

GovernEE – Good Governance in Energy Efficiency

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WP 3.1.1
**CROSS SECTORAL EVALUATION OF EXISTING ENERGY PROJECTS AND
STRATEGIES ON PUBLIC HEATING**

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Summary of Existing energy projects, best practices on public heating

Project name/Building	Project level	Short Description	Evaluation/ Result	website	photos
<p style="text-align: center;">Project_1 Use of Renewable and Alternative Energy Sources at Bethesda Hospital</p>	national	<ul style="list-style-type: none"> -Use of Renewable and Alternative Energy Sources - installation surface heating and cooling system -controlling system -replacement of old and run-down windows 	<p>The new system increase the use of renewable energy sources and install energy efficient measures result: Producing Renewable Energy: 555 MWh/ year</p>	http://www.bethesda.hu	
<p style="text-align: center;">Project_2 Elizabeth's Hospital "A" building energy modernization, Hódmezővásárhely</p>	national	<p>Object: Reducing energy consumption of buildings to improve thermal characteristics</p>	<p>Saving Energy: 2836.5 GJ /a, ie 83 438 m3 of natural gas per year, CO2 emission savings of 161 tonnes per year</p>	http://www.energiakozpont.hu/english	
<p style="text-align: center;">Project_3 László Németh Elementary and Secondary School energy modernization, Hódmezővásárhely</p>	national	<ul style="list-style-type: none"> -replacement of old and run-down windows - new heating system - building thermal insulation 	<p>Results Saving Energy: 2138,8 GJ / year, , CO2 emission savings of 1,4 tonnes per year</p>	http://www.energiakozpont.hu/english	
<p style="text-align: center;">Project_4 College Cseresnyes reconstruction, Hódmezővásárhely</p>	regional	<ul style="list-style-type: none"> -replacement of old and run-down doors, windows and skylights 	<p>Emission reducing, better thermal insulation, aesthetic quality change</p>	http://www.westpa.hu/cgi-bin/westpa/index.cgi?view=palyazati&szintID=48&ID=143	
<p style="text-align: center;">Project_5 TELENOR Headquarter building Törökbálint</p>		<ul style="list-style-type: none"> - new building with environmentally-friendly engineering technology, based on renewable energy sources 	<p>Will cut down on CO2 emissions equivalent to those generated by about 500 homes, making it one of Hungary's "greenest" office buildings.</p>	http://www.teleenor.hu/en/corporate-responsibility/environment/teleenor-house/	

1. Existing energy projects, best practices on public heating

1.1 *Project 1_ Use of Renewable and Alternative Energy Sources at Bethesda Hospital_Budapest, Hungary*

1.1.1 Description of the buildings



The Hospital consists of several buildings built in different periods.

The project is connected to the first enhanced area: environmental protection, more specifically the use of renewable energy sources.

The project is organised and implemented by the Foundation of Bethesda Hospital. The objective is the development of a system comprising sun collector, gas engine and heat pump, which produces energy for the buildings of the hospital. The energy is used for operating the system for heating and cooling, which provides heating of the buildings and cooling them in the summertime. Besides that the system shall be capable of providing domestic hot water for the buildings as well.

1.1.2 Technical aspects



Elements of the project:

- 60m² vacuum tube solar collector
- 1 solar parabola

- 12 air-water absorption heat pump
- 15-20 kW capacity gas engine
- installation surface heating and cooling system
- controlling system
- replacement of old and run-down windows
- publicity
- management

By developing the system the objectives shall be as follows:

- energy optimisation
 - replacement of the highest possible proportion of energy for serving comfort demands with renewable energy sources
 - reduction of peak demands by storage of energy
 - fulfilment of increasing cooling demands with natural energy sources
 - use of cheaper energy
 - selection of solutions that shall have long term recover economic yield
- increase of the comfort of the hospital

All these shall be supplemented by the completion of the renovation of the buildings, the replacement of the existing but worn-out doors and windows with better and more up-to-date doors and windows with better heat insulation features.

