

# ENERGY EFFICIENT HOMES FOR LOW-INCOME HOUSEHOLDS IN MACEDONIA

## PROGRAM OVERVIEW 2009 - 2021



## ➤ Innovation

as key strategic orientation:

Housing microfinance, construction, energy efficiency, facility management, legalization, urban development...

- Work with institutional donors
- Creation of functional partnerships
- Establishment of licensed legal entities as model to increase

sustainability and impact

# PORTFOLIO 2005-2010

МОЖНОСТИ

Home  
Improv.  
Fund  
(micro  
loans)

Since  
July  
2005

ХОРИЗОНТИ

Roma  
Housing  
Fund  
(micro  
loans)

Since  
July  
2007



Water  
Supply  
& Sanit.

2008  
to  
2010



New  
Builds  
Veles

Since  
Sep.  
2008

**Construction**

**Financing**

**Advocacy**

**Capacity dev.**

**Volunteer eng.**

**Community dev.**



Energy  
Efficient  
Homes

Since  
June  
2009



EU  
funded  
projects  
for  
Roma

2011  
to  
2016



Former  
Kosovo  
refugees  
and  
migrants

2012  
to  
2016



Improv.  
Energy  
Efficien.

2011  
to  
2015



Legaliz.  
of  
Informal  
Homes

2012  
To  
2015

**Construction**

**Financing**

**Advocacy**

**Capacity dev.**

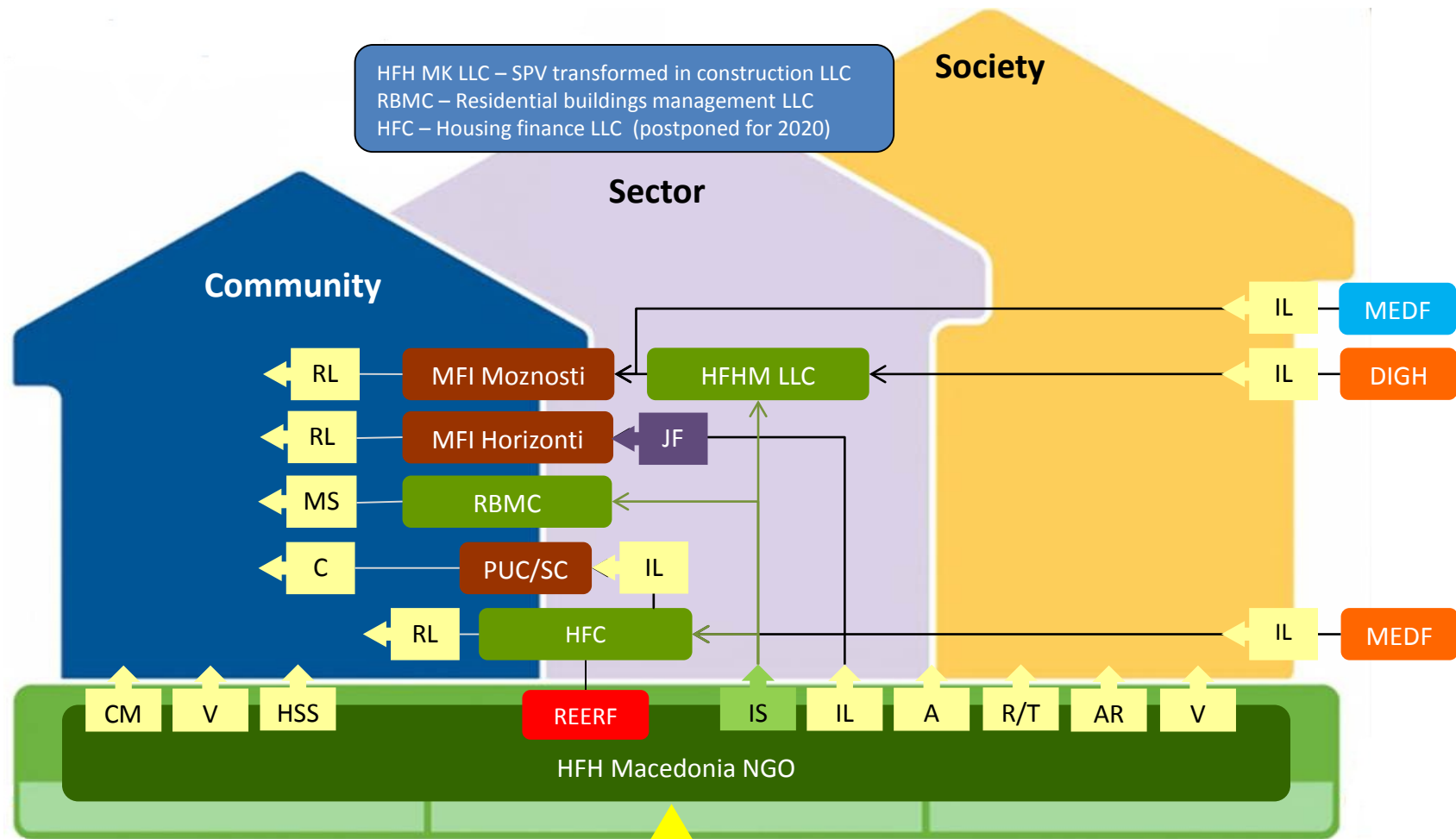
**Volunteer eng.**

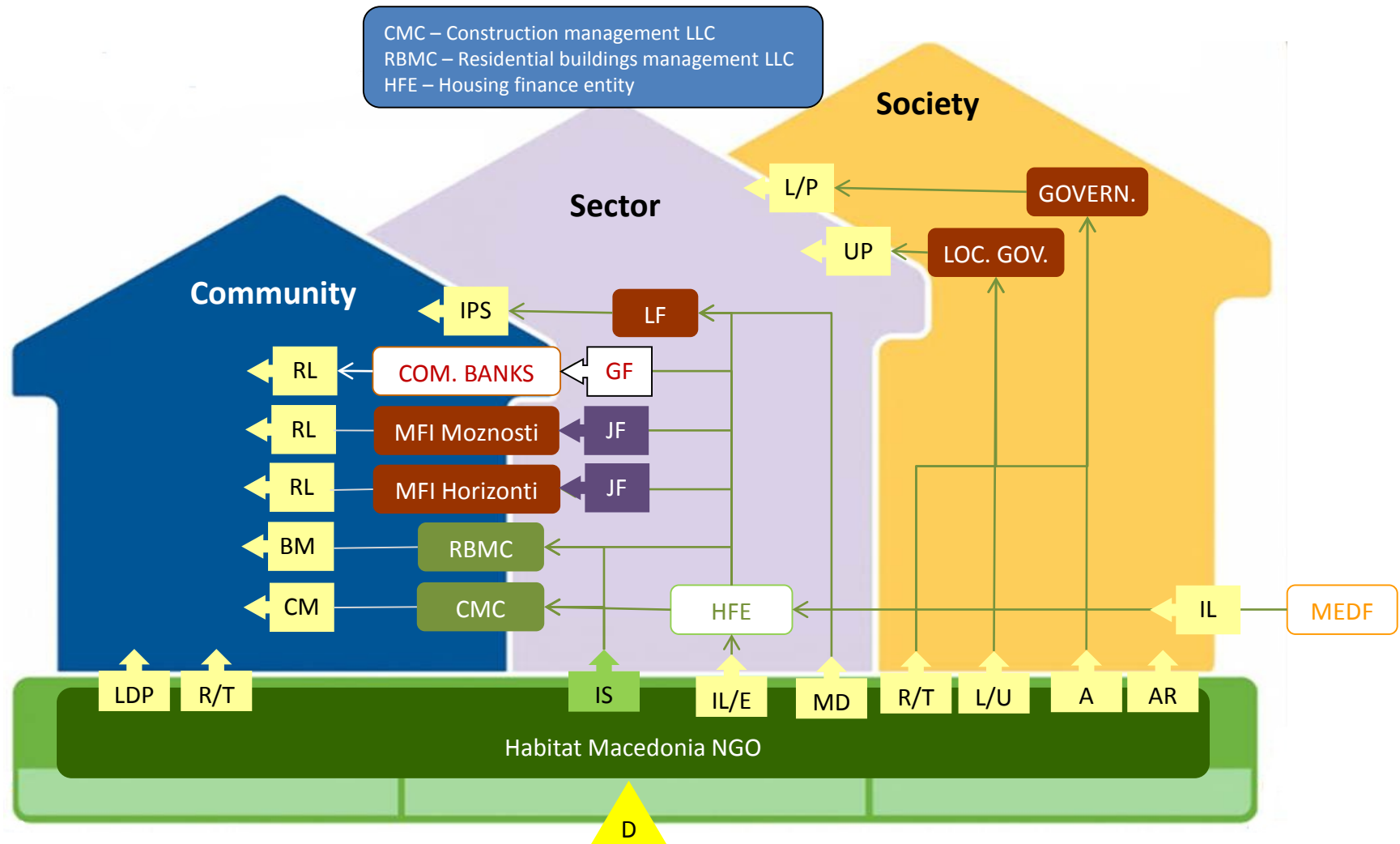
**Community dev.**



Housing  
for  
people  
with  
disabil.

