

PD-ABR-005

***Hungary Deliverable:
Hospital Demonstration Projects -
Project Plans***

Prepared by

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Veszprém County Hospital Project Plan

Updated January 1998

Background

The proposed project is the outcome of the Energy Managers Contest conducted by EGI Contracting Engineering Co Ltd and the Hungarian Chamber of Engineers under Electrotek Concepts Inc 's USAID contract. Mr Sandor Nagy, Energy Manager at Veszprem County Hospital, submitted a proposed energy savings plan, which included many of the measures listed below, for the contest. The rationale and calculations of proposed savings were so sound, that EGI and Electrotek selected Veszprem for one of the hospital demonstration projects. Mr Nagy was also one of the winners of the contest, and participated in the invitational travel to the US in September 1997.

The Veszprem County Hospital is an 840-bed hospital, comprised of multiple buildings, including a separate school and museum, spread out over the hospital campus. The total energy use of Veszprém hospital is as follows: 4450 MWh/year at a cost of 51.1 million HUF, 1.93 million cubic meters of natural gas per year (65,620 GJ/year) at a cost of 65.6 million HUF, and 155,800 cubic meters of water per year at a cost of 22.6 million HUF.

Technical Description

There are five energy efficiency measures proposed for implementation, and one still under consideration.

- Steam traps and condensate system upgrade for the laundry,
- Heating system controls for building A,
- Water saving equipment in the out-patient building,
- New boiler for the out-patient building,
- Refurbishing the indoor lighting system with compact fluorescent lights, and,
- Converting the water system of the hydrotherapy tubs to a closed loop system (under consideration)

Short descriptions of the five measures to be implemented follow.

Laundry improvements Twenty-five steam traps, a new condensate tank, two electric condensate pumps and level switches, and some new piping will be installed in the laundry. These improvements will lower steam loss.

Heating system controls Currently building A of the hospital has two heating circuits which have manually controlled steam/water exchangers. The new heating controls

would provide computerized control of these circuits and would be connected to the building management system of the hospital

Water saving equipment Automatic faucets and toilet flushers will be installed in the out-patient building. Much water is lost due to open faucets or running toilets. Mr. Nagy has had one of his staff members go to all the bathrooms regularly to turn everything off, and has already seen savings.

New boiler This component of the project would detach the specialized out-patient building from the main heating system. A new boiler would be installed in the building.

Lighting Compact fluorescent lights will replace the existing bulbs in building A.

Economic Analysis of the Project

The chart below details the costs and savings generated by each component of the project.

<i>Analysis of costs and savings (USD)</i>			
Measure	Total Cost	USAID Part	Annual Savings
Steam traps	5,541	5,015	5,260
Heating system controls	14,210	10,000	8,527
Water saving equipment	6,170	3,010	6,316
New boiler	11,548	2,075	3,685
Lighting	6,000	4,000	3,700

<i>Project Summary</i>	
Total Cost	\$43,469
USAID Funding	\$25,000
Saved Energy	4150 GJ/year
Annual Cost Savings	\$27,488
Simple Payback, Project	1.6 years
Simple Payback, USAID	11 months

Implementation Schedule

The implementation schedule is on target. The steam traps, water saving equipment, boiler, and heating controls have been ordered. The lighting will be ordered by the beginning of February. The expected implementation schedule is as follows:

December, 1997	Steam traps, Water saving equipment, boiler ordered
January, 1998	Final equipment ordered
January-March, 1998	Equipment delivered to Veszprem
May, 1998	Installation complete

**JOVK Vác Hospital
Project Plan
January 1998**

Background

Electrotek's work with JOVK Hospital followed on the previous USAID hospital partnership programs in Hungary. At the request of USAID-Budapest, Electrotek Concepts, Inc. worked with EGI Contracting/Engineering to assess the energy savings options at JOVK Hospital. EGI conducted an energy audit under its subcontract to Electrotek and found very promising potential energy efficiency projects, leading to the design of this demonstration project.

Technical Description

The USAID project will include the following components:

- Feed water pump replacement and new boiler level switches, and
- Automatic control of the blowdown of the two boilers.

Concurrently to the implementation of the USAID project, JOVK Hospital is pursuing a loan from the German Coal Fund to modernize the heating system and substations. The USAID project is an important first step in the hospital's overall energy efficiency plan, and is enabling the hospital to meet the 20% cofinancing requirement of the German Coal Fund.

