How to measure energy poverty in practice?
- case study from Hungary

Energiaklub

Climate Policy Institute Applied Communications

ENERGIAKLUB
CLIMATE POLICY INSTITUTE
APPLIED COMMUNICATIONS

ELTE University –

Energy Geography Research Group

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Energy Poverty and Environment Conference

Kibbutz Ketura: 9-10th February 2022

Overview

I. Level of energy poverty in Central Europe and in Hungary

II. Causes of energy poverty in Hungary

III. Field survey from Bükkalja by ELTE University;

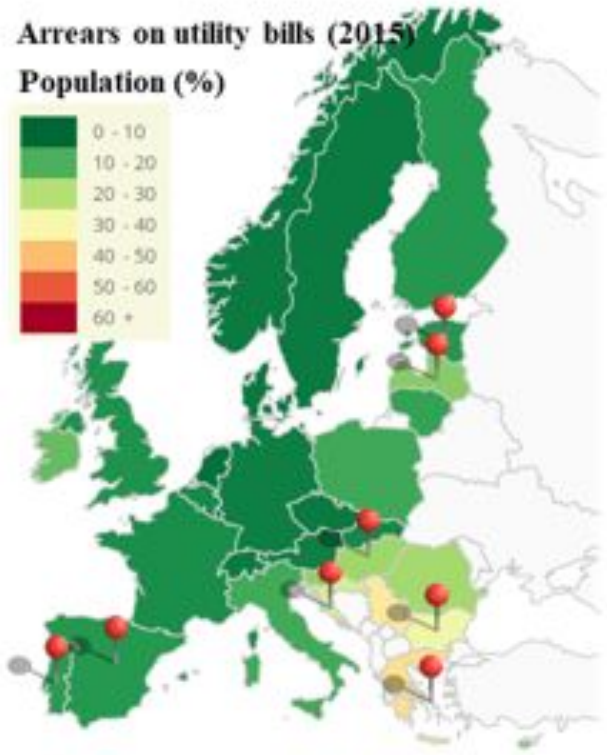
IV. Upscale energy poverty measurement by PowerPoor project

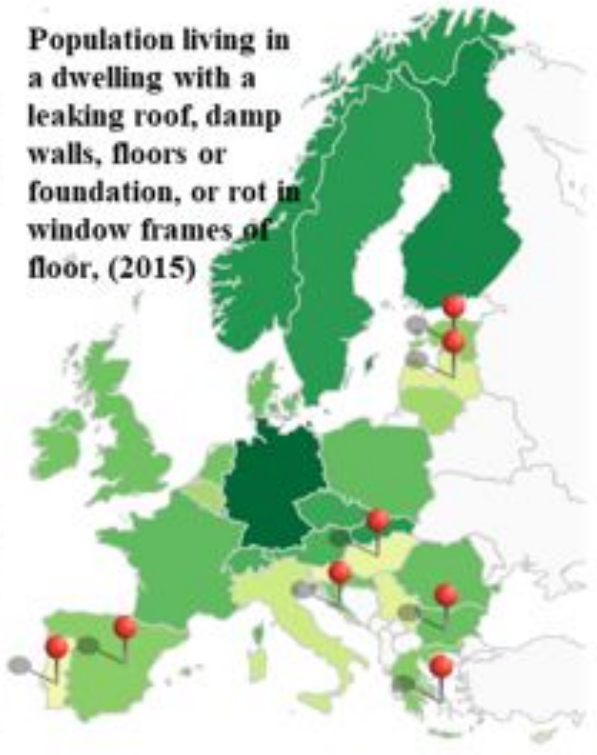
V. Synergies: PowerPoor and ELTE survey in Bükkszentkereszt

Level of energy poverty in Central Europe and in Hungary

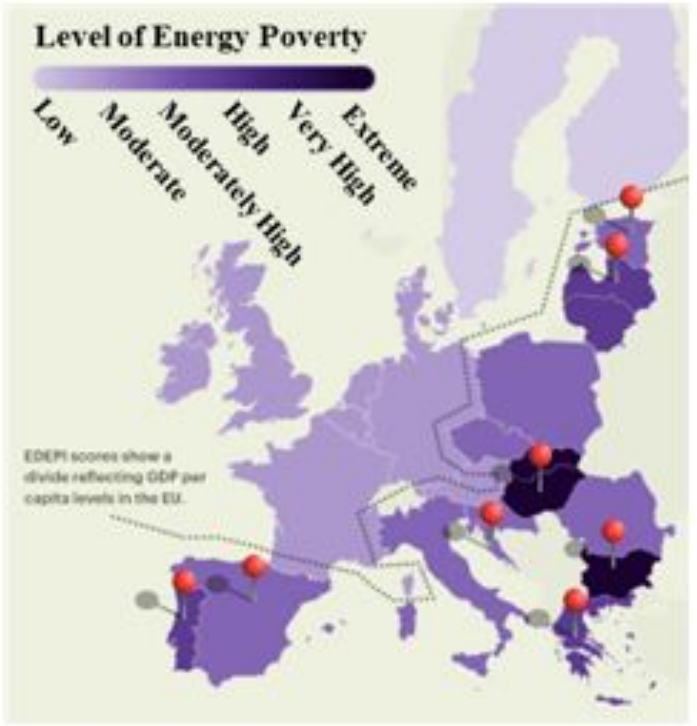
I.