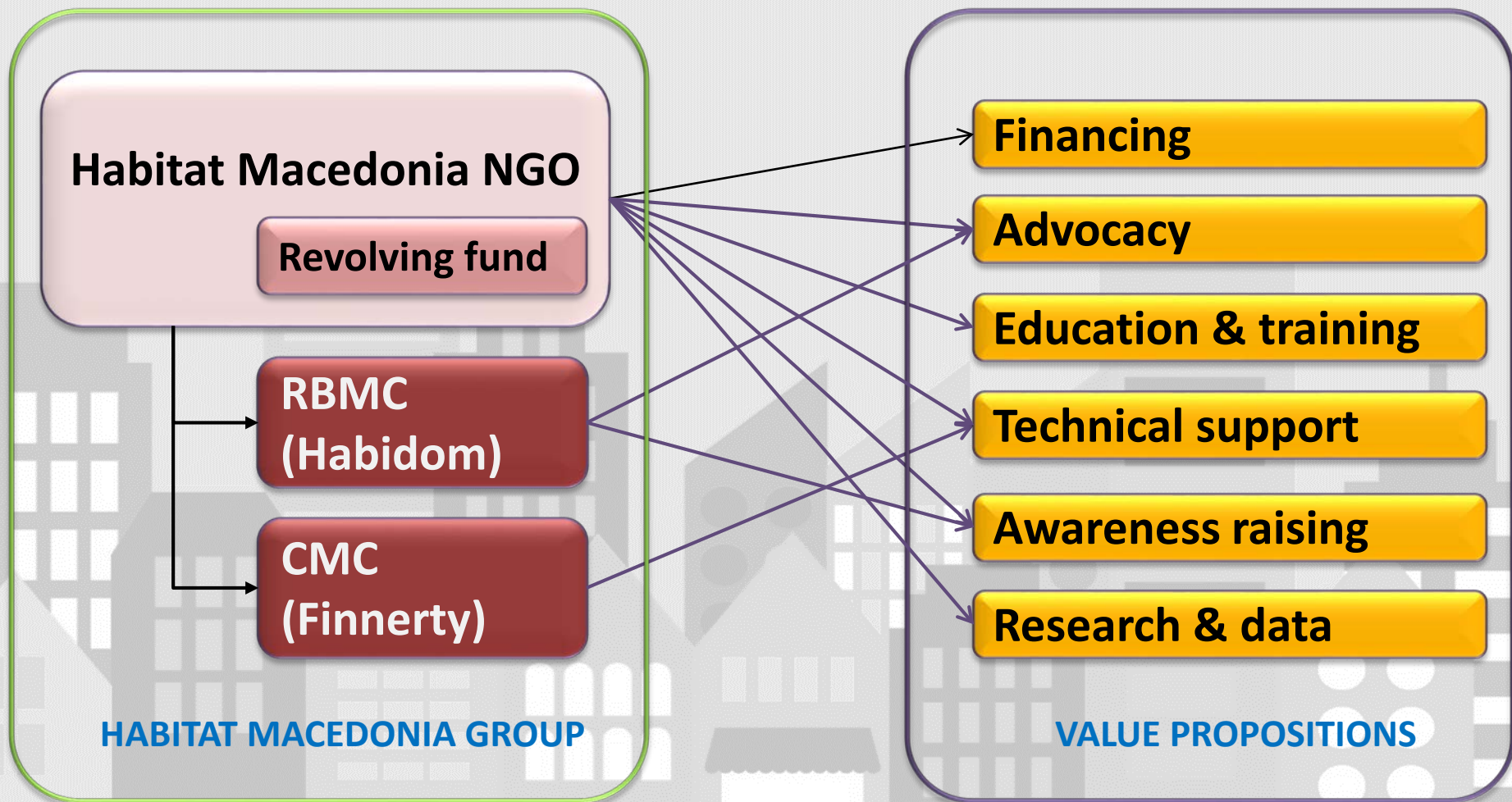
Since  
Sep.  
2012





RL – retail lending   LDP – lending demonstration projects   IS – institutional support   IL/E – institutional lending/equity   GF – Guarantee fund   A/AR – advocacy/awareness raising  
R/T – research/training   L/U – legalization/urbanization   CM – construction management   BM – buildings management   JF – joint funds  
UP – urbanization plans   L/P – laws & policies   LF – lead firms   IPS – innovative products & services

# Delivery by multiple entities







**Residential energy efficiency revolving fund: existing, fully functional since 2010**

**HOMEOWNERS:**  
Awareness raised and apartment buildings' management improved, resulting in financial participation for REE interventions, ultimately resulting in energy and financial savings



ХАБИДОМ

**Residential buildings management: existing, fully functional since 2015**

**CENTRAL & LOCAL GOVERNMENTS:**  
Enabled legal and policy environment

**PRIVATE SECTOR:**  
Motivated, capable and competitive

Housing market gap analysis and market facilitation

Labor market development

Private sector equity investments

**Terwilliger Center for Innovation in Shelter**

Registry of Apartment Buildings and Apartments: database with 45 parameters for each of 12000 multi-apartment buildings in Macedonia



Sustainable Energy Action Plans & Programmes for local governments, as recommended by the Initiative 2020 of the Covenant of Mayors, including residential sector and financial allocation for REE interventions

Model for financial participation of central & local governments in REE interventions



EU FP Research & Innovation: ComAct, Excite & Mesures

Households or local governments from eight Macedonian municipalities included in the activities.





# Residential energy efficiency pilot phase (2009-2011)

- Developing rationale for investing in REE: housing stock, test buildings, energy audits
- Regulatory framework analysis
- Market-based financing models
- New customer segments: homeowners' education and support
- Initial work force development (internships)
- Support to stakeholder's advisory group

## Residential building in Skopje

2 stories, 14 apartments, built in 1954, rehabilitated in 2010



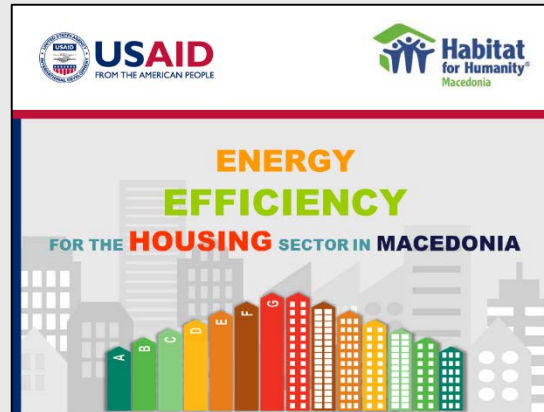
# Energy Efficient Homes for Low-Income Households in Macedonia

Residential building in Skopje

14 stories, 112 apartments, built in 1960, rehabilitated in 2012







## IEE PROJECT 2011 - 2015

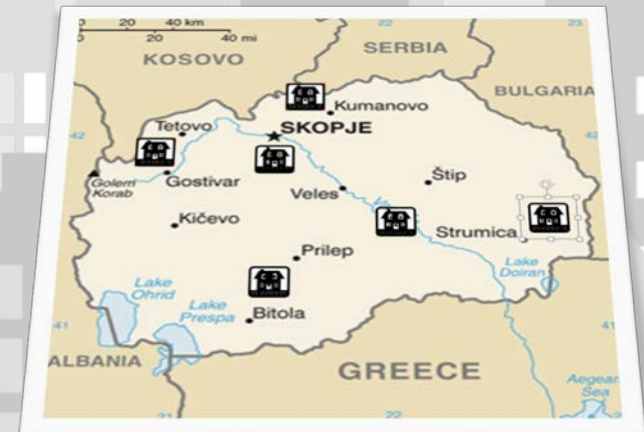
USAID and Habitat for Humanity Macedonia project originally named: Energy Efficiency for the Low Income Housing Sector in Macedonia was a rare and innovative effort aimed at developing a set of activities so to help Macedonian households living in collective apartment buildings reduce their vulnerability to energy price increase, bearing in mind at the same time the climate change issues.

