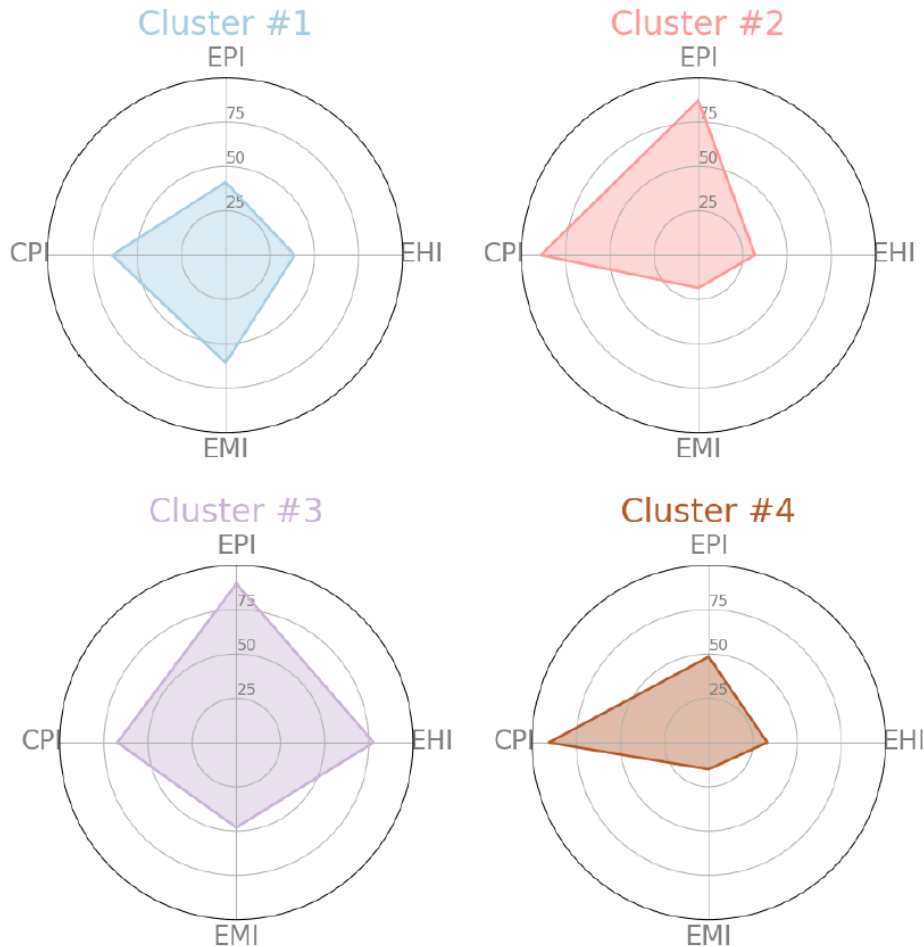


Energy citizens profiles based on clustering results and within-cluster statistics for the UK [1]

Profile development for citizens based on clustering results of CO2 emission for ECHOES dataset – Greece and the Netherlands



In ENCLUDE we did...



Spider plots of index-based clustering results for each of the four clusters [1]

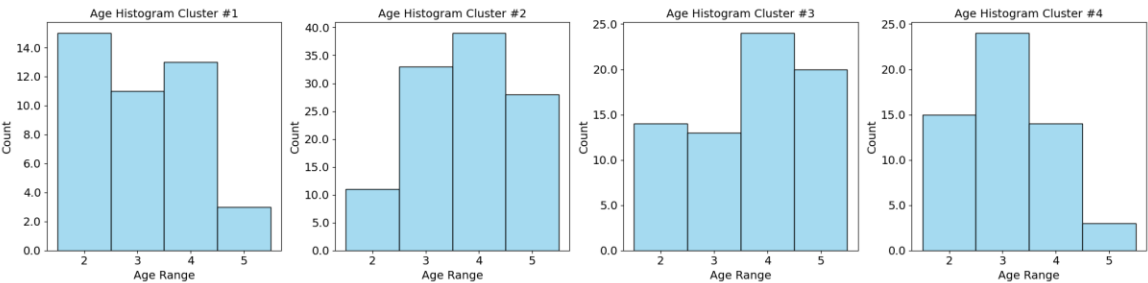
- Clustering ENCLUDE data via defined indices based on answers to questions in 4 categories: **Energy poverty, Mobility, Housing, and Climate Change Perception** [1].
- The aim is to calculate indices for each category using simple addition of answers which are mapped into meaningful numbers.
- 4 indices are defined (rescaled to 0-100) for each respondent based on relevant questions to each index [1].
- k-mean clustering method is applied to the full data set

Cluster	Population	Energy Poverty Index	Energy Housing Index	Energy Mobility Index	Climate Perception Index
1	111	41.12	39.08	60.80	64.28
2	76	87.22	31.98	18.57	89.18
3	54	89.62	77.81	47.99	67.37
4	42	48.37	33.18	15.10	90.47

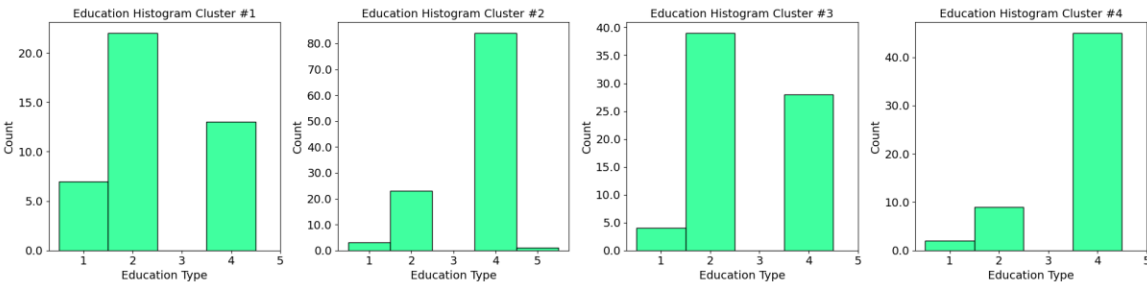
In ENCLUDE we learned...



