Best practices for residential energy efficiency (REE) by Habitat for Humanity International

ComAct

Community Tailored Actions for Energy Poverty Mitigation

Gyorgy Sumeghy

HFHI/EME

UN-ECE webinar on Ukraine

November 18, 2022

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 892054.

Structure of presentation

- Context in Central and Eastern Europe
- Habitat REE projects
- The eco-system of residential energy efficiency
- The blueprint for scaling up REE investment
- Empowering and activating the communities of homeowners
- Resource centers
- Database development in North Macedonia
- EE assessment tools from Bosnia and Hercegovina
- Winterization projects for Ukrainian refugees and in Ukraine
- Policy recommendations
- Key resources

ComAct Community Tailored Actions for Energy Poverty Mitigation

Context of residential building stock in Central and Eastern Europe

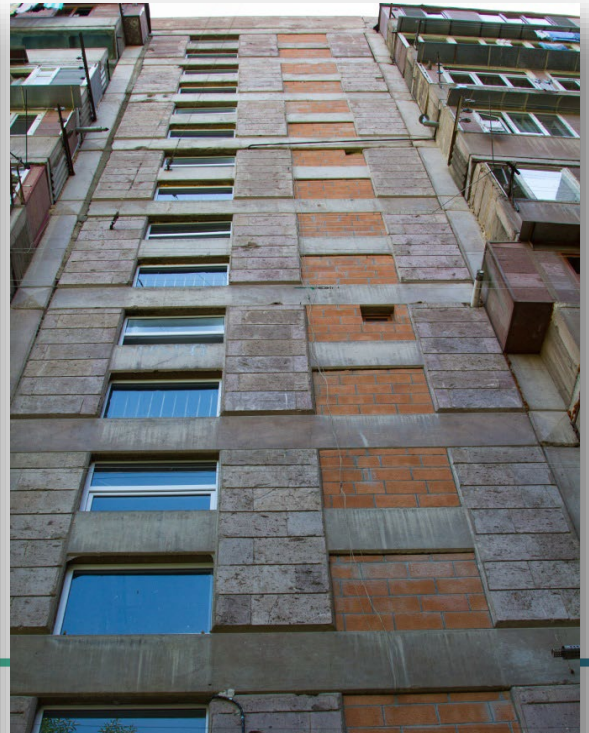
- **Pre-fabricated multi-apartment buildings** built between 1960-90 represent **30-70%** of the total housing stock in the CEE region
- Quick mass privatization in the 1990s led to **80-90% owner-occupation rates, without an adequate framework for building maintenance and management**
- New homeowners **lacking resources to maintain their own apartment** and **common building facilities**
- New homeowners **not aware of their ownership rights and responsibilities**



ComAct Community Tailored Actions for Energy Poverty Mitigation

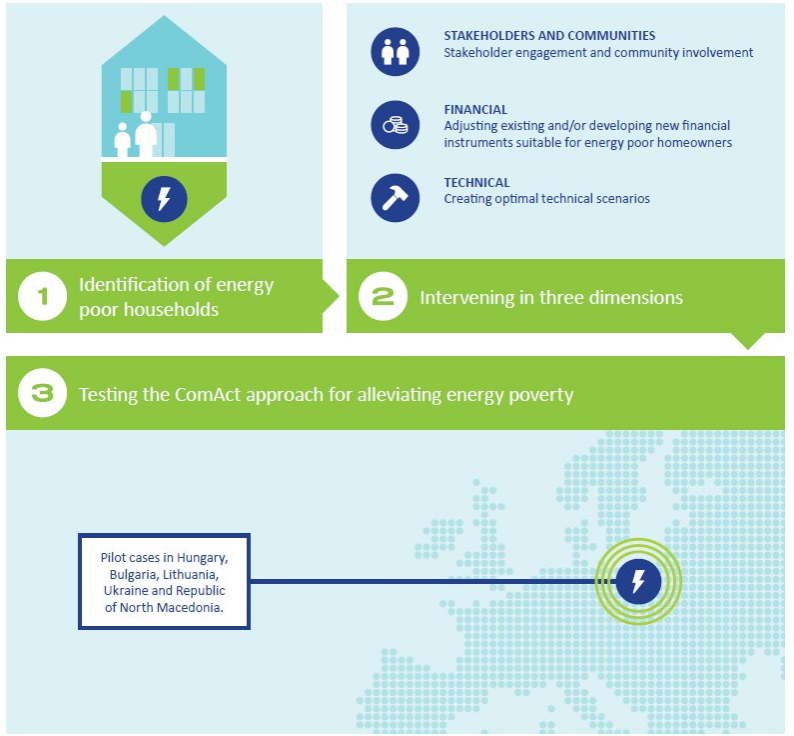
REELIH Project

- **Residential Energy Efficiency for Low Income Households-REELIH project in Armenia; Bosnia and Herzegovina; North Macedonia – with the support of USAID**