# COVERAGE

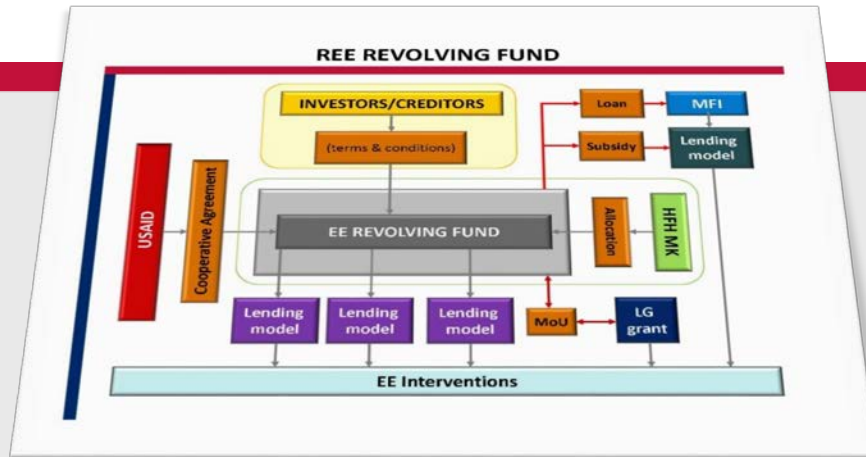
Program related cooperation initially established through signing MoUs with

Mayors of **6** municipalities in Macedonia.

Specific project activities were organized in another **3** municipalities.



# FINANCING



As part of the program there

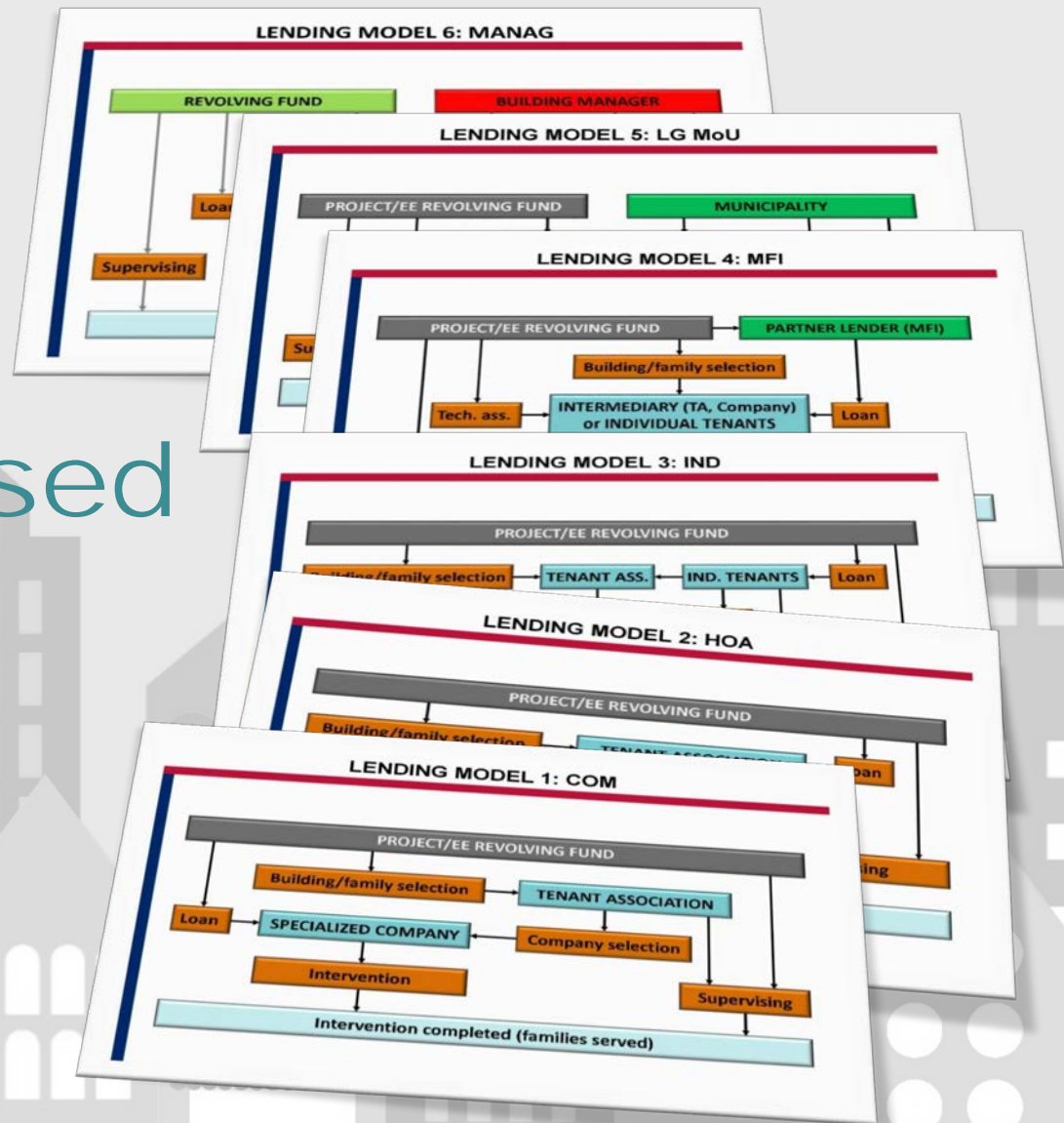
was REE Revolving Fund  
established, with US\$ 900K  
disbursed and additional US\$  
850K leveraged by the partnering  
municipalities.

# FINANCING MODELS

There were

6 unique  
market based  
lending  
models

developed and  
tested by the  
program team.



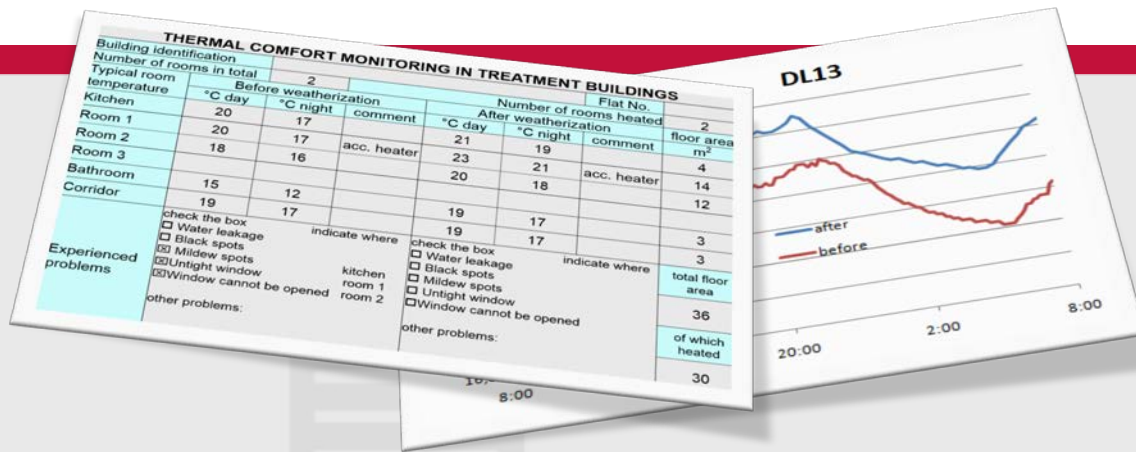


# BUILDINGS

There were 36 (65)  
apartment  
buildings renovated  
in 5 (12) municipalities,  
totaling 700 (1900)  
homeowners served with the EE  
upgrades, financed by the REE  
Revolving Fund.