Level of energy poverty in Europe





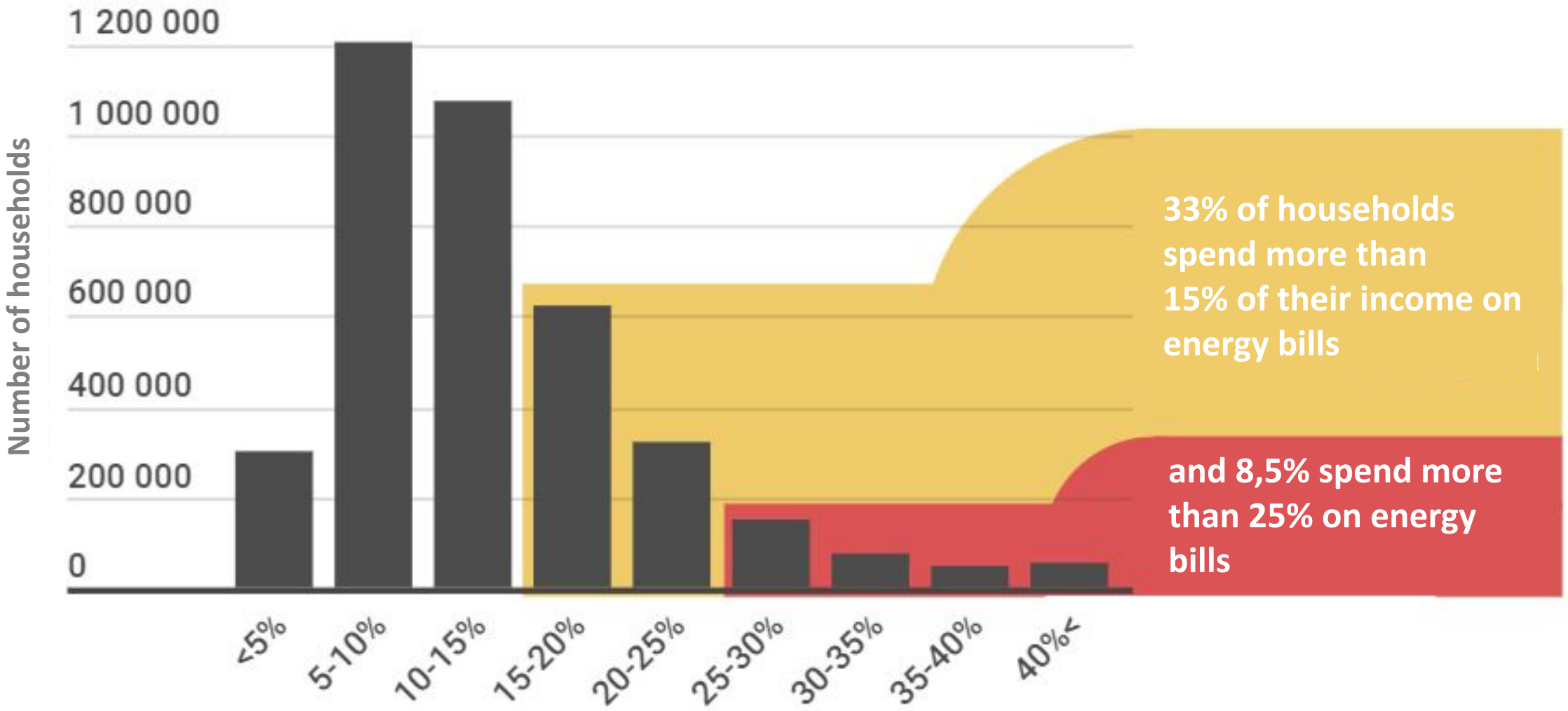
Source: EU Energy Poverty Observatory



Source: OpenExp 'European Energy Poverty Index'

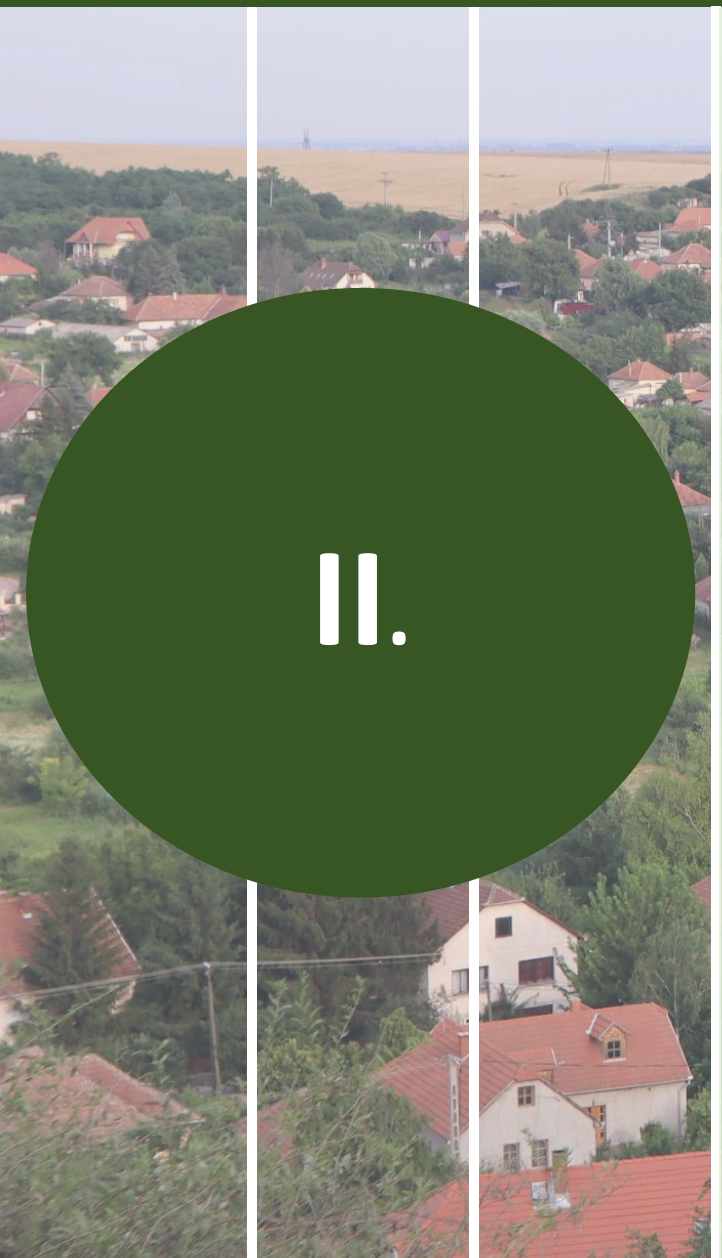
Source: Study on Energy Poverty in the Danube Region, *2019*

Households spending on energy bills in Hungary



Source: *a KSH Miben élünk? adatfelvétele (2015), a számítás az Energiahasználat társadalmi kihívásai c., a Társadalomtudományi Kutatóközpont Szociológiai Intézetében zajló kutatása keretében készült*

