PF4EE
PRIVATE FINANCE FOR ENERGY EFFICIENCY

European Investment Bank
The EU bank

European Commission

Life

Energy Efficiency Projects in Europe

Examples of energy efficiency projects that could be financed through the PF4EE instrument

March 2019

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adelphi

MACS Energy & Water

Brochure „Energy Efficiency Projects in Europe“

The brochure “Energy Efficiency Projects in Europe” collects examples of good practice energy efficiency projects across Europe, including information on their estimated energy and cost savings. The brochure can be used as a source of inspiration, by bankers as well as their clients.

Private Finance for Energy Efficiency (PF4EE)

This brochure has been developed as part of the Expert Support Facility of the “Private Finance for Energy Efficiency” instrument. PF4EE is a joint financial instrument of the European Investment Bank and the European Commission under the European Union’s LIFE Programme. PF4EE was launched in 2015 to provide adequate and affordable commercial financing for energy efficiency investments across Europe. The instrument leverages energy efficiency financing through PF4EE partner banks, which benefit from an EIB loan, a risk sharing facility, and dedicated expert support.

The PF4EE loan conditions and how to apply:

Who can apply?	In general: SMEs, MidCaps and large enterprises (including ESCOs)
Loan size?	Up to EUR 5 million, depending on company type and project
Maturity?	3-20 years
Target projects?	Energy efficiency projects relating to existing buildings, industry, public lighting, district heating and cooling; as well as small renewable energy projects for self-consumption and cogeneration of heat and power.
How to apply?	The energy savings potential of investment projects must be estimated and documented to qualify for PF4EE financing. Get in touch with a PF4EE partner bank to learn which documentation is required.

Download this document & find out more about PF4EE on the project webpage pf4ee.eib.org

- ✓ Overview of and links to participating partner banks
- ✓ Links to the PF4EE Web-Check Tools and the EEQuest Tool
- ✓ Overview of pipeline development activities
- ✓ PF4EE news and success stories
- ✓ Downloadable material
- ✓ Contact information

Energy Efficiency in Existing Buildings

→ Investments which improve the energy performance of an existing building, either relating to the building envelope or to the building's technical system

IFA Continental Hotel
SPAIN – Gran Canaria


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Measure

Installation of a new chiller with a heat recovery system; heat used for pool heating and domestic hot water generation

Key figures

Total investment cost:
EUR 42,900

Annual energy savings:
114,452 kWh

Annual cost savings:
EUR 6,867

Payback period:
6.2 years

Source: Creara Energy Experts

Office building
CROATIA – Zagreb

Measure

Deep renovation of a business building, including the complete renovation of the outer building envelope (including all the walls and openings, i.e. windows and doors) to low energy standard, reconstruction of heating, cooling and ventilation systems, installation of new LED technology in the lighting system and installation of a PV power generation system on the facade.

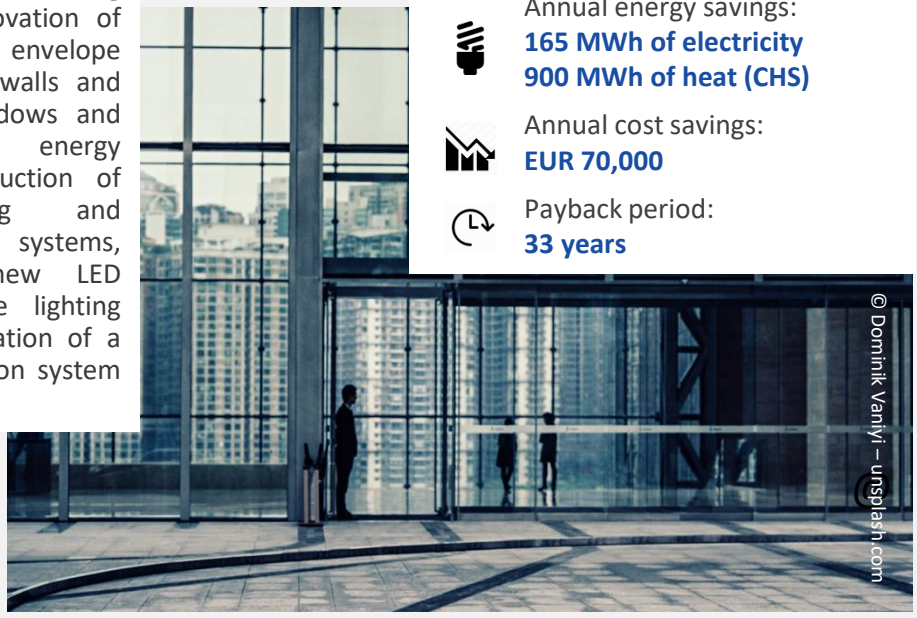
Key figures

Total investment cost:
EUR 2,300,000

Annual energy savings:
165 MWh of electricity
900 MWh of heat (CHS)