# ENERGY AUDITS



There were 20 detailed and 17 walk-through energy audits completed, confirming the 20-39% of energy savings in the renovated buildings.

# INVESTOR FORUM

| Market potential<br>(est. number of<br>apartments) | Windows<br>replacement<br>(EUR 1100 per<br>apartment) | Façade<br>installation<br>(EUR 1500 per<br>apartment) | TOTAL<br>(EUR) |
|--|---|---|----------------|
| 107.679  | 118.446.790   | 161.518.350   | 279.965.140    |

REE Investor Forum and similar events were organized, where several international organizations confirmed Habitat Macedonia estimate of the potential for investing in REE in Macedonia reaching EUR 300 million, with the possibility the same amount to be paid off within 6-8 years through energy savings.

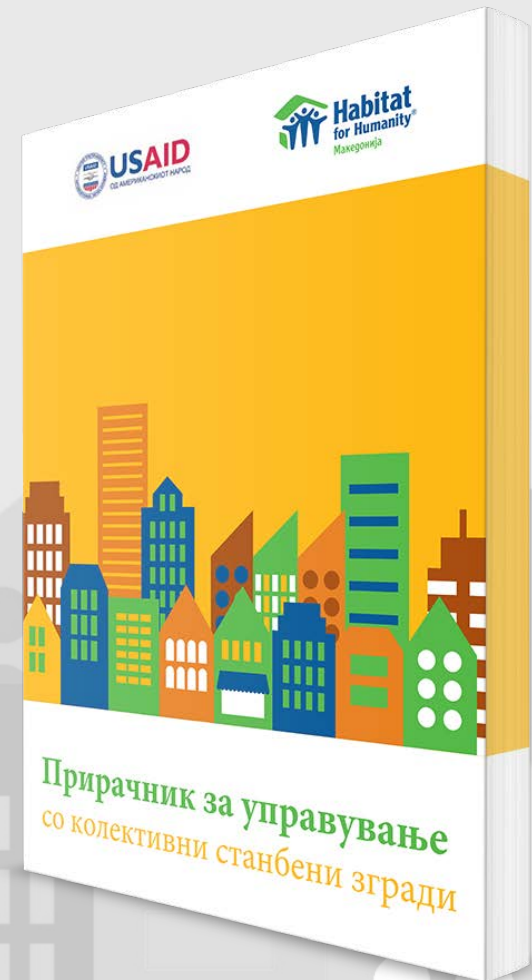
# RESOURCE CENTER



Tenant Association Resource Center was established with its web portal's content created so to be of benefit of at least 150K homeowners living in collective apartment buildings in Macedonia.

# MANAGEMENT

There were more than  
2000  
homeowners  
educated regarding  
the benefits of EE  
upgrades, and a Manual  
for Management of  
the Collective  
Apartment Buildings  
prepared and published.





# GREEN JOBS

There was  
Green Jobs  
Study prepared  
and published in  
Macedonian and  
English, with 245  
stakeholders in 6  
Macedonian cities  
attending its  
presentation.



# HIGH SCHOOL CURRICULA



HFH Macedonia's initiative to introduce Energy Efficiency of Buildings as extra curricula subject in the Macedonian technical high schools was officially approved by the Ministry of Education and Science.





# HIGH SCHOOL TEXTBOOK

Subject related textbooks in both Macedonian and Albanian language were prepared and published, with more than 1000 students from 17 Macedonian high schools expected to benefit each year.

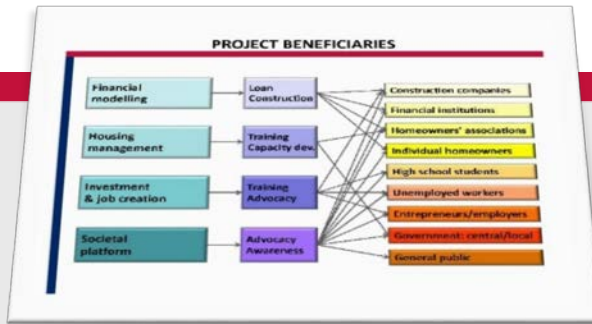




# INTERNSHIPS & TRAINING

There were 40 (140) high school teachers trained in EE curricula. There were 116 interns from technical high schools in 7 Macedonian cities that completed separate internship program.

The project also provided 160 training hours on Entrepreneurship and Business Planning in EE and RE, attended by 105 entrepreneurs.




# STAKEHOLDERS


There were REE Stakeholder Group meetings organized, attended by more than 300 participants from more than 50 governmental institutions, international organizations, NGOs, academic institutions and private sector companies. There were also round tables focused on enforcement of the Law on Housing, attended by more than over 200 participants.

# REGISTRY


There were pilot surveys completed in 3 (30) municipalities aimed at establishing Registry of Collective Apartment Buildings and Apartments for all 80 municipalities in Macedonia.



**USAID**  
UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT



**Habitat**  
for Humanity



**ГРАЖДАНСКИ  
ДОКЛАД ЗА ПРОЕКТА**

**ИМЕНА НА СТОЯНОСТИТЕ**

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| Имена на стопаните на стопанските земи | Други              |
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# SKOPJE – CENTAR 2014

