



ENERGY EFFICIENT HOMES FOR LOW-INCOME HOUSEHOLDS IN MACEDONIA

REE REVOLVING FUND



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

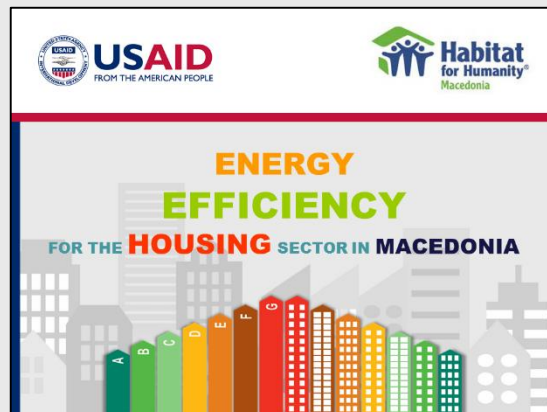
2 stories, 14 apartments, built in 1954, rehabilitated in 2010



Residential building in Skopje

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

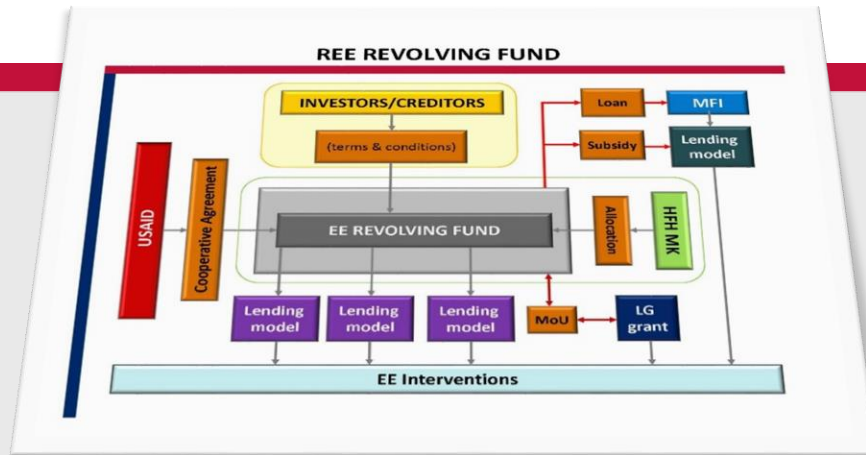




IEE PROJECT AND FOLLOW UP

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.

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.