Annual cost savings:
EUR 70,000

Payback period:
33 years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Source: Study undertaken by EIHP

Installation of low-flow showerheads + tap aerators

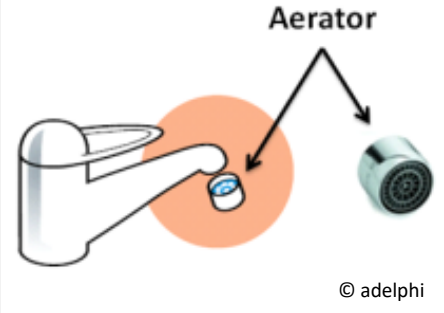
SPAIN

Key figures

Total investment cost:
EUR 5,600

Annual energy savings:
250,925 kWh

Payback period:
0.2 years



Measure

Installation of 415 units of low-flow showerheads and tap aerators, substituting conventional filters. Note: Tap aerators mix water with air bubbles, while low-flow showerheads appropriately spread the water flow. Tap aerators are simply screwed on the tap, and low-flow showerheads replace the previous one.

Source: Creara Energy Experts

Corona del Mar Hotel

SPAIN – Alicante

Measure

Installation of an ozone washing system

Key figures

Total investment cost:
EUR 7,080

Annual energy savings:
92,862 kWh

Annual cost savings:
EUR 7,393

Payback period:
1 year

Source: Creara Energy Experts; see also:http://www.nezeh.eu

Hotel Restaurant Biberach

FRANCE – Bélesta

Key figures

Total investment cost:
EUR 177,100

Supportive financing:
EUR 45,055 (ADEME)
EUR 45,055 (Languedoc Roussillon Region)

Annual cost savings:
EUR 5,000

Measures

Geothermal installation , including:

- Horizontal and vertical probes responding to the respective terrain
- Storage of hot and cold water in two old tanks that have been insulated
- Two geothermal pumps have been installed to cover the heating (and cooling) demand

Source: ADEME. Les exemples à suivre. Retrieved from http://www.ademe.fr/sites/default/files/assets/documents/geothermie-sur-champ-sondes-cave-hotel-restaurant-riberach-belesta-66-2013.pdf on 25 April 2018.

University building

PORTUGAL

Key figures

Total investment cost:
EUR 381,700

Annual cost savings:
EUR 31,530

Payback period:
12.1 years

Measures

- Walls external thermal insulation
- Roof thermal insulation
- Low-e double-glazing
- Biomass boiler
- Micro PV power plant (self-consumption, 10 kWp)

Source: RdA – Climate Solutions

Installation of heat pumps
SLOVAKIA

Measure

A small company involved in the production of machine components addressed the issue of its future heating as part of the reconstruction of the office building. The building was originally heated by two electric boilers with a power of 2x30 kW. The object could not be connected to the heat supply system and there was also no gas connection. After considering various alternatives, the company decided to install heat pumps (i.e. two air / water heat pumps of 22 kW). As part of the project, the heating system was reconstructed. Also, the radiators' surfaces were adapted to the low-temperature heating method.

Key figures

Total investment cost:
EUR 33,000

Annual energy savings:
70 MWh

Annual cost savings:
EUR 6,700

Payback period:
5 years

General information: The main advantage of heat pumps is that they make it possible to use the heat of the environment, which is available for free. Heat pumps convert this heat to a temperature-utilisable level, with the amount of electrical energy needed for the transformation being several times smaller compared to the same effect achieved by the direct use of electric energy for heating. In addition to economic efficiency, heat pumps contribute to protecting the environment and increasing energy independence.

Source ENVIROS

Indalo Park
SPAIN - Barcelona

Measures

- Replacement of the existing two stage oil burner with a natural gas burner (modulating type)
- Installation of a variable speed motor driving the pump that serves the fancoil's circuit

Key figures

Total investment cost:
EUR 47,479

Annual energy savings:
31,105 kWh

Annual cost savings:
EUR 8,213

Payback period:
5.8 years

Source: Creara Energy Experts

Multi-apartment building Ulica Kolarove breze

CROATIA – Zagreb

Key figures

Total investment cost:
EUR 102,300 (40% grant from Environmental Protection and Energy Efficiency Fund)

Annual energy savings:
128 MWh of electricity

Annual cost savings:
EUR 17,000

Payback period:
6 years (without grant)

Measure

The energy renovation of the building covered the vertical waterproofing of the walls in the ground, the thermal insulation of ceilings and the attic with mineral wool, the insulation of the external walls with 14 cm expanded polystyrene and the replacement of exterior joinery (windows and doors).