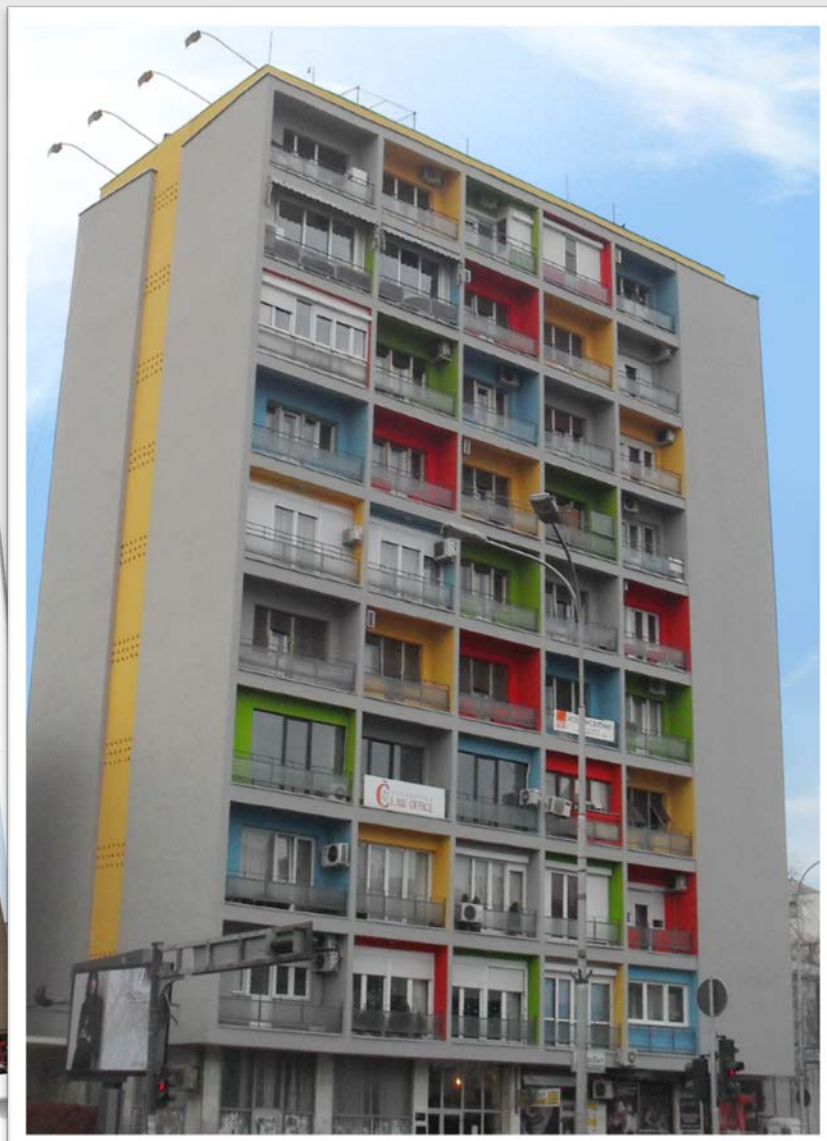
Partnering  
municipality





# SKOPJE – CENTAR 2014

Partnering  
municipality







# SKOPJE – KARPOS 2014

Partnering  
municipality







# SKOPJE – KARPOS 2014

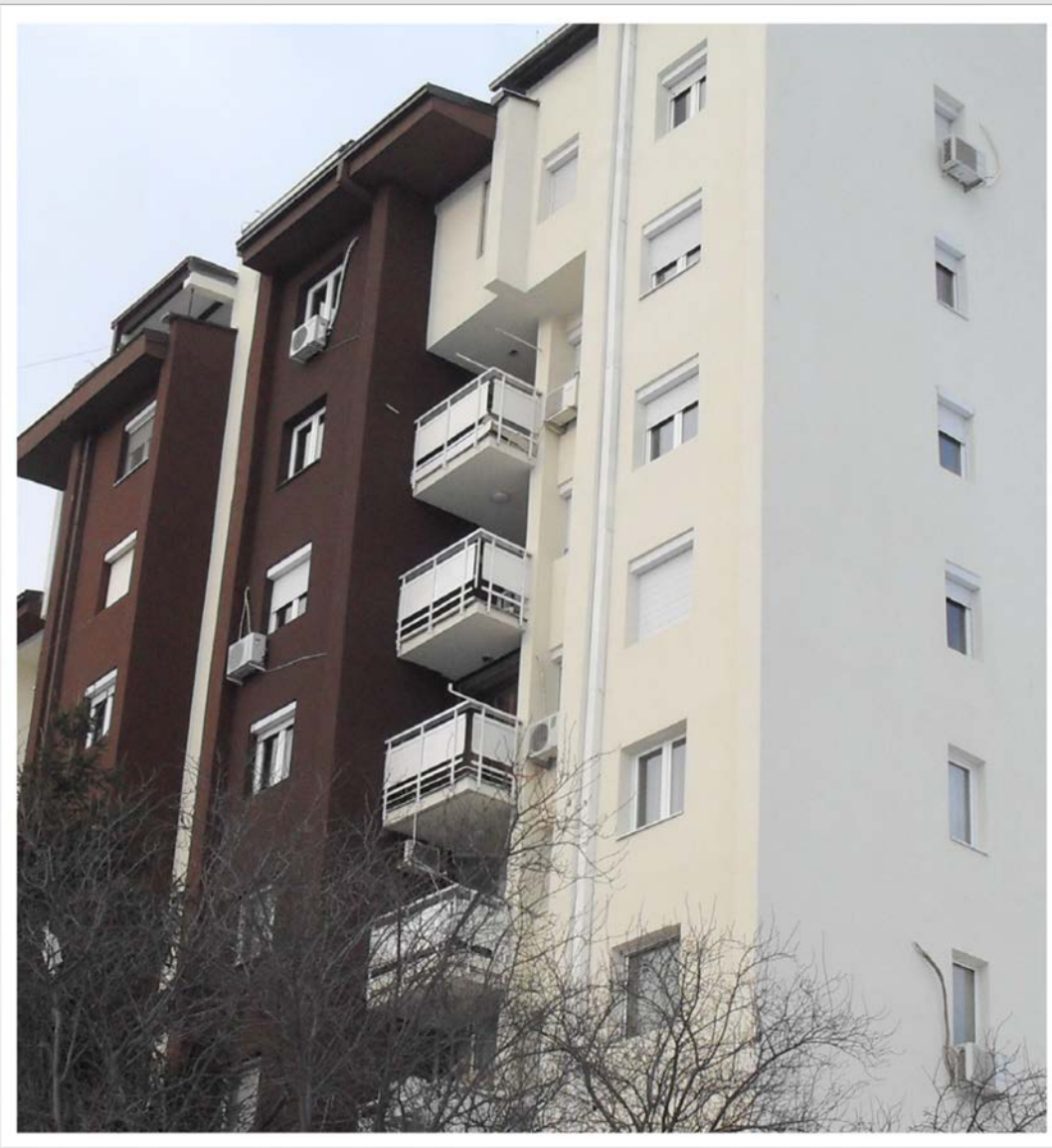
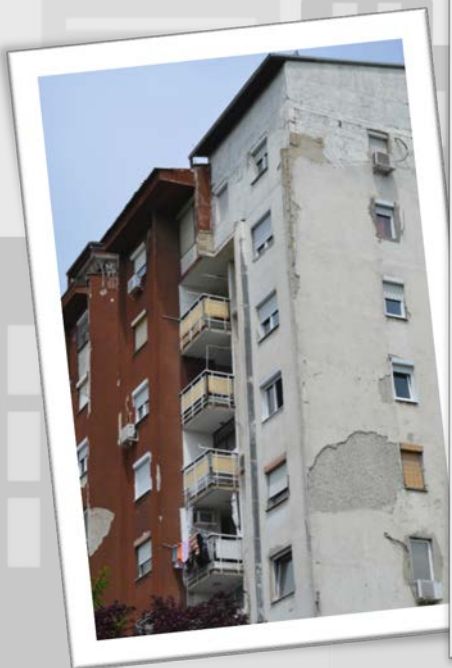
Partnering  
municipality





