

# Residential Energy Efficiency in Low Income Housing - REELIH

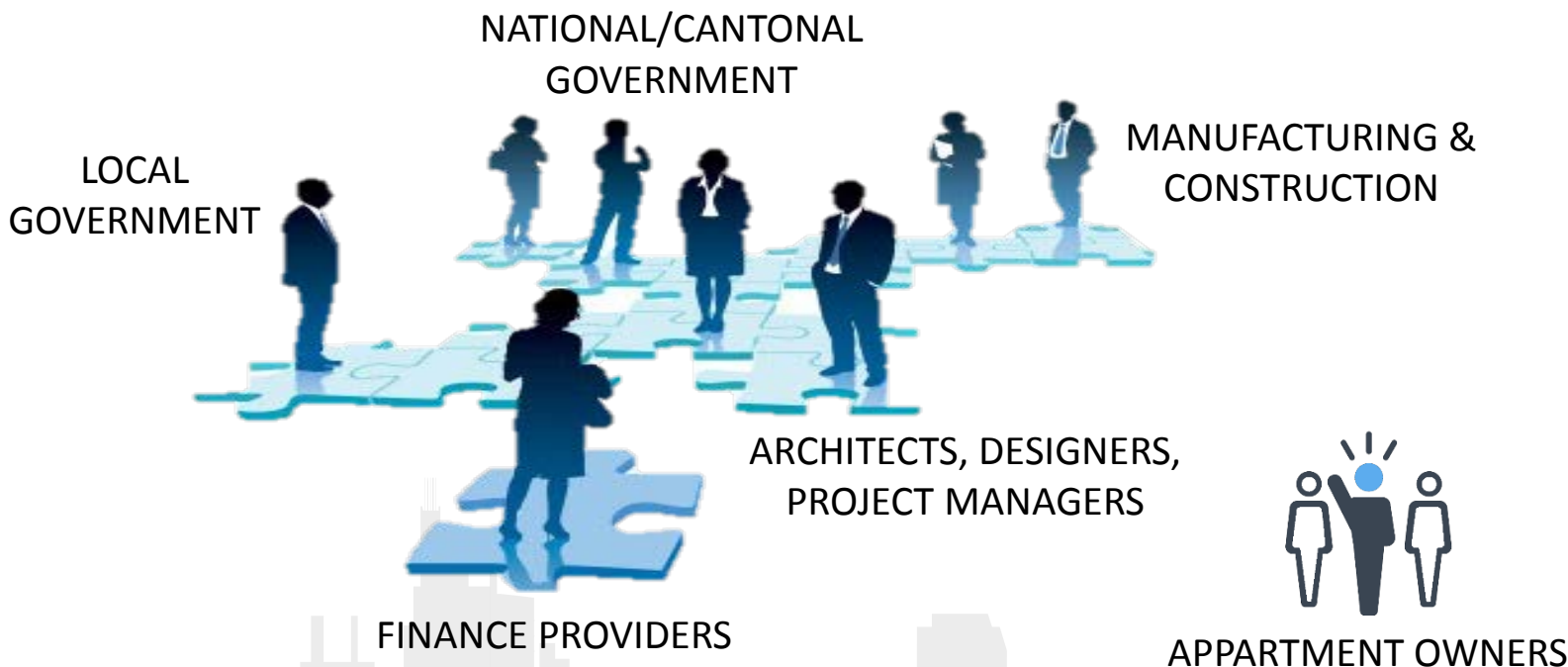
Lessons from Bosnia  
and Herzegovina

ENERGY EFFICIENCY COORDINATION GROUP –  
WORKSHOP – VIENNA, 27 JUNE 2017

# Context

- Much of the existing housing stock dates back to 1960s
- Mostly pre-fabricated **multi-story apartment buildings** -in some countries representing 30% in some more than 70%
- After the privatization of 1990, 90%+ of dwellings are **privately owned**
- Old residential management and maintenance structures collapsed, new ones are weak or non-existing
- Residential heating accounts for more than **40 % of energy use**
- Utilities were subsidized by the government, but the cost now is increasing
- Estimated **energy savings potential** of energy efficiency measures in residential buildings range between 20-40%