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Background information

This multi-apartment building was constructed as a temporary accommodation for people who have lost their homes in the large flood in 1964. Throughout the years, this temporary accommodation became permanent. The building has 33 residential units, most of them smaller than 30m^2. Prior to the renovation, the building used 222.6 kWh/m^2 per year for heating, which could be reduced by 80% (the building's energy class improved from F to B). Thereby, the energy efficiency measures could significantly reduce the tenants' energy costs. The reduction of energy costs amounts to approx. 0.77 EUR/m^2, while for enabling the investment the tenants needed to increase the building management fee by 0.64 EUR/m^2, leaving a net annual saving of 0.13 EUR/m^2. Even more importantly, the quality of life in the building has increased significantly. In addition to the co-financing by the Fund, the building also obtained funds from the European Investment Bank through a commercial bank loan for 10 years at an interest rate of 5.6%.

Source: Environmental Protection and Energy Efficiency Fund. Retrieved from http://fzoeu.hr/docs/primjeri_dobre_prakse_projekata_energetske_ucinkovitosti_u_hrvatskoj_2015_godine_v1.pdf on 24 April 2018; Planetaris. Retrieved from www.planetaris.com/na%C5%A1a-rje%C5%A1enja/energetska-obnova-zgrada/vi%C5%A1estambene-zgrade/primjeri on 24 April 2018.

Hotel Villa Adriatica

CROATIA – Supetar

Measure

Energy efficiency and renewable energy measures required to become nearly zero energy hotel, including Variable Refrigerant Volume (VRV) system for Heating, Ventilating, and Air Conditioning (HVAC), building envelope refurbishment, water consumption reduction, domestic hot water preparation with solar collectors, lighting system reconstruction, new appliances in the laundry room, photovoltaic system and VAR compensator.

Key figures

Total investment cost:
EUR 95,000

Annual energy savings:
35,000 kWh

Annual cost savings:
EUR 5,000

Payback period:
19 years

Source: Nearly Zero Energy Hotels . See also: https://nezeh.com/; EIHP

Retrofit of the Karlovac hospital (ESCO model)

CROATIA

Key figures

Total investment cost:
EUR 8,500,000

Grant:
EUR 2,600,000

Annual energy savings:
6.5 GWh of heat

Annual cost savings:
EUR 528,000

Annual repayment fee to ESCO:
EUR 423,000

Payback period:
14 years

Measures

- Building envelope insulation
- Replacement of windows
- Fuel switch to natural gas
- Heating substations
- Thermostatic valves
- Heat pumps
- Solar thermal systems
- New cooling system
- Replacement of in-door lighting

Background information

The Karlovac general hospital was constructed in six phases between 1963 and 1990. It has a gross surface of 37,000m^2 and accommodates 429 patient beds. The investment is completed through an ESCO model, with co-financing from the Environmental Protection and Energy Efficiency Fund. The payback period, i.e. the duration of the Energy Performance Contract, is 14 years. Annual cost savings are 528,000 EUR, while annual net cost savings (savings after repayment of the fee to the ESCO) are approx. 105,000 EUR.

Source: APN – Croatian Real-estate Agency. Retrieved from www.apn.hr/ob-karlovac.aspx; Ministry of Construction and Physical Planning. Retrieved from www.mgipu.hr/doc/EnergetskaUcinkovitost/EnergetskaObnova/Energetska_obnova_OB_Karlovac-info.pdf on 24 April 2018; Rockwool Adriatic – Energy Renovation of Hospital in Karlovac. Retrieved from https://www.youtube.com/watch?v=fmhhU2qwd2U on 24 April 2018.

Multi-apartment building Ulica Vincenta iz Kastva

CROATIA - Zagreb

Measures

- 14cm thermal insulation of the walls
- 6+8cm thermal insulation of the roof and partial replacement of windows and doors
- Joinery replacement in 23 apartments (with installations of double glazed windows and three-glazed windows with two layers)
- Replacement of the exterior joinery in the common unheated spaces of the building

Background information

The building was constructed during the years 1960-1968. It has 53 apartments, a net surface area of 4,614 m^2 and is connected to the district heating system. In 2015, the energy renovation of the building was finalised, enabling a reduction of annual energy consumption for heating purposes from 165.73 kWh/m^2 (energy class E) to 47.76 kWh/m^2 (energy class B).

Key figures

Total investment cost:
EUR 347,000 (Grant 40%)

Annual energy savings:
413 MWh of heat (DHS)

Annual cost savings:
EUR 14,400

Payback period:
24 years (without grant)

Source: Environmental Protection and Energy Efficiency Fund; Planetaris. Retrieved from www.planetaris.com/na%C5%A1a-rje%C5%A1enja/energetska-obnova-zgrada/vi%C5%A1estambene-zgrade/primjeri/ on 24 April 2018; Fugger – Upravljanje nekretninama. Retrieved from http://www.fugger.hr/2016/02/23/zavrsena-je-energetska-obnova-zgrade-vincenta-iz-kastva-2-zagreb/ on 24 April 2018.