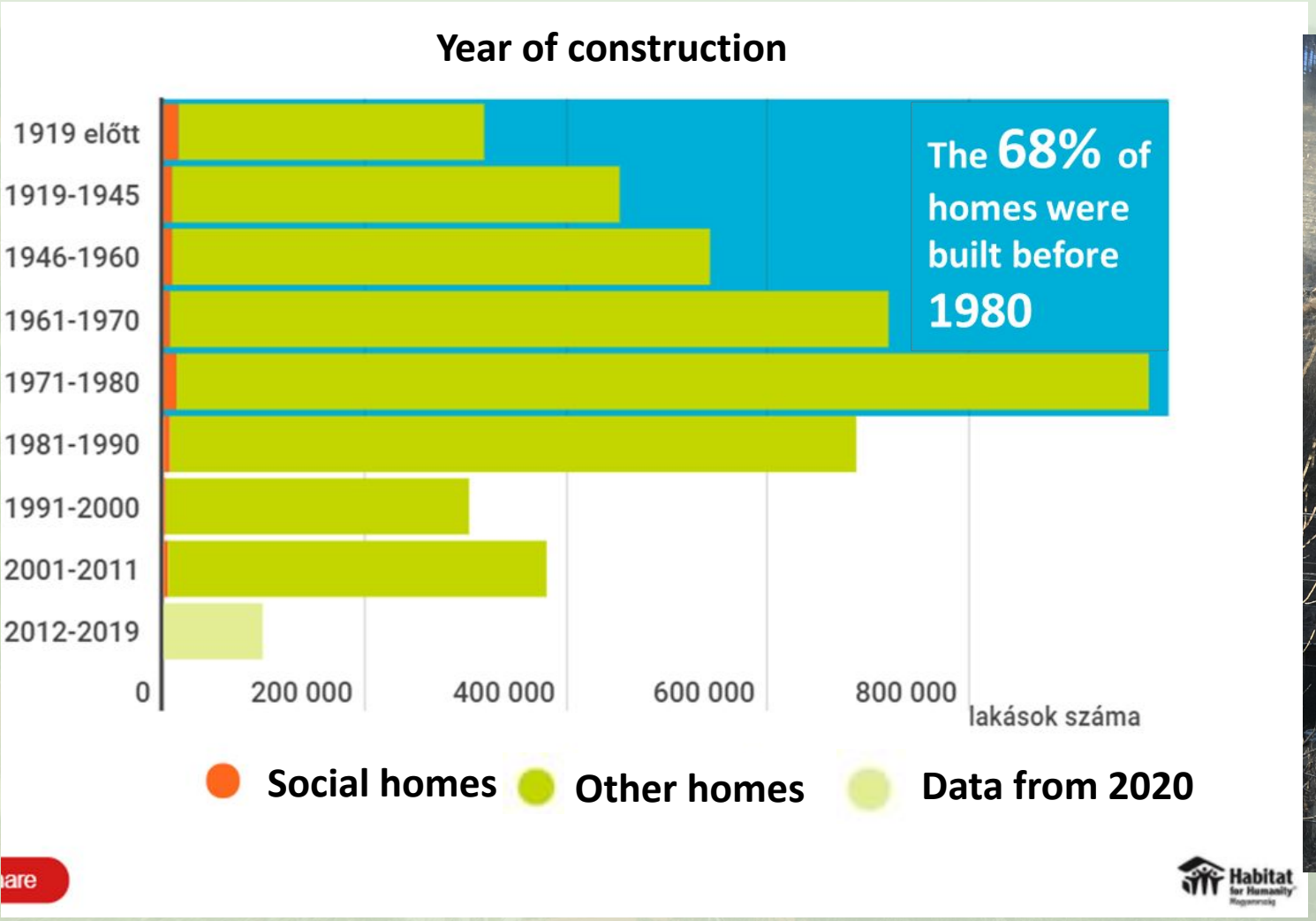
Causes of energy poverty in Hungary



II.

If the energy prices are one of the cheapest among the European countries, what can be the main reasons of high level of energy poverty?

Reason #1 inefficient and poorly insulated building stock



Reason #2 inefficient and outdated heating applications

Reason #3 wrong heating habits and lack of awareness

- Use of lignite (both indoor and outdoor air pollution);
- Wet wood (properly seasoned wood has a higher heating value and less PM emission);
- Incineration of (any kind of) household waste;

Source: Elosztó projcet

Field survey from Bükkalkja by ELTE University

III.

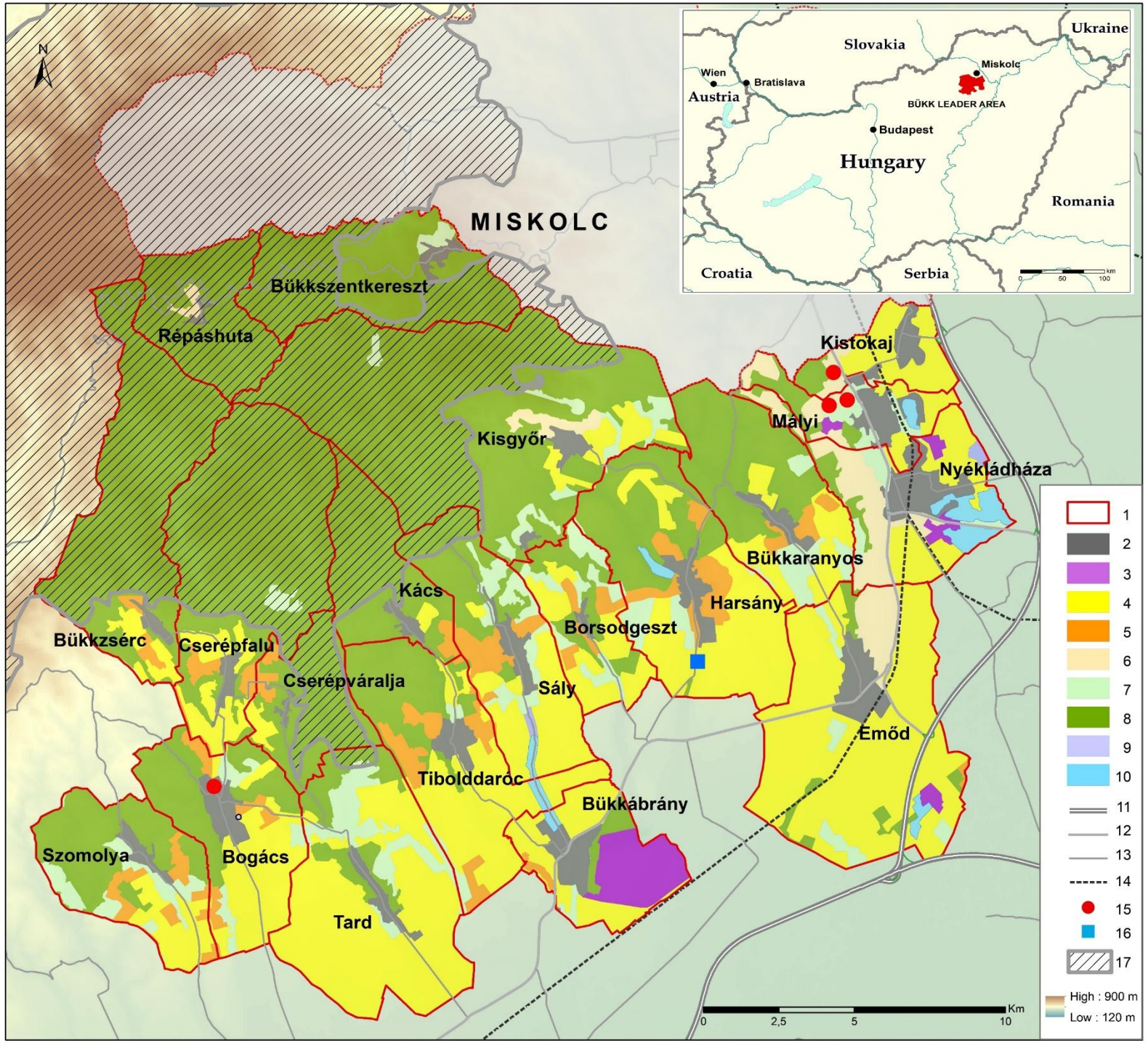
Study area/results (20 settlements)

Population: ~36 000

Number of households: ~13 000

Number of questionnaires: 1577

- Forest: 52%
- Arable land: 29%
- Pasture: 6%
- Build-up area: 5%
- Grapes, orchard 4%
- Other, e.g. water: 2%



Field surveys for estimating heating energy consumption

- Survey is ongoing since 2015;
- More than 100 students were involved;
- >1500 interviewed households;
- Quantitative data;
- Qualitative data;
- Complemented by national databases;
- Validated by online heat atlases (e. g. Hotmaps)

Quantitative data

1.

