POWERPOOR

Empowering Energy Poor Citizens through Energy Cooperative Initiatives

Part I - Understanding the phenomenon of Energy Poverty, concepts, and policies at national and European level

Eleni Kanellou (NTUA) and Julien Dijol (Housing Europe)

26th January 2023

This project has received funding from the European Union's HORIZON 2020 research and innovation programme under grant agreement No 890437

Module 1 – Structure and content

- Module goals
- Module content
  - PART I: Introduction to energy poverty
  - PART II: The POWERPOOR project
- Q&As and discussion
  - Key takeaways
  - Further reading

Module 1 – Goals

- To familiarise the audience with the concept of **energy poverty**, existing policies to address the issue, and the current governance frameworks for energy initiatives at the EU and global levels

- To present the **POWERPOOR approach** and introduce the role of energy supporters and mentors

PART I: Introduction to Energy Poverty

- Concepts: Understanding Energy Poverty
- Energy Poverty in the Global Agenda
- Energy Poverty in Numbers
- EU Energy Poverty Landscape
- Key energy poverty alleviation policies at the EU level

"Adequate warmth, cooling, lighting and the energy to power appliances are essential services needed to guarantee a decent standard of living and citizens' health."

EU Energy Poverty Observatory, 2018
(www.energypoverty.eu)

Understanding Energy Poverty

Energy Poverty Concept

- ✓ Energy poverty is defined as a set of conditions where:

“individuals or households are not able to adequately heat, cool, or provide other required energy services in their homes at affordable cost” (1)

- ✓ Energy poverty is:

“the inability to realise essential capabilities as a direct or indirect result of insufficient access to affordable, reliable and safe energy services, and taking into account available reasonable alternative means of realising these capabilities” (2)

(1) Pye et al., 2015; Bouzarovski, 2018
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Energy poverty is often understood “as a situation where a household cannot meet its domestic energy needs”(1)

Living in inadequately heated or cooled households negatively impacts human health and well-being. In addition, individuals who are unable to meet their basic energy needs are prevented from fully participating in society.

(1) EU Energy Poverty Observatory, 2020 / Picture credits: freepik.com

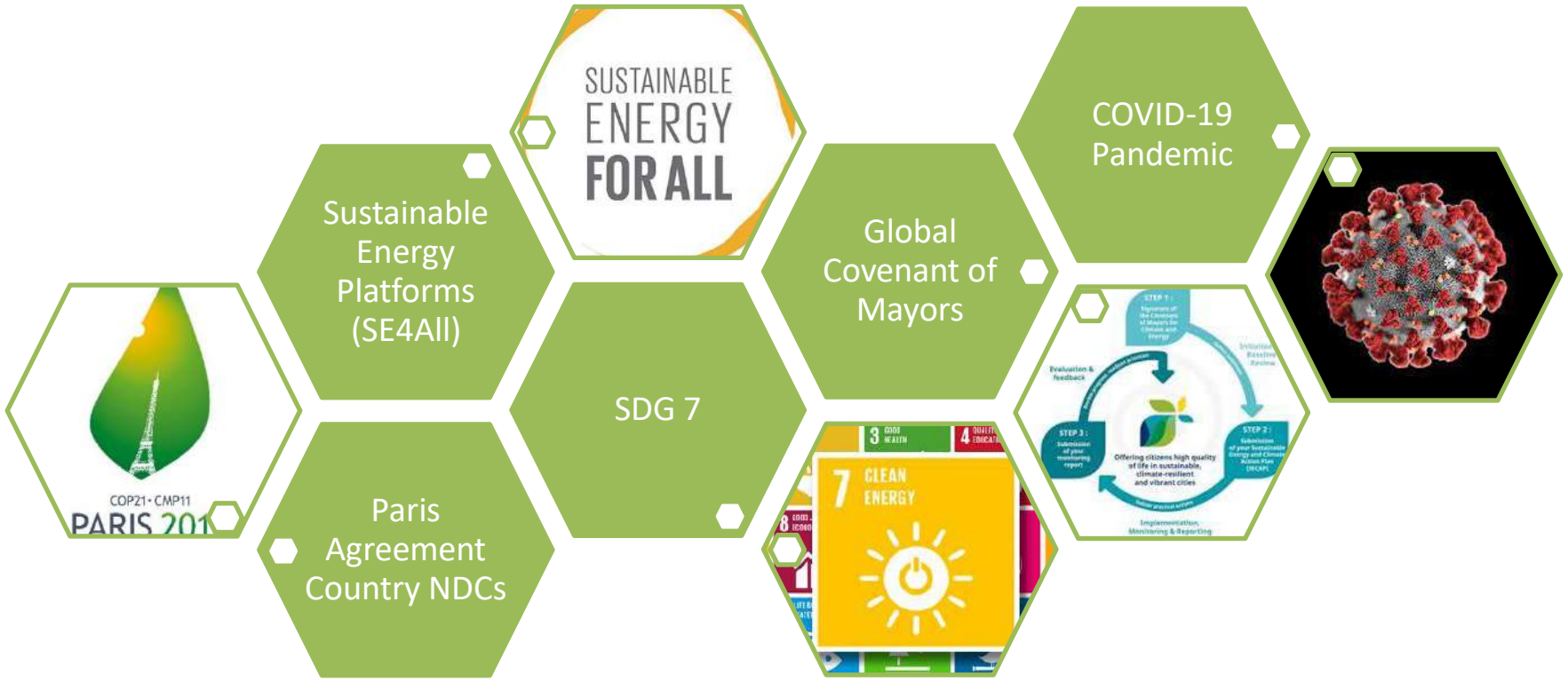
Understanding Energy Poverty

Energy Poverty in Europe – A complex challenge

Source: Energy Poverty in the European Union, YouTube: https://youtu.be/kT-lpCdd_WI

Understanding Energy Poverty

Energy Poverty in the Global Sustainability Agenda



Energy poverty is a serious concern which receives increasing attention in the global sustainability agenda. It is addressed in several international frameworks and platforms.

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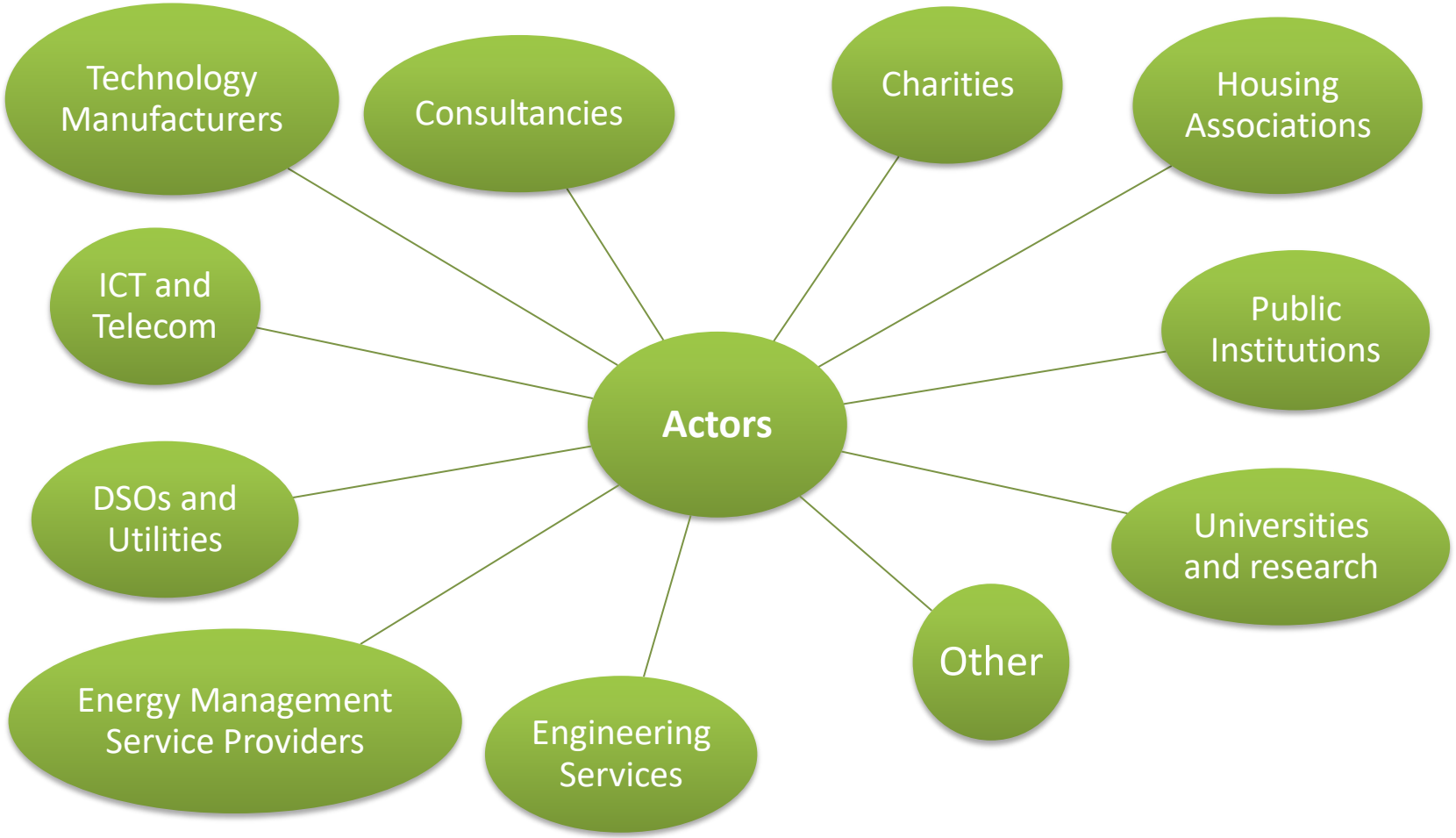
Understanding Energy Poverty

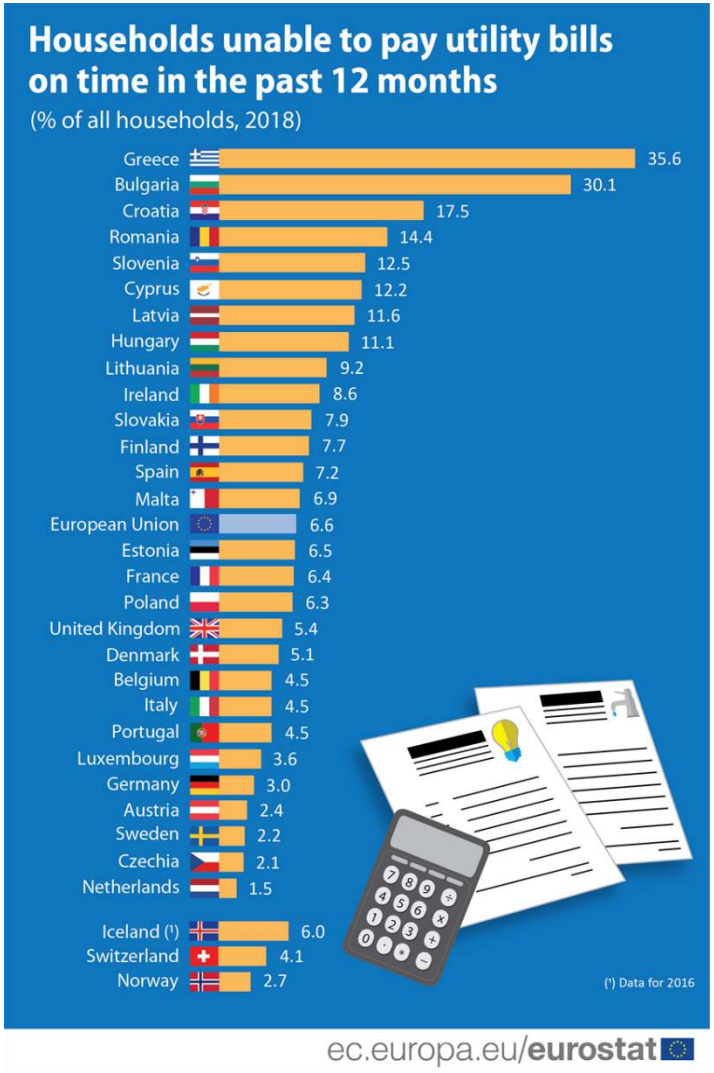
Key Actors in the Energy Poverty Landscape



Source: JRC Science for Policy Report. "Energy poverty through the lens of EU research and innovation projects". (2019)

Energy poverty facts in Europe

People unable to pay utility bills on time and keep their homes warm



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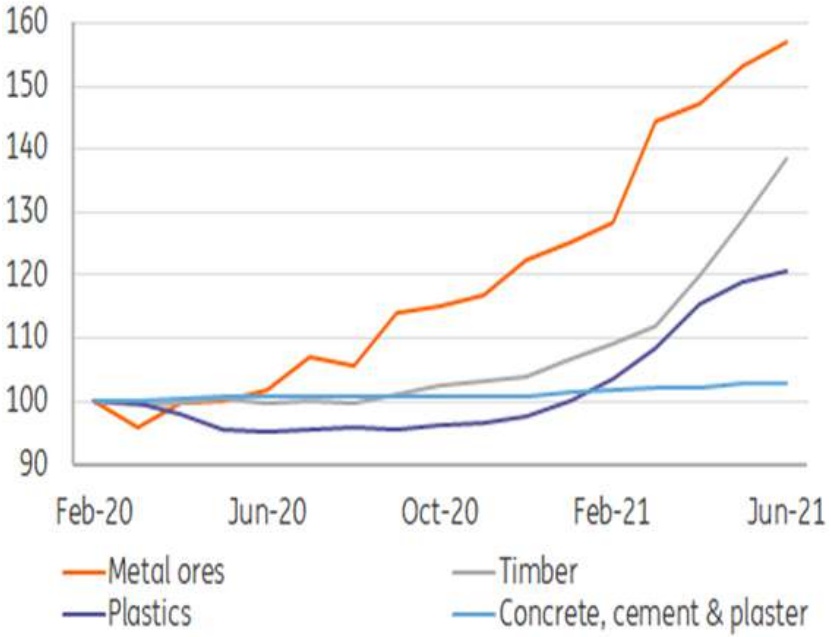

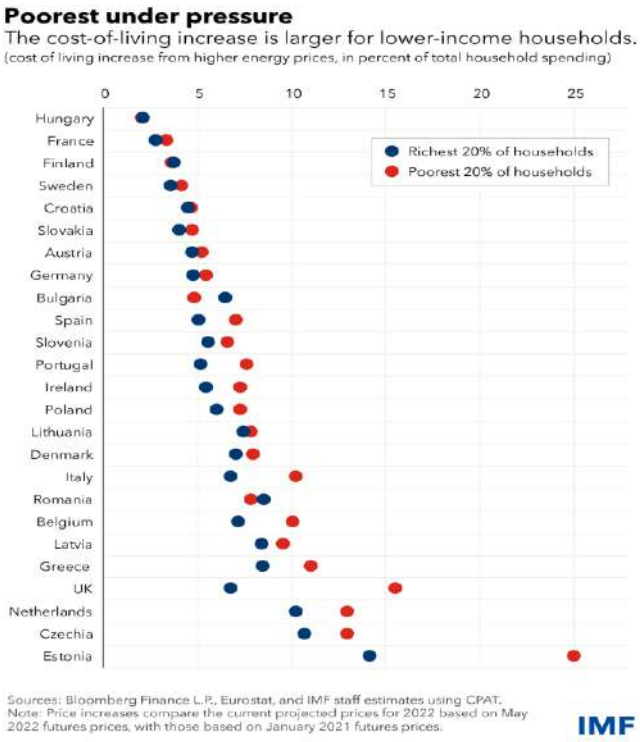

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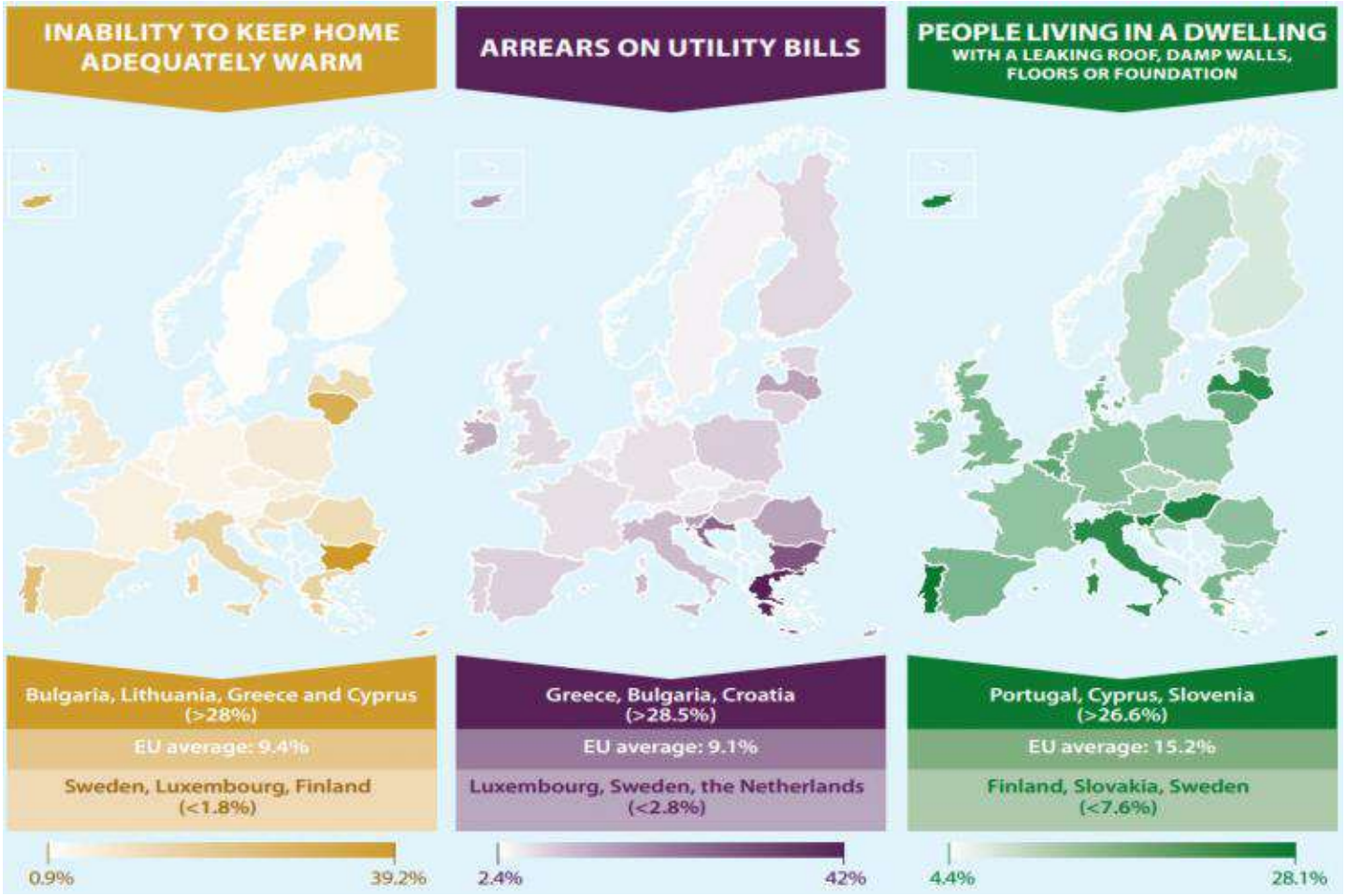


Source: Eurostat, 2020

Energy poverty policy framework in Europe

The Energy Poverty Advisory Hub

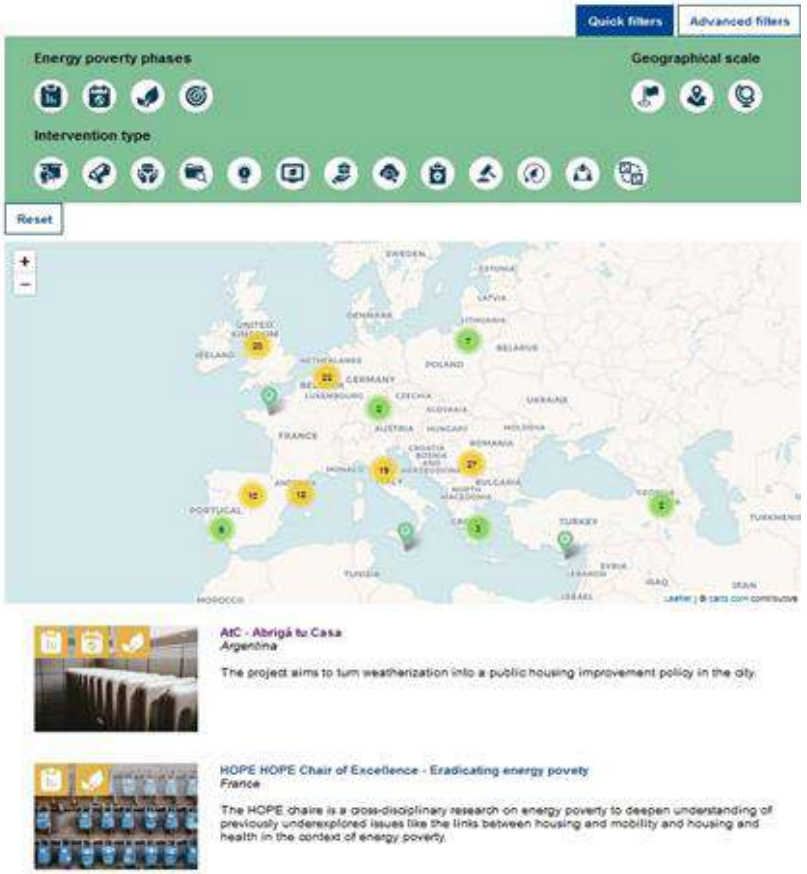
CASE STUDY	Energy Poverty Advisory Hub (EPAH)	REACH
		Pan-European
DESCRIPTION	The Energy Poverty Advisory Hub, the leading EU initiative run by the European Commission at the request of the European Parliament, is a collaborative network of stakeholders aiming to eradicate Energy Poverty and accelerate the just energy transition of European local governments	
Vision and Mision	**Vision** Eradicate energy poverty and accelerate the just energy transition of European local governments **Mission** To be the center of energy poverty experience and expertise in Europe	
APPROACH	By providing direct support, online training, research to local authorities and civil society organisations & by building a collaborative network of all stakeholders interested in taking action to combat energy poverty in Europe.	

Source: EU Energy Poverty Observatory https://www.energypoverty.eu/

Energy poverty policy framework in Europe

The Energy Poverty Advisory Hub – Tools and Activities

- ✓ **The EPAH Atlas:** resources about projects and initiatives in Europe. (POWERPOOR is included)

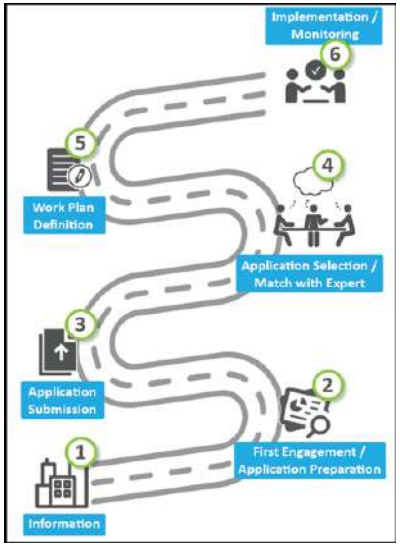


Energy poverty policy framework in Europe

The Energy Poverty Advisory Hub – Tools and Activities

- ✓ **The EPAH Online Training Courses – Certified Trainings**

- ✓ **The EPAH Direct Support**
  - ✓ **Helpdesk, Technical Assistance and Direct Support**



Energy poverty policy framework in Europe

The H2020 "Mitigating Households Energy Poverty" sister projects

POWERPOOR
Empowering Energy Poor Citizens through Joint Energy Initiatives

EnergyMeasures
Tailored Measures Supporting Energy Vulnerable Households

ComAct
Community Tailored Actions for Energy Poverty Mitigation

STEP
Solutions to Tackle Energy Poverty

ImpowerMed
Empowering Women to Take Action Against Energy Poverty in the Mediterranean

ENPOR
Actions to Mitigate Energy Poverty in the Private Rented Sector

SocialWatt
Connecting Obligated Parties to Adopt Innovative Schemes towards Energy Poverty Alleviation

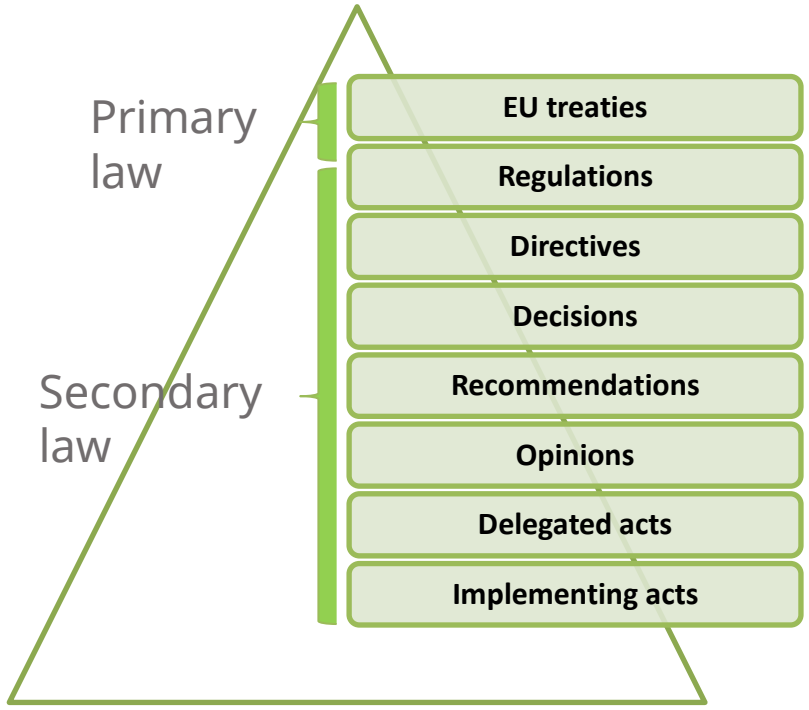
EU energy poverty alleviation policies

1. Types and categories of energy poverty alleviation policies

The rule of law is one of the fundamental values of the European Union. This means that every action taken by the EU is based on treaties that have been democratically approved by its members.

EU laws help the Union achieve objectives established in EU treaties and put EU policies into practice. There are two main types of EU laws:

- ✓ **Primary and secondary laws**
- ✓ **Legislative and non-legislative acts**



Source: https://ec.europa.eu/info/law/law-making-process/types-eu-law_en

EU energy poverty alleviation policies

1. Types and categories of energy poverty alleviation policies

Energy Poverty Handbook (2016)

POLICIES are reflected in different types of measures

- Financial interventions to support payment of bills (short term relief)
- Additional consumer protection for users in the energy retail markets
- Energy efficiency programmes (building efficiency and energy-efficient appliances)
- Information provision and raising awareness

Source: http://bpie.eu/wp-content/uploads/2016/11/energypovertyhandbook-online.pdf

EU energy poverty alleviation policies

Key stakeholders implementing policy measures on a national level in alignment with national and EU policy frameworks

Source: http://bpie.eu/wp-content/uploads/2016/11/energypovertyhandbook-online.pdf

EU energy poverty alleviation policies

2. List of energy poverty alleviation policies at the EU level

Directive (EU) 2018/2002 on energy efficiency

"When designing the measures to fulfil energy saving objectives, Member States should take into account the need to **alleviate energy poverty** in accordance with criteria established by them, and they shall include information about the outcome of measures to alleviate energy poverty"

Directive (EU) 2018/844 on energy performance of buildings

"Member States must outline relevant national measures to help **alleviate energy poverty**, as part of their long-term renovation strategies to support the renovation of the national stock of residential and non-residential buildings"

Regulation (EU) 2018/1999. Governance of the Energy Union and Climate Action

"MS must include an objective of energy poverty alleviation in their National Energy and Climate Action Plans (NECPs)"

Source: https://eur-lex.europa.eu/homepage.html

EU energy poverty alleviation policies
2. List of energy poverty alleviation policies at the EU level

Directive (EU) 2019/944 Internal market for electricity

Article 28 Vulnerable consumers

Policy plans and measures to **alleviate energy poverty** and ensure that vulnerable consumers have access to energy in critical periods but no definition

Article 29 Energy poverty

When assessing the number of households in energy poverty pursuant to point (d) of Article 3(3) of Regulation (EU) 2018/1999, Member States shall establish and publish a set of criteria, which may include low income, high expenditure of disposable income on energy and poor energy efficiency.

Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources

Empowering jointly acting renewables self-consumers also provides opportunities for renewable energy communities to advance energy efficiency at household level and helps fight energy poverty through reduced consumption and lower supply tariffs. Member States should take appropriate advantage of that opportunity by, inter alia, assessing the possibility to enable participation by households that might otherwise not be able to participate, including vulnerable consumers and tenants.

Renovation Wave (Area of intervention 6)

"Using renovation as a lever to address **energy poverty** and access to healthy housing for all households (...). The Commission will launch an Affordable Housing Initiative for 100 lighthouse project and will examine whether and how the EU budget resources alongside EU Emissions Trading System (EU ETS) revenues could be used to fund national energy efficiency and savings schemes."

Source: https://eur-lex.europa.eu/homepage.html

EU energy poverty alleviation policies

2. Most recent developments at EU level

Energy efficiency Directive – article 8

Member States shall ***establish and*** achieve a ***minimum*** share of the required amount of cumulative end-use energy savings among people affected by energy poverty, ***low-income households*****,** vulnerable customers and, where applicable, people living in social housing. This share shall at least equal the proportion of households in energy poverty as assessed in their National Energy and Climate Plan established in accordance with Article 3(3)(d) of the Governance Regulation 2018/1999. ***Member States shall, in their assessment of the share of energy poverty in their National Energy and Climate Plans, consider the indicators referred to in points (a) to (bb) of this subparagraph***. If a Member State had not notified the share of households in energy poverty as assessed in their National Energy and Climate Plan, the share of the required amount of cumulative end-use energy savings among people affected by energy poverty, ***low-income households,*** vulnerable customers and, where applicable, people living in social housing, shall at least equal the arithmetic average share of the following indicators for the year 2019 or, if not available for 2019, for the linear extrapolation of their values for the last three years that are available:

a) Inability to keep home adequately warm

b) Arrears on utility bills; and

(ba) ***total population living in a dwelling with a leaking roof, damp walls, floors or foundation, or rot in window frames or floor***

(bb) ***at-risk-of-poverty rate (Eurostat, SILC and ECHP surveys [ilc_li02]) (cutoff point: 60 % of median equivalised income after social transfers.***

EED article 22

Member States shall implement energy efficiency improvement measures and related consumer protection or information measures, in particular those set out in Article 21 and Article 8(3), as a priority among people affected by energy poverty, vulnerable customers and, where applicable, people living in social housing to alleviate energy poverty.

3. To support vulnerable customers, people affected by energy poverty and, where applicable, people living in social housing, Member States shall: a) implement energy efficiency improvement measures to mitigate distributional effects from other policies and measures, such as taxation measures implemented according to Article 9 of this Directive, or the application of emission trading in the buildings and transport sector according to the ETS Directive b) make the best possible use of public funding available at national and Union level, including, where applicable, the financial contribution Member State received from the Social Climate Fund and revenues from allowance auctions from emission trading pursuant to the EU ETS, for investments into energy efficiency improvement measures as priority actions

EU energy poverty alleviation policies

2. Most recent developments at EU level

Energy Performance of Buildings Directive (EPBD) article 9

Member States shall ensure that residential buildings and building units achieve at the latest
(i) after 1 January 2030, at least energy performance class F; and
(ii) after 1 January 2033, at least energy performance class E;

Article 15

Financial incentives, in the form of grants or guarantees, shall take revenue based parameters into account when allocating financial support to ensure that they target as a priority vulnerable and low income households, people affected by energy poverty and people living in social housing

EU energy poverty alleviation policies

2. Most recent developments at EU level

ETS2

Distributors of fuels and gas for heating will have to purchase CO2 allowances from January 1st 2027.

The amount of CO2 allowances available will decrease over time (-5% every year)

but the price of C02 allowance will be capped at 45€ until 2030

if the current spike in energy prices continues, enforcement will be pushed back a year

SCF

a Social Climate Fund for the period 2026-2032 will be established and finance by a part of the revenues from the ETS Buildings and Transport

The expected amount available from the auctioning is 65 bio€

Each member state would submit to the Commission a 'social climate plan', containing the measures and investments they intend to undertake to cushion the impacts of the new emission trading system on vulnerable households. Such measures could include increasing the energy efficiency of buildings, the renovation of buildings, the decarbonisation of heating and cooling in buildings and the uptake of zero-emission and low-emission mobility and transport, and measures providing direct income support in a

References and further reading

- ✓ POWERPOOR Online Library: http://powerpoor.eu/library
- ✓ Energy Poverty Observatory: https://www.energypoverty.eu
- ✓ Eurostat: https://ec.europa.eu/eurostat

PART II: The POWERPOOR project

- Approach, content and concept of the POWERPOOR project
- Description of the tools developed within the project
- Results and actions until now

The Project at a glance

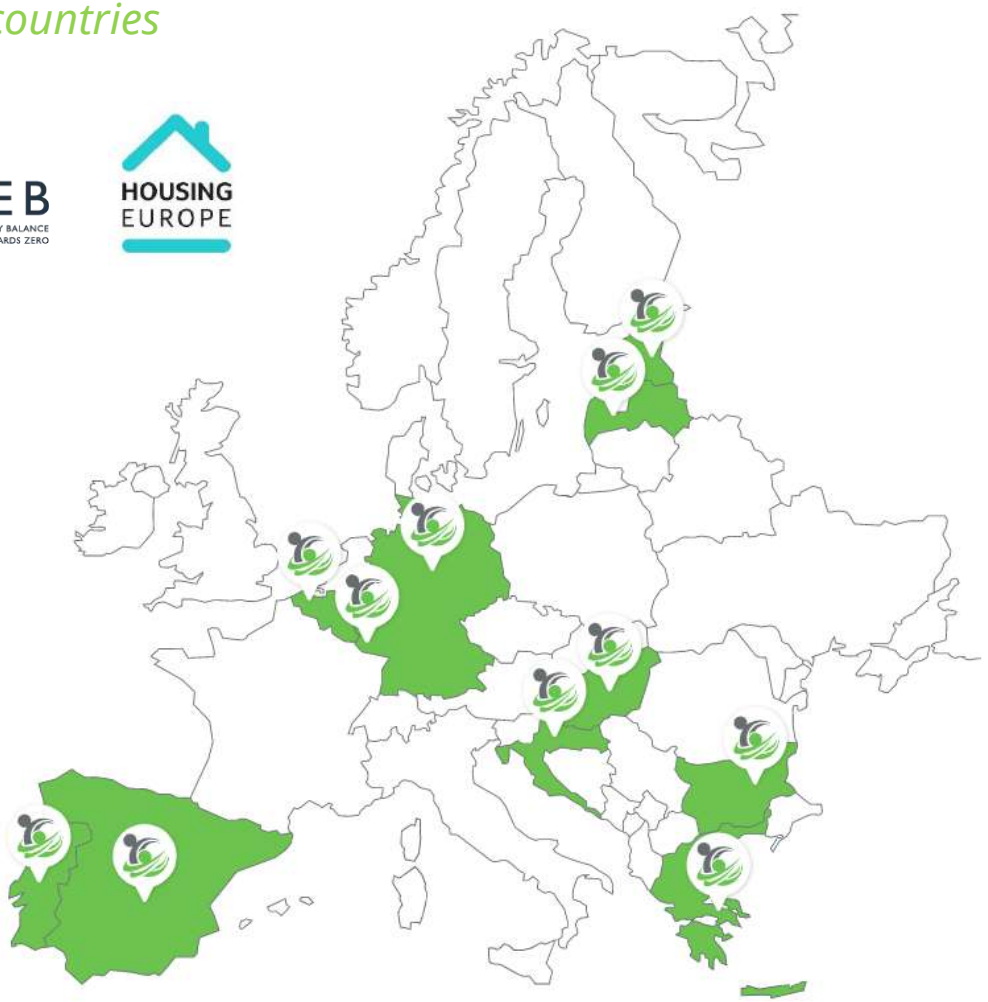
Start: 01/09/2020 Duration: 36 Months	Empowering Energy Poor Citizens through Joint Energy Initiatives	Coordinator: National Technical University of Athens (NTUA) Project partners: 14

European Union's Horizon 2020 Research and Innovation Programme

Budget: €1,999,812.50	Grant Agreement number: 890437 — POWERPOOR — H2020-LC-SC3-2018-2019-2020/ H2020-LC-SC3-EE-2019

The POWERPOOR consortium

14 participating partners – 11 countries
- 8 pilot countries



POWERPOOR leads the way in

Supporting energy poor citizens to implement energy efficiency interventions and participate in joint energy initiatives, through the development of the POWERPOOR support programmes and tools, with the aim to alleviate energy poverty.

Facilitating behavioural change in energy usage and enabling the uptake of energy efficiency measures through experience and knowledge sharing, as well as through joint energy initiatives and citizen engagement campaigns targeting groups of consumers in energy poor communities.

Promoting energy community projects / alternative financing schemes and assisting citizens to pursue funding opportunities (e.g., energy communities, energy cooperatives & crowdfunding).

Energy poverty alleviation support schemes
will be designed, developed and implemented in 8 pilot countries across Europe, led by a network of certified Energy Supporters and Energy Mentors.

Through energy poverty alleviation support schemes
citizens are positioned at the heart of the solution through a gradual transition from an energy poor citizen towards an informed consumer and later an active prosumer.

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Energy Poverty Mitigation Toolkit

Identify citizens suffering from energy poverty

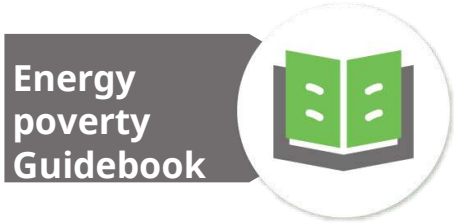
Module 1 - ENPOV

Enable them to understand their energy use

Module 2 - ACTIONS

Communicate innovative financing

Module 3 - FUND



Incorporate energy poverty mitigation actions into SECAPS

Module 4 - PLAN

Training material

The toolkit can be utilised by citizens suffering from energy poverty, public and national authorities, energy communities or cooperatives, experts in the field, or other stakeholders

Energy poverty support programmes

In each pilot country, energy poor households and citizens will be identified, leveraging the knowledge of the local partners (**POWER-TARGET**).

Energy support programmes will be developed by a certified network of **Energy Supporters**, who will provide energy poor citizens :

(a) Tips and information to encourage behaviour change and/or small-scale interventions (**POWER-ACT**), in addition to

(b) Information on how to take part in innovative financing schemes such as energy communities, cooperatives and crowdfunding campaigns to fund interventions that can alleviate the problem (**POWER-FUND**).

Local Energy Poverty Alleviation Offices will be established in the participating municipalities, run by a certified network of **Energy Mentors**

Energy Supporters *will directly engage energy-poor citizens and assist them in planning, securing funding and implementing energy efficiency interventions.*
Energy Mentors *will provide support and expertise in all the key areas associated to the operation and/or creation of an energy community / cooperative of energy poor citizens.*

Engagement activities

- ✓ **Group training seminars** and **a series of webinars** will be organised in the 8 pilot countries (Bulgaria, Croatia, Estonia, Greece, Hungary, Latvia, Portugal and Spain) so that interested individuals can become **Energy Supporters and/or Energy Mentors**.

- ✓ Through **face-to-face (F2F) tailor-made training seminars**, the local project partners will also train representatives from cities and regions, members of energy communities/cooperatives and other social service organisations, facilitating the establishment of Local Energy Poverty Offices that can operate as focal points on energy poverty.

Interested individuals may include public authorities (employees of local and regional authorities), members of existing communities/cooperatives, social workers, local consultants, professionals and entrepreneurs in the field of sustainable energy, health practitioners, university graduates and young scientists.

Expected results

- ✓ A total of **1.100 Energy Supporters and Energy Mentors** trained and certified.
- ✓ Establishment of **15 Energy Poverty Alleviation offices**.
- ✓ **8 National Roadmaps** in 8 European countries (Bulgaria, Croatia, Greece, Latvia, Estonia, Portugal, Spain) recommending policies to tackle energy poverty.
- ✓ **1 European Roadmap** aiming to alleviate energy poverty across Europe.
- ✓ Establishment of the **POWERPOOR Alliance** network to support the sustainability of the project results after its completion.

The role of Energy Supporters and Mentors

Energy Supporters

Engage with households and energy poor citizens directly and help them to understand their energy spending, to plan small scale energy efficiency interventions, to adopt behavioural changes that will help them lower their energy consumption and expenses and guide them to further mitigate energy poverty using joint energy initiatives and innovative financing schemes.

Energy Mentors

They are providing support in all the areas that are related with setting up and operating an energy community or cooperative and leveraging innovative financing schemes in a municipality, city, or region level to mitigate energy poverty.