Hotel

GREECE – Athens

Key figures

Total investment cost:
EUR 35,000

Annual energy savings:
165,000 kWh

Annual cost savings:
EUR 27,500

Payback period:
15 months

Measure

Replacement of 500 existing lighting fixtures (80W each) with LEDs (42W)

Background information

CO_2 emissions:

- Before: 136.15 tons
- After: 79.42 tons

Source: KAFKAS. Retrieved from http://corporate.kafkas.gr/Uploads/Documents/1766/payasusave%2020160526.pdf on 25 April 2018.

Effective ventilation systems
CZECH REPUBLIC

Key figures

Total investment cost:
CZK 17 mio (~ EUR 665,000)

Annual energy savings:
420 MWh (heat)
2,000 MWh (electricity)

Annual cost savings:
CZK 5.5 mio (~EUR 217,000)

Payback period:
3 years

Measure

Based on the recommendations of an energy audit, the company management decided to reconstruct the existing air-conditioning equipment. The project consisted in the complete renovation of the air-conditioning units with units of exhaust air recovery. As part of the project, the wet air supply system was changed and the management system was modernised. The simple payback time of the project did not exceed 3 years, which was also one of the key management requirements.

General information

Heat recovery units use the heat of the exhausting air for heating the fresh air that is coming from outside. Also, it can be used in the reverse, for cooling purposes. In this case, cooler air exhausted from the air-conditioned area cools the warmer air sucked from the outside. A well-designed heat recovery system can save up to 90% of energy for heating or cooling. Depending on the local conditions and the scope of the measure, the simple payback time of projects for streamlining building ventilation ranges from 3 to 8 years.

Source: ENVIROS

Hotel
GREECE – Zakynthos Island

Measures

- Replacement of the traditional light bulbs with LEDs
- Improvement of the air-conditioning system (replacement of the outdoor units with others including inverters)
- Installation of a card key in all rooms to save energy when rooms are not occupied

Key figures

Total investment cost:
EUR 35,000

Annual energy savings:
40,000 kWh

Annual cost savings:
EUR 3,300

Payback period:
10.6 years

Source: neZEH. Retrieved from www.nezeh.eu/posters/retrofitting_an_existing_hotel_a_case_study.html on 25 April 2018; information from M. Fyrillas (Env. Engineer, LEED Green Associate) & E. Andreou (Architect, Env. Consultant)

Thermal insulation of a laboratory building
SLOVAKIA

Measure
In order to reduce heat losses, a building project for the thermal insulation of a laboratory building of a medium-sized industrial enterprise was carried out, concerning both the building envelope and the roof of the building. Thanks to this measure, the energy consumption for building heating could be reduced by more than 50%.

Key figures

Total investment cost:
EUR 58,600

Annual energy savings:
115 MWh

Annual cost savings:
EUR 4,700

Payback period:
12.5 years

General information
Energy needed for the heating of buildings is one of the most important cost items in the area of housing. By improving the thermal and technical properties of older buildings, heating costs can be reduced significantly. The payback period of building insulation projects is rather long compared to other types of energy-saving measures, ranging between 10 and 30 years depending on the specific conditions.

Source: ENVIROS

Hotel Caballero
SPAIN - Mallorca

Key figures

Total investment cost:
EUR 80,027

Annual cost savings:
EUR 30,234

Payback period:
2.7 years

Measures

- Installation of 16 solar thermal collectors
- Installation of tubular heat exchanger
- Retrofitting of old gas boiler

Source: Creara Energy Experts

Energy Efficiency in Industry

→ Investments which improve the energy performance of industrial processes, industrial equipment or an industrial facility

Paper company: energy efficiency in production

SLOVAKIA

Measure

The paper company primarily addressed problems with technical failures during production, which were found to result from insufficient heat source performance. The problem was resolved through the implementation of a waste heat recovery system within the existing process. In addition to minimising the downtime in production and improving the production economy, this also contributed to absolute energy savings and delayed the need for high investments in a new heat plant.

Key figures

Total investment cost:
EUR 350,000

Annual energy savings:
11,000 MWh (natural gas)

Annual cost savings:
EUR 330,000

Payback period:
1.1 years

Source: ENVIROS

Footwear facility: energy intensive industry

PORTUGAL

Measures

- Energy management system (monitoring and control)
- LED lights
- Replacement of the chiller with a high efficiency chiller
- Heat recovering from the boilers

Key figures

Total investment cost:
EUR 369,150

Annual cost savings:
EUR 64,650

Payback period:
5.7 years

Source: RdA – Climate Solutions

Use of waste heat in compressed air systems

CZECH REPUBLIC

Measure

A medium-sized engineering firm has decided to implement a project aimed at recovering the waste heat generated by the production of compressed air. The project consisted of supplementing existing air compressors with heat exchangers to extract heat from compressor cooling and to use it in the existing heating and hot water system. The implementation of the project eliminated entirely the need for natural gas for the preparation of hot water; in the heating season, the consumption of natural gas for heating was reduced. The simple payback time of this project was only one year.