ComAct Community Tailored Actions for Energy Poverty Mitigation

Community tailored actions for energy poverty mitigation



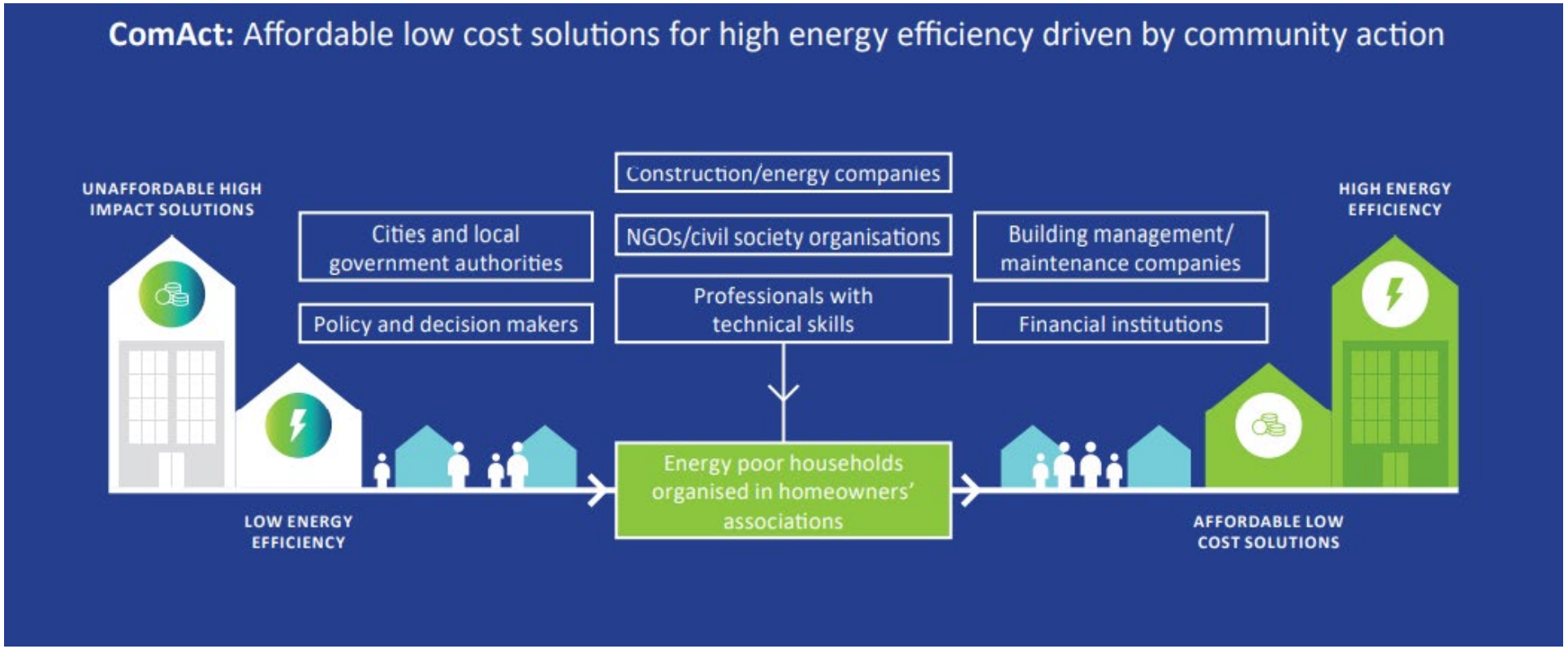
- 2020-2023
- Funded by EU / Horizon 2020
- Affordable low-cost solutions for high energy efficiency driven by community action
- **Key approach:** Resource Centers

Habitat for Humanity · Vartotojų aljansas Lithuanian Consumers Alliance · BPIE · ENOVA Consultants and Engineers · Habitat for Humanity Macedonia · IWO · EnEffect · Metropolitan Research Institute Budapest · Асоциация