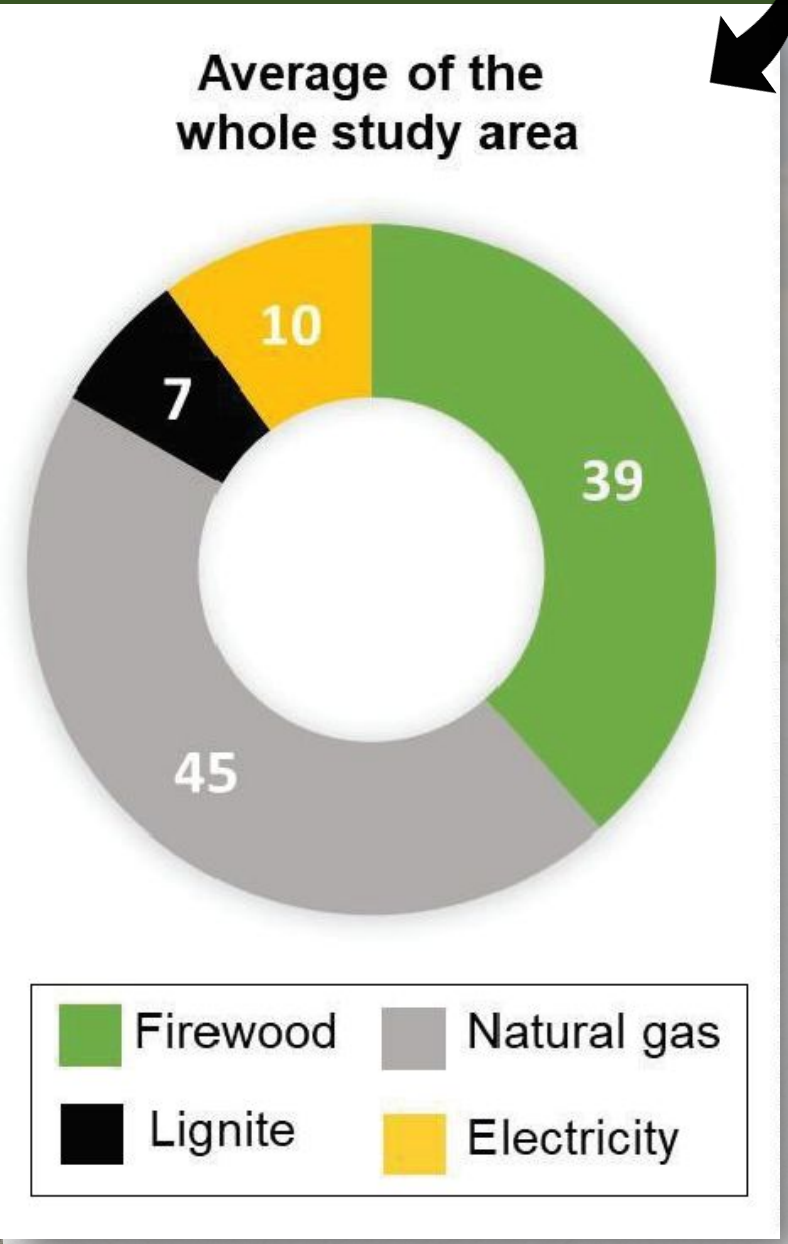
- Heated floor area.
- Number of residents.
- Fuel type for space and water heating.
  (firewood [drying period], lignite, natural gas, electricity)
- Type and age of heating device.
  (wood/coal/pellet stove, boiler, convector).
- Amount of fuel consumed per year.
  (energy bill OR amount in kWh, kg, m^3)
- Is there thermal insulation on the roof/external walls? What kind of material and thickness?
- How many glass window panes? Which direction?