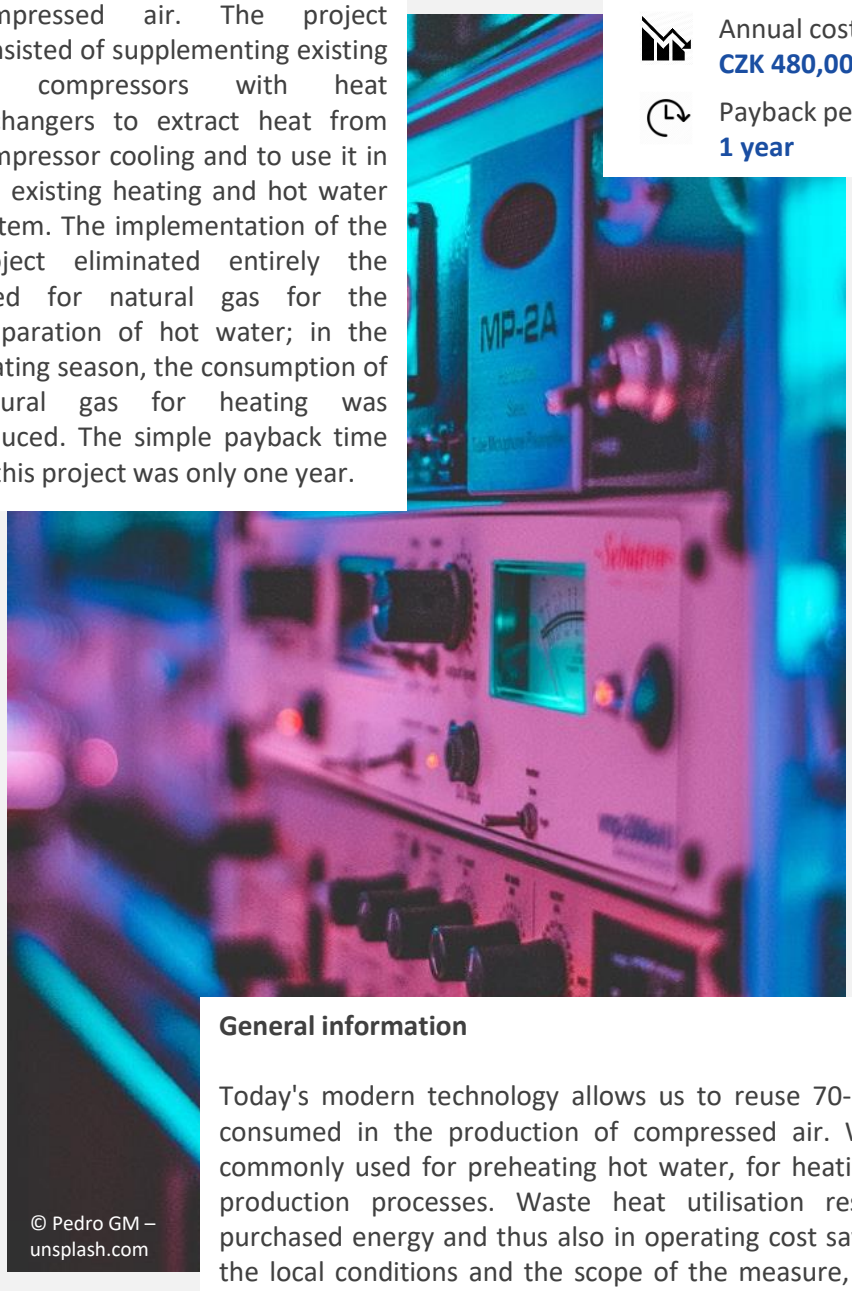
Key figures

Total investment cost:
CZK 480,000 (~EUR 18,800)

Annual energy savings:
860 MWh (natural gas)

Annual cost savings:
CZK 480,000 (~EUR 18,800)

Payback period:
1 year



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General information

Today's modern technology allows us to reuse 70- 90% of the energy consumed in the production of compressed air. Waste heat is most commonly used for preheating hot water, for heating or for the use in production processes. Waste heat utilisation results in savings in purchased energy and thus also in operating cost savings. Depending on the local conditions and the scope of the measure, the simple payback period for reusable waste heat projects usually ranges from 1 to 5 years.

Source: ENVIROS

Factory for production of electricity generators
ITALY

Measures

- Monitoring system, lamps replacement
- Compressors, compressed air network
- *Heat recovery (not incl. in key figures)*

Key figures

Total investment cost:
EUR 80,200

Annual cost savings:
EUR 37,700

Payback period:
2.1 years

Source: Energy survey undertaken by RINA Consulting S.p.A.

Ceramics factory
ITALY

Key figures

Total investment cost:
EUR 432,500

Annual energy savings:
889 MWh (electricity)
148,200 Sm³ (natural gas)

Annual cost savings:
EUR 187,700

Payback period:
2.3 years

Measures

- Compressed air maintenance
- Thermal insulation hot water network
- Monitoring system
- New compressor
- Lamps replacement
- New chiller
- Heat recovery from ovens

Source: Energy survey undertaken by RINA Consulting S.p.A.