The role of Energy Supporters and Mentors

- ✓ Growing ecosystem of energy communities and of the notion of prosumers across EU, need of people with knowledge.
- ✓ Municipalities, cities, and regions will need guidance in leveraging innovative financing schemes.
- ✓ Energy Supporters and Mentors get a wider view of the energy poverty issue and how it can be addressed with joint energy initiatives leveraging innovative financing schemes.
- ✓ Becoming part of a pan European network that fosters synergies, knowledge and experience exchange

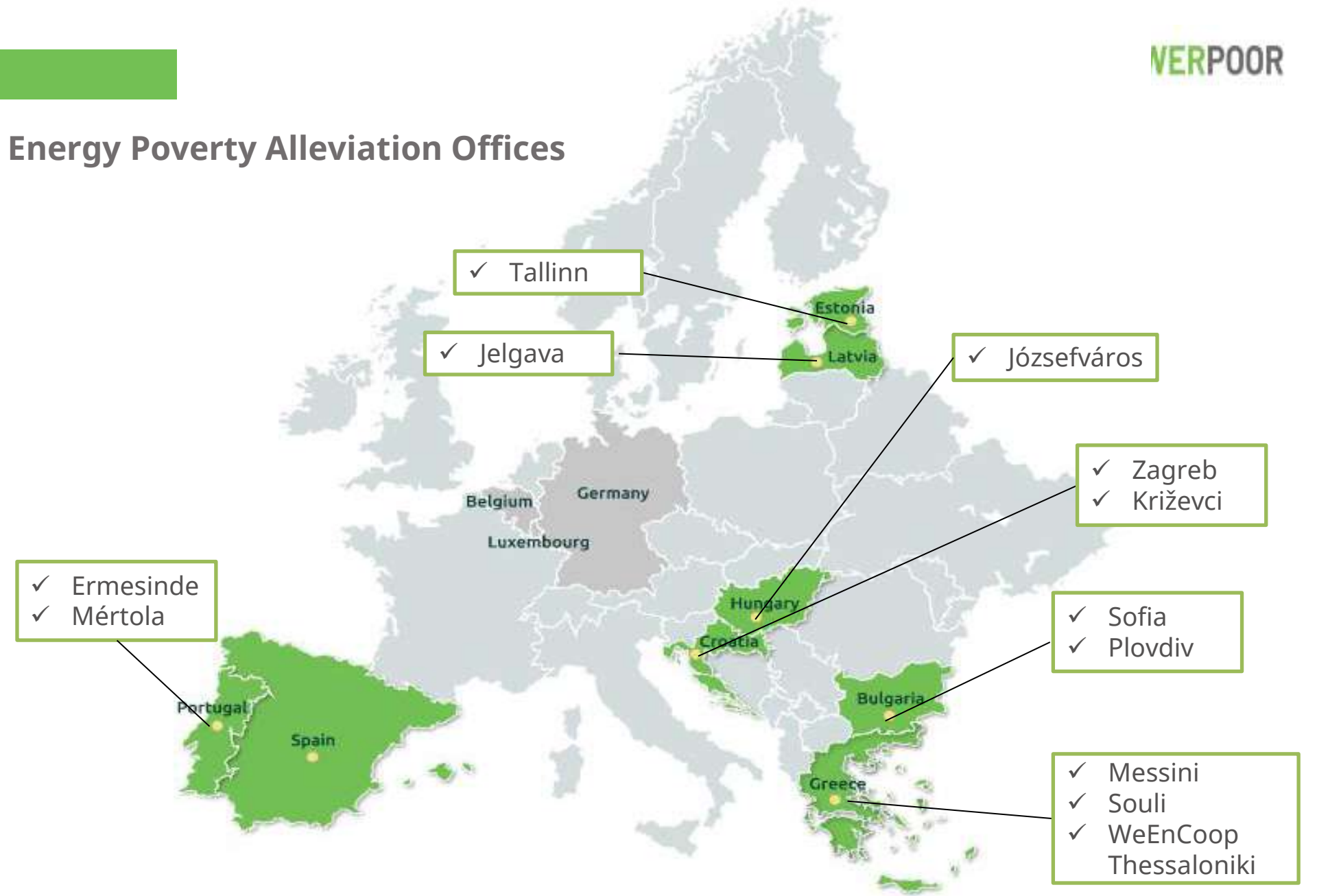
In a nutshell

- ✓ More than 750 people have attended the 35 training seminars across EU
- ✓ More than 550 people became certified Energy Supporters and Mentors
- ✓ 1400 interactions in the tools
- ✓ Support of about 8.000 households in 52 municipalities, 10 of which have also established an Energy Poverty Alleviation Office
- ✓ More than 700 home visits in energy poor households
- ✓ 15 info days with more than 550 attendees
- ✓ Presentations in 58 events with 30.000 attendees across Europe

Training Seminars

Energy Supporters and Mentors in action

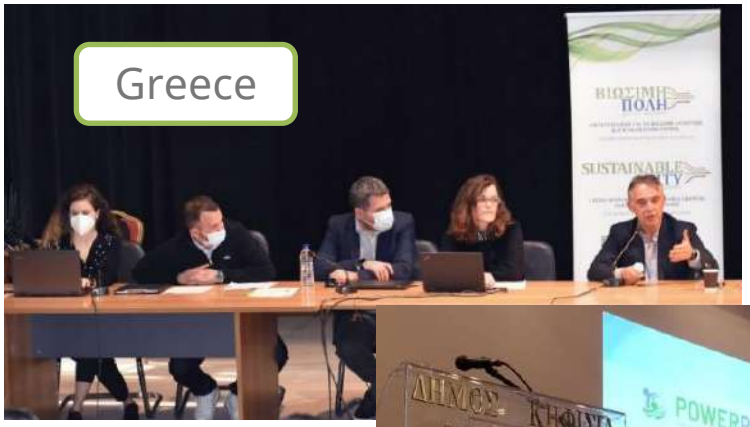
Energy Poverty Alleviation Offices



Energy Poverty Alleviation Offices

Latvia

Info days



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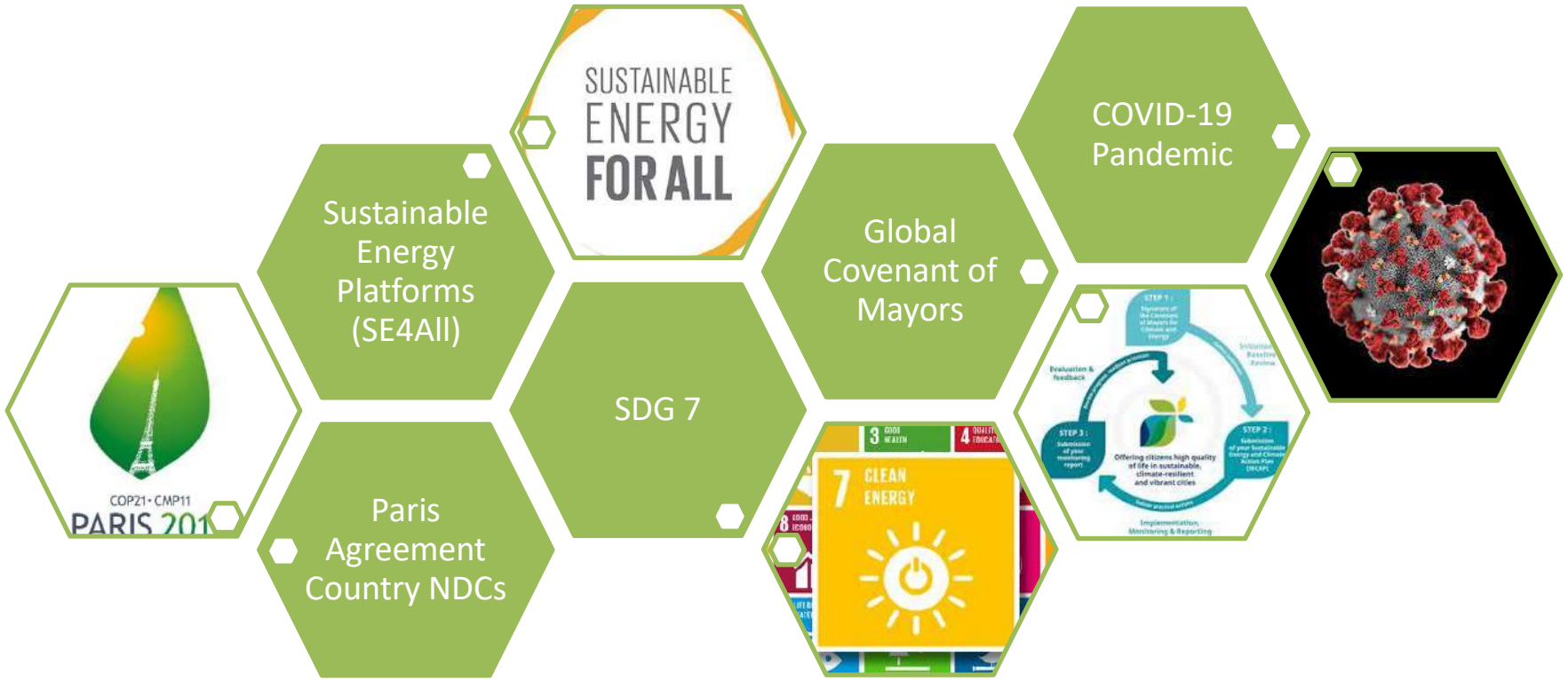
Energy Poverty in the Global Sustainability Agenda



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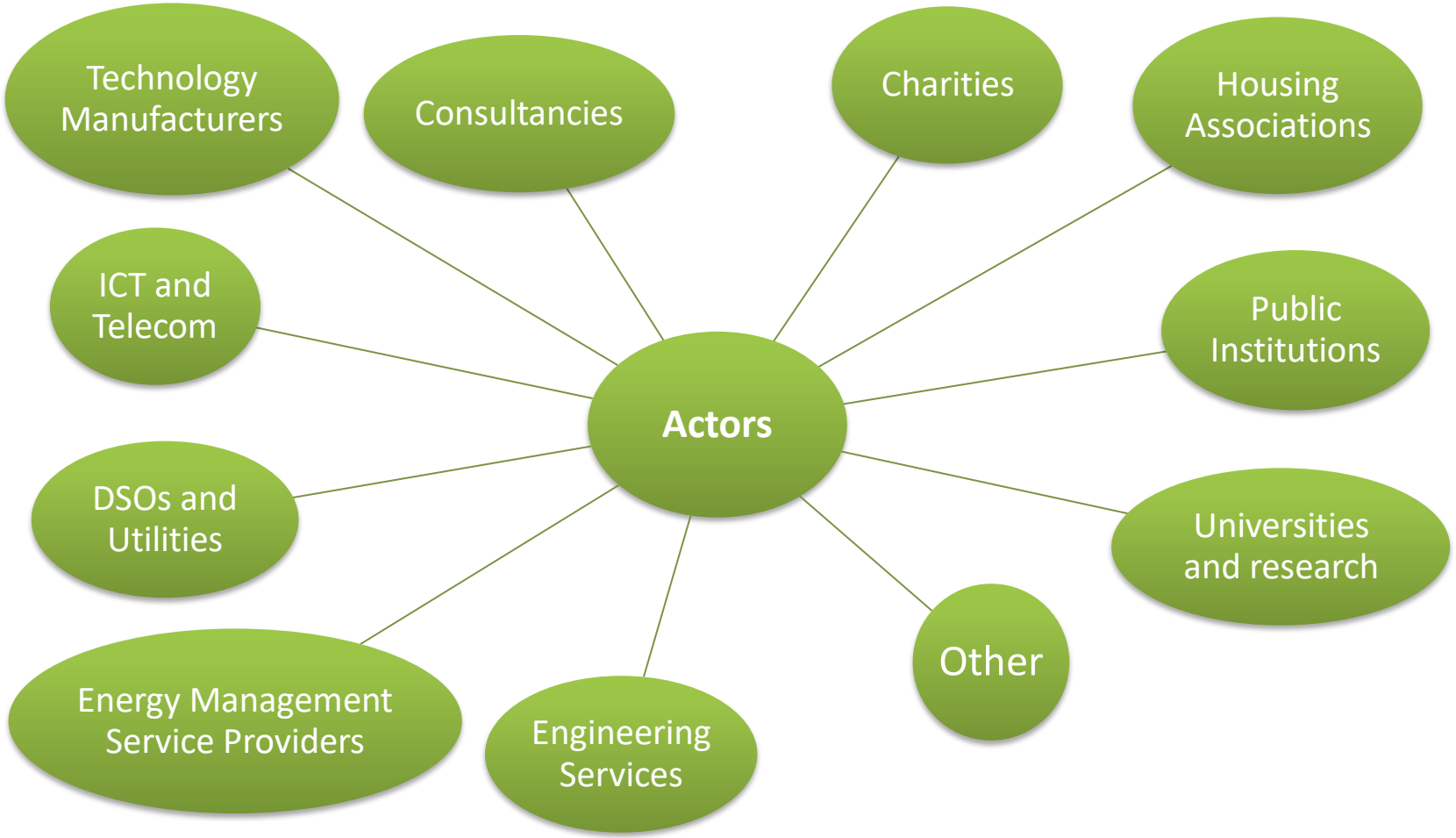

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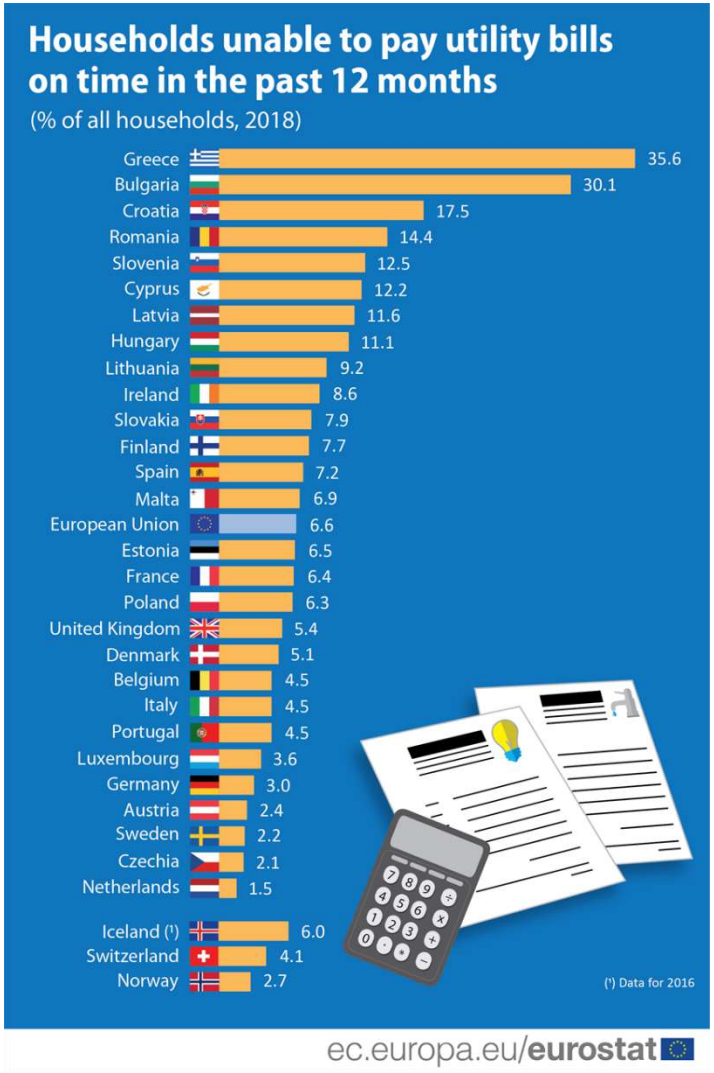

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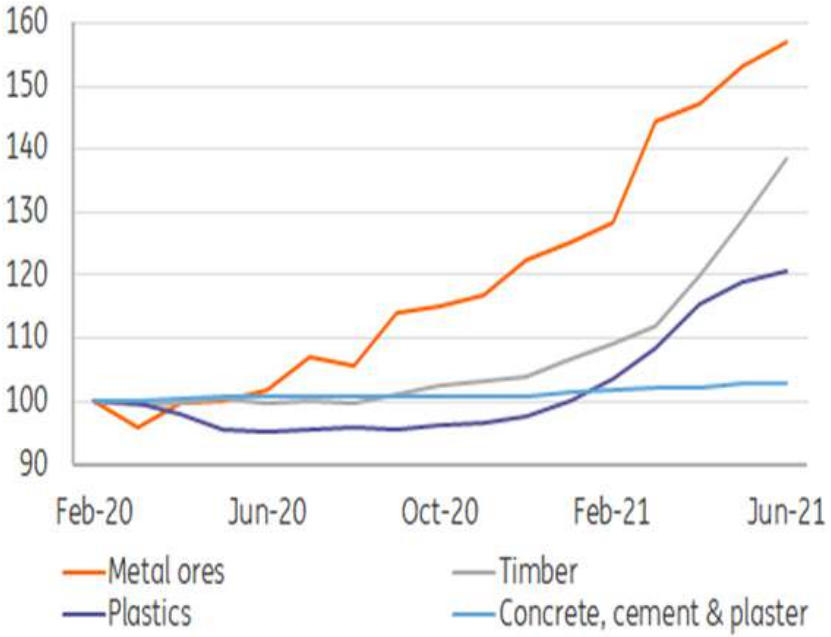

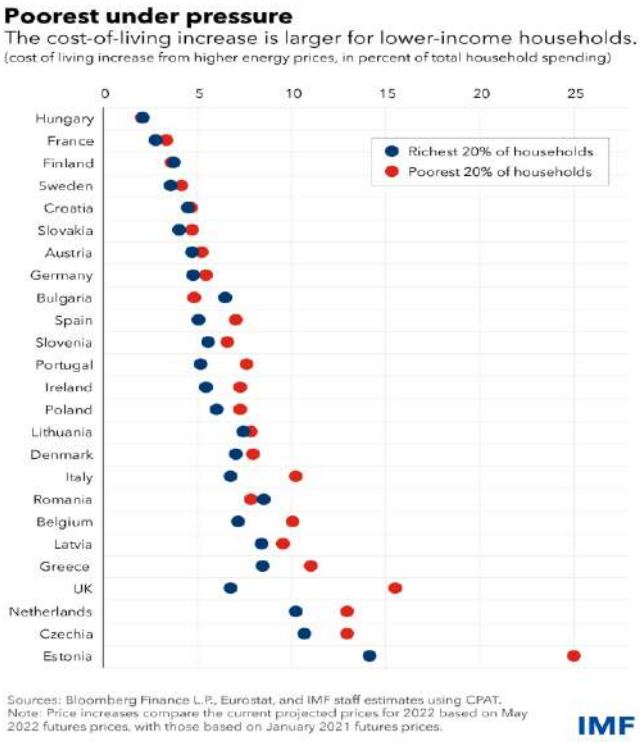

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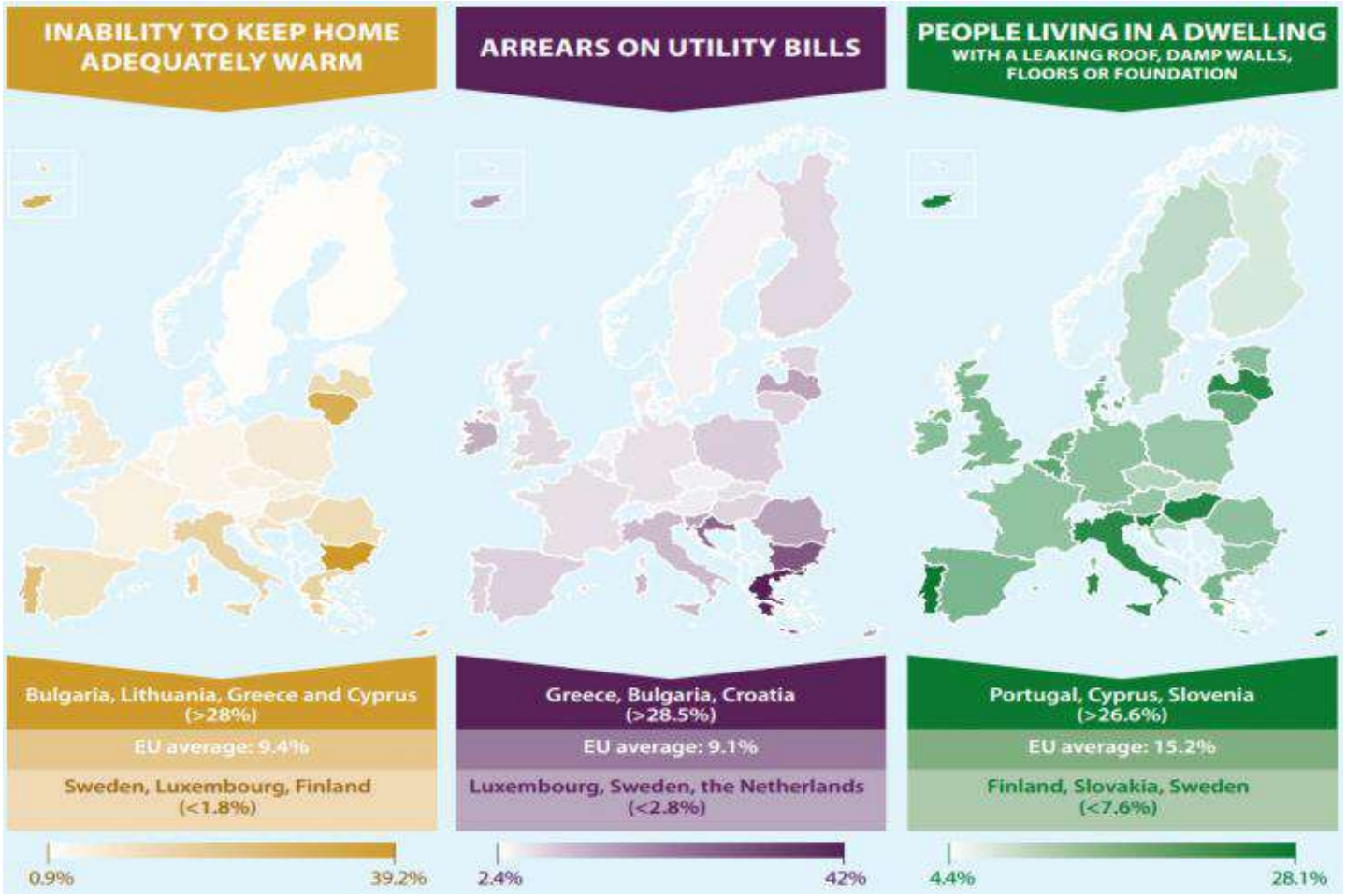

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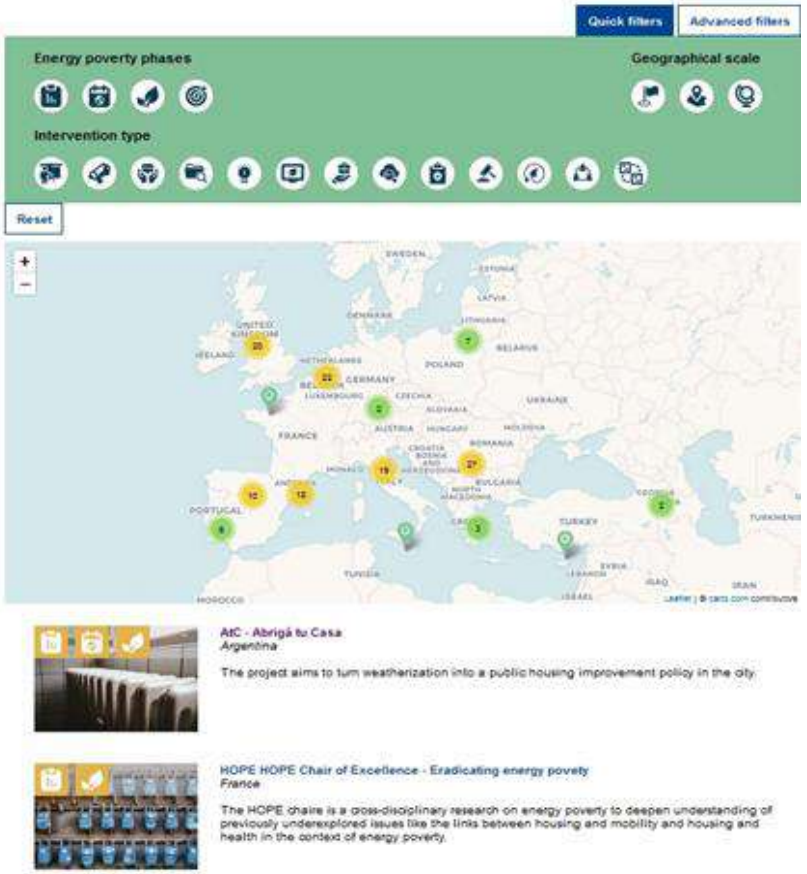
Vision and Mision	**Vision** Eradicate energy poverty and accelerate the just energy transition of European local governments **Mission** To be the center of energy poverty experience and expertise in Europe	
APPROACH	By providing direct support, online training, research to local authorities and civil society organisations & by building a collaborative network of all stakeholders interested in taking action to combat energy poverty in Europe.	

Source: EU Energy Poverty Observatory https://www.energypoverty.eu/

Energy poverty policy framework in Europe

The Energy Poverty Advisory Hub – Tools and Activities

- ✓ **The EPAH Atlas:** resources about projects and initiatives in Europe. (POWERPOOR is included)

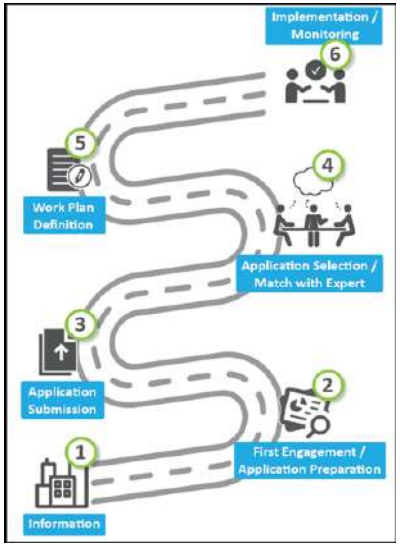


Energy poverty policy framework in Europe

The Energy Poverty Advisory Hub – Tools and Activities

- ✓ **The EPAH Online Training Courses – Certified Trainings**

- ✓ **The EPAH Direct Support**
  - ✓ **Helpdesk, Technical Assistance and Direct Support**



Energy poverty policy framework in Europe

The H2020 "Mitigating Households Energy Poverty" sister projects

POWERPOOR
Empowering Energy Poor Citizens through Joint Energy Initiatives

EnergyMeasures
Tailored Measures Supporting Energy Vulnerable Households

ComAct
Community Tailored Actions for Energy Poverty Mitigation

STEP
Solutions to Tackle Energy Poverty

ImpowerMed
Empowering Women to Take Action Against Energy Poverty in the Mediterranean

ENPOR
Actions to Mitigate Energy Poverty in the Private Rented Sector

SocialWatt
Connecting Obligated Parties to Adopt Innovative Schemes towards Energy Poverty Alleviation

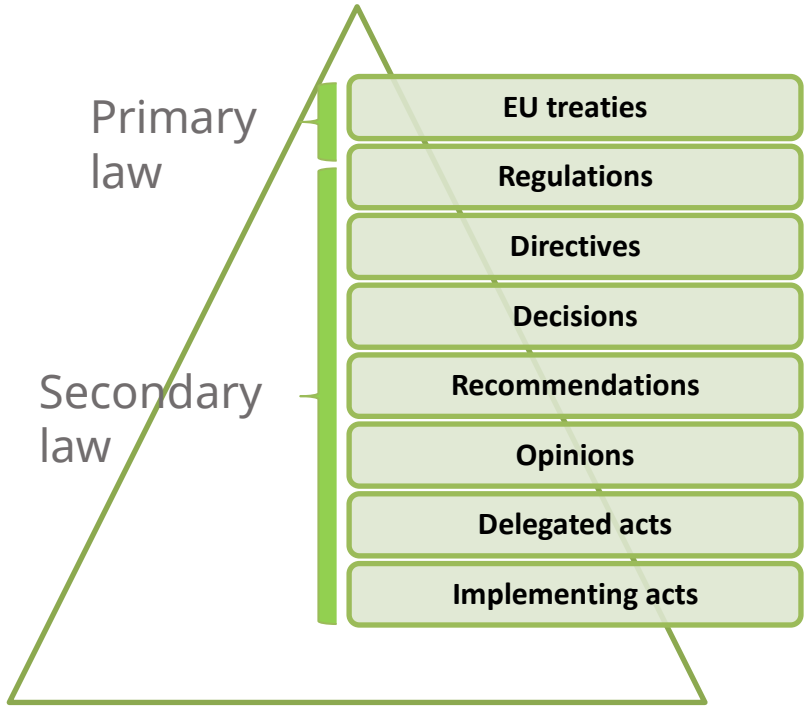
EU energy poverty alleviation policies

1. Types and categories of energy poverty alleviation policies

The rule of law is one of the fundamental values of the European Union. This means that every action taken by the EU is based on treaties that have been democratically approved by its members.

EU laws help the Union achieve objectives established in EU treaties and put EU policies into practice. There are two main types of EU laws:

- ✓ **Primary and secondary laws**
- ✓ **Legislative and non-legislative acts**



Source: https://ec.europa.eu/info/law/law-making-process/types-eu-law_en

EU energy poverty alleviation policies

1. Types and categories of energy poverty alleviation policies

Energy Poverty Handbook (2016)

POLICIES are reflected in different types of measures

- Financial interventions to support payment of bills (short term relief)
- Additional consumer protection for users in the energy retail markets
- Energy efficiency programmes (building efficiency and energy-efficient appliances)
- Information provision and raising awareness

Source: http://bpie.eu/wp-content/uploads/2016/11/energypovertyhandbook-online.pdf

EU energy poverty alleviation policies

Key stakeholders implementing policy measures on a national level in alignment with national and EU policy frameworks

Source: http://bpie.eu/wp-content/uploads/2016/11/energypovertyhandbook-online.pdf

EU energy poverty alleviation policies

2. List of energy poverty alleviation policies at the EU level

Directive (EU) 2018/2002 on energy efficiency

"When designing the measures to fulfil energy saving objectives, Member States should take into account the need to **alleviate energy poverty** in accordance with criteria established by them, and they shall include information about the outcome of measures to alleviate energy poverty"

Directive (EU) 2018/844 on energy performance of buildings

"Member States must outline relevant national measures to help **alleviate energy poverty**, as part of their long-term renovation strategies to support the renovation of the national stock of residential and non-residential buildings"

Regulation (EU) 2018/1999. Governance of the Energy Union and Climate Action

"MS must include an objective of energy poverty alleviation in their National Energy and Climate Action Plans (NECPs)"

Source: https://eur-lex.europa.eu/homepage.html

EU energy poverty alleviation policies

2. List of energy poverty alleviation policies at the EU level

Directive (EU) 2019/944 Internal market for electricity

Policy plans and measures to **alleviate energy poverty** and ensure that vulnerable consumers have access to energy in critical periods but no definition

Article 29 Energy poverty

When assessing the number of households in energy poverty pursuant to point (d) of Article 3(3) of Regulation (EU) 2018/1999, Member States shall establish and publish a set of criteria, which may include low income, high expenditure of disposable income on energy and poor energy efficiency.

Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources

Empowering jointly acting renewables self-consumers also provides opportunities for renewable energy communities to advance energy efficiency at household level and helps fight energy poverty through reduced consumption and lower supply tariffs. Member States should take appropriate advantage of that opportunity by, inter alia, assessing the possibility to enable participation by households that might otherwise not be able to participate, including vulnerable consumers and tenants.

Renovation Wave (Area of intervention 6)

"Using renovation as a lever to address **energy poverty** and access to healthy housing for all households (...). The Commission will launch an Affordable Housing Initiative for 100 lighthouse project and will examine whether and how the EU budget resources alongside EU Emissions Trading System (EU ETS) revenues could be used to fund national energy efficiency and savings schemes."

Source: https://eur-lex.europa.eu/homepage.html

EU energy poverty alleviation policies

2. Most recent developments at EU level

- ✓ July 2021 the EC announced its Fit for 55 package, designed to deliver 55% emissions reductions by 2030, tackle energy poverty and ultimately make Europe the “first carbon neutral continent by 2050”

- ✓ Including a new Social Climate Fund that will provide dedicated funding to Member States to support European citizens most affected or at risk of energy poverty.

EU energy poverty alleviation policies

2. Most recent developments at EU level

Energy efficiency Directive – article 8

Member States shall ***establish and*** achieve a ***minimum*** share of the required amount of cumulative end-use energy savings among people affected by energy poverty, ***low-income households*****,** vulnerable customers and, where applicable, people living in social housing. This share shall at least equal the proportion of households in energy poverty as assessed in their National Energy and Climate Plan established in accordance with Article 3(3)(d) of the Governance Regulation 2018/1999. ***Member States shall, in their assessment of the share of energy poverty in their National Energy and Climate Plans, consider the indicators referred to in points (a) to (bb) of this subparagraph***. If a Member State had not notified the share of households in energy poverty as assessed in their National Energy and Climate Plan, the share of the required amount of cumulative end-use energy savings among people affected by energy poverty, ***low-income households,*** vulnerable customers and, where applicable, people living in social housing, shall at least equal the arithmetic average share of the following indicators for the year 2019 or, if not available for 2019, for the linear extrapolation of their values for the last three years that are available:

a) Inability to keep home adequately warm

b) Arrears on utility bills; and

(ba) ***total population living in a dwelling with a leaking roof, damp walls, floors or foundation, or rot in window frames or floor***

(bb) ***at-risk-of-poverty rate (Eurostat, SILC and ECHP surveys [ilc_li02]) (cutoff point: 60 % of median equivalised income after social transfers.***

EED article 22

Member States shall implement energy efficiency improvement measures and related consumer protection or information measures, in particular those set out in Article 21 and Article 8(3), as a priority among people affected by energy poverty, vulnerable customers and, where applicable, people living in social housing to alleviate energy poverty.

3. To support vulnerable customers, people affected by energy poverty and, where applicable, people living in social housing, Member States shall: a) implement energy efficiency improvement measures to mitigate distributional effects from other policies and measures, such as taxation measures implemented according to Article 9 of this Directive, or the application of emission trading in the buildings and transport sector according to the ETS Directive b) make the best possible use of public funding available at national and Union level, including, where applicable, the financial contribution Member State received from the Social Climate Fund and revenues from allowance auctions from emission trading pursuant to the EU ETS, for investments into energy efficiency improvement measures as priority actions

EU energy poverty alleviation policies

2. Most recent developments at EU level

Energy Performance of Buildings Directive (EPBD) article 9

Member States shall ensure that residential buildings and building units achieve at the latest
(i) after 1 January 2030, at least energy performance class F; and
(ii) after 1 January 2033, at least energy performance class E;

References and further reading

- ✓ POWERPOOR Online Library: http://powerpoor.eu/library
- ✓ Energy Poverty Observatory: https://www.energypoverty.eu
- ✓ Eurostat: https://ec.europa.eu/eurostat

PART II: The POWERPOOR project

- Approach, content and concept of the POWERPOOR project
- Description of the tools developed within the project
- Results and actions until now

The Project at a glance

Start: 01/09/2020

Duration:
36 Months

Empowering Energy Poor Citizens through Joint Energy Initiatives

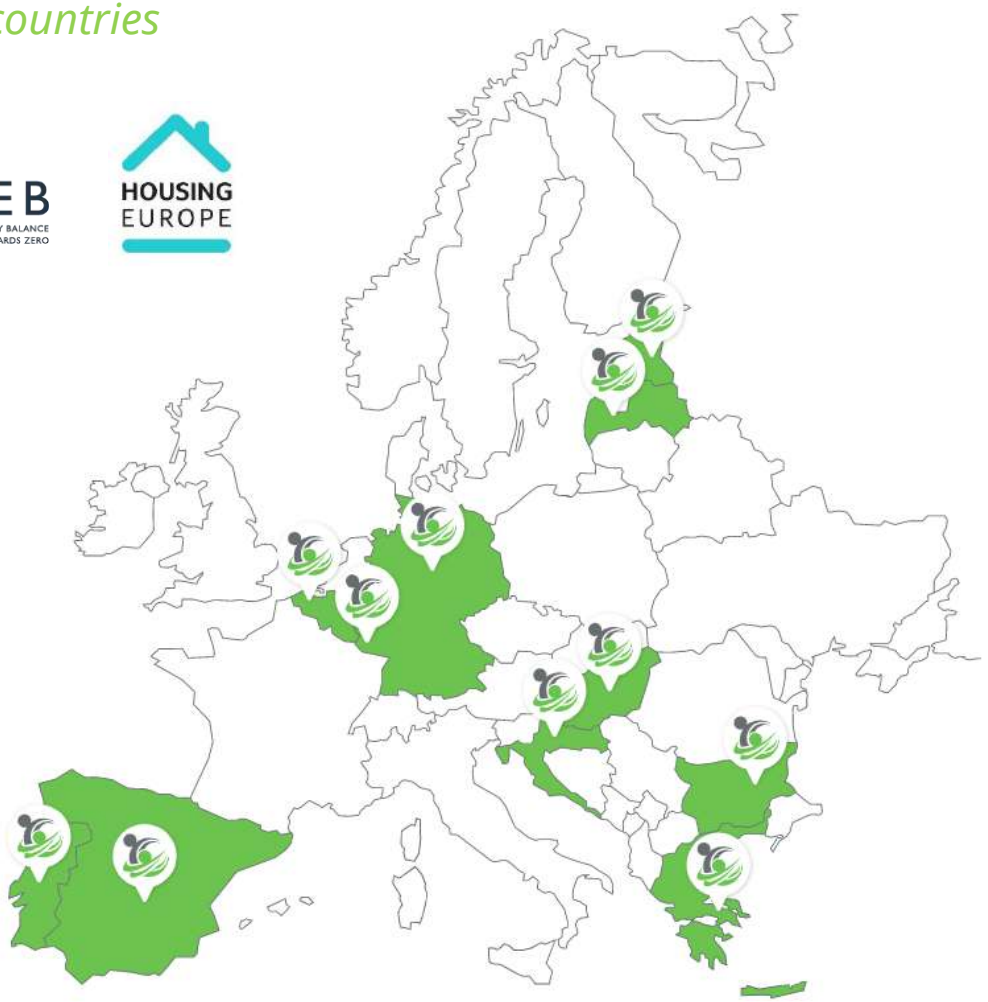
Coordinator:
National Technical University of Athens (NTUA)
Project partners: 14

European Union's Horizon 2020 Research and Innovation Programme

Grant Agreement number:
890437 — POWERPOOR —
H2020-LC-SC3-2018-2019-2020/
H2020-LC-SC3-EE-2019

The POWERPOOR consortium

14 participating partners – 11 countries
- 8 pilot countries



POWERPOOR leads the way in

Supporting energy poor citizens to implement energy efficiency interventions and participate in joint energy initiatives, through the development of the POWERPOOR support programmes and tools, with the aim to alleviate energy poverty.

Facilitating behavioural change in energy usage and enabling the uptake of energy efficiency measures through experience and knowledge sharing, as well as through joint energy initiatives and citizen engagement campaigns targeting groups of consumers in energy poor communities.

Promoting energy community projects / alternative financing schemes and assisting citizens to pursue funding opportunities (e.g., energy communities, energy cooperatives & crowdfunding).

Energy poverty alleviation support schemes
will be designed, developed and implemented in 8 pilot countries across Europe, led by a network of certified Energy Supporters and Energy Mentors.

Through energy poverty alleviation support schemes
citizens are positioned at the heart of the solution through a gradual transition from an energy poor citizen towards an informed consumer and later an active prosumer.

POWERPOOR

Energy Poverty Mitigation Toolkit

Identify citizens suffering from energy poverty

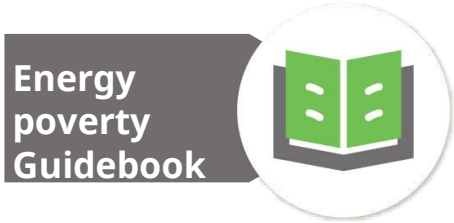
Module 1 - ENPOV

Enable them to understand their energy use

Module 2 - ACTIONS

Communicate innovative financing

Module 3 - FUND



Incorporate energy poverty mitigation actions into SECAPS

Module 4 - PLAN

Training material

The toolkit can be utilised by citizens suffering from energy poverty, public and national authorities, energy communities or cooperatives, experts in the field, or other stakeholders

Energy poverty support programmes

In each pilot country, energy poor households and citizens will be identified, leveraging the knowledge of the local partners (**POWER-TARGET**).

Energy support programmes will be developed by a certified network of **Energy Supporters**, who will provide energy poor citizens :

(a) Tips and information to encourage behaviour change and/or small-scale interventions (**POWER-ACT**), in addition to

(b) Information on how to take part in innovative financing schemes such as energy communities, cooperatives and crowdfunding campaigns to fund interventions that can alleviate the problem (**POWER-FUND**).

Local Energy Poverty Alleviation Offices will be established in the participating municipalities, run by a certified network of **Energy Mentors**

Energy Supporters *will directly engage energy-poor citizens and assist them in planning, securing funding and implementing energy efficiency interventions.*
Energy Mentors *will provide support and expertise in all the key areas associated to the operation and/or creation of an energy community / cooperative of energy poor citizens.*

Engagement activities

- ✓ **Group training seminars** and **a series of webinars** will be organised in the 8 pilot countries (Bulgaria, Croatia, Estonia, Greece, Hungary, Latvia, Portugal and Spain) so that interested individuals can become **Energy Supporters and/or Energy Mentors**.

- ✓ Through **face-to-face (F2F) tailor-made training seminars**, the local project partners will also train representatives from cities and regions, members of energy communities/cooperatives and other social service organisations, facilitating the establishment of Local Energy Poverty Offices that can operate as focal points on energy poverty.

Interested individuals may include public authorities (employees of local and regional authorities), members of existing communities/cooperatives, social workers, local consultants, professionals and entrepreneurs in the field of sustainable energy, health practitioners, university graduates and young scientists.

Expected results

- ✓ A total of **1.100 Energy Supporters and Energy Mentors** trained and certified.
- ✓ Establishment of **15 Energy Poverty Alleviation offices**.
- ✓ **8 National Roadmaps** in 8 European countries (Bulgaria, Croatia, Greece, Latvia, Estonia, Portugal, Spain) recommending policies to tackle energy poverty.
- ✓ **1 European Roadmap** aiming to alleviate energy poverty across Europe.
- ✓ Establishment of the **POWERPOOR Alliance** network to support the sustainability of the project results after its completion.

The role of Energy Supporters and Mentors

Energy Supporters

Engage with households and energy poor citizens directly and help them to understand their energy spending, to plan small scale energy efficiency interventions, to adopt behavioural changes that will help them lower their energy consumption and expenses and guide them to further mitigate energy poverty using joint energy initiatives and innovative financing schemes.

