



European
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JRC SCIENCE AND POLICY REPORTS

The European GreenBuilding Projects Catalogue 2014



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2014



EUR 27001 EN

Joint
Research
Centre

European Commission

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JRC92774

EUR 27001 EN

ISBN 978-92-79-44658-0 (PDF)

ISBN 978-92-79-44659-7 (print)

ISSN 1831-9424 (online)

ISSN 1018-5593 (print)

doi:10.2790/765654

Luxembourg: Publications Office of the European Union, 2014

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The European GreenBuilding Projects Catalogue 2014

**Paolo Bertoldi
Barbara Cuniberti
Andrea De Luca**

2014

Presentation

The goal of substantially improving end-use energy efficiency and promoting the use of renewable energy sources is a key component of the EU energy and environmental policies, shared by all EU Member States. The European Commission Directorate General Energy and Transport contributes to this goal through a series of actions under the "Intelligent Energy - Europe" Programme. In addition, given the large share of energy consumption in buildings and the large cost effective energy saving potential, special attention has been dedicated to the building sector. To this end a major step forward is represented by the Directive 2010/31/EU on the Energy Performance of Buildings.

The GreenBuilding Programme (launched in January 2005) is one of these actions, aimed specifically at private and public non-residential buildings.

The GreenBuilding Programme is a European Commission voluntary programme through which non-residential building owners and occupiers, being private or public organisations, are aided in improving the energy efficiency and to introduce renewable energy sources into their building stock. Any enterprise, company or organisation (hereinafter defined as "organisation") planning to contribute to the GreenBuilding Programme objectives can participate.

This document describes some of the projects implemented by GreenBuilding Partners in the period July 2011 to August 2012. The projects have been implemented in different types of buildings, such as office buildings, schools, hotels, shopping mall, etc. Both new construction and the refurbishment of existing buildings are covered by the report.

Additional information on the goals and the results of the GreenBuilding programme, as well as the current Partner's list and the list of the National Contact Points can be founded in the GreenBuilding Programme website at:

<http://iet.jrc.ec.europa.eu/energyefficiency/>

[Paolo Bertoldi](#)

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Partner: A15 Psykiatri

Building: Landstinget Uppsala Län

GreenBuilding 2014

Project: New Building

Address: Uppsala

Country: Sweden

Building Description and Technical Measures

The project is a new building of Psychiatric hospital. The project is located in Uppsala in Sweden. The project includes open care section, 96 close care places, administration offices as well as teaching and researching spaces. Today, the psychiatrists in this region is scattered in different hospitals. By gathering the different services in the new building experts can treat the patients more efficiently. Furthermore the council hopes to integrate the university research and teaching in the same building. The building design is aiming to accommodate various activities and easily adapt to new or modified activities. The building is supplied by district heating and cooling. The ventilation plant is provided with a heat recovery system. The lighting system is daylight controlled.

Technical Data

Building use	Healthcare & Social Work
Area	30.906 m²
PEC before or reference value	138, 00kWh/m²y
PEC	78,00 kWh/m²y
Energy savings %	43 %
Absolute savings	1.854.360,00 kWh/y
Financial info	/



Partner: Aachener Grundvermögen KAG mbH

Building: Münster Arkaden

GreenBuilding 2014

Project : Refurbishment

Address: Ludgeristraße 100, 48143 - Münster

Country: Germany

Building Description and Technical Measures

The Münster Arkaden is a shopping centre in North Rhine Westphalia. It was constructed in 2005. It is divided into two construction sections and has 5 upper floors and 2 basement floors. The whole building shell is integrated in the building picture of the historic centre of Münster. In the basement is placed the district heating transfer station, including two plate heat exchanger. The basic heating is provided by different ventilation system with equipped with heat recovery. The thermal volumes are recorded via meters installed in the individual areas. For cooling there are two reciprocator chillers. The lighting consists on fluorescent lamps as well as LEDs. Many areas are equipped with clock timer.

Technical Data

Building use	Wholesale & Retail
Area	43.671 m²
PEC before or reference value	286,20 kWh/m²y
PEC	212,06 kWh/m²y
Energy savings %	26 %
Absolute savings	3.237.767,00 kWh/y
Financial info	/



Partner: AB Platzer Gårda 8:2

Building: Gårda 8:2

GreenBuilding 2014

Project: Refurbishment

Address: Norra Kustbanegatan 19, 41664 - Göteborg

Country: Sweden

Building Description and Technical Measures

AB Platzer Gårda 8:2 This refurbished building was an industrial building and is today converted into a fitness gym. The building has 3 stores above ground and 1 below the ground. Energy savings measures have been taken in the ventilation system by increasing the inlet air temperature and hereby reducing heating loads and reducing the air flow rate by 17%. Intervention on the heating system has been also made and supply temperature has been lowered to reduce heating load. Furthermore, the differential pressure drop over the pump has been also reduced.

Technical Data

Building use	Sport & Leisure
Area	2.254 m²
PEC before or reference value	106,70 kWh/m²y
PEC	77,00 kWh/m²y
Energy savings %	28 %
Absolute savings	66.943,00 kWh/y
Financial info	/



Partner: AB Platzer Gullbergsvass I:I

Building: Gullbergsvass I:I

GreenBuilding : 2014

Project: Refurbishment

Address: Lilla Bommen 3, 41104 - Göteborg

Country : Sweden

Building Description and Technical Measures

The original office building had a heated floor area of 15218m². The refurbishment intervention started in 2011 and took place in three stages. Two new stories have been added on top of the extending construction. The actual heated floor area amounts to 19567m². The building is supplied by district heating and district cooling. Along with the addition of this new stories, some energy saving measures have been taken, including lowering the supply air temperature of the ventilation system from 20 to 16,5 degrees celsius, adding thermostats valves to the radiators and exchanging and upgrading circulation pumps.

Technical Data

Building use	Office
Area	19.567 m²
PEC before or reference value	103,80 kWh/m²y
PEC	58,90 kWh/m²y
Energy savings %	43,3 %
Absolute savings	465.694,00 kWh/y
Financial info	/



Partner: A.D.I.I. Development GmbH & Co.KG

Building: OBI Parsdorf

GreenBuilding 2014

Project : New Building

Address: Taxetstrasse 1, 85599 - Parsdorf

Country: Germany

Building Description and Technical Measures

This OBI retail is located in Parsdorf, Germany. The envelope of the building is very well insulated. Windows are equipped with aluminium frames with thermal break and solar control double glazed unit. The heating system is based on a condensing boiler and on well dimensioned heating pumps with power regulation. On the system a night-drawdown is active. The lighting system is equipped with a daylight responsive control. The ventilation system is provided of a heat recovery system (75%).

Technical Data

Building use	Wholesale & Retail
Area	8.904 m²
PEC before or reference value	267,00 kWh/m²y
PEC	191,00 kWh/m²y
Energy savings %	28,5 %
Absolute savings	676.704,00 kWh/y
Financial info	€ 121.900,00

Partner: Areim Kista I AB

Building: Färöarna 3

GreenBuilding : 2014

Project: Refurbishment

Address: Kistagången 20, 16440 - Kista

Country : Sweden

Building Description and Technical Measures

The building is situated in Kista, Stockholm, Sweden. The original building stood ready in 1986, built for office use. Also after the renovation the building is designed for office space. On ground level there is a commercial area including shops, cafés and lunch restaurants as well as nursing establishment. Level 1-11 is mainly office space. The main entrance is situated in building A. The building is divided into 8 parts, named A-H. The system for heating and cooling of the building is a solution with a geothermal heat pump, collecting heat from the ground during heating season and recapturing heat into the ground during cooling season and at the same time enabling cooling of the building. The heat pump is installed during the renovation process.

Technical Data

Building use	Office
Area	44.077 m²
PEC before or reference value	88,80 kWh/m²y
PEC	38,50 kWh/m²y
Energy savings %	57 %
Absolute savings	2.217.073,00 kWh/y
Financial info	/





Partner: Auhof Center Besitz und Betrieb GmbH

Building: Shopping Centre AUHOF CENTER - Building 6

GreenBuilding 2014

Project : New Building

Address: Albert Schweitzer Gasse 6 | 1140 - Vienna

Country: Austria

Building Description and Technical Measures

Building 6 is the recently (2012) new built part of the Shopping Centre AUHOF CENTER in 1140 Vienna. It was planned and built with the aim of energy saving and a small carbon footprint. The main goal for the investor and owner was to operate the building with low running cost thus to improve the competitiveness in terms of renting. The building envelope incorporates a high standard of thermal insulation and it is partly equipped with shading devices. Heating energy is provided by district heating (generated by a gas driven boiler plant, located in a neighboured building. For cooling there are two air-cooled compact cooling machines installed. Their automatic control is permanently optimizing the degree of efficiency. Heating and cooling mainly is done by three VAV air handling units, two of them (with a total 74.000 m³/h) equipped with highly efficient heat recovery systems (77% degree of efficiency) and the one for gastronomic spaces (16.500 m³/h) with a plate heat exchanger with 59% efficiency. To handle the additional cooling load there is a closed circular piping of cooled water 6/12°C to serve the cooling devices within the shops. For the sanitary hot water production stand-alone 5 litre electric driven water boilers have been chosen instead of a central storage tank and circulation piping (with big losses of energy because of permanent water circulation).

Technical Data

Building use	Wholesale & Retail
Area	11.658 m²
PEC before or reference value	160,70 kWh/m²y
PEC	138,70 kWh/m²y
Energy savings %	27 %
Absolute savings	256.476,00 kWh/y
Financial info	€70.000,00



Partner: Beijing Badaling Forest Tourism Development Co, Ltd

Building: Service center - Forest Tourism Centre

GreenBuilding 2014

Project: New Building

Address: Clove Valley Badaling Forest, Beijing 010

Country: China

Building Description and Technical Measures

There are four types of hotel buildings and one Service Center on DengXiangGu Hotel site. The Service Center is the main building on the hotel area. The building has two floors. The inside air is exchanged by a standard air handling unit with a battery for heat in the wintertime and a battery for cooling in the summertime. A cooling battery is situated in the air handling unit. This unit cools the incoming air. The heating system supports the building with primary heating water to a multi-tank, providing hot water and heating water as well. Primary heating water is produced by wood burners with additional solar hot water collectors. Low energy bulbs are used according to energy efficiency standards.

Technical Data

Building use	Hotel & Accomodation
Area	2.190 m²
PEC before or reference value	205,00 kWh/m²y
PEC	150,00 kWh/m²y
Energy savings %	27 %
Absolute savings	120.450,00 kWh/y
Financial info	/



Partner: Beijing Badaling Forest Tourism Development Co, Ltd

Building: Forest Tourism Centre - Hotel A

GreenBuilding 2014

Project: New Building

Address: Clove Valley Badaling Forest, Beijing 010

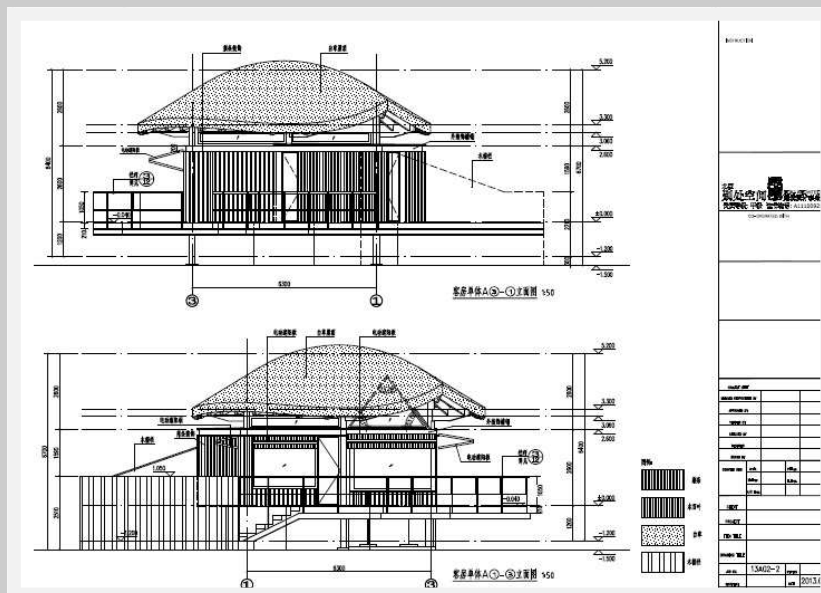
Country: China

Building Description and Technical Measures

Hotel A stands on piles about 1 m above the ground. It has one floor level. The inside air is exchanged by the use of natural ventilation. A duct leads outside air through the ground and into a wall in the building where the air is released at a high point in the bedroom/living room. The return air is placed in the bathroom/shower. To meet summer conditions a local cooling unit lowers the temperature. The heating system supports the building with primary heating water to a multi-tank giving hot water and heating water as well. Primary heating water is produced by wood burners with additional solar collectors. Low energy bulbs are used according to Green Building demands.

Technical Data

Building use	Hotel & Accomodation
Area	41 m²
PEC before or reference value	298,00 kWh/m²y
PEC	161,00 kWh/m²y
Energy savings %	54 %
Absolute savings	5.617,00 kWh/y
Financial info	/



Partner: Beijing Badaling Forest Tourism Development Co, Ltd

Building: Forest Tourism Centre - Hotel C

GreenBuilding 2014

Project: New Building

Address: Clove Valley Badaling Forest, Beijing 010

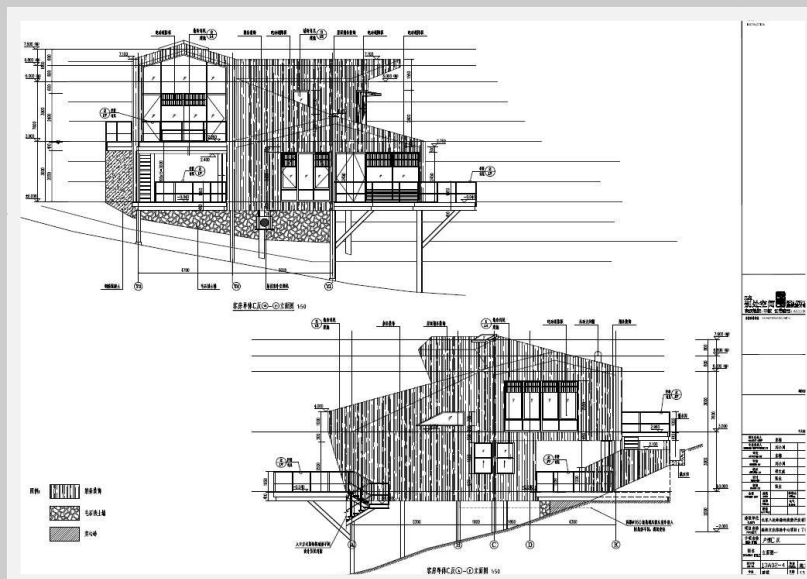
Country: China

Building Description and Technical Measures

Hotel C stands on piles about 1 m above the ground. It has one floor level. The inside air is exchanged by the use of natural ventilation. A duct leads outside air through the ground and into a wall in the building where the air is released at a high point in the bedroom/living room. The return air is placed in the bathroom/shower. To meet summer conditions a local cooling unit lowers the temperature. The heating system supports the building with primary heating water to a multi-tank giving hot water and heating water as well. Primary heating water is produced by wood burners with additional solar collectors. Low energy bulbs are used according to Green Building demands.