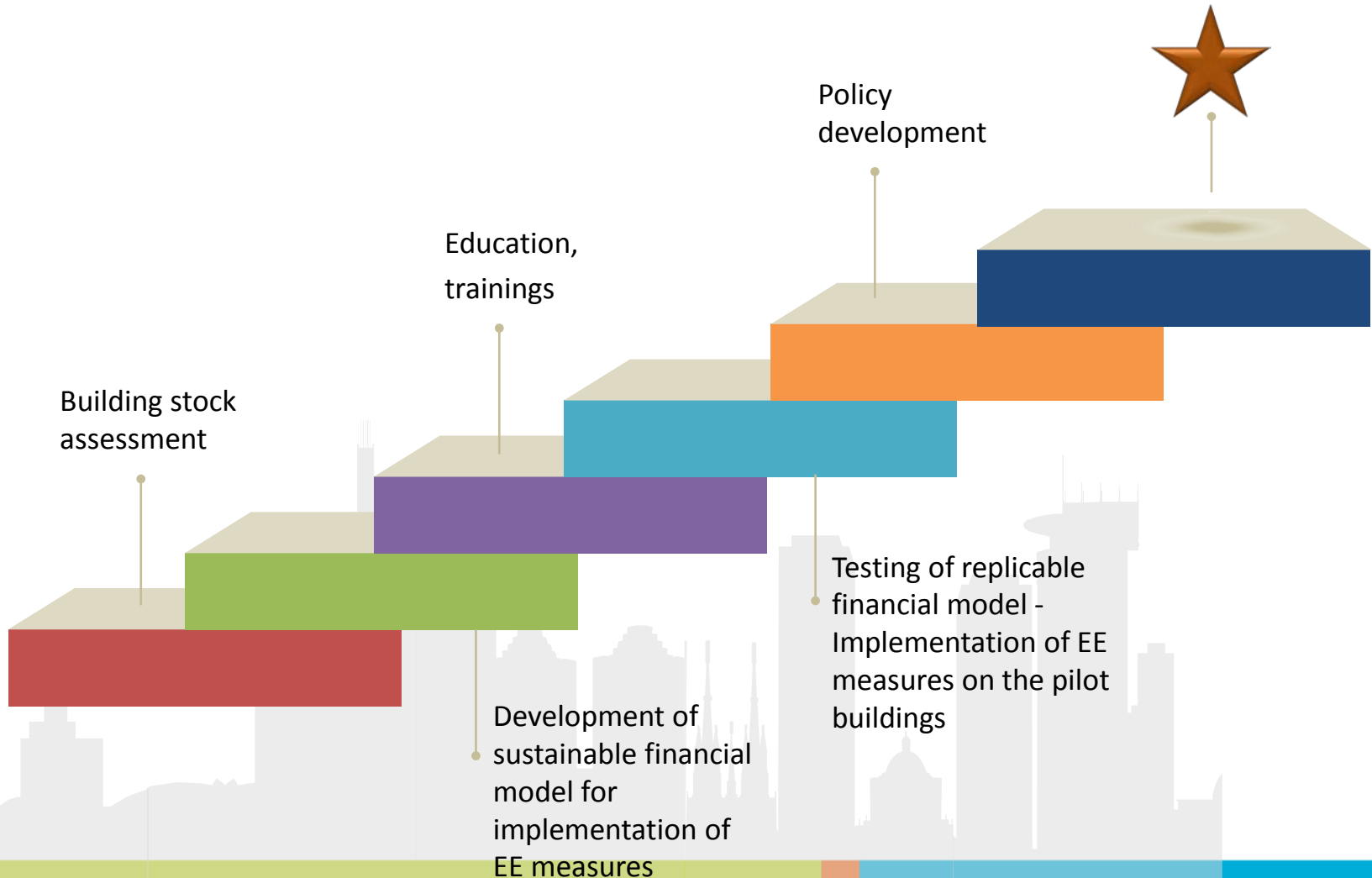
# Key Stakeholders



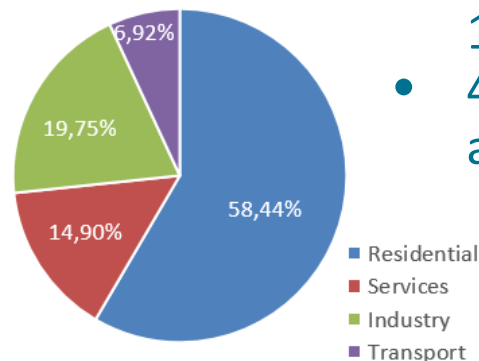
# Goals



# How to achieve them?



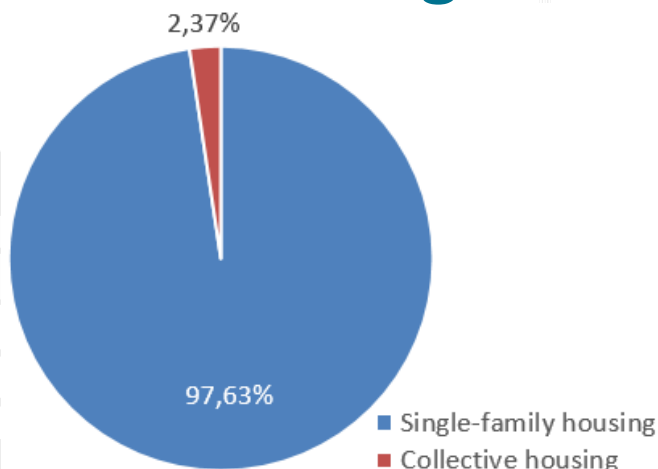
# Final energy consumption per sectors in 2010



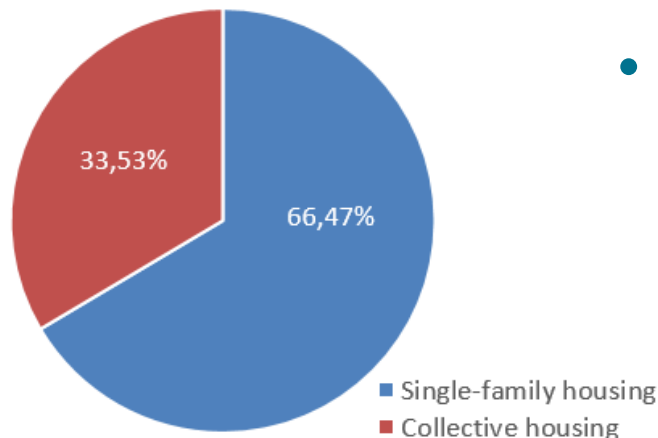
- Energy intensity of BiH: 0.5 toe / 1000 USD of GDP
- 4 times higher than EU/OECD average

*First National Energy Efficiency Action Plan 2010-2018*

# Ratio of single-family and collective housing



by total no. of buildings



by total no. of dwelling units

- 20,422 collective residential buildings