Short descriptions of the two measures to be implemented follow:

Feed water pump replacement and new boiler level controls Three new feed water pumps will be installed. The existing feedwater pumps are oversized and 25 years old, and therefore the efficiency of the pumps is less than 30%. Within the scope of the proposed project, three properly sized pumps will be installed, two for normal operations, and one standby pump. The pumps will be equipped with an automatic control system. The boilers will be equipped with electronic water level controls. The current control valve has a pressure drop of up to five bars at nominal load.

Automatic control of the blowdown of the two boilers Automatic control of blowdown will lead to both energy savings and cost savings from avoided water treatment.

Economic Analysis of the Project

The chart below details the costs and savings generated by each component of the project

<i>Analysis of costs and savings (HUF)</i>				
Measure	Total Cost	USAID Part	Saved Energy	Savings
Feed water pump and new level controls	6,400,000	6,000,000	145 MWh/year Reduced contracted capacity 15 kW	1,500,000
Automatic control of boiler blowdown	3,000,000	2,000,000	542 GJ/year Avoided water treatment	656,000 HUF
Total	9,400,000	8,000,000		2,156,000

Payback

The estimated simple payback for the total project is approximately 4.36 years. The estimated payback for the USAID contribution is 3.7 years.

Implementation Schedule

The expected implementation schedule follows

December 19, 1997	MOU signed by JOVK
January, 1998	Equipment ordered
February, 1998	Measurement and Verification Plan signed
February-March, 1998	Equipment delivered
March-May, 1998	Equipment installed
May-December, 1998	Monitoring of savings

Szent Gyorgy Hospital, Székesfehérvár
Project Plan
January 1998

Background

The technical staff of Szent Gyorgy Hospital, Székesfehérvár entered the energy manager contest. The high quality of their application, which included cost and payback analysis and cash-flow calculations, led to negotiations between Electrotek/EGI and the hospital to conduct a demonstration project.

The Székesfehérvár Hospital consists of 40 buildings and 1914 beds. The steam heat supply system is run by five boilers in main section of the hospital. The system feeds the entire hospital campus, which includes the main section, two new, more modern buildings, and several outer buildings which are located across the street from the main hospital and fed by two substations. The pipes connecting the outer section are old and extremely leaky. The main heating system is also in very poor condition – over 200 steam traps are broken and flash steam and condensate build-up are serious problems. The system efficiency is 16.2%, and only 2-12% in the summer months when only hot water is generated.

Technical Description

The project includes the following components:

- Separation of the outer buildings from the steam heat supply system and the installation of two local boilers to provide hot water heating, and
- Installation of 200 steam traps, insulation, and new valves in the old system.

Székesfehérvár Hospital will receive additional funding from the German Coal Fund. Due to the timing of the project and the delays already incurred, the project will be implemented in two parts. USAID will provide the majority of funding for the steam traps, and this will be implemented as soon as final approval of the German Coal Fund loan is received. The loan money will be used to complete the project.

Short descriptions of the two measures to be implemented follow:

Separation of the outer buildings and installation of two local boilers As explained above, the outer buildings will be disconnected from the main heat supply system and two boilers will be installed in local substations.

Installation of 200 Steam Traps and system upgrade 200 steam traps will be installed throughout the existing main steam system to reduce losses and problems from flash steam and condensate build-up. Pipes will be insulated and leaky valves replaced.

Economic Analysis of the Project

The chart below details the costs and savings generated by each component of the project

<i>Analysis of Costs and Savings (HUF)</i>			
Measure	Total Cost	USAID Portion	Savings
Installation of 200 steam traps	5,500,000	5,000,000	5,500,000
Separation of outer buildings and installation of boilers, insulation and valve replacement	42,075,000	0	19,270,000
Total	47,575,000	5,000,000	24,770,000

Payback

The estimated simple payback for the total project is approximately *19 years*. The estimated payback for the component that USAID is funding is *1 year*.

Implementation Schedule

The expected implementation schedule follows, and is thus far on schedule

December 19, 1997	MOU signed by hospital
February, 1998	Decision on German Coal Fund, project moves forward
February, 1998	Steam traps ordered
March, 1998	Monitoring and Verification Plan signed
March-April, 1998	Steam traps delivered
April-May, 1998	Steam traps installed
Summer, 1998	Other project components completed
May-December, 1998	Monitoring of savings