# SKOPJE – AERODROM 2014

Homeowners  
initiative







# KUMANOVO 2013

Homeowners  
initiative





# PRILEP 2015

Partnering  
municipality

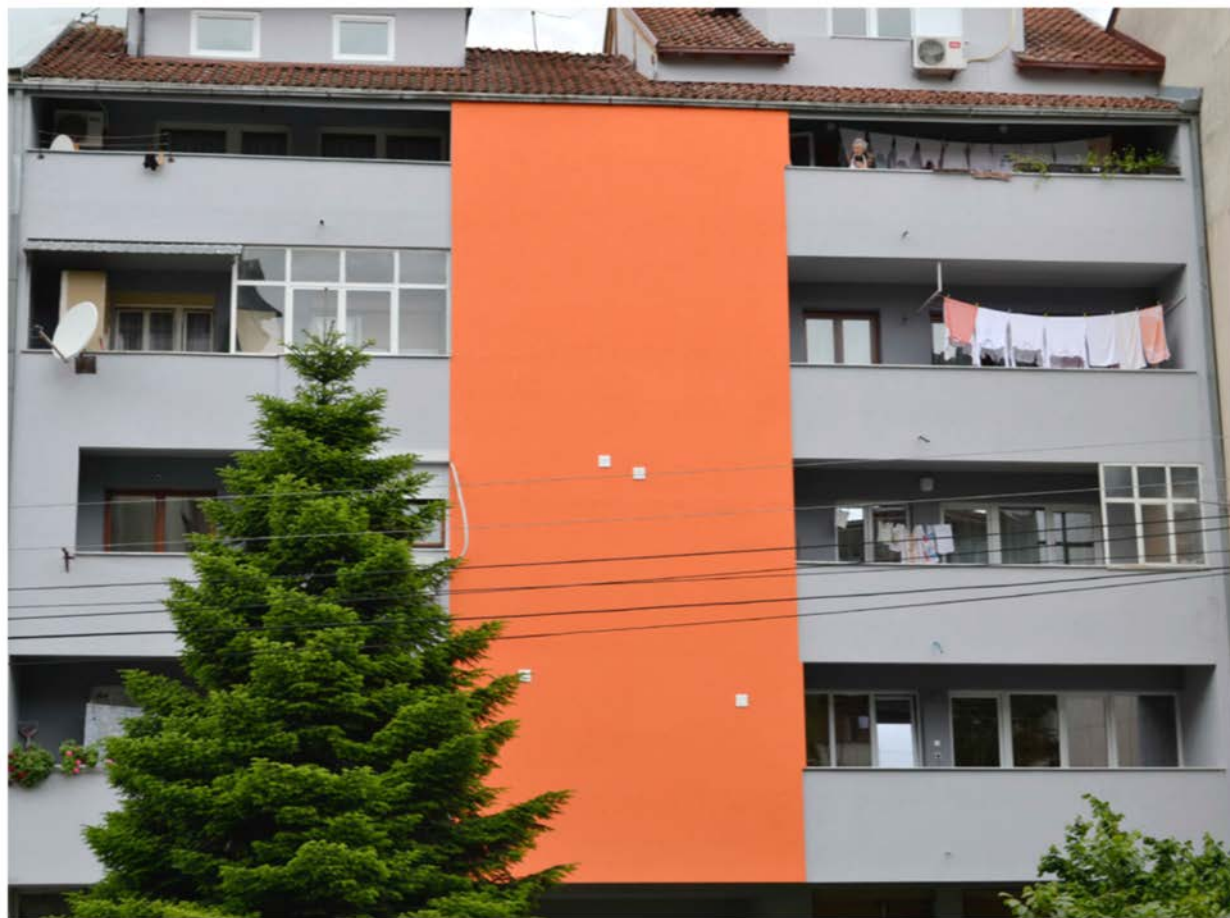






# TETOVO 2014

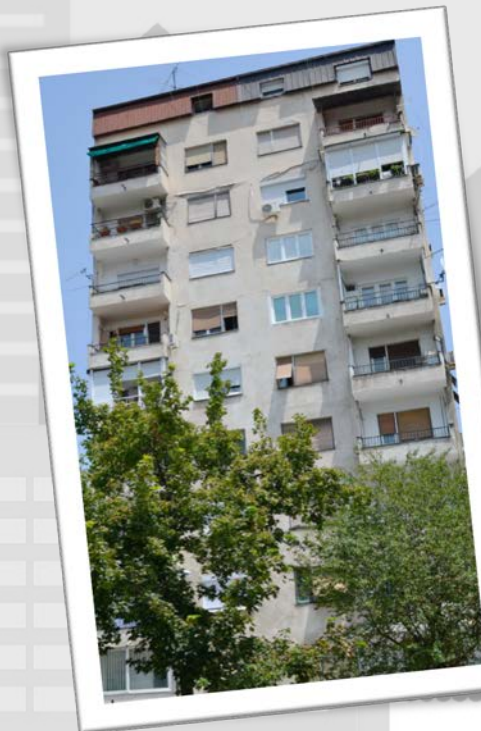
**Homeowners  
initiative**





# SKOPJE – CENTAR 2015

Partnering  
municipality





# KUMANOVO 2014

Homeowners  
initiative







# SKOPJE – CENTAR 2014

Partnering  
municipality





# SKOPJE – CENTAR 2014

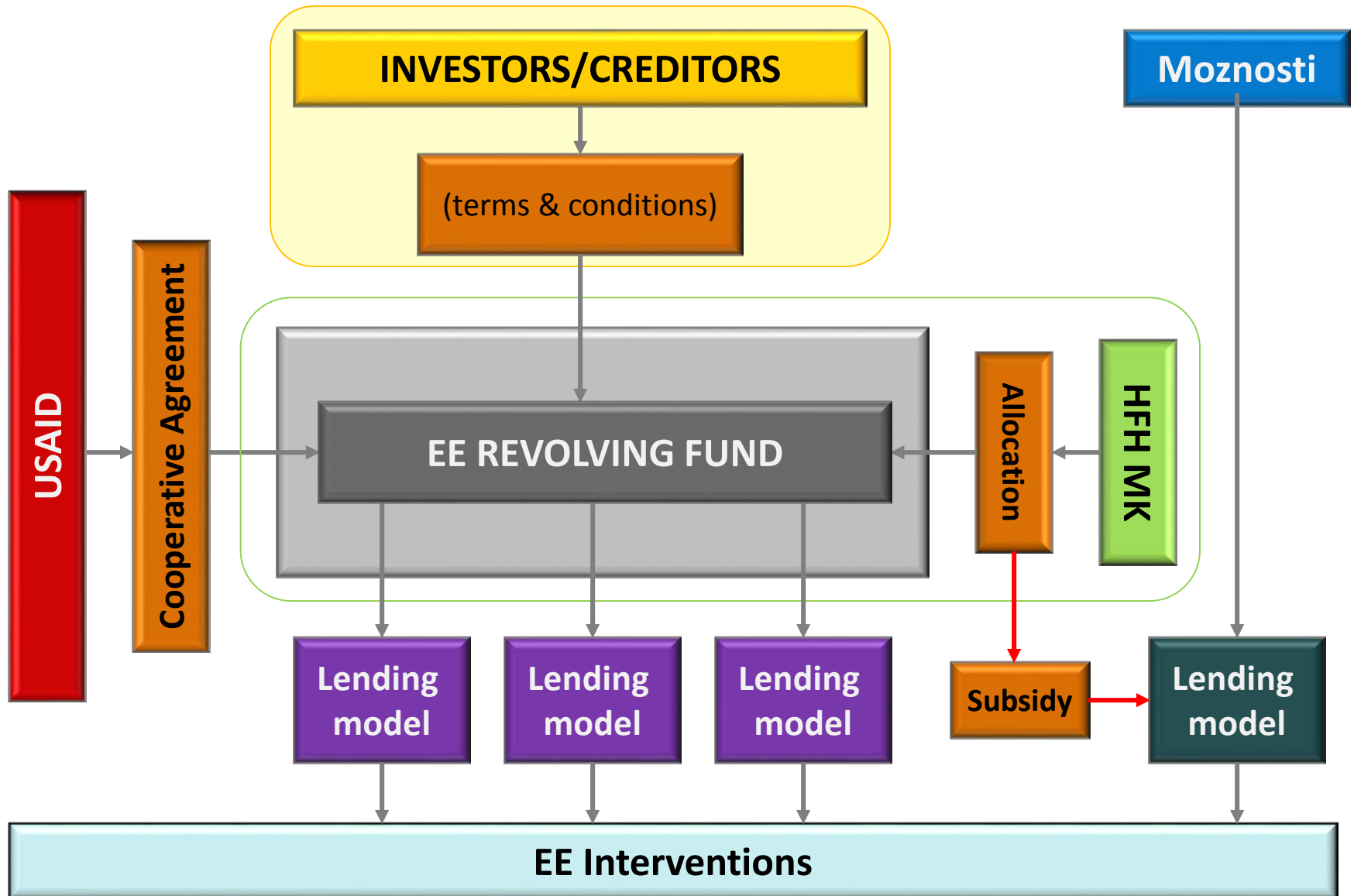
Partnering  
municipality



# REE REVOLVING FUND

- Established with the portion of USAID 2011 Cooperation Agreement award (originally US\$ 700K)
- Matched with Habitat Macedonia's funds (US\$ 250K as of December 31, 2016)
- Retail and quasi-retail lending to homeowners, homeowner associations and EE specialized companies, total of 440 families served since April 2015
- Institutional partners involved (Moznosti and Horizonti)
- Sole market provider of loans to homeowner associations
- Focus on quality of the REE loan portfolio

# REE REVOLVING FUND





- Research activity that should result in critically important databank turned into tool for the local governments, private investors, as well as homeowners and their associations
- Nation-wide, helps 80 local governments respond to the Housing Law requirement
- More than 10,000 buildings to be researched, with more than 150,000 apartments, 0.5 M data
- Databases already completed and made public in 33 municipalities.
- Database currently includes 4535 buildings with 123,482 apartments.
- Supportive to Habitat Macedonia's housing market development activities.