As a whole it can be ascertained that by means of the development of the system, conventional energy saving as well as cost reduction are expected together with the increase of the comfort level of the hospital; the condition of the patients and the working conditions of the employees are expected to improve.

1.1.3 Legal, financial and administrative aspects

Country	Hungary
Project title	Use of renewable and alternative energy sources at Bethesda Hospital.
Case number	HU0112
Priority sector	Environment and sustainable development
Grant	€ 719,480
Status	Ongoing
Type og project assistance	Individual Project
Project promoter	Bethesda Hospital Foundation
Type of institution	Non governmental organisation
Project website	http://www.bethesda.hu
Project duration	19 months
Project cost	€ 819,032
Grant rate	90%
Grant from	EEA Financial Mechanism and Norwegian Financial Mechanism
Grant agreement date	2009-07-08

1.1.4 Results and performance obtained

The purpose of the Project is to reduce the consumption of traditional energy, increase the use of renewable energy sources and install energy efficient measures at the Bethesda Hospital, with the overall objective of protecting the environment through reduction of CO2 emissions.

The completed Project include the following activities and results:

1. Purchase and installation of gas engine system, sun collector system and heat pump system;
2. Development and reconstruction of heating and cooling system (air-conditioning) and domestic hot water system;
3. Establishment of energy optimization system for building engineering and thermoinsulation of building (replacement of doors and windows);
4. Project management and publicity activities.

Producing Renewable Energy: 555 MWh/ year, CO2 emission savings of 378 tonnes per year

1.2 Project 2 *Elizabeth's Hospital "A" building energy modernization, Hódmezővásárhely*

1.2.1 Description of the buildings



The boundary structure of the building and mechanical engineering structures do not meet current standards. The wooden doors and windows of the building are average 50-year old, the boundary heat transfer factors are higher than the current regulations.

1.2.2 Technical aspects

General objectives Reducing energy consumption of buildings to improve thermal characteristics, upgrade institutions heating-, cooling-, hot water- and lighting systems, and complex, multi-activities involving energy efficiency improvement projects.

Specific objectives Reducing energy consumption in the building "A" of the Hospital, under the same amenities. This will be achieved by replacement and modernization of doors, windows and heating system (using the new geothermal district heating system, new thermostat system). With the developed new system the building's heat loss is less and the efficiency of the heating system is increased, thus decreasing the environmental impact, since less waste gas will be release after the project implementation.

Elements of the project:

- controlling system
- new heat center for using the cities geothermal heat
- new condensation boilers
- replacement of old and run-down windows
- publicity
- management

1.2.3 Legal, financial and administrative aspects

Project title Elizabeth's Hospital "A" building energy modernization, Hódmezővásárhely

Programme name KEOP-5.3.0/A/09-2010-0112, Environment and Energy Operative Programme

Programme level National

Duration 2009-2010

Partnership "Energy Centre" Energy Efficiency, Environment and Energy Information Agency Non-Profit Company, EU

Target groups Businesses, government agencies and institutions, nonprofit organizations, other economic organizations in Hungary.

1.2.4 Results and performance obtained

Results Saving Energy: 2836.5 GJ / year, ie 83 438 m³ of natural gas per year, CO₂ emission savings of 161 tonnes per year

Website: <http://www.energiakozpont.hu/english>, <http://www.energiakozpont.hu/keop-2009-530a>

1.3 Project 3_ *László Németh Elementary and Secondary School energy modernization, Hódmezővásárhely*

1.3.1. Description of the building



The structure of the buildings cooling surface and mechanical engineering structures do not meet current standards. The heat loss of the original doors and windows of the building were very high, the boundary heat transfer factors were higher than the current regulations.

1.3.2. Technical aspects



General Objectives:

Reducing energy consumption of buildings to improve thermal characteristics, upgrade institutions heating-, hot water- and lighting systems, and complex, multi-activities involving energy efficiency improvement projects.

