

**UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT**

**Enterprise Energy Efficiency - 3E**

***PILOT PROJECT PROPOSAL No. B2-2***  
***ROGATICA – LOW INCOME HOUSING***

**SITE VISIT REPORT AND PILOT PROJECT PROPOSAL  
EVALUATION**

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**Chief of Party**

Sarajevo, July 25, 2011

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## ***CONTENTS***

1. PILOT PROJECT PROPOSAL SCREENING REPORT
2. PROJECT EVALUATION SUMMARY
3. PROJECT TECHNICAL DESCRIPTION AND ANALYSIS

## ***ATTACHMENT***

- A. LETTER FROM THE HILFSWERK AUSTRIA

# 1. Pilot Project Proposal Screening Report

<b>I Partners:</b>		
U.S. Embassy, RS Ministry of Refugees and Displaced Persons, Rogatica Municipality and Hilfswerk Austria		
<b>II Proposed EE measures after USAID 3E analysis:</b>		
1. Thermal insulation of façade		\$22,000
2. EE light bulbs		\$2,000
3. Complete efficient building design, engineering and construction		\$468,000
<b>Total cost:</b>		<b>\$492,000</b>
<b>III Co-funding contributions:</b>		
1. Direct co-funding from partner's own funds;		
RS Ministry of Refugees and Displaced Persons		\$33,000
Rogatica Municipality		\$85,000
2. Partner co-financing from borrowed funds;		
3. Other donors' co-funding:		
U.S. Embassy in BiH		\$350,000
4. Provision of works and services (e.g., decommissioning of old equipment, installation of new equipment, design and supervision services, monitoring and verification (M&V));		
5. Provision of materials and equipment (e.g., piping, wiring, insulation material, control equipment); and		
6. Partnership with a private sector partner that might contribute any of above.		
<b>Total confirmed co-funding by partner/donors:</b>		<b>\$468,000</b>
<b>IV Co-funding by USAID 3E:</b>		
<b>Total 3E Project co-funding based on best estimate:</b>		<b>\$24,000</b>
<b>V Compliance with criteria for selection:</b>		
1. Replicability potential and relative ease of implementation;	0 - 12	12
2. Readiness and ability to put in place clear M&V procedures for reporting on post-implementation energy savings;	0 - 12	10
3. Appropriate geographic location, building type and types of technologies so that the total portfolio of 10 pilot projects when implemented demonstrates various EE measures, technologies and practices applied to different building types or EE practices and are located across the country;	0 - 24	24
4. Amount of co-financing for the pilot project that the partner is willing to or able to secure, or the amount of assistance the pilot project can obtain from other donors or private sector;	0 - 24	24
5. For the public sector - willingness to introduce energy management practices into other public buildings that are responsibility of the partner;	0 - 12	8
6. For municipalities - readiness to sign the EU Covenant of Mayors on EE;	0 - 4	0
7. For all – a willingness to support the raising of EE awareness of building users and citizens at large.	0 - 12	12
<b>Total:</b>	<b>100%</b>	<b>90%</b>
<b>VI Environmental Compliance:</b>		
Confirm that the pilot project implementation does not cause any environmental concerns or adverse environmental effects.		Yes

## 2. Project evaluation summary

### 2.1 Basic data about the project:

#### 2.1.1 Low income housing in Rogatica (Urban apartment building)

- Project is to reduce thermal losses in the apartment building
- The year of construction = 2011
- Number of floors = 3 (basement, ground floor + 1 floors)
- Number of apartments = 14
- Usable area including hallways = 800 m<sup>2</sup>
- Average heated area per apartment = 32m<sup>2</sup>
- Facade area = 585m<sup>2</sup>
- Number of operating days = Official heating season= 206 days
- Heating by individual furnaces and radiator system

### 2.2 Recommended measures:

1. Thermal insulation of the building facade (10 cm EPS).
2. Installation of energy efficient light bulbs (CFL) in place of the incandescent bulbs.

### 2.3 Rationale:

1. A well insulated facade will further reduce the heating costs for individuals living in these buildings and reduce the energy expenditure component of their household budget.
2. The windows that will be installed will be double glazed and are energy efficient.
3. Energy efficient lighting will further reduce the users' energy bills.
4. USAID 3E is cooperating with another international donor in the area of energy efficiency.

### 2.4 Benefits:

- Practical demonstration of energy savings and improved thermal comfort through thermal insulation and good quality windows.
- Stimulate local economy and building practices - local companies will construct the building and install windows and insulation.
- Capacity building of the local companies.
- Increase awareness of the local governments of benefits of thermal insulation, which may lead to new regulations related to energy consumption in buildings and financial support of local governments for such projects.
- Increase awareness of building owners that they are responsible for the maintenance of the whole building and that proper maintenance increases property value and reduces energy costs.
- Reduction of usage of coal and wood for heating because of better insulation.
- Reduction of CO<sub>2</sub> emissions because of reduction in coal consumption.
- Public health improvement.

### 3. Project Technical Description and Analysis

#### 3.1 Introduction

The U.S. Embassy in BiH, Hilfswerk Austria, the RS Ministry of Refugees and Displaced Persons and the Municipality of Rogatica are constructing three new buildings for low-income families. The building will be located in the center of Rogatica, in close vicinity of the Municipality building. This building will showcase an urban living environment. The building will have a basement, ground floor and two floors. There will be an area of 100m<sup>2</sup> on the ground level for miscellaneous activities. There will be 14 apartments; 12 apartments with a living space of 30m<sup>2</sup> and 2 apartments with a living space of 40m<sup>2</sup>. Each apartment has a basement storage space.

Because of the purpose of the buildings – housing for low-income individuals – it is necessary to achieve a high level of energy efficiency in order to lower the living costs for the occupants.

#### 3.2 Project description

The USAID 3E Project will finance the thermal insulation of the building, a 10cm thick thermal insulation that is in line with the requirements for this particular climate zone. The building design has a favorable form factor which reduces specific energy consumption. The windows will be double glazed, which will reduce the specific energy consumption; and the roof will be insulated. The apartments will have individual heating furnaces. 3E will also change the light bulbs to compact florescent light bulbs (CFL) which will provide further savings for the home owners.



Figure 1. Construction site

#### 3.3 Technical and financial analysis

The buildings in question are currently being built (Figure 1), which is the reason heating records are not available. The impact of the thermal insulation installation is modeled and calculated in order to show the savings potential.

The estimated heat loss through the façade walls, with and without thermal insulation, are shown in the following table (Table 1):

**Table 1. Building energy consumption**

Energy carrier	Unit	Present	After measures	Savings
Wood/coal	MWh	70	15	55

The reduction of CO2 emissions achieved by thermal insulation, assuming 80% of fuel is coal, will be 20-25 tons per year.

The cost for the measures and the payback period is shown in the following table (Table 2.).

**Table 2. Preliminary cost and benefit analysis for recommended measures**

Measures	Investment [\$]	Annual Savings Est. [\$]	Simple payback period [year]
Facade urban building	22,000	3,500	6,28
EE light bulbs	2,000	1,000	2

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