Technical Data

Building use	Hotel & Accomodation
Area	144 m²
PEC before or reference value	273,00 kWh/m²y
PEC	147,00 kWh/m²y
Energy savings %	54 %
Absolute savings	18.144,00 kWh/y
Financial info	/



Partner: Beijing Badaling Forest Tourism Development Co, Ltd

Building: Forest Tourism Centre - Hotel D

GreenBuilding 2014

Project: New Building

Address: Clove Valley Badaling Forest, Beijing 010

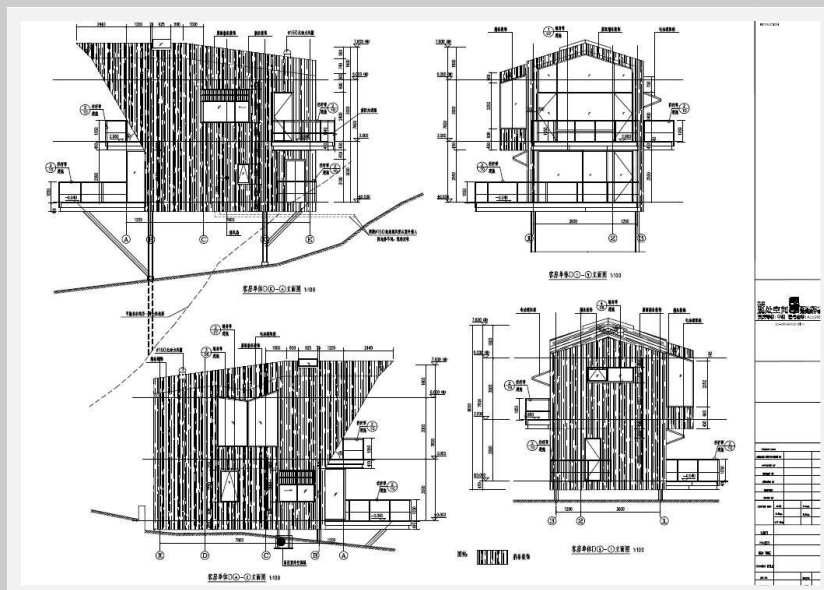
Country: China

Building Description and Technical Measures

Hotel D stands on piles about 1 m above the ground. It has one floor level. The inside air is exchanged by the use of natural ventilation. A duct leads outside air through the ground and into a wall in the building where the air is released at a high point in the bedroom/living room. The return air is placed in the bathroom/shower. To meet summer conditions a local cooling unit lowers the temperature. The heating system supports the building with primary heating water to a multi-tank giving hot water and heating water as well. Primary heating water is produced by wood burners with additional solar collectors. Low energy bulbs are used according to Green Building demands.

Technical Data

Building use	Hotel & Accomodation
Area	71 m²
PEC before or reference value	332,00 kWh/m²y
PEC	192,00 kWh/m²y
Energy savings %	42,2 %
Absolute savings	9.940,00 kWh/y
Financial info	/



Partner: Benkerwiese Verwaltungs- und Verwertungsges.m.b.H.

Building: HYPO NOE Zentrale St. Pölten

GreenBuilding : 2014

Project: New Building

Address: Hypogasse I, 3100 - St. Pölten

Country : Austria

Building Description and Technical Measures

This office building was erected in 2012 and hosts the Headquarter of HYPO NOE banking group. Special attention was paid on high flexibility with regard to expansion possibilities as well as on low running cost via low maintenance intensity. Vertically adjustable out-board sunshades were installed to reduce the cooling load of the building. Heating and cooling is provided by ground water heat pump. For covering peak loads the object is connected to the district heating of the city of St.Pölten. Ventilation systems are equipped with high efficient heat recovery. High comfort is guaranteed by low air speeds and no sound sources in the working space. Cooling is partially provided by cooling ceilings. Additionally, the main part of energy savings has been realized by smart adaption of the mechanical and electrical services, besides a photovoltaic plant on roof top (32 kWp) producing about 33200 kWh/a electricity.

Technical Data

Building use	Office
Area	13.728 m²
PEC before or reference value	/ kWh/m²y
PEC	164,76 kWh/m²y
Energy savings %	36,9 %
Absolute savings	/ kWh/y
Financial info	/



Partner: Billa AG

Building: Billa Feldkirchen - supermarket

GreenBuilding 2014

Project : New Building

Address: Schillerstraße 1, 9560 - Feldkirchen in Kärnten

Country: Austria

Building Description and Technical Measures

This new energy efficient supermarket adopted the following measures:

- Energy recovery: usage of thermal discharge of cooling plants for heating (compound refrigeration system, one of the compressors can be switched over to a heat pump to cover peaks loads), no heating system is required.
- Highly efficient cooling plant and refrigeration equipment: 6 level regulation, energy efficient refrigeration equipment in the salesroom with LED lighting and doors with insulation glass, efficient internal airflow, fans with efficient EC motors, optimal dimensioning of all components, online monitoring system
- Lighting system equipped with LED lighting in all areas of the shop except several T5 fluorescent tube .

Technical Data

Building use	Wholesale & Retail
Area	898 m²
PEC before or reference value	147,44 kWh/m²y
PEC	63,90 kWh/m²y
Energy savings %	56,6 %
Absolute savings	75.018,00 kWh/y
Financial info	€ 50.000,00



BOTTEGA VENETA

Partner: Bottega Veneta Srl

Building: Atelier Bottega Veneta Montebello Vicentino

GreenBuilding 2014

Project: Refurbishment

Address: Località Conti Maltraverso 1, 36054 - Montebello Vicentino

Country: Italy

Building Description and Technical Measures

The project is a redevelopment of an existing building, a traditional Venetian villa, with an addition of a new built volume. The building is used for design offices, sample handcrafting area, conference room and a part of technical space. The main activity of the new building complex will be related to management. The main energy saving measures includes: high-efficiency groundwater heat pump with heat recovery; AHU with packaged heat recovery unit; hydronic heating/cooling coil and high efficiency fans; high efficiency envelope; presence controlled interior lighting system; photovoltaic array integrated with new roof (amorphous silicon).

Technical Data

Building use	Manufacturing & Industry
Area	9.337 m²
PEC before or reference value	75,50 kWh/m²y
PEC	25,20 kWh/m²y
Energy savings %	66,6 %
Absolute savings	469.651,00 kWh/y
Financial info	/





Partner: Bougie`, Bougie`, Cleven, Jütten GbR

Building: REWE Birgden - Heinsberg

GreenBuilding 2014

Project : New Building

Address: Bahnhofstraße 9a, 52538 - Gangelt-Birgden

Country: Germany

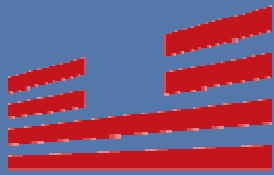
Building Description and Technical Measures

In 2011, the owners' association BBCJ GbR started planning a supermarket in the center of Birgden to provide an accessible shopping facility for all citizens, including the ones without a car. The options were building a flat-roofed supermarket with little natural light and an average and therefore poor energy performance, or showing initiative and setting the priorities differently. In cooperation with Rewe the BBCJ established a concept of sustainability, environmental protection and a customer-centered focus. The result is a building whose energy performance rates about 30 % lower than conventional constructions - due to thicker layers of insulation, appropriate material selection and special plant engineering in conjunction with the interior design. The energy saving is achieved, among others, through heat recovery from the commercial refrigeration, the use of a controlled ventilation system, large windows with a climate-controlled exterior shading system and photovoltaic plant. The rooftop photovoltaic installation provides not only the market but also the planned office building units with a self-containing power supply.

Technical Data

Building use	Wholesale & Retail
Area	1.941 m²
PEC before or reference value	215,50 kWh/m²y
PEC	110,60 kWh/m²y
Energy savings %	48,7 %
Absolute savings	203.527,00 kWh/y
Financial info	/





CentrumPalmovka

Partner: Centrum Plamovka a.s.

Building: Nová Palmovka

GreenBuilding : 2014

Project: New Building

Address: Praha 8

Country : Czech Republic

Building Description and Technical Measures

The building consists of two parts. One hosts a business centre with two underground and two above ground floors. The second building hosts administrative offices and has nine floors above ground. The structure is very well insulated and thermal bridges are minimized. Standards double glasses are equipped with external sun protection and are controlled automatically. The heat source for the buildings is two heat exchangers with high efficiency (90%). Main heat source is district heating from central source in Prague. Heat pumps with variable speed are used for parallel demand of cooling and heating. AHUs will be controlled with timed programmes based on the usage requirements and are equipped with heat recovery. For cooling a couple of air cooled chillers are placed on the roof. One of them is equipped with heat exchanger for free cooling. Both of them are supplying air for handling units and fan coils.

Technical Data

Building use	Office
Area	31.479 m²
PEC before or reference value	179,00 kWh/m²y
PEC	119,90 kWh/m²y
Energy savings %	33 %
Absolute savings	1.836.673,00 kWh/y
Financial info	/





Partner: Corem Bergslagen AB

Building: Nickeln 2

GreenBuilding 2014

Project: Refurbishment

Address: Södra Gärdesvägen 4, 734 32 - Hallstahammar

Country: Sweden

Building Description and Technical Measures

The building consists of workshop space and a car retailer. The renovations were made between September 2011 and Mars 2012. The major change which took place during the renovation was the replacement from an oil-fired boiler to a district heating system. The ventilation system has been equipped with new air handling units. A web based regulation system has been implemented.

Technical Data

Building use	Manufacturing & Industry
Area	1.769 m²
PEC before or reference value	397,30 kWh/m²y
PEC	258,46 kWh/m²y
Energy savings %	35 %
Absolute savings	245.714,00 kWh/y
Financial info	/

Partner: COSMOS Grundstücks- und Vermögensverwaltung GmbH

Building: Bauhaus Gießen

GreenBuilding 2014

Project : New Building

Address: Bänningerstraße 9, 35394 - Gießen

Country: Germany

Building Description and Technical Measures

The project concerns a new construction of a highly energy efficient and modern retail centre (DIY market) in Singen, Germany. The building satisfy the requirements of the German Energy Regulation (EnEV 2009) with regard to annual primary energy consumption by more than 36%, and in terms of the heat transfer coefficient by more than 25%. The shopping mall is used 13 hours a day for 303 days/years. The envelope is very well insulated; windows are equipped with heat mirror double glazed unit. The heating system is provided with a gas boiler and well dimensioned heat pumps with power regulation; the ventilation plant is equipped with a heat recovery system. All energy consumption are monitored with a BEMS.

Technical Data

Building use	Wholesale & Retail
Area	10.894 m²
PEC before or reference value	162,03 kWh/m²y
PEC	102,68 kWh/m²y
Energy savings %	36,6 %
Absolute savings	646.591,00 kWh/y
Financial info	€1.550.000



Partner: COSMOS Grundstücks- und Vermögensverwaltung GmbH

Building: Bauhaus Singen

GreenBuilding 2014

Project : New Building

Address: Bänningerstraße 9, 35394 - Gießen

Country: Germany

Building Description and Technical Measures

This new construction is a highly energy efficient and modern retail centre in Singen, Germany. The building is equipped with ventilation system with heat recovery with efficiency of 77%. The heating system is equipped with high performing gas boiler and well dimensioned heating pumps with power regulation. The construction's shell is very well insulated; windows are fit with heat mirror double glazed unit. The lighting system is equipped with efficient fluorescent lamps; time scheduling control system is active. All energy consumptions are monitored with a Building Energy Management System.

Technical Data

Building use	Wholesale & Retail
Area	10.643 m²
PEC before or reference value	255,30 kWh/m²y
PEC	189,70 kWh/m²y
Energy savings %	25,7 %
Absolute savings	698.155,00 kWh/y
Financial info	€1.950.000





Partner: EDEKA Handelsgesellschaft Südwest mbH

Building: EDEKA Lebensmittelmarkt Hemsbach

GreenBuilding 2014

Project : New Building

Address: Hüttenfelderstraße 1, 69502 - Hemsbach

Country: Germany

Building Description and Technical Measures

This new retail market is a very well insulated construction with an average U value of 0.3 W/m²/K. The heating as well as the cooling of the building is provided by a geothermal system. In that way, the use of fossil fuels can be completely relinquished. Process heat for cooling is recovered by a heat recovery system. The heating system is equipped with a low temperature boiler and thermostatic valves. In order to improve the microclimate, the roof is partially greened. In the bidding procedure of the construction it was increasingly called upon local companies.

Technical Data

Building use	Wholesale & Retail
Area	1.935,5 m²
PEC before or reference value	212,10 kWh/m²y
PEC	130,80 kWh/m²y
Energy savings %	38,3 %
Absolute savings	157.112,25 kWh/y
Financial info	€ 210.000





Partner: EDEKA Handelsgesellschaft Südwest mbH

Building: EDEKA Lebensmittelmarkt Königstein im Taunus

GreenBuilding 2014

Project : New Building

Address: Limburger Straße 40-42, 61462 - Königstein im Taunus

Country: Germany

Building Description and Technical Measures

This new retail market is a very well insulated construction with an average U value of 0.3 W/m²/K. Process heat for cooling is recovered by a heat recovery system. The heating system is equipped with a gas- low temperature boiler and thermostatic valves. In order to improve the microclimate, the roof is partially greened. In the bidding procedure of the construction it was increasingly called upon local companies. The market and the outdoor area is equipped with highly energy efficient LED-lightings.

Technical Data

Building use	Wholesale & Retail
Area	3.144 m²
PEC before or reference value	179,00 kWh/m²y
PEC	79,40 kWh/m²y
Energy savings %	55,6 %
Absolute savings	313.041,00 kWh/y
Financial info	€ 315.000



Partner: EDEKA Handelsgesellschaft Südwest mbH

Building: EDEKA Lebensmittelmarkt Lambrecht

GreenBuilding 2014

Project : New Building

Address: Hauptstrasse 31, 67466 - Lambrecht

Country: Germany

Building Description and Technical Measures

This new retail market is a very well insulated construction with an average U value of 0.3 W/m²/K. The heating as well as the cooling of the building is provided by a geothermal system. In that way, the use of fossil fuels can be completely relinquished. Process heat for cooling is recovered by a heat recovery system. In order to improve the microclimate, the roof is partially greened. In the bidding procedure of the construction it was increasingly called upon local companies.

Technical Data

Building use	Wholesale & Retail
Area	1.960,3 m²
PEC before or reference value	156,50 kWh/m²y
PEC	114,00 kWh/m²y
Energy savings %	27,2 %
Absolute savings	83.473,00 kWh/y
Financial info	€ 30.678,85



Partner: EDEKA Handelsgesellschaft Südwest mbH
Building: EDEKA Lebensmittelmarkt Lörrach-Brombach

GreenBuilding 2014

Project : New Building

Address: Hofmattstraße, 79541 - Lörrach-Brombach

Country: Germany

Building Description and Technical Measures

This market is very well insulated (U value: 0,3 W/m²/K) and equipped with highly energy efficient LED-lights. Process heat for cooling is covered by a heat recovery system. In order to improve the microclimate, more than 2.100m² of the roof surface are greened. The heating system is equipped with well dimensioned heating pumps and it is regulated on outdoor temperature input. Night-drawdown and week end drawdown is active. The heating system is also equipped with a condensing boiler and thermostatic valves. The cooling strategy is supported by manual mobile external shading, room air-conditioner and an air-water heat pump.

Technical Data

Building use	Wholesale & Retail
Area	2.053 m²
PEC before or reference value	183,90 kWh/m²y
PEC	129,40 kWh/m²y
Energy savings %	29,6 %
Absolute savings	111.888,00 kWh/y
Financial info	€ 97.635,00





Partner: EDEKA Handelsgesellschaft Südwest mbH

Building: EDEKA Lebensmittelmarkt Oberthal

GreenBuilding 2014

Project : New Building

Address: Im Brühl, 66649 - Oberthal

Country: Germany

Building Description and Technical Measures

This EDEKA retail is a new, well insulated building. Its average envelope value amounts to 0,34 W/m²K. As heating system a gas fired condensing technology with heat recovery system is installed. The system is provided with thermostatic valves, night drawdown and week-end drawdown. The market is equipped with highly energy efficient LED-lights. For the cooling system an air-water heat pump is used. The ventilation system is equipped with heat recovery.