*Census of population, households and dwellings in Bosnia and Herzegovina, 2013*

# EE Action plans Tuzla Canton



Action plan  
and financial  
model

3D model and  
database

Tenants  
interviewing

Analysis of  
results

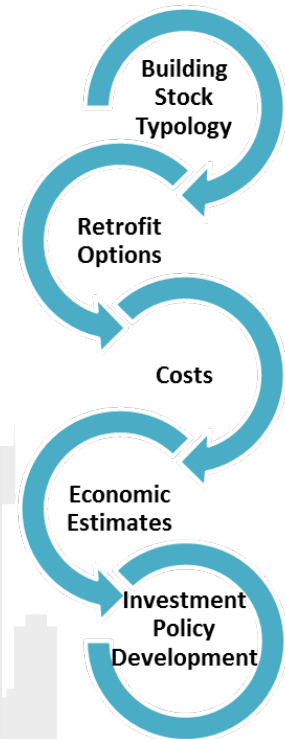
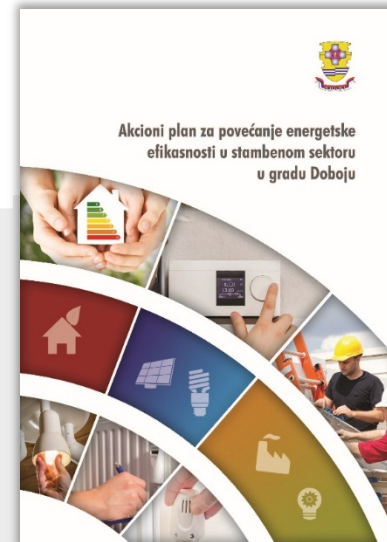
Data processing

Measuring

973+248

Photographing  
each building

# City of Dobojo



# EE Action plans

File Edit Select Layer Graph Shapes Search Scripts Window Help

Viewport | Perspective View | 102 Objects (1 selected) | 102 Polygons (1 selected)

Inspector

Shape

Rules

Rule File  Assign...