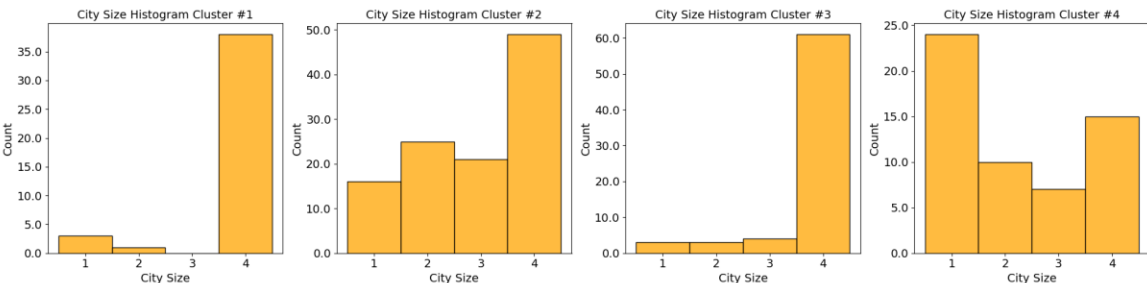
Age



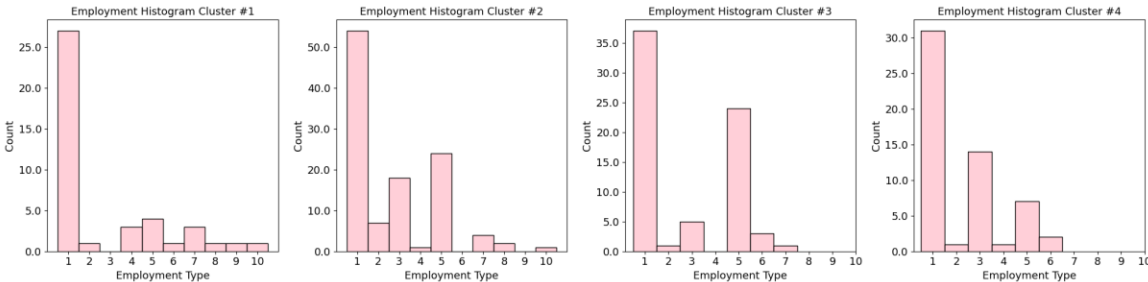
Education



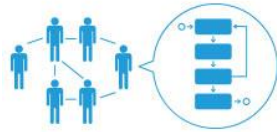
City Size



Employment status



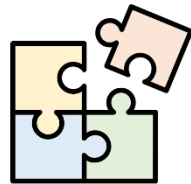
In ENCLUDE we did...



*Agent-based
Models*

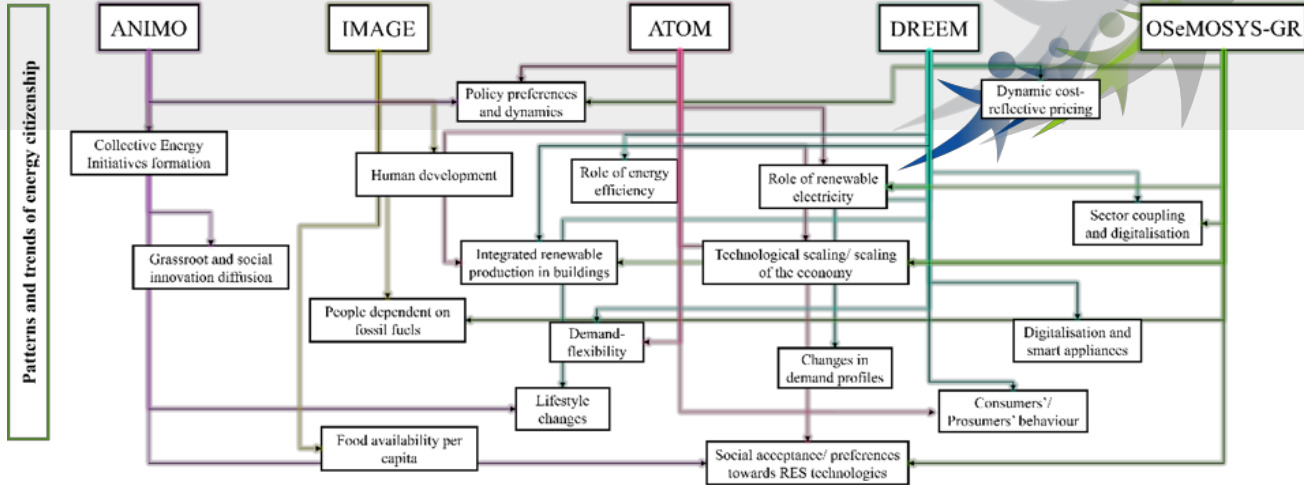


*Demand-side
Models*



*Integrated
Assessment
Models*

...for integration of **individual** and **collective** factors
of decision-making in the context of
ENERGY CITIZENSHIP !



- We **matched** patterns and trends of energy citizenship to our models...
- We built “people-centered” **storylines**, and “future-world” **narratives**...
- We **quantified** the impact of energy citizenship at the **local** level...
- We **quantified** the impact of energy citizenship at the **national** and the **supranational** level...

In ENCLUDE we learned...



Transformative



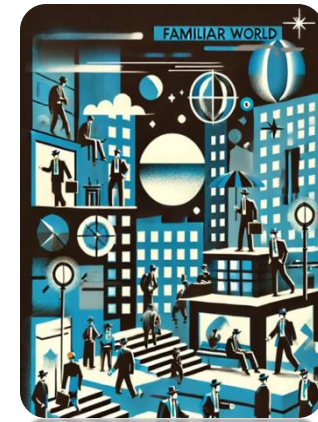
Scenario

Design



Framework

*“Future-world”
narratives*



*“People-centered”
storylines*



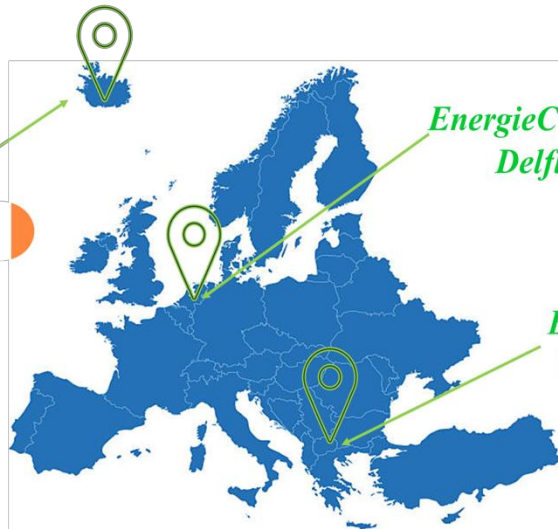
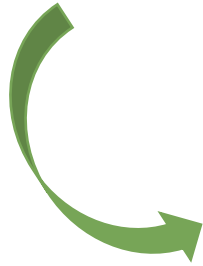
In ENCLUDE we did...