Technical Data

Building use	Wholesale & Retail
Area	1.620 m²
PEC before or reference value	210,30 kWh/m²y
PEC	131,00 kWh/m²y
Energy savings %	37,7 %
Absolute savings	128.428,00 kWh/y
Financial info	€ 96.500,00





Partner: EDEKA Handelsgesellschaft Südwest mbH

Building: EDEKA Lebensmittelmarkt Weinheim

GreenBuilding 2014

Project : Refurbishment

Address: Gewerbestraße 7, 69469 - Weinheim

Country: Germany

Building Description and Technical Measures

The supermarket was completely redesigned, modernized and equipped with latest technology concerning heating, refrigeration, ventilation and electrical devices. Additionally a heat recovery system was installed into the refrigeration plant. The new ventilation plant for the gastronomy area will be supported by an air-to-water heating pump. The building envelope was not modified.

Technical Data

Building use	Wholesale & Retail
Area	9.473 m²
PEC before or reference value	906,00 kWh/m²y
PEC	668,00 kWh/m²y
Energy savings %	26,3 %
Absolute savings	225.457,00 kWh/y
Financial info	/



Partner: EPS Rathaus Viertel Guntramsdorf Errichtungs- und Beteiligungsverwaltungs GmbH & Co KG
Building: Rathausviertel Guntramsdorf - Bauteil 2

GreenBuilding : 2014

Project: New Building

Address: Rathaus Viertel I, 2353 - Guntramsdorf

Country : Austria

Building Description and Technical Measures

Rathausviertel Guntramsdorf, Building 2” achieves a high standard in energy efficiency by a mix of technical measures adopted: optimisation of building thermal envelope, compactness of the structure, ventilation systems with efficient heat recovery, low consumption lighting system, reduction of cooling requirements by means of solar control and external sun shadings. The office areas in the upper floors were designed according to the tenants 'requirements. Flexible floor plans ensure maximum usage possibilities. The floors can be either divided into four units or can be used entirely, whether as individual offices, team office or open space.

Technical Data

Building use	Office
Area	3.252,72 m²
PEC before or reference value	/ kWh/m²y
PEC	171,60 kWh/m²y
Energy savings %	31,6 %
Absolute savings	1.388.179,20 kWh/y
Financial info	€ 1.050.000,00





Partner: Fabege AB

Building: Farao 8

GreenBuilding : 2014

Project: Refurbishment

Address: Pyramidvägen 11, 16956 - Solna

Country : Sweden

Building Description and Technical Measures

This refurbished building host offices. For optimal indoor climate and low energy consumption the building adopted new energy efficient fans, lighting system has been equipped with fluorescent lights and regulated by occupancy sensors .The tenants have the possibilities to start the ventilations by hand too. Solar shades have been installed to avoid unwanted solar gains. A new control system has been installed for the heating system. The building was supplied by district heating and cooling.

Technical Data

Building use	Office
Area	8.506 m²
PEC before or reference value	304,00 kWh/m²y
PEC	140,80 kWh/m²y
Energy savings %	54 %
Absolute savings	1.388.179,20 kWh/y
Financial info	/





Partner: Fabege AB

Building: Getingen 13

GreenBuilding : 2014

Project: Refurbishment

Address: Sveavägen 149, 11346 - Stockholm

Country : Sweden

Building Description and Technical Measures

This building was built in the sixties. It has a total area of 13.934 m² and hosts offices. In order to upgrade its energy efficiency performance the followings measures has been taken: improved heat recovery on the ventilation system, installation of heat recovery system on the extract air from the garage, presence detection on the lighting system in the garage areas, improved control on the heating and cooling system of the office areas.

New control system for controlling and monitoring the buildings heating- and cooling systems has been also installed.

Technical Data

Building use	Office
Area	13.934 m²
PEC before or reference value	211,00 kWh/m²y
PEC	158,00 kWh/m²y
Energy savings %	25 %
Absolute savings	520.000,00 kWh/y
Financial info	/





Partner: Fastighets AB Briggen

Building: Sändaren I

GreenBuilding : 2014

Project: Refurbishment

Address: Agnesfridsvägen 111, 212 37 - Malmö

Country : Sweden

Building Description and Technical Measures

The project concerns the upgrade of an office building constructed in 2010. The building ventilation system has been equipped with efficient heat recovery. The heat is provided by district heating. For cooling free cooling is adopted. The lighting system is equipped with occupancy linking controls. Measures taken have made possible to save 57% of energy consumption.

Technical Data

Building use	Office
Area	11.963 m²
PEC before or reference value	164,50 kWh/m²y
PEC	71,10 kWh/m²y
Energy savings %	57 %
Absolute savings	1.117.344,20 kWh/y
Financial info	/



Partner: Fastighets AB Briggen

Building: Stillman 40

GreenBuilding : 2014

Project: Refurbishment

Address: Krusegatan 34, 21113 - Malmö

Country : Sweden

Building Description and Technical Measures

The building was erected in the 1960s and hosts two offices, one small wash bay and one inventory area. During the years numerous adjustments has been made. During this project, to adjust the building for a new tenant, an energy goal has been set for the building with the aim to achieve EU GreenBuilding and at least 25 % energy improvement. To reach this goal an energy analysis of the buildings performance has been made. A dynamic simulation has been made: new heating exchanger, new pumps, fans and FTX systems have been adopted and additional insulation of the roof has been placed.

Technical Data

Building use	Office
Area	1.790 m²
PEC before or reference value	124,70 kWh/m²y
PEC	82,80 kWh/m²y
Energy savings %	34 %
Absolute savings	75.017,76 kWh/y
Financial info	/



Partner: Fastighets AB Brostaden**Building: Varpen 8B**

GreenBuilding 2014

Project: New Building

Address: Smista Allé 32, 14170 - Segeltorp

Country: Sweden

Building Description and Technical Measures

Varpen 8 is a new building construction which hosts retail space, showroom and storage areas. It is located next to the Sweden largest highway south of Stockholm. The building is very well insulated and the average U value achieved is very low: 0.26 W/m²/K. It is supplied by district heating and equipped with a controlled ventilation system with heat recovery system (80% efficiency). The lighting system is provided with occupancy presence controls.

Technical Data

Building use	Manufacturing & Industry
Area	1.496 m²
PEC before or reference value	100,00 kWh/m²y
PEC	66,80 kWh/m²y
Energy savings %	33 %
Absolute savings	46.667,20 kWh/y
Financial info	/



Partner: Fastighets AB Lastkajen

Building: Elektra 23

GreenBuilding : 2014

Project: Refurbishment

Address: Elektravägen 25, Hägersten

Country : Sweden

Building Description and Technical Measures

This project concerns the refurbishment of a building constructed between 1945-59. It hosts office space and a workshop area. The changes made in 2010 consists in the following intervention: installation of a web based regulation system, installation of new air handling units with frequency controlled drives for the ventilation system and the adoption of new cooling units.

Technical Data

Building use	Office
Area	10.067 m²
PEC before or reference value	152,50 kWh/m²y
PEC	45,30 kWh/m²y
Energy savings %	70,3 %
Absolute savings	79.645,00 kWh/y
Financial info	/



Partner: Fastighets AB ML 4

Building: MAX IV, Byggnad E

GreenBuilding : 2014

Project: New Building

Address: Odarslövsvägen, 22592 - Lund

Country : Sweden

Building Description and Technical Measures

MAX IV will be a national laboratory with the University of Lund as host university. Nearly two thousand scientists are expected to use MAX IV yearly when the facility is fully built. MAX IV will be the most advanced Synchrotron research facility in the world. The research facility demand a great amount of energy for its operation, for this reason has been designed very energy efficient so that energy consumption is just a fraction of what a conventional Synchrotron light facility consumes. The excess heat generated will be recycled and primary supply the whole research facility and sold to the district heating network. This project concerns building E, which is the facility's office building.

Technical Data

Building use	Office
Area	4.950 m²
PEC before or reference value	94,80 kWh/m²y
PEC	55,00 kWh/m²y
Energy savings %	42 %
Absolute savings	197.190,00 kWh/y
Financial info	/





Partner: Folksam

Building: Spelbomskan 12

GreenBuilding : 2014

Project: Refurbishment

Address: Bohusgatan 12, Stockholm

Country : Sweden

Building Description and Technical Measures

The building Spelbomskan 12 is located in downtown Stockholm. It houses a billiards hall and high-school with a cafeteria. The building develops on several levels of offices and garages. The total area of the building is 24 537 m², distributed over nine stories above ground and five below. It is heated by district heating and through a heat pump. The energy usage of the reference year, June 2010-May 2011, was 145,8 kWh/m². The estimated, specific usage within one year is 94,9 kWh/m²,yr. In the last few years, the heating system has been optimized, allowing the indoor temperature to be reduced. This has dropped the usage by 13,3 kWh/m². A new ventilation system is currently being installed, which is calculated to reduce the usage by another 33,3 kWh/m².

Technical Data

Building use	Office
Area	24.537 m²
PEC before or reference value	145,80 kWh/m²y
PEC	94,90 kWh/m²y
Energy savings %	35 %
Absolute savings	1.248.933,30 kWh/y
Financial info	/





Partner: Fyrishov AB

Building: Svartbäcken 1:10

GreenBuilding 2014

Project: New Building

Address: Idrottsgatan 2, 75333 - Uppsala

Country: Sweden

Building Description and Technical Measures

The building is designed to be used for a multitude of functions, ranging from musical to sporting events. Energy consumption in the building is mostly reduced by the utilization of a heat pump and a ventilation system with heat recovery. A well-insulated building envelope further reduces energy usage. Low-usage primary energy is supplied by a geothermal heat pump with district heating for peak demand. The cooling load is in large part covered by free cooling from the boreholes which are then recharged. To reduce the proportion of purchased electricity, 193 m² of photovoltaic cells have been installed on the property.

Technical Data

Building use	Sport & Leisure
Area	7.919 m²
PEC before or reference value	108,00 kWh/m²y
PEC	43,60 kWh/m²y
Energy savings %	60 %
Absolute savings	345.268,40 kWh/y
Financial info	/



Partner: G.a Livförs. SEB Trygg Liv

Building: Grinden 16

GreenBuilding : 2014

Project: Refurbishment

Address: Sankt Eriksgatan 32, 11234 - Stockholm

Country : Sweden

Building Description and Technical Measures

Grinden 16 was built in 1963. The total rentable area is 6050 square meters. The majority of the building is occupied by offices space, but there are also other services as a gym and a restaurant. Grinden 16 is situated on Kungsholmen, in the west part of Stockholm. The building is easy to access, with buses and two metro lines stopping close by. A new district heating plant has been installed and the regulation system on the heating and the ventilation plants has been optimised.

Technical Data

Building use	Office
Area	6.038 m²
PEC before or reference value	208,00 kWh/m²y
PEC	136,20 kWh/m²y
Energy savings %	34,6 %
Absolute savings	433.528,40 kWh/y
Financial info	€ 160.000,00

Partner: G.a Livförs. SEB Trygg Liv

Building: Neptunus 31

GreenBuilding : 2014

Project: Refurbishment

Address: Grevgatan 34, 11438 - Stockholm

Country : Sweden

Building Description and Technical Measures

Neptunus 31 was built in 1956 in the eastern part of Stockholm. Is an office building with a grocery store and a restaurant at the ground level. The building is supplied by district heating; the ventilation system is equipped with a heat recovery system. Energy efficiency measures taken to improve the efficiency of the technical plants included a reduction of the time of ventilation and of the heating system through the optimization of the regulation. New more efficient lamps have been installed.

Technical Data

Building use	Office
Area	4.690 m²
PEC before or reference value	268,00 kWh/m²y
PEC	180,00 kWh/m²y
Energy savings %	32,9 %
Absolute savings	412.720,00 kWh/y
Financial info	€ 15.000,00

Partner: G.a Livförs. SEB Trygg Liv

Building: Skålen 24

GreenBuilding : 2014

Project: Refurbishment

Address: Norra stationsgatan 93, 11364 - Stockholm

Country : Sweden

Building Description and Technical Measures

Skålen was built in 1973. The building hosts offices as well as shops at ground level. Skålen is situated at Tor-splan/Norrastationsgatan in the northern part of Stock-holm. The building is easy to access from busses, metro and trains. The building has been renovated to upgrade it from energy efficiency perspective. External wall insu-lation has been improved. The ventilation system is pro-vided with heat recovery. The building is supplied by district heating and cooling. Operating time for heating and ventilation has been reduced.

Technical Data

Building use	Office
Area	17.993 m²
PEC before or reference value	133,00 kWh/m²y
PEC	96,90 kWh/m²y
Energy savings %	27,1 %
Absolute savings	648.960,00 kWh/y
Financial info	€ 50.000,00

Partner: G.a Livförs. SEB Trygg Liv

Building: Släggan 14

GreenBuilding : 2014

Project: Refurbishment

Address: Hornsgatan 168, 11728 - Stockholm

Country : Sweden

Building Description and Technical Measures

Släggan 14 was built in the period 1898-1904. The total rentable area is 8011 square meters. The majority of the area is for offices and the remaining area hosts shops situated at the ground level. Släggan is situated in Hornstull, in the south part of Stockholm. The building is easy to access; the metro station is in the building next doors. It is supplied with district heating and cooling. The ventilation system is equipped with heat recovery. Operating time for heating and ventilation has been reduced. The lighting system has been equipped with energy efficient lamps.

Technical Data

Building use	Office
Area	8.013 m²
PEC before or reference value	94,20 kWh/m²y
PEC	64,03 kWh/m²y
Energy savings %	32,1 %
Absolute savings	241.752,00 kWh/y
Financial info	€ 13.000,00



Partner: Gavlefastigheter AB

Building: Rörbergs Flygplats

GreenBuilding : 2014

Project: Refurbishment

Address: Rörbergsvagen 10, Gävle

Country : Sweden

Building Description and Technical Measures

This project concerns a new office building with a heated floor area of 10.233 m². The building is supplied by district heating. On the heating system a night-drawdown and weekend-drawdown system is active. The building is equipped with a centralized mechanical cooling plant and with room air conditioner. To avoid unwanted solar gains windows are fitted with selective glazing and shading devices. Local free cooling is part of the cooling strategy. The ventilation system is provided with a heat recovery system. All energy consumption are recorded. The lighting system is equipped with efficient lamps, electronics ballasts and painted reflectors.

Technical Data

Building use	Transport Infrastructure
Area	2.330 m²
PEC before or reference value	322,20 kWh/m²y
PEC	207,50 kWh/m²y
Energy savings %	36 %
Absolute savings	267.251,00 kWh/y
Financial info	/





Partner: Ghelamco Poland Sp. z o.o. S.K.A

Building: Warsaw Spire Building B

GreenBuilding : 2014

Project: New Building

Address: Plac Europejski 6, 00-844 - Warszawa

Country : Poland

Building Description and Technical Measures

This building is one of the three A-class offices building complex called Warsaw Spire, located at European Square in Wola business district of Warsaw. Building B is a 55 meter high tower with 15 above ground stories. The building has good thermal insulation to reduce heat loss in winter. The windows are provided with double glazed unit with a low solar energy transmittance. The lighting system is equipped with energy efficient lamps, LED technology and motion sensors. Electricity meters are installed on the main systems. All meters are connected to the BMS. The ventilation plant is equipped with a rotary heat exchanger and energy efficient fans. The air conditioning system is equipped with high-efficiency chillers. Chilled water pumps have inverters which adapt their operation to the refrigerant demand of the building.