Energy Mentors

They are providing support in all the areas that are related with setting up and operating an energy community or cooperative and leveraging innovative financing schemes in a municipality, city, or region level to mitigate energy poverty.

The role of Energy Supporters and Mentors

- ✓ Growing ecosystem of energy communities and of the notion of prosumers across EU, need of people with knowledge.
- ✓ Municipalities, cities, and regions will need guidance in leveraging innovative financing schemes.
- ✓ Energy Supporters and Mentors get a wider view of the energy poverty issue and how it can be addressed with joint energy initiatives leveraging innovative financing schemes.
- ✓ Becoming part of a pan European network that fosters synergies, knowledge and experience exchange

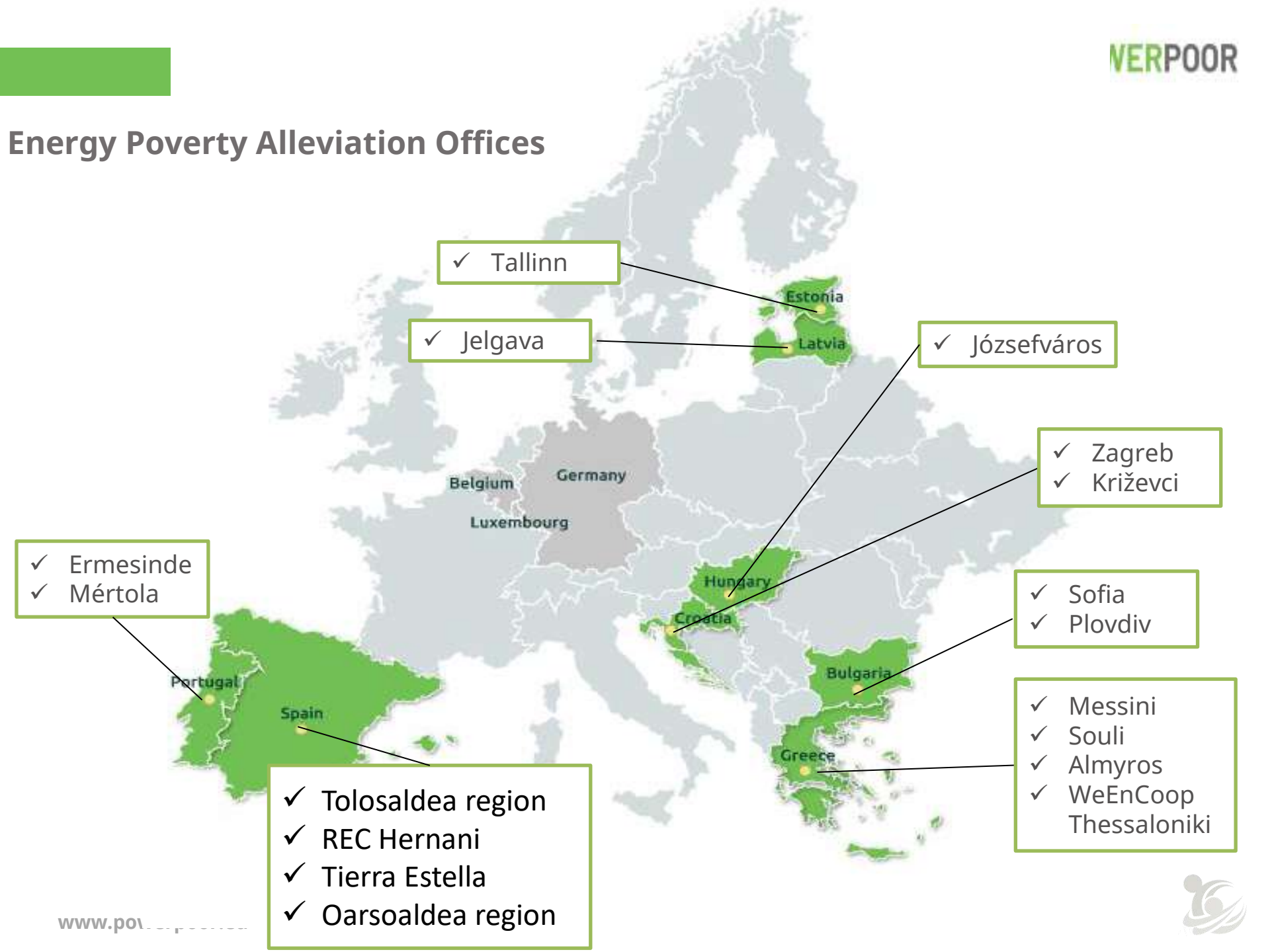
In a nutshell

- ✓ More than 1600 people have attended the 51 training seminars across EU
- ✓ More than 950 people have become certified Energy Supporters and Mentors
- ✓ 2600 interactions in the tools
- ✓ Support of about 8.000 households in 52 municipalities, 17 of which have also established an Energy Poverty Alleviation Office
- ✓ More than 900 home visits in energy poor households
- ✓ 18 info days with more than 550 attendees
- ✓ Presentations in more than 70events with 30.000 attendees across Europe

Training Seminars

Energy Supporters and Mentors in action

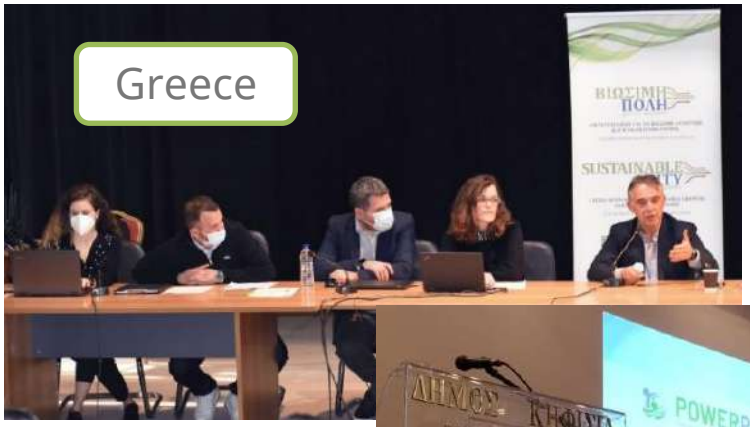
Energy Poverty Alleviation Offices



Energy Poverty Alleviation Offices

Latvia

Info days



POWERPOOR

Thank you!

This project has received funding from the European Union's HORIZON 2020 research and innovation programme under grant agreement No 890437

POWERPOOR

Empowering Energy Poor Citizens through Joint Energy Initiatives

Part II - The POWERPOOR toolkit
The POWER-TARGET and POWER-ACT tools

Eleni Kanellou NTUA, Greece

26 of January 2023

This project has received funding from the European Union's HORIZON 2020 research and innovation programme under grant agreement No 890437

Module 1 – Goals

- To familiarise the audience with the POWERPOOR Toolkit and in particular the two tools POWER TARGET and POWER ACT

- Provide practical examples of how to fill them in

- Provide “Read the utility bills” exercises

The POWER-TARGET and POWER-ACT

- The POWERPOOR toolkit
- The POWER-TARGET tool
- The POWER-ACT tool
- Exercises for the proper use of the POWERTARGET and POWERACT tools

The POWERPOOR Toolkit

POWER TARGET

Identify energy poor citizens with a simple data driven approach

POWER ACT

Enable them to understand their energy use and propose tips and tricks to enhance energy efficiency

POWER FUND

Communicate innovative financing – Energy Communities /Cooperatives and Crowdfunding

Energy poverty Guidebook

Incorporate energy poverty mitigation actions into SECAPS – the Energy Poverty Guidebook for Energy Planning

Energy Poverty Mitigation Toolkit

POWER - TARGET

The **POWER-TARGET** toolkit will:

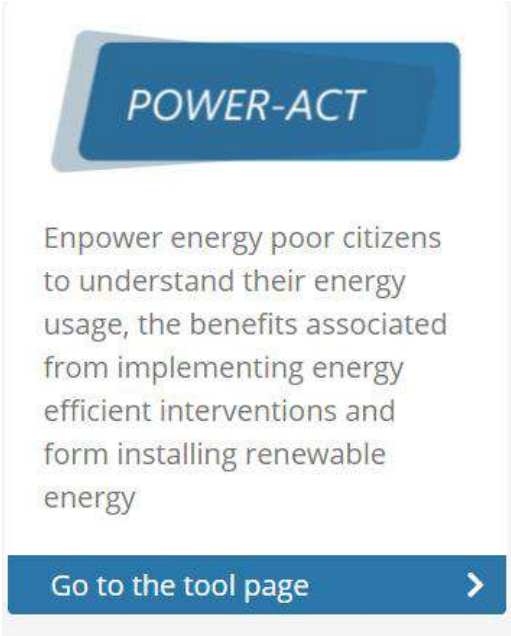
- ✓ Identify citizens suffering from energy poverty using a data-driven approach that facilitates the identification of citizens, communities, neighborhoods or districts and
- ✓ Undertake quantitative and qualitative analyses to support the development of the **POWER-TARGET** tool.

Energy Poverty Mitigation Toolkit

POWER - ACT

The **POWER-ACT** toolkit will:

- ✓ Empower citizens suffering from energy poverty to understand their energy use, the benefits associated with energy efficiency interventions and encouraging the installation of renewable power generation capacities,
- ✓ Evaluate users' thermal comfort,
- ✓ Create energy profiles,
- ✓ Evaluate costs and benefits of energy efficiency actions (e.g., payback period), and
- ✓ Encourage behaviour change (e.g., smart tips).



Energy Poverty Mitigation Toolkit

POWER - FUND

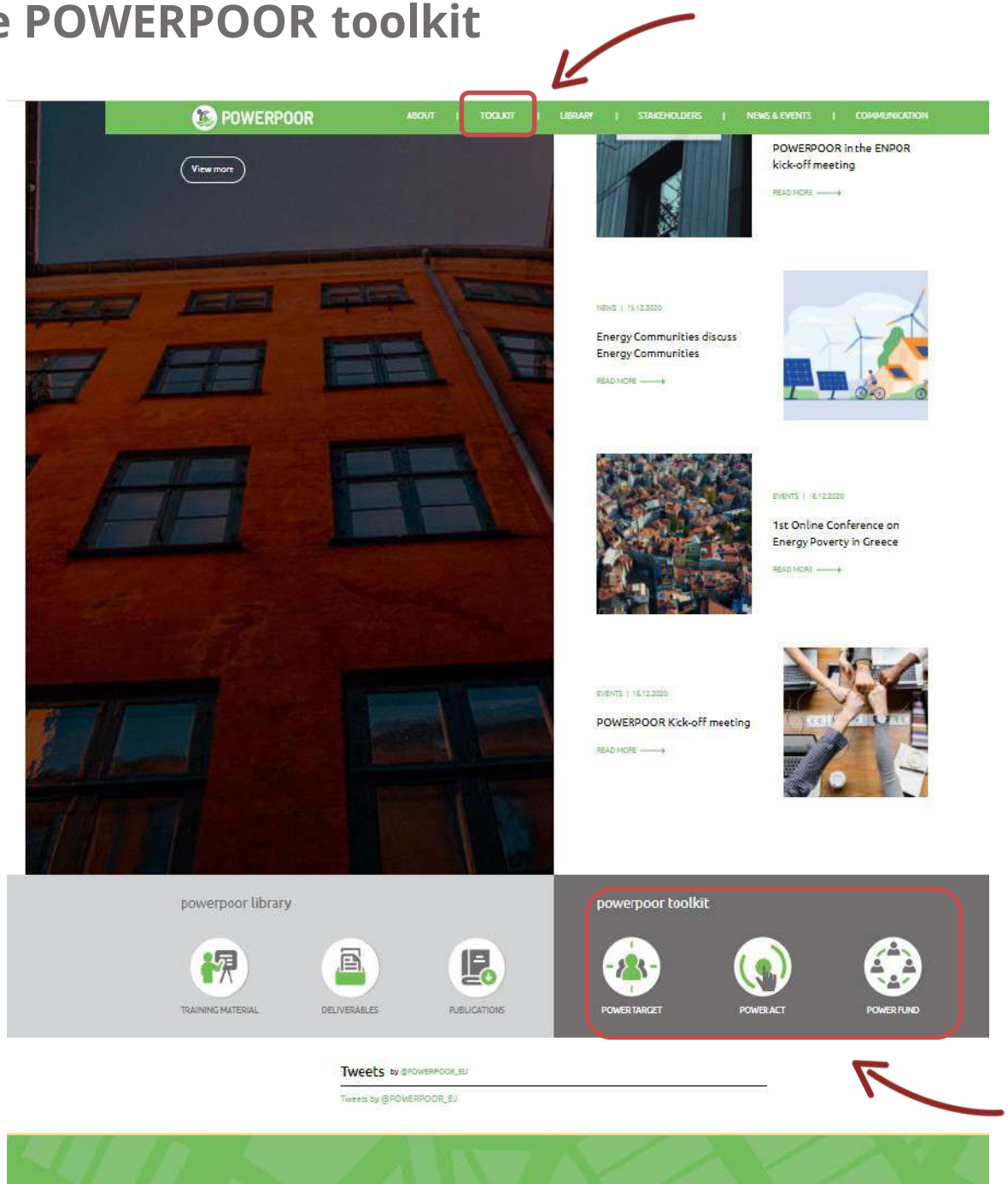
The **POWER-FUND** toolkit will:

- ✓ Communicate innovative financing opportunities to address energy poverty and engage citizens,
- ✓ Collate information on innovative financing opportunities and guide users on how to pursue these,
- ✓ Provide an online marketplace for energy cooperatives in energy poor communities, and
- ✓ Engage users and citizens through the launch of crowdfunding campaigns.

Accessing the POWERPOOR toolkit

Through the website:

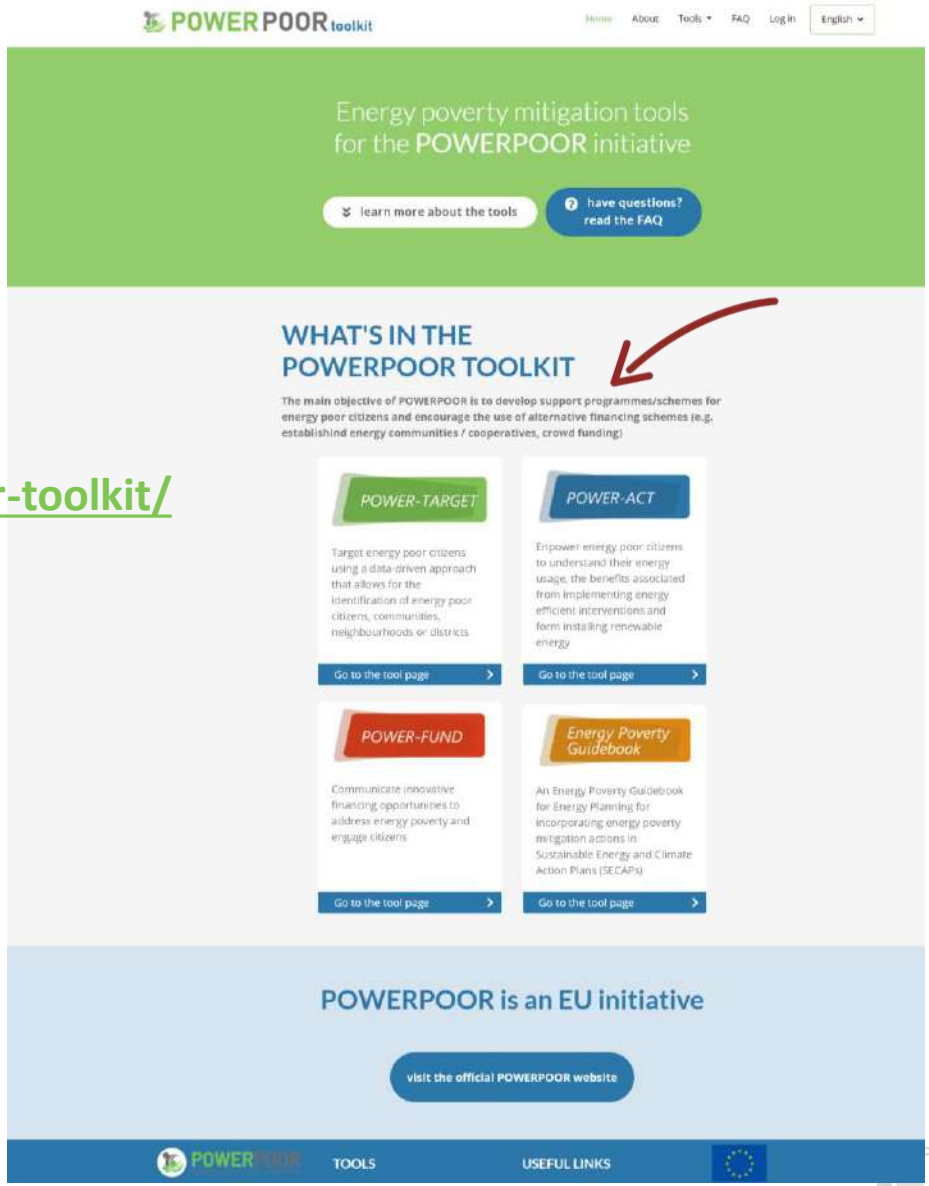
www.powerpoor.eu



Accessing the POWERPOOR toolkit

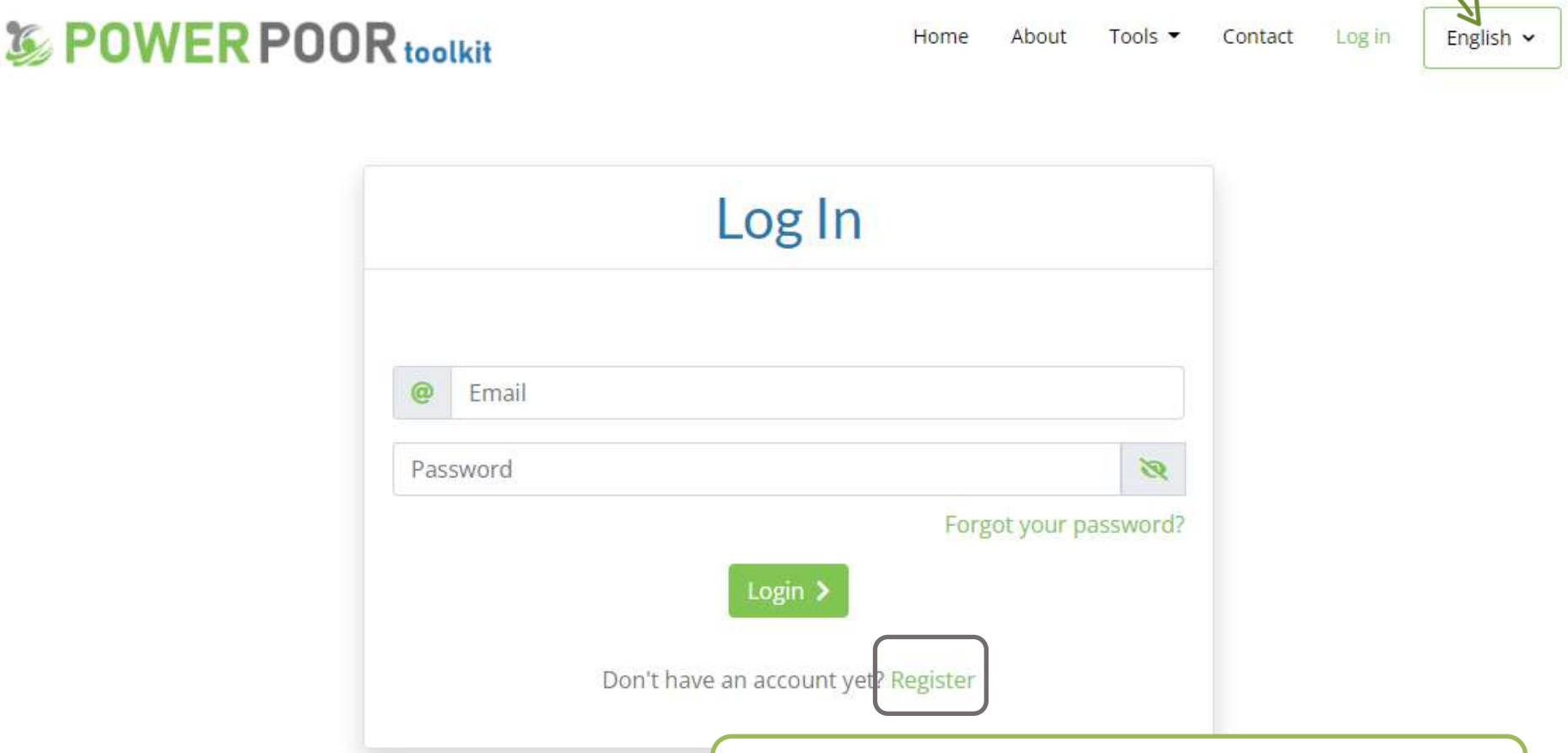
Through the standalone page:

http://powerpoor.epu.ntua.gr/powerpoor-toolkit/



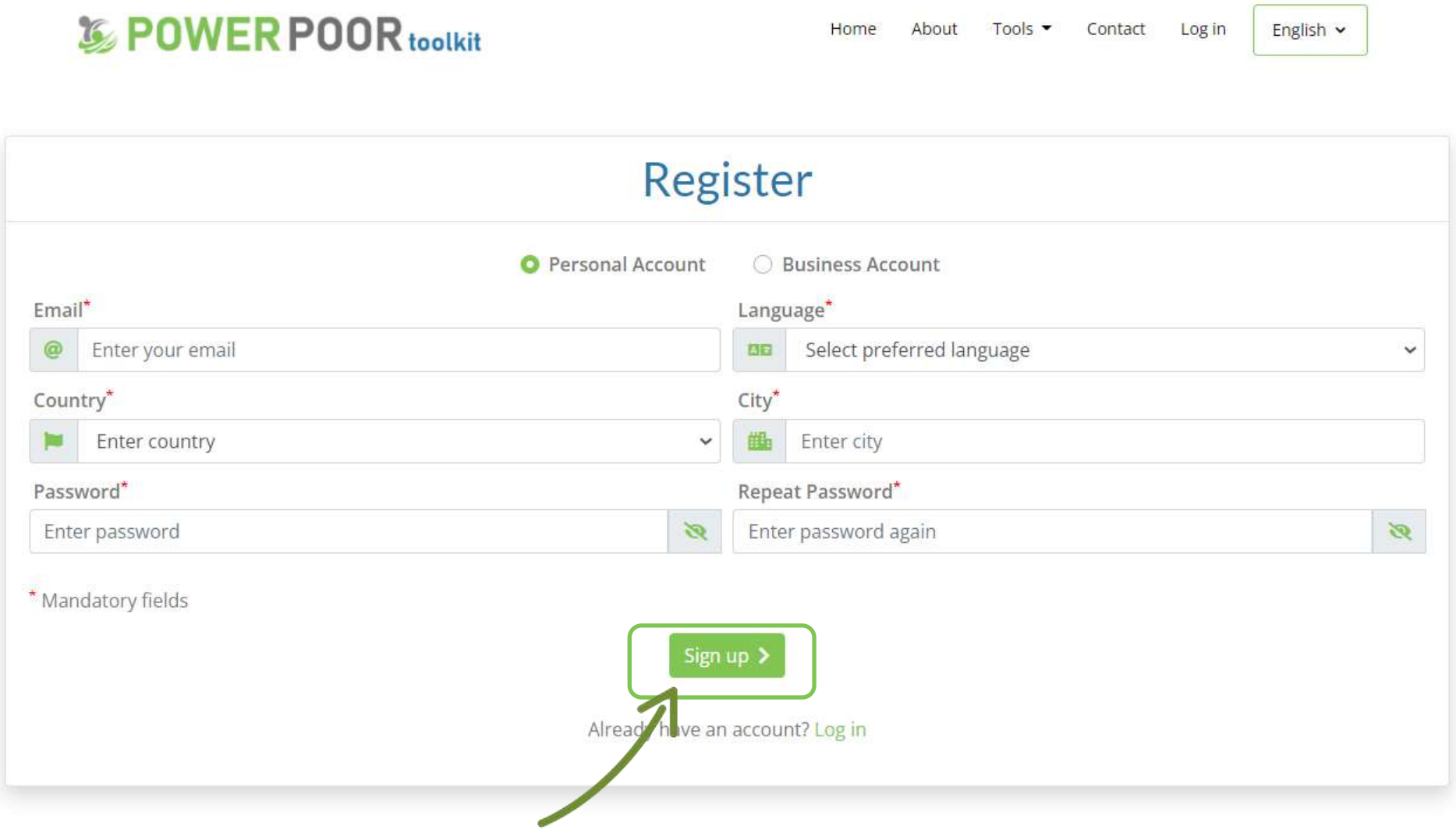
Register / Sign in

Choose your preferred Language



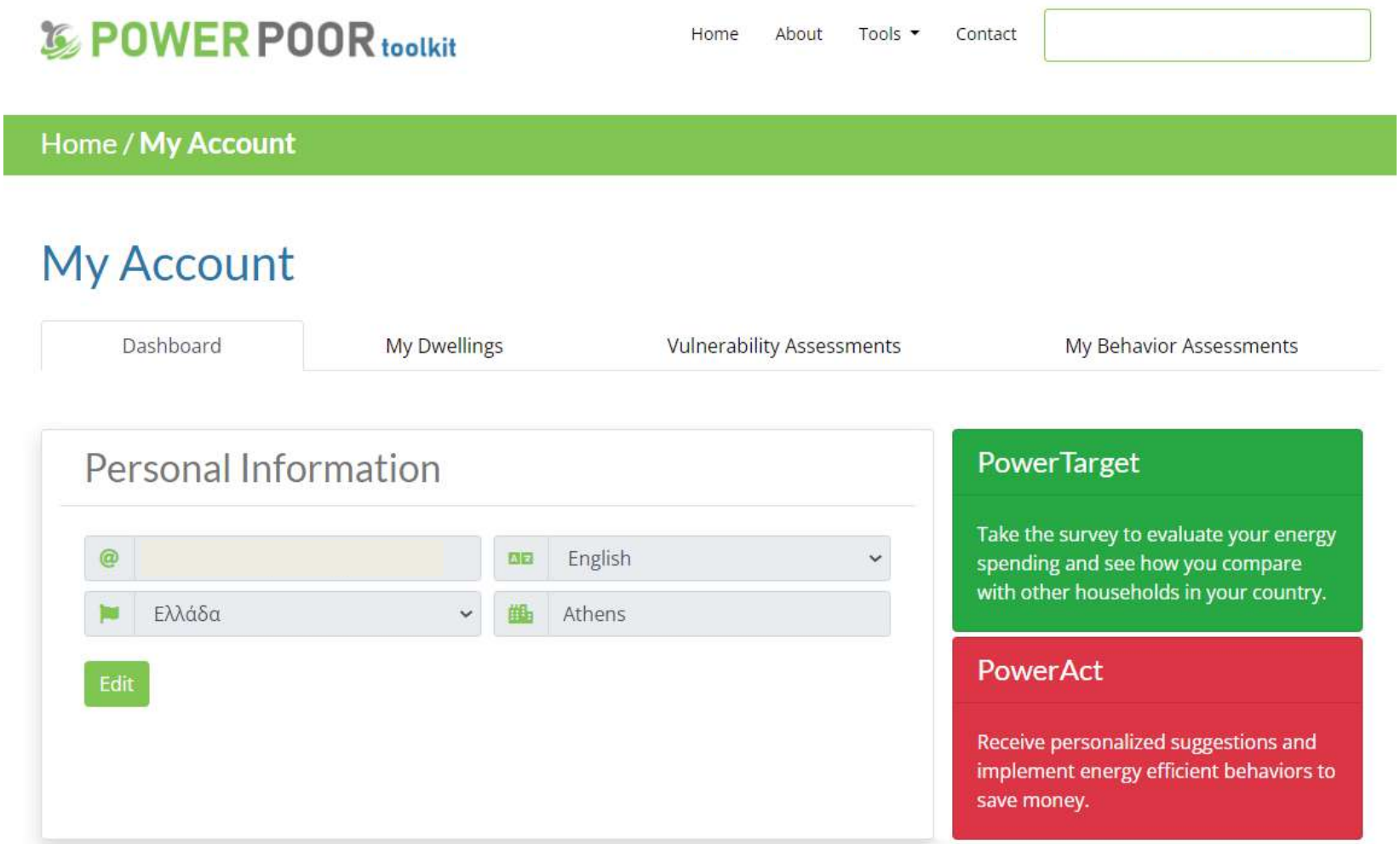
Please Register if you are a new user in the POWERPOOR toolkit

Register / Sign in



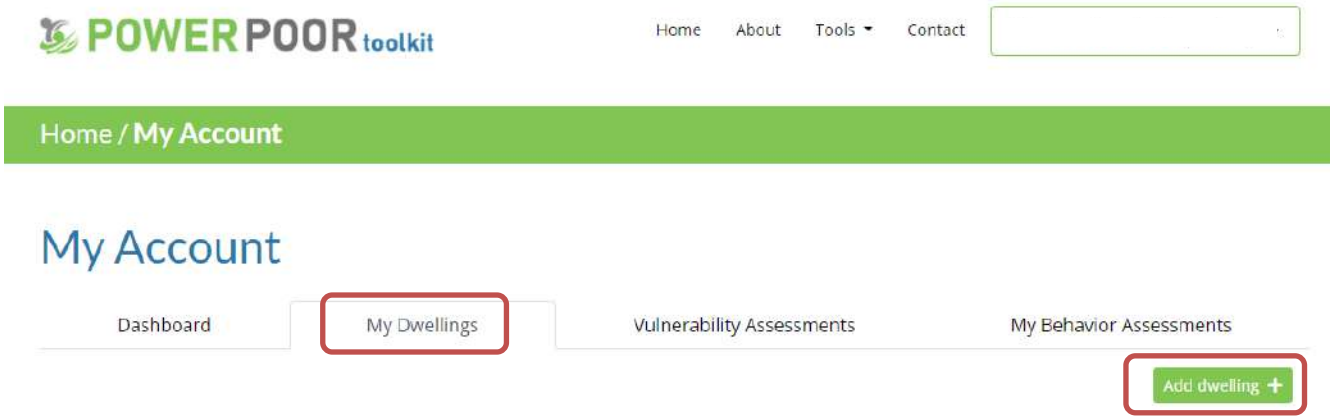
Fill out all the fields and press Sign up

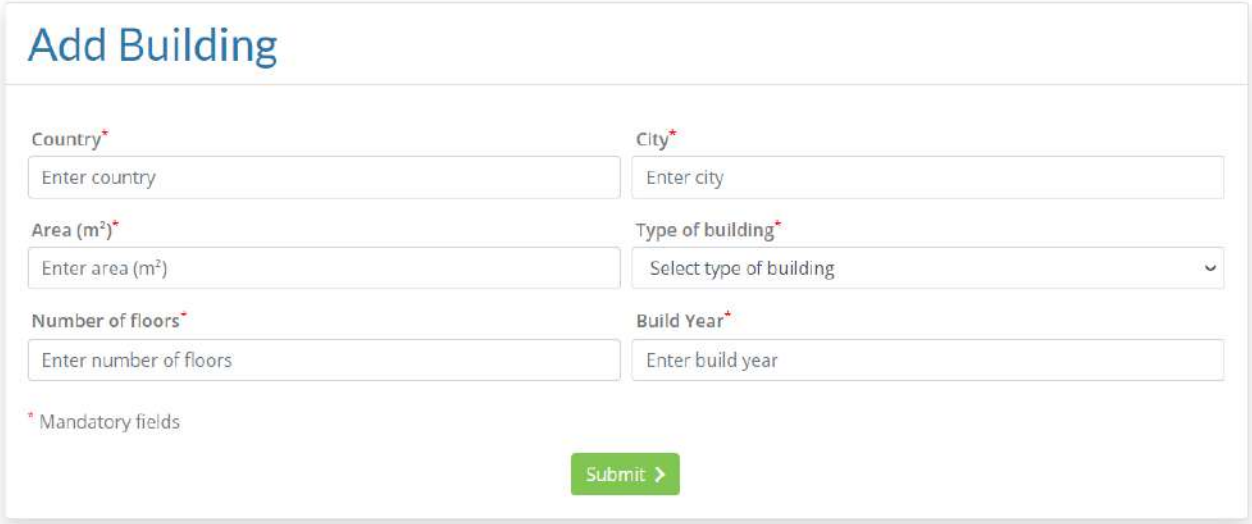
Overview of the My Account page



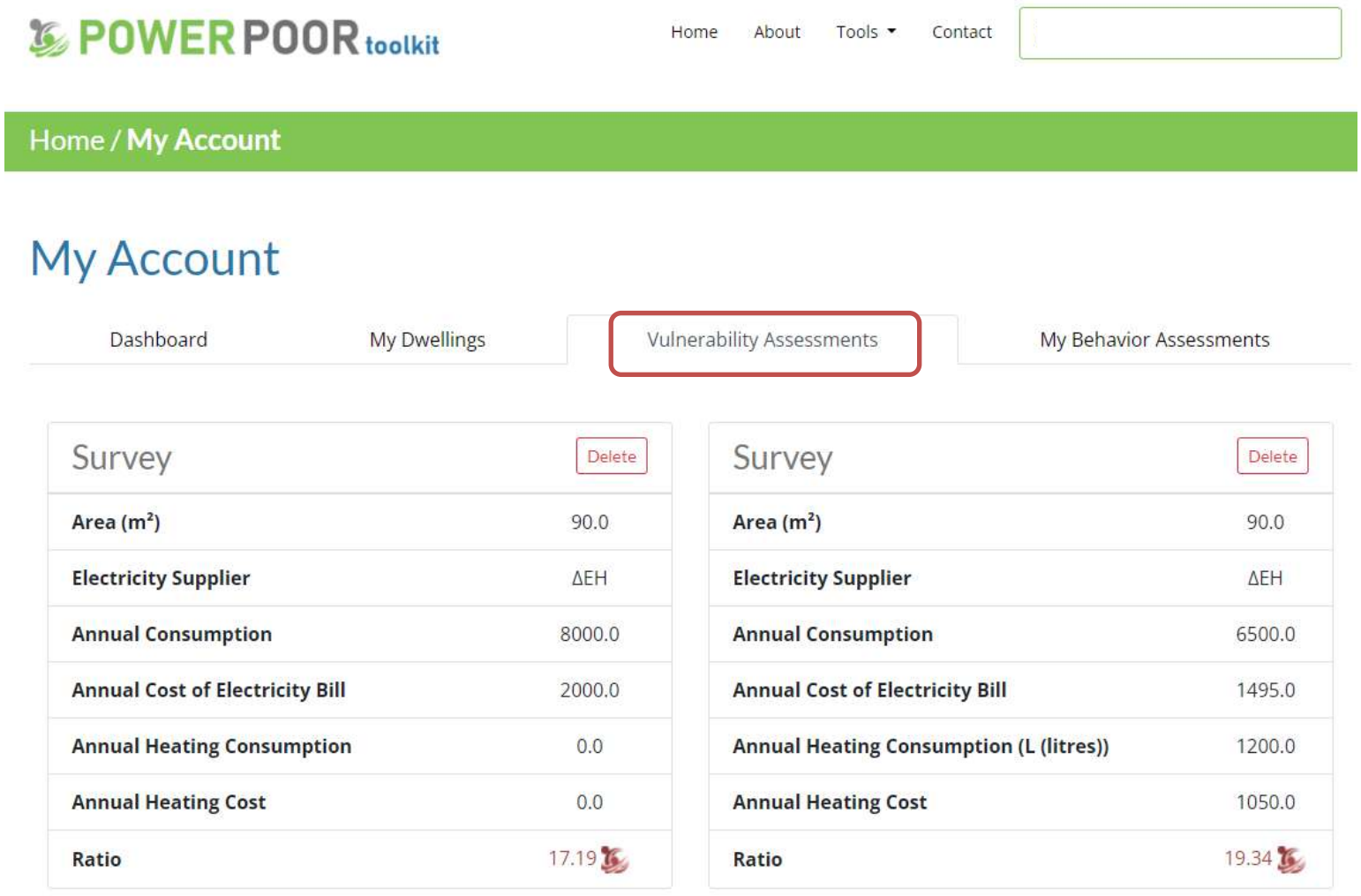
Overview of the My Account page

Different dwellings can be added by the same user

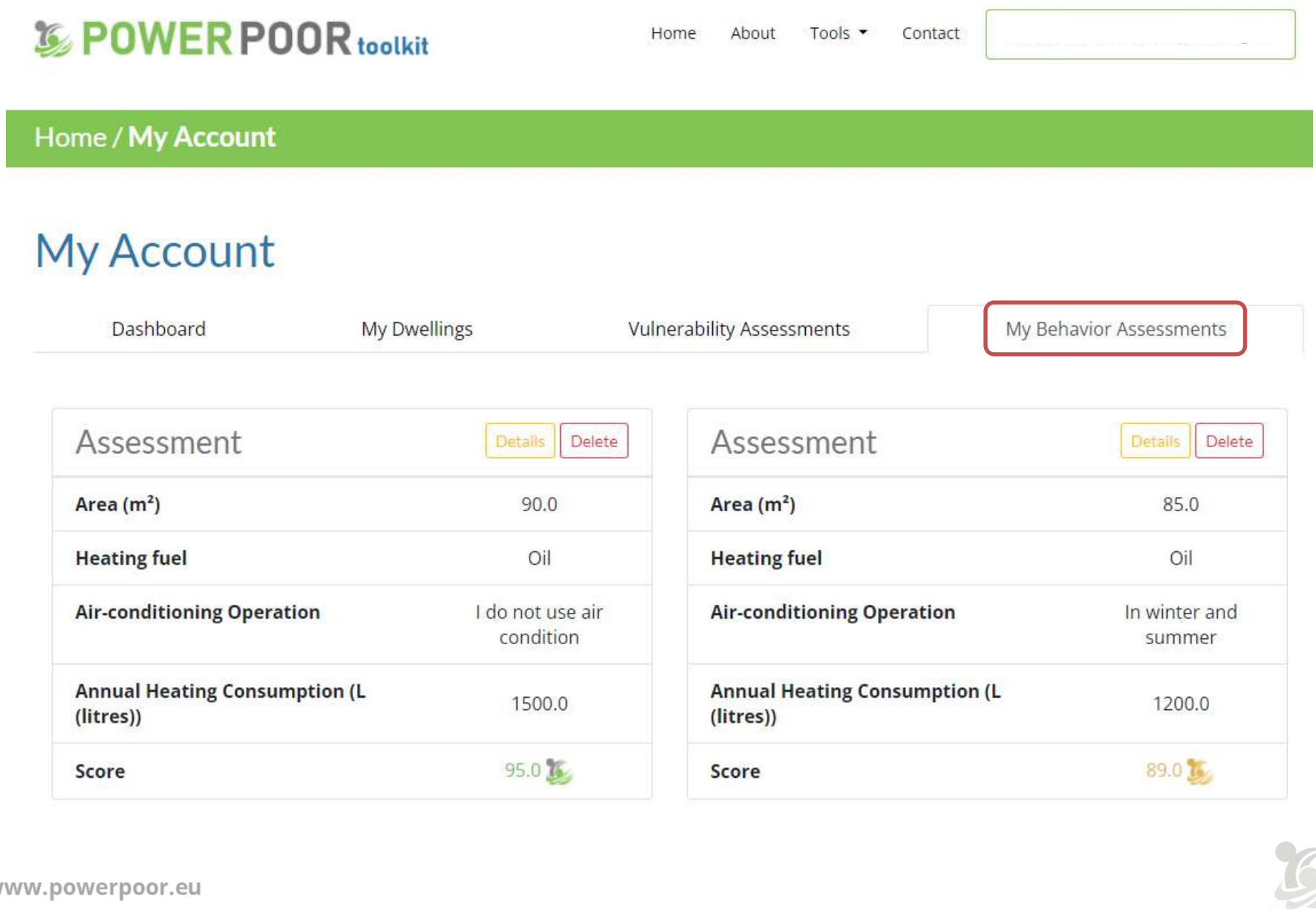




Overview of the My Account page



Overview of the My Account page

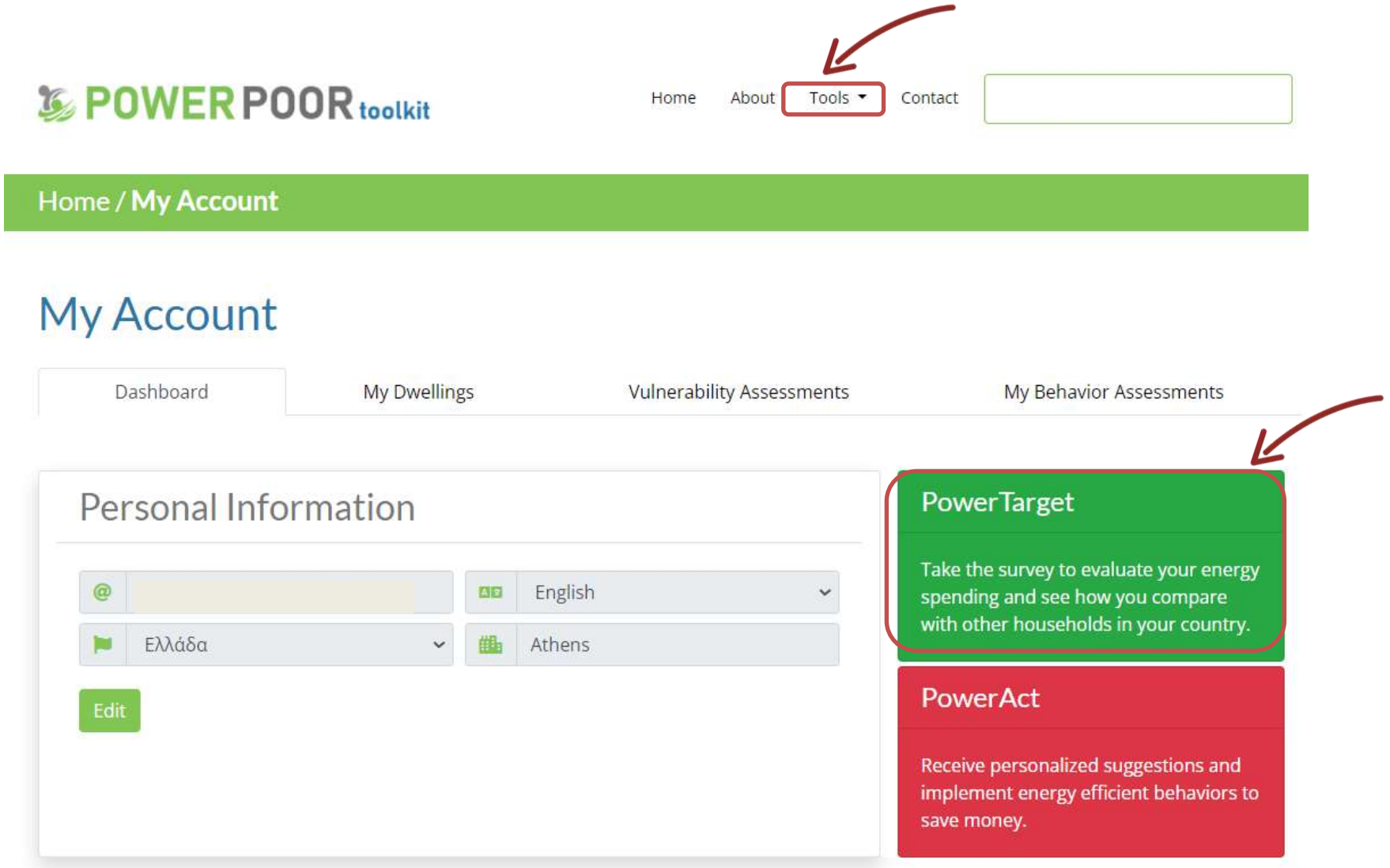


The POWER TARGET tool

- ✓ Identify energy poor citizens using a simple data-driven approach that facilitates the identification of citizens, communities, neighborhoods or districts