Start Rule  Select...

Reports

Object Attributes

Adresa	Armije BiH 40 ...
GPS	3
Id	0
Investicij	0
Ivesticija	445656
Nacin	
Napomena	
Obim_tlocr	261.98
Potencij_1	0
Potencij_2	126321.53
Potencij_3	97612.09
Potencij_4	620134.54
Potencijal	396200.92
Potrebna	1648905.26
PovrAjina_	0
SHAPE_ID	67
Smanjenje	167.85
Tlocrt	1560
Ukupna	445656
Ukupna_pov	2058.5
Visina	30.9
AREA_CUBEMET(ES)	170760113.406

Grid Size 100m | MGI Balkans 6

MGI Balkans 6 (EPSG:31276) Free Memory: 3987[MB] 5834[MB]



Tuzla Canton + The City of Dobož

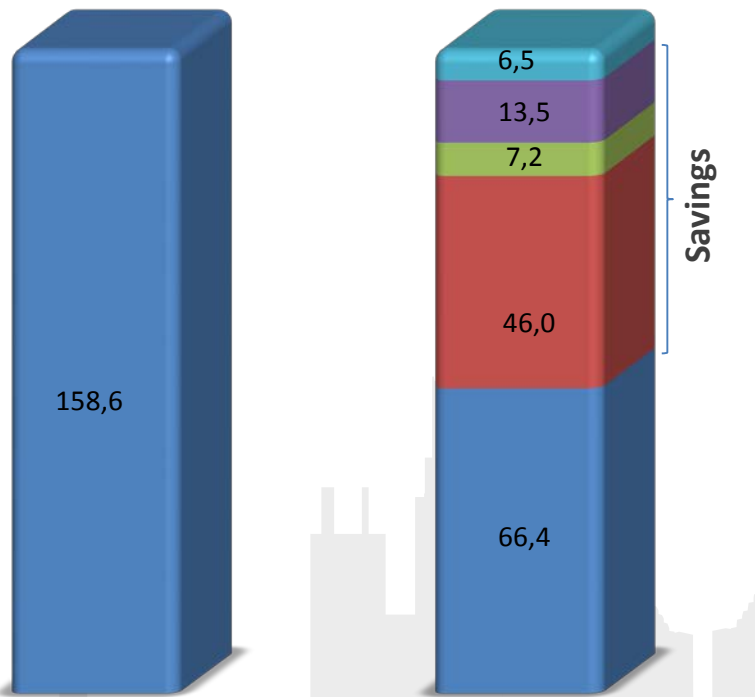
1,221



949

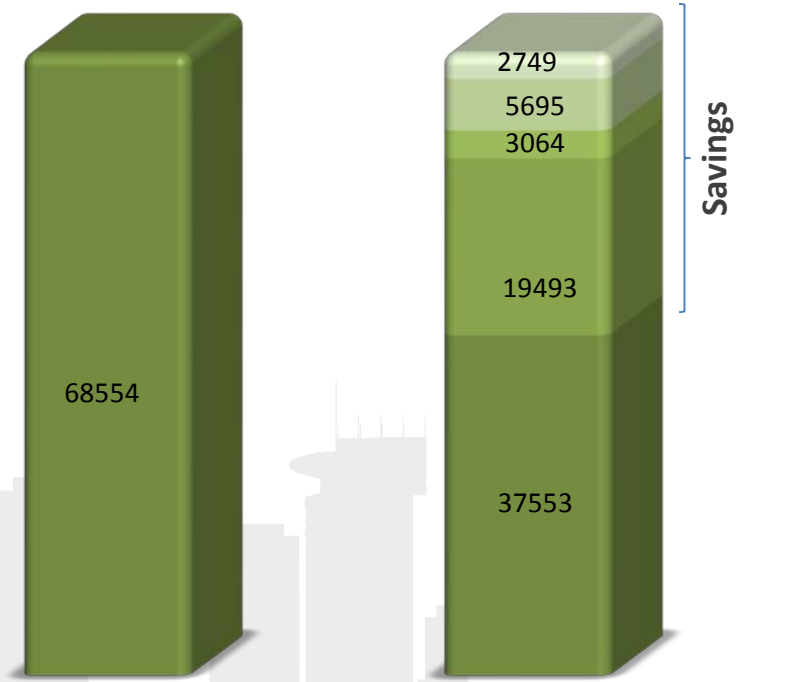
Residential buildings with the need to implement EE measures

