Title
Energy Efficiency at Household Buildings

Short description
In 2011, the Greek Ministry of Environment and Energy initiated the “Energy Efficiency at Household Buildings” program, as part of the EU Commission’s Operational Programme (OP) "Competitiveness and Entrepreneurship" for the period 2007-2013. This program aimed to improve the energy efficiency of residential houses in Greece, particularly ones built before the 1980’s when an energy efficient housing policy was put in effect. Citizens could apply for a grant from the program to fund renovation works for their house. These works included the installation of newer and more efficient door and window frames, upscaling of the outer walls of the house with materials offering better insulation and the installation of more modern and efficient heating and hot water systems. Energy inspectors would assess the efficiency levels of the building and would suggest potentially needed works. The application would be forwarded to one of the cooperating banks of the program and, if it was approved, a loan would be given to the interested citizen to fund the works. Certain percentages of these loans would be covered by the program’s funds based on the annual income levels of the beneficiaries, with higher participation of the program for people of lower economic status. After the installation of the required works, the energy inspector would assess the efficiency levels of the house again, and judge whether the building was able to rise higher on the energy efficiency scale.

Topic
Living – Energy efficient housing

Characteristics (type, level)
National, Intervention

Country/Countries of implementation
Greece

Aims and Objectives
The main goals of this program are the improvement of the energy efficiency of residential houses to reduce their energy use and their carbon footprint. This is achieved via infrastructure works in houses to upgrade their insulation and water heating systems.

Target Group
The project targets citizens who reside in houses of poor energy efficiency, are interested in improving these figures and fall within categories of a certain income range

- **Category A1**: Annual personal income: <€12.000 / family income: <€20.000
- **Category A2**: Annual personal income: €12.000-€40.000 / family income: €20.000-€60.000
- **Category B**: Annual personal income: €40.000-60.000 / family income: €60.000-€80.000

Status
Completed

The practice was concluded in 2015. A second round "Saving II" is currently in its planning phase and will be implemented in 2017.

Start and Completion dates

The practice was initiated in 2011 and was concluded in 2015.

Lifestyle and Behavior Change

By improving the insulation and heating systems of houses, residents will not have to spend a lot of energy in the form of electricity, heating oil or natural gas to keep their house warm or cool during the different seasons.

Effects on:

Health and Wellbeing	Information from the program points out that many of the houses constructed before the 1980's do not have proper insulation and heating systems. This has a negative effect on the proper levels of heat retention during winter and protection from higher temperatures during summer. Residents experience these temperature fluctuations during the different seasons over prolonged periods of time, which can potentially harm them. By improving the insulation of the house, it will be easier to keep one's house warmer during winter and cooler during summer.
Vulnerable populations	Socio-economically vulnerable citizens, who are interested in applying for the program, receive higher incentives to implement these infrastructure works. The program can subsidize up to 70% of the total cost of the works for people who declare up to €12.000 annual personal income or up to €20.000 annual family income. These groups often live in houses of poor energy efficiency because of their relatively lower purchasing or maintenance cost. The program can help them deal effectively with this matter and improve their living and health quality.
Environment	The practice can directly affect the environment through the lower energy expenses for heating or cooling of houses. By making houses more energy efficient, CO2 emission levels drop because of the lower energy required for indoor temperature management. The local urban environment will also benefit from the practice, as heat island effects will drop due to the reduced need for air conditioning and heat emissions of buildings during summer.

Initiated and/or implemented by

The practice was initiated by the Greek Ministry of Environment and Energy. The main reason which led to its creation was Greece's agreements with EU legislations and policies to protect the environment and promote more sustainable ways of energy use during the upcoming decades. Figures from energy use studies show that Greece uses as much as 60%

of its energy for house heating. Greece annually spends about €2 billion for importing heating oil. By saving even about 20%-25% of heating energy requirements from thermal insulation works, it would translate to saving as much as €500 million for the economy.

Stakeholders and sectors involved

- Hellenic Fund for Entrepreneurship and Development (ETEAN A.E.): Responsible for the creation and management of an Information Reception System for applications and for the ongoing implementation and quality control of the program.

- Special Agency for the Coordination and Implementation of Actions in the Sectors of Energy, Natural Wealth and Climate Change: Responsible with the planning and coordinating the implementation of the program and the cooperation between all relevant stakeholders.

Financial support

The budget for the program in the 2011-2013 period was calculated to €396 million. Financial support was provided through:

- The European Regional Development Fund
- National Funds (National Strategic Reference Framework 2007-2013 - NSRF)

Evidence-base

This program was based on evidence provided by studies that assessed the energy use in Greece.

- Electricity use in Greece accounted for 27% of the total residential energy consumption between 2001-2005, and the rest 73% was spent for heating

- Buildings in Greece account for up to 36% of the total energy consumption and during 2000-2005 they increased their energy use by 24%, reaching 8,54 Mtoe, one of the highest increases in Europe

Main activities

The program included the following activities:

1. The citizen interested in improving their house energy efficiency submits an application.
2. An energy inspector conducts an evaluation of the current energy efficiency levels of the house and suggests potential implementation of works.
3. The citizen forwards their application to a bank which collaborates with the program. If the application is approved, a loan of up to €15.000 is given to the person in order to fund the improvement works. A percentage of this loan will be covered by the program's budget, depending on the individual's annual income level.
4. Depending on each specific case, relevant renovation works take place (such as installation of proper thermal insulation on the outer walls, revamping of the door and window frames or upgrading the heating and hot water systems).
5. After the implementation of these works, the energy inspector assesses the energy efficiency of the house again and calculates the improvement which was achieved.

Evaluation

The evaluation of the practice was carried out in the form of random sampling tests of houses that underwent upgrades and the level of energy efficiency that was achieved after the renovation works.

Main results

By 2015, 39.607 houses had received various works as part of the program. Following the second round of energy inspections after the renovations, this translated to 653.83 GW/h of annual primary energy savings.

Key success factors and barriers

The key success factors included the good cooperation between the relevant stakeholders, particularly when it came to the matter of distributing the funding to each prefecture. Another success factor of the program was the creation of more than 2.500 jobs (engineers, energy inspectors, bank accountants etc). However, the most important factor was the overwhelming interest from the general public and their willingness to participate.

The main barrier for this program lied with the approval of applications. In many cases, most of the required works to improve the energy efficiency of a house would exceed the maximum allowed amount of €15.000 to be subsidized. Furthermore, the reports state that progress has often been hindered due to the ongoing economic recession, with many thousands of applications currently remaining "frozen" and unable to be completed.

INHERIT Perspective

The Energy Efficiency at Household Buildings program has been included within INHERIT because of its potential to achieve a triple-win. By improving the energy efficiency of houses, it aims to protect the health and wellbeing of citizens, particularly the more socioeconomically disadvantaged ones, by allowing them to more easily, economically and effectively manage the indoor temperatures. The environment also benefits as as more efficient use of energy means fewer pollutants are released into the atmosphere.

More information

Energy Efficiency at Households website

Description of the Program (file in Greek)

Presentation on select results of the Program (file in Greek)

Certificates of Energy Performance of Buildings. Statistical Analysis for 2015 (file in Greek)

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