Hungary · Bulgaria · Lithuania · Ukraine · North Macedonia

ComAct Community Tailored Actions for Energy Poverty Mitigation

ComAct eco-system



ComAct Community Tailored Actions for Energy Poverty Mitigation

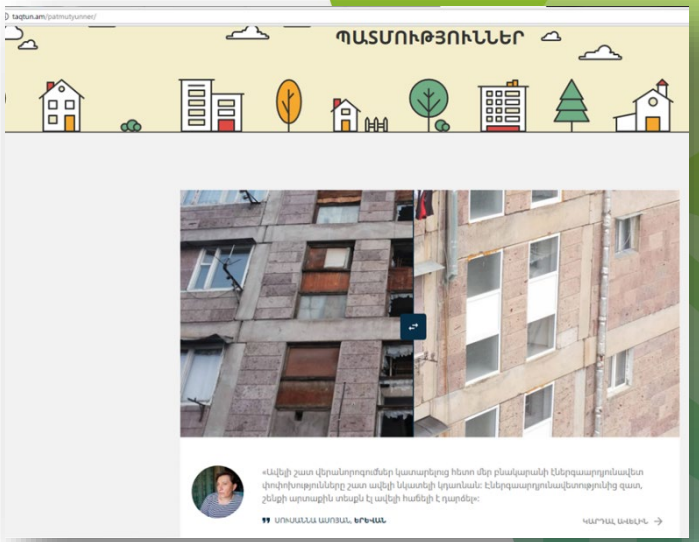
Blueprint to scale up REE investment

- Identifying the need in the community
- Empowering and activating the communities of homeowners
- Facilitate the eco-system of residential energy efficiency
- Establish Resource Centers (One-stop-shops)
- Develop database of apartment buildings
- Evaluate the investment need based on technical measures
- Optimizing technical Solutions for energy efficiency in MFABs
- Financing schemes for multi-apartment buildings

ComAct Community Tailored Actions for Energy Poverty Mitigation

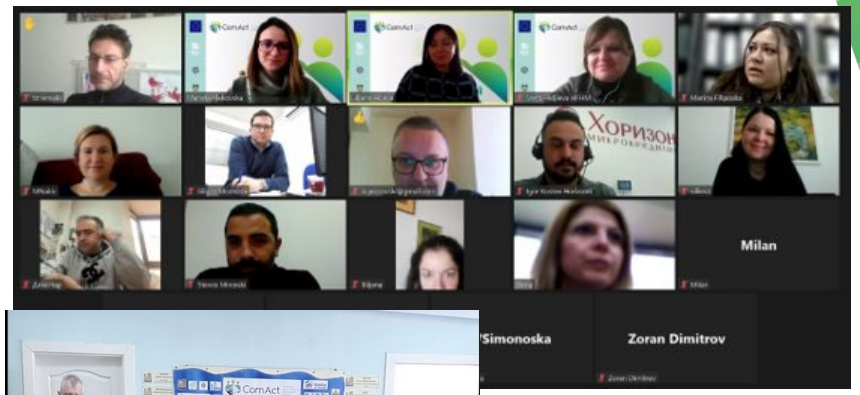
Empowering HOAs

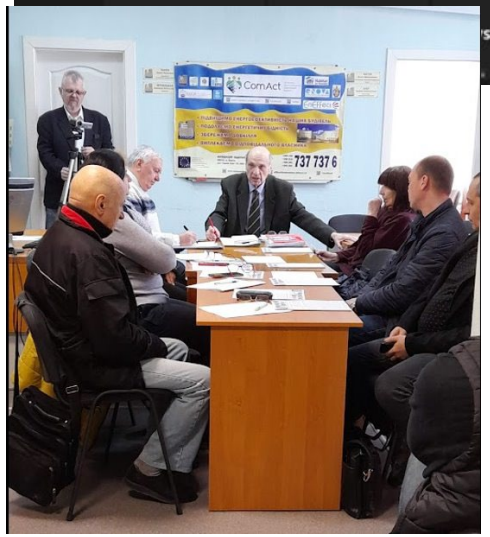
- **Community training and facilitating decision-making**



ComAct Community Tailored Actions for Energy Poverty Mitigation

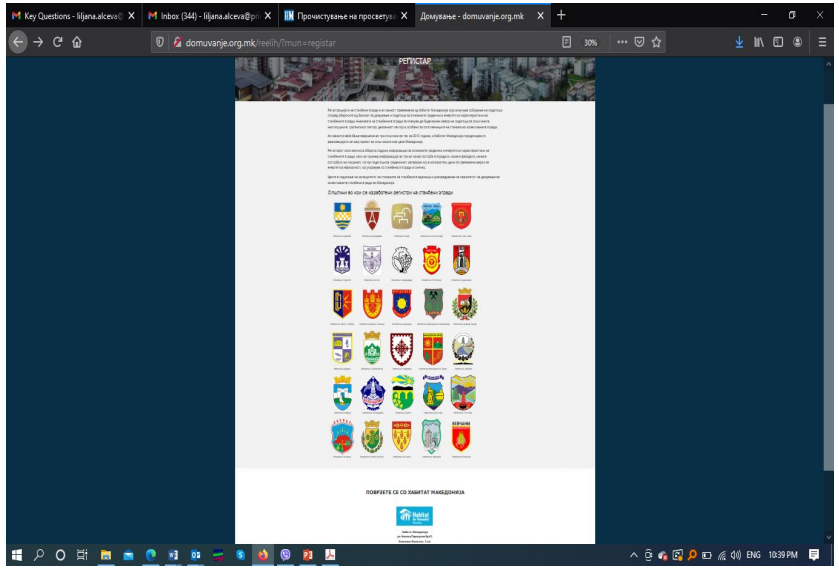
Resource Centers and community activities in pilots