ANIMO

grAssroot innovatiON diffusioN MOdel

Agent-based
model



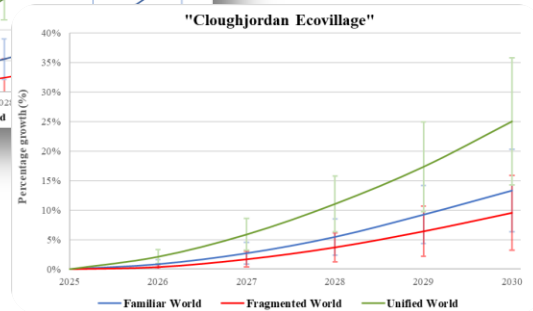
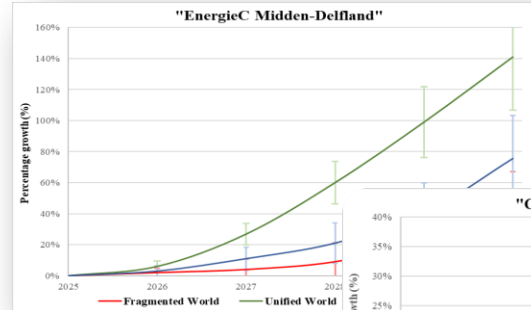
Cloughjordan
Ecovillage

EnergieC Midden-
Delfland

Belica Energy
Community



*Population density alone
does not ensure growth!*



**Togetherness
matters!**

*Our work encourages the future growth
of Collective Energy Initiatives (CEIs):*

- Identify and prioritize CEIs with the **highest potential of further growth** and **optimize resource allocation**,
- Increase **likelihood** for citizen **participation**,
- Impact of CEIs on **reducing carbon emissions** at the **local level**,
- Optimize **infrastructure** development.

In ENCLUDE we learned...

...about 6 different personas outlining potential characteristics & motivations...

Targeted communication
strategies and tailored
policymaking



The Green Guardian

- Environmentalist
- Concerned about conventional energy sources
- Carbon footprint reducers
- Grid reliance reducers



The Eco-Collaborators

- Community-oriented
- Motivated by large environmental movements
- Appreciators of RES to reduce their environmental impact



The Self-Reliant Saver

- Self-sufficiency seekers
- Valuing energy independence
- Financial savers
- Motivated by lower energy bills



The Security-Minded Sceptic

- Attracted to financial benefits of CEIs
- Strong communal sense
- Trusting to their neighbors' positive experiences
- Encourage adoption



The Tech Trailblazer

- Technologic innovators
- Value smart home integration
- Interested in experimenting with and adopting latest technology



The Eco-Conscious Saver

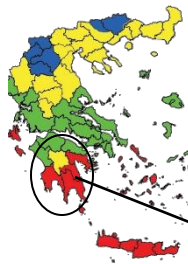
- Environmentally conscious
- Carbon footprint reducers
- Money savers
- Mainly interested in CEIs' financial benefits

...driving citizens' **decision** to **join** a CEI, e.g., energy community, ecovillage!

In ENCLUDE we did...

Towards a “green” rebranding of a Coal and Carbon Intensive Region into a city of the people, by the people, for the people

National scale
Greece



Regional scale
Peloponnese region



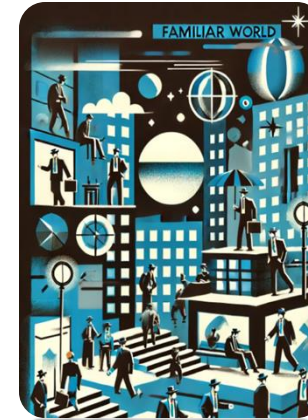
Local scale
Municipality of
Megalopolis



THE JUST
TRANSITION
PLATFORM



Familiar World



HELLENIC REPUBLIC
Ministry of the Environment
and Energy

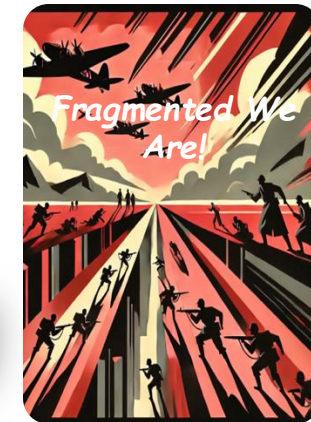


National
Energy and Climate
Plan

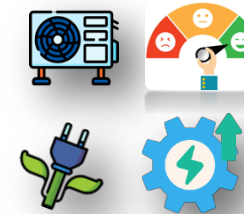
- Current EU and NECP policies
- Mid-late phase out of fossil-fuels



Fragmented World



Unified World



In ENCLUDE we learned...

More PEOPLE around
Europe need to know
that

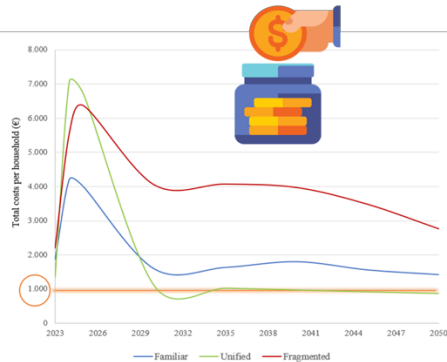


A **green** citizen-led transition in Megalopolis could not only be environmentally friendly, but also the **most financially viable** option in the long term.

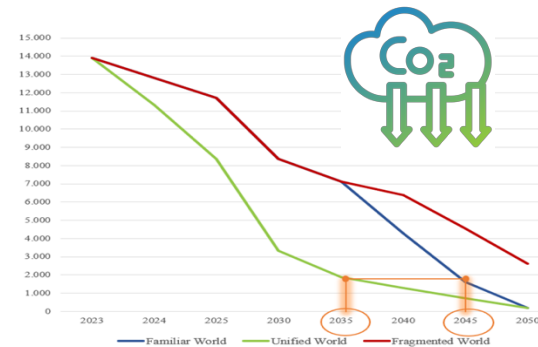
A **GREEN TRANSITION** is not necessarily an **EXPENSIVE** one

Around **€300 million** could be saved at the municipality level. Downscaling to the household level, this translates to total savings of around **€60,000** by 2050 (i.e., ~3 times the **current GDP per capita** in Greece)!

A **green** citizen-led transition could decrease households' energy **costs**, limiting the effect of **wage** reduction, and provide a significant helping hand to the **most vulnerable citizen groups**.



“Unified World” achieves significant emission cuts by 2030- a milestone that “Familiar World” doesn’t reach until over 10 years later!



Coal & Carbon Intensive Regions CAN achieve BOTH sustainability and economic prosperity!

In ENCLUDE we did...