BUILDINGS

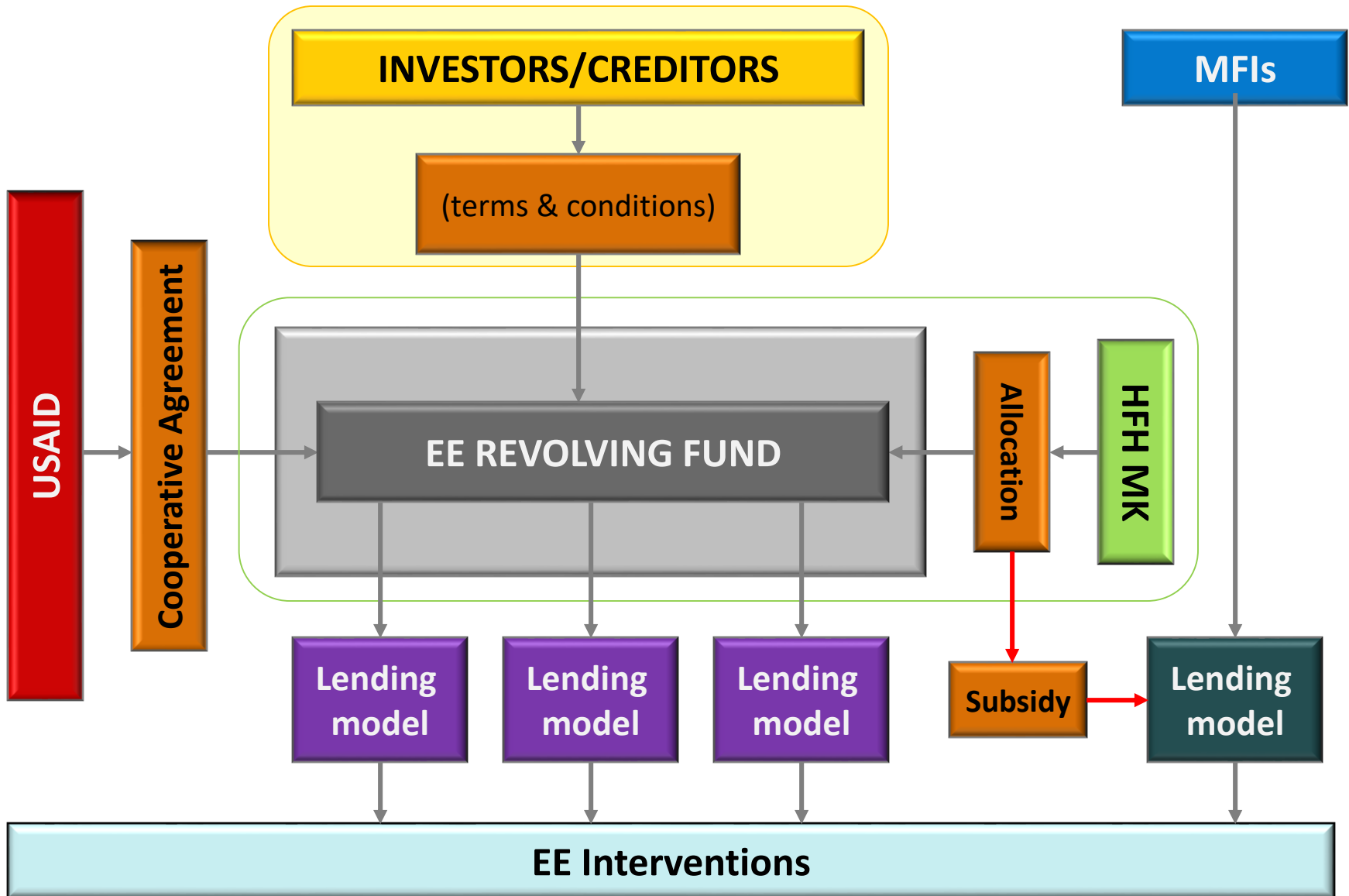
There were **36 (65)**
apartment
buildings renovated
in **5 (12)** municipalities,
totaling **700 (1900)**
homeowners served with the EE
upgrades, financed by the **REE**
Revolving Fund.



REE REVOLVING FUND

- **Established with the portion of USAID Cooperation Agreement award (originally US\$ 700K)**
- **Matched with Habitat Macedonia's funds (US\$ 1.5M as of June 30, 2023)**
- **Retail lending to homeowners, homeowner associations and EE specialized companies, total of 1900 households served since April 2015**
- **Institutional partners involved (MFI Moznosti and MFI Horizonti)**
- **Sole market provider of loans to homeowner associations**
- **Focus on quality of the REE loan portfolio**