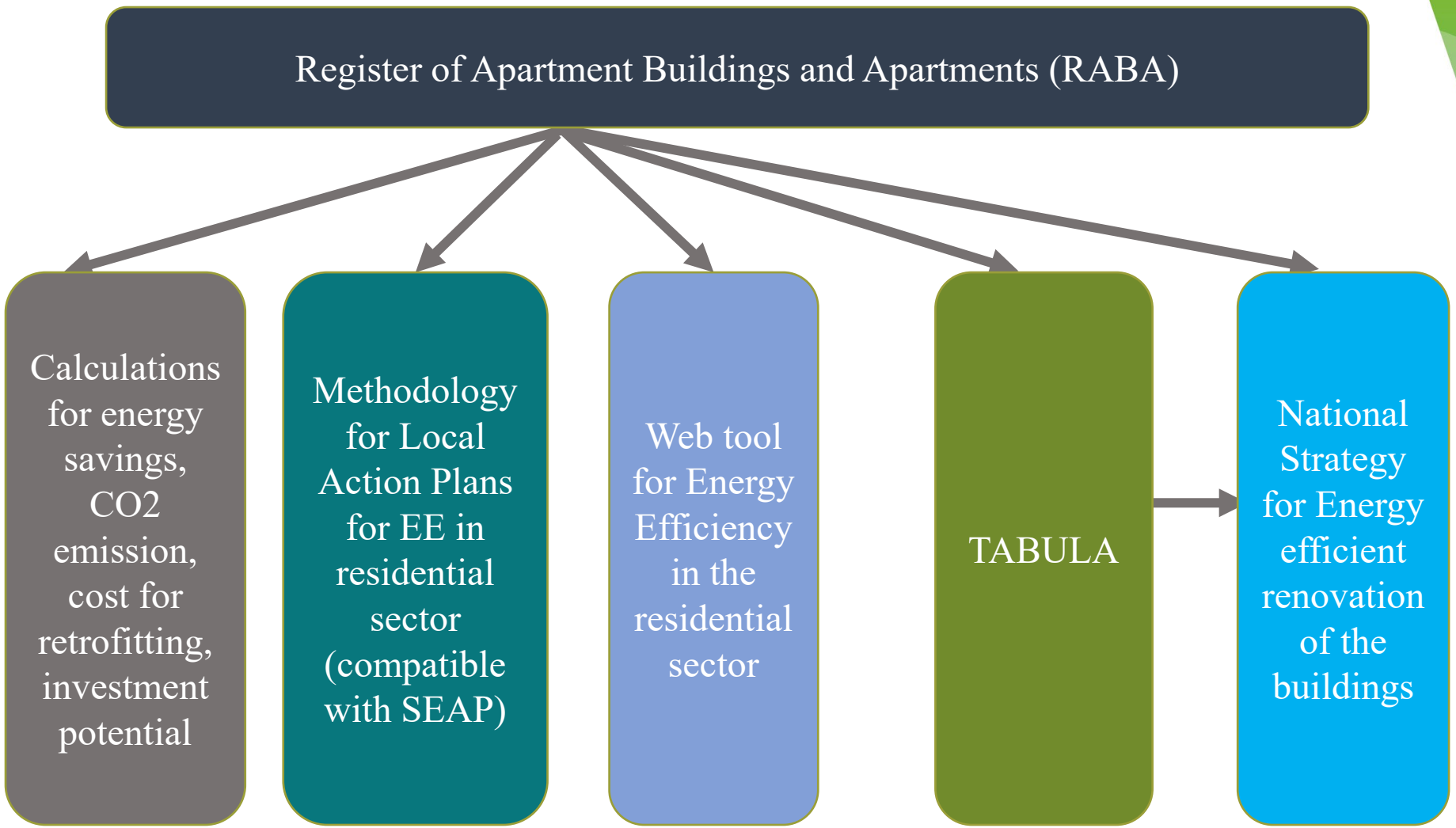
RABA

- Today, RABA is a data base of 3.838 buildings, 115.440 apartments in 30 municipalities in Macedonia.
  - Memorandum of understanding
  - Additional questions of interest of municipality
  - Training for surveyors
  - www.domuvanje.org.mk
  - Overview of the information about the quality of housing stock at municipal level
  - On-line survey