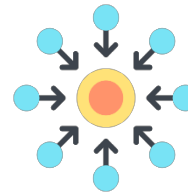
Citizen preference-led planning alternatives towards 100% renewable-based energy systems, or fossil fuel-based economies



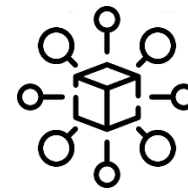
Unified World



100% renewable-based planning



Centralized



Decentralized

Familiar World

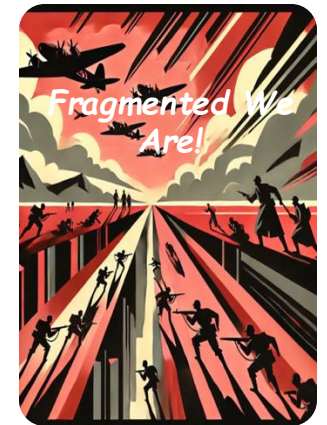


BUSINESS AS USUAL



**National
Energy and Climate
Plan**

Fragmented World



Fossil fuel-dependent planning



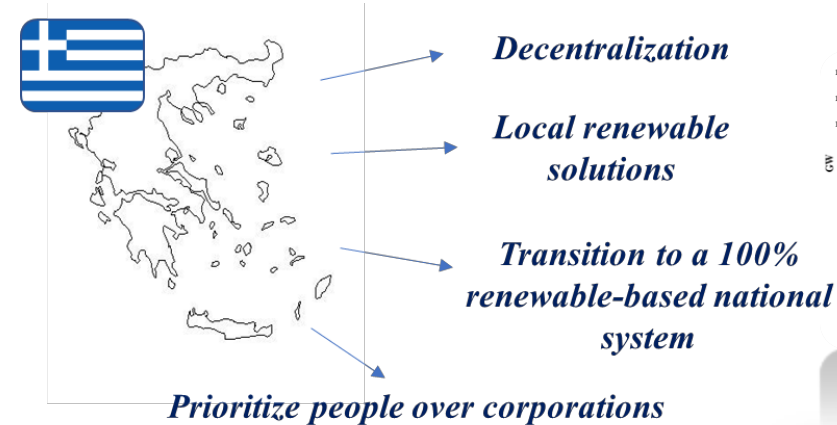
Gas



Lignite

In ENCLUDE we learned...

Integrate citizens' preferences into decision-making!



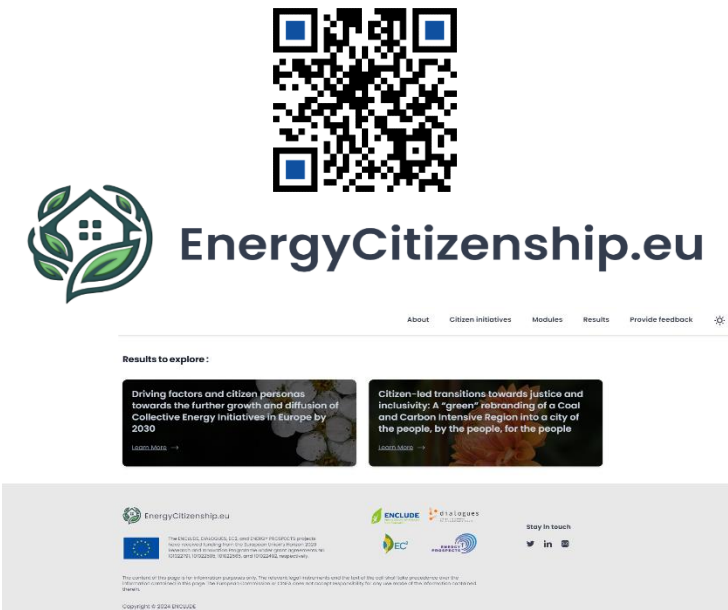
- ✓ Electricity mix
- ✓ Capital costs and investments
- ✓ Power generation
- ✓ Carbon footprint
- ✓ Total costs of electricity supply
- ✓ Socioeconomic benefits for citizens



A green energy system isn't just sustainable. It's also PROFITABLE!

- **Investment timing** is a key factor for the energy transition since *the earlier citizens* start investing in solar rooftop PV the *higher* the potential *socioeconomic benefits* are going to be.
- Acknowledge that a “**Decentralized**” energy system can provide citizens with a more **democratized** and **equitable** future.
- Recognize that a “**Centralized**” energy system presents a more **individualistic** and **unfair** future in which socioeconomic benefits are distributed between a **smaller share** of people.

Find more about our work...!



Published May 14, 2024 | Version v1

Project deliverable [Open](#)

Report on the decarbonisation impact of energy citizenship at the local level: Deliverable 5.3 Energy Citizens for Inclusive Decarbonization (ENCLUDE)

Fotopoulos, Dimitris¹ [ID](#); Manias, Nikos¹ [ID](#); Kleanthis, Nikos¹ [ID](#); Papantonis, Dimitris¹ [ID](#); Stavrakas, Vassilis¹ [ID](#); Flamos, Alexandros¹ [ID](#)



1. Technoeconomics Systems of Energy Laboratory (TEESlab), Department of Industrial Management & Technology, School of Maritime and Industry, University of Piraeus, Karaoli & Dimitriou 80, Piraeus, 185 34, Greece



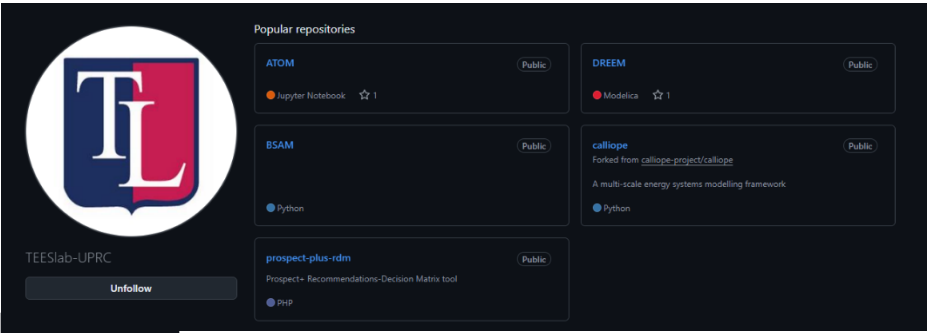
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Project deliverable [Open](#)

Report on the decarbonization potential of energy citizenship at the national and the EU levels: Deliverable 5.4 Energy Citizens for Inclusive Decarbonization (ENCLUDE)

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Thank you!

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Assoc. Prof. Anastasia Ioannou**



ENCLUDE project has received funding from the
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programme under grant agreement No 101022791



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Thank you!