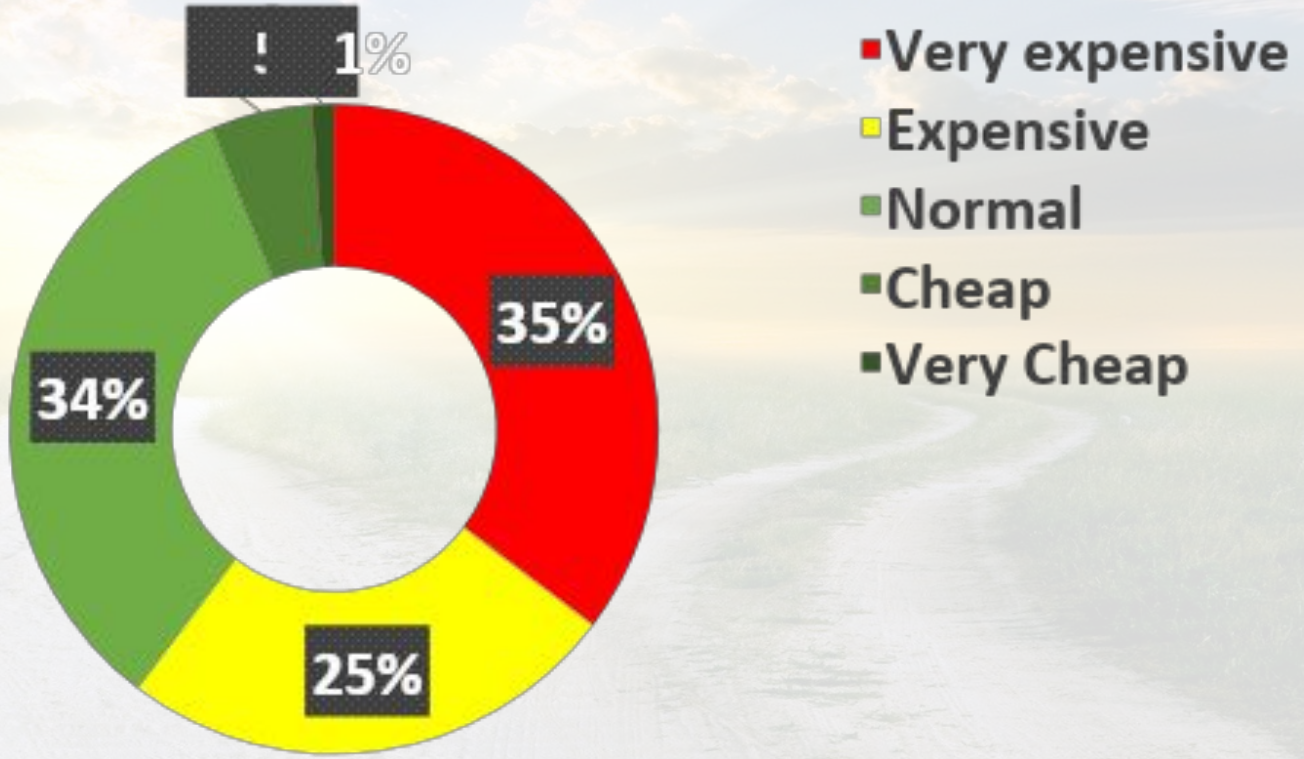
Qualitative data

2.

- The citizen’s perception of indoor thermal comfort condition.
- The citizen’s perception of outdoor air pollution.
- How expensive do you consider the heating bill compared to your income? (scale 1. very expensive to 5. very cheap).

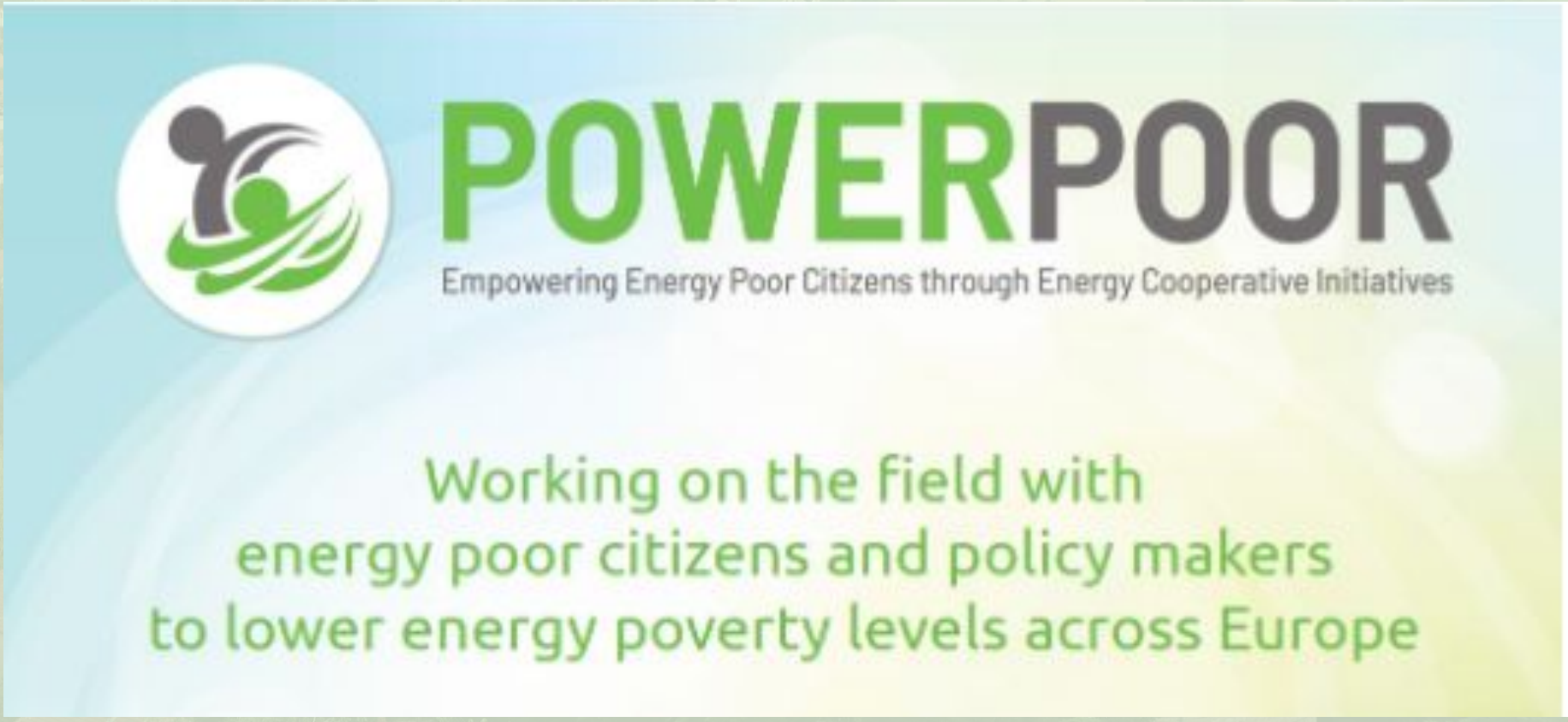
Results of the heating energy mix and energy affordability





Upscale energy poverty measurments by PowerPoor project

IV.