Technical Data

Building use	Office
Area	19.475 m²
PEC before or reference value	434,81 kWh/m²y
PEC	313,16 kWh/m²y
Energy savings %	27,9 %
Absolute savings	2.369.133,70 kWh/y
Financial info	/





Partner: Górnośląski Park Przemysłowy Sp. z.o.o.

Building: Goppert-Mayer office building, GPP Business Park

GreenBuilding : 2014

Project: New Building

Address: Konduktorska 39A, 40-155 Katowice

Country : Poland

Building Description and Technical Measures

Goeppert-Mayer office building was built in 2012 and is part of GPP Business Park – complex of energy efficient office buildings located in Katowice. It is a very ambitious project complying the highest environmental standards and energy efficiency. Thanks to technology used is the building it is not only environmentally friendly but also cost-effective. Use of energy-saving solutions and state of the art equipment decreases operational charges and also improve healthier and therefore more productive working environment. It is equipped in the innovative system of tri-generation. Among the advantages of using tri-generation is reduction of energy waste relating to the transport on energy carriers, energy saving and very low pollution emissions. The use of a number of energy-saving measures, controlled and managed with the modern building management system (BMS) has confirmed the design assumptions while defined the energy use in the Goeppert-Mayer building at the level of approximately 50% lower than in the typical A-class building while also preserving full user comfort.

Technical Data

Building use	Office
Area	7.180 m²
PEC before or reference value	298,00 kWh/m²y
PEC	209,00 kWh/m²y
Energy savings %	30 %
Absolute savings	639.020,00 kWh/y
Financial info	€ 662.000





Partner: Göteborgs Hamn AB

Building: Arendal 764:291

GreenBuilding 2014

Project : New Building

Address: Tankgatan Gema-Kjells väg, 418 34 - Göteborg

Country: Sweden

Building Description and Technical Measures

The building is a logistics centre with an administrative office. The office area is developed on two levels. The building is used 365 days/year for 17 hours/day. The energy-saving measures taken are the following: controlled lighting in the warehouse, CO₂ controlled ventilation in the warehouse in order to minimize losses, ventilation system with heat exchange for the office. The building is supplied by district heating.

Technical Data

Building use	Logistics & Storage
Area	20.815 m²
PEC before or reference value	80,00 kWh/m²y
PEC	55,00 kWh/m²y
Energy savings %	31 %
Absolute savings	520.375,00 kWh/y
Financial info	/



Partner: H5 GmbH & Co KG

Building: Hotel Schani Wien

GreenBuilding 2014

Project: New Building

Address: Karl Popper Strasse, 1100 - Vienna

Country: Austria

Building Description and Technical Measures

The „Hotel Schani“ is located in Karl-Popper-Strasse, 1100 Vienna. The 135 rooms are heated and cooled by a 2-pipe-change-over ceiling-induction-system in combination with a primary air-handling system of 21.000 m³/h, which also supplies the lobby. The central air-handling system is installed as a VVS (Volume/Variable/System)-plant. Heat is recovered via high-efficiency plate heat exchanger. All plant parts, air and water pipes and fittings are state-of-the-art insulated. Particular emphasis was placed on low energy consumption. The energy is supplied by district heating and district cooling. Safety lights will be implemented in LED-technology with value of approximately 3.6 W per luminaire. The connected load of the approximately 210 luminaires is approximately 750 W. The conditioning of the guest room can be individually controlled via the guest's Smartphone. An energy monitoring is carried out centrally and is constantly monitored automatically. The Hotel will be completed and opened in spring 2015.

Technical Data

Building use	Hotel & Accomodation
Area	4653,3 m²
PEC before or reference value	192,10 kWh/m²y
PEC	103,50 kWh/m²y
Energy savings %	46 %
Absolute savings	412.282,00 kWh/y
Financial info	/



Partner: Hallsberg Brevterminal AB

Building: Lilla Älberg 1:8 - Hallsberg Brevterminal

GreenBuilding 2014

Project: New Building

Address: Tomta 166, 69491 - Hallsberg

Country: Sweden

Building Description and Technical Measures

This building hosts a manufacturing industry. The operations require huge sorting machines, which emit large heat loads that must be dissipated. The business is in operation 22 hours per day (ventilation and lighting around the clock). The building's heating system, however, is dimensioned to withstand heating during construction, vacations and downtime. During operation hours the heating demand is covered mostly by the internal heat load. For the Green Building application the buildings energy need is calculated using a reference operation to demonstrate the energy efficiency of the building. The building is connected to a ground source heat pump that can provide cooling in summer.

Technical Data

Building use	Manufacturing & Industry
Area	20.484 m²
PEC before or reference value	110,00 kWh/m²y
PEC	48,70 kWh/m²y
Energy savings %	56 %
Absolute savings	1.255.669,20 kWh/y
Financial info	/



Partner: Hans-Werner May

Building: New building of the customer centre “Technikum“

GreenBuilding : 2014

Project: New Building

Address: Otto-Hahn-Straße 2, 56218 - Mülheim-Kärlich

Country : Germany

Building Description and Technical Measures

The new building of a customer centre “Technikum“ is located in 56218 Mülheim-Kärlich, Otto-Hahn-Straße 2. It is built as annex building to the neighbouring existing building “Technikum“. The customer centre has two full storeys with a floor area of about 380 sqm. The building has no underground level. The two storeys are connected with stairs. The height of storey is about 3,30 m. The building is constructed in massive construction (reinforced concrete / masonry). The facade has a composite heat insulation system with triple glazing windows. The heating plant is equipped with electric heat pumps with power regulation. Thermostatic valves are installed. The cooling system is equipped with an air-air heat pump. The ventilation system is provided with a heat recovery system.

Technical Data

Building use	Office
Area	522 m²
PEC before or reference value	210,00 kWh/m²y
PEC	173,00 kWh/m²y
Energy savings %	25,2 %
Absolute savings	19.314,00 kWh/y
Financial info	€ 115.000,00





Partner: Harry Sjögren AB

Building: Vägmästaren 5

GreenBuilding : 2014

Project: New Building

Address: Syrénngatan 1, 43443 - Kungsbacka

Country : Sweden

Building Description and Technical Measures

This project concerns an office building of 3.000 m². The building is provided with a highly insulated envelope. Its average U value amounts to 0.3 W/m²/K. The ventilation unit has a high heat recovery. The building has various setting values for heating and cooling, depending on whether the building is used or not. The lighting system is demand controlled.

Technical Data

Building use	Office
Area	3.000 m²
PEC before or reference value	93,00 kWh/m²y
PEC	62,00 kWh/m²y
Energy savings %	33 %
Absolute savings	93.000,00 kWh/y
Financial info	/





Partner: Hemsö Vårdfastigheter AB

Building: Rydboholm 1:477

GreenBuilding 2014

Project: Refurbishment

Address: Hagkällvägen 2, 513 34 - Viskafors

Country: Sweden

Building Description and Technical Measures

The building hosts a health care two floors building. It was erected in 1981 with brick wall, 2-pane and 3-pane glass windows and was provided with a heat recovery ventilation system. The refurbishment concerned the following measures: optimization of the heating and ventilation system regulation parameters, new variable speed pump for the heating system, new radiator thermostats and replacement of the Diesel fired boiler with air-water heat pump and new Bio-oil fired boiler. The installation of an electrical boiler was not possible because it would demand a costly replacement of the main electrical cable to supply the building. In 2014 new speed variable fans are going to improve even more the energy savings.

Technical Data

Building use	Healthcare & Social Work
Area	2.701 m²
PEC before or reference value	146,50 kWh/m²y
PEC	64,00 kWh/m²y
Energy savings %	56 %
Absolute savings	222.832,50 kWh/y
Financial info	/





Partner: Hörmann KG Verkaufsgesellschaft

Building: Neubau eines Neubau Schulungszentrum

GreenBuilding : 2014

Project: New Building

Address: Upheider Weg 91, 33803 - Steinhagen-Amshausen

Country : Germany

Building Description and Technical Measures

This new building will be used as a training centre, as show room and as an office space. It has a very well insulated envelope; windows are fit with solar control double glazed unit "hard coating" and equipped with movable shading devices. The heating production system is a tri/co-generator plant. The ventilation system is provided with a heat recovery system. It will be cooled by an adiabatic cooling system. The lighting system is equipped with efficient fluorescent lamps and controlled by occupancy linking controls. On the roof will be installed a photovoltaic system plant.

Technical Data

Building use	Office
Area	6.302 m²
PEC before or reference value	168,50 kWh/m²y
PEC	79,60 kWh/m²y
Energy savings %	49,1 %
Absolute savings	113.905,00 kWh/y
Financial info	/



Partner: Ikano Retail Centres AB

Building: Handlaren 3 - Ikano Handelsplats Norra Backa byggnad 2

GreenBuilding 2014

Project : New Building

Address: Norra Backagatan 5, 78170 - Borlänge

Country: Sweden

Building Description and Technical Measures

Norra Backa Handelsplats Byggnad 2, Ikano is located in Borlänge. The building will be built on one floor and the total Atemp is 8 739 m². The building consists of retail, storage and a small part is for staff facilities and offices. Geothermal energy, with high efficiency provides the building with heating and cooling. The building is also using waste heat from the store's food cooling system as a heat source. The building is ventilated by a supply and exhaust systems with high recovery. The heating and cooling of the building are supplied by the ventilation. All ventilation flows, temperatures and up-times for ventilation are governed by needs. The outdoor air is controlled by CO₂ and temperature. Hot tap water is produced by an electric boiler.

Technical Data

Building use	Wholesale & Retail
Area	8.739 m²
PEC before or reference value	75,00 kWh/m²y
PEC	50,40 kWh/m²y
Energy savings %	33 %
Absolute savings	214.979,40 kWh/y
Financial info	/





Partner: Ikano Retail Centres AB

Building: Handlaren 3 - Ikano Handelsplats Norra Backa byggnad 3

GreenBuilding 2014

Project : New Building

Address: Norra Backagatan 7, 78170 - Borlänge

Country: Sweden

Building Description and Technical Measures

Norra Backa Handelsplats Byggnad 3, Ikano is located in Borlänge. The building will be built on one floor and the total Atemp is 4.442 m². The building consists of retail, storage and a small part is for staff facilities and offices. Geothermal energy, with high efficiency provides the building with heating and cooling. The building is also using waste heat from the store's food cooling system as a heat source. The building is ventilated by a supply and exhaust systems with high recovery. The heating and cooling of the building are supplied by the ventilation. All ventilation flows, temperatures and up-times for ventilation are governed by needs. The outdoor air is controlled by CO₂ and temperature. Hot tap water is produced by an electric boiler.

Technical Data

Building use	Wholesale & Retail
Area	4.442 m²
PEC before or reference value	75,00 kWh/m²y
PEC	33,20 kWh/m²y
Energy savings %	56 %
Absolute savings	185.675,60 kWh/y
Financial info	/





Partner: Ikano Retail Centres AB

Building: Handlaren 3 - Ikano Handelsplats Norra Backa byggnad 4

GreenBuilding 2014

Project : New Building

Address: Norra Backagatan 9, 78170 - Borlänge

Country: Sweden

Building Description and Technical Measures

Norra Backa Handelsplats Byggnad 4, Ikano is located in Borlänge. The building will be built on one floor and the total Atemp is 2.974 m². The building consists of retail, storage and a small part is for staff facilities and offices. Geothermal energy, with high efficiency provides the building with heating and cooling. The building is also using waste heat from the store's food cooling system as a heat source. The building is ventilated by a supply and exhaust systems with high recovery. The heating and cooling of the building are supplied by the ventilation. All ventilation flows, temperatures and up-times for ventilation are governed by needs. The outdoor air is controlled by CO₂ and temperature. Hot tap water is produced by an electric boiler.

Technical Data

Building use	Wholesale & Retail
Area	2.974 m²
PEC before or reference value	75,00 kWh/m²y
PEC	39,80 kWh/m²y
Energy savings %	47 %
Absolute savings	104.684,80 kWh/y
Financial info	/





Partner: Ikano Retail Centres AB

Building: Köpmannen 2

GreenBuilding 2014

Project : New Building

Address: Östra Esplanaden, Älmhults

Country: Sweden

Building Description and Technical Measures

The project concerns a commercial building in Älmhult, in southern Sweden. It is a building with concrete slab with thermal insulation, walls of precast insulated elements and a roof with trapezoidal sheet and overhead insulation. The building is supplied with district heating. To minimize the energy use insulation density features have been increased; control of heating has been optimized and ventilation has been equipped with heat recovery. The lighting system is time controlled.

Technical Data

Building use	Wholesale & Retail
Area	7.897 m²
PEC before or reference value	136,00 kWh/m²y
PEC	57,00 kWh/m²y
Energy savings %	58 %
Absolute savings	623.863,00 kWh/y
Financial info	/





Partner: Ikano Retail Centres AB

Building: Östra Torp Handelsplats Ikano Norr Hus I

GreenBuilding 2014

Project : New Building

Address: Östra Torpvägen, 451 76 - Uddevalla

Country: Sweden

Building Description and Technical Measures

Östra Torp handelsplats Ikano Norr hus I is located in Uddevalla, at Östra Torp. The building will be built in one floor and the total Atemp is 9. 595m². The building hosts retails and storage. A small part will be dedicated to staff facilities and offices. Geothermal energy, with high efficiency provides the building with heating and cooling. The building is ventilated by a supply and exhaust systems with high recovery, 77%. The heating and cooling of the building are supplied by the ventilation. All ventilation flows, temperatures and uptimes for ventilation are controlled by needs. The outdoor air input is controlled by CO₂ and temperature. The lighting system is equipped with high energy efficient lamps; in the toilets and dressing rooms lights are controlled by a presence control system. Hot tap water is produced by an electric boiler.

Technical Data

Building use	Wholesale & Retail
Area	9.595 m²
PEC before or reference value	55,00 kWh/m²y
PEC	41,00 kWh/m²y
Energy savings %	25 %
Absolute savings	134.330,00 kWh/y
Financial info	/





Partner: Ikano Retail Centres AB

Building: Östra Torp Handelsplats Ikano Norr Hus 2

GreenBuilding 2014

Project : New Building

Address: Östra Torpvägen, 451 76 - Uddevalla

Country: Sweden

Building Description and Technical Measures

Östra Torp handelsplats Ikano Söder hus 2 is located in Uddevalla, at Östra Torp. The building will develop on one floor with a total Atemp of 14.650m². The building consists of retails, storage and a small part of staff facilities and offices. Geothermal energy, with high efficiency, provides the building with heating and cooling. The building is ventilated by a supply and exhaust systems with high recovery, 75%-77%. The heating and cooling of the building are supplied by the ventilation system. All ventilation flows, temperatures and uptimes for ventilation are governed by needs. The outdoor air is controlled by CO₂ and temperature. The fans and all lighting are very energy efficient. The lighting in toilets and dressing rooms are controlled by presence. Hot tap water is produced by an electric boiler.