Using the POWER TARGET tool

Overview of the personal account page

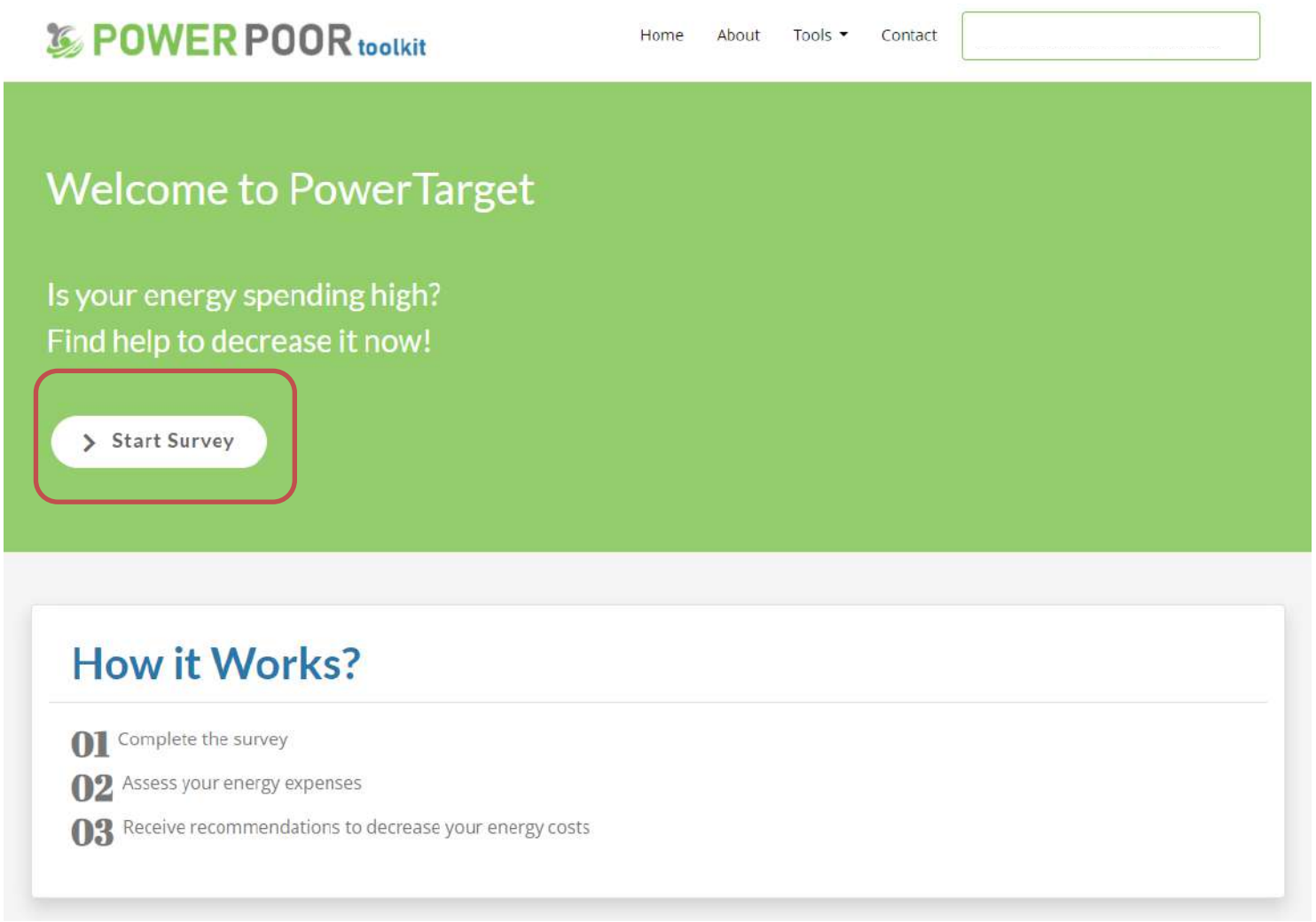


Using the POWER TARGET tool

Or accessing it through the homepage

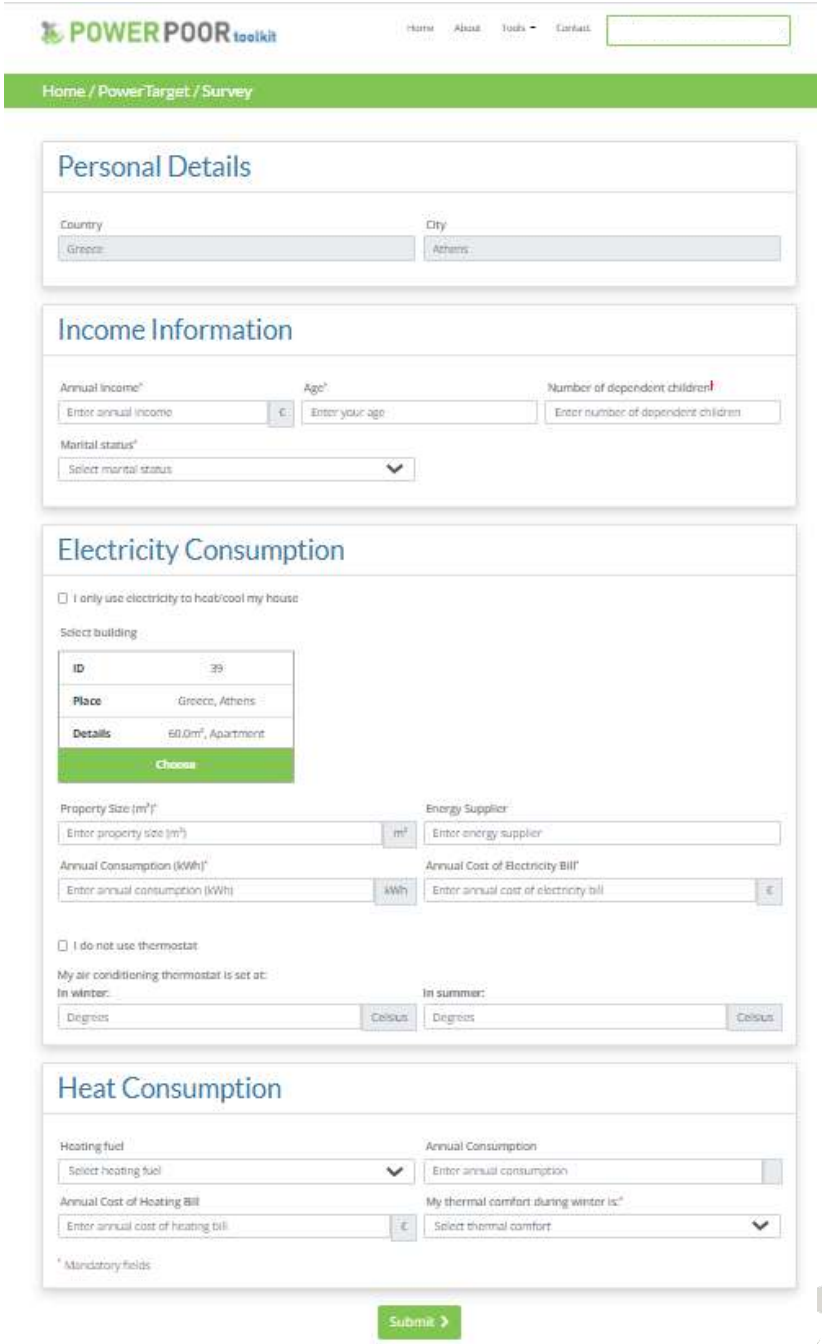
http://powerpoor.epu.ntua.gr/powerpoor-toolkit/

Using the POWER TARGET tool



The POWER TARGET survey

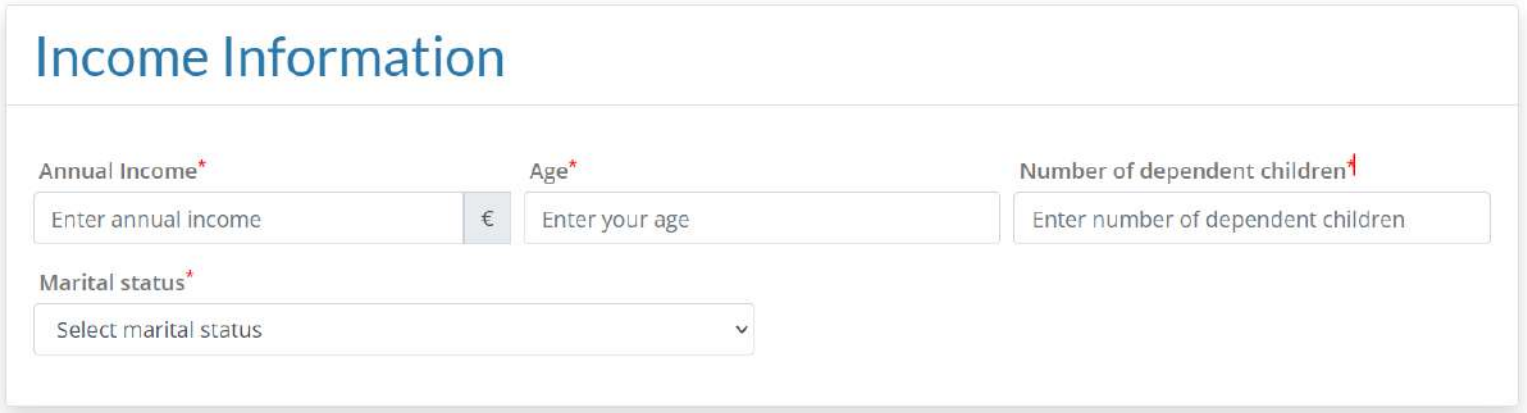
The 3 sections that need to be filled in



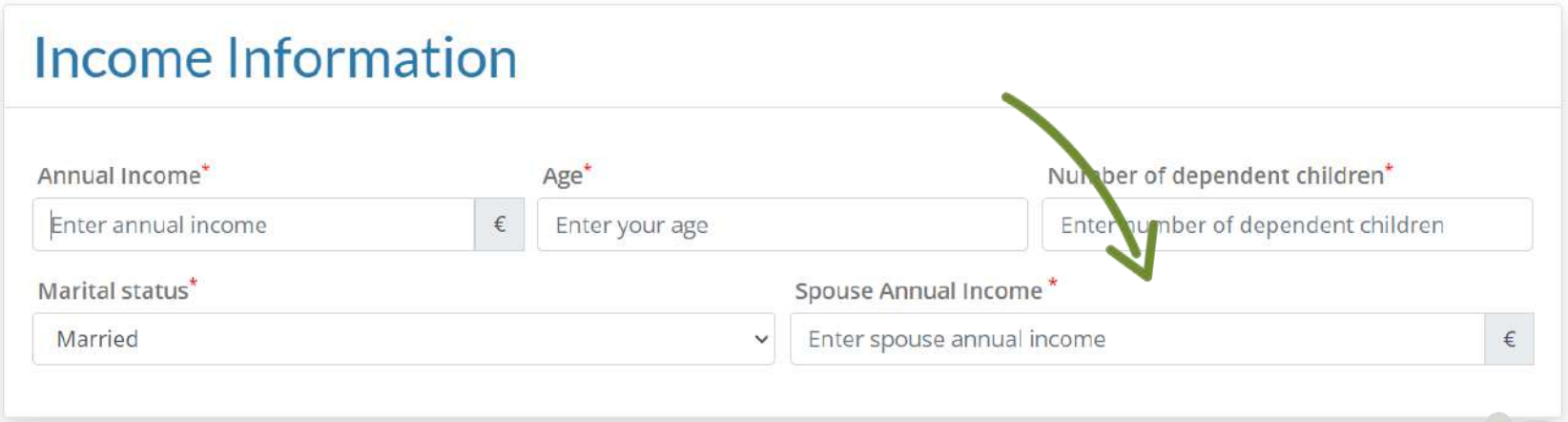
The POWER TARGET survey

Section 1 – Income information

1



… if there is a spouse fill in their income here



The POWER TARGET survey

Section 2 – Electricity consumption

Fields with an * are mandatory to fill in

Electricity Consumption

☐ I only use electricity to heat/cool my house

Select building

ID	39
Place	Greece, Athens
Details	60.0m², Apartment

Choose

2

Property Size (m²)* — Enter property size (m²) — m²

Energy Supplier — Enter energy supplier

Annual Consumption (kWh)* — Enter annual consumption (kWh) — kWh

Annual Cost of Electricity Bill* — Enter annual cost of electricity bill — €

☐ I do not use thermostat

My air conditioning thermostat is set at:

In winter: Degrees — Celsius

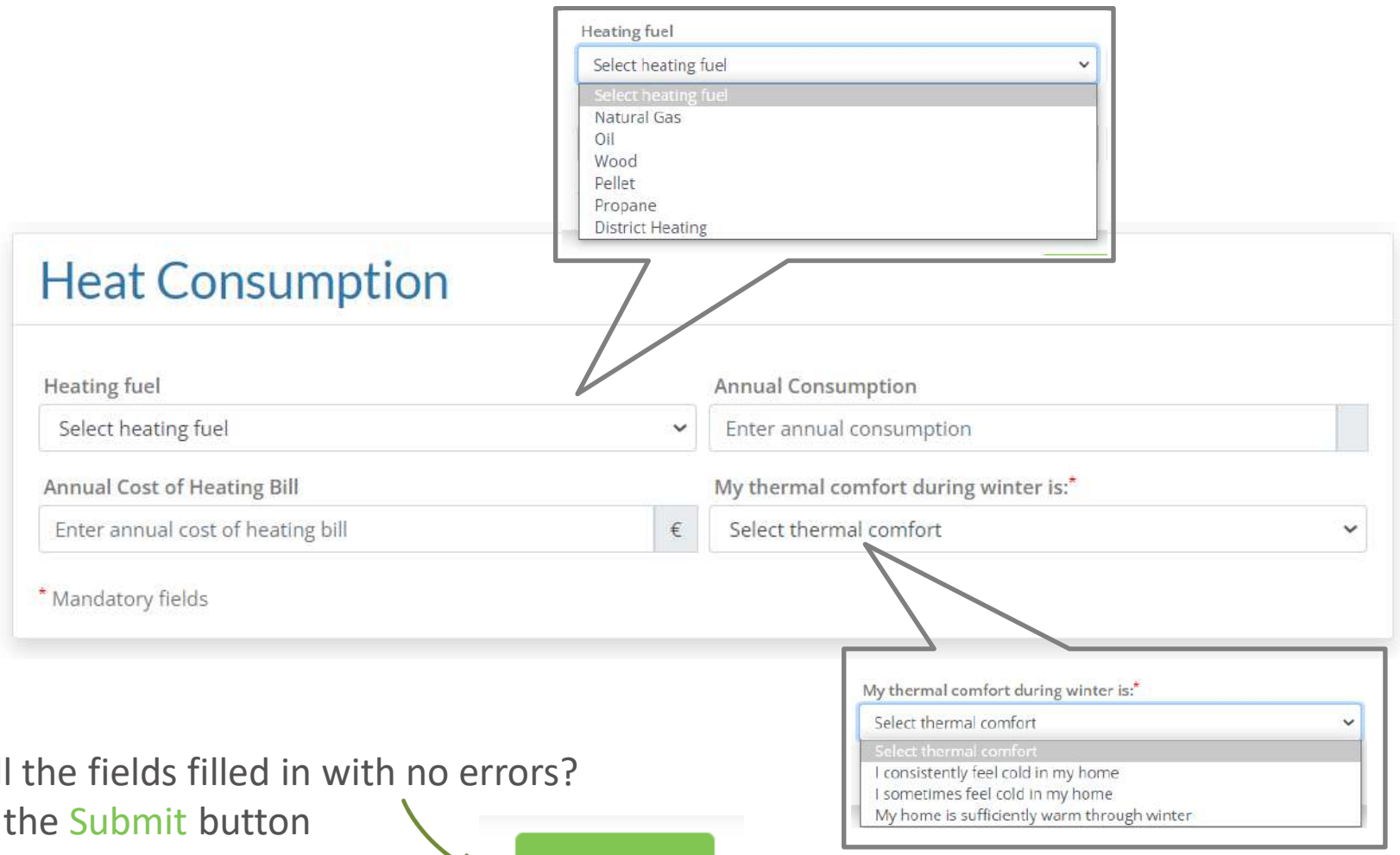
In summer: Degrees — Celsius

! Temperature in the house in winter and in summer

The POWER TARGET survey

Section 3 – Heat consumption

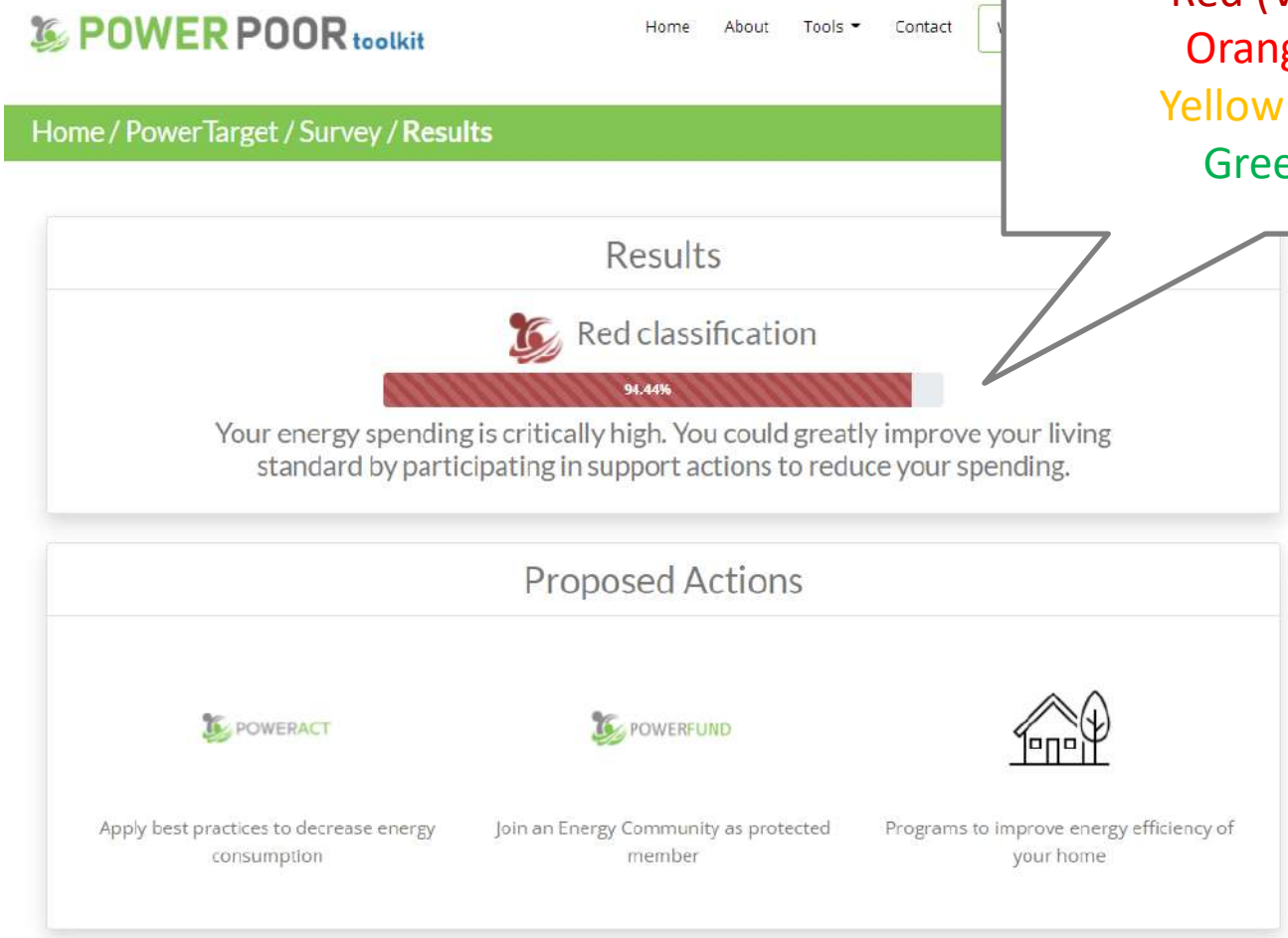
3



Are all the fields filled in with no errors?
Press the Submit button

Submit ›

The POWER TARGET survey
Results…



Classification according to the ratio of energy expenses to the income

Red (Very high)

Orange (high)

Yellow (Medium)

Green (Low)

The POWER TARGET survey
Results...

Score	Description
0-6.99%	**Green** Classification: Not close to the energy poverty threshold
7%-9.99%	**Yellow** Classification: Not technically energy poor, but close to the energy poverty threshold (At risk of energy poverty)
10%-15%	**Orange** Classification: Energy Poor, adjusted percentage of energy spending is above threshold
>15%	**Red** classification: Energy Poor, adjusted percentage of energy spending significantly above threshold

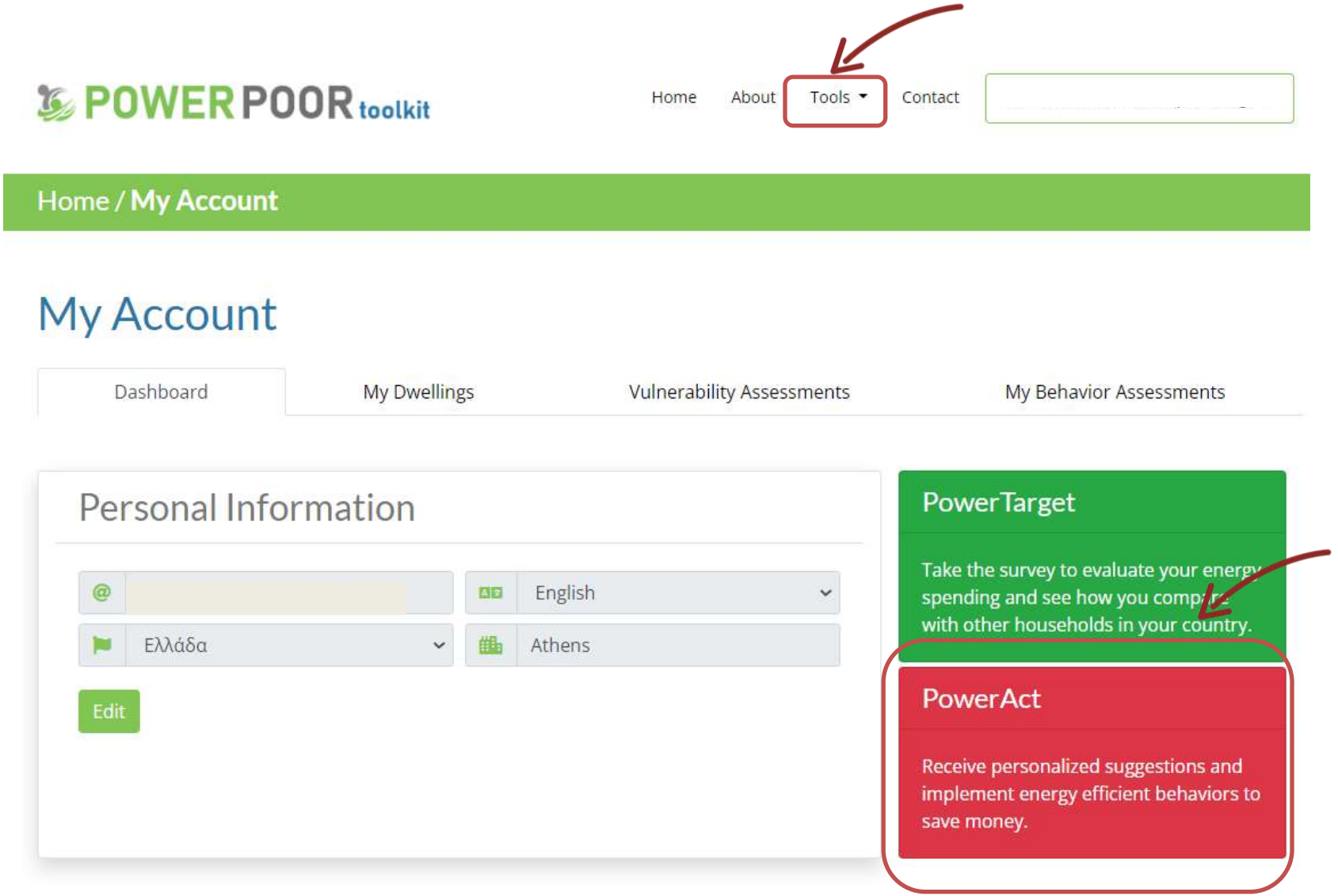
Το εργαλείο POWER ACT

POWERPOOR

POWER ACT

- ✓ Empowers energy poor citizens to understand their energy use, the benefits associated with energy efficiency interventions and encourages the installation of renewable power generation capacities

Overview of the My Account page

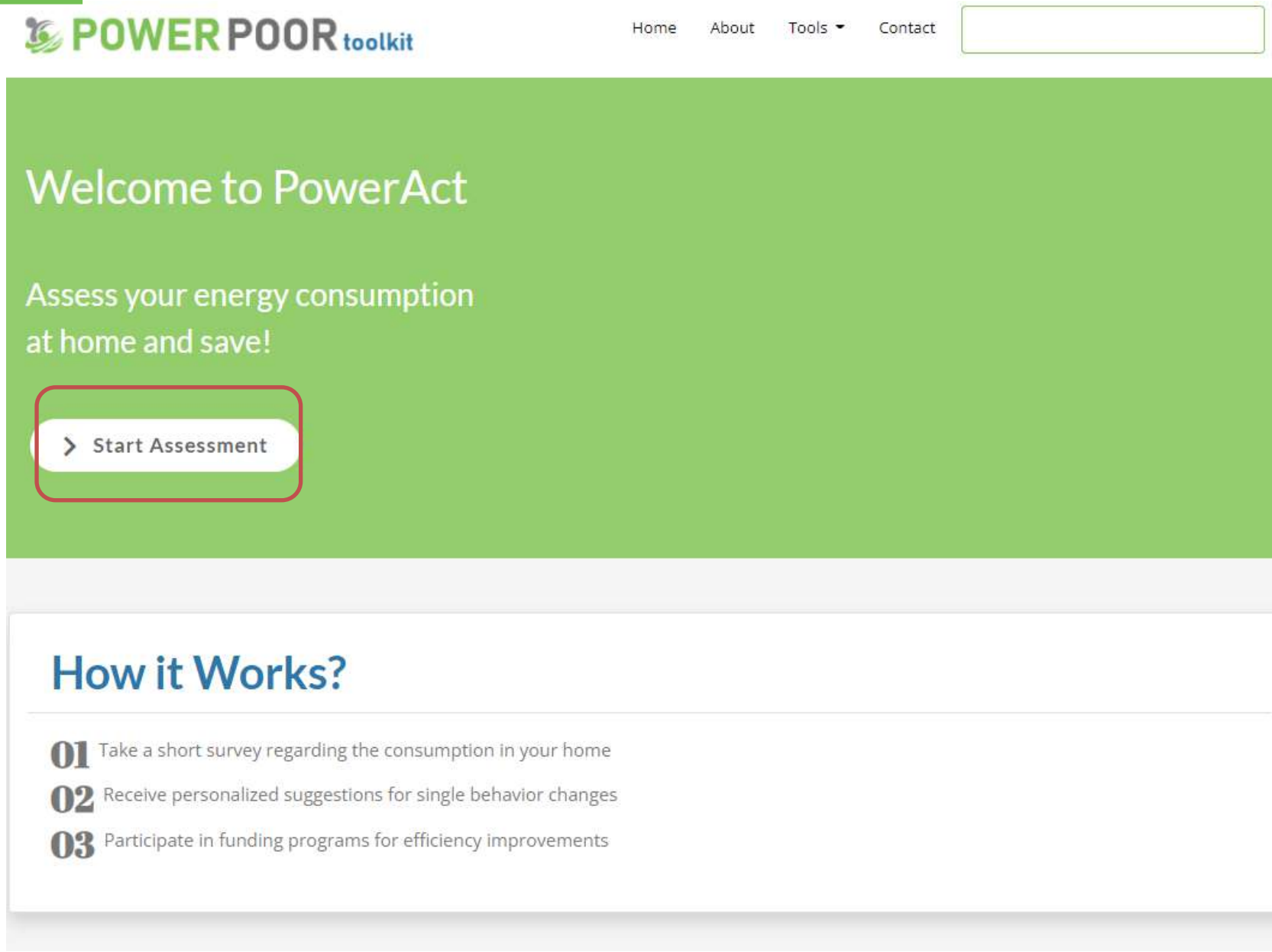


Using the POWER ACT tool

Or accessing it through the homepage

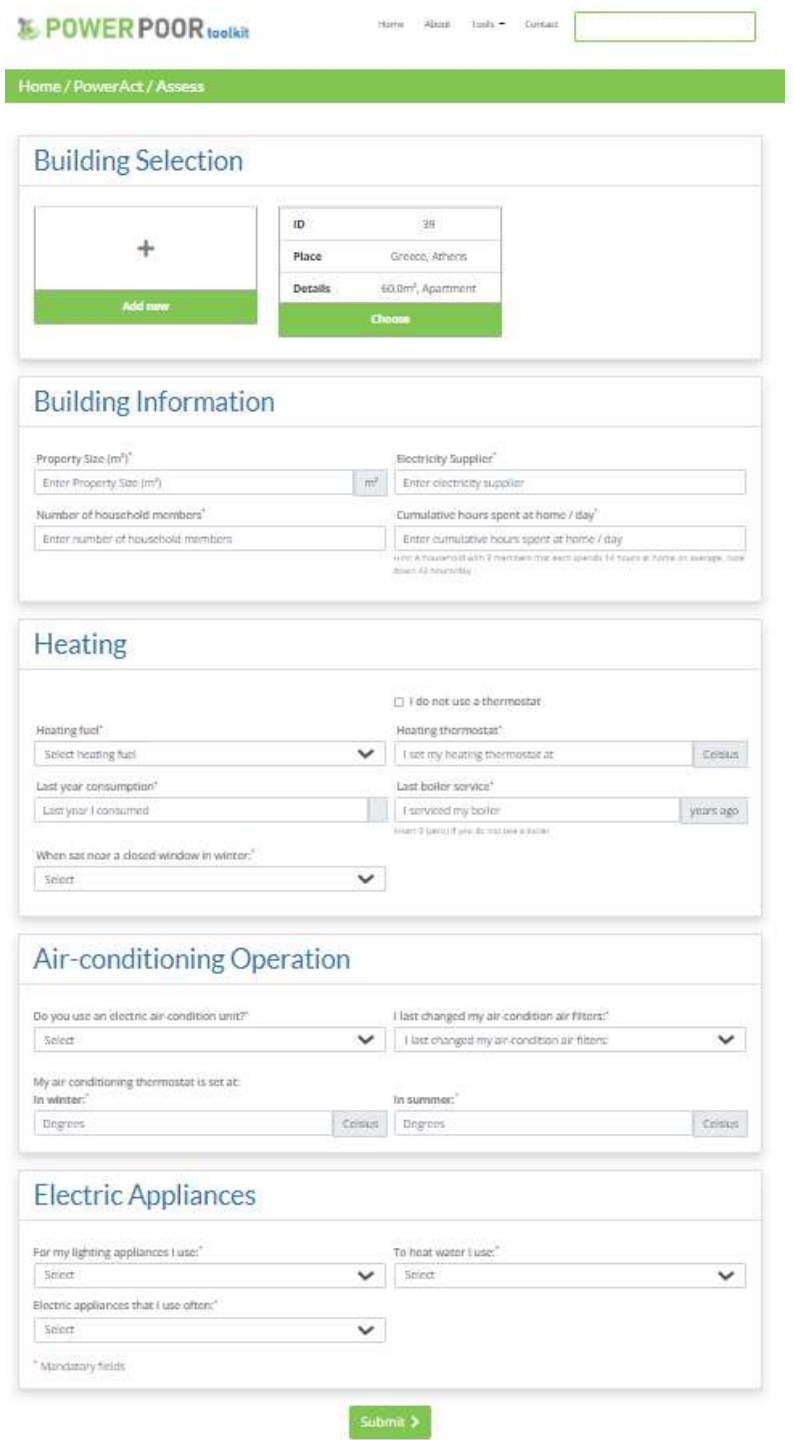
http://powerpoor.epu.ntua.gr/powerpoor-toolkit/

Using the POWER ACT tool



The POWER ACT survey

The 4 sections to be filled in



1

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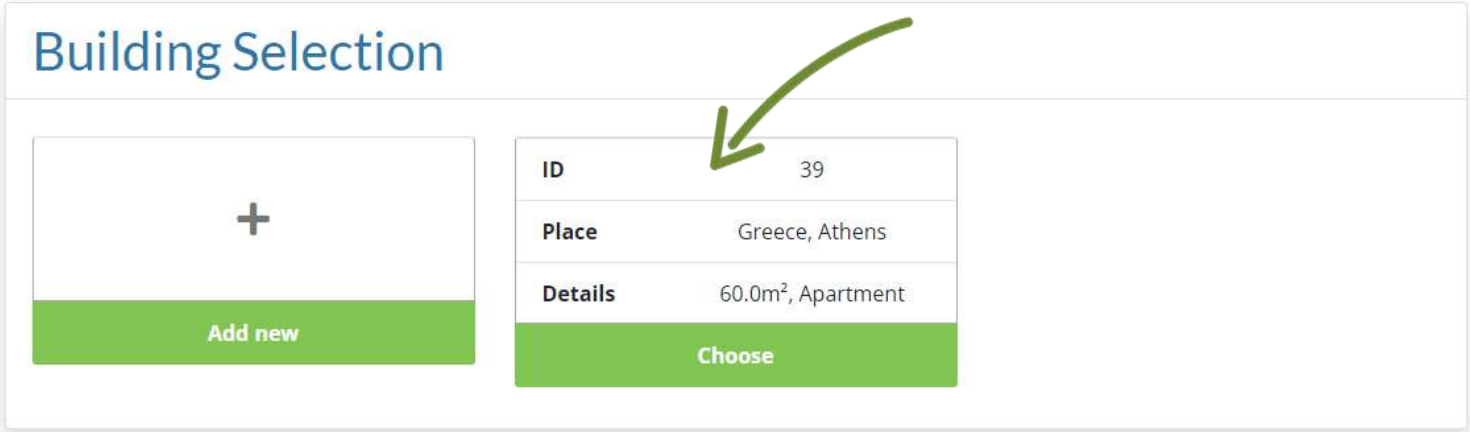
4

The POWER ACT survey

Section 1 – Building information

…choose one of the existing buildings or add a new one



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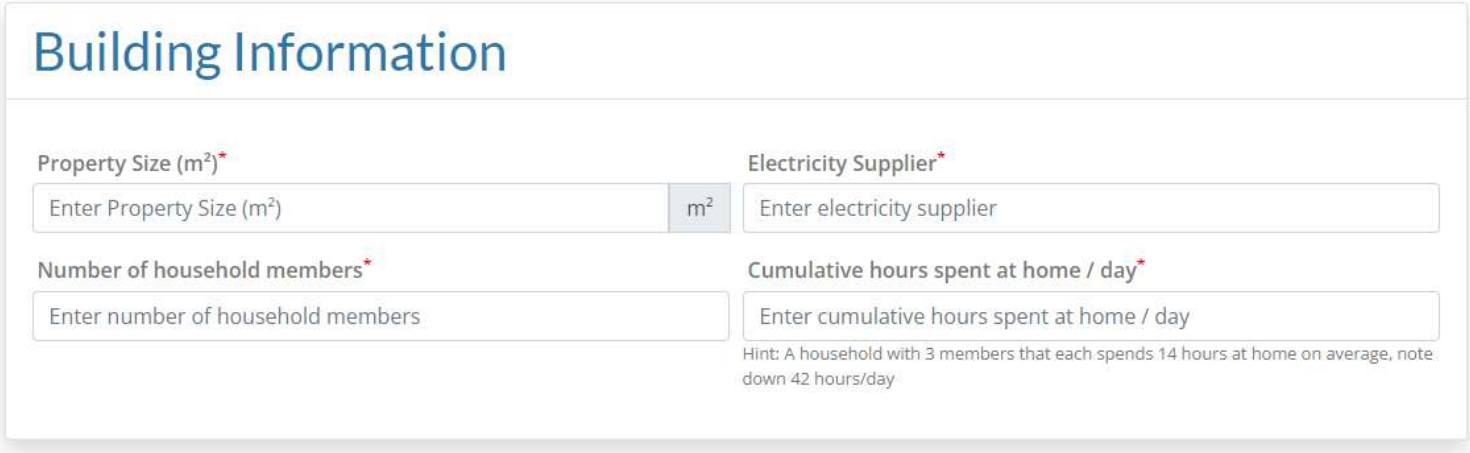
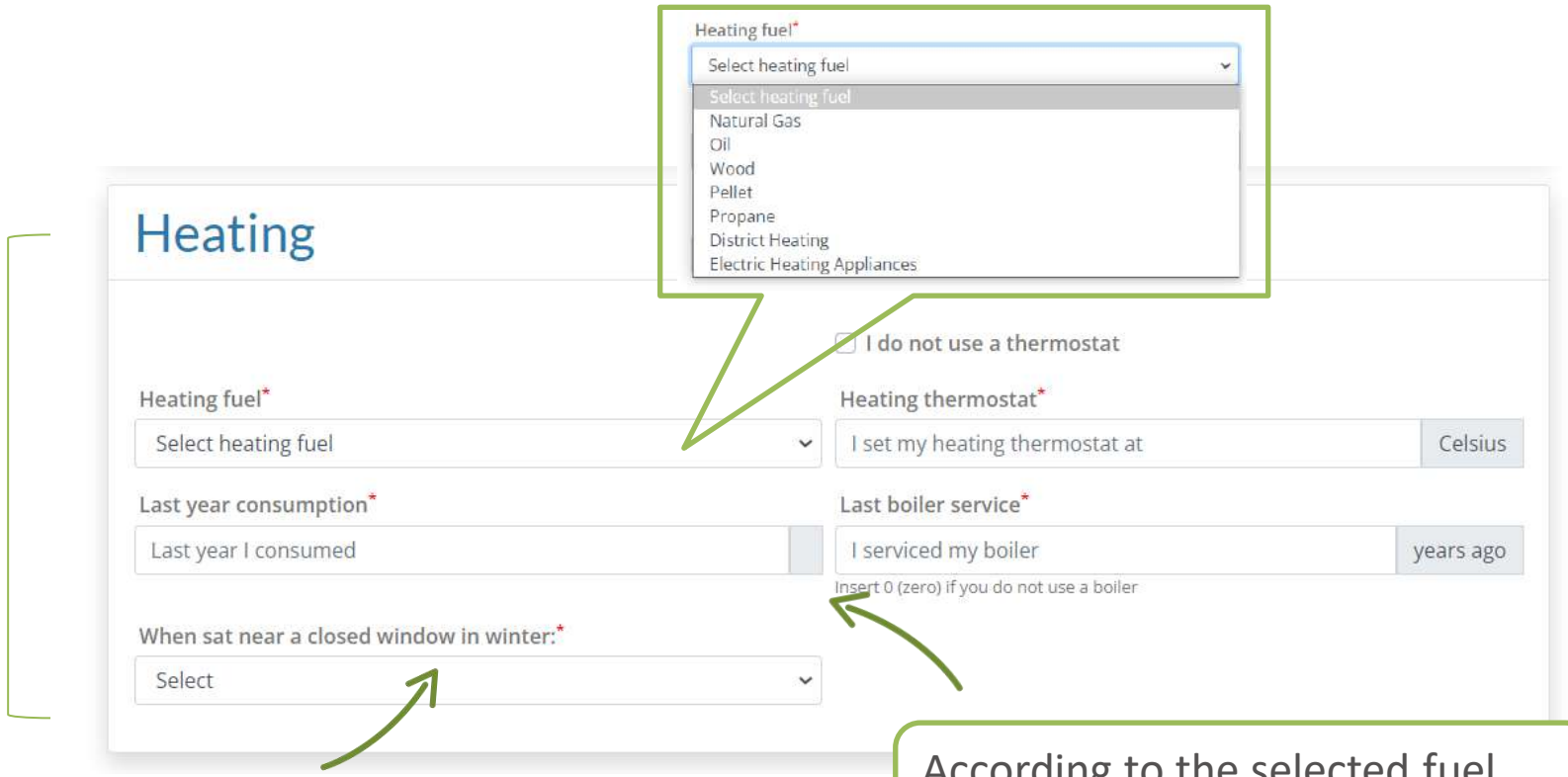