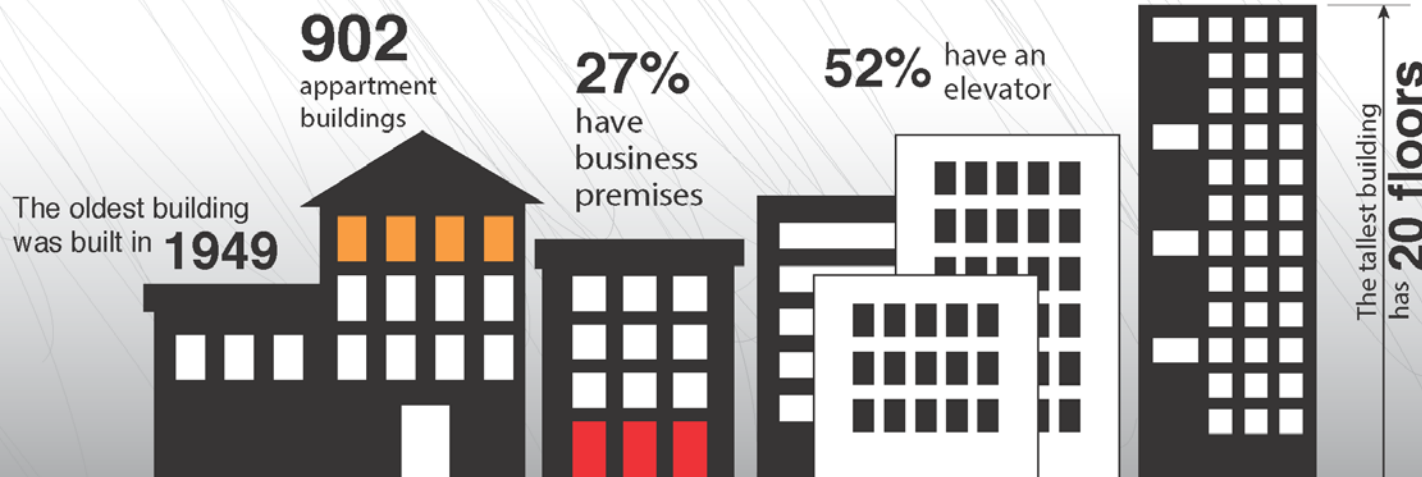
# Registry of apartment buildings and apartments



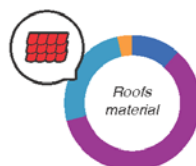
MUNICIPALITY of  
AERODROM

Display of data extracted  
from the register of apartment  
buildings implemented in the  
Municipality of Aerodrom

**Register of Apartment Buildings and Apartments (RABA)** is a research activity conducted by Habitat Macedonia on the whole territory of the Republic of Macedonia. It will result in critically important databank which will support local governments, homeowners as well as housing market development activities. The main focus is to establish a Register of managers of residential buildings and collect data on construction and energy characteristics of all apartment buildings.



- 46% damaged without thermal facade
- 34.3% undamaged without thermal facade
- 19% undamaged with a thermal facade
- 1.7% damaged with a thermal facade



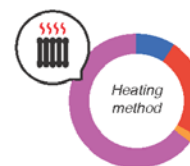
- 55.6% salomite - asbestos cement roof
- 29.9% metal sheet roof
- 10.6% concrete, wood and tile
- 3.7% shingle



- 41.3% energy efficient windows
- 40.6% non energy efficient windows
- 18.1% high quality energy efficient windows



- 49.4% community of owners
- 25.9% building management company
- 24.7% without management

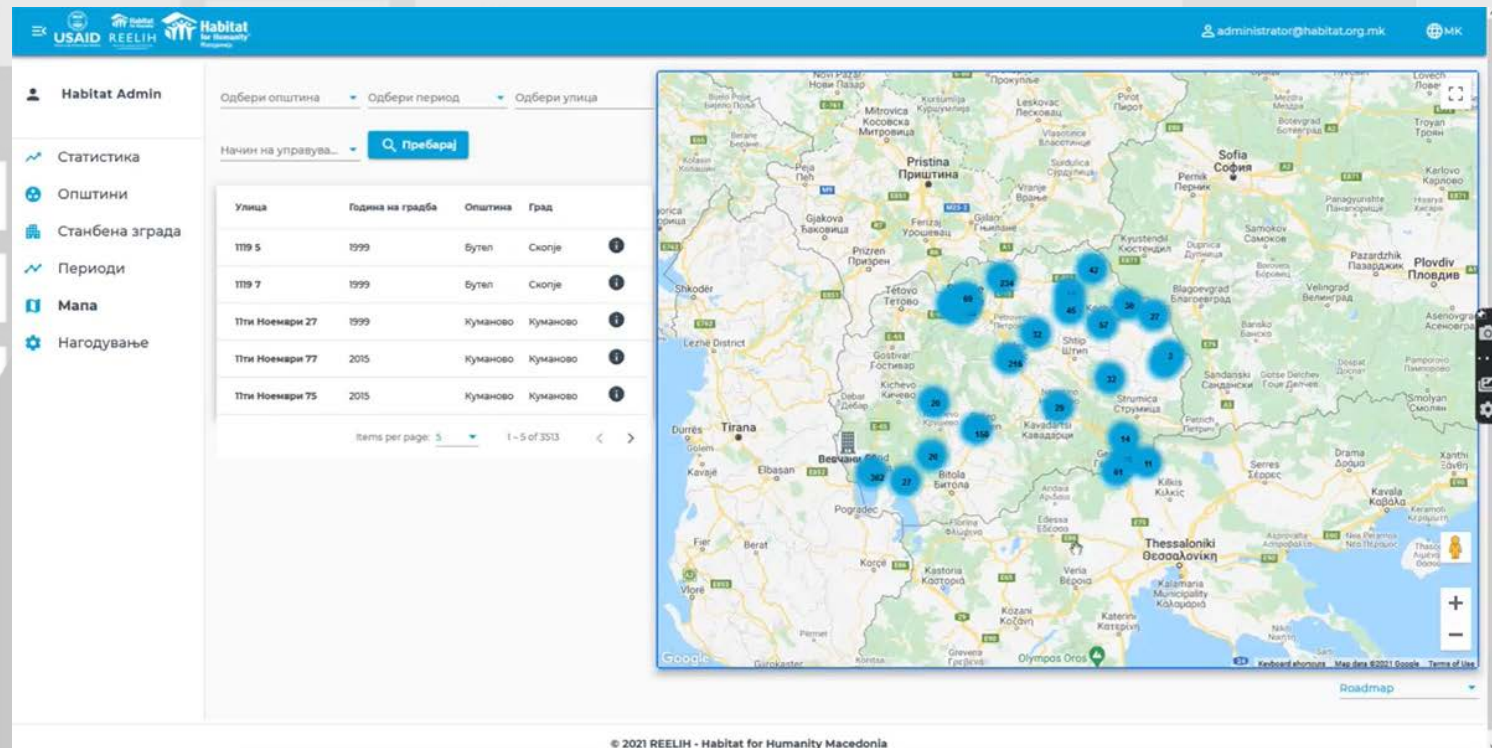


- 64.5% central heating
- 24% electricity, oil and central heating
- 9.4% electricity
- 2.1% firewood / briquettes and other



- 54.5% no thermal insulation, has leakage
- 20.5% no thermal insulation, no leaks
- 18.7% with thermal insulation, no leaks
- 6.3% has thermal insulation, undamaged

- Recently RABA was converted into a web tool for energy efficiency in the residential sector, with information for each registered building, including the energy and CO<sub>2</sub> emission savings.



# MARKET DEVELOPMENT

- Complex set of HFHI TCIS funded activities that will complement the existing credit line and support equity investments in small Macedonian companies, follows up on Investor Forum in 2015
- Includes assessing the market size, market gaps and potential for investments in the housing sector with particular focus on energy efficiency upgrades of collective apartment buildings
- Foresees equity investment vehicle that will support angel and VC investments
- HFHI Ron Terwilliger fellowship granted to Habitat Macedonia for the purpose



# Residential building management (since 2015)

- HFHM investment based on business canvas modeling, aimed at improving the quality and transparency of the management of MFABs, including safeguarding the reserve funds
- Focus on underserved MFABs in urban areas, currently 187 buildings with 4450 apartments/households under management
- Identification of implementation gaps in the housing legislation

# Construction management (since 2017)

- Habitat Macedonia investment, legal requirement for licensing
- Prompt and quality service for in-house needs, as well as for external market
- Identification of implementation gaps in the construction and EE legislation
- Complementing operations with HFH NGO and RBMC

# Saint-Gobain partnership

- EE interventions on MFABs through two financing models
- EE improvements for the decentralized housing solutions for persons with special needs
- Involvements of university level students
- Education of multinational corporations for the social benefits of improving energy efficiency



# REELIH

- Developing methodology that incorporates RABA data, calculation and municipal priorities into the SECAP format, including residential sector, as recommended by EU Initiative 2020 of the Covenant of Mayors,
- Advising on models for financial participation of local governments in REE interventions.
- Knowledge sharing platform.
- Creation of guarantee fund as de-risking instrument for REE investments.