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ENCLUDE
Energy Citizens for Inclusive
Decarbonization

Topic #3 – Mobilizing Energy Citizenship

ENCLUDE final event, 25.09.2024



TU Delft Delft
University of
Technology



HOLISTIC

ETH zürich

**How has ENCLUDE
mobilized energy
citizenship?**

**What does this mean for
energy citizenship in the
future?**

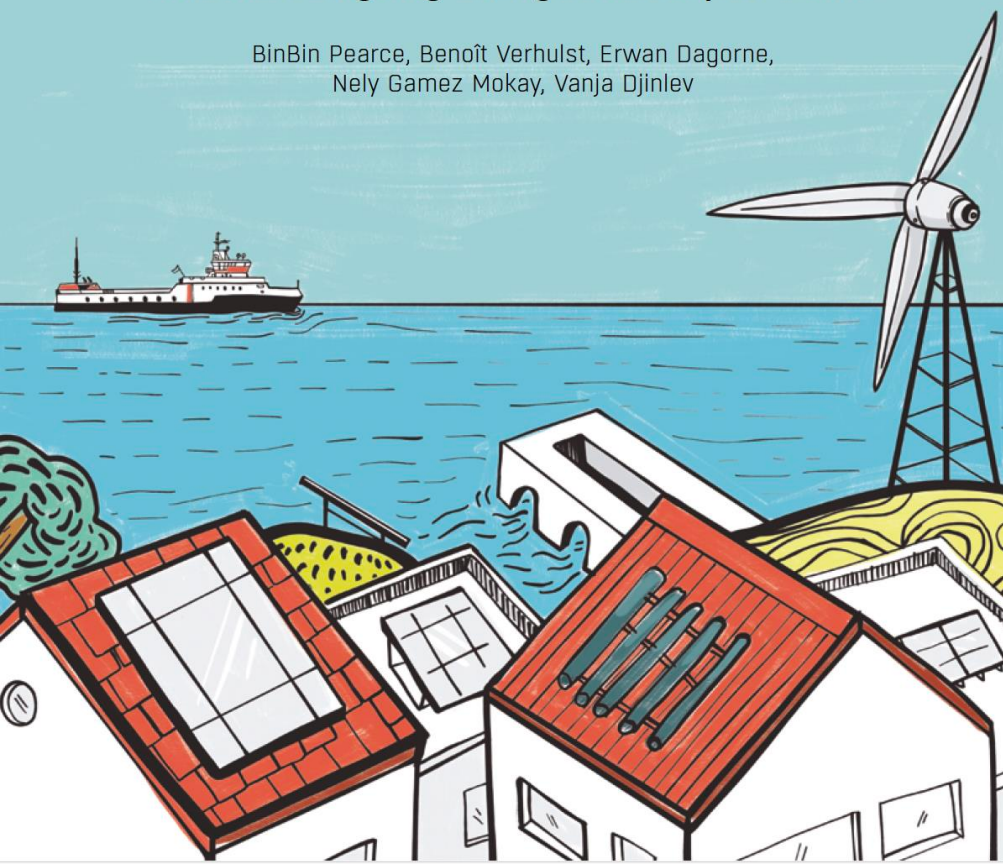




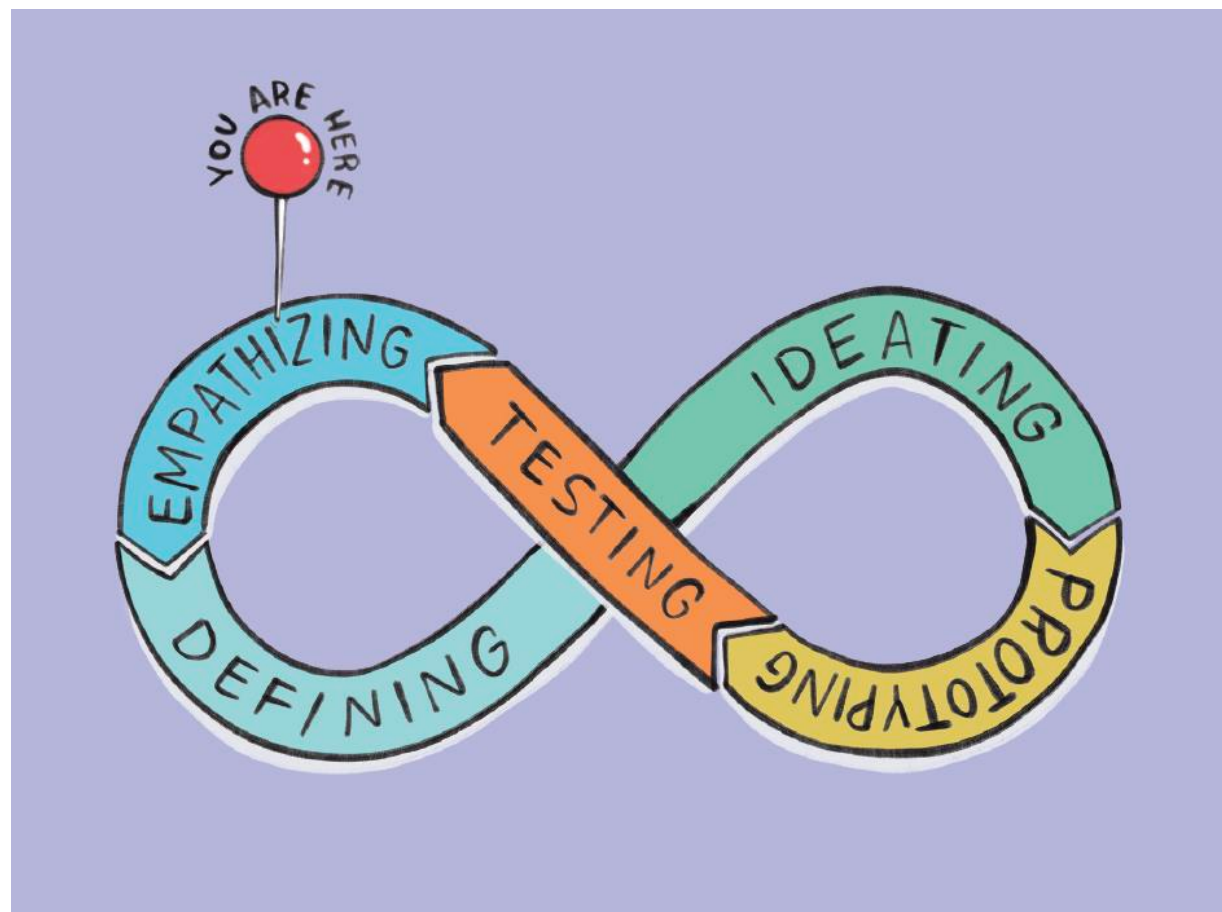
A Changemaker's Guide to the Energy Transition