Fields with an * are mandatory

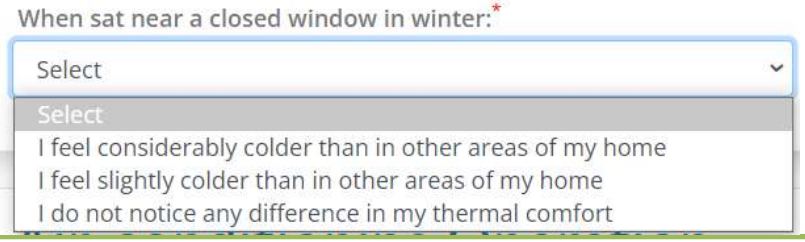
The POWER ACT survey
Section 2 – Heating

2



According to the selected fuel e.g., litters for oil or kWhs for gas

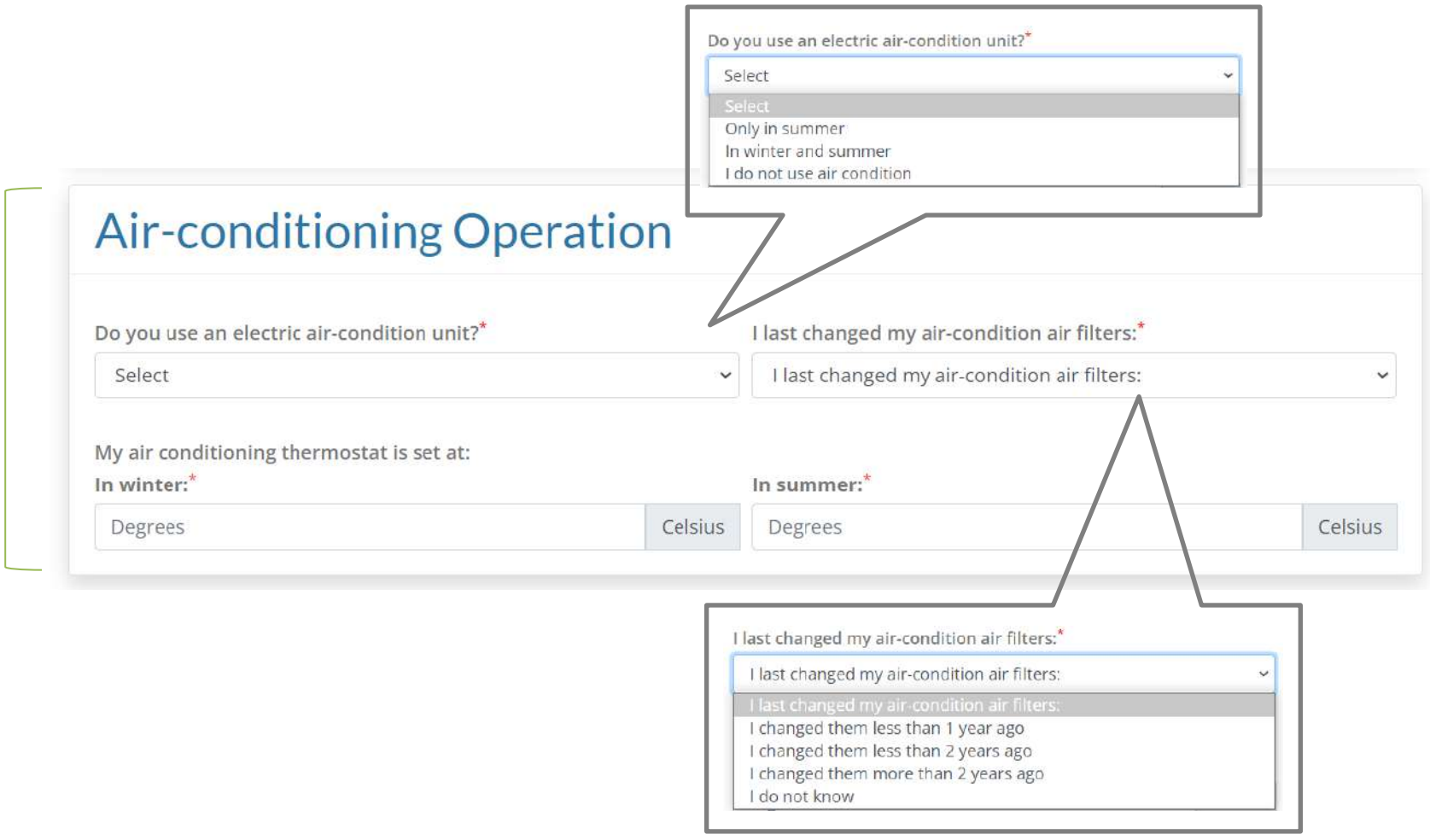
! Qualitative assessment relevant to thermal comfort



The POWER ACT survey

Section 3 – Air conditioning operation

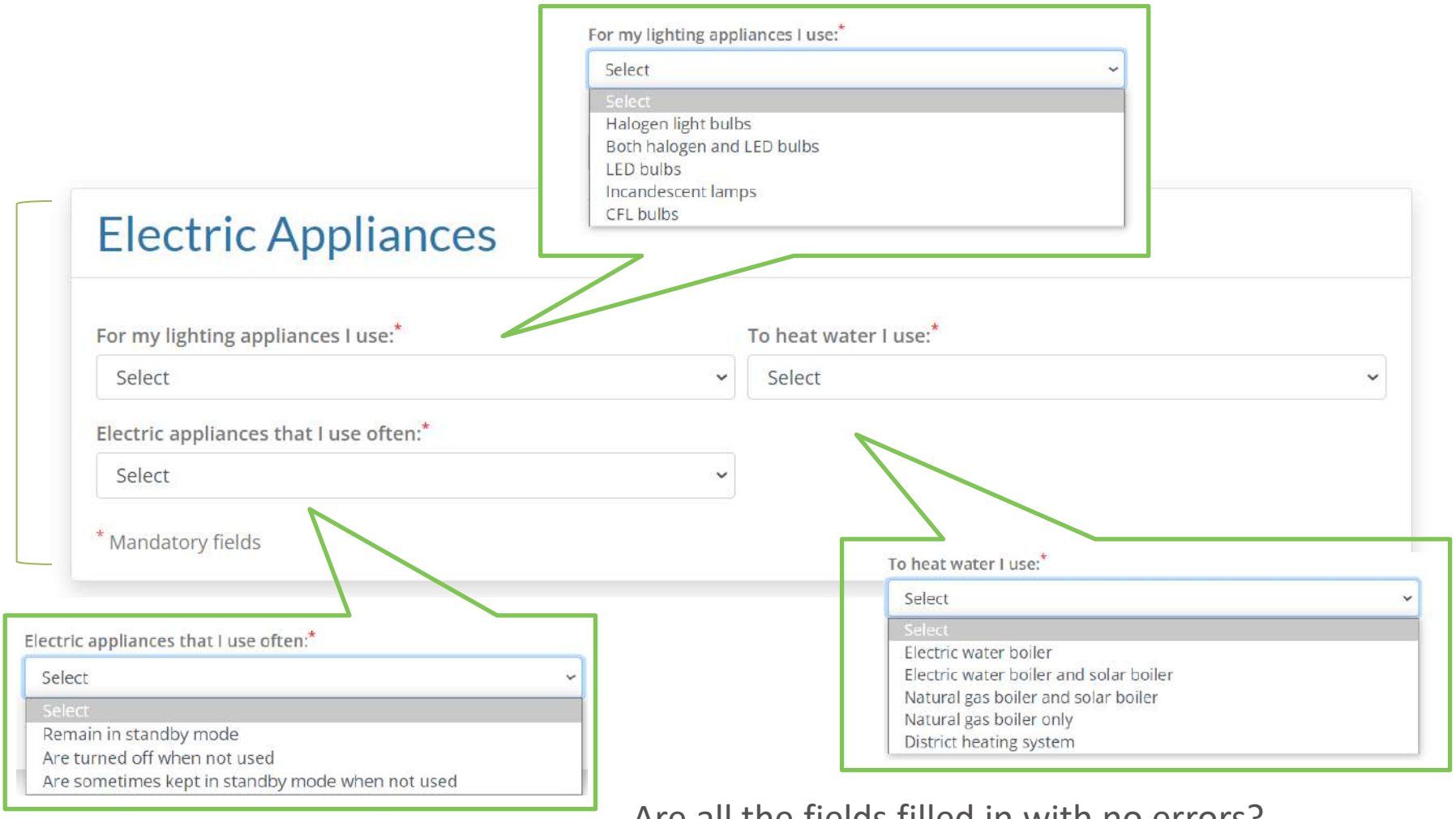
3



The POWER ACT survey

Section 4 – Electric appliances

4

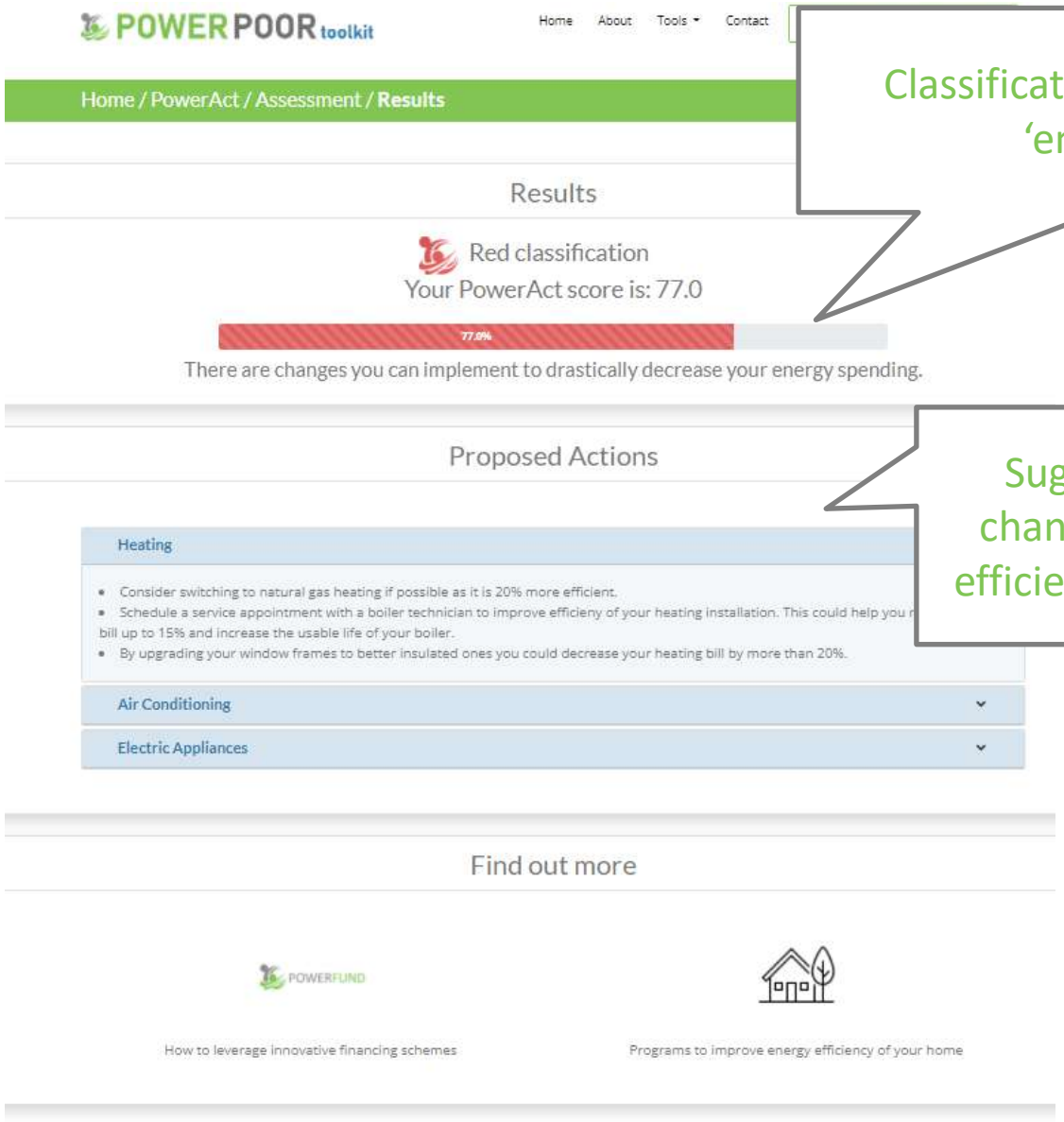


Are all the fields filled in with no errors?
Press the Submit button

Submit ›

The POWER ACT survey

Results...



Classification according to the 'energy' habits

Suggestion of behavioral changes to enhance energy efficiency and/or reduce costs

The POWER ACT survey

Results...

Score	Description
0-30	**Red** classification: Responses to multiple structured questions indicate significant margin for improvement in the behavioural aspect.
30-50	**Yellow** Classification: Responses indicate user has adopted a limited number of energy efficient practices but substantial margin for improvement remains.
50-75	**Blue** Classification: Responses from structured questions indicate adoption of multiple energy efficient practices. There is still some margin of improvement.
75-100	**Green** classification: Responses from structured questions indicate exceptional adoption of energy efficient practices. There is very limited room for improvement with implementing only behavioural changes.

Exercise

Reading a utility bill

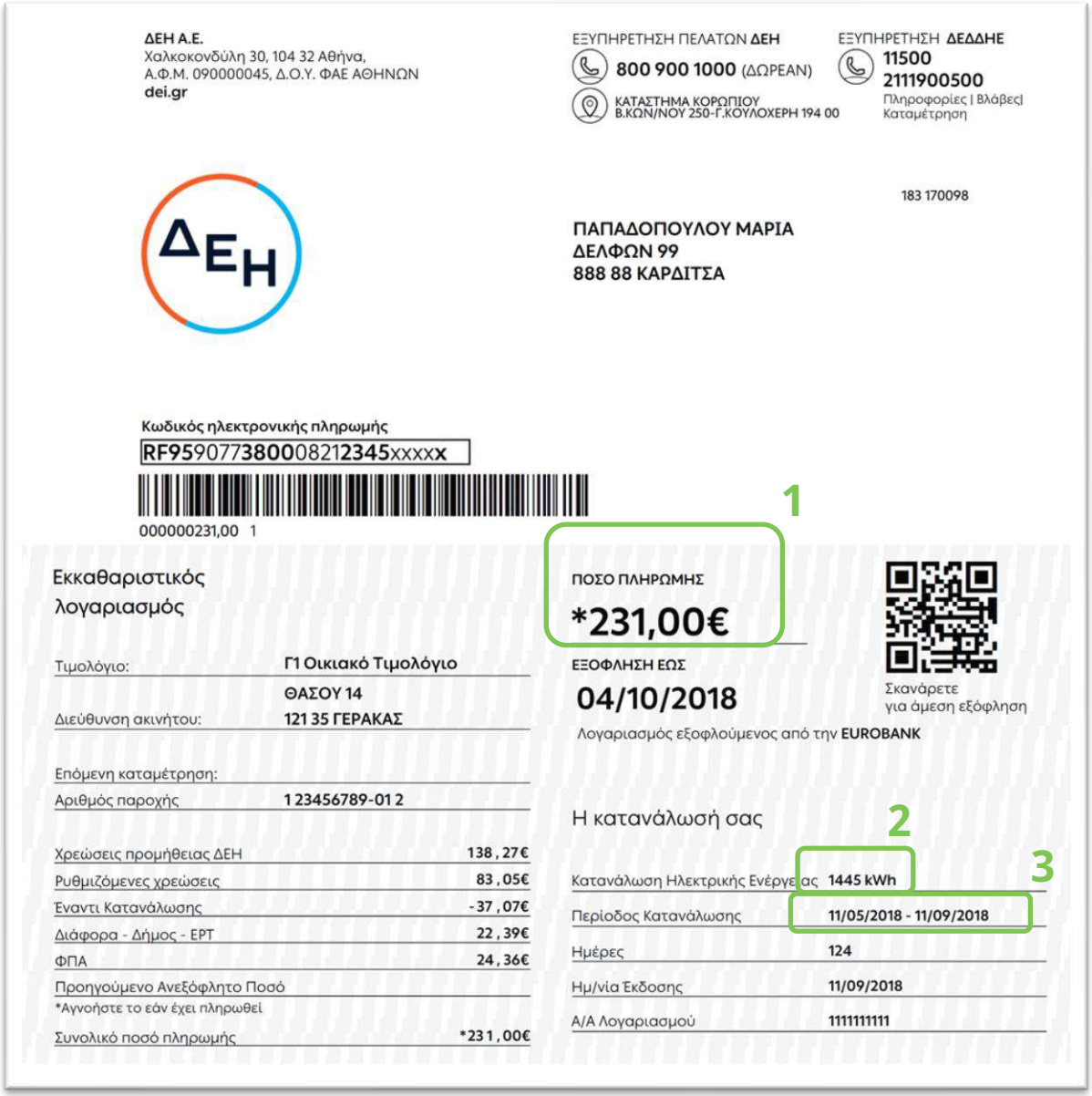
Reading a utility bill

1. Electricity bill
2. Energy (kWh) spent for a specific time period
3. The time period

Tip!

To calculate the annual electricity bill (kWh), add the respective kWhs spent and the cost during the last year.

For the specific Greek supplier (DEH) the time period is 4 moths. That way we can use the last 4 bills and they will add up to the expenses of a year.



ΔΕΗ Α.Ε.
Χαλκοκονδύλη 30, 104 32 Αθήνα,
Α.Φ.Μ. 090000045, Δ.Ο.Υ. ΦΑΕ ΑΘΗΝΩΝ
dei.gr

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888 88 ΚΑΡΔΙΤΣΑ

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Εκκαθαριστικός λογαριασμός

ΠΟΣΟ ΠΛΗΡΩΜΗΣ
*231,00€

ΕΞΟΦΛΗΣΗ ΕΩΣ
04/10/2018

Σκανάρετε για άμεση εξόφληση

Λογαριασμός εξοφλούμενος από την EUROBANK

Τιμολόγιο:	Γ1 Οικιακό Τιμολόγιο
Διεύθυνση ακινήτου:	ΘΑΣΟΥ 14 121 35 ΓΕΡΑΚΑΣ
Επόμενη καταμέτρηση:	
Αριθμός παροχής	1 23456789-01 2

Χρεώσεις προμήθειας ΔΕΗ	138,27€
Ρυθμιζόμενες χρεώσεις	83,05€
Έναντι Κατανάλωσης	-37,07€
Διάφορα - Δήμος - ΕΡΤ	22,39€
ΦΠΑ	24,36€
Προηγούμενο Ανεξόφλητο Ποσό *Αγνοήστε το εάν έχει πληρωθεί	
Συνολικό ποσό πληρωμής	*231,00€

Η κατανάλωσή σας

2

3

Κατανάλωση Ηλεκτρικής Ενέργειας	1445 kWh
Περίοδος Κατανάλωσης	11/05/2018 - 11/09/2018
Ημέρες	124
Ημ/νία Έκδοσης	11/09/2018
Α/Α Λογαριασμού	1111111111

Reading a utility bill

1. Natural Gas bill
2. Total energy spent in a specific time period
3. The time period

Πηγή: https://www.zenith.gr/pliromi-logariasmou/

Thank you!

Eleni Kanellou, NTUA,
ekanellou@epu.ntua.gr

This project has received funding from the European Union's HORIZON 2020 research and innovation programme under grant agreement No 890437

POWERPOOR

Empowering Energy Poor Citizens through Energy Cooperative Initiatives

Part III - From theory to practice. Good practices and case studies - Energy-saving measures, behavioural changes, visits to vulnerable households

Eleftheria Touloupaki,
Architect Engineer PhD cand., Scientific Associate INZEB
26 January 2023

This project has received funding from the European Union's HORIZON 2020 research and innovation programme under grant agreement No 890437

Household energy performance

1. Introduction: household energy consumption, terminology
2. Simple energy audit
3. Simple energy efficiency measures and practical tips

PART III: Household energy performance

1. Introduction: household energy consumption, terminology

BASIC TERMS

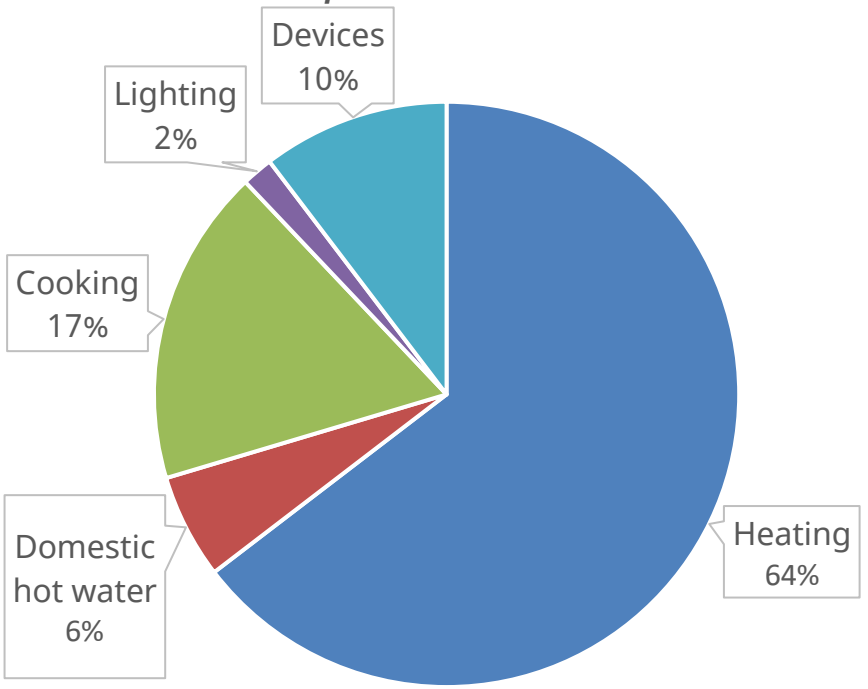
Energy (kWh) = Power (kW) x time (h)

1kWh:

- 10W LED bulb x 100h (~4 days)
- 2kW electric water heater x 0.5h
  - Energy to heat 21l of water from 10C to 50C
- 2kW electric convection heater x 0.5h

The typical non-energy efficient home in Greece consumes ~250kWh/m²

Average household energy consumption in Greece



Source: Hellenic Statistical Authority

PART III: Household energy performance

1. Introduction: household energy consumption, terminology

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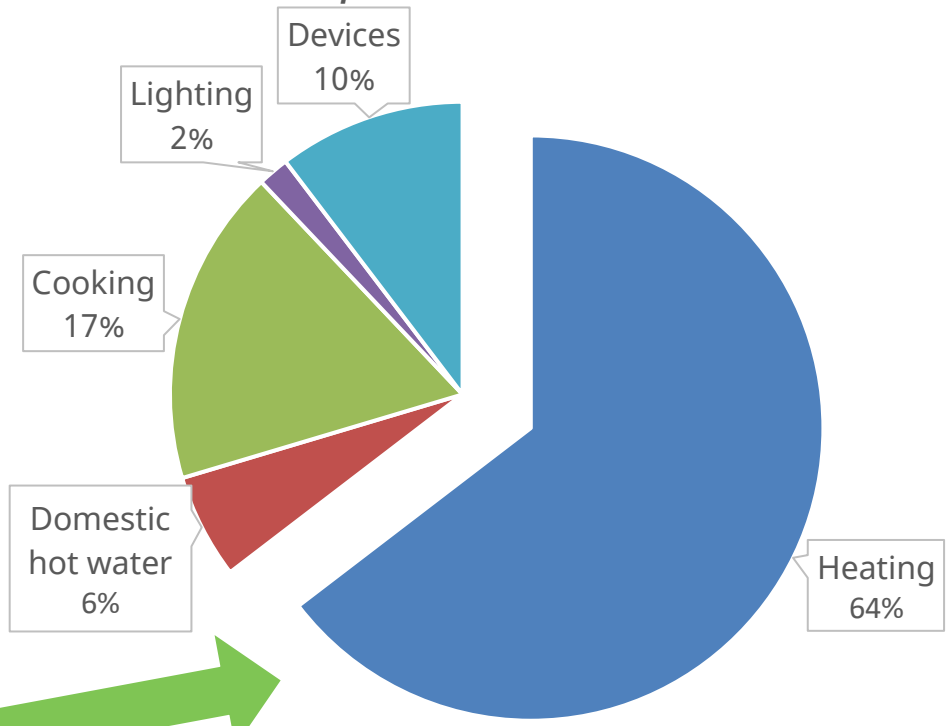
Why is it important to focus on heating when talking about energy efficiency?

Average household energy consumption in Greece



Source: Hellenic Statistical Authority

PART III: Household energy performance

1. Introduction: household energy consumption, terminology

Most common heating sources of energy:

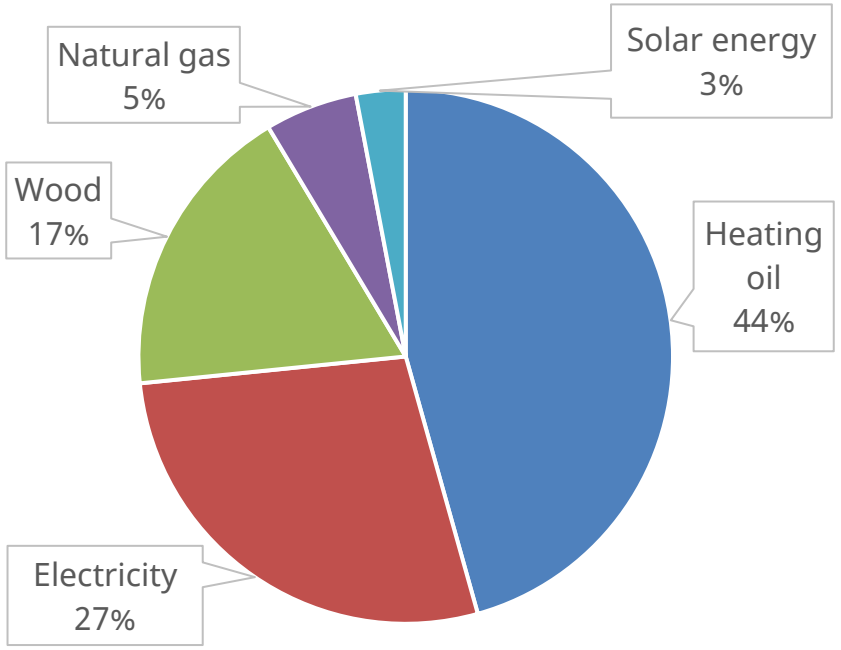
Wood

- Direct heating (stove, fireplace)
- Furnace connected to hot water tank + radiators

Electric

- Electric resistive heating
  - Convection heaters
  - Radiating heaters
  - Thermal storage heaters
- Air to air heat pumps – air conditioning devices

Final energy fuel distribution in Greece



Source: Hellenic Statistical Authority

PART III: Household energy performance

1. Introduction: household energy consumption, terminology

Most common heating sources of energy:

Natural gas

- Typically furnace connected to hot water tank + radiators

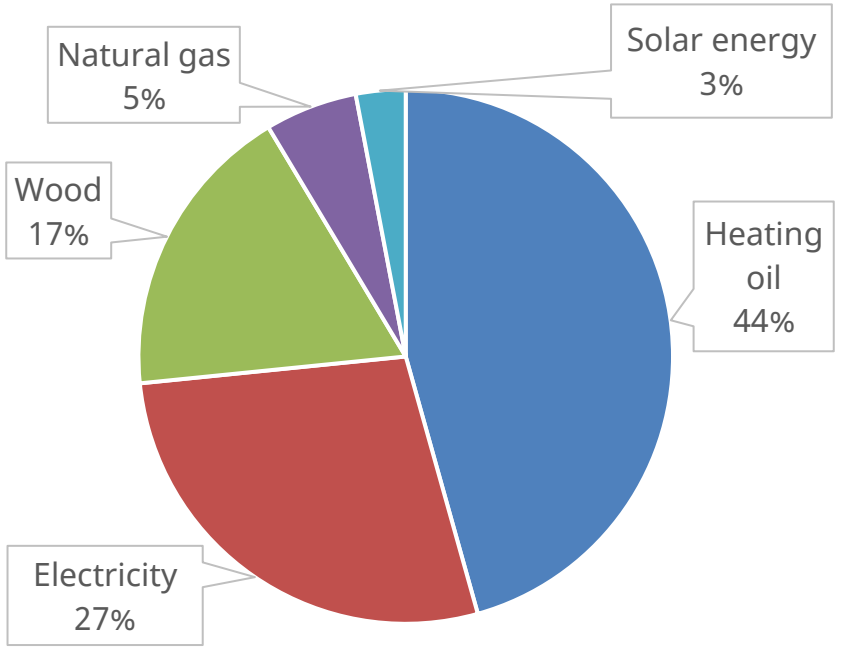
District heating

- Urban areas, apartment buildings
- Fuel source is typically fossil fuel

Light distillate (heating) oil & Liquid Petroleum Gas (LPG)

- Typically furnace connected to hot water tank + radiators

Final energy fuel distribution in Greece



Source: Hellenic Statistical Authority

PART III: Household energy performance

1. Introduction: Heating technology overview

	UNIT	COST*	FEATURES	SAFETY
Wood	m3 for raw wood Kg/ton for pellets	~0.035EUR/kWh ✓ important to use properly dried wood	• Direct heating (stove in living space) or • Central heating (furnace + water distribution to radiators) • 1 „spatial meter of wood" =1575 kWh	• Carbon monoxide (CO) suffocation risk if chimney is not regularly maintained • Fire hazard if stove is faulty
Electric – resistive	kWh	Day: ~0.22EUR/kWh Night: ~0.13EUR/kWh	• Simple to use • Thermal electric storage heaters taking advantage of lower tariff	• Fire hazard if devices are faulty or if heaters are covered
Electric – heat pump (Air-Air)	kWh	Day: ~0.22EUR/kWh Night: ~0.13EUR/kWh	• Coefficient of Performance 2.5-4: for 1kWh electricity, 2.5-4kWh thermal energy is pumped into indoor space. • Lower efficiency at lower outdoor temperatures	• Some devices cannot operate at low outdoor temperatures (-5C or lower)

** Reference values only (for Greece), actual prices vary due to multiple factors*

PART III: Household energy performance
1. Introduction: Heating technology overview

	UNIT	COST*	FEATURES	SAFETY
Natural gas	m3/kWh	~0.12EUR/kWh	• Regulations allow only condensation boilers to be sold, which have higher requirements for chimneys. Customers often need chimney reconstruction and delay replacing old boilers • 1 m³ = 9,4-10,2 kWh	• Some gas boilers need minimal water pressure to operate properly, water reactors can cause issues • Carbon monoxide (CO) suffocation risk if chimney is not regularly maintained
District heating	kWh, kW, m2	~0.025EUR/kWh	• Confusing billing methods reduced customer trust in district heating schemes • Cannot cover all areas	
Heating oil & LPG	Liters, kg	~0.12EUR/kWh ~0.15EUR/kWh	• Local storage tank required • 1 L heating oil = 11,86 kWh • 1 kg LPG= 12,80 kWh	• Fire hazard due to storage of flammable fuel

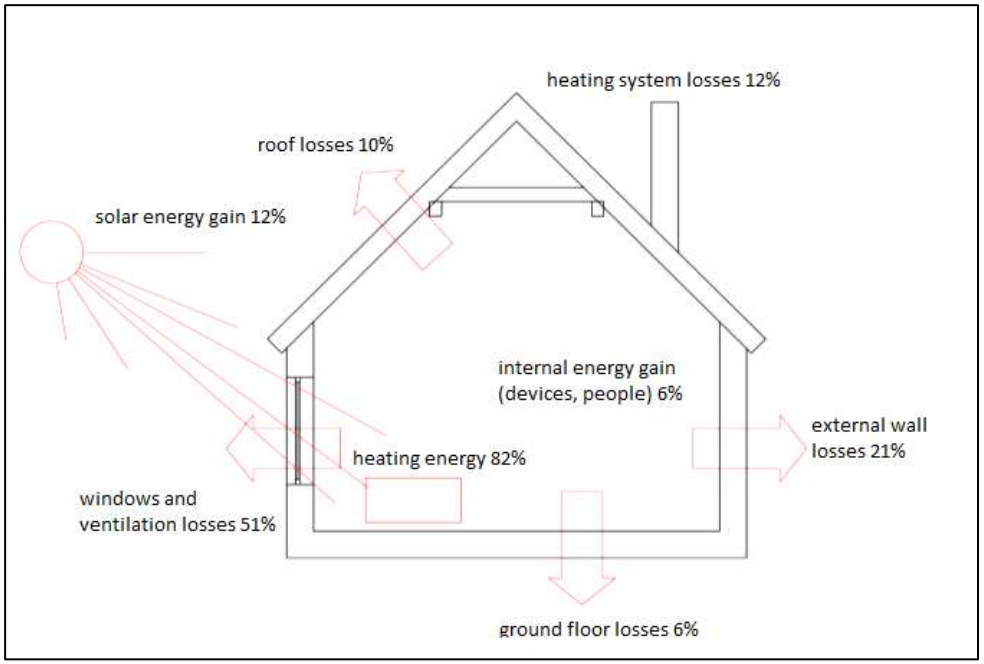
** Reference values only (for Greece), actual prices vary due to multiple factors*

PART III: Household energy performance
1. Introduction: Building thermal envelope

Thermal insulation
- Walls, roofs, windows, floors
- Important to avoid thermal bridges

Thermal mass
- More thermal mass indoors increases thermal inertia and makes the space more thermally passive
- E. g. solar thermal energy can be stored by the floor below the window

Heating system efficiency
- Regular maintenance is important for efficient heating system operation
- Correct temperature setpoint regulation can reduce energy consumption
- Is the heat distributed in equally or concentrated in one spot?



Reference values for thermal energy gains and losses / Source: REACH

Air-tightness
- Gaps on windows & doors cause drafts & thermal energy leaks
- Bathroom and kitchen extraction fans need non-return flaps to reduce draft

PART III: Household energy performance

1. Introduction: Building thermal envelope

Geographic orientation

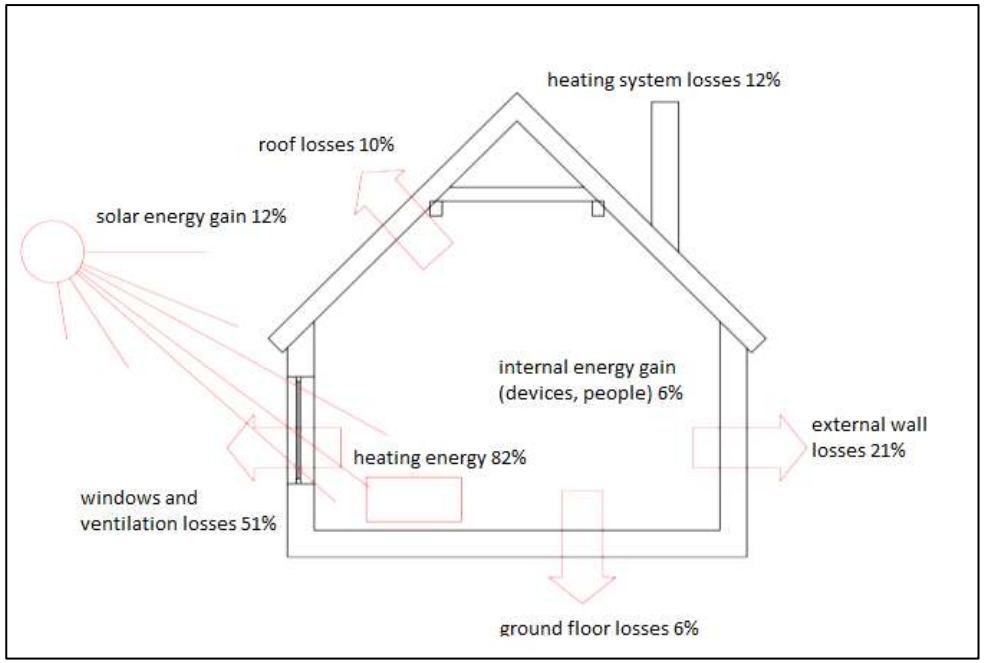
- Orientation towards south results in more solar energy gain
- Eaves above windows allow low angle winter sun to enter the windows, while keeping out high-angle summer sun

Shape / form factor

- Compact space distribution with minimal surfaces exposed to outside conditions result in less energy losses

Neighboring dwellings

- Walls shared with heated areas lose less energy



Reference values for thermal energy gains and losses / Source: REACH

PART III: Household energy performance

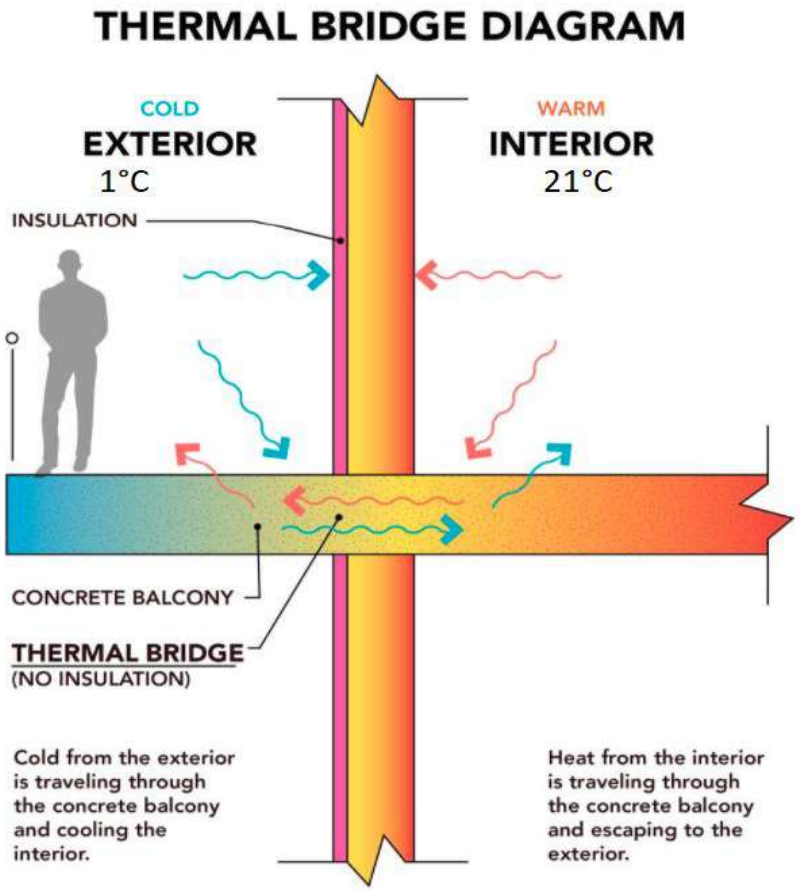
1. Introduction: Building thermal envelope

Thermal bridge

- Thermal conductive connection between interior and exterior of the building
- Non-insulated walls, concrete balconies

Water vapour, air tightness & mold

- 1 person can generate ~1.5kg water vapour per day
- Cooking, showering, drying clothes, dishwashing also generate water vapour
- If living space is air-tight and not ventilated, water remains trapped inside
- Mold often occurs on cold spots where water vapour condensates (thermal bridges)



https://civilengineering4u.wordpress.com/2017/05/29/thermal-bridging/

https://www.isse.org.uk/articles/dampness

PART III: Household energy performance

2. Simple energy audit

Goal of the simple energy audit is to gather key information **to determine the existing energy situation** in the household.

After the audit, energy supporters should be able **to propose measures to reduce energy costs and increase quality of life.**

Checklist

- **Heating/cooling system**
- **Energy performance of the building**
- **Energy appliances**
- **Energy behaviour**
- **Safety considerations**
- **Energy bill analysis**

PART III: 2. Simple energy audit

Key steps

DATA COLLECTION

Find:

Energy consumption for heating, electricity, water (kWh, l.)

Energy use: heating types (gas, wood!, district heating, oil, electricity), electric devices (how many, stand-by consumption…)

Energy performance of the building envelope: insulation, outer walls, roof, chimney, thermal bridges.

ENERGY ANALYSIS

Define:

Consumption patterns (e.g. season, daily, monthly

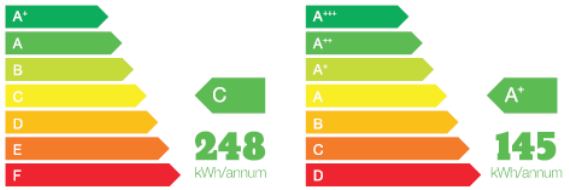
Significant energy use (will lead to best EE measure pay-off)

Benchmarks (using the latest energy performance indicators kWh/m2)

PRESENTATION OF RESULTS

Report to beneficiary

Certification



PART III: Household energy performance
2. Simple energy audit

POINTS TO KEEP IN MIND

HEATING

- Heating type – gas/district heating/electricity/wood/pellets
- Positioning of heat emission devices in the living/working space – are heating devices close to cold walls that act as heat sinks? What is the heat distribution in the room?
- Heating system service periods

BUILDING ENERGY PERFORMANCE

- Wall composition from inside to outside with focus on thermal insulation and thermal mass properties; detection of potential thermal bridges
- Windows and doors – air tightness inspection, glass type (single/double/triple)
- Ventilation openings – air flow inspection in the kitchen and bathroom extraction fan openings

PART III: Household energy performance

2. Simple energy audit

POINTS TO KEEP IN MIND

ENERGY BEHAVIOR

- What are the biggest “energy pain points”?
- Parts of the house/flat that feel cold
- Any activities that are avoided because of cold – e.g. sitting at the table for too long
- Body parts that feel cold – feet, hands, back
- Determine if there are any applicable government energy poverty alleviation schemes
- How long will the tenants live in the property?
- Any renovation needed/planned soon?