REE REVOLVING FUND

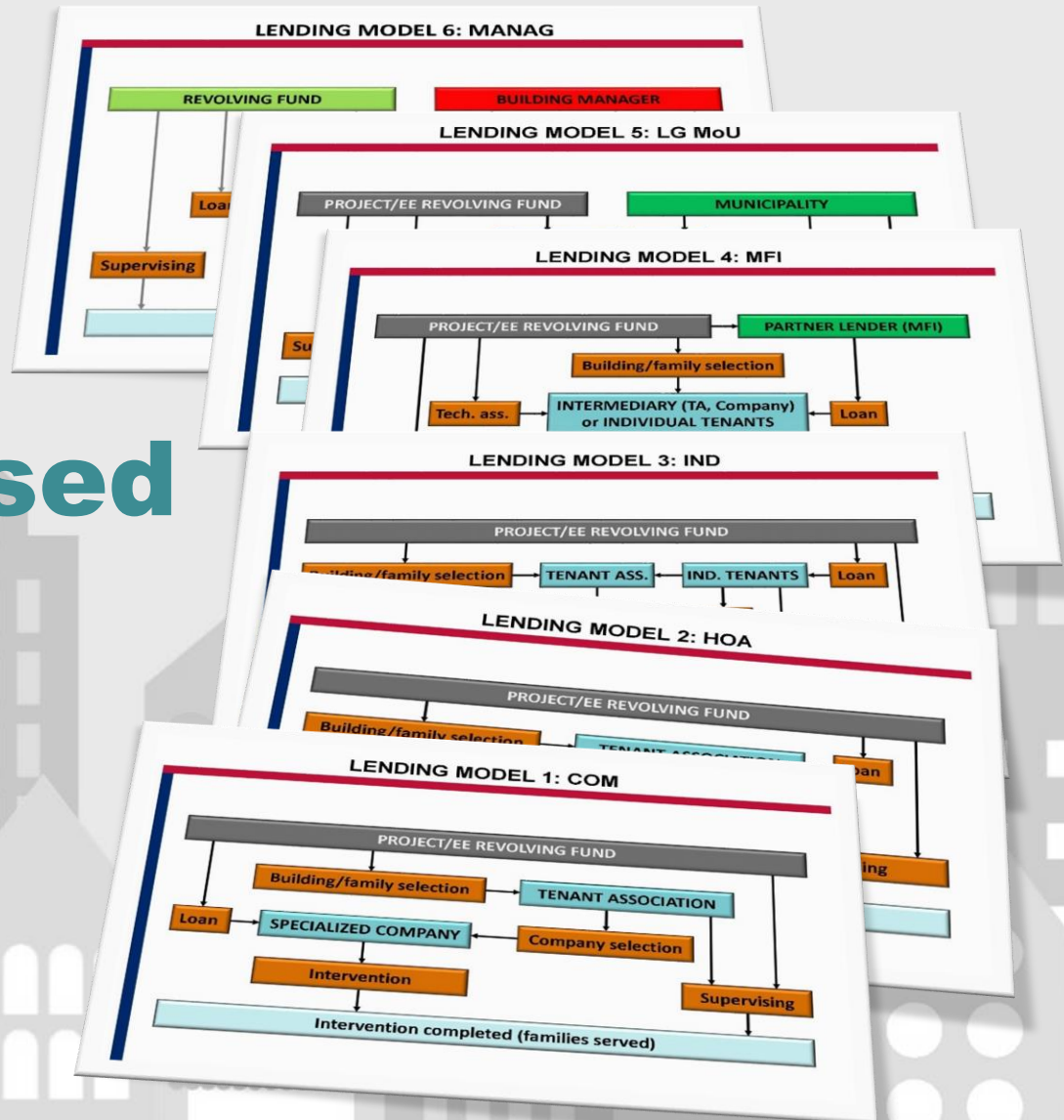


FINANCING MODELS

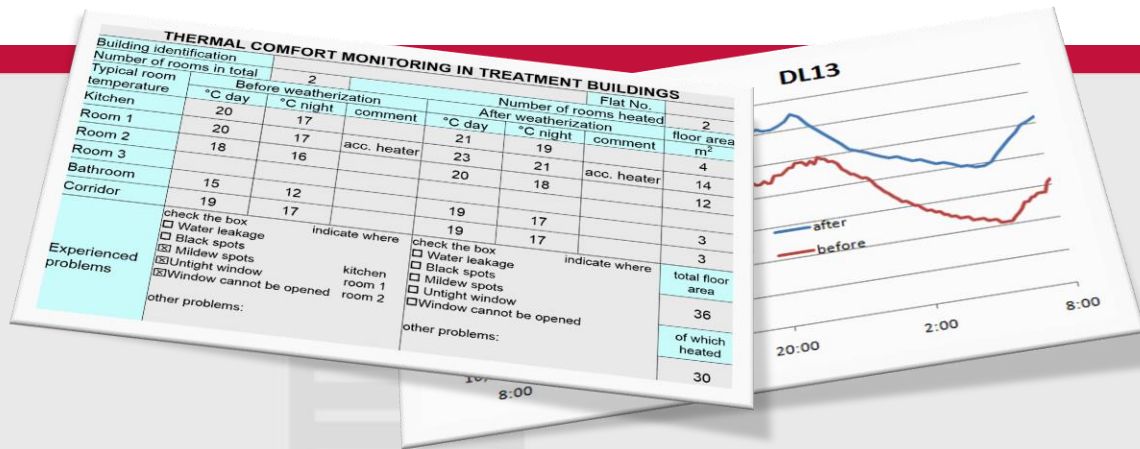
There were

6 unique market based lending models

developed and tested by the program team.