Citizens designing change one step at a time

BinBin Pearce, Benoît Verhulst, Erwan Dagorne,
Nely Gamez Mokay, Vanja Djinlev



The ENCLUDE collaborative playbook



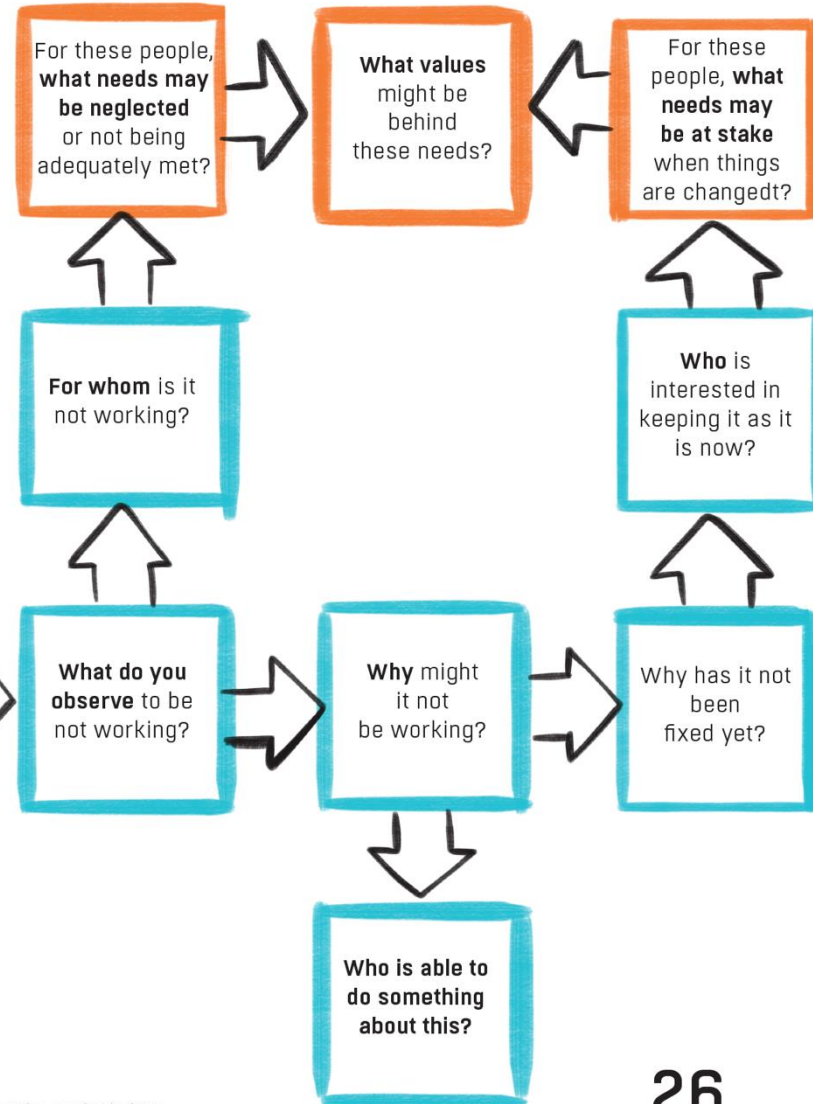
ENCLUDE's co-creation training for designing for system change

At the end of this exercise, you should have developed a good idea about not only about **what** is happening, but also **why** and how it is happening and **who** are the people affected or can affect the problem. Together, this information amounts to having an **INSIGHT** about the problem.



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Empathise and find insights



5/ An example of insights

A tip from a past participant :

"Maybe the thing with design thinking is that you cannot do it alone. It needs a couple of minds around you to clarify or maybe share ideas because when you do it alone it can be OK but in the end, maybe the targeted group may not appreciate it."



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Empathise and find insights

4/ Write your problem statement from one point of view

For **one** of the actors you have named in 2/, take a try at creating your first problem statement. You can use the following structure to give it a try:
SOMEONE... (a specific group of people that you named already);
NEED(S)*... (something lacking/unmet values which this group of people could use help with);
HOWEVER* OR BECAUSE*... (an insight about this group of people from Step 1/).

*Please note that you do not need to use this structure exactly. These words are here as a hint, but you can use your own.

Examples of a single perspective problem statement:



Women and girls in rural areas of Nigeria need to have a way of accessing fuel for cooking that is not detrimental to their health and which also does not take up all of their time such that they have no more time left for their education or other personal development goals.



However, currently, they have to walk long distances and spend a lot of time collecting wood fuel, which makes them vulnerable to physical violence and takes away time for education. The fuel also burns in stoves which causes a lot of indoor pollution, causing negative health impacts for these women and girls.



Write another problem statement for several actors.

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Define the problem

SOMEONE...

NEEDS...

HOWEVER...
or BECAUSE...

36

Define the problem

6/Some tips when you are faced with obstacles

After prototyping and getting feedback, you may still have some obstacles that you are facing. Here are a few tips for how you might want to address these challenges:

The solution tested doesn't match needs

Go back to the problem statement.

Modify it if it needs corrections and/or start the ideation process again.

The solution is too expensive or time demanding

Go back to the list of ideas from your brainstorming;

Restart ideation...

... and/or explore other aspects of your problem statement less cost or time demanding

The scale of the project is much too large for what I can do or test

Go back to the list of ideas from your brainstorming;

Restart ideation...

... and/or explore other aspects of your problem statement less cost or time demanding

And that's it! You're at the end of one cycle of the design process. Now, you are able to go back to any step to refine your ideas or to rethink your assumptions. We admire you for taking on these challenges. Get in contact with us if you want more assistance!

Medium

High

Low



All templates are available to download from

encludeproject.eu/resources

Future of Energy Citizenship



“No one is too small to make a difference” – playbook to be featured in partnership with UNYouth4Capacity at COP 29 – Azerbaijan

How will ENCLUDE keep mobilizing energy citizenship?



Interactive Platform: EnergyCitizenship.eu



How to involve citizens in the energy transition?

Energy citizenship is a term used by activists, academics, and increasingly, policymakers to conceptualise the potential roles that citizens could (or should) play within the energy system.

This website collects research results from four Research and Innovation projects on energy citizenship funded by the Horizon 2020 programme of the European Union. Results have been curated into four pathways for different audiences which are presented below.