ComAct Community Tailored Actions for Energy Poverty Mitigation

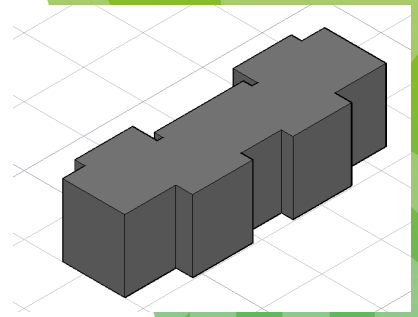
Utilization of RABA



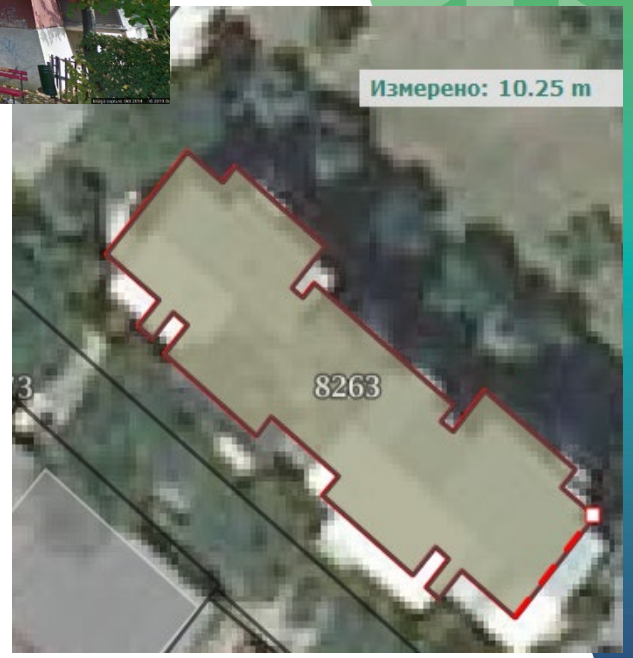
Data proofing and calculations

- Comparison of data from RABA with the Cadaster and creating 3D model.
- Methodology and tool for calculation of energy parameters.
- According the Rule book of energy characteristics of buildings from 2013 there are 4 categories according the date of construction:
  - before 1965;
  - 1965-1980;
  - 1980 – 1990; and
  - after 1990
- Calculation are used for estimation of energy savings, CO2 emission, costs for energy measures, investment potentials…