SAFETY

- State of the chimney - Carbon monoxide hazard
- Old electric heaters, obstructing airflow around heaters
- Electric installation (e.g. if high-power electric heaters are used)

PART III: Household energy performance

2. Simple energy audit

USEFUL TOOLS

- Distance meter
- kWh meter
- Photo camera
- Infrared thermometer

PART III: Household energy performance

2. Simple energy audit

COMMUNICATION TIPS when performing household visits

BENEFICIARIES COULD BE:

- Elderly people,
- People with various health problems (physical and mental): hearing or visually impaired, anxious, depressive.

DO's and DONT's of household visit

- First contact is important: smile, introduce yourself, make eye contact, shake hands (but be aware of COVID-19 measures!)
- Explain the purpose of the visit and what will happen during the visit.
- DO NOT enter the house prior to invitation!
- DO NOT enter the rooms without the presence of the beneficiary!
- Repeat that the energy visit is FREE of CHARGE, you are not selling anything!
- Up to 2 persons are optimal for the visit
- Adapt the communication based on beneficiary health status (hearing, vision, invalid person...)
- Leave contact details and inform them about the next steps
- Respect the dignity of the beneficiary, their home, privacy, values.
- DO NOT share private data with third persons (GDPR).
- Listen to the beneficiary patiently, but allow yourself to leave (if you have enough data, or if it is not comfortable for you).
- Inform mentor if any problem occurs.

PART III: Household energy performance

3. Energy efficiency measures and practical tips

How to save energy?

REDUCE TOTAL ENERGY CONSUMPTION but do not reduce comfort (improve it)

FIND SIGNIFICANT ENERGY USERS

- **Replace with EE**

New A rating (2020) consumes up to 100 kWh less per year

or

- **Reduce their operation time**

Using timer for electric water heater

FIND THERMAL BRIDGES or HOLES like windows, entrance door, outer walls, ceiling toward non-heated attic

- **"Patch" them**

Insulation strips, reflexive foils, thermal insulation

USE NATURAL LIGHTING AND SUN RADIATION OPTIMALY by adjusting room orientation/use, shading devices

PROTECT HOUSE FROM OVERHEATING IN SUMMER by using blinds, eaves, trees on south side of the house

Simple measures will show quick results with small investment, but low impact.

Optimal measure is one with quick results, lower investment and higher impact

= **SHORT PAYBACK PERIOD**

ENERGY RENOVATION as a long-term approach

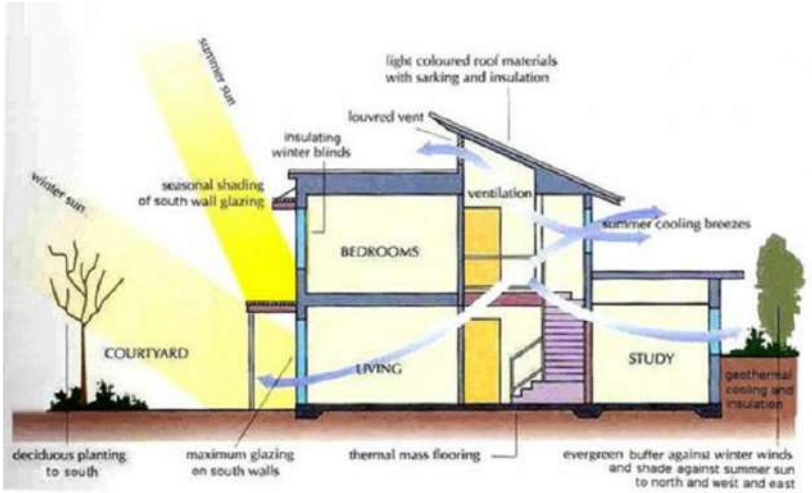
PART III: Household energy performance

3. Energy efficiency measures and practical tips

EXAMPLE: Passive solar retrofit 250 kWh/m2 to 15 kWh/m2 annually

MAXIMIZE

- solar gain in heating season
- thermal insulation (cost effective!)
- use of wasted heat (heat exchangers)
- use of renewable sources



MINIMIZE

- solar gain in cooling season (no need for air conditions)
- air leaks (but allow fresh air to come in!)
- thermal bridges

OPTIMIZE

- thermal mass (slows down temperature change!)

PART III: Household energy performance

3. Energy efficiency measures and practical tips

Example: ENERGY RENOVATION of a family house
250 kWh to 90 kWh per m2

LARGE investments

1. **THERMAL INSULATION** of outer envelope
2. **EE** windows and doors
3. **HEATING SYSTEM** renewed
4. **SOLAR THERMAL** system

SMALL and MEDIUM investments:

EE lighting, EE appliances, draft proofing, water saving devices

PART III: Household energy performance

3. Energy efficiency measures and practical tips

Example: ENERGY RENOVATION of a family house with 100 m2

Outer envelope THERMAL INSULATION

MEASURE	INVESTMENT	PAYBACK PERIOD (YEARS)	EXPECTED LIFETIME (YEARS)
10 cm mineral wool/EPS on outer wall	40-45 Eur/m2	~15 (depends on energy used)	50
20 cm mineral wool in roof	10 Eur/m2	3-5 (depends on energy used)	50

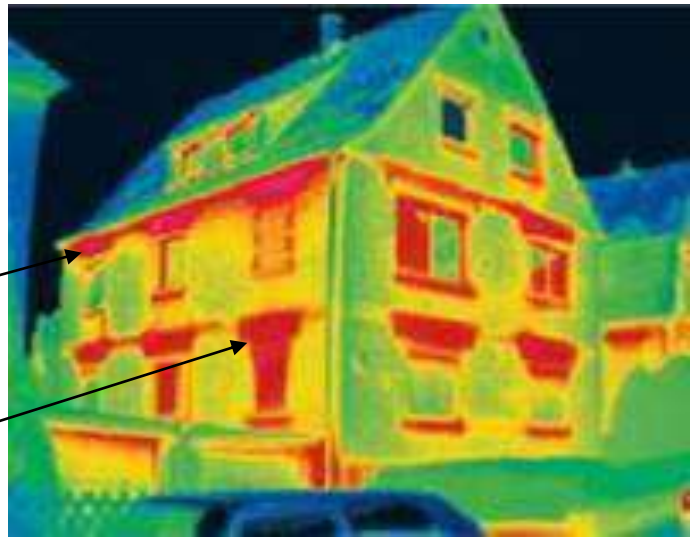
PART III: Household energy performance

3. Energy efficiency measures and practical tips

Example: ENERGY RENOVATION of a family house with 100 m2

Outer envelope THERMAL INSULATION

- MOISTURE problems if material with **low vapour diffusion factor** is used
- **Good ventilation** is crucial
- THERMAL BRIDGES - High quality installation reduces risk of TB on windows, doors, roofs



PART III: Household energy performance

3. Energy efficiency measures and practical tips

Example: ENERGY RENOVATION of a family house with 100 m2

Outer envelope THERMAL INSULATION

Natural materials increase sustainability by reducing embedded energy (recycled cellulose, sheep wool, straw bale)

PART III: Household energy performance

3. Energy efficiency measures and practical tips

Example: ENERGY RENOVATION of a family house with 100 m2

ENERGY EFFICIENT windows and doors
U value – heat transfer coefficient: lower U – better insulation - higher price

MEASURE	INVESTMENT	PAYBACK PERIOD (YEARS)	EXPECTED LIFETIME (YEARS)
ENERGY EFFICIENT windows • PVC, alu, wood • U value less than 1,2 W/m2K)	300-400 EUR/m2	~15-20 (depends on type installed and energy used)	50

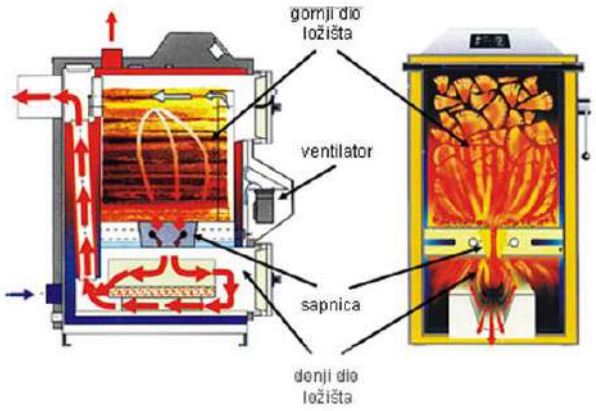
PART III: Household energy performance

3. Energy efficiency measures and practical tips

Example: ENERGY RENOVATION of a family house with 100 m2

HEATING SYSTEM – change of energy source from heating oil to biomass

MEASURE	INVESTMENT	ANNUAL ENERGY SAVINGS	PAYBACK PERIOD (YEARS)	EXPECTED LIFETIME (YEARS)
BIOMASS pirolitic instead of heating oil boiler	5800 EUR	2600 L oil	3-4	15
BIOMASS pelet instead of heating oil boiler	3000 EUR	2100 L	2-3	15

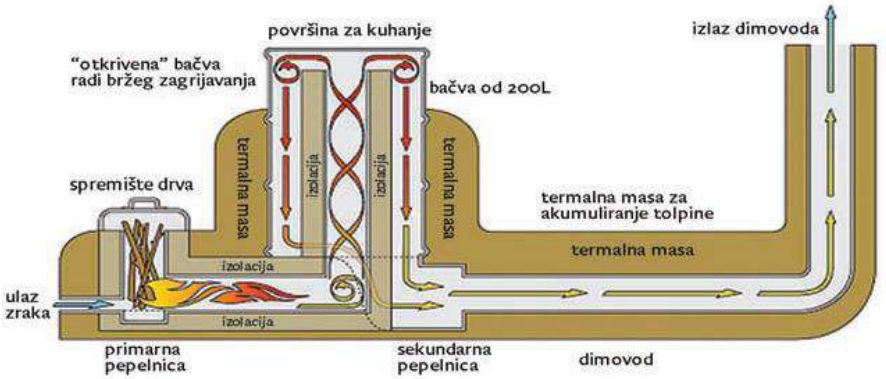


Sources: DOOR, https://door.hr/
https://www.centrometal.hr/

PART III: Household energy performance

3. Energy efficiency measures and practical tips

HEATING SYSTEM – standard wood burning furnace vs. high efficient „Rocket stove”



Sources: DOOR, https://door.hr/
https://www.zmag.hr/

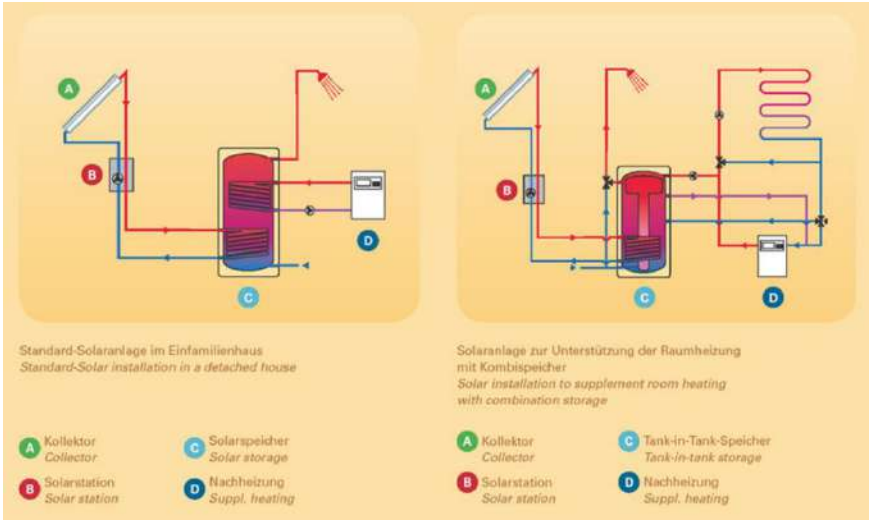
PART III: Household energy performance

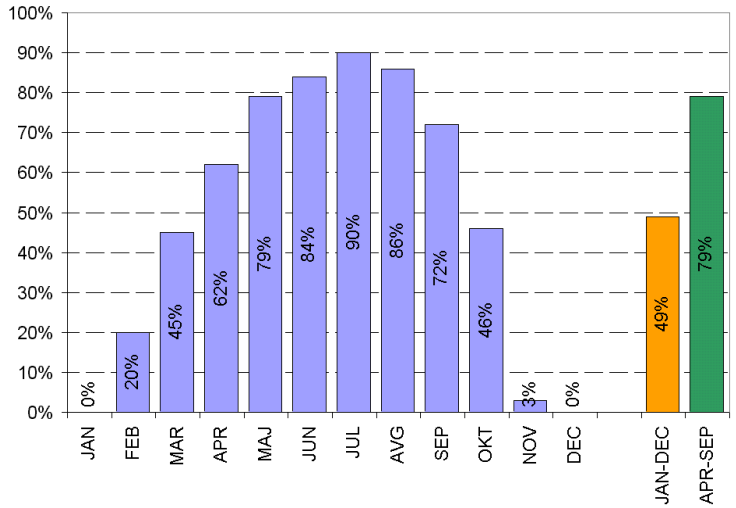
3. Energy efficiency measures and practical tips

Example: ENERGY RENOVATION of a family house with 100 m2

MEASURE	INVESTMENT	ANNUAL ENERGY SAVINGS	PAYBACK PERIOD (YEARS)	EXPECTED LIFETIME (YEARS)
SOLAR THERMAL SYSTEM instead of ELECTRIC BOILER for sanitary water and/or heating backup	3000 EUR	2000 kWh	10 (no incentives or change in electricity price)	25

Source: DOOR, https://door.hr/





 Sources: https://www.dgs.de

PART III: Household energy performance

3. Energy efficiency measures and practical tips

Example: ENERGY RENOVATION of a family house with 100 m2

MEASURE	INVESTMENT (design, equipment, transport, installation, insurance)	ANNUAL FINANCIAL SAVINGS	SIMPLE PAYBACK PERIOD (YEARS)	EXPECTED LIFETIME (YEARS)
Photovoltaic power plant for own supply (4 kW)	~ 3500 EUR	385 EUR	9 years	25

Source: DC

Sources: https://www.elektro-beckhaeuser.de/photovoltaik/
https://www.energysage.com/solar/101/net-metering-for-home-solar-panels/

Thank you for your attention!

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This project has received funding from the European Union's HORIZON 2020 research and innovation programme under grant agreement No 890437

POWERPOOR

Empowering Energy Poor Citizens through Energy Cooperative Initiatives

Part III - From theory to practice. Good practices and case studies - Working on the ground with energy-poor households and policymakers on lowering energy poverty levels

Anamari Majdandžić (DOOR)

26th January 2023

This project has received funding from the European Union's HORIZON 2020 research and innovation programme under grant agreement No 890437

Module 2 – Structure and content

- Module content
  - PART I – EU energy poverty alleviation policies
  - PART II - Energy poverty alleviation actions
  - PART III - Household Energy Performance
- Module summary
  - Key takeaways
  - Further reading

Module 2 – Goals

- To identify the types of energy poverty alleviation policies and measures adopted by different stakeholders, with emphasis on their results and benefits for citizens facing energy poverty episodes

- To provide trainers, supporters and mentors information, tips and tools to improve Household Energy Performance

PART I: European energy poverty alleviation policies

1. Types and categories of energy poverty alleviation policies

2. Key energy poverty alleviation policies at the EU level

3. Summary of all national policies + case studies/actions/best practices from partners

PART I: EU energy poverty alleviation policies

1. Types and categories of energy poverty alleviation policies

Energy Poverty Handbook (2016)

POLICIES are reflected in different types of measures

- Financial interventions to support payment of bills (short term relief)
- Additional consumer protection for users in the energy retail markets
- Energy efficiency programmes (building efficiency and energy-efficient appliances)
- Information provision and raising awareness

Source: http://bpie.eu/wp-content/uploads/2016/11/energypovertyhandbook-online.pdf

PART I: EU energy poverty alleviation policies

Key stakeholders implementing policy measures on a national level in alignment with national and EU policy frameworks

Source: http://bpie.eu/wp-content/uploads/2016/11/energypovertyhandbook-online.pdf

PART I: EU energy poverty alleviation policies

2. List of energy poverty alleviation policies at the EU level

Directive (EU) 2019/692 Internal Market for Natural Gas Directive

States that "**energy poverty** is a problem and Member States should take action"

Directive (EU) 2018/2002 on energy efficiency

"When designing the measures to fulfil energy saving objectives, Member States should take into account the need to **alleviate energy poverty** in accordance with criteria established by them, and they shall include information about the outcome of measures to alleviate energy poverty"

Directive (EU) 2018/844 on energy performance of buildings

"Member States must outline relevant national measures to help **alleviate energy poverty**, as part of their long-term renovation strategies to support the renovation of the national stock of residential and non-residential buildings"

Regulation (EU) 2018/1999. Governance of the Energy Union and Climate Action

"MS must include an objective of energy poverty alleviation in their National Energy and Climate Action Plans (NECPs)"

Source: https://eur-lex.europa.eu/homepage.html

PART I: EU energy poverty alleviation policies

2. List of energy poverty alleviation policies at the EU level

Directive (EU) 2019/944 Internal market for electricity

Policy plans and measures to **alleviate energy poverty** and ensure that vulnerable consumers have access to energy in critical periods

Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources

Empowering jointly acting renewables self-consumers also provides opportunities for renewable energy communities to advance energy efficiency at household level and helps fight energy poverty through reduced consumption and lower supply tariffs. Member States should take appropriate advantage of that opportunity by, inter alia, assessing the possibility to enable participation by households that might otherwise not be able to participate, including vulnerable consumers and tenants.

Renovation Wave (Area of intervention 6)

"Using renovation as a lever to address **energy poverty** and access to healthy housing for all households (…). The Commission will launch an Affordable Housing Initiative for 100 lighthouse project and will examine whether and how the EU budget resources alongside EU Emissions Trading System (EU ETS) revenues could be used to fund national energy efficiency and savings schemes."

Source: https://eur-lex.europa.eu/homepage.html

PART II: Energy poverty alleviation actions

1. Croatia - Policies

Key national policies	Name of policy affecting energy poverty	Coordinating authority	Short description	Category
Energy Act (Official Gazette, No. 120/12, 14/14, 102/15, 68/18)	Regulation on the monthly allowances for vulnerable energy customers, the manner of participation in reimbursement of the energy costs of the beneficiary and the actions of the competent social welfare centres (Official Gazette, number: 31/2022)	Minister of Labor, Pension System, Family and Social Policy	• Co-financing of electricity costs to a maximum of 500 HRK per month (66 euro per month) • solidarity fee paid by electricity customers from the household category in the amount of 0.03 HRK for each kWh of electricity consumed	Additional consumer protection Financial interventions
Energy Act (Official Gazette, No. 120/12, 14/14, 102/15, 68/18)	Regulation on the criteria for acquiring the status of vulnerable energy customers from networked systems (Official Gazette, number: 120/12, 14/14, 95/15, 102/15, 68/18)	Ministry of Economy and Sustainable Development	• Definition of the status of “vulnerable customer”	Additional consumer protection
Energy Act (Official Gazette, No. 120/12, 14/14, 102/15, 68/18)	Regulation on the criteria for acquiring the status of a protected customer in conditions of crisis in gas supply (Official Gazette, number: 65/2015)	Ministry of Economy and Sustainable Development	• Definition of “protected customer” • Regulation to protect certain categories of end users of gas in crisis in gas supply → required quantities of gas for all protected customers and allocates them to suppliers	Additional consumer protection

Source: https://www.zakon.hr/

PART II: Energy poverty alleviation actions

1. Croatia - Policies

Key national policies	Name of policy affecting energy poverty	Coordinating authority	Short description	Category
Energy Act (Official Gazette, No. 120/12, 14/14, 102/15, 68/18	2015 Agreement of Cooperation in Combating Energy Poverty Measures	Ministry of Economy and Sustainable Development	• The agreement on cooperation in measures to combat energy poverty by which HEP took over the costs of solidarity compensation, was established by agreement between the Government of the Republic of Croatia and suppliers and may expire at any time	Additional consumer protection
Electricity Market Act (Official Gazette, Nos. 22/13, 102/15, 68/18, 52/19)	Decision on the amount of the fee for the use of space used by production plants for the production of electricity (Official Gazette, No. 84/2013, 101/2013, 72/2015)	Ministry of Economy and Sustainable Development	• Owners of production plants for electricity production are obliged to pay compensation to the premises where power plants are built to local self-government units →municipalities and cities, which should be used for social welfare programs	Financial interventions
Energy Efficiency Act (Official Gazette, No. 127/14, 116/18, 25/20)	Regulation on the obligation system of energy efficiency (Official Gazette, No. 41/2019)	Ministry of Economy and Sustainable Development	• The fee for vulnerable energy customers (in accordance with the regulation on social welfare) is increased by 20% for an energy-saving customer or 10% for residential energy-saving customer	Financial interventions

Source: https://www.zakon.hr/

PART II: Energy poverty alleviation actions

1. Croatia - policies

Key national policies	Name of policy affecting energy poverty	Coordinating authority	Short description	Category
Social Welfare Act care (OG 157/13, 152/14, 99/15, 52/16, 16/17, 130/17, 98/19)	The Guaranteed Minimal Support programme (Social Welfare Act (Official Gazette, number: 157/13, 152/14, 99/15, 52/16, 16/17, 130/17, 98/19, 64/20, 138/20)	Minister of Labour, Pension System, Family and Social Policy	• The right to financial assistance for a single person or a household to meet their basic living needs	Additional consumer protection Financial interventions
Social Welfare Act care (OG 157/13, 152/14, 99/15, 52/16, 16/17, 130/17, 98/19)	Decision on the basis for calculating the amount of the minimum fee (Official Gazette, No. 157/2013)	Minister of Labor, Pension System, Family and Social Policy	• guaranteed minimum financial assistance → 800.00 HRK (107 EUR) • single parent → 100% (800.00 HRK) for an adult member of the household → 60% (480.00 HRK = 64 EUR) for a child → 40% (320.00 HRK = 43 EUR) and for a child of a single parent → 55% (440.00 HRK = 59 EUR) • single person or household - using wood for heating (3 m³ of wood or approved monetary amount to cover that cost)	Additional consumer protection Financial interventions
Act on Write-Off of Debts to Natural Persons (Official Gazette, No. 62/2018)	/	Croatian Electricity Company (HEP)	• writes off debts to persons up to the maximum amount of debt of HRK 5,000	Additional consumer protection Financial interventions

Source: https://www.zakon.hr/

PART II: Energy poverty alleviation actions

1. Croatia - policies

Key national policies – future strategy and actions plans	Name of policy affecting energy poverty	Coordinating authority	Short description	Category
Long-term strategy for the renovation of the national building stock until 2050	Program for energy renovation of family houses for the period 2014 - 2020 - "Decision on the extension of financing in 2021 for the implementation of the Program for energy renovation of family houses for the period from 2014 to 2020 with a detailed plan for the period until the end of 2020".	Environmental Protection and Energy Efficiency Fund	• Public Call in 2020: Public call for citizens at risk of energy poverty • there will be a new Program for the energy renovation of family houses from vulnerable groups of citizens from 2021-2027	Energy efficiency programmes
Long-term strategy for the renovation of the national building stock until 2050	Program for energy renovation of multi-apartment buildings for the period up to 2030 - Decision on adoption of the Program for energy renovation of multi-apartment buildings for the period up to 2030 (Official Gazette, No. 143/2021).	Environmental Protection and Energy Efficiency Fund	• the Program lacks concrete measures to meet the needs of energy-poor citizens in the energy renovation of apartment buildings	Energy efficiency programmes
Long-term strategy for the renovation of the national building stock until 2050	Program to combat energy poverty, which includes the use of renewable energy sources in residential buildings in assisted areas and areas of special state concern for the period 2019-2021 (Decision (Official Gazette, No. 143/2021)	Central State office for Reconstruction and housing care	• The program covers the renovation of 387 residential buildings (but 413 buildings are listed in the table) and 100% of the renovation costs are planned to be financed.	Ministry of Economy and Sustainable Development

Source: https://www.zakon.hr/

PART II: Energy poverty alleviation actions

1. Croatia - policies

Key national policies – future strategy and actions plans	Name of policy affecting energy poverty	Coordinating authority	Short description	Category
Long-term strategy for the renovation of the national building stock until 2050 – Decision (Official Gazette, No. 140/2020)	National recovery and resilience plan (NPOO)	Ministry of Spatial Planning, Construction and State Property.	• Most of the grant in the building sector part will be directed toward the renovation of buildings damaged in the earthquake including energy renovation.	Financial interventions
Action Plan for Energy and Climate Sustainable Development (SECAP)- Osijek Action Plan for Energy and Climate Sustainable Development (SECAP)- Zadar	/	City of Osijek, Zadar i Rijeka	• Measure 1: Co-financing of energy renovation of family houses for vulnerable groups of citizens at risk of energy poverty • Measure 2: Small EE measures for vulnerable groups of citizens at risk of energy poverty	Financial interventions
Zagreb strategy for the fight against poverty and social exclusion for the period from 2021 to 2025	/	City of zagreb	• Measures from energy poverty is: ensuring energy packages for beneficiaries of the right to compensation for housing costs. One of the activities of this measure is the provision of energy packages	Financial interventions

Source: https://www.zakon.hr/

PART II Energy poverty alleviation actions

1. Croatia - policies

Key national policies – future strategy and actions plans	Name of policy affecting energy poverty	Coordinating authority	Short description	Category
Energy development strategy of the Republic of Croatia until 2030 with a view to 2050 (Official Gazette, No. 25/2020)	Energy Poverty Reduction Program until 2026	Ministry of Economy and Sustainable Development	• no active policy • it is planned to implement energy efficiency measures in 50,000 households	Financial interventions Energy efficiency programmes
Integrated National Energy and Climate Plan for the Republic of Croatia for the period from 2021 to 2030 (NECP)	Program to combat energy poverty, which includes the use of renewable energy sources in residential buildings in assisted areas and areas of special state concern for the period 2019-2021	Ministry of Economy and Sustainable Development	• currently there is no public information available on the stage of development of this Program	Financial interventions Energy efficiency programmes

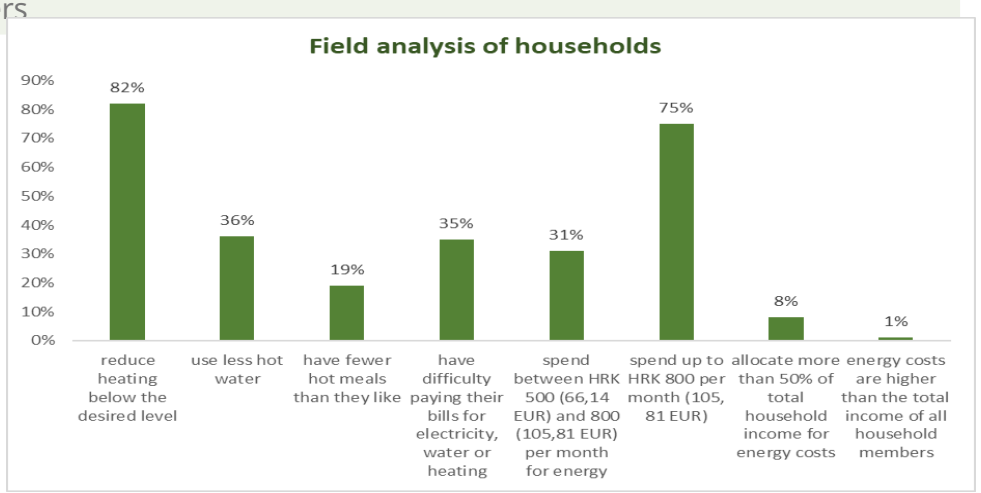
Source: https://www.zakon.hr/

PART II: Energy poverty alleviation actions
2. Croatia - case studies/ actions/best practices

CASE STUDY	ENERGY POVERTY ACTION FER (Fair Solutions for Better Community)	LOCATION Zagreb, Croatia
DESCRIPTION	• Project implementation period: 03/2018.-03/2020 • Budget: - 1.167.759,73 HRK (154.090,43 EUR) • Partners: DOOR, Faculty of Electrical Engineering and Computing, University of Zagreb and City of Zagreb • Stakeholders: students, professors, NGOs, energy poor citizens • Source of funding: European Social Fund (ESF) and State Budget (UZUVRH) • Description: investigating energy consumption habits in energy-poor households, implementing energy efficiency measures, educating energy advisors	
SOLUTION	• A methodology has been developed for the systematic engagement of associations as a subject in college • A policy proposal has been made for the City of Zagreb to combat energy poverty • Developed a model for calculating energy consumption	
IMPACT	• Students performed energy audits of 102 energy-poor households in the City of Zagreb and installed energy-saving equipment • identification of a vulnerable customers	

FER RJEŠENJA ZA BOLJU ZAJEDNICU

Source: https://door.hr/portfolio/fer-rjesenja-za-bolju-zajednicu/



PART II: Energy poverty alleviation actions
2. Croatia - case studies/actions/best practices

CASE STUDY	ENERGY POVERTY ACTION **REACH - Reduce Energy use And Change Habits**	LOCATION **Bulgaria, Croatia, North Macedonia, Slovenia**
DESCRIPTION	• Contributing to energy poverty abatement at practical and structural levels • Empowering energy-poor households to take actions to save energy and change their habits, • Establishing energy poverty as an issue that demands structural solutions at local, national and EU levels • Implementing project activities at national level (investigating energy consumption habits in energy-poor households, implementing energy efficiency measures, educating energy advisors) • Participating in EU-level activities (international conferences, public policy advocacy)	
SOLUTION	• Established overview of fuel poverty for 4 countries • Local workshops for local actors, trainings for teachers and trainings for energy advisors • Implemented 1600 visits of households with tailor-made advice, package of energy saving devices, guidebook and post-visit support	
IMPACT	• 20 local actors engaged in local actions, 20 trained teachers and 250 trained energy advisors • 3200 hours of energy audits, 3200 hours of energy advising, 4800 installed EE devices, • Savings of 1280 t CO2, • 768 toe of energy and 512.000 EUR • Recommendations reach out to at least 160 decision makers and about 400.000 people, engaging the decision-makers in triggering policies and measures for fuel poverty	

Source: REACH – Reduce Energy use And Change Habits (door.hr)

REACH
Reduce Energy use And Change Habits

PART II: Energy poverty alleviation actions
2. Croatia - case studies/actions/best practices

CASE STUDY	ENERGY POVERTY ACTION **Znanjem do toplog doma „Through knowledge to warm home"**	LOCATION **Sisačko-Moslavačka County, Croatia**
DESCRIPTION	• Goal: to initiate an innovative social service - energy consultancy for poor households - and enable energy-poor households to save energy and change their habits. • Project implementation period: 02/2012-04/2016 • Budget: ~102.572 EUR • Partners: DOOR (project coordinator), City of Petrinja, Youth society „Novi Svijet" (Lušćani) • Source of funding: European Social Fund, Croatian national budget	
SOLUTION	• The implementation of the described activities aimed to focus on energy poverty as a problem that requires tailor-made policies and measures at local, national and EU levels due to the high prevalence of energy-poor households in Sisak-Moslavina County	
IMPACT	• Educational activities conducted on energy poverty and energy efficiency • Report on energy poverty in Sisačko Moslavačka County, public policy analysis • Organized meetings between local government and local NGOs focused on energy poverty • Simple energy audits conducted in 80 households, data collection • Recommendations issued to consider energy poverty in local energy and social policies • Public discussion and round table conducted	

Source: *https://door.hr/portfolio/znanjem-do-toplog-doma/*

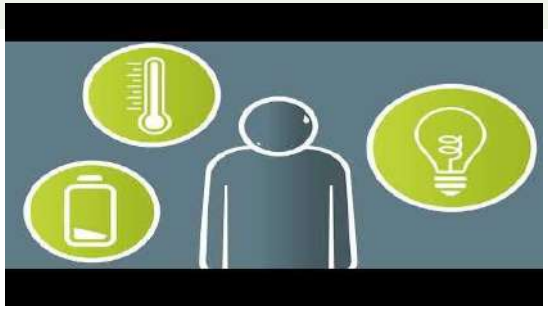
Utility cost share compared to household income

PART II: Energy poverty alleviation actions
2. Croatia - case studies/actions/best practices

CASE STUDY	ENERGY POVERTY ACTION **IDEA - Innovative Direction in Energy Advising**	LOCATION **Slovenia, Bulgaria, Croatia, Cyprus**
DESCRIPTION	• Project implementation period: 11/2017-11/2019 • Budget: 134.598 EUR • Stakeholdrs: NGOs and energy poor citizens • Source of funding: Erasmus+ • Description: IDEA was a project that aimed to decrease energy poverty by implementing an educational platform for energy awareness.	
SOLUTION	• educational programme with a curriculum for adult education about energy poverty • a set of innovative educational materials (tools, methods, practices, initiatives,...) defined in the curriculum • a guide to accompany the curriculum and to help interested stakeholders to implement it - complemented by video tutorials for each tool and an overview webinar in each country • a website (http://www.project-idea.eu/) to allow access • to all the educational materials and guidance	
IMPACT	• a tool for future simple energy audits	

iDEA

Source: http://www.project-idea.eu/



For an overview, please take a look at this video: https://youtu.be/u9hPk 2zmBIE

PART II: Energy poverty alleviation actions
2. Croatia - case studies/actions/best practices

CASE STUDY	ENERGY POVERTY ACTION **Together to more comfortable housing 1-4**	**LOCATION** **Zagreb, Croatia**
DESCRIPTION	• Project implementation period: 2016-2020 • Budget: 11.200 EUR (over 4 years) • Partners: Local NGOs working with vulnerable citizens • Source of funding: City of Zagreb, Social protection and disability fund • Description: Project is focused on visits to energy poor households in city of Zagreb. Project has been renewed for 4 consecutive years, with specific vulnerable groups addressed every year. For example, women-only households or homes from disabled people.	
SOLUTION	• Household visits consist of acquiring data, giving advice on energy efficiency and giving out small energy efficiency aid packs (LED bulbs, sealants for windows...).	
IMPACT	• ~10 households visited each year • Reduced energy consumption (not quantified) • Increased quality of life (not quantified) • Policy recommendations to the city administration to address energy poverty affecting vulnerable citizens	

Energy efficiency aid packs

Slika 1. Prikaz potrošnje energije u tipičnom kućanstvu[2]

PART II: Energy poverty alleviation actions
2. Croatia - case studies/actions/best practices

CASE STUDY	ENERGY POVERTY ACTION **ENPOR – Action to Mitigate Energy Poverty in the Private Rented Sector poverty**	LOCATION **Velika Gorica, Croatia**
DESCRIPTION	• Project implementation period: 09/2020-09/2023 • Budget: 1.999.966,25 EUR • Source of funding: HORIZON 2020 • Partners: Netherlands, Germany, Belgium, United Kingdom, Greece, Croatia, Italy, Estonia and Austria • Description: The general objective of the ENPOR project is to draw attention to energy poverty in the private rental sector (PRS), taking into account the needs of landlords and tenants and to include them in the wider political context	
SOLUTION	• an assessment of the extent of the energy poverty problem in the PRS at the EU level • supporting the development of policies tailored to the specific needs of households in the PRS • Pilot city Velika Gorica → Target so-called free – based tenancy, which always includes two separate families/households in the same dwelling. This subgroup has not been targeted yet and rented apartments were mainly out of policy focus due to lack of information.	
IMPACT (expected)	• highlighted innovative and "win-win" ways to increase energy efficiency for vulnerable households in the PRS with special emphasis on creating synergies between landlords and tenants and sustainable solutions • establishment of a REACT group to enable the exchange of local and national knowledge on energy poverty in the PRS at EU level	

Source: www.enpor.eu

PART II: Energy poverty alleviation actions

3. Croatia - active energy poverty projects

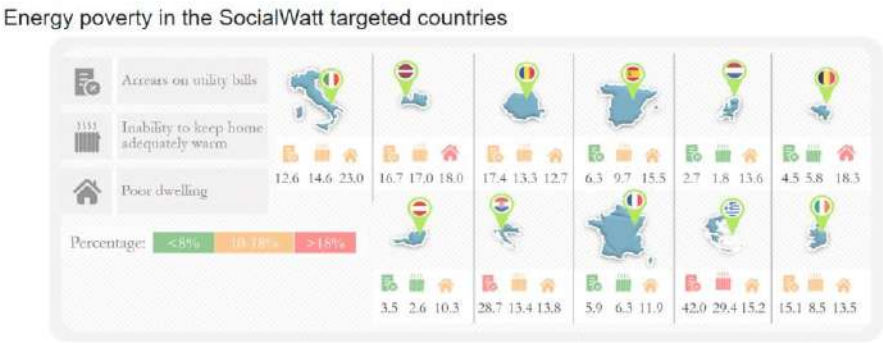
CASE STUDY	ENERGY POVERTY ACTION **EmpowerMed– Empowering women to take action against energy poverty**	LOCATION **Zadar, Croatia**
DESCRIPTION	• Project implementation period: 09/2019-09/2023 • Budget: 1.982.150 EUR • Source of funding: HORIZON 2020 • Partners: Slovenia, Croatia, Italy, Spain; France, Germany, Albania • Description: The main objective of the project is to contribute to energy poverty abatement in the Mediterranean	
SOLUTION	• implementing a set of practical energy efficiency and RES measures, tailored to empower households in energy poverty and specifically focused on women and health • assessing their efficiency and impacts to formulate policy recommendations • promoting policy solutions among key actors for stimulating action against energy poverty at local and EU level.	
IMPACT (expected)	• 10,200 participants empowered to fight energy poverty in 6 pilot areas • Primary energy savings - 6.5 GWh/yr, CO2 emission reduction 1.600 tCO2/yr • 160.000 € investment in sustainable energy, 780.000 € wider economic savings • 50 women and men freed of debt or disconnection from power grid • At least 60% women participating in project activities • Public policy and best practices advocacy to fight energy poverty	

EmpowerMed

Source: www.empowermed.eu/

PART II: Energy poverty alleviation actions
2. Croatia - case studies/actions/best practices

CASE STUDY	ENERGY POVERTY ACTION **SocialWatt**	LOCATION **Croatia**
DESCRIPTION	• Project implementation period: 09/2019-09/2022 • Budget: 1.998.297,50 EUR • Partners: EU (Greece, Netherlands, Belgium, Austria, Romania, France, Spain, Ireland, Latvia, Croatia, Italy) • Source of funding: HORIZON 2020 • Description: SocialWatt will develop and provide utilities and energy suppliers with appropriate tools for effectively engaging with their customers and working together towards alleviating energy poverty	
SOLUTION	• SocialWatt will also enable obligated parties under Article 7 of the Energy Efficiency Directive across Europe to develop, adopt, test and spread innovative energy poverty schemes	
IMPACT (expected)	• Identify energy poor households • Develop innovative schemes to alleviate energy poverty • Build the capacity of utilities, energy suppliers and social services • Implement the schemes to alleviate energy poverty • Replicate the project's outcomes and provide policy recommendations	



Source: https://www.socialwatteu/

PART II: Energy poverty alleviation actions
2. Croatia - case studies/actions/best practices

CASE STUDY	ENERGY POVERTY ACTION **ENGAGER - European Energy Poverty: Agenda Co-Creation and Knowledge Innovation**	LOCATION **Croatia**
DESCRIPTION	• Project implementation period: 2017-2021 • Source of funding: The COST Association • Research network funded via the European Co-operation in Science and Technology (COST) scheme	
SOLUTION	• It is aimed at developing and strengthening an international community of researchers and practitioners focused on combating energy poverty	
IMPACT (expected)	• Involves currently more than 200 members from over 40 countries	

Source: http://www.engager-energy.net/

Thank you for your attention!

Name of Presenter(s)
Name of Organisation, Country
e-mail -

This project has received funding from the European Union's HORIZON 2020 research and innovation programme under grant agreement No 890437

POWERPOOR

Empowering Energy Poor Citizens through Energy Cooperative Initiatives

Part III - From theory to practice. Good practices and case studies.