Wool mill

ITALY

Measure 1

Enhancement of the measuring and monitoring system: electricity, steam, natural gas, hot water, cold water, temperature, installation of the data transmission network and of the data analyser

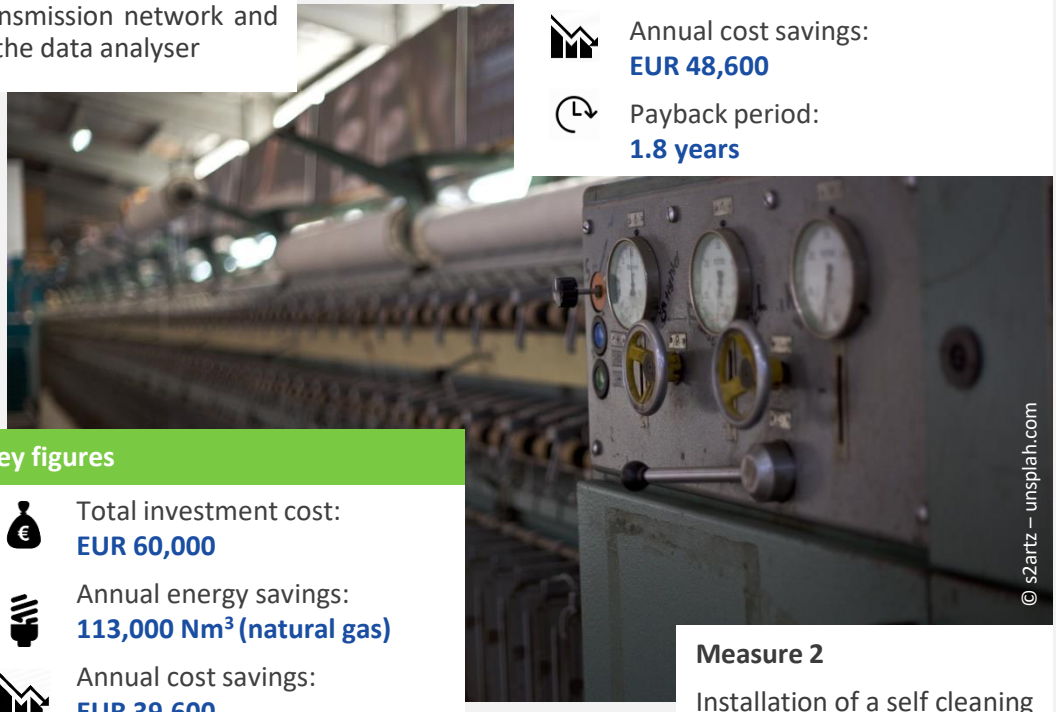
Key figures

Total investment cost:
EUR 88,000

Annual energy savings:
171 MWh (electricity)
49,300 Nm³ (natural gas)

Annual cost savings:
EUR 48,600

Payback period:
1.8 years



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Key figures

Total investment cost:
EUR 60,000

Annual energy savings:
113,000 Nm³ (natural gas)

Annual cost savings:
EUR 39,600

Payback period:
1.5 years

Measure 2

Installation of a self cleaning heat exchanger (efficiency around 70%)

Measure 3

Heat recovery from exhaust gases of the boilers

Key figures

Total investment cost:
EUR 220,000

Annual energy savings:
229,000 Nm³ (natural gas)

Annual cost savings:
EUR 80,000

Payback period:
2.8 years

Source: Energy survey undertaken by RINA Consulting S.p.A.

Paper factory
POLAND

Measures

- Replacement of two pulpers at the pulping shop
- Replacement of HW refiners
- Replacement of 8 vacuum pumps by a turboblower unit
- Replacement of the 2 existing drying hoods by new ones operating at a higher dew point
- Replacement of old sheeter by a new one
- Renewal of moving bed biofilm reactor (MBBR) air blowers
- Renewal of two compressors in the paper mill compressor station
- Installation of high efficiency lighting

Key figures

Total investment cost:
EUR 9,550,000

Annual energy savings:
32,700 MWh of steam
11,400 MWh of electricity

Annual cost savings:
EUR 1,294,000

Payback period:
7.4 years

Source: Energy survey undertaken by RINA Consulting S.p.A.

Ceramic bricks industry
FRANCE

Key figures

Total investment cost:
EUR 1,800,000

Annual energy savings:
Gas: 2,570,000 Nm3
Electricity: 237,000 kWh

Annual cost savings:
EUR 286,800

Payback period:
6.5 years

Measure

Replacement of the kiln

Benefits: Better insulation; shortening of the firing cycle; heat recovery for drying purposes and improvement of drying process

Operational results: Decreased specific gas consumption for firing and drying (from 125 to 60 m^3/tn finished product) and decreased specific electricity consumption (from 100 to 94 kWh/tn finished product)

Source: Energy Audit by the engineer K. Argyroudis

Engineering firm: efficient heat production
SLOVAKIA

Measure
The management of a medium-sized engineering firm has decided to renovate a steam boiler to meet stricter emission limits and to make heat production more efficient. The measure consisted of replacing the original burner with a new low-emission burner. The return time of the project was approx. 3 years.