The POWERPOOR project

POWERPOOR

Empowering Energy Poor Citizens through Joint Energy Initiatives
POWERPOOR

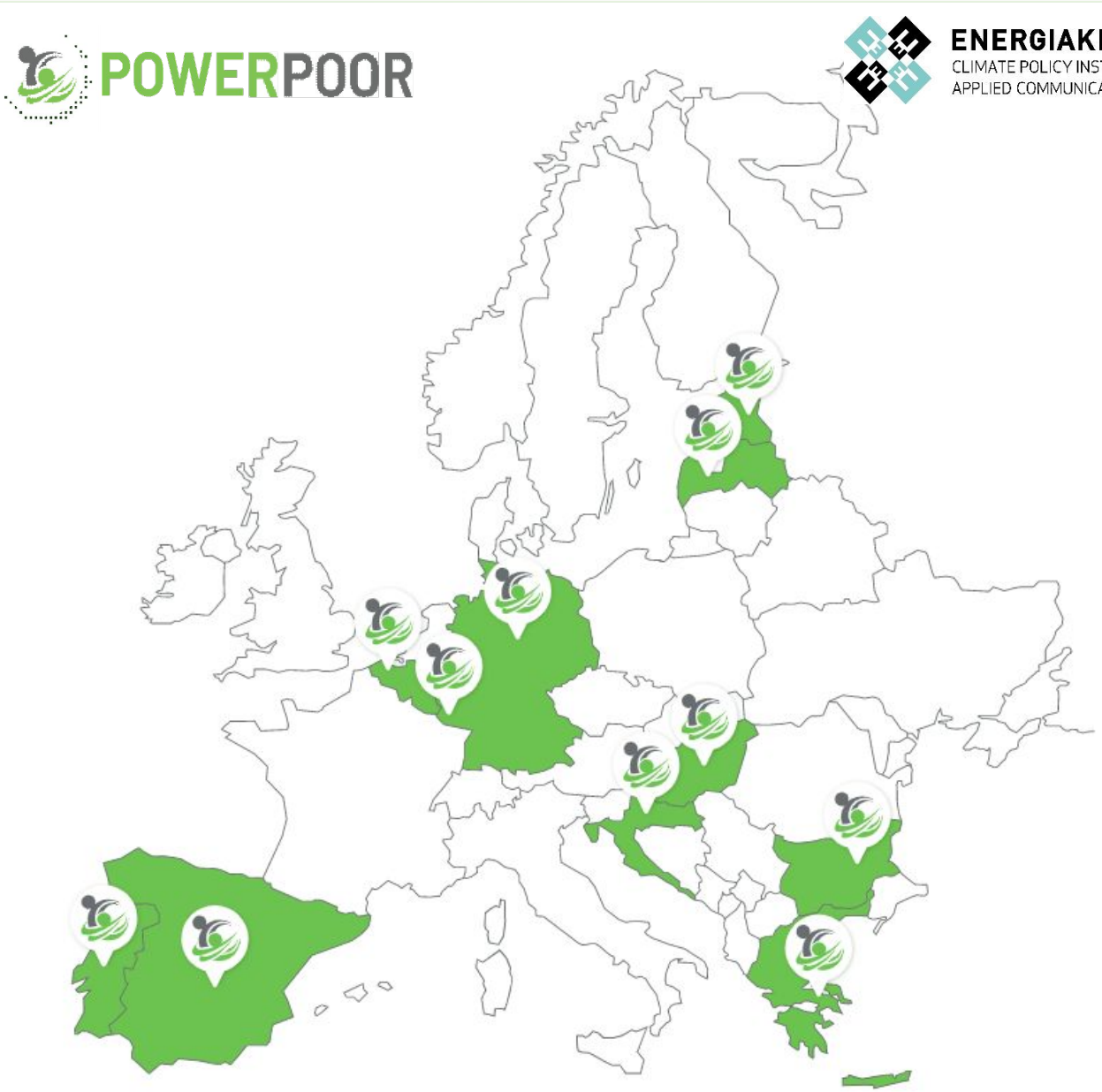
Started:
01/09/2020
Duration:
36 Months

Coordinator:
National Technical University of Athens (NTUA)
Participants: 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



Energy Poverty Mitigation Toolkit

Energy Poverty Mitigation Toolkit

The POWERPOOR Energy Poverty Mitigation Toolkit aims at providing an integrated solution to users and supporting them at identifying whether they are energy vulnerable. In case they do the tool can propose changes (behavioral or low cost energy efficiency interventions) they can take to improve their well being. Finally, the tool can propose customised solutions regarding their involvement funding proposing the users' involevement in innovative funding schemes such as crowdfunding or participation in energy cooperatives. Find out more!

POWER TARGET

OPEN TOOL

POWER ACT

OPEN TOOL

POWER FUND

OPEN TOOL

Power Target

POWER POOR toolkit

Home About Tools Contact Welcome, csontos.csaba@ttk.elte.hu

Country: Hungary

City: Budapest

Income Information

Annual Income* — Enter annual income — €

Age* — Enter your age

Number of dependent children* — Enter number of dependent children

Marital status* — Select marital status

Electricity Consumption

☐ I only use electricity to heat/cool my house

Select building

ID	20
Place	Hungary, Budapest
Details	56.0m², Apartment
Choose	

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

Heat Consumption

Heating fuel — Select heating fuel

Annual Consumption — Enter annual consumption

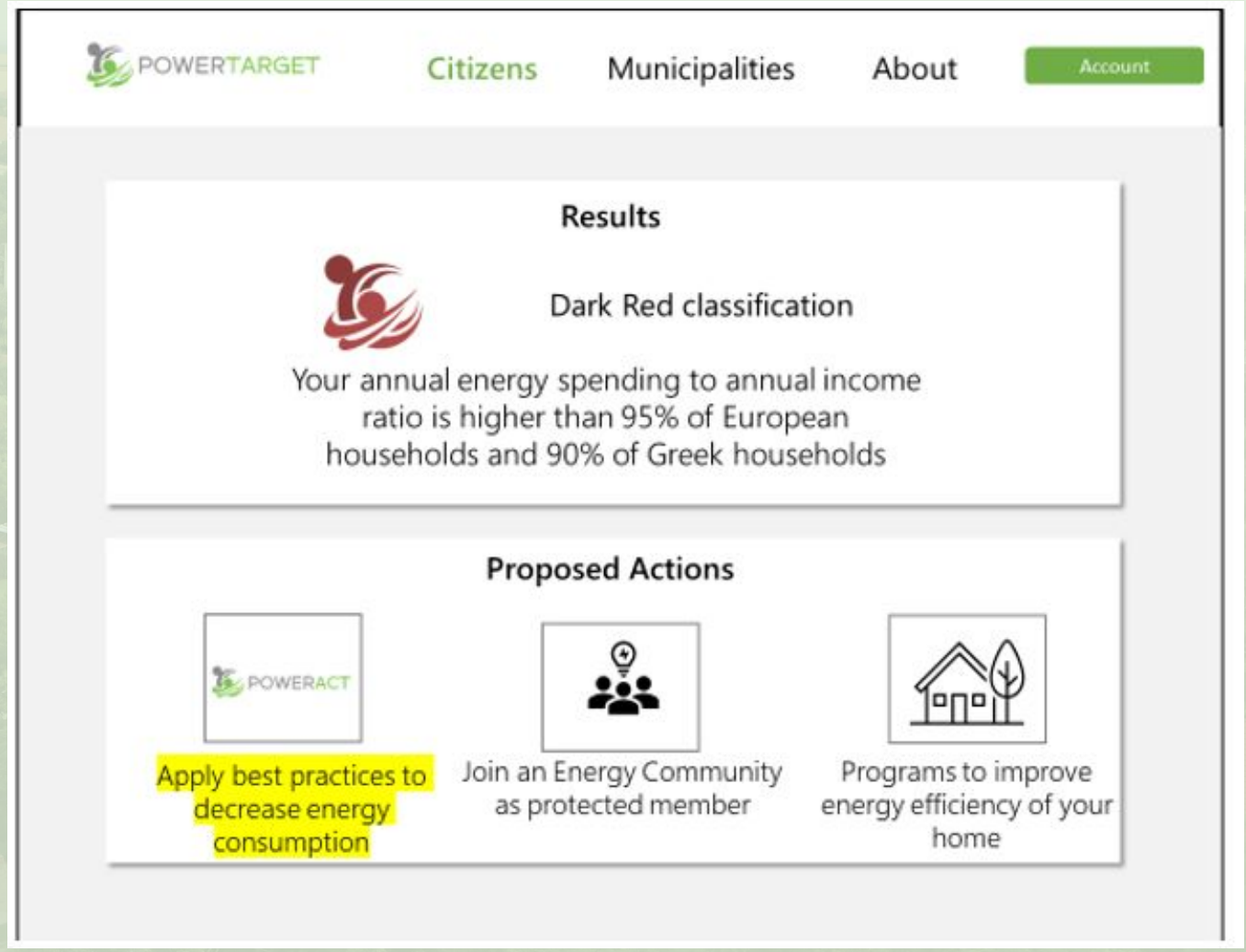
Annual Cost of Heating Bill — Enter annual cost of heating bill — €