<https://energycitizenship.eu>

Including information from **4 Horizon 2020 projects**



Knowledge base about energy citizenship



Learn

Energy Citizenship in the Making

A policy brief on pathways to support citizen engagement in the European energy transition

Learn More →

AUTHORS

ENCLUDE, DIALOGUES, EC2, ENERGY PROSPECTS

AUDIENCE

Polymakers

Learn

A Changemaker's Guide to the Energy Transition

A playbook that aims to take citizens step by step to design, implement and reflect on an initiative of their own related to the energy transition

Learn More →

AUTHORS

ENCLUDE

AUDIENCE

Citizens

<https://energycitizenship.eu/modules/>

Energy citizenship conceptualization



EnergyCitizenship.eu

About

Citizen initiatives

Modules

Results

Provide feedback



Target audiences

Expressions of energy citizenship

Energy citizenship can relate to both the rights and responsibilities that people have within the energy system. Traditionally, citizens were assumed to be only passive consumers of the system but there are increasingly more modes of participation including in issues related to energy access and production but also in the political and governance aspects of energy. In each of these modes, ENCLUDE researchers have identified multiple expressions of energy citizenship which can be explored by pressing on the icons on this page.

More details can be found in [a report by ENCLUDE researchers](#). Nevertheless, ENCLUDE is not the only project that has explored the energy citizenship concept. Click on the links below to learn more about the different perspectives explored by [EC2](#), [Energy Prospects](#), and [DIALOGUES](#).



Access



Consumption



Production



Governance

Energy Access

This category concerns those on the margins of the energy system and it is linked to the framing of energy as a resource and as a source of wealth.



Excluded



Dispossessed



Academics

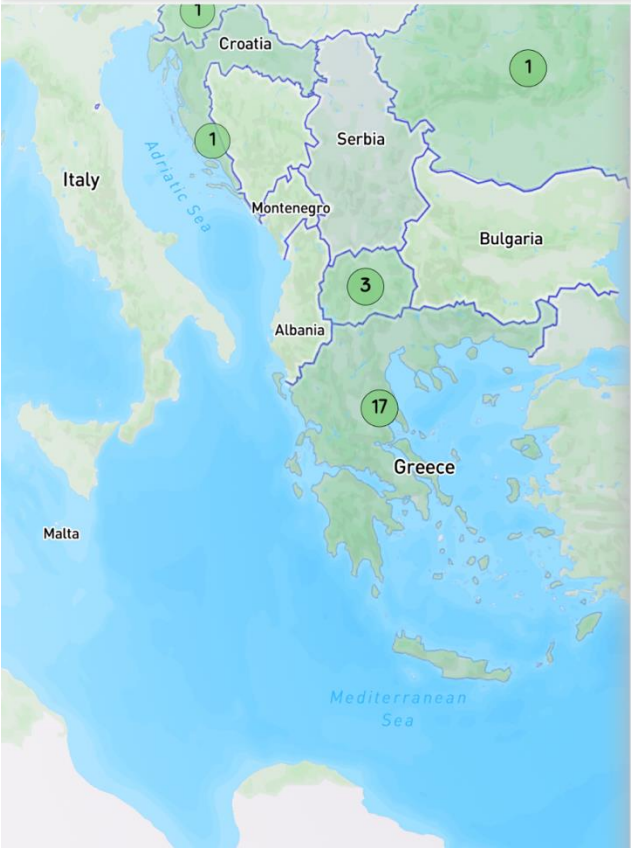
<https://energycitizenship.eu/about/>

Examples of citizen initiatives



 EnergyCitizenship.eu

AboutCitizen initiativesModulesResultsProvide feedback



Energy Initiatives

Greece

 Open Filters  Close Quotes

Pilot project on energy sector digitalization

The pilot offered residents of three cities in Greece the opportunity to familiarize themselves with new technologies, focused on the digitalization of the energy sector.

[Learn More](#) →

Energy community in a large city

The community aims to develop solar PV parks to cover the electricity demand of its members.

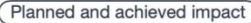


Quotes

"Our goal is to exploit the 3 main sources which are: the sun, not only for electricity and for heat with solar panels but also through solar thermal applications with mirrors, wind in any case, and in fact, wind is the one that will have the largest share in energy production and biomass."



"Our philosophy though is, in our cooperative, that most of the energy can be provided to small and medium [income] citizens, not big companies. Although we had some suggestions, we wanted to provide all of our generated electricity to small businesses, and poor families so that we can help as many people as possible."



Target audiences



Practitioners



Policymakers

https://energycitizenship.eu/interactive_map

Driving factors and impacts of citizen initiatives



About Citizen initiatives Modules Results Provide feedback



Min

Average

Max

On this page

Introduction

Research/ Policy questions

What are potential driving factors that could support the diffusion and further growth of Collective Energy Initiatives i...

What is the emission reduction (decarbonization) potential related to the further growth of CEIs around...

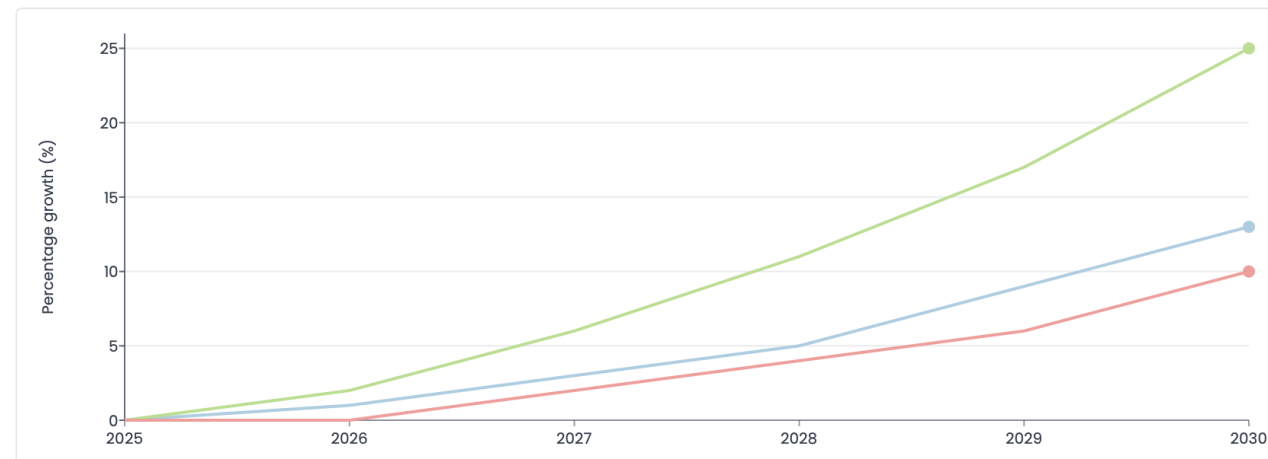
Citizen personas: what individual motivations are driving the further growth of Collective Energy Initiative...