Technical Data

Building use	Wholesale & Retail
Area	14.650 m²
PEC before or reference value	55,00 kWh/m²y
PEC	23,00 kWh/m²y
Energy savings %	58 %
Absolute savings	468.800,00 kWh/y
Financial info	/





Partner: Kapt'n Browser gmbH

Building: Neubau Kindertagesstätte - Kita Hauptstraße

GreenBuilding 2014

Project: New Building

Address: Hauptstraße 3a, 10317 - Berlin-Lichtenberg

Country: Germany

Building Description and Technical Measures

The building is newly erected in 2014 and will be used as a Kindergarten. The building envelope and the technical plants are designed to achieve a Primary Energy Consumption (PEC) at least 25% below the national legal values. Windows are equipped with heat mirror triple glazed unit. The average U-value of the building envelope will be 0,31 W/m²*K. Heating energy is provided by an electrical heat pump. The heating [plant has an out-door temperature regulation. The lighting system is equipped with occupancy linking controls.

*only for heating equipment.

Technical Data

Building use	Education
Area	1.038 m²
PEC before or reference value	187,00 kWh/m²y
PEC	134,00 kWh/m²y
Energy savings %	28,4 %
Absolute savings	50.028,00 kWh/y
Financial info	€ 27.200,00*



Partner: KB Platzer Bagaregården 17:26

Building: Bagaregården 17:26

GreenBuilding : 2014

Project: Refurbishment

Address: Byfogdegatan 11, 415 05 - Göteborg

Country : Sweden

Building Description and Technical Measures

This project concerns the refurbishment of an office building. Twenty square meters per person are provided. Each person has one computer and a screen. Different measures have been implemented for energy saving reasons:

1. Installation of heat pump
 2. Installation of new ventilation - cooling unit for warm days that also take care of the internal heat loads and heat it up when the outdoor temperature drops. Excess heat can be recycled or moved.
 3. Updating of the control and regulation technology and frequency converter to fans in ventilation units
- The building is supplied by the district heating system.

Technical Data

Building use	Office
Area	5.774 m²
PEC before or reference value	111,20 kWh/m²y
PEC	65,20 kWh/m²y
Energy savings %	41 %
Absolute savings	265.604,00 kWh/y
Financial info	/



Partner: KB Platzer Tingstadvassen 3:8

Building: Tingstadvassen 3:8

GreenBuilding 2014

Project : Refurbishment

Address: Krokegårdsgatan 5, 417 05 - Göteborg

Country: Sweden

Building Description and Technical Measures

This building hosts a shopping mall with stores of varied size. Restaurants and café are also included. It was built in the nineties and has been upgraded to be more energy efficient. The measures taken are the followings: AHU equipped with heat exchanger which replaces the exhausted fans; new inverters for fans and added CO2 controlled ventilation system; improved entrance doors for minimized infiltration through doors; adjusted set-points and schedules for heat production and ventilation.

Technical Data

Building use	Wholesale & Retail
Area	4.800 m²
PEC before or reference value	186,10 kWh/m²y
PEC	127,10 kWh/m²y
Energy savings %	32 %
Absolute savings	283.200,00 kWh/y
Financial info	/



Partner: Keyser Fastigheter

Building: Stillbilden 3

GreenBuilding 2014

Project: Refurbishment

Address: Stallarholmsvägen 12, 12459 - Bandhagen

Country: Sweden

Building Description and Technical Measures

Stillbilden is an industrial building located in Bandhagen. It has been renovated with a geothermal system for heating and the ventilation system (CAV) has been equipped with a heat recovery system. The building's envelope performance has been improved through additional insulation. In addition to the stocking activity, in the building is there also an office space for the staff.

Technical Data

Building use	Manufacturing & Industry
Area	712,8 m²
PEC before or reference value	350,50 kWh/m²y
PEC	59,70 kWh/m²y
Energy savings %	83 %
Absolute savings	207.282,00 kWh/y
Financial info	/



Partner: Klöver AB

Building: Dalasalen hus 5, Falun 8:9

GreenBuilding 2014

Project: Refurbishment

Address: Kaserngården 3, 791 40 - Falun

Country: Sweden

Building Description and Technical Measures

The project relates to a property on Kaserngården 3, in Falun, Sweden. The building was an old military building, which listed among the important heritage-cultural building of the country. The building develops on one floor of 1.449 m². The building today is used as a restaurant. Heat is supplied by district heating. The mechanical ventilation is equipped with a heat recovery system. Improvements include: balancing and zoning of the radiator circuit and balancing pumps for the heating system, sealing the windows and balancing pumps and airflows in the ventilation system, additional insulation on the attic with 40 cm of ecofiber.

Technical Data

Building use	Restaurant & Catering
Area	1449 m²
PEC before or reference value	297,70 kWh/m²y
PEC	205,50 kWh/m²y
Energy savings %	31 %
Absolute savings	133.597,00 kWh/y
Financial info	/



Partner: Klöver AB

Building: Forskarbyn 2

GreenBuilding : 2014

Project: Refurbishment

Address: Forskarvägen 1-3, Örebro

Country : Sweden

Building Description and Technical Measures

The project concerns a renovation of a building of the 90's. The building hosts offices and retails. It has 5 floors for a total surface of 5.203 m². It is made of concrete and is supplied by a district heating system. The heat is delivered by a hydronic system. In 2009 several measures has been taken with the goal of upgrade the construction with an energy saving perspective. New circulation pumps have been adopted and the heating system has been equipped with a new balancing system and is now demanded controlled. As a result the energy demand was decreased of 33%.

Technical Data

Building use	Office
Area	5.203 m²
PEC before or reference value	153,90 kWh/m²y
PEC	102,70 kWh/m²y
Energy savings %	33 %
Absolute savings	266.393,00 kWh/y
Financial info	/



Partner: Klöver AB

Building: Kanoten 10

GreenBuilding : 2014

Project: Refurbishment

Address: Lagergrens gata 7 652 26 Karlstad

Country : Sweden

Building Description and Technical Measures

The project relates to a property on Lagergrens Gata 7 in Karlstad, Sweden. The object has a concrete frame with concrete facade built in 1989. This office building consists of five floors for a total surface of 10.165 m². In 2009-2010, there several measures have been taken with an energy saving purpose. The mechanical ventilation has been equipped with a heat recovery system. The lighting system is equipped with LED lighting and presence control. Heating is provided by district heating through hydronic systems operating efficiency. The result is an energy savings of more than 33 %.

Technical Data

Building use	Office
Area	10.165 m²
PEC before or reference value	78,80 kWh/m²y
PEC	46,60 kWh/m²y
Energy savings %	41 %
Absolute savings	327.313,00 kWh/y
Financial info	/



Partner: Klöver AB

Building: Kv Isafjord

GreenBuilding : 2014

Project: New Building

Address: Nolsögatan 3, plan 28, 16440 - Kista

Country : Sweden

Building Description and Technical Measures

Kv Isafjord I is a 27 700 m² new built 10 floors office building. There are two story parking garage placed below ground level. In addition to the office spaces at 1st floor (main floor), there are spaces for the following use: reception, conference areas, goods receiving and environmental rooms. The building envelope has a good U-value. The heating system is equipped with a geothermal plant with COP 4; the building is connected to the district heating system. The building is provided with heat recovery and VAV ventilation system. The lighting system is time-controlled.

Technical Data

Building use	Office
Area	27.000 m²
PEC before or reference value	60,00 kWh/m²y
PEC	41,00 kWh/m²y
Energy savings %	32 %
Absolute savings	513.000,00 kWh/y
Financial info	/



Partner: Klöver AB

Building: Oxbacken 7

GreenBuilding : 2014

Project: Refurbishment

Address: Krantorpsgatan 1, 702 25 - Örebro

Country : Sweden

Building Description and Technical Measures

The project concerns the refurbishment of an office building of the 80' with a facade of brick and wood. It has a total area of 2.920 m2. Energy consumption has decreased dramatically with the installation of a new geothermal heat pump. The construction is provided with demand controlled ventilation system, equipped with high efficiency heat recovery (90%). The lighting system is time controlled.

Technical Data

Building use	Office
Area	2.920 m²
PEC before or reference value	65,00 kWh/m²y
PEC	39,00 kWh/m²y
Energy savings %	40 %
Absolute savings	75.920,00 kWh/y
Financial info	/



Partner: Klöver AB

Building: Pigan I

GreenBuilding : 2014

Project: Refurbishment

Address: Riagatan 53, 702 26 - Örebro

Country : Sweden

Building Description and Technical Measures

The application relates to a property on Riagatan 53 in Örebro. The property has a concrete frame with brick facade built in 1992. The building consists of one floor of 932 square meters. The house is used for mail sorting and associated office area.

Heating is done by district heating with hydronic heating systems. In 2011, there were several measures operating efficiency, resulting in energy savings of over 25 percent.

Technical Data

Building use **Office**

Area **932 m²**

PEC before or reference value **180,80 kWh/m²y**

PEC **125,00 kWh/m²y**

Energy savings % **31 %**

Absolute savings **52.005,00 kWh/y**

Financial info /





Partner: **KOBRA Team d.o.o.**

Building: **Business building "KOBRA"**

GreenBuilding : 2014

Project: New Building

Address: Levičnikova cesta 2, 8310 - Šentjernej

Country : Slovenia

Building Description and Technical Measures

This new office building is located in Šentjernej, Slovenia. Its heated net floor area amounts to 1.267.3 m². The building is very well insulated and has an average U-value of 0.3 W/m²/K. Windows are equipped with triple glazed unit. Thermal bridges have been localized and eliminated. It is equipped with an electric heat pump for heating and with a ground source heat pump for cooling. The ventilation system is provided with heat recovery 9&8% efficiency. A solar thermal plant (hot water collector with selective glazing) and a PV plant (145.078 kWh/y generated) are also installed.

Technical Data

Building use	Office
Area	1.267 m²
PEC before or reference value	49,70 kWh/m²y
PEC	19,10 kWh/m²y
Energy savings %	61,6 %
Absolute savings	38.830,00 kWh/y
Financial info	/





KRAUKLIS
GRENDE

Partner: Krauklis Grende

Building: Ērgļi

GreenBuilding : 2014

Project: Refurbishment

Address: Lauksaimniecības street 14, LV-4840 - Ērgļi

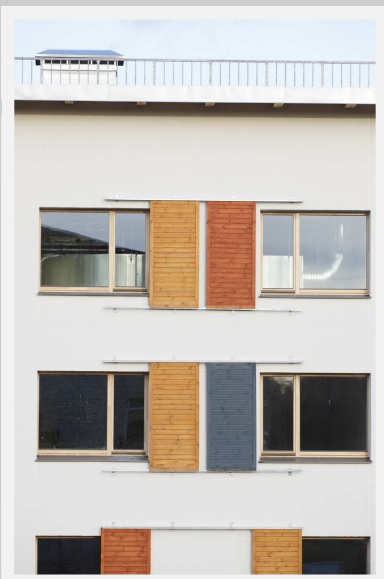
Country : Latvia

Building Description and Technical Measures

This school student dormitory located in Ērgļi has been built in 1972; no refurbishment intervention has been taken in all these years, except minor repairs. During renovation it was planned to achieve very low energy (EnerPhit) standard. Efficient heat recovery on the ventilation system has been provided. Insulation has been added to roof and wall structure (70 cm and 40 cm thick respectively). Existing walls $U=1.05$, roof $U=0.52$, windows $U=2,6$ W/m²K; after refurbishment: walls $U=0.117$, roof 0.072 , windows $U=0.7$ W/m²K. The building heating system is supplied by district heating. A biomass boiler has been adopted. Energy consumption data after renovation shows more than 80% energy savings and overall students feel more comfortable after renovation. The analysis demonstrates that in considering long-term investments in measures for energy efficiency, it is necessary to implement deep renovation.

Technical Data

Building use	Office
Area	3.346 m²
PEC before or reference value	154,00 kWh/m²y
PEC	28,00 kWh/m²y
Energy savings %	81,8 %
Absolute savings	2.107.800,00 kWh/y
Financial info	/





Partner: Krauklis Grende

Building: Ventspils municipality building

GreenBuilding : 2014

Project: Refurbishment

Address: Jūras street 36, LV 3601 - Ventspils

Country : Latvia

Building Description and Technical Measures

Before renovation this municipal building in Jūras street 36, Ventspils, was characterized by high energy consumption and low indoor quality. The existing situation of the building has been assessed by energy auditors and civil engineers. During design phase careful design solutions have been defined to achieved maximum energy savings. New ventilation system with heat recovery has been adopted and existing internal duct system has been used where possible. A ventilated facade system has been adopted on the south side of the construction. The main measures applied are: roof insulation and renovation; exterior basement insulation; facade insulation; new windows, door and blinds to protect occupants from overheating during summer period; solar collector systems for hot water preparation during summer and some periods in autumn and spring; mechanical ventilation system with high efficiency recovery; heating system insulation, balancing and adaption to low energy building requirements.

Technical Data

Building use	Office
Area	2.486 m²
PEC before or reference value	259,70 kWh/m²y
PEC	22,00 kWh/m²y
Energy savings %	83,7 %
Absolute savings	259.701,00 kWh/y
Financial info	/





Partner: Lantmännen Byggnads AB

Building: Kv. Fristaden 5

GreenBuilding : 2014

Project: Refurbishment

Address: S:t Göransgatan 160, 11217 - Stockholm

Country : Sweden

Building Description and Technical Measures

Part of the building has been renovated and also a new part has been added. Existing windows are improved with add-on energy panes and automatic external shading devices. The HVAC system has been completely replaced and equipped with efficient heat recovery. Insulation has been improved on the roof and ground floor. The building is supplied by district heating. The lighting system is demand controlled.

Technical Data

Building use	Office
Area	16.556 m²
PEC before or reference value	125,00 kWh/m²y
PEC	81,00 kWh/m²y
Energy savings %	36 %
Absolute savings	728.464,00 kWh/y
Financial info	/

Partner: LC Fastigheter 3AB

Building: Halmstad 7:101

GreenBuilding 2014

Project: New Building

Address: Handelsvägen 4, 30230 - Halmstad

Country: Sweden

Building Description and Technical Measures

The building consists of an office area on two levels with a space with warehouse and production activities on one floor. The office portion has a water-based radiator heating system and FTX ventilation with comfort cooling. The floor that consists of production activities has water-driven air heating and FTX ventilation. The building envelope is very good with a mean U-value of 0.192 and an air leakage of 0.12 l/s-m² at 50Pa. This, together with FTX recovery for the entire building, enables the building to meet the requirements for certification.

Technical Data

Building use	Manufacturing & Industry
Area	11.720 m²
PEC before or reference value	80,00 kWh/m²y
PEC	38,70 kWh/m²y
Energy savings %	52 %
Absolute savings	484.036,00 kWh/y
Financial info	/





Partner: Lidl Danmark

Building: Administrationsbygningen

GreenBuilding : 2014

Project: New Building

Address: Nordhøj 8, 4600 - Køge

Country : Denmark

Building Description and Technical Measures

This project concerns an administration building for Lidl Danmark. The building has a very well insulated envelope with a U value (W/m²/K) of 0.26. The building is supplied with district heating and is equipped with an air-water heat pump for the cooling system. In order to reduce solar heat gains windows have triple glazed unit with selective glazing. The ventilation system is provided with heat recovery (81% efficiency). The building is also equipped with a photovoltaic plant.

Technical Data

Building use	Office
Area	1.582 m²
PEC before or reference value	72,70 kWh/m²y
PEC	46,80 kWh/m²y
Energy savings %	35,6 %
Absolute savings	40.973,00 kWh/y
Financial info	€ 45.000,00





Partner: Lomma kommun

Building: Löddesnäs 8:1

GreenBuilding 2014

Project: Refurbishment

Address: Amiralsvägen 24, 237 32 - Bjärred

Country: Sweden

Building Description and Technical Measures

This project concerns a primary school located in Lomma Kommun which was built in the seventies. The building achieved a very good energy saving target through the complete renovation of the ventilation system (CAV) which has been equipped with heat recovery. The heating system is equipped with an efficient gas boiler, no cooling system is provided.