The KEOP tenders can not just include projects about exchange windows and insulation, but also complex solutions must be used which help to save specific energy and money for the municipality.

Therefore major energy design calculations and studies have been made for achieving the most effective solution.

Elements of the project:

- old, outdated windows and doors replacement
- the abolished glass block walls are changed
- glazed doors and windows are causing
- new building insulation (walls & roof) 10cm insulation
- geothermal based district heating center transformation from permanent mass flow to variable mass flow
- new heating system (pipes, radiators, controllers)
- new control system: whether the individual rooms can be individually controlled

1.3.3. Legal, financial and administrative aspects

Project title: László Németh Elementary and Secondary School energy modernization
Programme name: **KEOP-5.3.0/A/09-2010-0110**, Environment and Energy Operative Programme
Programme level: National
Duration: 2009-2010
Partnership "Energy Centre" Energy Efficiency, Environment and Energy Information Agency Non-Profit Company, EU

Total financial investment: £ 161,216,579
The amount of aid: EUR 117,075,479 (72.62%)
Own contribution amount: £ 44,141,100 (27.38%)

1.3.4. Results and performance obtained

Results Saving Energy: 2138,8 GJ / year, , CO2 emission savings of 1,4 tonnes per year

The Local Government spend about 3 million HUF less/ per year for energy costs.

Website <http://www.energiakozpont.hu/english>, <http://www.energiakozpont.hu/keop-2009-530a>

1.4 Project 4_ *College Cseresnyes reconstruction, Hódmezővásárhely*

1.4.1. Description of the building



The college was built in 1969. The building is 38 years old, the renovation became necessary, because of the structure of the cooling surface and the windows.

1.4.2. Technical aspects

The replacement of external doors and windows were necessary from aesthetic point of view, and energy conservation aspects is organically connected with this application. The existing window frames are dangerous because of their old age and corrosion.

The replacement of external doors and windows on the North and South side of the building. The replacement of exterior windows and doors lead to better thermal insulation, and aesthetic quality change. In addition to the already improved insulation energy savings are available too. Doors and

windows quality are made by which the heat factor of the throughput of today's thermal requirements are met.

1.4.3. Legal, financial and administrative aspects

The purpose of the decentralized local government development assistance programs are the development of municipal services and related fixed assets, supply of intangible assets, the reduction of existing inequalities.

Project title College: Cseresnyes reconstruction, Hódmezővásárhely
Programme name: **HÖFCÉDE** local government development subsidy without geographical limitation
Programme level: Regional
Duration: 2007
Partnership: Pannon Regional Development Council West

1.4.4. Results and performance obtained

Emission reducing, better thermal insulation, aesthetic quality change

The replacement of external doors and windows results improved thermal insulation, aesthetic quality change and in addition energy savings. Doors and windows are chosen, that thermal transmittance coefficient meet the current technical requirements. The replacement of doors windows and skylights eliminate the dangerous condition of the building facade.

Website <http://www.westpa.hu/cgi-bin/westpa/index.cgi?view=palyazati&szintID=48&ID=143>

1.5 Project 5_ *TELENOR* Headquarter building, Törökbálint

1.5.1 Description of the building



The headquarters of Telenor Hungary, the Telenor House of Törökbálint is one of Hungary's most state-of-the-art and most environmentally friendly corporate headquarters offering an office space of 14,000 square meters on six floors and in nine wings arranged in a fan shape. The office is located the outskirts of Budapest, and it has a floorspace of 26.520 m².