The Green Guardian

The Security-Minded Sceptic

The Eco-Collaborators

Cloughjordan Ecovillage - Ireland



SCENARIO

Familiar World Unified World Fragmented World

https://energycitizenship.eu/results/result_animo

Target audiences



Academics



Practitioners



Policymakers

Wider impacts of citizen-led transitions



On this page

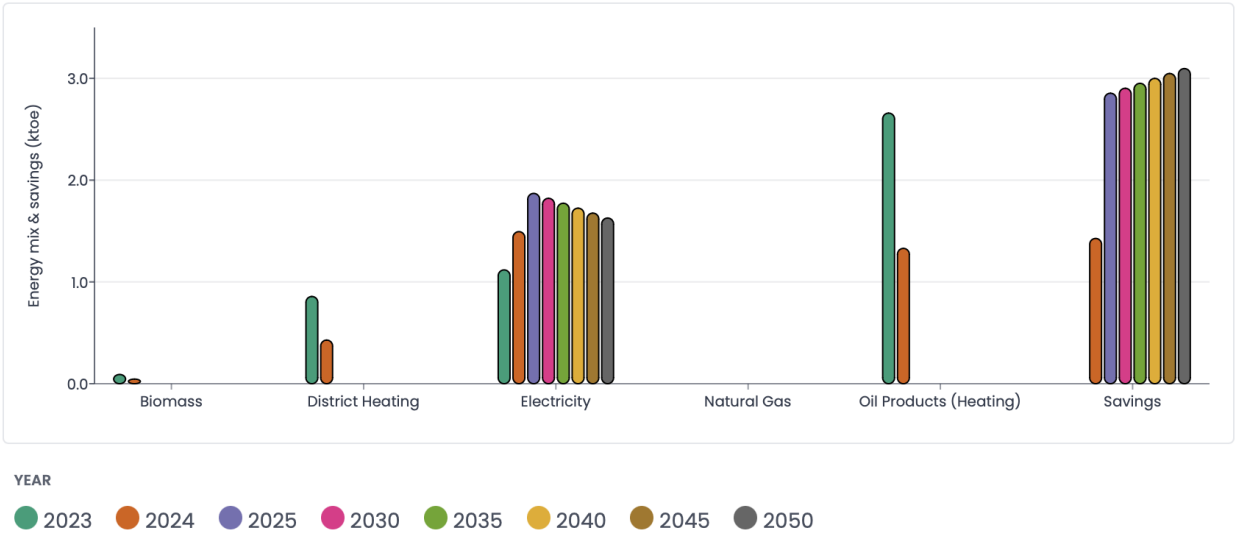
Introduction

Research Questions

“Can a citizen-led transition based on investments in energy efficiency solutions, and lifestyle and behavioral...

“What is the emission reduction (decarbonization) potential of different transition pathways at the municipality...

Unified World



Conversely, in a future characterized by **distrust** and **skepticism**, where individuals prioritize energy security and lower bills over combating against the climate crisis (i.e., “*Fragmented World*” scenario), the use of fossil fuel-based products remains entrenched in the energy mix **until 2050**. In this scenario, the vision of

Target audiences



Academics



Policymakers

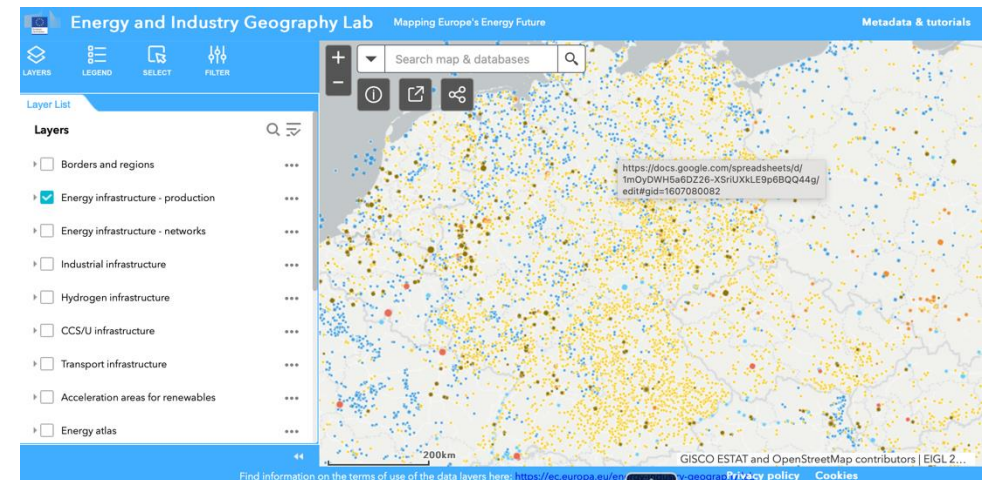
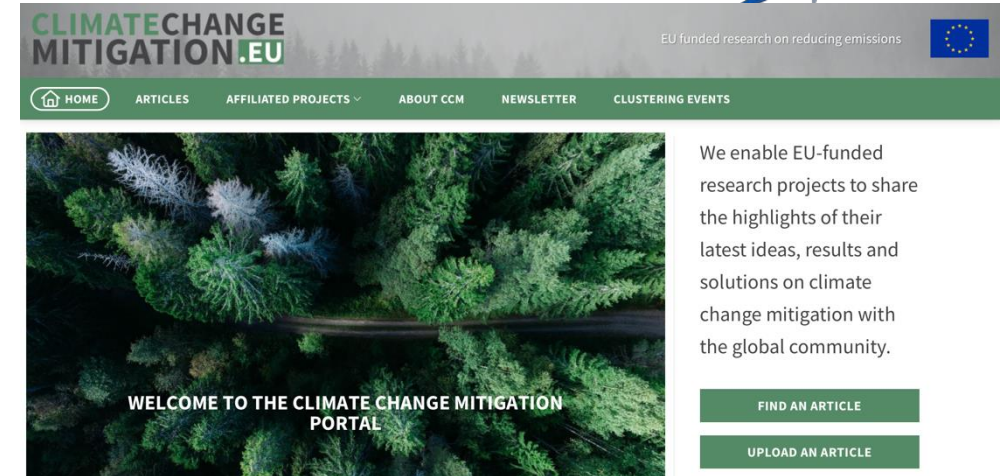
https://energycitizenship.eu/results/result_bleed

Future of Energy Citizenship (platform)



Ways to continue the platform:

- Future EU projects to “carry the torch” and add new materials (similar to climatechangemitigation.eu)
- Relevant EU initiatives e.g., [JRC's Energy and Industry Geography Lab tool](#)
- As part of a future version of the ENCLUDE Academy



Thank you!

BinBin Pearce

George Xexakis



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