Heating energy needs [GWh/a]



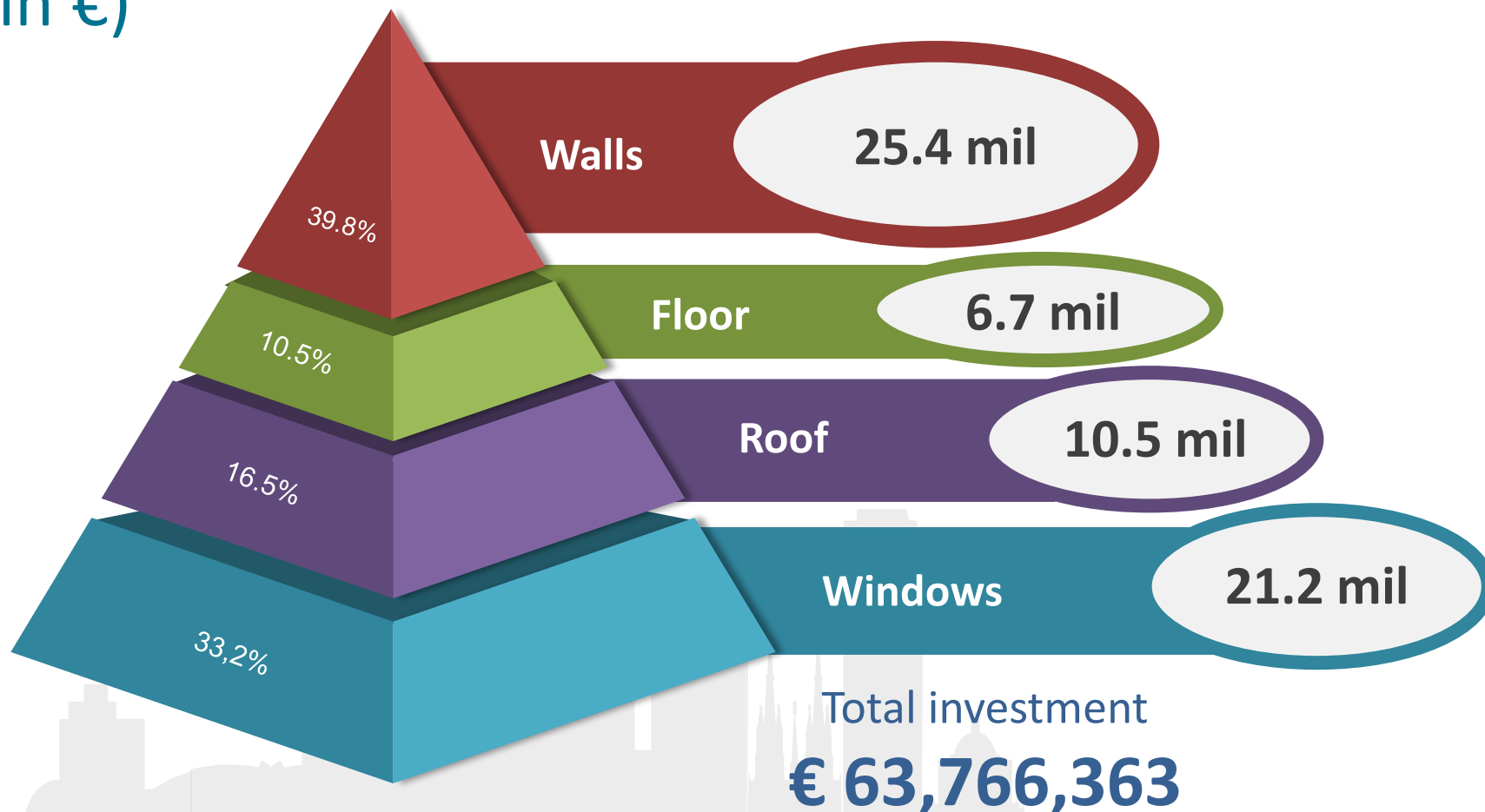
- Current energy needs
- Wall insulation savings
- Roof insulation savings
- Windows replacement savings
- Floor insulation savings