My thermal comfort during winter is:* — Select thermal comfort

* Mandatory fields

Interpretation of the POWER TARGET scocres

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



Interpretation of the POWER TARGET scocres

Energy Supporter

... and you will work on the ground with energy-poor citizens to advise them on behavioral changes, assist them to plan, secure funding and implement energy efficiency interventions.

or

Energy Mentor

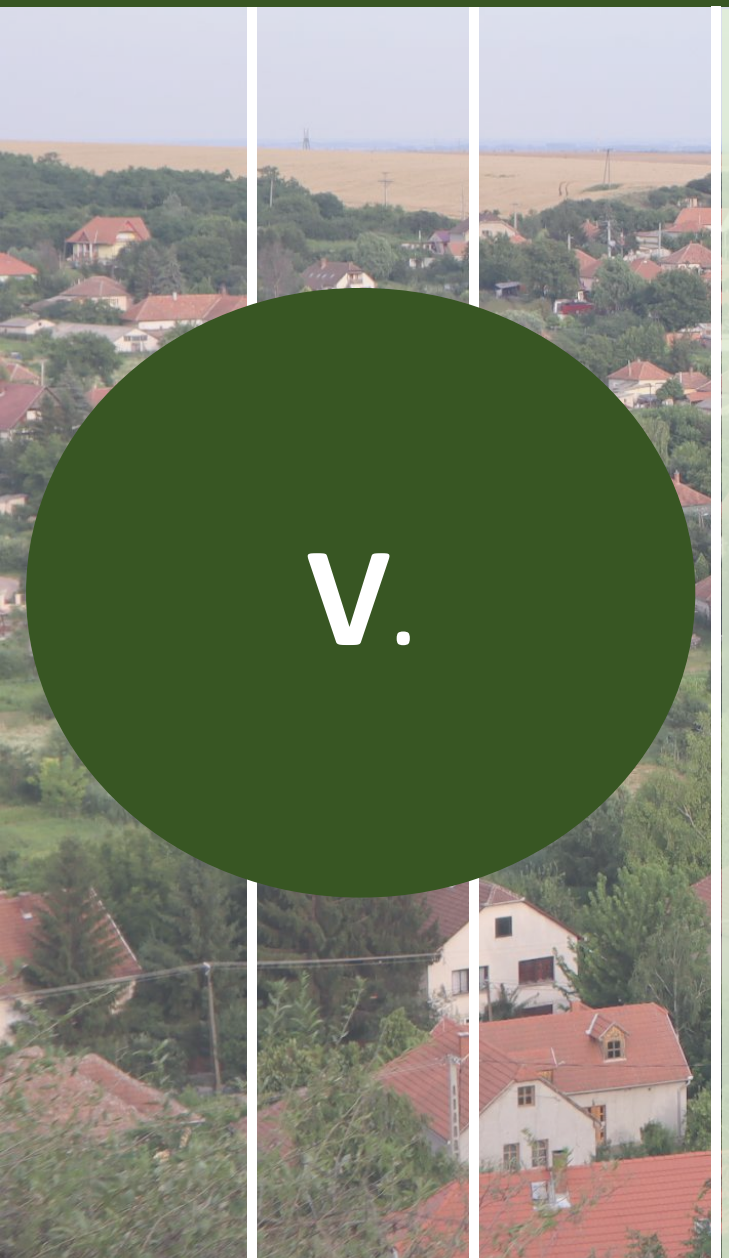
... and you will work on a municipality level and provide support and expertise in all the key areas associated with the operation and / or creation of an energy community / cooperative, comprised of energy-poor citizens.

EU wide (international) training webinars are coming in March, July, mid-Decmber and next January.

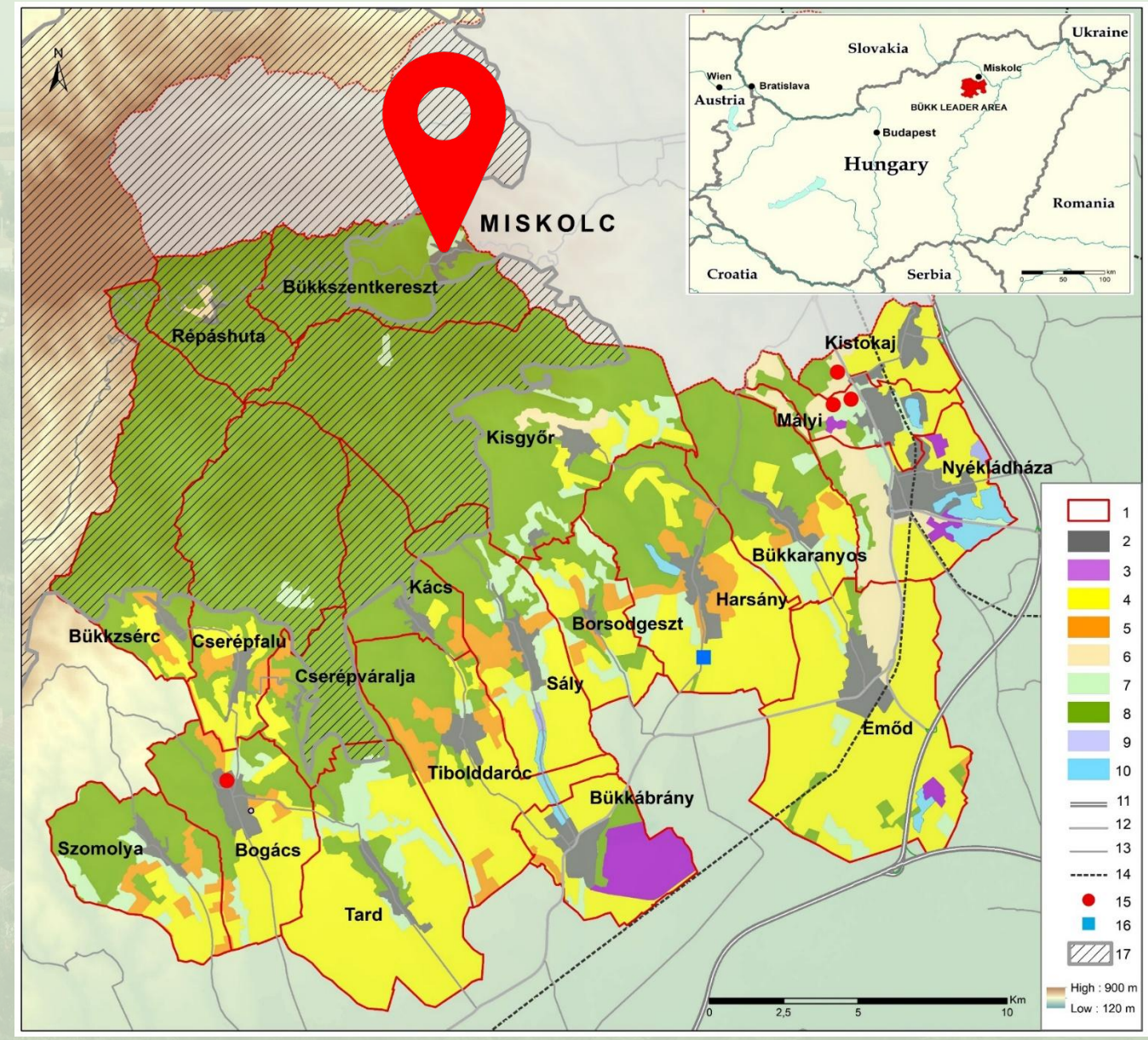
Tipp!