Edit Lakatos, Housing Europe

26 January 2023

PART III: Household energy performance

3. Energy efficiency measures and practical tips

Example: ENERGY RENOVATION of a family house with 100 m2

SMALL and MEDIUM investments:

- Standby appliances
- **Draftproofing, reflective foils**
- EE lighting
- EE appliances
- Water saving devices

3-4 windows,
20 EUR investment,
Payback period of 1 year

3 radiators
20 Eur investment,
Payback period of
1 year

PART III: Household energy performance

3. Energy efficiency measures and practical tips

Energy box

PART III: Household energy performance

3. Energy efficiency measures and practical tips

Example: ENERGY RENOVATION of a family house with 100 m2

SMALL and MEDIUM investments:

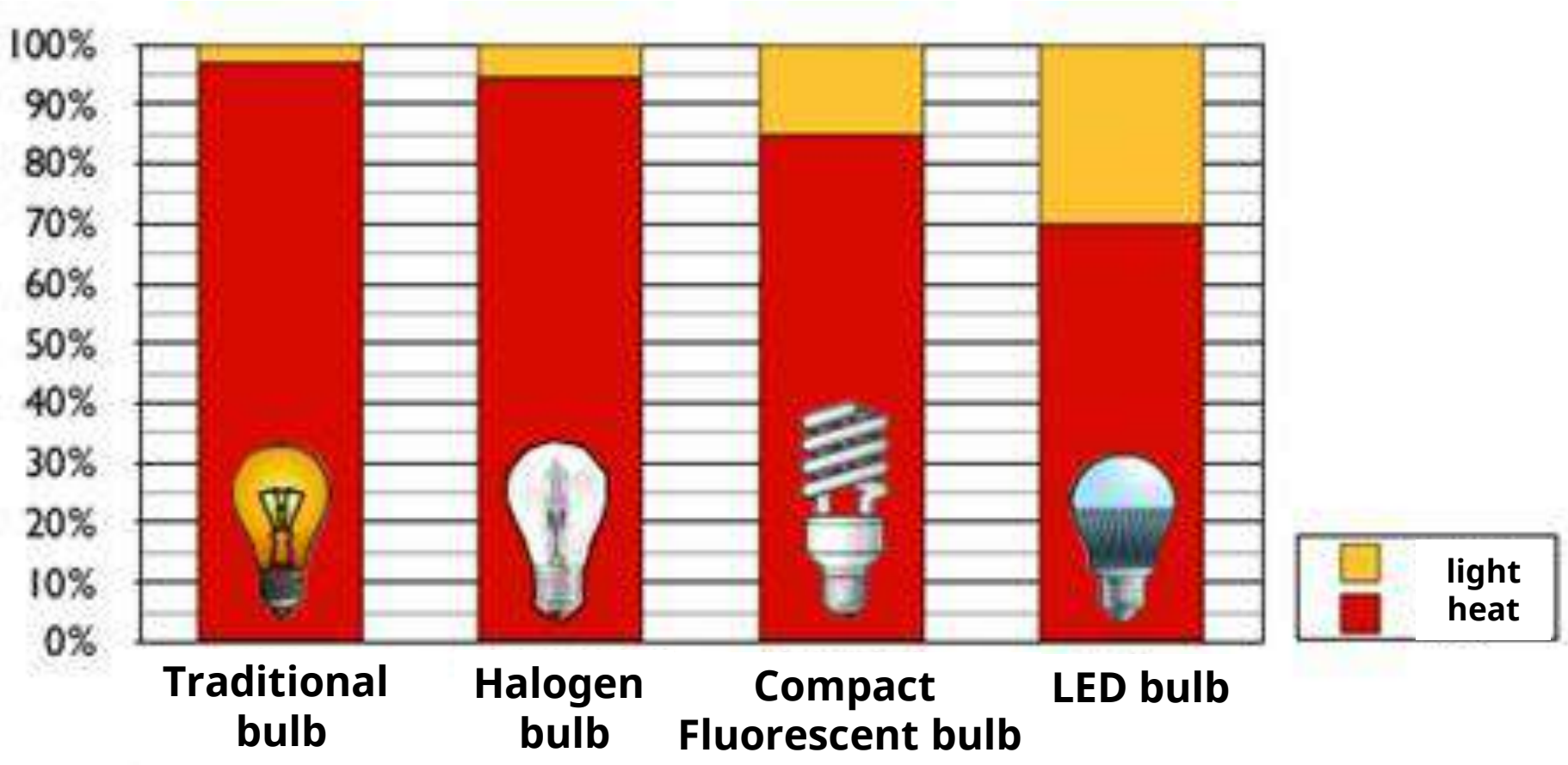
- Standby appliances
- Draftproofing, reflective foils
- **EE lighting**
- EE appliances
- Water saving devices

2 LED bulbs,
14 EUR investment,
Payback period of 1 year

PART III: Household energy performance

3. Energy efficiency measures and practical tips

Keep in mind!
EE ≠ energy saving



Also, lifetime and durability matter!

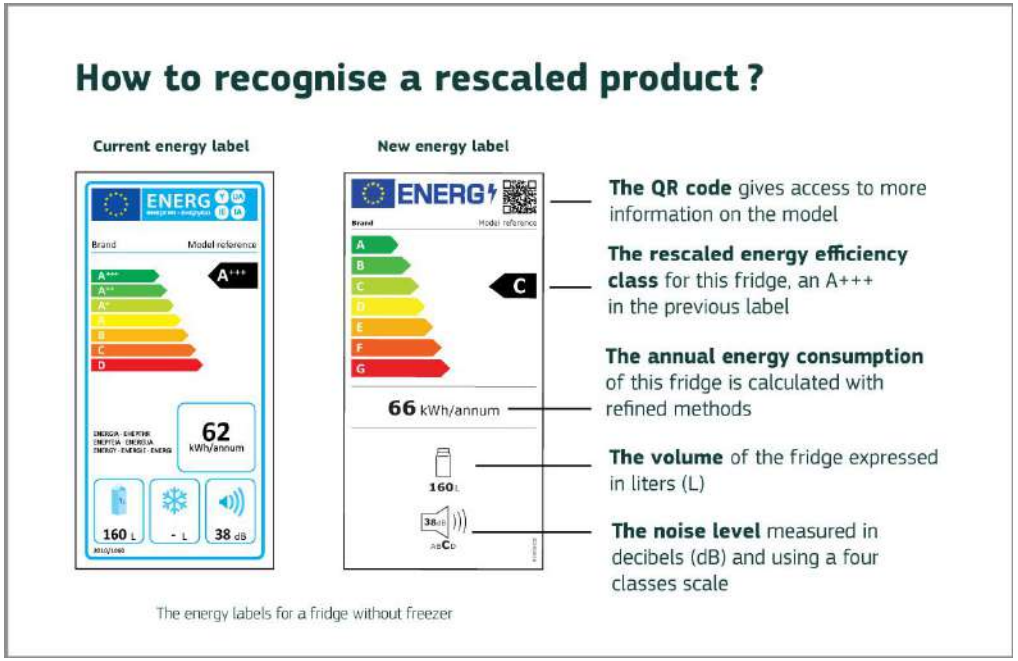
PART III: Household energy performance

3. Energy efficiency measures and practical tips

Example: ENERGY RENOVATION of a family house with 100 m2

SMALL and MEDIUM investment:

- Standby appliances
- Draftproofing, reflective foils
- EE lighting
- **EE appliances**
- Water saving devices



New 2021 energy labels

Source: https://ec.europa.eu/info/energy-climate-change-environment/standards-tools-and-labels/products-labelling-rules-and-requirements/energy-label-and-ecodesign/product-database/qr-code-new-energy-label_en

PART III: Household energy performance

3. Energy efficiency measures and practical tips

PART III: Household energy performance

3. Energy efficiency measures and practical tips

Example: ENERGY RENOVATION of a family house with 100 m2

SMALL and MEDIUM investments:

- Standby appliances
- Draftproofing, reflective foils
- EE lighting
- EE appliances
- **Water saving devices**

10 m3 potential savings compared to normal tap

PART III: Household energy performance

3. Energy efficiency measures and practical tips

HEATING – practical tips

WOOD HEATING

- When buying a furnace, select one that fits the size of the room.
- Close air intake whenever the furnace is not in use to avoid heat loss through the chimney
- Make sure that there is no exhaust gas leakage into the living space (!)
- Make sure that the wood is dry enough to be used as fuel
- Regularly inspect and clean the chimney
- Don’t overfill the furnace with wood
- Consider stovepipe heat reclaim radiators to increase heat transfer to the room

GAS/ CENTRAL HEATING

- Reduce thermostat set points for unused rooms
- Insulate hot water piping, especially if passing through “cold” areas
- Service the system regularly

PART III: Household energy performance

3. Energy efficiency measures and practical tips

HEATING – practical tips

WOOD HEATING

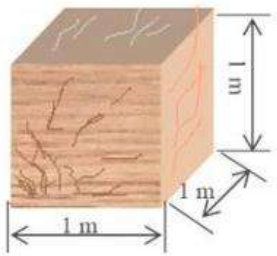
The proper way to light firewood

- **use only dry, raw (untreated) firewood (avoid all other flammable substances)**
- **load firewood in this way (see picture 1)**
- **light the pile from above**

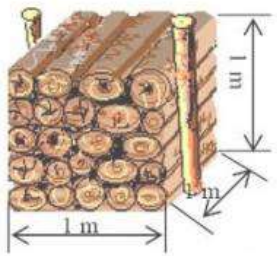
PART III: Household energy performance

4. Understanding energy and electricity

- Cubic meter vs spatial meter of wood
- When buying wood, spatial meter measure is used
- 1 spatial meter of wood is ~0.7m³, depending on cutting shape
- 1 "spatial meter of wood" =1575 kWh
- 1 kWh derived from burning wood: ~0.03EUR/kWh



1m³ wood



1 spatial meter wood

- Wood must be properly dried before being used as fuel (less than 20% humidity)
- burning wet wood causes energy loss and can lead to deposits of creosote building up in the chimney
- Wood should be stored exposed to south, exposed to wind, protected from rain and snow, separated from the ground, with enough space around it to allow enough airflow

Drying time	Oblice (cylindric pieces of wood) outdoors	Oblice (cylindric pieces of wood) stored after 3 months	Cjepanice (1/4 oblice) stored after 3 months
Starting humidity	76%	76%	76%
6 months	46%	44%	28%
12 months	35%	32%	23%
15 months	32%	27%	20%
18 months	27%	22%	15%
24 months	24%	18%	14%

Sources:
http://kamin.16mb.com/savjeti/kupovina-drveta-za-ogrijev/
https://algoritam.home.blog/2020/01/19/zasto-kubik-drva-nije-isto-sto-i-metar/

PART III: Household energy performance

3. Energy efficiency measures and practical tips

ELECTRICITY – practical tips

- Use night/"cheap" electricity tariff for heating – especially for electric thermal storage heaters and electric water heaters
- Use socket timers to heat only rooms that are in use at certain part of the day
- Keep heating elements clean and free of airflow obstruction
- Use insulation + reflective pads between heating element and the wall

PART III: Household energy performance

3. Energy efficiency measures and practical tips

SANITARY HOT WATER – practical tips

- Use night/"cheap" electricity for water heaters
- Limit water heater temperature – around 60C is enough for most household needs
- Avoid excessively low water heater temperatures to prevent the growth of Legionella bacteria
- If the existing water heater is poorly insulated, consider additional insulation
- The size of the water heater should match the needs of the household – water heaters larger than necessary are less efficient
- Take a shower instead of a bath
- Remove lime scale (especially in case of hard water) from electric heating elements to increase efficiency
- Check pipe fittings – faulty water mixers and shower heads cause hot water leakages

PART III: Household energy performance

3. Energy efficiency measures and practical tips

INSULATION and BUILDING ENVELOPE – practical tips

- Use insulation + reflective pads between heating elements and the wall
- Use rubber seals on doors/windows to eliminate unwanted airflow
- Utilize window blinds for passive energy efficiency
- Close blinds during the night to reduce heat loss through the windows
- Open blinds to allow the sun to warm up the rooms
- Look for mold and damp walls to determine cold spots on the walls – consider additional insulation around these spots
- Thick carpets can reduce heat loss through the floors

PART III: Household energy performance

3. Energy efficiency measures and practical tips

HOME APPLIANCES – practical tips

- When buying a new appliance, pay attention to the appliance energy class
- Defrost refrigerators regularly
- Keep refrigerators away from heat sources and leave enough empty space behind them to allow efficient heat rejection
- Check if the refrigerator doors are airtight
- Don’t set refrigerator setpoint too low – suggested values are 4C for refrigerators and -18C for freezers
- Use laundry washing machines and dryers during low electricity tariff periods
- Consider using lower water temperature while doing laundry
- Consider natural drying instead of electric dryer
- Induction stoves are more efficient than electric resistance ones
- Keep pot lids on when cooking to reduce required energy
- Shut down electronic devices when not in use; avoid leaving them on or in standby mode

PART III: Household energy performance

3. Energy efficiency measures and practical tips

LIGHTING – practical tips

- Turn off the lights in unoccupied rooms
- Use natural lighting when possible
- Correct light fixture can reduce power required for lighting a room

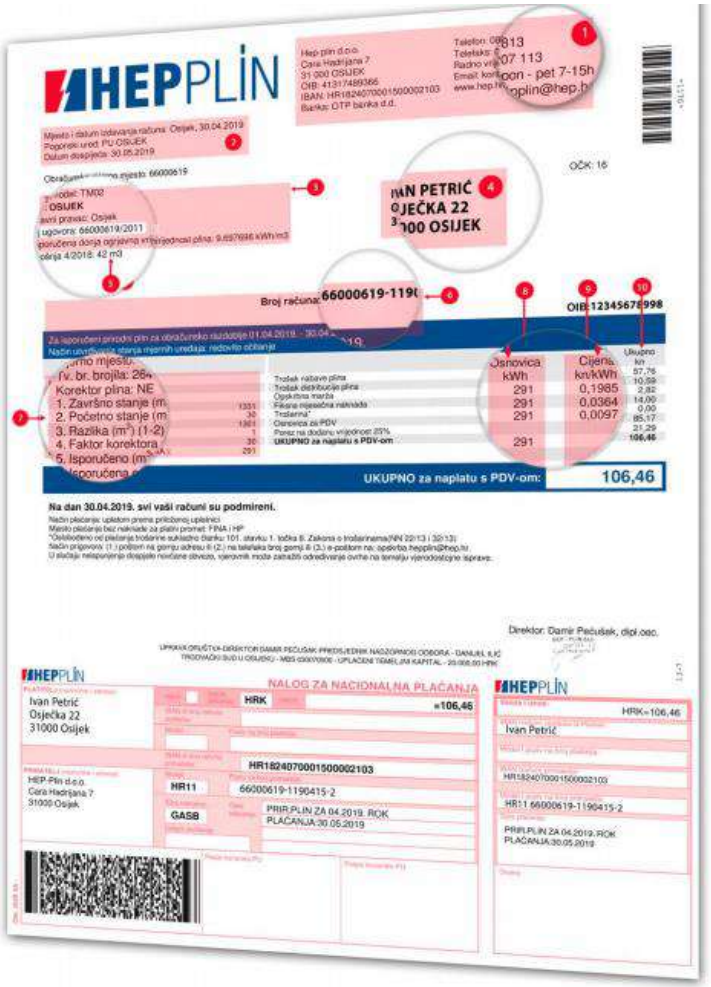
PART III: Household energy performance

4. Understanding energy and electricity utility bills - Gas

1. **Informacije o izdavatelju:** podaci o izdavatelju računa
2. **Informacije o računu:** podaci o mjestu i datumu izdavanja računa, pripadnosti organizacijskoj jedinici unutar HEP-Plin-a d.o.o., datumu dospijeća
3. **Tehnički podaci**: podaci o Tarifnom modelu, MRS-i , obračunskom mjernom mjestu, dobavnom pravcu i isporučenoj donjoj ogrijevnoj vrijednosti sukladno Mrežnim pravilima plinskog distribucijskog sustava (NN 50/18)
4. **Podaci o kupcu:** naziv i adresa navedena za dostavu računa
5. **Potrošnja:** podaci o prošlogodišnjoj potrošnji u istom obračunskom razdoblju u m_3
6. **Broj računa:** obračunsko mjerno mjesto, podaci o pozivu na broj, obračunsko razdoblje na koje se odnosi
7. **Podaci o potrošnji:** podaci o tvorničkom broju plinomjera, podaci o postojanju korektora plina (DA/NE), razlika početnog i završnog stanja, pretvorba u kWh (umnožak potrošene količine plina (m_3) i donje ogrijevne vrijednosti).
8. **Osnovica kWh:** osnovna jedinica mjere obračunskih elemenata. Od 1. siječnja 2012. godine na tržištu prirodnog plina RH primjenjuje se mjerna jedinica kWh (kWh/h).
9. **Cijena kn/kWh:** sukladno Odluci o iznosu tarifnih stavki za javnu uslugu opskrbe plinom za razdoblje od 1. travnja do 31. prosinca 2019. za energetski subjekt HEP-Plin d.o.o. (NN 15/19)
10. **Ukupno kn:** umnožak osnovice (kWh) i cijene (kn/kWh), svedeno na dvije decimalne jedinice

- 1 m^3 of natural gas: ~9.4kWh
- 1kWh of natural gas: ~0.04EUR/kWh

- Natural gas is measured in cubic meters (m^3)
- However, natural gas can have different energy densities in different locations
- Gas volume is multiplied with lower heating value of gas, specific for diferent distribution areas
- Resulting energy in kWh is billed according to price per kWh



Source: https://www.hep.hr/elektra/UserDocsImages/dokumenti/cesta-pitanja/Pojasnjenje_racuna_2_2018.pdf

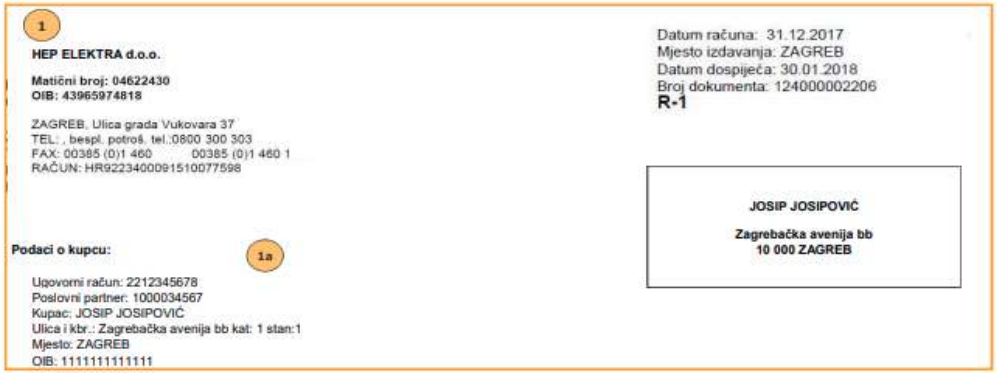
PART III: Household energy performance

4. Understanding energy and electricity utility bills - Electrical

- Electricity price in Croatia:
  - Day: ~0.15EUR/kWh
  - Night: ~0.8EUR/kWh

- Actual electricity readings are taken several times per year, while bills are issued monthly based on assumptions. Consumers are often confused by the balancing accounting.
- Items explained in the bill:

1: customer information
2: billing period
3: measurement units
4: energy consumed, high/low tariff
5: unit prices (energy, grid usage, renewables surcharge, "solidarity surcharge")
6: subtotals per each item
7: total for energy
8: total for renewables surcharge
8a: total for "solidarity surcharge"
9, 10: Value Added Tax (VAT)
11: total bill for the billing period
12: issued bills for the period based on estimates – obsolete for new meters
13: difference between estimated and real energy consumption
14: balance – can be positive or negative, depending on how much is owed or overpaid
15: total due payment



1

HEP ELEKTRA d.o.o.

Matični broj: 04622430
OIB: 43965974818

ZAGREB, Ulica grada Vukovara 37
TEL: , bespl. potroš. tel.:0800 300 303
FAX: 00385 (0)1 460 00385 (0)1 460 1
RAČUN: HR9223400091510077598

Datum računa: 31.12.2017
Mjesto izdavanja: ZAGREB
Datum dospijeća: 30.01.2018
Broj dokumenta: 124000002206
R-1

JOSIP JOSIPOVIĆ

Zagrebačka avenija bb
10 000 ZAGREB

Podaci o kupcu: 1a

Ugovorni račun: 2212345678
Poslovni partner: 1000034567
Kupac: JOSIP JOSIPOVIĆ
Ulica i kbr.: Zagrebačka avenija bb kat: 1 stan:1
Mjesto: ZAGREB
OIB: 1111111111111

2

RAČUN br: 2212345678-180120-3, razdoblje: 13.06.2017. - 28.12.2017.

Opis	3 Jed. mjere	4 Količina	5 Jed. Cijena kn	6 Iznos kn	
Električna energija viša dnevna tarifna stavka	kWh	###	0,84	2.470,44	
Električna energija niža dnevna tarifna stavka	kWh	###	0,41	604,34	
Naknada za obračunsko mjerno mjesto	mjesec	6,5	17,40	112,75	
Iznos za električnu energiju				**3.187,53**	7
Naknada za poticanje proizvodnje iz obnovljivih izvora	kWh	###	0,105	463,58	8
Solidarna naknada	kWh	###	0,03	83,97	
Popust za solidarnu naknadu				-83,97	8a
Porezna osnovica 9				3.651,11	
PDV 13% (osnovica: 3.651,11)				474,64	10
A. UKUPAN IZNOS RAČUNA				4.125,75	11
B. Zbroj izdanih rata za obračunsko razdoblje 13.06.2015. - 28.12.2016. 12				3.507,60	
C. RAZLIKA (A-B)				618,15	13
D. Dugovanje na dan obračuna (31.12.2017.)				0,00	
Ukupno za platiti (C + D)				**618,15**	14

Oslobođeno od plaćanja trošarine sukladno članku 101. stavku 8. točki 5. Zakona o trošarinama. 15

DRUGA STRANA RAČUNA:

OBRAČUN POTROŠNJE

Obračunsko mjesto: JOSIP JOSIPOVIĆ ZAGREB, Zagrebačka avenija bb
Broj obračunskog mjesta: 12345677890 Kategorija potrošnje: Kućanstvo Tarifni model: BIJELI Obr.:1

Broj brojila	Tar. Stavka	Datum od	Datum do	Br. mjeseci	Stanje od	Stanje do		Konstanta	Potrošak
6 A 111111	RVT R1	13.6.2017	1.10.2017	3,61	72.020	73.097	- procjena	1	1.077
	RVT R2				44.982	45.521	- procjena	1	539
	RVT R1	1.10.2017	28.12.2017	2,87	73.097	74.961		1	1.864
	RVT R2				45.521	46.456		1	935

Source: https://www.hep.hr/elektra/UserDocsImages/dokumenti/cesta-pitanja/Pojasnjenje_racuna_2_2018.pdf

PART III: Household energy performance

Energy Poverty Alleviation Offices

Estonia

- Office in Tallinn
- Visitors: mainly managers or members of apartment associations from multi-family buildings
- A free consultation on their energy consumption from an energy expert, who helps to identify if they are at risk of energy poverty and gives recommendations for energy efficient living.
- Representatives of apartment associations can obtain instructions for energy-efficient renovations and the installation of RES for large housing estates.

PART III: Household energy performance
Energy Poverty Alleviation Offices

Bulgaria

- Offices in 2 cities
- A dedicated desk and sitting area for visitors, it is served by all of the SOFENA employees.
- Difficulty to engage people at first, but a good number of home visits were made to areas with a high number of energy poor citizens
- Since that, 2-3 visitors a week.
- In most cases: visitors live in multifamily buildings, are already aware of the soft measures for improving the temperature comfort of their homes.
- They are interested to know what else they can do to reduce their energy bills, and are asking about financial schemes that would help them finance larger scale improvements, or will enable them to buy PVs.

PART III: Household energy performance

Energy Poverty Alleviation Offices

Croatia

- 2 Offices
- Bill reading and analyses,
- simple energy audits,
- advisory on simple measures to reduce energy consumption and increase living standards,
- advisory on possible technical solutions,
- currently available funding and financing options for energy poor households

PART III: Household energy performance

Energy Poverty Alleviation Offices

Croatia

- How can we change a distributor for electricity, water or heating?
- Could you calculate the cost-effectiveness of putting photovoltaic systems on my home?
- Could you calculate the cost-effectiveness of replacing a gas heating with a heat pump in my home?
- When will the next public calls be opened to co-finance the renovation?
- A list of institutions that can help me reduce my energy bills?
- Could we define ourself as energy poor household?

PART III: Household energy performance

Energy Poverty Alleviation Offices

Spain

- Numerous enquiries by phone and via email, and above all through the Base Social Services with they work in coordination.
- The responses are associated with:
  - If the prices they have contracted are "correct",
  - Why they have such high consumption if they have "nothing" plugged in
  - Whether they could be beneficiaries of the social electricity bonus
  - Whether there is any social bonus for heating
  - Whether we can help them change supplies to the regulated market or request the social bonus
- Many cases where people say they do not consume anything, and they do not understand why they have such a high consumption: after analysing the consumers, we discover that they have 2 freezers that are over 20 years old, or that they sleep with the television on.
- Sometimes, people have too much power contracted, so they are paying in their bills more than what they really need. The Office would advise to update the contracts, remove all unnecessary services and to shift to the regulated market (where the price is fixed by the regulator).


Errenteria
ADN
kreaktiboa
Errenteriako Udala
KOMUNITATE ENERGETIKOAK COMUNIDADES ENERGÉTICAS
EGITARAUA/PROGRAMA

PART III: Household energy performance

Energy Poverty Alleviation Offices

Hungary

- Municipality of Józsefváros, Budapest and Municipality of Terézváros, Budapest
- 2 volunteer consultants
- A lot of interest from the older age group
- asking about subsidies, possibility of financial support, and they are willing to take advantage of any financial support.
- owners of large apartments over 80 m^2, with high ceilings and poorly insulted windows, typically elderly residents living alone.
- utility bill cost reduction possibilities: many of the customers had collected and recorded their consumption for years, but they had difficulty in interpreting the data.


RENO PONT
Az energiatudatosság otthon kezdődik.
renopont.hu


ENERGIATANÁCSADÓ
IRODA

POWERPOOR

Empowering Energy Poor Citizens through Energy Cooperative Initiatives

Part IV - Energy communities and innovative financing schemes to tackle energy poverty

Oliver Gajda (EUROCROWD)

15 March 2023

This project has received funding from the European Union's HORIZON 2020 research and innovation programme under grant agreement No 890437

Module – Structure and content

- Module goals
- Module content
  - I – Collective Innovative Actions for Energy Poverty
  - II – Crowdfunding & Innovative Finance
  - III – Energy Cooperatives
  - IV – Power Fund Tool
- Module summary
  - Key takeaways
  - Further reading

I: Collective Energy Initiatives for Energy Poverty – An Introduction

What are Collective Energy Initiatives for Energy Poverty?

What can they do to alleviate energy poverty?

Collective Energy Initiatives

Collective Energy Initiatives, as the name indicates, are initiatives to bring citizens together and develop joint strategies to:

- gain **access** to affordable energy,
- **tackle issues** such as energy poverty,
- **empower** citizens in the energy market,
- find a **new electricity source**, for instance, by switching from traditional retailers to renewable energy ones and/or to self-generation.

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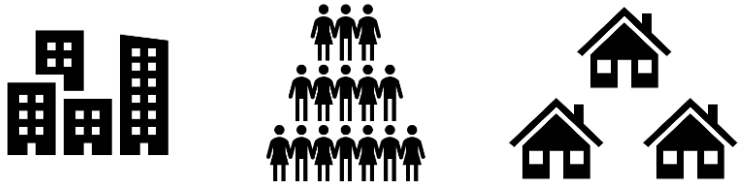
How can you achieve an ambitious goal without having sufficient resources to do it on your own?

Normally, you might ask your friends and family to help you by either donating some money or giving you a small loan.

When you expand that idea to an entire neighborhood or region and build an organization around it, it becomes a community, be it via cooperatives or crowdfunding.



Collective Energy Initiatives
Definition

Energy communities are…

- A way of organising **collective citizen actions** to influence the energy system

- Entities that exercise **energy-related activities** (generation, distribution, supply, aggregation, consumption, sharing, storage of energy, provision of energy-related services, etc.)

- Non-commercial **market actors**, that can facilitate collective switching campaigns, collective investments in solar panels, the ownership of an energy supply company, a distribution network, etc.

Collective Energy Initiatives

Definition

Energy communities are based on…

- Ownership and control by citizens, local authorities and small businesses
- Social, environmental or local economic benefits rather than profit-making
- Privately funded (or with support from business and authorities)

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Collective Energy Initiatives
Differences

ENERGY COMMUNITIES

Two new definitions at the EU level

Renewable Energy Community (REC)		Citizen Energy Community (CEC)
All forms of renewable energy	⟷	Technology-neutral (only electricity)
Proximity of RE projects	⟷	No geographic limits
Individuals, local authorities and micro/small/medium enterprises	⟷	Any participant
Autonomous from individual members and traditional market actors	⟷	Undefined degree of autonomy
Effective control by individuals, local authorities and micro/small enterprises	⟷	Effective control includes medium-sized enterprises

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Collective Energy Initiatives
Differences

Energy Communities can have different legal forms:

Foundations

Partnerships

Limited liability companies

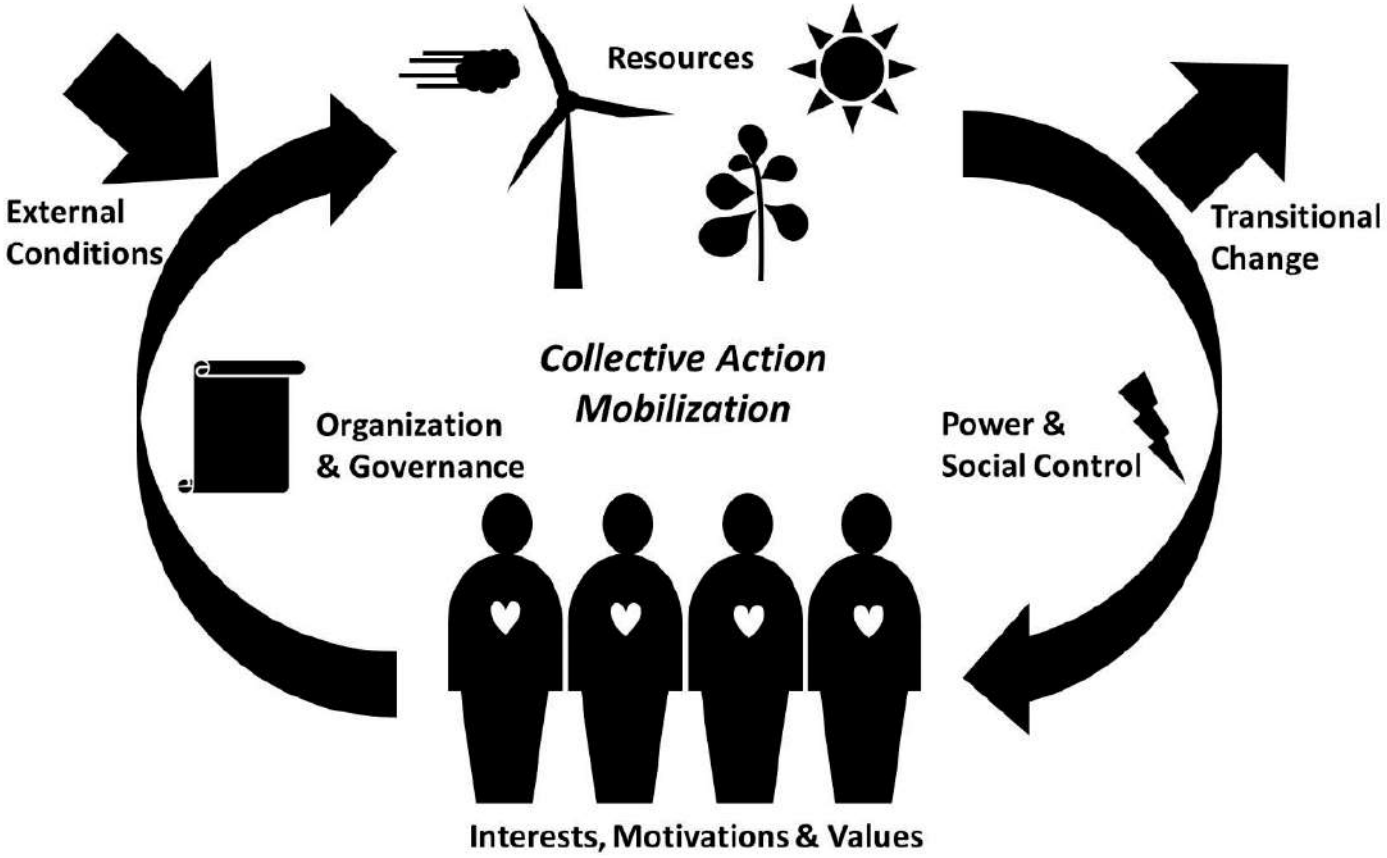
Energy cooperatives

Associations

Trusts

Non-profit organisations

What can they do to alleviate energy poverty?



II: Crowdfunding & Innovative Finance

What is crowdfunding?

How does it work?

How can community finance help tackle energy poverty?

Crowdfunding & Innovative Finance

Key elements

Open call to **raise funds** for a specific project

From **anyone with Internet access**
(potentially)

Through an **Internet-based** mechanism
(specialised website)

Foreseeing **tangible or intangible benefits** in exchange for each economic contribution

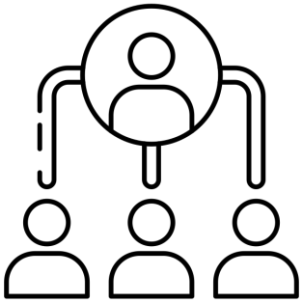
Crowdfunding & Innovative Finance

Main actors

Promoter

Platform

Crowd



Icons by Silvia Natalia from the Noun Project

Crowdfunding & Innovative Finance

Terminology and different Models

Non-financial *Match-funding* *Financial*

Donation

Philanthropic donation or gift, no return expected

Up to 10.000 €

Reward

Contribution in exchange for a perk or a product pre-order

Up to: 30.000 €

Equity

Investment for an ownership share in the business

Avg: 350.000 €

Lending

Capital repayment most often with interest

500k - 2 million €

Project co-financed by the European Regional Development Fund

Crowdfunding & Innovative Finance

Campaign concept outline

Your objective

What do you need funds for?

Project type

Social cause? Tech? Consumer product?

Project stage

Pre-seed? Seed? Early Stage? Growth?

Type of capital

Equity? Debt? Donation? Commercial?

Funds needed

How much money do you need to achieve your objective?

Target audience

Who is the target audience of your campaign?

TYPE OF CROWDFUNDING

Crowdfunding & Innovative Finance

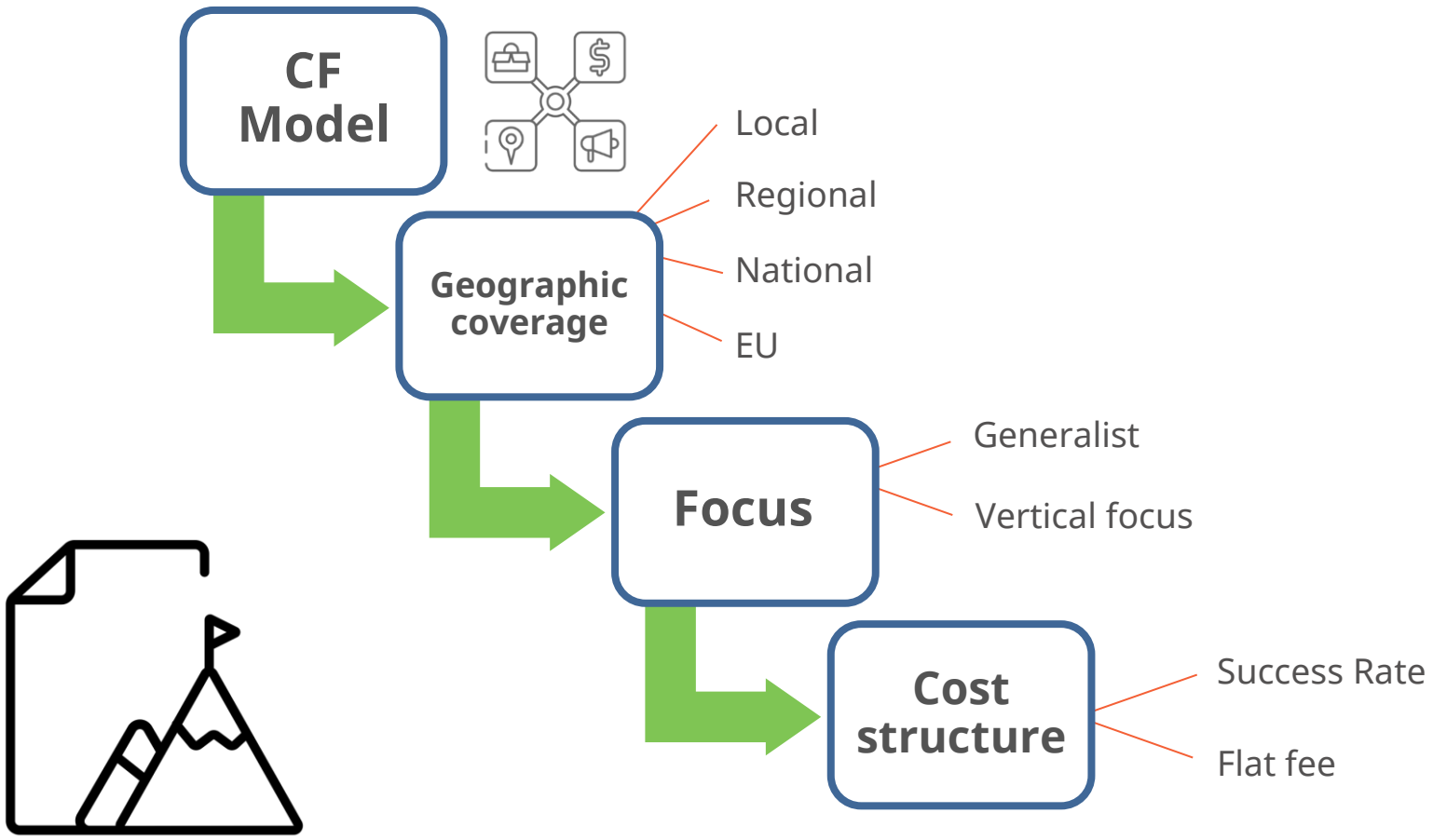
Focus on the typology of crowdfunding that you use

Set the right incentives

Donation	Reward	Equity	Lending
• Appel to intrinsic motivation & philanthropy • Provide updates on the latest developments of projects • Express grattitude to your donours	• Extrinsic + intrinsic motivation • Offer a variety of rewards considering different income and interest levels • Perks' perceived value • Market rate	• Financial return • Intrinsic motivations • Valuation • % offered • Promise & deliver growth	• Financial return • Interest rate

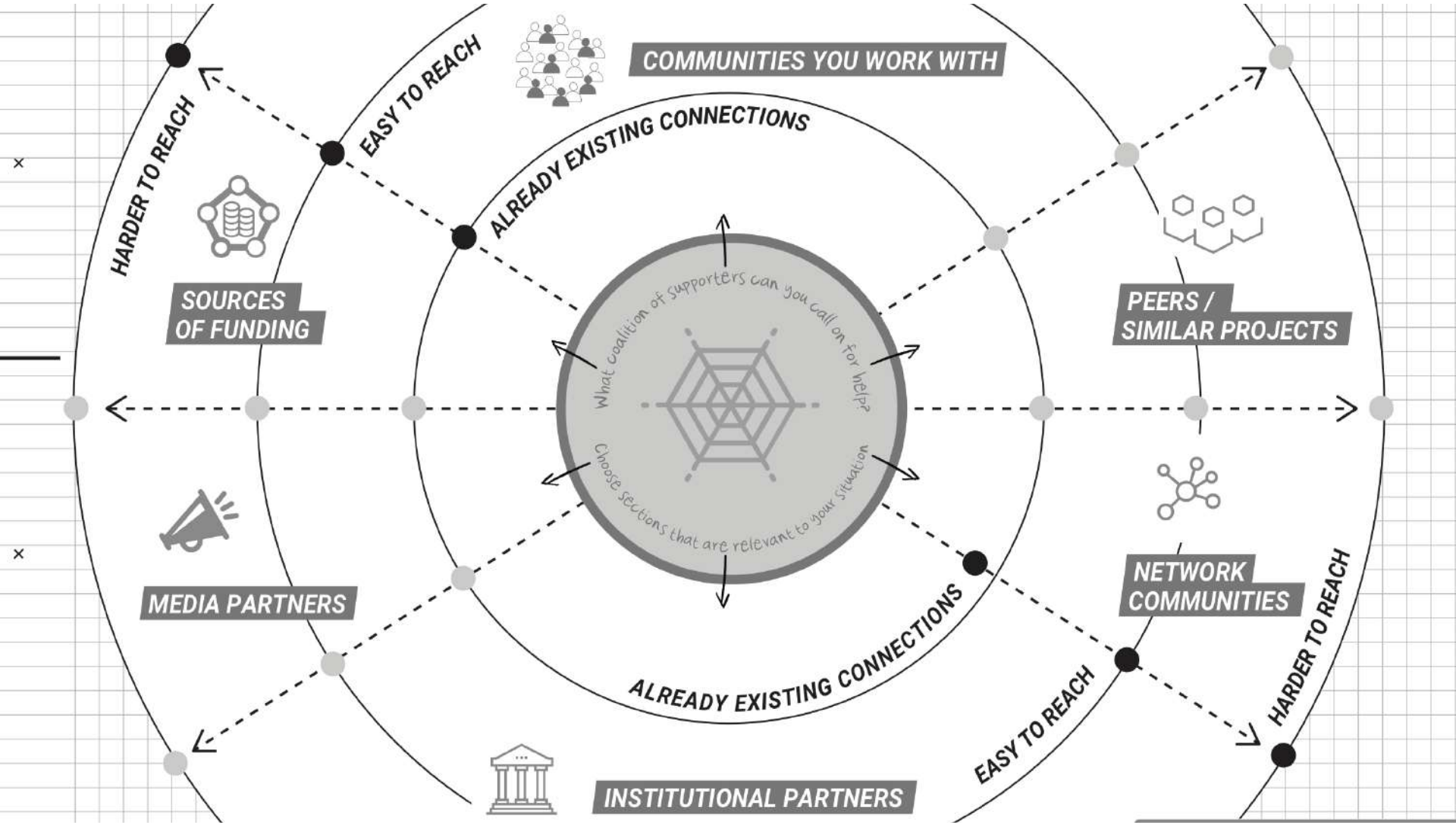
Crowdfunding & Innovative Finance

How to choose your crowdfunding platform



Icon by Silvia Natalia and Pedro from the Noun Project

Identify your community and network



Icon by Pedro from the Noun Project

POWERPOOR

Case Study 1

CASE STUDY	SOLARISATION OF GREECE: REWARD CROWDFUNDING CAMPAIGN FOR SOLAR PANELS	LOCATION GREECE
DESCRIPTION	With energy poverty being one of the most dramatic symptoms of the debt crisis in Greece (6 out of 10 households were struggling to pay their energy bills), investing in the abundant sun, the country's biggest asset, helped put money back in people's pockets by reducing their energy bills, brought them back into the job market by teaching them new skills and giving them opportunities, while contributing to the renewable energy transition.	
SOLUTION	Greenpeace Greece launched a **reward-based crowdfunding** campaign to finance the installation of solar panels onto the houses of families who lived on the brink of energy poverty in the island of Rhodes.	
IMPACT	**35.063€ raised from 1161 backers** Lower energy bills for involved households with significant savings Reduced dependency on oil energy production and oil subsidies	

Source: https://www.indiegogo.com/projects/solarization-of-greece#/updates/all

Case Study 2

CASE STUDY	Crowdlending campaign for the energy reabilitation of a homeowner community	LOCATION
		SPAIN
DESCRIPTION	Project to replace community boilers and other energy efficiency measures in the centralized hot water production system of a community of homeowners in Barcelona. The project achieved significant savings in the energy consumption of the centralized Domestic hot water (DHW) production system, as well as a fair distribution of the real consumption of each home.	
SOLUTION	**Crowdlending** campaign for the realization of a series of energy efficiency proposals: • Replacement of old atmospheric gas boilers with new, more efficient watertight boilers • Replacement of the old circulation pumps • New monitoring and control system • Installation of individual ACS meters in each house	
IMPACT	**49,600€ raised from 56 backers** Lower energy consumption for involved households with significant savings on the energy bill CO2 emissions reduced by 16 tons/year	

Source: https://www.ecrowdinvest.com/detalles/comunidad-propietarios-barcelona#description

How Collective Innovative Actions can tackle energy poverty

Case Study 3

CASE STUDY	#LaEnergiaDelCole Photovoltaic installation in a rural school committed to sustainability and the right to energy	LOCATION
		SPAIN
DESCRIPTION	Project to replace community boilers and other energy efficiency measures in the centralized hot water production system of a community of homeowners in Barcelona. The project achieved significant savings in the energy consumption of the centralized Domestic hot water (DHW) production system, as well as a fair distribution of the real consumption of each home.	
SOLUTION	**Reward crowdfunding** campaign which the main objective is obtain funding for 42,5 Kwp PHOTOVOLTAIC Installation for collective self-consumption: • Drafting of the technical project, legalization and construction management. • Installation of coplanar structure, with 66 mono-crystalline silicon modules of 340 wp, three-phase inverter of 20KW AC Nom, electrical protections and wiring. • Monitoring system for the intelligent management of the installation and net generation meter.	
IMPACT	**29,052€ raised from 202 backers (with 2 matchers, 1000€ each) / 20,000 € "in kind"** Reinforce the (rural) Eco-School infrastructure Increase the energy awareness of the community and actively involves them in energy saving actions Dynamization and collective construction of a model of governance, criteria for participation and sharing of collective self-consumption and tackle energy poverty in the community	

Source: https://en.goteo.org/project/la-energia-del-cole

III: Energy cooperatives

What they are?