CO2 emissions [tons]



- Current CO2 emissions
- Wall insulation savings
- Roof insulation savings
- Windows replacement savings
- Floor insulation savings

# EE measures investments for Tuzla Canton and City of Dobojo (in €)



# EE Action plans

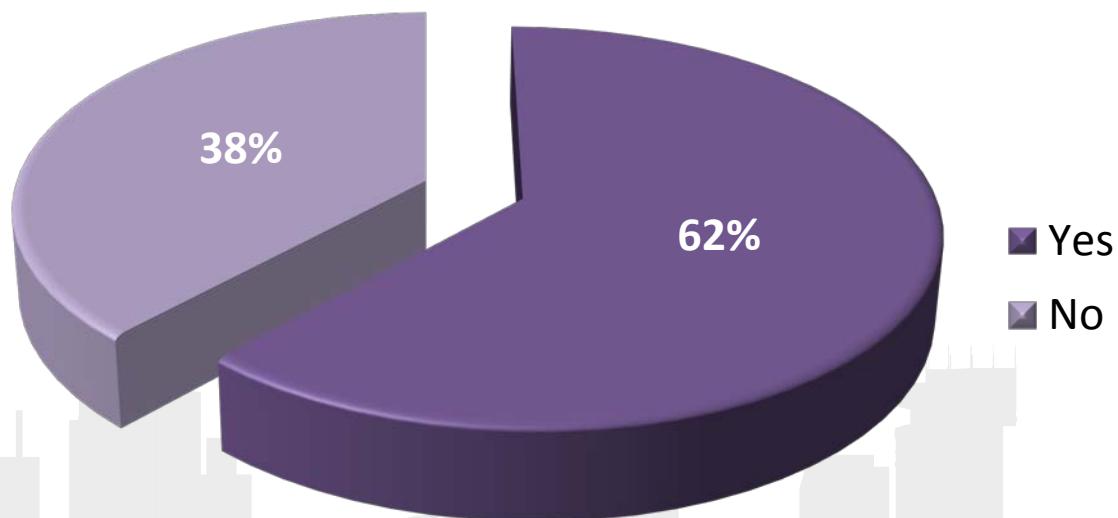
Tenants  
interviewing

residential buildings



106

## Readiness to invest into EE measures



**Questionable?!**

- 🏠 12 municipalities + 2 cities, population cca. 550,000 (15% of the country's population)
- 🏠 1221 residential buildings analysed
- 🏠 949 preliminary energy audits performed
- 🏠 Total annual heating needs – 158.6 GWh
- 🏠 Potential energy savings – 73.2 GWh (46%)
- 🏠 Current CO<sub>2</sub> emissions from multi apartment residential buildings – 68.554 t/a
- 🏠 Potential CO<sub>2</sub> emissions reduction – 31.001 t/a (45.2%)
- 🏠 Total EE measures investment potential – € 63.8 milion

# Achieved through REELIH

Municipality: Živinice

Before



After



Total investment: €28,180

Expected savings: 44 %

# Challenges

- **Poor residential management:** individual apartment ownership is > 90% but flat owners not used & not asked to take responsibility for common space maintenance
- **Institutional and system challenges** – significant gaps in laws, enforcement of laws and HOA and residential management regulations
- **Access to financing** for HOA's or common space investments (guarantees) doesn't exist. "Risky"?
- **Low "starting points" of cooperation** among these stakeholders: HO's ⇔ HOA's, HO's ⇔ HO's, Banks ⇔ HO's, Banks ⇔ HOA's

# Lessons Learned

- **Demonstration projects** and evidence-based advocacy increase demand & action
- **Does “energy efficiency” sell?** - modify/unify language - point to “other” benefits (environmental, economic, societal, aesthetic)
- **Politicians discover “political capital”** in REE, **investors have still to discover business interest**
- **Subsidies should be at the “right level”,**
- **Need to use “good examples”** in comparable environments (e.g. Slovakia in 90s-2000s )





**Besim Nebiu**  
**REELIH Manager**

[Policy paper: How to improve residential energy efficiency in  
South Eastern Europe and CIS](#)

[www.getwarmhomes.org](http://www.getwarmhomes.org)

[www.topaodom.ba](http://www.topaodom.ba)