Technical Data

Building use	Education
Area	1.088 m²
PEC before or reference value	223,20 kWh/m²y
PEC	117,10 kWh/m²y
Energy savings %	48 %
Absolute savings	115.436,80 kWh/y
Financial info	/





Partner: Lomma kommun

Building: Löddesnäs 8:2, building nr. 1

GreenBuilding 2014

Project: Refurbishment

Address: Apotekarevägen 21, 237 32 - Bjärred

Country: Sweden

Building Description and Technical Measures

The project concerns the refurbishment of an educational building with a total Atemp area of 3.275 m². It is a one floor building made of concrete. The heat is provided by a natural gas boiler. The main intervention for the energy efficiency up-grade of the construction was the replacement of the ventilation system, which is equipped with a high efficiency heat recovery system. The lighting system is controlled by a occupancy linking control system.

Technical Data

Building use	Education
Area	3.275 m²
PEC before or reference value	194,40 kWh/m²y
PEC	99,10 kWh/m²y
Energy savings %	49 %
Absolute savings	312.108,00 kWh/y
Financial info	/





Partner: Lomma Kommun

Building: Löddenäs 8:2 building nr. 2

GreenBuilding 2014

Project: Refurbishment

Address: Apotekarevägen 21, 237 32 - Bjärred

Country: Sweden

Building Description and Technical Measures

This project concerns the refurbishment of a sporting facility for school's children. It was built in the 70s. and restored in 2012. The former heating system has been replaced with a new-energy-efficient gas boiler system. The old system used heat pipes that had big heat losses and that have been substituted. The ventilation system is equipped with heat recovery.

Technical Data

Building use	Sport & Leisure
Area	1.446 m²
PEC before or reference value	159,20 kWh/m²y
PEC	94,60 kWh/m²y
Energy savings %	41 %
Absolute savings	93.411,60 kWh/y
Financial info	/





Partner: Marc Asbeck
Building: Bürogebäude TPO III

GreenBuilding : 2014

Project: New Building

Address: Fritz Erler Strasse 4, 53113 - Bonn

Country : Germany

Building Description and Technical Measures

This new office building is located in Bonn. It has net floor area of 3.099,98 m². In general this building is used 14 hours a day and 310 days per year. It hosts offices, stock area and personnel rooms. The envelope is constructed with massive walls provided with thermal insulation. The average U value amounts to 0.44 W/m²/K. In order to reach the targeted temperature of 20⁰ C a district heating system is provided. The lighting system is equipped with luminescent screen tubes.

Technical Data

Building use	Office
Area	3.099 m²
PEC before or reference value	142,00 kWh/m²y
PEC	112,00 kWh/m²y
Energy savings %	26,9 %
Absolute savings	152.160,90 kWh/y
Financial info	/





Partner: Marc Asbeck
Building: Tower Park Office IV

GreenBuilding : 2014

Project: New Building

Address: Fritz - Schäfer - Straße 7,53113 - Bonn

Country : Germany

Building Description and Technical Measures

The office building consists of seven floors above ground and three underground. The regular floors have a clear height of 3,47 m. From the first floor to the third floor, the facade is glazed all around. For this area, windows with hidden inner frames were selected. There is also the foyer, an atrium three floors high with a windows-post-and-beam construction. The post-and-beam constructions and the other windows are produced with thermally insulated, powder-coated aluminium profiles. Double glazing was selected with $U_w, <1.40 \text{ W / m}^2 \text{ K}$. The external walls between the third and the sixth level are insulated with an external thermal insulation composite system. The ceiling of the cantilevered-garage is executed as a green roof. The flat roof is arranged in levels of terraces. The basic heating is provided by groundwater wells in conjunction with heat pumps. The peak load is covered by district heating.

Technical Data

Building use	Office
Area	4.238 m²
PEC before or reference value	124,00 kWh/m²y
PEC	92,60 kWh/m²y
Energy savings %	25,4 %
Absolute savings	133.073,20 kWh/y
Financial info	€ 53.000,00





Partner: Metropol Development GmbH
Building: Cäcilienstasse Köln – After 2010

GreenBuilding 2014

Project : New Building

Address: Cäcilienstraße 30, 50667 - Köln

Country: Germany

Building Description and Technical Measures

On the premises are located two parallel-standing 4-floor buildings between the Cäcilienstrasse and Kronengasse. Between the buildings, in the interior courtyard, exists a 2,5 level underground parking. The building is used as office and technic building by the Deutsche Telekom. The project concerns the refurbishment of an existing building and new two more floors. The 5th floor of Kronengasse is planned as a stair-level with roof-top terraces. On the flat roof of the spandrel-braced 4-floor building will be rise the technical floor. The addition of storey will be in light-weight design with steel skeleton structure. The interior finish will be built in plasterboard stud wall. The heating plant is connected to the district heating network. The ventilation system is provided with heat recovery. In the refurbished part all new fluorescent lamps have replaced the old ones.

Technical Data

Building use	Wholesale & Retail
Area	2.359 m²
PEC before or reference value	162,20 kWh/m²y
PEC	105,40 kWh/m²y
Energy savings %	35 %
Absolute savings	133.991,00 kWh/y
Financial info	/





Partner: Metropol Development GmbH

Building: Cäcilienstasse Köln – 1970 Renovation

GreenBuilding 2014

Project : Refurbishment

Address: Cäcilienstraße 30, 50667 - Köln

Country: Germany

Building Description and Technical Measures

On the premises are located two parallel-standing 4-floor buildings between the Cäcilienstrasse and Kronengasse. Between the buildings, in the interior courtyard, exists a 2,5 level underground parking. The building is used as office and technic building by the Deutsche Telekom. The project concerns the refurbishment of an existing building and new two more floors. The 5th floor of Kronengasse is planned as a stair-level with roof-top terraces. On the flat roof of the spandrel-braced 4-floor building will be rise the technical floor. The addition of storey will be in light-weight design with steel skeleton structure. The interior finish will be built in plasterboard stud wall. The heating plant is connected to the district heating network. The ventilation system is provided with heat recovery. In the refurbished part all new fluorescent lamps have replaced the old ones.

Technical Data

Building use	Wholesale & Retail
Area	1.850 m²
PEC before or reference value	127,20 kWh/m²y
PEC	94,00 kWh/m²y
Energy savings %	26,1 %
Absolute savings	61.050,00 kWh/y
Financial info	/



Partner: Mr. Hans Christoph List

Building: Office building Stubenbastei 5 / Cobdengasse 2

GreenBuilding : 2014

Project: Refurbishment

Address: Stubenbastei 5, 1010 - Vienna

Country : Austria

Building Description and Technical Measures

This office building was erected in 1978 and, since 1995 – after a partly refurbishment – hosted the department of the Austrian ministry of the environment. In 2013 a total refurbishment of this building took place, with the goal to reduce energy consumption and cost of energy substantially to meet – at the end – the regulations of the Green Building Programme of EU Commission.

Due to the marble façade of the building (located in the centre of the city of Vienna which is UNESCO World Heritage Site, witnessed by ICOMOS) the thermal refurbishment was mostly limited to the substitution of the windows ($U=0,97$). In addition to that the main part of saving of energy had to be realized by the mechanical and electrical services. Actions taken as changing the cooling system to highly energy efficient TURBOCOR chillers, equipping the existing air handling units with heat recovery systems (office zone) or exchanging them (kitchen and internal zone), changing the lighting from existing 36 W luminescent screen tubes to LED (incl. daylight control), modernization of digital control and in addition to that installation of a photovoltaic plant on roof top (20 kWp) leads to a remarkable energy saving.

Technical Data

Building use	Office
Area	9.941 m²
PEC before or reference value	173,0 kWh/m²y
PEC	104,30 kWh/m²y
Energy savings %	40 %
Absolute savings	687.036,00 kWh/y
Financial info	€ 1.035.000,00

Partner: Municipality of Evrotas

Building: Bassourakos Building-Cultural Center

GreenBuilding 2014

Project : Refurbishment

Address: Bouboulinas 6, 23051 - Skala Lakonias

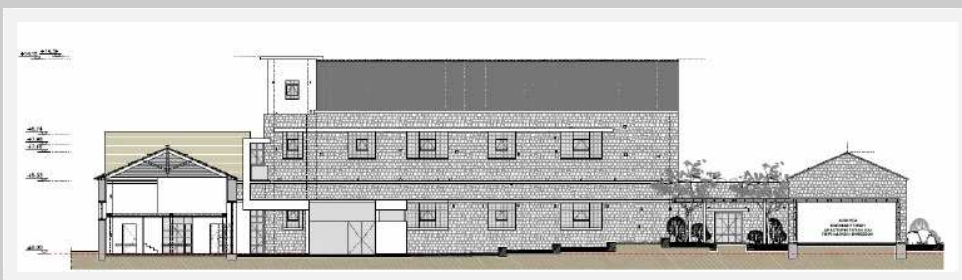
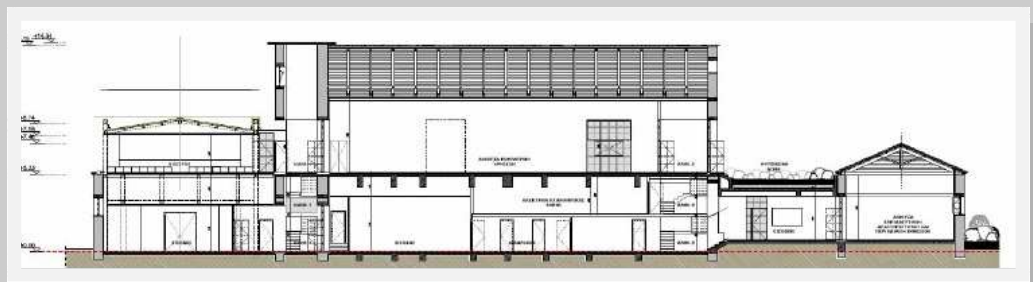
Country: Greece

Building Description and Technical Measures

The project is a redevelopment of an existing building, a traditional Venetian villa, with an addition of a new built volume. The building is used for design offices, sample handcrafting area, conference room and a part of technical space. The main activity of the new building complex will be related to management. The main energy saving measures includes: high-efficiency ground-water heat pump with heat recovery; AHU with packaged heat recovery unit; hydronic heating/cooling coil and high efficiency fans; high efficiency envelope; presence controlled interior lighting system; photovoltaic array integrated with new roof (amorphous silicon).

Technical Data

Building use	Cultural
Area	1.680 m²
PEC before or reference value	147,20 kWh/m²y
PEC	93,30 kWh/m²y
Energy savings %	36,6 %
Absolute savings	90.536,00 kWh/y
Financial info	€ 285.000,00





Partner: **NCC Property Development AB**

Building: **Fraktalen I**

GreenBuilding : 2014

Project: New Building

Address: Solnavägen/Norra Stationsgatan 4/80C, 11333 - Stockholm

Country : Sweden

Building Description and Technical Measures

Fraktalen I is a new twelve floor building which will hosts offices, garage and a shopping mall. The building's energy heat demand is guarantee by a district heating system. An efficient heat recovery system is installed on ventilation. Heating and cooling air flows in the offices are variable-dependent on temperature. The envelope is very well insulated and reaches a high performance standard.

Technical Data

Building use	Office
Area	35.873 m²
PEC before or reference value	120,00 kWh/m²y
PEC	75,60 kWh/m²y
Energy savings %	37 %
Absolute savings	1.592.761,00 kWh/y
Financial info	/





Partner: NCC Property Development AB

Building: Kaninen 30

GreenBuilding : 2014

Project: New Building

Address: Rådmanngatan 16, Malmö

Country : Sweden

Building Description and Technical Measures

The heated area of the building amounts to 16.803 m² and has two floors above ground and shared parking garage below ground level. The building has a concrete structure with prefabricated façade elements consisting of steel stud walls with mineral wool insulation and various façade coverings. The ventilation plant is equipped with both constant and variable flow ventilation systems and with heat recovery. The heat is provided by district heating and distributed by radiators. Cooling is produced by a central cooling unit with free cooling when the outdoor temperature is below 7C. Cooling is distributed through the ventilation system and local fan coils. To improve the indoor climate and reduce the cooling demand, external solar shadings are placed on the south and west façades, as well as solar control glass.

Technical Data

Building use	Office
Area	16.803 m²
PEC before or reference value	146,00 kWh/m²y
PEC	65,10 kWh/m²y
Energy savings %	55 %
Absolute savings	1.359.362,70 kWh/y
Financial info	/



Partner: NCC Property Development A/S

Building: Flintholm – Company House

GreenBuilding : 2014

Project: New Building

Address: Dirch Passers Allé 76, 2000 - Frederiksberg

Country : Denmark

Building Description and Technical Measures

This building is designed for offices with common reception, access area, canteen and meeting rooms. At lower floor parking area and retails are located. The heat is provided through district heating. The ventilation system is equipped with heat recovery with 84% efficiency. For cooling strategy selective glazing is adopted. A centralized mechanical cooling plant is installed. NCC property development considers low-energy building a very good investment in a long term perspective, because they are easier to let out and to sell. The BMS installed in the building measures the energy consumption from all major sources; central heating and domestic hot water system, power consumption for fans, cooling and lighting are equipped with separate accessible energy meters.

Technical Data

Building use	Office
Area	22.367 m²
PEC before or reference value	95,09 kWh/m²y
PEC	65,06 kWh/m²y
Energy savings %	31,5 %
Absolute savings	671.010,00 kWh/y
Financial info	/





Partner: NCC Property Development A/S

Building: Tegholmen – Company House

GreenBuilding : 2014

Project: New Building

Address: Tegholms Allé 1, 2450 - Copenhagen

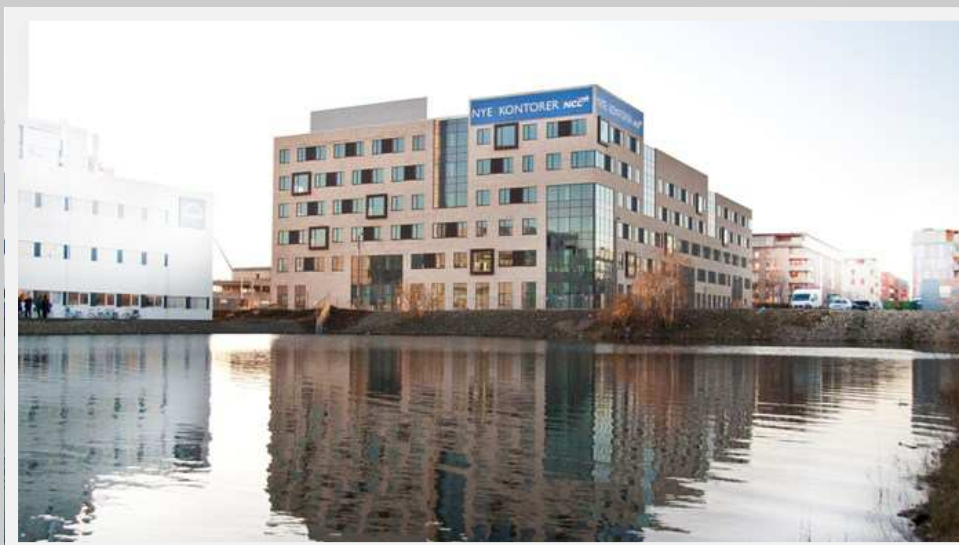
Country : Denmark

Building Description and Technical Measures

This building is designed for offices with common reception, access area, canteen and meeting rooms. The building envelope is very performing, its U value amount to 0.2 W/m²/K. Heat is provided through district heating. The ventilation system is equipped with heat recovery with 84% efficiency. For cooling strategy selective glazing is adopted. A centralized mechanical cooling plant is installed. NCC property development considers low-energy building a very good investment in a long term perspective, because they are easier to let out and to sell. The BMS installed in the building measures the energy consumption from all major sources; central heating and domestic hot water system, power consumption for fans, cooling and lighting are equipped with separate accessible energy meters.