How they work?

How can they help fight energy poverty?

POWERPOOR

ENERGY COOPERATIVES

A type of social and economic enterprise

A legal form that enables citizens to collectively own and manage energy-related projects and services

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

Energy cooperatives

Source: International Co-operative Alliance: https://www.ica.coop

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Energy cooperatives provide

Accessibility

- **Economy**
  - Fair prices
- **Governance**
  - Fair decisions

Solidarity

- **Fair conditions**
  - Well-being rather than profit
- **Support**
  - Knowledge sharing

Sustainability

- **Social**
  - Integration and cohesion
- **Environmental benefits**
  - Less health risks

Local economy

- **From citizens, for citizens**
  - Benefits remain local
- **Financial autonomy**
  - Less external dependence

Energy cooperatives help to

- **Sharing locally produced energy with vulnerable consumers**
  - More accessible energy prices
- **Collective purchase or ownership of goods and services**
  - Support for making investments with large upfront costs
  - Opportunity to participate in collective energy generation with no or low investments
- **Reinvesting in the community**
  - Round-up or similar mechanisms in energy bills to support vulnerable consumers
  - Accessible loans for investments within the community (e.g. microcredit)

POWERPOOR

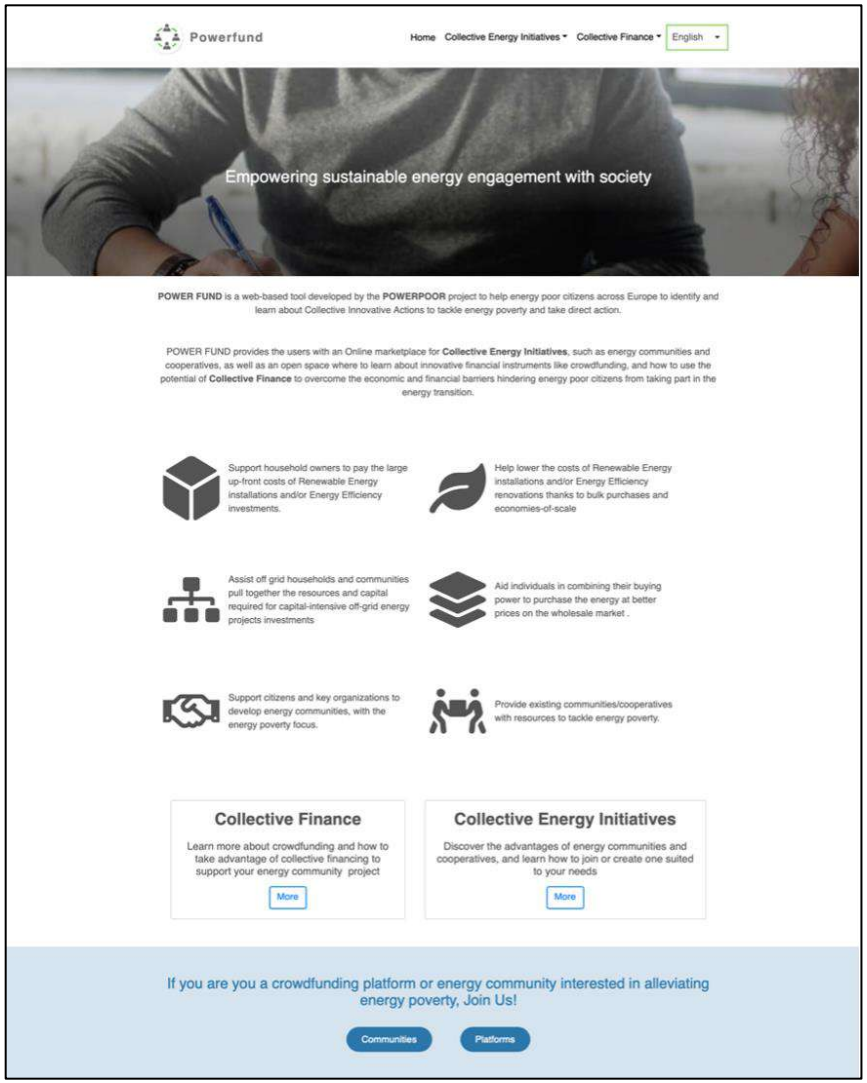
CASE STUDY

CASE STUDY	ENERGY SOLIDAIRE LES AMIS D'ENERCOORP	LOCATION
		France
PROBLEM DESCRIPTION	12M citizens in France suffer from energy poverty.	
SOLUTION	A non-profit association created a solidarity fund that raises money through micro-donations from the energy bills of consumers who are members of an energy cooperative. The resources support local social initiatives tackling fuel poverty by donating renewable energy from energy producers.	
IMPACT	So far Enercoop has: - 2500 clients, each donating around 36€ per year. - **90 000 € are annually** collected, of which 50% are directly given to 6 associations that help citizens renovate their houses.	

IV- POWER FUND

What is it?

How to use it



POWER FUND is a Web based tool to help energy poor citizens identify and learn about collective innovative actions to tackle energy poverty.

To this end POWER-FUND integrates two main sections:

An Online marketplace for Collective Energy Initiatives

A open space on innovative financial instruments and community finance

http://powerfund.eu

Module Summary

Key Takeaways

References and Further Reading

1

Community investments **allow building/household owners to pay the large upfront costs of investments** in Renewable Energy Sources (RES) or Energy Efficiency (EE), which traditional financial institutions may not be interested in funding or able to finance, to **support installation services** and to **allow property owners to overcome the energy efficiency gap**.

2

Community-based financing allows **individuals who would not be able to purchase their own generation system**, or do not have a sunlit private roof or area, **to take part in the renewable energy transition** by **investing in EE** and **derive income from it**.

3

Community-based financing can **lower installation costs and increase revenues** for individuals **by utilizing economies-of-scale** and optimal siting of generation capacities, **improving the returns on such investments**.

References and further reading

- POWERPOOR Online Library: http://powerpoor.eu/library
- Powerfund Tool: https://www.powerfund.eu/
- Energy Poverty Observatory: https://www.energypoverty.eu
- Successful Crowdfunding in 15 Steps by ECN: https://www.youtube.com/playlist?list=PLKS4qNWhGkZEQKKDlGtNlg26aWonGC_MK
- "Community Energy: A practical guide to reclaiming power" by Friends of the Earth Europe, REScoop and Energy Cities. October 2020. Available here: https://www.rescoop.eu/toolbox/community-energy-a-practical-guide-to-reclaiming-power

Thank you for your attention!

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This project has received funding from the European Union's HORIZON 2020 research and innovation programme under grant agreement No 890437

POWERPOOR

Empowering Energy Poor Citizens through Energy Cooperative Initiatives

Part V - The role of local authorities in tackling energy poverty

Alis Daniela Torres & Arthur Hinsch, ICLEI Europe

26.01.2023

This project has received funding from the European Union's HORIZON 2020 research and innovation programme under grant agreement No 890437

Module Content

- Module introduction
- PART I - Energy poverty in cities´ sustainable energy and climate action planning processes
- PART II – Energy Poverty Guidebook, Social Innovation Tools and Energy Poverty Alleviation Offices in Cities
- Module summary (key takeaways and further reading)

Module Goals

- To understand the importance of energy poverty actions as key inputs to local sustainable energy and climate action planning processes on a local level

- To identify key climate and social innovation tools and methods to mainstream energy poverty in cities planning, including energy poverty alleviation offices.

PART I: Energy poverty in cities´ sustainable energy and climate action planning processes

- Energy poverty challenges and opportunities for cities
- The EU Covenant of Mayors, SECAPs and the new energy poverty pillar
- Mainstreaming energy poverty in cities' SECAP

Energy Poverty Challenges at the City-level

Districts with restricted access to modern sources of energy (heating and cooling)

- Poor housing conditions
- Centralized energy services
- Non-energy efficient building stock

Citizens unable to pay energy bills (particularly in winter)

- Vulnerable citizens: elderly and children
- Increasing energy costs

Restricted local energy sourcing

- Imported electricity (regional/national)
- Multilevel governance challenges
- Restricted renewable energy funding

Limited citizen engagement in energy communities initiatives

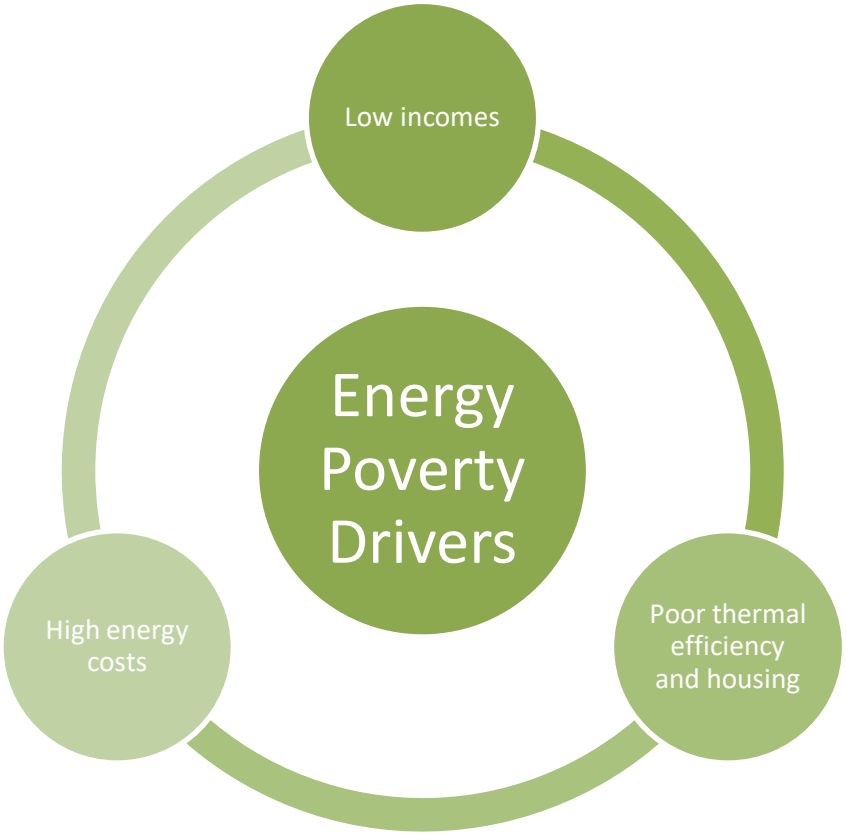
- Lack of incentives to new projects
- Knowledge gaps

Overall impact on citizens' quality of life: health impacts, people pushed further into poverty, increased stress levels, etc.

(1) EU Energy Poverty Observatory and Global Convenant of Mayors. Factsheet 2018.
(2) EU Report. 2015. Energy poverty and vulnerable consumers in the energy sector across the EU: analysis of policies and measures Policy Report

Challenges related to energy poverty in cities

Main drivers of energy poverty



These interrelations can be identified mainly in cities and urban settings

(1) Energy Poverty Handbook. 2016.

Energy Poverty Opportunities for Cities

Aligning energy poverty policies with local sustainability context

Contribution to local and national **energy and GHG emissions reduction** targets

Citizen engagement

- Energy cooperatives
- Community projects

Foster district energy developments

- Green & clean technologies
- Decentralized projects
- Public-private partnerships

Innovative energy finance

- Community finance
- Crowdfunding
- Mobile payments

Adoption of new technologies

- Smart Metering / Smart Grids
- Building Energy Efficiency
- ICTs for energy poverty awareness creation

(1) *EU Report. 2015. Energy poverty and vulnerable consumers in the energy sector across the EU: analysis of policies and measures Policy Report*

(2) *UNEP, ICLEI, INHABITAT. 2015. Unlocking district energy.*

Energy Poverty at the local level

"Local interventions, **if well planned**, can offer long-term solutions for households dealing with energy poverty."(1)

(1) *Pye et al., 2015; Bouzarovski, 2018*
(2) *.Day , G.Walker, N.Simcock, Conceptualising energy use and energy poverty using a capabilities framework, Energy Policy 93 (2016)*

Energy Poverty at the local level
Challenges

Municipalities are the first who must cope with energy poverty impacts. However, this is not an easy task, as energy poverty:

- may affect people in various ways,
- is difficult to be measured, and
- needs customised actions relevant to local context.

Sustainable energy and climate action plans (SECAP) *must integrate the energy poverty component into the rest of their mitigation and adaptation actions.*

Tackling energy poverty in SECAPs
The EU Covenant of Mayors

As part of the ***European Covenant of Mayors*** movement, cities and towns are ***taking climate and energy action*** to secure a better future for their citizens.

Source. EU Co

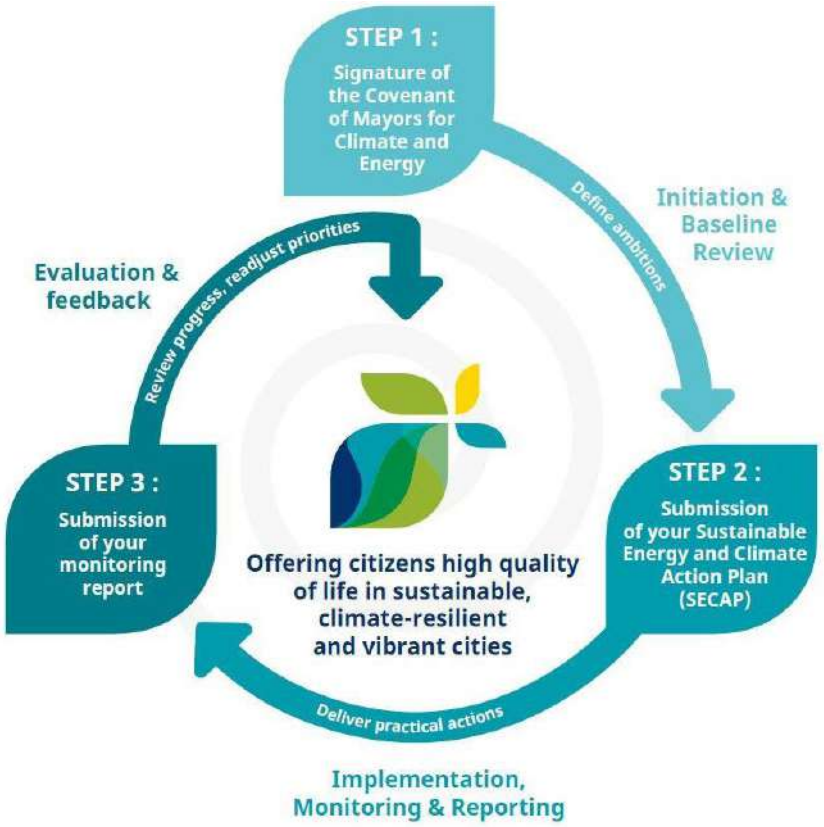
Tackling energy poverty in SECAPs

The EU Covenant of Mayors – an ever-growing community

Source. EU Covenant of Mayors. December . 2021

Tackling energy poverty in SECAPs

The Covenant of Mayors' step-by-step guide



The CoM. is *working* ***framework*** *to incorporate energy poverty into SECAPs is being developed*

In collaboration with the EU Energy Poverty Advisory Hub, CoM supports local and regional authorities across Europe in alleviating energy poverty by:

- **sharing knowledge** and **resources** to build local capacities.
- **building a set of indicators** to assess energy poverty on a local level

Tackling energy poverty in SECAPs

Energy Poverty in the SECAP

1. *Assessing energy poverty* - Is my municipality affected by energy poverty?
2. *Identifying vulnerable groups* - Who are the most vulnerable groups?
3. ***Designing actions*** **-** How can I design effective energy poverty actions?

Including energy poverty in Sustainable Energy and Climate Action Plans (SECAPs)

1. Design a strategy to tackle the issue and mainstream energy poverty into mitigation and adaptation measures
2. Indicate the vulnerable groups targeted in the actions
3. ***Define indicators*** to monitor and report quantitative on data on energy poverty

Reporting energy poverty in the frame of the Sustainable Energy and Climate Action Plan (SECAP)

Source. EU Covenant of Mayors. MRE Task Group. 2021

Tackling energy poverty in SECAPs
Designing Energy Poverty Policies in Cities

STEP 1: Shortlist Measures

- Area focus
- Financial resources

STEP 2: Explore Measures

- Target groups
- Stakeholders

STEP 3: Define Measure

- Implementation responsibilities
- Funding options

High Cost
- Investment assistance
- Energy audits

Low Cost
- Information desk
- Information campaign

Target Group Options
- Social or private housing
- Vulnerable consumers
- Specific energy types

Key Stakeholders
- Internal stakeholders
- External stakeholders

- Local/regional governments
- National government
- European Union
- Businesses
- Energy suppliers
- Network operators
- NGOs

Source: EPOV. 2019. Designing effective energy poverty policies in municipalities.

Tackling energy poverty in SECAPs

Integration of Energy Poverty in the SECAP template

The integration of Energy Poverty in the SECAP template is defined in 4 elements:

Reduction goal	Assessment tool	List of indicators	Actions

A political commitment built on the CoM EU commitment text…

Energy Poverty		
Goal	**Target year**	**Base year**
Tackle energy poverty to ensure a just transition by [select target year]	[Drop-Down]	[Drop-Down]

…supported by the possibility to choose **monitoring indicators** for quantitative targets

Source. EU Covenant of Mayors. 2021

Integration of Energy Poverty in the SECAP template

List of indicators (a flexible approach!)

- A list of **54 indicators** divided in six categories:

  - Climate (4 indicators)
  - Socio economic (19 indicators)
  - Facilities/housing (20 indicators)
  - Mobility (5 indicators)
  - Policy and Regulatory Framework (5 indicators)
  - Participation/awareness raising (1 indicator)

These indicators offer options to define, quantify and work with energy poverty topics at the local level, thanks to the variety and diversity of the indicators, municipalities can choose the most tailored indicators to their context and possibilities

Source. Draft indicators. EU Covenant of Mayors.. 2021

Integration of Energy Poverty in the SECAP template

List of indicators (a flexible approach!)

ANNEX - Indicators for Energy Poverty

This annex serves as a source of inspiration only. None of these indicators are compulsory, but rather illustrative examples.

Area	Priority level	Related indicators	Unit	Description
Climate	Monitoring indicator	Frequency of heat waves	Average per monthly/year	Frequency of heat waves per month in a year
	Monitoring indicator	Frequency of cold waves	Average per monthly/year	Frequency of cold waves per month in a year
	Monitoring indicator	Number of heating degree days per year	Number of HDD and CDD /year	Heating degree day is a measurement designed to quantify the demand for energy needed to heat a building, it is based on the outside temperature where heating is needed
	Monitoring indicator	Number of cooling degree days per year	Number of HDD and CDD /year	Cooling degree day is a measurement designed to quantify the demand for energy needed to cool a building, it is based on the outside temperature where cooling is needed
Socio-economic	Monitoring indicator	Percentage of populaton or housholds spending up to XX % their income on energy services	[%]	Share of population / housholds spending more thant an specific percentange of their incomes on energy services putting them in an situation of energy poverty
	Monitoring indicator	Vulnerable households	[%]	**The here provided description is only an example, municipalities can write here their own description of vulenarable housholds / population** Households with lonely parents, parents with more than 3 childrens, families with low incomes, housholds reciving social soport, families with low level of education housholds out total number of hausholds
	Monitoring indicator	Arrears on utility bills	[%]	Share of (sub-) population having arrears on utility bills, based on question "In the last twelve months, has the household been in arrears, i.e. has been unable to pay on time due to financial difficulties for utility bills (heating, electricity, gas, water, etc.) for the main dwelling?"
	Related indicator	Average price of electricity	[€]	Average price in [€] of the consummed electricity kwh in the municipal housholds
	Related indicator	Average price of gas	[€]	Average price in [€] of the consummed gas kwh in the municipal housholds
	Related indicator	Energy related expenditure / local GDP	[%]	Relationship between the yearly energy cost the housholds and the local GDP, percentual average of the local GDP destinated to the energy
	Monitoring indicator	High share of energy expenditure in income (2M)	[%]	The 2M indicator presents the proportion of households whose share of energy expenditure in income is more than twice the national median share. Note: where income distributions are more equal, variance in energy expenditure translates to higher 2M shares. High variance in energy/income shares can occur due to structural differences in energy expenditure between household groups, as well as in situations where energy is often, but not exclusively, included in rent.
	Related indicator	Citizens under poverty threshold / number of citizens	[%]	Percentage of the local population suffering from poverty, persons and families under the limit of incones considering the familiy size
	Related indicator	At-risk-of-poverty rate	[%]	People at risk of poverty or social exclusion (% of population). The at-risk-of-poverty rate is the share of people with an equivalised disposable income (after social transfer) below the at-risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income after social transfers.

Source. Draft indicators. EU Covenant of Mayors. 2021

Integration of Energy Poverty in the SECAP template

Assessment and monitoring tool

Using the **monitoring indicators** municipalities can track the development of specific energy poverty related aspects

The **monitoring indicators** can be used as local targets to monitor the reduction of energy poverty at the local level

A **flexible approach**: municipalities can decide with which indicators to work

Energy Poverty Assessment

Macro-areas	Elements	Used indicator(s)	Unit	Households /Persons	Base Year	Current level	Use for monitoring	Target level
Climate	Heat and cold	Frequency of heat waves	Days per year		[Drop-down]	[Drop-down]		[Drop-down]
		Frequency of cold waves	Days per year		[Drop-down]	[Drop-down]		[Drop-down]
		Number of heating degree days per year	HDD + CDD / year		[Drop-down]	[Drop-down]		[Drop-down]
		Number of cooling degree days per year	HDD + CDD / year		[Drop-down]	[Drop-down]		[Drop-down]
Macro-areas	**Elements**	**Used indicator(s)**	**Unit**			**Current level**		**Target level change**
Facilities	Housing	F+G+H band (EPC) dwelling/total number of dwelling	[%]		[Drop-down]	[Drop-down]		[Drop-down]
		Energy consumption (electricity + heating) per capita / national energy consumption (electricity + heating) per capita	[%]		[Drop-down]	[Drop-down]		[Drop-down]
		Share of buildings renovated per year	[%]		[Drop-down]	[Drop-down]		[Drop-down]
		Share of households or persons with presence of leak, damp, rot in their dwelling / total households or persons	[%]	[Drop-down]	[Drop-down]	[Drop-down]		[Drop-down]
		Percentage of households or persons within the municipality experiencing heating discomfort / total households or population	[%]	[Drop-down]	[Drop-down]	[Drop-down]		[Drop-down]
		Percentage of households or persons within the municipality experiencing cooling discomfort / total households or population	[%]	[Drop-down]	[Drop-down]	[Drop-down]		[Drop-down]
		Households or persons connected to the electricity and gas grid / total households or persons	[%]	[Drop-down]	[Drop-down]	[Drop-down]		[Drop-down]
	Public transport	Population or households not having access to essential services within 1 h by walking, cycling or public transport / total population or households	[%]	[Drop-down]	[Drop-down]	[Drop-down]		[Drop-down]
		Persons or households living more than one km from nearest public transport station / number of persons or households	[%]	[Drop-down]	[Drop-down]	[Drop-down]		[Drop-down]
Socio - economic		Percentage of population or housholds spending up to XX % their income on energy services	[%]	NE	[Drop-down]	[Drop-down]		[Drop-down]
		Vulnerable households or persons / total households or persons	[%]	[Drop-down]	[Drop-down]	[Drop-down]		[Drop-down]
		Arrears on utility bills / total population or households	[%]	[Drop-down]	[Drop-down]	[Drop-down]		[Drop-down]
		Inability to keep home adequately warm	[%]	[Drop-down]	[Drop-down]	[Drop-down]		[Drop-down]
		High share of energy expenditure in income (2M)	[%]		[Drop-down]	[Drop-down]		[Drop-down]
Framework elements		Existence of energy poverty strategy / specific measures related energy poverty	Yes / No		[Drop-down]	[Drop-down]		[Drop-down]
		Existing rent regulation	Yes / No		[Drop-down]	[Drop-down]		[Drop-down]
		Awareness-raising campaigns targeting targeting vulnerable households	Yes / No		[Drop-down]	[Drop-down]		[Drop-down]
		Engagement and cooperation with stakeholders	Yes / No		[Drop-down]	[Drop-down]		[Drop-down]

Source. Draft indicators. EU Covenant of Mayors. 2021

Tackling energy poverty in SECAPs
Energy Poverty Actions

Cities develop different types of energy poverty actions, for example:

- ✓ **Training and educational activities**

  Awareness-raising campaigns, workshops for students, establishment of energy poverty municipal offices, and more

- ✓ **Energy efficiency measures**

  Classification of domestic energy efficiency measures, collective renovations (blocks, neighbourhoods)

- ✓ **Use of renewables**

  Net-metering projects, RES energy communities, energy contracts

Source: Energy Poverty actions proposed in C-TRACK 50 SECAPs, including Greek cities

Tackling energy poverty in SECAPs
Still, there is a lot more to do

An integrated approach based on qualitative and quantitative information could be developed by:

1. Assessing the municipality's vulnerability to energy poverty;
2. Identifying the specific households suffering from energy poverty;
3. Choosing and customising tools that are tailored to the local context to tackle the issue

*The **POWERPOOR** toolkit and overall methodology can be used effectively to achieve these goals*

Tackling energy poverty in SECAPs
Still, there is a lot more to do

*The **POWERPOOR Energy Poverty Guidebook for Energy Planning (D5.2)** to support local authorities on alleviating energy poverty.*

- Guidelines to identify vulnerable communities / citizens
- Guidelines to develop **integrated and innovative energy poverty** alleviation actions
- Strategies to include this actions in the SECAPs and other urban sustainability planning frameworks.

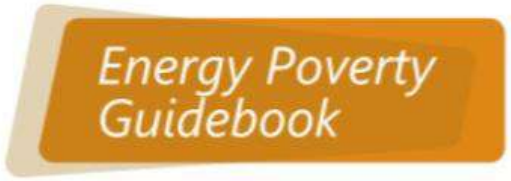
PART II: Climate and Social Innovation Tools.

Energy Poverty Guidebook

How can social and climate systems innovation alleviate energy poverty?

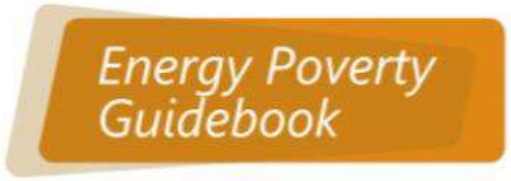
Concrete Examples

The POWERPOOR Energy Poverty Guidebook for Energy Planning



The POWERPOOR Energy Poverty Guidebook for Energy Planning has been developed to enable municipalities to be part of a sustainable future and play their role in the just energy transition by following the POWERPOOR approach of tackling energy poverty through joint energy initiatives and leveraging innovative financing schemes.

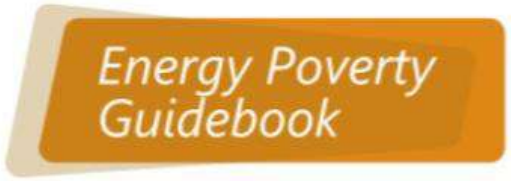
The POWERPOOR Energy Poverty Guidebook for Energy Planning



The Guidebook includes:

- ✓ Energy poverty mitigation through joint energy initiatives
  - The POWERPOOR approach
  - The role municipalities can play
- ✓ Preparing the bottom-up approach
- ✓ Energy poor citizens support programmes
- ✓ TARGETing the problem
- ✓ ACTions to tackle energy poverty
- ✓ FUNDing joint energy initiatives to tackle energy poverty

The POWERPOOR Energy Poverty Guidebook for Energy Planning



The POWERPOOR Energy Poverty Guidebook for Energy Planning is available:

- ✓ On the POWERPOOR website → https://powerpoor.eu/toolkit
- ✓ In the stand-alone POWERPOOR Toolkit page →

  http://powerpoor.epu.ntua.gr/powerpoor-toolkit/

Energy Poverty Alleviation Offices

- One-stop-shop for citizens and directly support them
- Energy Mentors can come from different fields
- Different formats possible e.g. the Office can work directly within existing structures, also cross-departmental

The main objective of the Energy Poverty Alleviation Office is to be a one stop shop of information for citizens and directly support them to actively participate in planned activities, get familiar with the problem of energy poverty, propose to them behavioural measures and no regret low-cost energy efficiency measures, and guide them in participating in or setting up an energy community or familiarize them with leveraging innovative financing schemes to achieve energy efficiency goals.

Barcelona Energy Advice Points

- Avoiding the loss of access to basic supply
- Telephone service
- Application to social discount
- Job replacement programme

Source: City of Barcelona 2022

Stromspar-Check (Energy Savings Check)

- Run by Caristas and the Association of German Energy Agencies
- Sends “energy savings supporters” to households
- The supporters are themselves long-term unemployed and have received training
- Supported by about 120 German municipalities. Integrated into overall planning

Source: Stromspar-Check 2022

Climate System & Social Innovation

The concepts

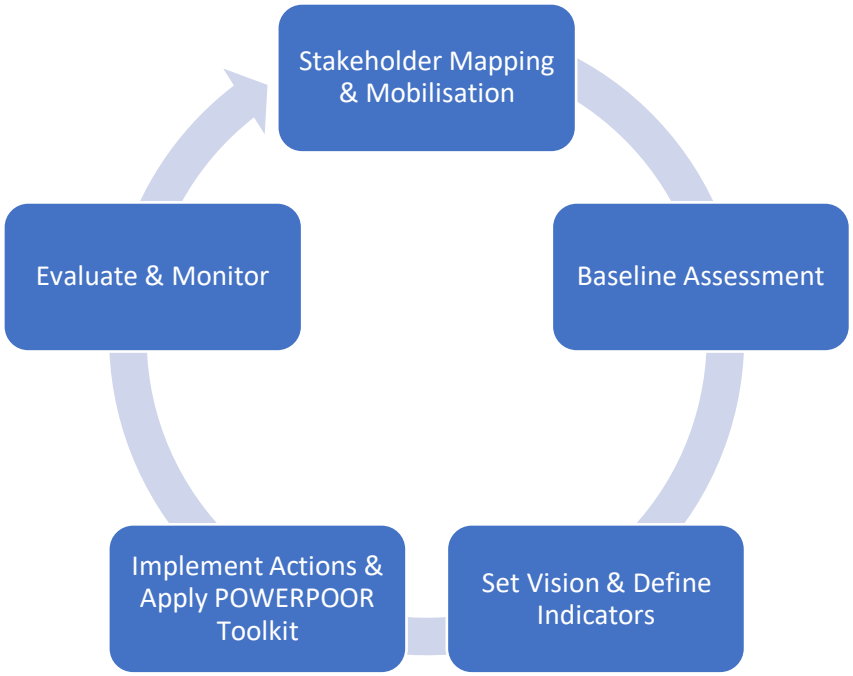
"Climate system innovation can be defined as a ***combination of technological and non-technological innovations*** that, if enacted together, maintain or improve the delivery of desired societal functions, with an absolute reduction in their environmental impacts"

"Problems are no longer simple or isolated. Instead, they can affect a myriad of stakeholders with different perceptions and interests, they are ***cross-sectoral, long-term, and interconnected with the ecosystem and societal structures***"

"Social innovation in energy transition is a process of **change in social relationships**, interactions, configurations, and/or the sharing of knowledge leading to, or based on, new environmentally sustainable ways of producing, managing, and consuming energy that **meet social challenges/problems**".

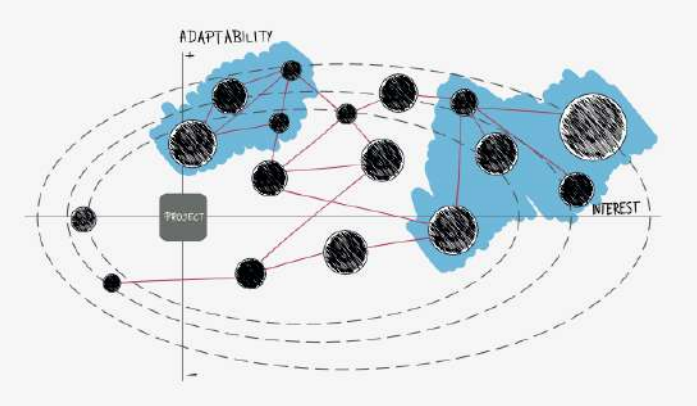
Source: Climate KIC. 2017 Climate Innovation Insights

National Energy Poverty Mitigation Roadmaps

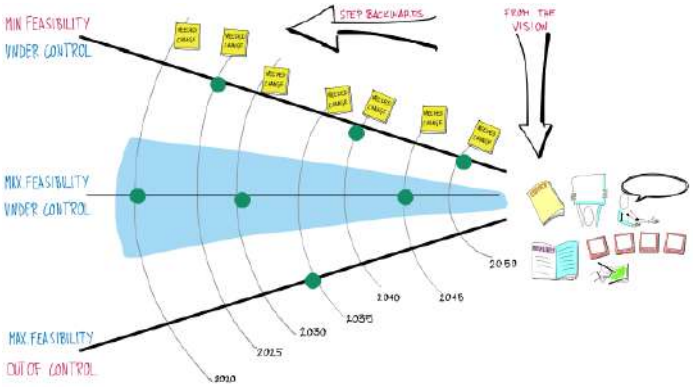


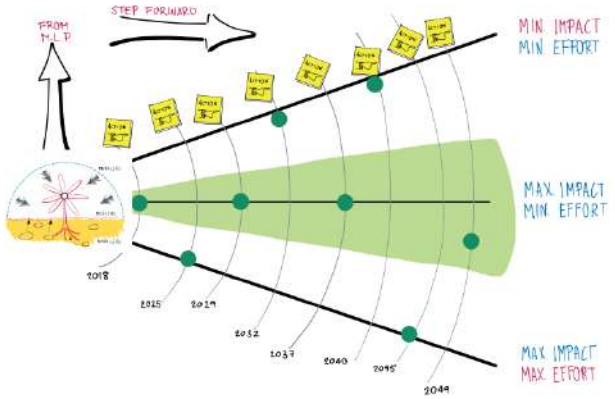
Source: POWERPOOR 2022, D5.9

Co-Create Your Actions



"We are in 2030, thanks to the adoption of these measures and the POWERPOOR approach, energy poverty in our country has been reduced by XXXXX".





Source: Climate KIC 2017, POWERPOOR 2022 D5.9

Selection of Key Actions from the Roadmaps

Energy Sector:

- Educate citizens
- Enable energy communities (also in relation to rennovation services)
- National schemes schould focus on promoting energy communties which include vulnerable consumers
- More progressive energy trariffs (social tariffs e.g. via energy communities)
- Include energy poverty in SECAPs. (e.g. Co-financing of rennovation efforts, one-stop-shops and promoting energy communities).
- Better integration between stakeholders and data collection

Buildings Sector:

- Establish building renovation committees in municipalities
- One-stop-shops (more widely accessible)
- 100% costs covering grants and more inclusive in terms of who is eligible
- Engage private sector and overcome split incentives

Social Sector:

- Social bonuses
- Ban on disconnections
- Rethink energy poverty term
- A more inclusive set of indicators to measure energy poverty
- Work with social medial influencers and celebreties
- Identify trusted professionals to play an intermediary role
- Dissemination of the concept and how to tackle it at schools/TV
- Promote crowdfunding

Source: POWERPOOR 2022, D5.9

What can municipalities do to accelerate RECs?

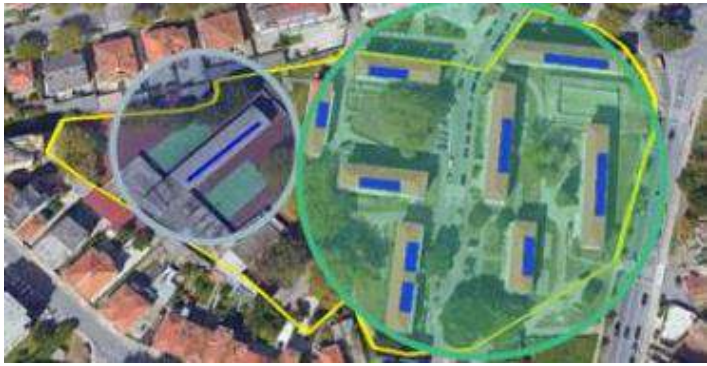
- Many things! E.g:
- They can make **public space available** and offer energy communities opportunities to participate in **public tenders**
- They can raise **awareness** and **share municipal staff and resources** e.g. join the board of the community
- They can set **concrete targets** for the promotion of energy communities and make them a firm part of their climate & energy plans
- They can **bring together different stakeholders** and **promote innovation** through co-creation and citizen engagement
- They can improve the **flexibility** and **resilience** of local grids
- They can **become part of energy communities** themselves
- They can **profit financially** from engaging with RECs e.g. through the generation of stable business tax revenues and access to renewable energy sources

→ They can save costs and can **protect vulnerable households**

Image source: PROSEU 2021 / Design Doppel

Municipality of Magliano Alpi, Italy

- Located within a micro-area of eight apartment blocks and a public school in Porto (multiple departments involved)
- Electricity will be generated from PV panel installed on the roofs and consumed within the community, with any excess being sold to the grid
- Ambition is to involve 118 families as well as young consumers who will receive rebates on their energy bills
- Within first five years, electricity will be distributed free-of-charge to the members of the community. After that at a lower rate than from traditional suppliers
- The local authority is closely involved as they own and manage a large number of buildings



Municipalities have the possibility to (re-) create a closer bond between citizens and public infrastructure. RECs can also be an enabler of public-private partnership and investments.

Municipality of Magliano Alpi, Italy

- Making the city hall, the library, the gymnasium and the municipal schools self-sufficient
- A reduction of energy cost for participants
- Municipality provided for smart metering and data management systems that allocate and control electricity flows between production and consumption points
- Municipality is a member of the REC and surrounding municipalities committed to adopt comparable models
- Benefits from new Italian funding support for building renovation and community energy. → “Magliano & Friends” to test sustainable business models

Municipality of Magliano Alpi, Italy

Municipality of Marupe and Riga Planning Region, Latvia committed to smart solutions

- PV panels installed on multi-apartment buildings and row-house buildings. Residents of the buildings benefits through rebates on their energy bills
- Tripartite agreement and ownership will come to homeowners association after 5 years.

→ Homeowners associations act as energy communities

Adapted from TREA 2021

Municipality of Tartu, Estonia includes SECAP objective is 150 GWh of electricity consumption annually, 15 GWh need to come from apartment association's rooftops

- Awareness raising and capacity building
- Working with homeowners associations
- Improve energy efficiency

Module 4 Key Takeaways

- ✓ Energy poverty actions are and will be key in achieving the goals of cities SECAPs. It is important that local governments **define and support actions** that reduce energy poverty alleviation in their territory.

- ✓ The integration of climate and social innovation tools to design and evaluate energy poverty actions is key to advance in the inclusion of energy poverty in cities sustainable energy planning processes. Due to the nature of energy poverty actions, **innovative approaches** are required to accelerate the adoption of actions

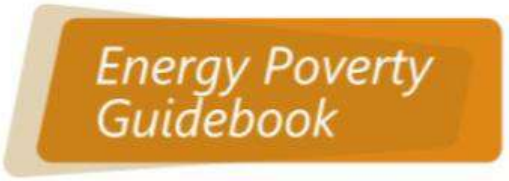
- ✓ The **POWERPOOR approach** including the POWERPOOR Toolkit and Guidebook is aimed at giving support to this process.

Further Reading

The POWERPOOR Energy Poverty Guidebook for Energy Planning is available:

- ✓ On the POWERPOOR website → https://powerpoor.eu/toolkit
- ✓ In the stand-alone POWERPOOR Toolkit page →

  http://powerpoor.epu.ntua.gr/powerpoor-toolkit/



- EU Covenant of Mayors. https://www.eumayors.eu/support/energy-poverty.html
- EPOV. 2019. Designing effective energy poverty policies in municipalities. https://www.energypoverty.eu/sites/default/files/downloads/publications/18-07/guidance_-_energy_poverty_policies_in_cities.pdf
- STEP IN project Interim Report – Urban Labs. https://www.step-in-project.eu/wp-content/uploads/D2.2_Urban-LL-Interim-Report_final.pdf
- Climate KIC. Climate Innovation tools.