1.5.2 Technical aspects

The building is equipped with environmentally-friendly engineering technology, based on renewable energy sources. The building draws its energy from geothermal heat pumps. The system uses 180 Borehole Heat Exchanger (BHE) drilled 100 meters deep (diameter 40 mm) to provide cold and hot water, therein regulating temperature in the building. The distance among the BHE's is 7 meter. The cooling capacity of the heat pumps is 965,7 kW, and the heating capacity is 862,2 kW. The energy required to produce sufficient hot water for the staff is provided by solar collectors. The total surface of the flat plate collectors is 168 m², which can supply the 60-70% of the hot water demand. The energy efficiency of the building is controlled by an intelligent building management system that allows efficient measurement and control of various equipment parameters. The building is equipped with exceptionally high efficiency insulation to minimize heat losses. External shades keep the building cooler during the summer and external heat retrieval equipment ensures that the building does not lose much energy through ventilation. The office building is equipped with energy-efficient air conditioning systems.

1.5.3 Legal, financial and administrative aspects

Coherence of the best practice with the local policy framework and with the national / regional legislation
Contribute to the achievement of - 2020 renewable energy target : Hungarian Renewable energy strategy to increase the share of RES 2008-2020

Description of the best practice background : TELENOR has stipulated several criteria related to environmental protection in the tender announced for the planning, implementation and operation of the building.

Actors involved in the best practice development - Hungarian heat pump association - HIDRO-GEODRILLING LTD.

Principal stakeholders that benefit from the GCHP application: TELENOR is an international company, that's why the whole company can benefit from the investment.

Source of financing of the best practice: other (explain which)

1.5.4 Results and performance obtained

Compared to a conventional building, the new headquarters will cut down on CO₂ emissions equivalent to those generated by about 500 homes, making it one of Hungary's "greenest" office buildings. The building and the engineering was carefully, specially and well designed. In the planning phase of the project an exploratory drilling and Thermal Response Test was done for 68 hours. The ground temperature at 100 meter depth is approximately 15-15.2°C. The operation of the heat pump system is carefully monitored, 3 monitoring point were installed to watch and check the COP and SPF of the heat pumps.

2. Strategies, action plans on public building energy consumption

2.1 National strategy

2.1.1 Action plan of renewable energy recovery of Hungary 2010-2020

Considerations determining the goals of national renewable energy policy

The most important strategic objective of Hungarian renewable energy policy is to optimize the joint implementation of the security of supply, competitiveness and sustainability as primary national economic goals, while also taking into account long-term considerations. There can be various forms of interaction between the aforementioned three goals – in many cases their implementation may conflict with one another, but they may also strengthen each another. For this reason, the measures drawn up for the achievement of these goals must place special emphasis on joint effects, the resolution of conflicts between the goals and the achievement of the greatest possible degree of consistency.

2.1.1.1 Objectives,

Based on the above, the consolidated national target has been set on the basis of the sum of realistically achievable maximum ratios with regard to the individual types of renewable energy sources. Taking into account the currently known parameters of the limiting factors, it would be a realistic target to increase the gross consumption of renewable energy sources to at least 120.56 PJ by 2020.

2.1.1.2 Priorities and expected results

Expected results: The goal is to substitute traditional energy sources with renewable and with waste energy, to create the conditions of economical energy source management, the reduction and prevention of identified energy losses at the lowest possible expenditure.

For the project purpose, we focus on priority (a) and (d).

Priority (a): Security of supply. Hungary is highly dependent on energy source imports, and fulfils 80 percent of its domestic crude oil demand, and over 83 percent of its natural gas consumption from imports, primarily from former CIS countries (due to the limited hydrocarbon reserves of the country, the share of imports may increase further). Through the use of renewable energy sources, the dependency on imports can be reduced, as the use of renewable energy is planned to be realised from domestic sources.

Priority (d): Development of a green economy. The rational use of renewable energy sources, in close coordination with energy conservation and energy efficiency programmes, may constitute the basis of the creation of a new (green) sector of the economy. New jobs will be created through the establishment and operation of investments, and in the related industries and horizontal sectors (e.g. equipment manufacture). The reduction of fossil energy source imports will lead to an improvement of the balance of payments and foreign trade balance, and to an increase of the GDP and domestic added value. Since in most areas the use of renewable energy sources is more advantageous in terms of operational costs than the use of fossil energy sources, the competitiveness of market actors investing in this field will also improve in the long term.