Technical Data

Building use	Office
Area	9.195 m²
PEC before or reference value	95,10 kWh/m²y
PEC	67,30 kWh/m²y
Energy savings %	29,3 %
Absolute savings	255.621,00 kWh/y
Financial info	/





NIMBUS OFFICE

Partner: Nimbus Real Sp z o.o.

Building: NIMBUS Office

GreenBuilding : 2014

Project: New Building

Address: Al. Jerozolimskie 98, 00-807 Warszawa

Country : Poland

Building Description and Technical Measures

Nimbus Office is a Class A, technically advanced office building situated downtown of Warsaw. The building consists of two parts: 13 floors in the western part and 14 floors in the eastern part of the building with a bright, generous lobby in the centre and 3 level underground parking for approx. 200 cars. The total office space amounts approximately 19000 m². It is designed for tenant's convenience and minimum environmental impact. The result is an eco-friendly and responsible building that meets modern environmental standards. During the design stage the following aspects were taken into account: sustainable land use, efficient use of water, energy, materials and natural sources and indoor environmental quality. High efficient envelope and HVAC system were developed to achieve high efficiency energy target and low operation costs. The BMS with multiple air quality and security sensors helps to control the building consumption. The building is equipped with green balconies and terraces, extensive glazing for maximum daylight sound insulated façade and environmentally friendly materials.

Technical Data

Building use	Office
Area	21.197 m²
PEC before or reference value	237,00 kWh/m²y
PEC	176,80 kWh/m²y
Energy savings %	25,5 %
Absolute savings	1.276.059,00 kWh/y
Financial info	/





Partner: Norrporten i Växjö AB

Building: Fries II

GreenBuilding : 2014

Project: Refurbishment

Address: Storgatan 21 m.fl, Växjö

Country : Sweden

Building Description and Technical Measures

This project concern the renovation of an office building .On the ground floor are located stores and offices, on the two top floors only offices. HVAC units are placed in the attic an in the basement floor, along with a garage. The ventilation system consists of separate supply- and extract air fan units; the plant is equipped with a heat recovery system. The supplied air is heated and cooled by heat pumps/chillers. The energy efficiency effort consists concentrate on the following 3 main actions:

- 1.The ventilations system has been renovated and the old fans have been replaced by new ones with better energy performance and variable speed.
2. The already existing VAV has been expanded.
3. The old pumps have been replaced by new ones.

Technical Data

Building use	Office
Area	2.330 m²
PEC before or reference value	322,20 kWh/m²y
PEC	207,50 kWh/m²y
Energy savings %	36 %
Absolute savings	267.251,00 kWh/y
Financial info	/



Partner: NP30 s.r.o.

Building: Na Poříčí 30 – Motel One

GreenBuilding 2014

Project: Refurbishment

Address: Na Poříčí 30, 110 00 - Prague

Country: Czech Republic

Building Description and Technical Measures

The project concerns the refurbishment of an ancient building located in the historical area of Prague. The building has two underground floors and seven floors above the ground (1st – 7th floor). The building was designed as an administrative building; after the intervention will be used as a hotel. The facades will be, according to the requirements of cultural heritage preservation, cleaned, repaired and fitted using original materials. Facades will not be thermally insulated. According to the results of the construction survey the walls are mainly of masonry bricks fitted with plaster, with the thickness 450-750 mm. The calculated heat transfer coefficient U of the exterior walls is 1.14 W/m²/K. New roof will respect the original covering, i.e. copper plate. Windows in the courtyard facades will be replaced. In the low-pressure boiler room is now installed a gas condensing boiler with the heating power of 285.2 kW. Each heating circuits will be equipped with an electronically controlled twin pump or two pumps with 100% reserve. For the cooling area of the hotel is designed central cooling system. The cold source is designed with a water-cooled compressor-type cooling unit. The fans of the AHU units will be equipped with frequency converters.

Technical Data

Building use	Hotel & Accomodation
Area	5.575 m²
PEC before or reference value	275,2,00 kWh/m²y
PEC	156,00 kWh/m²y
Energy savings %	42,5 %
Absolute savings	664.540,00 kWh/y
Financial info	/





Partner: OBI GmbH & Co. Deutschland KG

Building: OBI Olpe

GreenBuilding 2014

Project : New Building

Address: In der Trift 17, 57462 - Olpe

Country: Germany

Building Description and Technical Measures

This prototype market in Göppingen features a totally new system with regard to the storage of heating and ventilation system. The ventilation has been supplemented with a highly efficient heat recovery system; new motors with EC-technology have been used. The heating storage is provided by decentralised unit heaters with low power consumptions in combination with a modern control system. Instead of a heat and power plant, an absorption heat pump covers the corresponding part of the heat requirement. The heat pump is used for heating the tap water. Despite the enormous dimensions of the building the total shell is insulated above average. In the roof section very complex roof-lights are used which, by interaction with a modern light control system, provide an efficient, natural lighting with daylight. The whole lighting system is provided with a modern dimmable T5 lighting system.

Technical Data

Building use	Wholesale & Retail
Area	5.788 m²
PEC before or reference value	146,00 kWh/m²y
PEC	109,00 kWh/m²y
Energy savings %	25,4 %
Absolute savings	214.156,00
Financial info	€ 121.900,00





Partner: OBI GmbH & Co. Deutschland KG

Building: OBI Arnsberg

GreenBuilding 2014

Project : New Building

Address: Arnsberger Str, 59759 Arnsberg

Country: Germany

Building Description and Technical Measures

The prototype market in Göppingen features a totally new system with regard to ventilation and heating. The ventilation has been supplemented by an even higher heat recovery and new motors with EC-technology have been used. The stored heating is provided by decentralised unit heaters with low power consumption in combination with a modern control system. Instead of a one-block heat and power plant, an absorption heat pump covers a corresponding part of the heat requirement. A heat pump is also used for heating the tap water. Despite the enormous dimensions of the building the shell is insulated above average. In the roof section roof-lights are used which, by interaction with a modern light control system, provide for an efficient, natural lighting with daylight. The whole lighting system was changed over to a modern and dimmable T5 lighting in this process. The market is heated by an air-heating system. In the cash area radiant ceiling panels are used.

Technical Data

Building use	Wholesale & Retail
Area	7.995 m²
PEC before or reference value	177,20 kWh/m²y
PEC	132,00 kWh/m²y
Energy savings %	25 %
Absolute savings	361.374,00
Financial info	€ 121.900,00



Partner: Pharmaserv GmbH & Co. KG

Building: Eco-Lab M310

GreenBuilding 2014

Project: New Building

Address: Görzhäuserhof I, 35041 - Marburg

Country: Germany

Building Description and Technical Measures

M310 is a laboratory building with 4 floors and about 1.800m² gross space. Its design has two main targets: maximum attractiveness to the customer and supreme ecological effectiveness. The building will be used for testing medical care in market-launch-phase. The building is fully heated and chilled by a geothermal plant and a ground source field. The building envelope is shaped for maximum energy savings. The biggest impact on the energy consumption is the cooling because almost all of the test systems will run continuously (mostly 24h) and generate a high load of heat. Our concept is to store this energy down in the earth. Therefore it is possible to "re-use" about 70% of this energy during the winter months, also for other buildings (which is planned but not part of the application). So what we actually get is emission-free energy for cooling and reduced energy consumptions for heating. The special form of heating panels reduces ventilation systems to a minimum and save both energy and operating costs for the tenant. Energy savings is nearly 70 % compared to conventional concepts that can be realized. In addition to that the project is supported by the German Government by a special credit-programme called "ERP-Umwelt- und Energieeffizienzprogramm.

Technical Data

Building use	Healthcare & Social Work
Area	1.428 m²
PEC before or reference value	555,80 kWh/m²y
PEC	172,30 kWh/m²y
Energy savings %	69 %
Absolute savings	547.638,00 kWh/y
Financial info	€ 140.000,00





Partner: Platzer Fastigheter AB

Building: Högsbo 3:6-2

GreenBuilding : 2014

Project: Refurbishment

Address: Fältspatsgatan 6, 42130 - Västra Frölunda

Country : Sweden

Building Description and Technical Measures

The building was erected in the 60s and has a total heated surface of 8.736 m². The building is connected to the district heating system. Most of the installations were considered in good condition. The heating system includes new radiators, new handling units for ventilation and tap water. The used district heating is labelled "Naturskyddsföreningens Bra Miljöval". The major HVAC system was replaced in 2010 and this is also the major input which gave to the refurbishment an energy saving goal.

Technical Data

Building use	Office
Area	8.736 m²
PEC before or reference value	73,80 kWh/m²y
PEC	47,00 kWh/m²y
Energy savings %	36 %
Absolute savings	234.124,80 kWh/y
Financial info	





Partner: Platzer Fastigheter AB

Building: Nordstaden 13:12

GreenBuilding : 2014

Project: Refurbishment

Address: Packhusplatsen 5, 41113 - Gothenburg

Country : Sweden

Building Description and Technical Measures

This building hosts typical offices spaces. In average there are twenty square meters per person. Each person has one computer and screen. The following measures have been implemented: installation of district central cooling; updating of the control and regulation technology and operational optimization of total building; additional inside pane of glass for each window; ventilation unit customized as needed.

Technical Data

Building use	Office
Area	5.070 m²
PEC before or reference value	157,90 kWh/m²y
PEC	107,00 kWh/m²y
Energy savings %	32 %
Absolute savings	258.063,00 kWh/y
Financial info	





Partner: Platzer Fastigheter AB

Building: Nordstaden 20:5

GreenBuilding : 2014

Project: Refurbishment

Address: Packhusplatsen 3, 41113 - Göteborg

Country : Sweden

Building Description and Technical Measures

This refurbished building hosts typical offices spaces. In average there are twenty square meters per person. Each person has one computer and screen.

The following measures have been implemented:

1. Outdoor temperature linked sensors for corrective supply of air from ventilation
2. Adjustment of radiator system, including lowering the set point for heating in stairwell
3. Additional inside pane of glass for each window
4. Adjust operation time for ventilation after the occupations

Technical Data

Building use	Office
Area	2.763 m²
PEC before or reference value	179,30 kWh/m²y
PEC	123,00 kWh/m²y
Energy savings %	31 %
Absolute savings	155.556,90 kWh/y
Financial info	





Partner: Province of Bolzano
Building: New Technology Park

GreenBuilding : 2014

Project: New Building

Address: Via Alessandro Volta, Bolzano

Country : Italy

Building Description and Technical Measures

The New Technology Park of Bolzano is a new Centre of research on high efficiency buildings, energy saving, innovation and development of new technical solutions. The building is expected to be a paradigm of energy efficiency with very low environmental impact. Both the owner and designer aspire to achieve the targets of Net Zero Energy Building (NZEB) and total primary energy consumption less than 60 kWh/m²/yr. In order to achieve this energy target, from the definitive design phase, is been used an Integrated Energy Design process with an active collaboration of EURAC research (Institute of Renewable energy), one of the future tenants of this new office building. The building is equipped with a thermal solar plant and a PV plant. Cooling is provided through a ground source heat pump. Ventilation system is equipped with a heat recovery system.

Technical Data

Building use	Office
Area	11.556 m²
PEC before or reference value	168,00 kWh/m²y
PEC	37,50 kWh/m²y
Energy savings %	77,6 %
Absolute savings	1.506.655,00 kWh/y
Financial info	€ 715.707,00





Partner: Rudolf Leiner Ges.m.b.H

Building: Leiner Graz

GreenBuilding 2014

Project : Refurbishment

Address: Annenstraße 63, 8020 - Graz

Country: Austria

Building Description and Technical Measures

The building combines sales floor, storage space, restaurant area and offices. It consists of two buildings which are combined through a glass corridor. The construction has a huge glass front. It has been refurbished with energy efficiency criteria; new insulation on exterior wall, roof and ceiling has been placed. Old windows have been replaced. The building is conditioned by a ventilation system and efficient heat pumps. The efficiency of the heat recovery is 82%. Air renewal is arranged according to CO₂ content of the air inside the building. The heat pumps provide heat in winter and chill in summer. Central building control system is installed.

Technical Data

Building use	Wholesale & Retail
Area	19.290 m²
PEC before or reference value	423,03 kWh/m³a
PEC	297,30 kWh/m³a
Energy savings %	29,7 %
Absolute savings	3.031.601,00 kWh/y
Financial info	€ 2.710.000,00





Partner: Rudolf Leiner Ges.m.b.H

Building: Leiner Store Innsbruck

GreenBuilding 2014

Project : New Building

Address: Grabenweg 60, 6020 - Innsbruck

Country: Austria

Building Description and Technical Measures

The new built store of the furniture chain "Leiner" in Innsbruck was as a low energy building. The building consists of sales area and some smaller office spaces. The shell quality is very high, 58% under legal requirements. It is heated with efficient heat pumps; the ventilation system is provided with heat recovery with 82% of efficiency. Air renewal is arranged according to CO₂ content of the air inside the building. The heat pumps are also used for cooling. Windows are provided with external shading to avoid unwanted solar gains. Building control system is installed.

Technical Data

Building use	Wholesale & Retail
Area	17.781 m²
PEC before or reference value	7,99 kWh/m³a
PEC	3,73 kWh/m³a
Energy savings %	57,82 %
Absolute savings /	
Financial info	€ 21.380.000,00





Partner: Schachinger Immobilien und Dienstleistungs GmbH & Co

Building: Logistikhalle LT I

GreenBuilding 2014

Project : New Building

Address: Logistikpark I, 4063 - Hörsching

Country: Austria

Building Description and Technical Measures

The project concerns the high-bay storage of a logistics centre of the company Schachinger built with an ecologically construction in a wooden structure. The entire building services are optimized for highest energy efficiency. Geothermal energy is used via a ground water heat pump for the building's heating supply as well as for its cooling supply. A fixed elevated PV-plant with an installed power of 199 kW_{peak} provides a high self-coverage of electricity. To avoid undesirable solar gains the office is furnished with triple glazed windows with heat insulation and the high-bay storage has implemented double glazed windows with heat insulation. The offices are equipped with energy saving- and LED technology. The high bay storage is exclusively equipped with LED technology and with a daylight and demand management system.

Technical Data

Building use	Logistics & Storage
Area	12.118 m²
PEC before or reference value	123,00 kWh/m²y
PEC	17,70 kWh/m²y
Energy savings %	67 %
Absolute savings	/
Financial info	€ 545.702,00





Partner: Schwaiger Logistic GmbH
Building: Schwaiger Logistic Center, Hall A/B

GreenBuilding 2014

Project : New Building

Address: Sportplatzweg 13, 6336 - Langkampfen

Country: Austria

Building Description and Technical Measures

The logistic centre consists of 7 halls with high-bay racks, each hall measure between 800 and 1.000 m² and is used to store mainly pharmaceutical substances and medical equipment. Therefore, a set point temperature between 16° and 23°C has to be guaranteed all year long. On the upper level office areas have been installed. The ground floor was raised to the standard loading height of +1.20m.