Subscribe to the newsletter and follow us on social media to be the first ones who will hear about the exact dates!

Synergies: PowerPoor and ELTE survey in Bükkszentkereszt

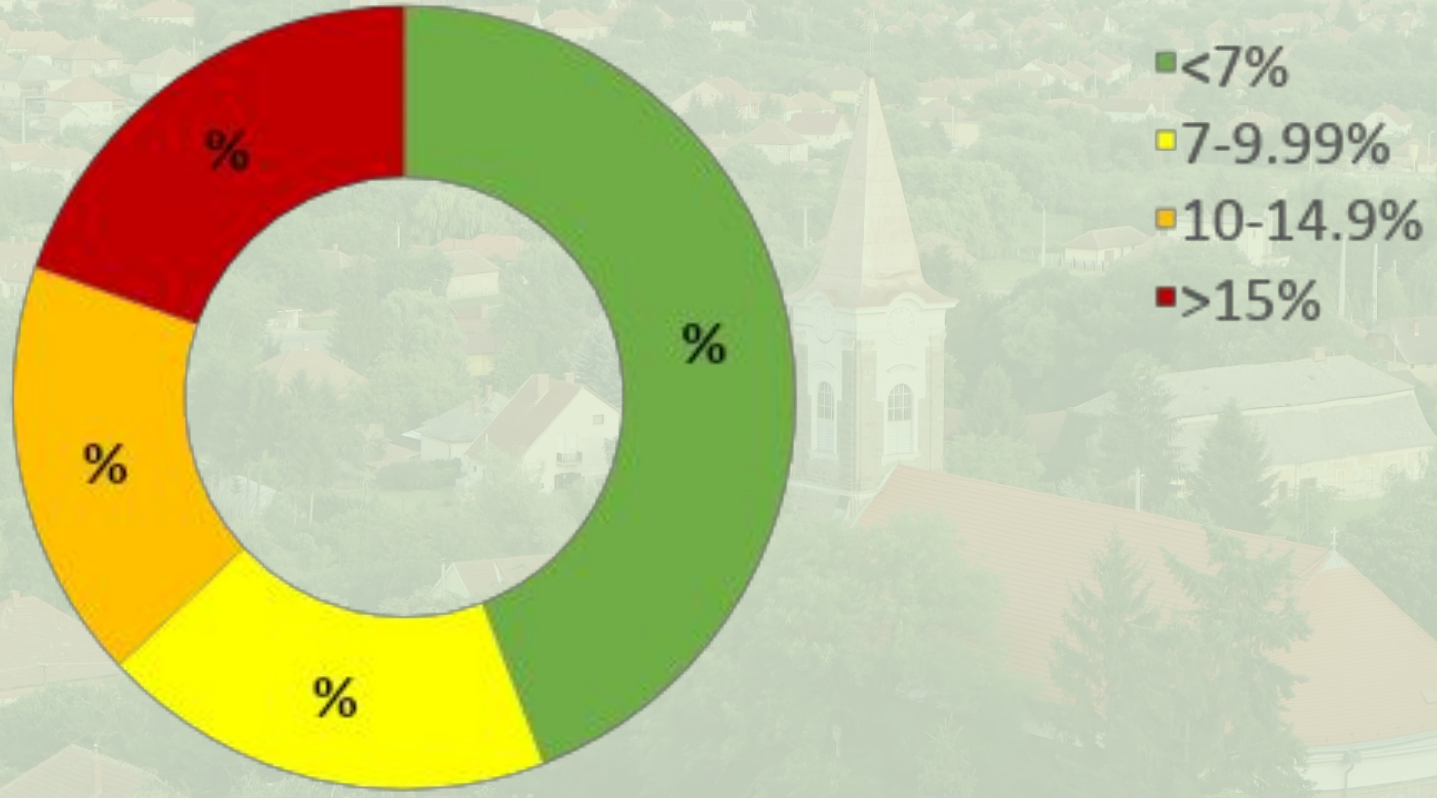


V.



Preliminary results of energy poverty level in Bükkszentkereszt

The level of energy expenditure in relation to household income (n=138)



Do not forget measuring energy poverty is inevitable to give proper answers to this complex challenge.

Thank you for your attention!

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Useful links

- Energiaklub's website: https://energiaklub.hu/en
- PowerPoor's website: https://powerpoor.eu/
- PowerPoor's facebook: https://www.facebook.com/PowerpoorEU
- Power Target: http://powerpoor.epu.ntua.gr/powerpoor-toolkit/target/
- Power Act: http://powerpoor.epu.ntua.gr/powerpoor-toolkit/act/
- PowerFund: https://www.powerfund.eu/
- PowerPoor's newsletter: https://powerpoor.us7.list-manage.com/subscribe?u=10044fa4423d88e6b6d76298e&id=a601b866a6
- International publications from Bükkalja Survey:
- Csontos Cs. et al. 2020: https://journals.aau.dk/index.php/sepm/article/view/3661/4179
- Campos J. et al. 2020: https://energsustainsoc.biomedcentral.com/articles/10.1186/s13705-020-00271-4?fbclid=IwAR24EQQl4v