Google Street View



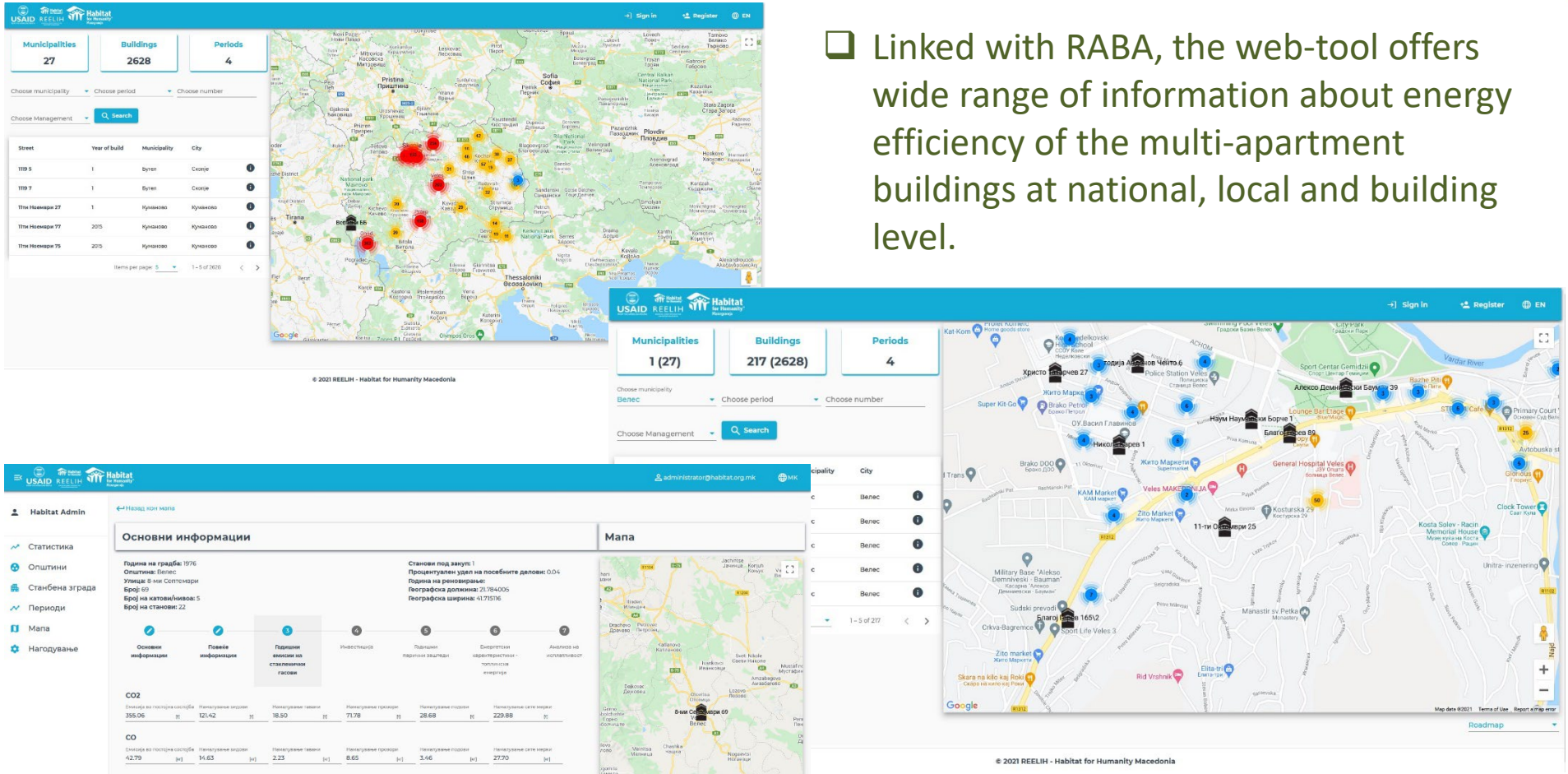
AutoCAD 3D модел



Agency of Cadaster and real-estate GIS portal

ComAct Community Tailored Actions for Energy Poverty Mitigation

Web-tool for energy efficiency in the residential sector



- Linked with RABA, the web-tool offers wide range of information about energy efficiency of the multi-apartment buildings at national, local and building level.

TABULA – Typology approach for building stock energy assessment

- TABULA is basis for the National Strategy for Energy Renovation of the Buildings, which is in line with EU Directives for long term strategies for building renovations (EU Directive 2018/844 of May 2018).
- TABULA is categorizing buildings according the period of their construction (6-9 periods in Macedonia) and estimate energy consumption, CO2 emission, energy efficiency measures, etc.

Before reconstruction

During reconstruction

After reconstruction

ComAct Community Tailored Actions for Energy Poverty Mitigation

Energy audits and training for the residents

Parametar	Standard		Stvarni	Osnova	Osjetljivost kWh/m²a		Mjere	Ustede
1. Grijanje	**78,7**	kWh/m²a						
U – zid	0,90	W/m²K	0,35 >	0,35	+ 0,1 W/m²K	= 7,44	0,19 >	-11,69
U – prozor	2,65	W/m²K	2,24 >	2,24	+ 0,1 W/m²K	= 1,37	2,24 >	
U – krov	0,70	W/m²K	0,39 >	0,39	+ 0,1 W/m²K	= 2,38	0,39 >	
U – pod	0,65	W/m²K	0,65 >	0,65	+ 0,1 W/m²K	= 2,94	0,65 >	
Odnos kompaktnosti	0,58	-	0,58	0,58			0,58	
Faktor prozora	17,0	%	17,0	17,0			17,0	
Faktor dotoka od sunca	0,56	-	0,79 >	0,79			0,79 >	
Infiltracija	0,50	1/h	0,50	0,50	+ 0,1 1/ h	= 8,32	0,50	
Sobna temperatura	19,0	°C	22,0	22,0	+ 1 °C	= 4,38	22,0	
Donja temperatura	16,0	°C	17,0	17,0	+ 1 °C	= 3,12	17,0	
Doprinos od								
Ventilacija (grijanje)		kWh/m²a	0,00	0,00				
Osvjetljenje		kWh/m²a	1,79	1,79				
Razni potrosaci		kWh/m²a	0,00	0,00				
Potrebna energija		**kWh/m²a**	**48,2**	**48,2**				
Emisiona efikasnost	100,0	%	98,0	98,0				
Distribuc. efikasnost	95,0	%	95,0	95,0				
Automatska regulacija	97,0	%	93,0	93,0				
TUZ/PPE	96,0	%	96,0	96,0				
Suma		**kWh/m²a**	**58,0**	**58,0**				
Efikasnost gener.toplote	100,0	%	90,0	90,0				
Koristena energija		**kWh/m²a**	**64,5**	**64,5**				

ENOVA CONSULTANTS AND ENGINEERS

ENERGETSKI CERTIFIKAT NESTAMBENE ZGRAD

ZA SVE OBJEKTE	Objekat	▫ novi
	Vrsta objekta	Stambeni
	K.č. k.o.	K.č. br. 1261/2, k.o. Tešanj
	Adresa	Trg Alije Izetbegovića bb
	Mjesto	Tešanj
	Vlasnik/Investitor/Korisnik	Odbor etažnih vlasnika, Trg Alije Izetbegović
ZA NOVE OBJEKTE	Izvođač	
	Godina izgradnje	