Key figures

Total investment cost:
EUR 46,500

Annual energy savings:
500 MWh (natural gas)

Annual cost savings:
EUR 15,400

Payback period:
3 years

General information
In a boiler system, the task of the burner is to mix in the correct ratio of fuel and air and to ensure that it is burning under optimum conditions. Correct burner sizing and adjustment significantly helps to minimise perceptible heat losses and losses due to imperfect combustion. Hence, it has a major influence on the overall efficiency of the boiler. The lifetime of a well-sized and well-maintained boiler can exceed 40 years. By replacing the original burner with a high-efficiency burner with a smooth mixing ratio regulation, more than 5% of fuel savings can be achieved. Investments in burner replacement are not very investment-intensive, and offer favourable payback periods (2- 5 years).

Source: ENVIROS

Packaging facility (metal) / energy-intensive industry
PORTUGAL

Key figures

Total investment cost:
EUR 236,750

Annual energy savings/production:
550,500 kWh

Annual cost savings:
EUR 61,028

Payback period:
3.9 years

Measures

- Variable Speed Drives
- Tuning and maintenance of the metal sheets printing burner
- Energy Management System (ISO 50001 and submetering)
- PV power plant (self-consumption, 220 kWp)

Source: RdA – Climate Solutions

Dairy industry
ITALY

Key figures

Total investment cost:
EUR 115,000

Annual energy savings:
15,920 GJ

Annual cost savings:
EUR 60,225

Payback period:
1.9 years

Measure
Installation of an economiser

Background information

Heat in the dairy industry is provided by a gas-fired boiler. Some characteristics are:

- 20 tn/h superheated steam
- Fuel: natural gas, 10% excess air
- Boiler efficiency: 80%
- Flue gas temperature: 300 °C
- Fuel Consumption 292.680 GJ/y

After the installation of the economiser, the following could be achieved:

- Flue gas temperature: 180 °C
- Thermal loss reduction from flue gases: 4.8%

Source: Energy Audit by the engineer K. Argyroudis

Cogeneration of Heat and Power

→ Investments which promote the simultaneous generation of heat and electricity and thus allow for a more efficient use of fuel

Cogeneration units: hotel complex with swimming pool

CZECH REPUBLIC

Key figures

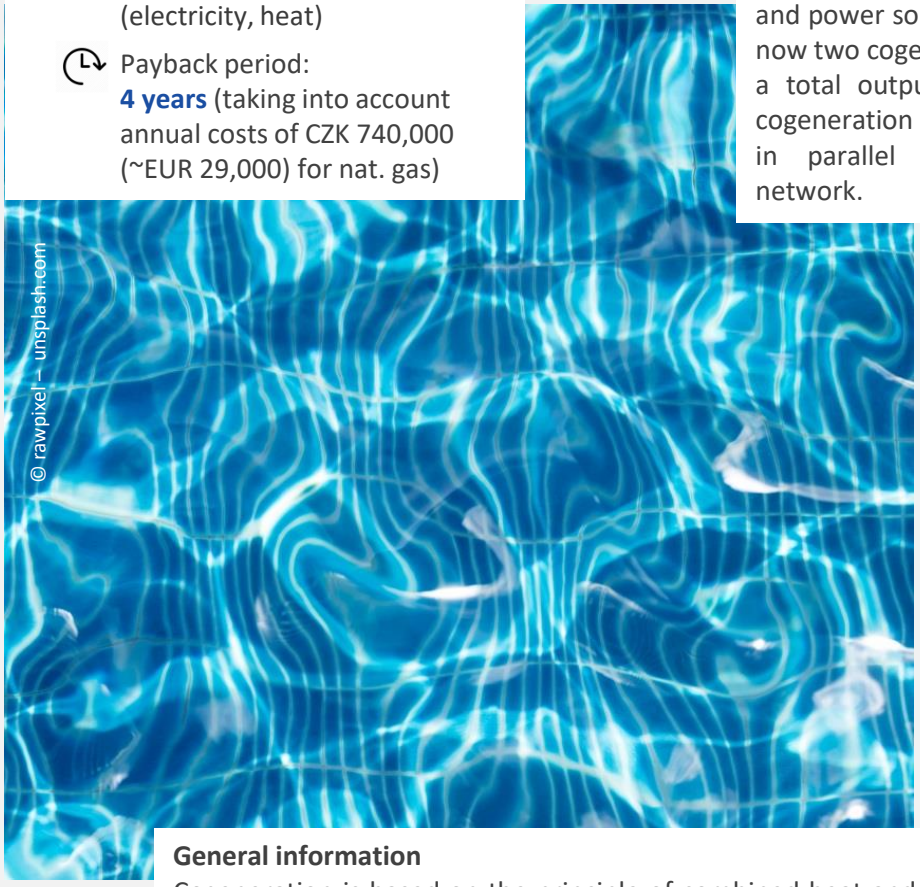
Total investment cost:
CZK 2.7 mio (~EUR 105,500)