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 (est. number of apartments)	Windows replacement (EUR 1100 per apartment)	Façade installation (EUR 1500 per apartment)	TOTAL (EUR)
107.679	118.446.790	161.518.350	279.965.140

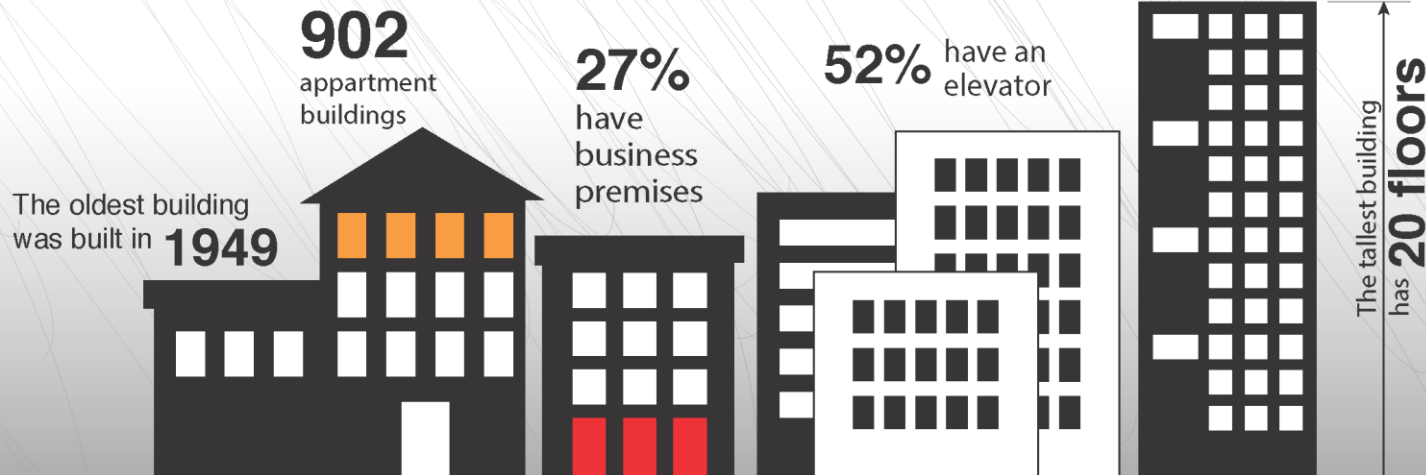
REE Investor Forum and similar events were organized, where several international organizations confirmed Habitat Macedonia estimate of the potential for investing in REE in Macedonia reaching **EUR 300 million**, with the possibility the same amount to be paid off **within 6-8 years** through energy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



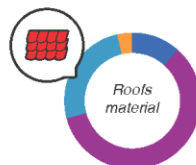
MUNICIPALITY of AERODROM

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



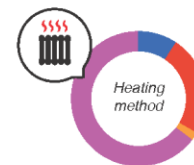
- 55.6% salonite - asbestos cement roof
- 29.9% metal sheet roof
- 10.6% concrete, wood and tile
- 3.7% shingle



- 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 CO₂ emission savings.**

The screenshot displays the RABA web application interface. The top navigation bar includes logos for USAID, REELIH, and Habitat for Humanity, along with the email address administrator@habitat.org.mk and the MK flag. The main interface is divided into a left sidebar with navigation options (Habitat Admin, Статистика, Општини, Станбена зграда, Периоди, Мапа, Нагудување) and a central content area. The content area features a search bar and a table of building data. The table has columns for 'Улица', 'Година на градба', 'Општина', and 'Град'. The data rows are as follows:

Улица	Година на градба	Општина	Град
1119 5	1999	Бутел	Скопје
1119 7	1999	Бутел	Скопје
Пти Ноември 27	1999	Куманово	Куманово
Пти Ноември 77	2015	Куманово	Куманово
Пти Ноември 75	2015	Куманово	Куманово

Below the table, there is a pagination control showing 'Items per page: 5' and '1 - 5 of 353'. To the right of the table is a map of Macedonia with blue circular markers indicating the locations of the buildings listed in the table. The map shows major cities like Pristina, Sofia, and Thessaloniki, and various districts and municipalities.

© 2021 REELIH - Habitat for Humanity Macedonia



**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
CO₂ emissions of 3670 t.**