$E_p = Q_{H,nd,ref} / A_k$ (kWh/m² a)

ENERGETSKI CERTIFIKAT ZA NESTAMBENE OBJEKTE

A+ ≤ 15
A ≤ 45
B ≤ 95
C ≤ 135
D ≤ 180
E ≤ 225
F ≤ 270
G > 270

PODACI O IZDAVAČU CERTIFIKATA

Ovlašteno pravno lice: ENOVA d.o.o. Sarajevo

Imenovano lice u ovlaštenom pravnom licu: ZLATKA SJENAR

Registarski broj ovlaštenog lica: 01-M2/13

Broj certifikata: EN 0005/15

Datum izdavanja / Rok važenja: 21.04.2015. / 21.04.2025.

Potpis i pečat

ComAct Community Tailored Actions for Energy Poverty Mitigation

Measuring of energy, CO2 and other impacts of residential energy efficiency investment

ComAct Community Tailored Actions for Energy Poverty Mitigation

Information on all residential buildings in Tuzla canton gathered (973 buildings)

Building recorded and shown in 3D model

Energy features measured

Energy savings calculated

Shape

Object Attributes

Adresa	7. Novembar 2
GPS	21
Investic_1	142725
Investic_2	0
Investicij	0
Ivesticija	0
Nacin	Toplana
Napomena	
Obim_tlocr	70
Potencij_1	0
Potencij_2	24178.01
Potencij_3	12224.18
Potencij_4	24178.01
Potencijal	0
Potrebna	186790.5
Površina_f	1595
Površina_k	306
SHAPE_ID	39
Smanjenj_1	0
Smanjenj_2	0
Smanjenj_3	10.24
Smanjenj_4	0
Smanjenje	10.24

CO_2 Impacts estimated

Investment Calculated

Policy recommend ations

Energy Savings in Tuzla Canton

- 973 buildings recorded in the residential stock in the Tuzla Canton (13 municipalities)
- 293 buildings use individual heating systems – current energy needs 28,219, 979 kWh pa
- Energy savings after full EE measures – 13,341,612 kWh/pa 48% savings
- 480 buildings use district heating systems – current energy needs 103,311,840 kWh pa
- Energy savings after full EE measures – 46, 913,027 kWh/pa 44,5% savings

TABELA 4.
Trenutne energijske potrebe i potencijalne uštede energije za objekte priključene na sistem daljinskog-centralnog grijanja

OBJEKTI PRIKLJUČENI NA SISTEM DALJINSKOG-CENTRALNOG GRIJANJA									
Općina	Broj stambenih objekata	Kompanija koja pruža usluge daljinskog –centralnog grijanja	Grijana površina	Trenutne potrebe za energijom	Potencijalna ušteda nakon izolacije zidova	Potencijalna ušteda nakon izolacije tavana	Potencijalna ušteda nakon zamjene prozora	Potencijalna ušteda nakon izolacije poda	Ukupne uštede nakon provođenja svih mjera
			m²	kWh/god	kWh/god	kWh/god	kWh/god	kWh/god	kWh/god
Banovići	18	JP Toplana d.o.o. Banovići	46.747,6	3.857.269,7	306.368,1	17.080,0	301.637,8	40.759,1	665.845,1
Gračanica	9	Eko toplane Gračanica d.o.o.	10.800,7	1.424.121,6	457.952,0	12.687,4	111.410,0	4.601,2	586.650,6
Lukavac	51	JP Rad Lukavac	50.399,6	7.012.784,8	2.350.531,6	154.173,5	685.975,5	135.422,4	3.326.102,9
Tuzla	402	JP Centralno grijanje dd Tuzla	841.134,9	91.017.664,6	26.715.095,7	3.023.357,5	8.111.275,9	3.484.700,0	41.334.429,1
UKUPNO	480		949.082,8	103.311.840,7	29.829.947,5	3.207.298,4	9.210.299,2	3.665.482,6	45.913.027,7

TABELA 3.
Trenutne energijske potrebe i potencijalne uštede energije za objekte sa individualnim sistemom grijanja