# Cooperation with local governments

- Memorandums of Understanding for cooperation in the field of energy efficiency signed with Municipalities of Veles, Centar (Skopje) and Gjorce Petrov (Skopje).



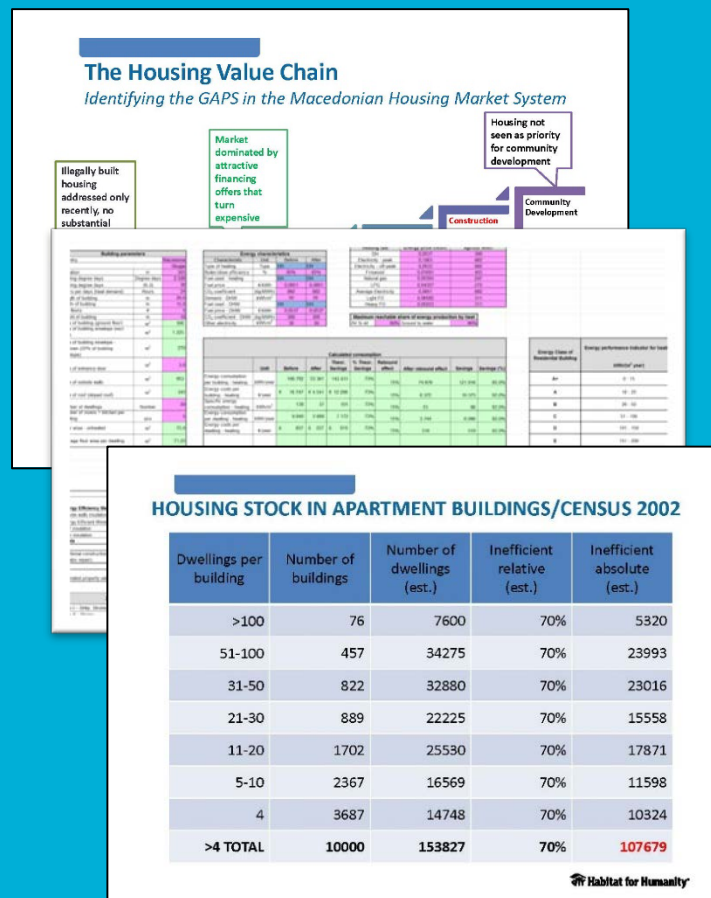


# Cooperation with local governments

- Supporting municipalities in developing sustainable models for energy efficiency of multi-apartment buildings:
  - ❖ Technical support to Municipality of Centar and Kisela Voda (Skopje) in developing and implementing procedures for subsidies (70% of costs for common spaces) to homeowners for retrofits and providing loans for homeowners.
  - ❖ Technical support to Municipality of Gjorce Petrov (Skopje) in planning, designing and implementing processes for supporting homeowners for retrofits, and providing loans. Municipal subvention for common spaces is 30%.

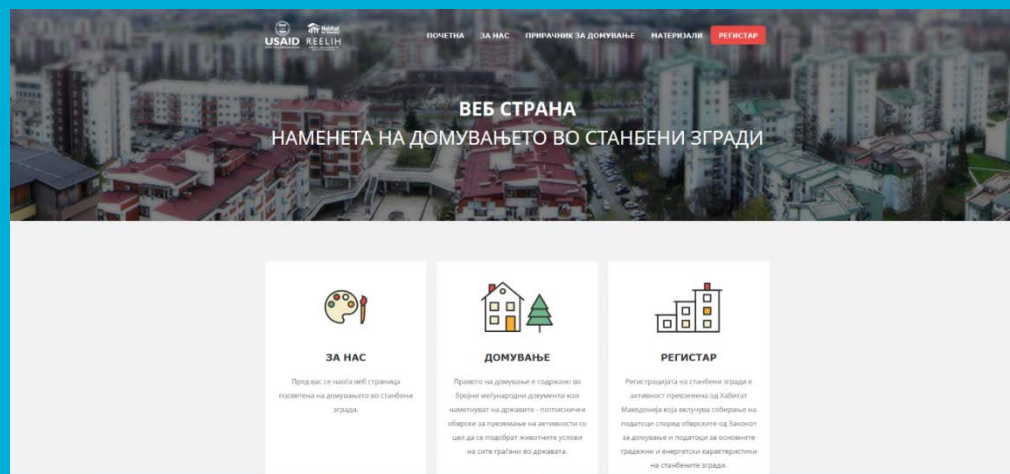
# Analyses and methodologies

- Calculation model for multi-family apartment buildings
- Preliminary analysis of housing stock in Macedonia
- Assessment on the quality of housing stock
- Draft methodology for municipal action plans





# Knowledge sharing platform



- [www.domuvanje.org.mk](http://www.domuvanje.org.mk), a knowledge sharing platform on housing in MFABs, provides info for homeowners, local authorities, companies, NGOs and general public, 1000 unique page view per quarter, 87% first time visitors



# HORIZON 2020



- In 2020 three projects were simultaneously awarded by the EU Framework Programme for Research and Innovation: Horizon 2020.
  - Approval was given to initiatives that basically link housing with energy.
  - Households or local governments from eight Macedonian municipalities are included in the activities proposed with these projects: Karposh, Kavadaraci, Kichevo, Kochani, Aerodrom, Centar, Kisela Voda and Djorche Petrov.



# HORIZON 2020

- ***Community Tailored Actions for Energy Poverty Mitigation***, proposed by a consortium led by HFH Area Office in Bratislava, with partners from 9 European countries.
- Transferring high-cost/high-impact interventions into low-cost/affordable and manageable solutions through:
  - Empowering and activating the communities of homeowners' associations
  - Financial tools affordable for low income families
  - Technical solutions that provide the most favorable cost-benefit ratio for each individual building.



# HORIZON 2020

- ***Award Excellence, Invest in Trust: Tailored Energy Management Services for East European Local Authorities***, proposed by a consortium led by the Bulgarian Center for Energy Efficiency EnEffect, with partners from 8 European countries.
  - Aiming to directly improve municipal sustainable energy and climate action plans and to influence preparation of SECAP.
  - Envisions various types of activities: development of EEA tools and training according the local context, mapping of available financing schemes for municipal Energy Efficiency and Renewable Energy projects, capacity building...
  - EEA methodology is standard for management with energy efficiency of local governments, becoming their legal obligation



# HORIZON 2020

- ***Tailored Measures Supporting Energy Vulnerable Households***, proposed by a consortium led by the University of Cork from Ireland, with partners from 12 European countries.
  - Partner in the latest project is Habidom, Habitat Macedonia's licensed company for residential buildings management.
  - Aiming to build knowledge and capacity for engaging energy poor citizens for performance change among both the consortium members and the wider energy poverty community.
  - The project supports the co-creation and trialling a set of innovative business model and governance and policy initiatives, while implementing an engagement programme, demonstrating a series of 'best practice' approaches to engaging energy poor citizens.





- ***Improvement of energy efficiency based on Typology Approach for Building Stock Energy Assessment (TABULA), method developed by EU research institutions.***
  - FITD supported comprehensive energy performance assessment of the national housing stock.
  - Recommended by the Macedonian Ministry of Economy as a necessary tool for creating National Strategy for Renovation of Buildings, introduced with the Energy Efficiency Law.
  - Implemented by a consortium, with Habitat Macedonia's subsidiaries Finerti and Habidom being consortium partners.

# Support to EE policies



- International Vishegrad Fund project: ***Transferring Visegrad Experience with Energy Efficiency Building Policies to Macedonia***
- Aiming to support Ministry of Economy and other relevant state institutions in creating policies for energy efficiency of buildings, and especially in the preparation of the National Strategy for energy efficiency of buildings.



Energy efficient reconstructions  
carried out on more than

60 apartment buildings

in Macedonia with over

1900 apartments,

resulting in overall annual energy savings

of 7910 MWh

and annual reductions of

CO<sub>2</sub> emissions of 3670 t.