Expected results: Increased incorporation of renewable energy sources during the modernisation of public buildings, in accordance with Article 13(6) of the ED

2.1.1.3 Measures (EE and/or RES in public building and/or historical building)

General objectives: An order of priority among the measures cannot be determined,

Specific objectives: For the project purpose, we focus on priority 27. Energy programmes for public buildings

General objectives: reducing the dependency on imports

Specific objectives: the use of renewable energy is planned to be realised from domestic sources.

Conclusion:

The utilisation and spreading of renewable energy sources could represent one of the breakthrough points for Hungary's economy. Hungary has excellent comparative assets in certain areas of energy sources, the exploitation of which will enable, in addition to the fulfilment of energy and climate policy objectives, economic development, job creation and the sustainable development of the countryside. The Government considers progress in renewable energy sources a part of complex green economy development, which is an integral part of the expansion of related industries (the environmental industry).

In 2010 a new era has begun in Hungary in the field of energy policy as well.

The objectives of the NAP have been determined on the basis of our assets, realistically achievable possibilities and the considerations of economic development and job creation. Based on these, significant progress can be expected in all segments of renewable energy sources; by 2020, gross renewable energy source use will double compared to the 2010 level. Significant progress can be expected in all segments of renewable energy sources.

2.1.2 KEOP (EEOP) Environment and Energy Operational Programme

Környezet és Energia Operatív Program (KEOP)

1.2.4.1 Objectives

General objectives

The EEOP is a support scheme announced for the financial planning period between 2007 and 2013.

Specific objectives

Owing to its membership in the European Union, Hungary is eligible to several thousand billion forints of aid from EU resources for development purposes in the period between 2007 and 2013. From the total budget of EUR 4916 million of the Environment and Energy Operational Programme, which is realised under the EU's cohesion policy, two priorities support energy projects in Hungary: 5.15 percent of the total budget are available for the goals of the priority axis "Increasing the use of renewable energy," and 3.14 percent for those of the priority axis "Efficient energy use" which is aimed at promoting energy saving.

1.2.4.2 Priorities and expected results

Priorities: Increasing the use of renewable energy, efficient energy use

Measures of each priority: Support for the priority axis "Increasing the use of renewable energy" is provided from the European Regional Development Fund, and therefore, only the regions of Western Transdanubia, Central Transdanubia, Southern Transdanubia, Northern Hungary, Northern Great Plain and Southern Great Plain (Hódmezővásárhely is located in this region) are eligible to EEOP aid. The region of Central Hungary supports investments aimed at increasing the use of renewable energy sources independently, through an operational programme of its own, a "mirror programme" corresponding to the renewable energy priorities of EEOP. The primary goal of EEOP is to have a favourable influence on the resource structure of domestic energy sources, i.e. to facilitate a shift from fossil energy sources to renewable ones. With a view to achieving an increased proportion of renewable energy sources, applications can be submitted for heat and/or electricity generation aid.

1.2.4.3 Measures, Funding scheme, Beneficiaries

Beneficiaries: Small-and medium-sized businesses, other businesses, governments and institutions, public organizations, civil society organizations.

The programme/call focus on RES/EE in public buildings and historical buildings.

Percentage of funding: 30-100%

Website: <http://www.nfu.hu/doc/534>

Further calls related to the previous Programme:

The Call title in local language: Új Széchenyi Terv, KEOP-2011-4.9.0 Épületenergetikai fejlesztések megújuló energiaforrás hasznosítással kombinálva

Call title in English: New Széchenyi Plan, KEOP-2011-4.9.0 Building energy recovery, combined with developments in renewable energy

The call has been published in the framework of the regional policy/strategy.

Expected projects referring to priority: Priority of this call - in line with the EU strategy to encourage local and decentralized, environmentally sound renewable energy penetration systems, with special emphasis on energy efficiency and energy savings.