OBJEKTI SA INDIVIDUALNIM SISTEMOM GRIJANJA								
Općina	Broj stambenih objekata	Grijana površina	Trenutne potrebe za energijom	Potencijalna ušteda nakon izolacije zidova	Potencijalna ušteda nakon izolacije tavana	Potencijalna ušteda nakon zamjene prozora	Potencijalna ušteda nakon izolacije poda	Ukupne uštede nakon provođenja svih mjera
		m²	kWh/god	kWh/god	kWh/god	kWh/god	kWh/god	kWh/god
Banovići	84	62.115,85	8.386.004,88	2.441.915,22	509.338,36	686.603,06	508.846,08	4.146.702,72
Čelić	4	2.279,28	297.364,69	76.684,41	24.728,79	23.386,06	4.200,30	128.999,56
Gračanica	33	18.033,91	3.616.694,76	1.298.846,90	105.098,60	215.124,79	381.727,84	2.000.798,13
Gradačac	35	32.916,00	3.362.196,49	449.289,31	149.890,01	317.121,75	114.821,94	1.031.123,01
Kalesija	6	4.260,95	675.339,11	116.930,28	26.522,55	98.702,54	968,86	243.124,23
Kladanj	27	12.443,68	2.262.372,09	648.499,05	110.191,94	225.955,77	138.569,55	1.123.216,31
Lukavac	43	21.159,22	3.642.419,64	1.233.930,42	208.882,12	311.379,29	193.714,39	1.947.906,22
Sapna	3	1.362,82	225.257,61	77.021,52	9.788,09	14.682,99	4.194,28	105.686,88
Teočak	1	619,32	73.038,97	6.596,12	0,00	8.618,37	5.035,62	20.250,11
Srebrenik	22	26.791,23	2.990.627,19	684.831,99	153.522,81	243.736,75	56.738,14	1.138.829,69
Živinice	35	17.563,04	2.740.842,54	769.120,05	320.062,77	274.175,79	119.353,13	1.482.711,74
UKUPNO	293	199.311,62	28.219.979,82	7.786.894,39	1.613.193,83	2.413.367,48	1.528.170,13	13.341.625,83

ComAct Community Tailored Actions for Energy Poverty Mitigation

Planned Winterization Interventions for Ukrainian refugees in Poland, Slovakia, Hungary and Romania

Physical upgrades

- Weather-proofing and repairs
- Heating Systems upgrades
- Energy efficiency and bill reductions
- Establish transit centers

Financial support

- Cash assistance
- Rental subsidy
- Utility bills subsidy

Core relief items

- Distribution of winterization kits
- Distribution of furniture

Housing solutions

- Provide short-term accommodation for refugees in transit
- Support with mid-term accommodation for refugees through social housing solutions

ComAct Community Tailored Actions for Energy Poverty Mitigation

Planned Winterization Inside Ukraine

Interventions specific to Ukraine in-country response:

- **Repair to damaged houses – 1,000 families**
- **Household winterization repair kits – 500 families**
- **Community infrastructure repairs and rehabilitation – TBC**
- **Technical assistance on repairs and affordable housing to municipalities**
- **Thought leadership on long term recovery and reconstruction of housing sector in Ukraine**

ComAct Community Tailored Actions for Energy Poverty Mitigation

Winterization Plan Overview

	Romania	Slovakia	Hungary	Poland	Ukraine
Estimated budget EUR	€385,000	€150,000	€55,000	€600,000	€2.5M (up to €5M)
Estimated target Individuals	2,000+	1,000+	50 (+existing caseload under solidarity accommodation programme)	2,500+	1,500 HH (4,000 individuals)

ComAct Community Tailored Actions for Energy Poverty Mitigation

Policy recommendations/1

- Recognize the owner-occupied MABs as a special form of social housing in Central and Eastern Europe
- Combine energy policy and social policy
- Identify the issue of alleviating energy poverty as one of the focus areas in shaping national building renovation goals
- Support renovations by mixed financing models (subsidies + loans) to make this predictable and sustainable long-term
- Create an enabling regulatory environment for banks to be able to scale up renovation loans for HOAs
- Strengthen the capacity of local governments so that they can provide complex technical assistance for HOAs

ComAct Community Tailored Actions for Energy Poverty Mitigation

Policy recommendations/2

- National and local governments should conduct massive awareness raising campaigns targeting HOAs to promote energy efficiency measures in owner occupied MABs
- Provide technical assistance for HOAs including social facilitation
- One-stop-shops targeting owner occupiers of MABs should provide complex technical assistance including social facilitation. This service should be provided by independent experts and paid by national or local government subsidies to ensure scaling up renovation of these buildings in a sustainable way

Selected key resources

- Policy Brief
- BBC video on renovating MABs in North Macedonia
- ComAct research papers and toolkits
- Gap analysis of the housing sector in Western Balkan countries
- REE Observatory for CEE first publication

Thank you for your attention!

ComAct

Community Tailored Actions for Energy Poverty Mitigation

Gyorgy Sumeghy

Associate Director, Policy and Advocacy

Habitat for Humanity International

Europe and the Middle East Area Office

gsumeghy@habitat.org

For REE projects: zkakalejcikova@habitat.org

For winterization for Ukrainians: RHaniffa@habitat.org

https://getwarmhomes.org/

https://comact-project.eu/

@ComActProject

ComAct project

www.comact-project.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 892054.