Annual cost savings:
CZK 1.4 mio (~EUR 54,700)
(electricity, heat)

Payback period:
4 years (taking into account annual costs of CZK 740,000 (~EUR 29,000) for nat. gas)

Measure

The hotel complex with swimming pool originally purchased heat from the heat supply system. Then it decided to install its own combined heat and power source. The hotel has now two cogeneration units with a total output of 60 kW. The cogeneration units are operated in parallel with the public network.



General information

Cogeneration is based on the principle of combined heat and power generation in one installation. The total efficiency of cogeneration units, depending on the unit performance and heat recovery rate, typically ranges between 80 and 95%. The economic efficiency of cogeneration depends on the total use of electricity and, in particular, the heat output. The return on investments is very favourable and ranges from 2 to 5 years.

Source: ENVIROS

Family sized biogas plant (OPG Vrček)

CROATIA

Key figures

Total investment cost:
EUR 1.3 mio capex:
40% from IPARD and the rest as bank loan + opex

Annual energy savings:
2.0 GWh electricity
3.16 GWh heat

Annual cost savings:
EUR 380,000 FIT +
heat used for pigsty

Payback period:
~ 10 years (opex influence)

Measure

The biogas plant OPG Vrček is part of a family farm that deals with pig breeding. In order to round off the food-waste-energy cycle, a biogas power plant of 250 kWel / 250 kWth was built at the farm in 2016. The manure from the farm with the addition of organic mass is used as a renewable source for producing electrical and thermal energy. At the same time, fermentation produces a high humus fertiliser for the organic fertilisation of the soil.

Background information

OPG Vrček is the first co-generating plant co-financed through the Instrument for Pre-Accession Assistance in Rural Development (IPARD) programme in the Republic of Croatia. The total investment amounted to EUR 1.3 million, of which ca. 40% were financed through the IPARD programme, and the rest through a commercial bank credit.

Source: Biogas Action H2020; EIHP

Paper producing industry

GREECE

Key figures

Total investment cost:
EUR 1,440,000

Annual cost savings:
EUR 374,000

Payback period:
4 years

Measure

Introduction of a CHP system with steam turbine fuelled with biomass residues

Background information

The industry consumes 11.13 GWh electricity annually; the monthly electricity consumption is stable and in the order of 885,000 kWh. The thermal processes of the industry require approximately 4.5 t/h of steam which are covered from the consumption of 2,320 t mazut annually. The proposed CHP system will be a steam turbine fueled with biomass with a capacity of 1,150 kWe.

Source: Study provided by EXERGIA S.A.

Energy Efficiency in Outdoor/Public Lighting

→ Investments which reduce the energy consumption of outdoor/public lighting systems through the installation of highly efficient lighting technologies, such as e.g. LEDs, sensors, monitoring systems

Renovation of public lighting system through an ESCO model

CROATIA

Measure

Replacement of 954 older technology lamps (sodium lamps and halogen lamps) with more efficient LED fixtures (i.e. 667 LED lamps with a maximum installed power of 39 W, 120 LED lamps with a maximum installed power of 78 W and 167 LED lamps with a maximum installed power of 110 W)

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Key figures

Total investment cost:
EUR 411,000

Grant:
EUR 147,000

Annual energy savings:
297 MWh electricity

Annual cost savings:
EUR 52,000

Payback period:
8 years (without grant)

Background information

In 2016, the city of Novigrad-Cittanova in Croatia modernised its street lighting system. Following an ESCO approach, the city outsourced the technical risks and financing of the project to the private bidder with the most economic bid proposal. Technical assistance was ensured by the EBRD and included support for the tender process, as part of an EU-funded Regional Energy Efficiency Programme (REEP). The project was co-financed by the Environmental Protection and Energy Efficiency Fund in the form of a capex grant of EUR 147,000, accounting for 36% of the total capital expenditure. As a co-benefit of the measure, citizens benefit from better quality lighting and reduced light pollution.

Source: European Bank for Reconstruction and Development. Retrieved from www.wb-reep.org/files/EBRD_REEP_CS_Novigrad.pdf on 24 April 2018.

Public lighting retrofit, municipality in Northern Greece

GREECE

Measures

- Installation of a remote lighting management system
- Replacement of old inefficient lights with LEDs

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Key figures

Total investment cost:
EUR 240,000

Annual energy savings:
435,103 kWh

Annual cost savings:
EUR 65,000

Payback period:
3.7 years

Source: Kataskeves Ktirion. Retrieved from http://kataskevesktirion.gr.

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