- energy efficiency improvement activities;
- improve the thermal characteristics of buildings (insulation, door and window replacement);
- upgrading institutions for heating, cooling and domestic hot water systems;
- upgrading non-productive businesses for heating, cooling and hot water systems;
- upgrading lighting systems;
- renewable energy developments in building energy for combined operations.

Beneficiaries: Small-and medium-sized businesses, other businesses, governments and institutions, public organizations, civil society organizations.

The call focus on RES/EE in public buildings.

Website: <http://ujszechenyiterv.gov.hu/content/7238/>

2.2 Regional strategies

2.2.1 KMOP (CHOP) Central Hungary Operational Programme

2.2.1.1 Objectives

Increasing the use of renewable energy sources (CHOP-3.3.3.-11)

Duration: 2011-13

General Objectives:

This programme constructions overall goal is spreading the reduce environmental damage with the use of renewable energy-based power production. The other general objective is to increase the use of renewable energy sources in electricity and heat overall use of energy and thereby reduce carbon dioxide emissions.

One of the priority areas in CHOP is - in line with national and EU energy policy - the mainstreaming of environmental considerations in economic development. The facility also aims to promote investments improving the use of renewable energy sources with non-repayable grants.

2.2.1.2 Priorities and expected results

Some of the main Eligible Activities:

Local heating and cooling demands solve with renewable energy sources:

1. Solar energy use Solar Systems (solar)
 - a) domestic hot water: demand full or partial satisfaction;
 - b) total or partial satisfaction: a domestic hot water and / or heating and / or cooling heat demand;
 2. Geothermal energy use
 3. Biomass
 4. Heat pump systems
- Cooling demands for renewable energy sources

2.2.1.3 Measures, Funding scheme, Beneficiaries

Financial issue:

The amount of aid is 1 billion HUF

Grant rate 10-90%

This tender may be awarded is a minimum amount of 3 million up to £ 100 million per project.

Website: http://www.sff.hu/9974.palyazat.megujulo_energiahordozo_felhasznalas_novelese_kmop_33_11

2.2.2 HÖFCÉDE_ Local governmental development subsidy without geographical limitation

2.2.2.1 Objectives

General objectives: Supporting the development function of local authorities

The purpose of the decentralized local government development assistance programs are the development of municipal services and related fixed assets, supply of intangible assets, the reduction of existing inequalities.

2.2.2.2 Measures, Funding scheme, Beneficiaries

Duration: 2007, 2008

Legal issue: 47/2008. (III. 5) Government Regulation

Eligible Activities: construction, planning, equipment

Form of support: non-refundable grant

Regions:

- South Great Plain Regional Development Council
- North Great Plain Regional Development Council
- West Transdanubian Regional Development Council
- thermal insulation, aesthetic quality change

3. Local strategies

There are no existing energy projects and strategies on public heating in Hungary.

4. Main Conclusions

Weaknesses of the existing programs

- **The programmes and financial sources are not extended enough**
- **The lack of overall national programmes** (energy efficiency + renewable energies)
- **The administration is too time-needed:**
Because of the complex EU regulations the programs need extensive administration system (it can be 100 pages), so the award of the tender can take months. In special cases the automated system cannot handle the energetic attachments.
- **The documentation is too detailed and not up to date enough:**
Extremely cost-and time-consuming - and not eligible - project preparation activities. That means: at submission the applicant must have a valid planning permission, and a complex feasibility study.

Strengths of the existing programs

- **Chance equality**
- **Specific environmental target values:** The advantage of the system is that the project savings are measurable, and there are strict controls.
- **Specific economical target values** (NPV, Payback time, IRR, Cashflow)
- **Specific energy target values** (building construction, HVAC, Renewable energies)
- **High intensity:** One of largest virtues of the programs support for non-residential buildings are the high intensity. Up to 70-80% contribution can be required for certain building types.
- **Automated system:** The applications are lightweight automatic procedures dealt with.