UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

Enterprise Energy Efficiency - 3E

PILOT PROJECT PROPOSAL No. B2-1
FOCA URBAN AND RURAL LOW INCOME HOUSING

SITE VISIT REPORT AND PILOT PROJECT PROPOSAL EVALUATION

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Chief of Party

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1. Pilot Project Proposal Screening Report

I Partners:
U.S. Embassy, Netherlands Embassy, Catholic Relief Services (CRS), the FBiH and RS Ministry of Refugees and Displaced Persons, and the Foca Municipality

II Proposed EE measures after USAID 3E analysis:	
1. Thermal insulation of façade	$34,000
2. EE lighting bulbs	$3,500
3. Complete efficient building design, engineering and construction	$897,000
Total cost:	**$934,500**

III Co-funding contributions:	
1. Direct co-funding from partner's own funds;	
RS and FBiH Ministry of Refugees and Displaced Persons	$162,000
Foca Municipality	$135,000
2. Partner co-financing from borrowed funds;	0
3. Other donors` co-funding:	
U.S. Embassy in BiH	$320,000
Netherlands Embassy	$280,000
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));	0
5. Provision of materials and equipment (e.g., piping, wiring, insulation material, control equipment); and	0
6. Partnership with a private sector partner that might contribute any of above.	0
Total confirmed co-funding by partner/donors:	**$897,000**

IV Co-funding by USAID 3E:	
Total 3E Project co-funding based on best estimate:	**$37,500**

V Compliance with criteria for selection:		
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	2
7. For all – a willingness to support the raising of EE awareness of building users and citizens at large.	0 - 12	12
Total:	**100%**	**92%**

VI Environmental Compliance:	
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 Foca (Urban apartment building)

- Project is to reduce thermal losses in the apartment building and lighting costs
- The year of construction = 2011
- Number of floors = 5 (basement, ground floor + 3)
- Number of apartments = 14
- Number of business/commercial premises = 3
- Usable area including hallways = 815 m^2
- Average heated area per apartment =50m^2
- Facade area = 600 m^2
- Number of operating days = Official heating season= 206 days
- Heating by individual furnaces and radiator system

2.1.2 Low income housing in Foca area (Two identical rural apartment buildings)

- Project is to reduce thermal losses in the apartment building and lighting costs
- The year of construction = 2011
- Number of floors = 2 (ground floor + 1)
- Number of apartments = 4
- Usable area including hallways = 200 m^2
- Average heated area per apartment =50m^2
- Facade area = 150 m^2
- 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 facades.
2. Installation of energy efficient light bulbs (CFL) in place of the incandescent bulbs.

2.3 Rationale:

1. The buildings being constructed by CRS are based on six previous projects that CRS has implemented for low income categories.
2. 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.
3. The windows that will be installed will be double glazed and are energy efficient.
4. Energy efficient lighting will further reduce the user's energy bills.
5. 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, good quality windows and EE lighting.
- 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 CO2 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, the Netherlands Embassy, Catholic Relief Services (CRS), RS and FBiH Ministry of Refugees and Displaced Persons and the Municipality of Foca are constructing three new buildings for low-income families. One building will be located in the town of Foca and two identical smaller buildings will be located in nearby villages. These buildings will showcase an urban (Figure 1) and rural (Figure 2) living environment. The urban building will have a basement, ground floor and three floors. There will be space for three business/commercial premises on the ground level and 14 apartments with an average living space of 50 m^2. The two rural buildings will be identical and will have four apartments with an average living space of 50 m^2.

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 one heating furnace connected to an individual radiator system for heating of the whole apartment building. The radiator system will allow heating of the whole apartment by only one furnace located in the living room area. This will increase the efficiency of the heating system. USAID 3E will also install energy efficient light bulbs (CFLs) in place of incandescent light bulbs, this will reduce the electricity consumption of the apartments and provide further savings for the occupants.

Figure 1. Construction site (left) and conceptual urban building design

Figure 2. Conceptual rural building design

3.3 Technical and financial analysis

The buildings in question are currently being built, 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 tables (Table 1 and Table 2):

Table 1. Energy consumption urban building

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

Table 2. Energy consumption rural building

Energy carrier	Unit	Present	After measures	Savings
Wood/coal	MWh	17.5	3.5	14

The reduction of CO2 emissions achieved by thermal insulation, assuming 80% of fuel is coal, will be 25-31 tons per year.

The cost for the measures and the payback period is shown in the following table (Table 3.).

Table 3. 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
Facade rural building (two identical buildings)	6,000	950	6,31
EE lights urban building	2,000	1,000	2
EE lights rural building	750	375	2

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LETTER FROM THE CATHOLIC RELIEF SERVICES (CRS)