UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

Enterprise Energy Efficiency - 3E

PILOT PROJECT PROPOSAL No. B3-5
ELEMENTARY SCHOOL "BRANKO COPIC" IN PRIJEDOR

SITE VISIT REPORT AND PILOT PROJECT PROPOSAL EVALUATION

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Chief of Party

Sarajevo, August 12, 2011

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1. Pilot Project Proposal Screening Report

I Partners:
The Prijedor Municipality and the RS Ministry of Education and Culture

II Proposed EE measures after USAID 3E analysis:	
1. Building envelope insulation	$60,000
2. Replacement of windows	$100,000
3. Overhaul of the heating system	$20,000
4. Installation of heating substation (200 kW) with automatic control system	$30,000
5. Monitoring and Verification System	$15,000
Total cost of proposed EE measures	**$225,000**

III Co-funding contributions:	
1. Direct co-funding from partner's own funds;	
Prijedor Municipality	$63,000
RS Ministry of Education and Culture	$39,000
2. Partner co-financing from borrowed funds;	$0
3. Other donors` co-funding:	
UNDP	$46,500
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));	$61,500
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:	**$163,500**

IV Co-funding by USAID 3E:	
Total 3E Project co-funding based on best estimate:	**$61,500**

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	12
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	22
5. For the public sector - willingness to introduce energy management practices into other public buildings that are responsibility of the partner;	0 - 12	10
6. For municipalities - readiness to sign the EU Covenant of Mayors on EE;	0 - 4	4
7. For all – a willingness to support the raising of EE awareness of building users and citizens at large.	0 - 12	12
Total:	**100%**	**96%**

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:

- Project is to reduce thermal losses in the building
- The year of construction = 1982
- The building is not thermally insulated
- Number of floors = 2 + basement
- Building heated area = 1988 m^2
- Gym hall heated area = 591 m^2
- Top floor ceiling area = 870 m^2
- Heated volume = 6591 m^3
- Outside wall area = 617 m^2
- Window area = 534 m^2
- Number of employees = 82
- Number of students = 1100
- Number of operating days = = 150-180 days
- Heat source – light fuel oil
- Estimated heat energy consumption = 680 MWh (261 kWh/m^2 annually)
- Total annual light fuel oil costs = 80,000 KM ($61,000)

2.2 Recommended measures:

1. Building envelope insulation.
2. Replacement of windows.
3. Overhaul of the heating system.
4. Installation of heating substation (200 kW) with automatic control system.
5. Installation of thermostatic valves.

2.3 Rationale:

1. The school windows are the original windows from 1982, and have not been painted regularly; thus, they are in poor condition. They cause a large heat loss and must be replaced.
2. The building walls are only 25 cm thick, and neither the walls, roof or the top celling slab are insulated. This creates a very large heat loss (much higher than allowed by today's construction code). The building envelope insulation measure has a short payback period.
3. A heating substation of the city's district network, located in the school basement, is supplying this school with heat. This heating substation has outdated equipment and no water supply temperature control; and, as a result, it is inefficient. The heating capacity needed for the building will be approximately 200 kW and a compact, high efficiency heating substation can be installed to replace the existing one.
4. The co-funding percentage by the Municipality and the RS Ministry of Education and Culture is substantial, covering more than 50% of the project.
5. These measures can be replicated in many schools, since most of them have none of more advanced heating control systems, insulation, or energy efficient windows installed.

2.4 Benefits:

- Demonstrate energy savings and improved thermal comfort through building envelope insulation, new windows and energy efficient heating substations with an automatic heating control system.
- Pave the way for the introduction of the practice of paying for actual energy consumed, which will motivate citizens to save energy and invest in energy efficiency measures.
- Increase public awareness of benefits of energy efficiency measures to support the practice of paying for actual energy consumed.
- Motivate local governments to financially support such projects.
- Stimulate local economy – if the practice of paying for actual energy consumed is introduced, local companies will install thermal insulation, windows, and repair roofs.
- Reduce of usage of light fuel oil by connecting to the
- Reduce of CO2 emissions
- Improve public health

3. Project Technical Description and Analysis

3.1 Introduction

The Municipality of Prijedor is interested in reducing energy consumption and to that end has signed the Covenant of Mayors. In achieving the targeted reduction in overall energy consumption, reduction in the building sector plays a crucial role. A number of buildings, including schools, commercial and apartment buildings, are connected to the district heating network. A large number of the buildings have very large specific energy consumption; and to motivate citizens to save energy and invest in energy efficiency measures, the practice of paying for actual energy consumed needs to be introduced. The school in question is using light fuel oil for heating and is not insulated, which is the most expensive solution.

3.2 Site visit report

The primary school "Branko Ćopić" building is located in the Rudnička street in the narrow city centre of Prijedor. The building was built in 1982 (Figure 1). The school is comprised of two buildings, the building where classrooms and offices are located, and the gymasium for sport and cultural activities. About 1100 pupils attend this school, and there are 82 employees. The main building has two floors, the ground floor and the first floor.

Figure 1. – Photo of the "Branko Ćopić" building

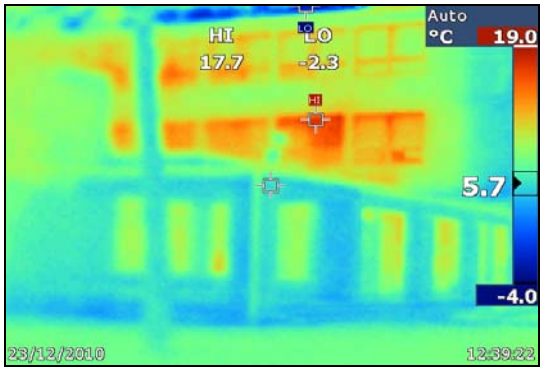

Figure 2. – Thermographic photo of the school building with clearly visible heat radiation

The school is funded by the RS Ministry of Education and Culture, and the school building is owned by the Municipality of Prijedor. The building is used 10.5 hours a day, from 0800 to 1830. Its brick walls are not thermally insulated. Since its construction, the school has not been renovated, and regular maintenance has not been done. Parts of the building, particularly those oriented towards north and west, are exposed more to the atmospheric impacts, such as rain and wind, and are in particularly poor condition. As a consequence, during heavy rains, the rain water drains into the classrooms, while during extreme weather conditions, the individual windows can get pulled out, jeopardizing significantly the safety of pupils.

3.3 Technical and financial analysis

Due to heating energy waste, significant funds are allocated to pay for the heating of the building premises, totaling about 89% of the budget for the energy costs of this building, and the remaining 11% cover the electricity and water costs. Based on the construction characteristics of the building and current energy use, this building falls in the category of highest consuming buildings. The proposed measures represent a complete solution for the problems that the employees and the students of the primary school "Branko Čopić," are faced with.

The estimated before and after measures energy consumption for this building are shown in the following table 1:

Table 1. Energy consumption

Energy carrier	Unit	Present	After measures	Savings
District heating	MWh	680	340	340

The reduction of CO2 emissions achieved by implementation of the measures is 220-230 tons per year.

The cost for the measures and the payback period is shown in table 2. It is assumed that the price per kWh remains the same and the payment for actual energy consumed is introduced.

Table 2. Preliminary cost and benefit analysis for recommended measures

Measures	Investment [$]	Annual Savings Est [$]	Simple payback period [year]
Building envelope insulation, window replacement, energy efficient heating substations with an automatic heating control system	210,000	30,000	7

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LETTER FROM THE MAYOR OF THE PRIJEDOR MUNICIPALITY