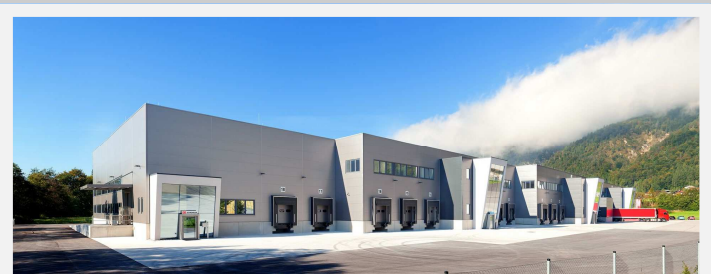
The base and base plates are well insulated. The building was erected following industrial standards: the framework consists of concrete components, the access areas have three stair cases of in-situ concrete cast. The facade is made of sandwich panels with high efficient PUR-insulation. Stone wool is used for the insulation of the flat roof and for the building components with fire safety requirements.

18 heat-insulated loading bays with dock shelters (which reduce the thermal losses during delivery to 20%) enable quick loading.

More than 600 m² skylights supply the halls with daylight for work-friendly atmosphere (therefore reducing artificial lighting). They can individually be opened for ventilation. Via bus-system all issues of relevance to energy and climate can be adjusted and controlled during operating time. Heating and cooling is provided by a water-water heat pump with a maximal power of nearly 350 kW. The building was erected in two construction stages in 2011 and 2013, all components are designed for long lifetime and reliability in day-to-day work under demanding working conditions.

Technical Data

Building use	Logistics & Storage
Area	8.401 m²
PEC before or reference value	133,78 kWh/m²y
PEC	37,83 kWh/m²y
Energy savings %	71,7 %
Absolute savings	806.075,90 kWh/y
Financial info	€ 575.080,00



Partner: Siemens AG Siemens Real Estate

Building: KiTa SieKids Erlangen

GreenBuilding 2014

Project: New Building

Address: Apotekarevägen 21, 237 32 - Bjärred

Country: Sweden

Building Description and Technical Measures

This new building hosts a kindergarten for 108 children and 18 employees. The building develops on two floors for a total area of 1.069 m². The envelope is very well insulated and windows are provided with triple glazing and permanent external shading. A blower door test has been done to prove the tightness of the shell. For heating the building is provided with a micro combined heat power with thermal solar collector support for winter. The air handling unit is equipped with heat recovery and has a capacity of 2.000 m³/h. The lighting system is equipped with occupancy linking controls.

Technical Data

Building use	Education
Area	1.069 m²
PEC before or reference value	206,30 kWh/m²y
PEC	151,60 kWh/m²y
Energy savings %	26,5 %
Absolute savings	58.365,00 kWh/y
Financial info	/





Partner: SGA Fastigheter AB

Building: Tele2 Arena

GreenBuilding 2014

Project: New Building

Address: Arenaslingan 14, 12177 - Johanneshov

Country: Sweden

Building Description and Technical Measures

Tele 2 Arena is a new arena in Stockholm. It will be used for soccer games, concerts etc. The calculated energy use is 83,6 kWh/m²/year. Due to the high density of people during events the energy use requirement from BBR is 125,2 kWh/m²/year. The GreenBuilding requirement is thus 93,9 kWh/m²/year. The construction is provided with district heating and district cooling. It is equipped with a demand-controlled ventilation system. The lighting system is equipped with presence control.

Technical Data

Building use	Sport & Leisure
Area	2.407 m²
PEC before or reference value	141,40 kWh/m²y
PEC	103,70 kWh/m²y
Energy savings %	26,7 %
Absolute savings	90.743,90 kWh/y
Financial info	/



Building Description and Technical Measures

This project concerns a new office building. The project is located on block Värmågan 6 in the Kungsholmen district of Stockholm City. The building comprises of 9-12 office floors above ground on split levels and 3 garage floors partially below ground level. The following actions have been taken in order to reduce the building's energy use by 25% compared with the national energy requirements of the Building Regulations (BBR):

- energy Simulations performed in the early stages to ensure that the technology choices leads to Green Building
- air handling unit is equipped with dual-coil heat exchanger for higher thermal efficiency than traditional, additionally LCC inspected air handling unit after installation
- air handling unit is equipped with free-cooling battery which covers the building and cooling baffles comfort cooling needs during the winter months while the excess heat is returned from the chilled beam system to preheat the incoming air
- energy monitoring with PIA performed in order to make energy forecasts and perform the required fine tuning in the early stage of the operational period
- the building is self-sufficient in cooling from the bed-rock without heat pumps need to be used, the system is also used to preheat the incoming air during the heating season

Technical Data

Building use	Office
Area	24.145 m²
PEC before or reference value	80,00 kWh/m²y
PEC	45,10 kWh/m²y
Energy savings %	44 %
Absolute savings	842.660,50 kWh/y
Financial info	/



Building Description and Technical Measures

This project concerns a new office building. The project is located on block Vålmågan 6 in the Kungsholmen district of Stockholm City. The building comprises of 9-12 office floors above ground on split levels and 3 garage floors partially below ground level. The following actions have been taken in order to reduce the building's energy use by 25% compared with the national energy requirements of the Building Regulations (BBR):

- energy Simulations performed in the early stages to ensure that the technology choices leads to Green Building
- air handling unit is equipped with dual-coil heat exchanger for higher thermal efficiency than traditional, additionally LCC inspected air handling unit after installation
- air handling unit is equipped with free-cooling battery which covers the building and cooling baffles comfort cooling needs during the winter months while the excess heat is returned from the chilled beam system to preheat the incoming air
- energy monitoring with PIA performed in order to make energy forecasts and perform the required fine tuning in the early stage of the operational period
- the building is self-sufficient in cooling from the bedrock without heat pumps need to be used, the system is also used to preheat the incoming air during the heating season

Technical Data

Building use	Office
Area	17.747 m²
PEC before or reference value	80,00 kWh/m²y
PEC	43,20 kWh/m²y
Energy savings %	46 %
Absolute savings	653.089,00 kWh/y
Financial info	/



Building Description and Technical Measures

This project concerns a new office building. The project is located on block Välmågan 6 in the Kungsholmen district of Stockholm City. The building comprises of 9-12 office floors above ground on split levels and 3 garage floors partially below ground level. The following actions have been taken in order to reduce the building's energy use by 25% compared with the national energy requirements of the Building Regulations (BBR):

- energy Simulations performed in the early stages to ensure that the technology choices leads to Green Building
- air handling unit is equipped with dual-coil heat exchanger for higher thermal efficiency than traditional, additionally LCC inspected air handling unit after installation
- air handling unit is equipped with free-cooling battery which covers the building and cooling baffles comfort cooling needs during the winter months while the excess heat is returned from the chilled beam system to preheat the incoming air
- energy monitoring with PIA performed in order to make energy forecasts and perform the required fine tuning in the early stage of the operational period
- the building is self-sufficient in cooling from the bed-rock without heat pumps need to be used, the system is also used to preheat the incoming air during the heating season

Technical Data

Building use	Office
Area	11.274 m²
PEC before or reference value	80,00 kWh/m²y
PEC	43,50 kWh/m²y
Energy savings %	46 %
Absolute savings	410.373,60 kWh/y
Financial info	/





Partner: Skanska Property Poland

Building: Green Day

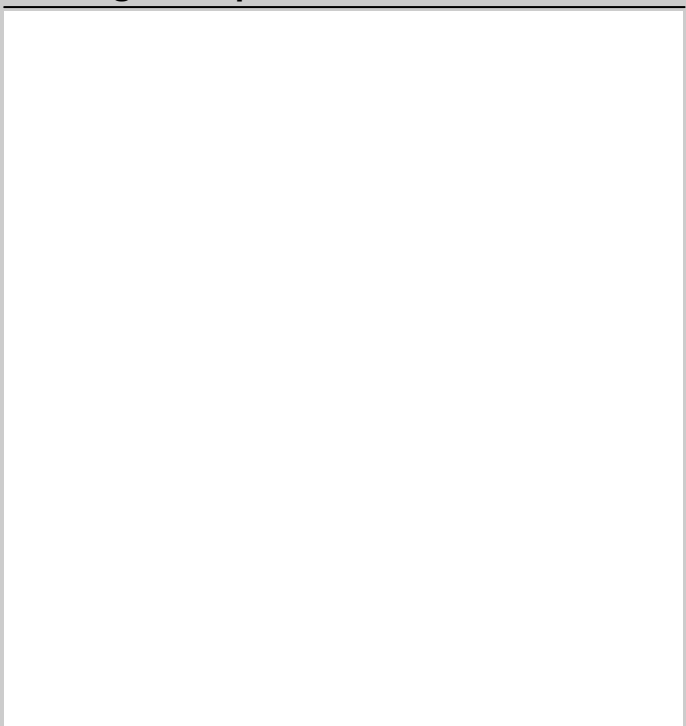
GreenBuilding 2014

Project : New Building

Address: Szczytnicka 9, 50-832 - Wrocław

Country: Poland

Building Description and Technical Measures



Technical Data

Building use	Office
Area	11.592 m²
PEC before or reference value	243,50 kWh/m²y
PEC	174,10 kWh/m²y
Energy savings %	28,5 %
Absolute savings	1.167.947,00 kWh/y
Financial info	/





Partner: Skövde kommun

Building: Ekedal I

GreenBuilding 2014

Project: New Building

Address: Fredsgatan 4, 541 83 - Skövde

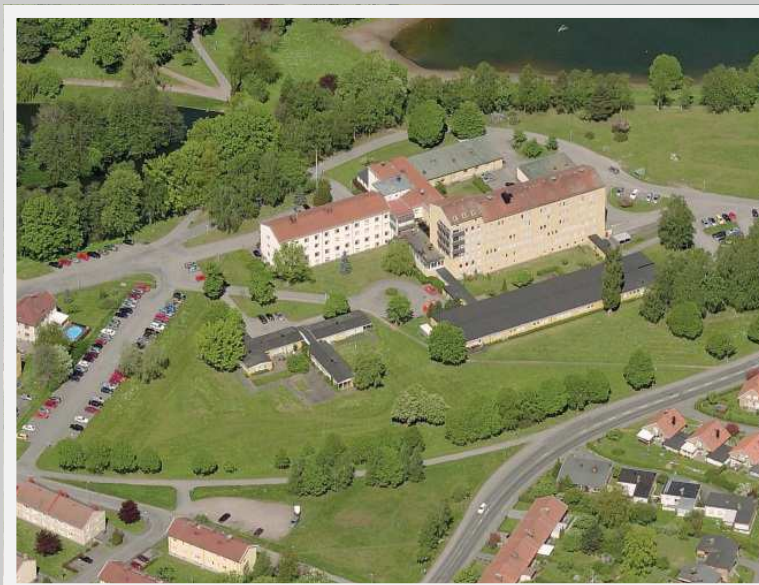
Country: Sweden

Building Description and Technical Measures

This new building hosts a retirement home. It has 6 floors and its total Atemp area is 4.443 m². The building is supplied by district heating. It has a very good envelope insulation which amounts to 0.3 W/m²/K. It is equipped with a VAV-system with heat recovery (80% efficiency). The cooling strategy is based on solar shadings and blinds. The lighting system is equipped with a presence control system.

Technical Data

Building use	Healthcare & Social Work
Area	4.443 m²
PEC before or reference value	106, 00kWh/m²y
PEC	68,50 kWh/m²y
Energy savings %	35 %
Absolute savings	166.612,50 kWh/y
Financial info	/



Partner: Sparkasse Rothenburg-Bremervörde

Building: Neubau einer Geschäftsstelle

GreenBuilding 2014

Project : New Building

Address: Hindenburgstr. 59, 27442 - Gnarrenburg

Country: Germany

Building Description and Technical Measures

This new office building is located in Gnarrenburg. Its average envelope U-value (W/m²/K) amounts to 0.36. For heat production a heat pump is in use. The ventilation system is equipped with heat recovery. Windows are provided with external shading with automatic controls and with triple glaze unit. A ground source heat pump is used for the cooling strategy. The lighting system is demand controlled in several areas. Both materials and technical equipment has been chosen to meet state of the art, technical system to be the most efficient and to minimize demand for primary energy.

Technical Data

Building use	Office
Area	804 m²
PEC before or reference value	131,50 kWh/m²y
PEC	59,30 kWh/m²y
Energy savings %	54,9 %
Absolute savings	58.048,00 kWh/y
Financial info	/

Partner: Sparkasse Rothenburg-Bremervörde

Building: Sparkassen Zentrale

GreenBuilding 2014

Project : New Building

Address: Kivinanstr., 27404 - Zeven

Country: Germany

Building Description and Technical Measures

This new office building is located in Zeven. Its average envelope U-value (W/m²/K) amounts to 0.39. For heat production a heat pump is in use. The ventilation system is equipped with heat recovery. Windows are provided with external shading with automatic controls and with triple glaze unit. A ground source heat pump is used for the cooling strategy. The lighting system is demand controlled in several areas. Both materials and technical equipment has been chosen to meet state of the art, technical system to be the most efficient and to minimize demand for primary energy.

Technical Data

Building use	Office
Area	6.816 m²
PEC before or reference value	137,00 kWh/m²y
PEC	82,70 kWh/m²y
Energy savings %	39,6 %
Absolute savings	370.109,00 kWh/y
Financial info	/



Partner: SPP Lokföraren AB

Building: Lokföraren

GreenBuilding 2014

Project : New Building

Address: Stationsgatan 12-16, 753 40 - Uppsala

Country: Sweden

Building Description and Technical Measures

Lokföraren is a building constructed with concrete and steel with large window. Building has two floors below ground and five floors above ground. The building hosts restaurants, offices and shops. The building`s heating system consists of district heating and the heat is distributed by water radiator system. Ventilation systems are both: constant airflow and variable air flow. Total temperate area is 15,187 m². Specific heating and cooling usage including pipe losses is 57,2 kWh / m², year and specific electrical energy use is 22,2 kWh / m², year.

Technical Data

Building use	Wholesale & Retail
Area	15.187 m²
PEC before or reference value	110,00 kWh/m³a
PEC	80,00 kWh/m³a
Energy savings %	27 %
Absolute savings	455.610,00 kWh/y
Financial info	/





Partner: Stena Fastigheter Stockholm AB

Building: Hägern Större 16

GreenBuilding 2014

Project : Refurbishment

Address: Drottninggatan 31-35, 10323 - Stockholm

Country: Sweden

Building Description and Technical Measures

This refurbished building is located in central Stockholm. It was built between 1980 and 1989 and renovated in 2011. The building hosts office space and retail. The main energy efficiency measure taken is the adoption of a new control and regulation systems and frequency-controlled ventilation with variable flow. The ventilation system is provided of heat recovery. The lighting system is equipped with presence –controlled.

Technical Data

Building use	Office
Area	12.068 m²
PEC before or reference value	128,00 kWh/m²y
PEC	89,70 kWh/m²y
Energy savings %	30 %
Absolute savings	462.204,00 kWh/y
Financial info	/





Partner: Stöber Ingenieure
Building: Siemens Forchheim

GreenBuilding 2014

Project: Refurbishment

Address: Simon - Hegele - Str., 91301 - Forchheim

Country: Germany

Building Description and Technical Measures

The described object is a building, which is used by the company Siemens. It has a net floor area of 13.566 m². Even this is the heated, lighted and electrical supported area. The heated net volume is 125.412m³. In general this building is used 10 hours a day and 310 days per year. The building is hosts offices, stock and personal rooms. Massive walls with thermal insulation cover the object. It has a trapezoidal sheet metal roof with thermal isolation above the main area and covered by an EPDM layer. To reach the targeted temperature of 21°C a gas oil boiler is installed. Luminescent screen tubes are used for the lightning.

Technical Data

Building use	Manufacturing & Industry
Area	13.560 m²
PEC before or reference value	303,00 kWh/m²y
PEC	226,00 kWh/m²y
Energy savings %	25,4 %
Absolute savings	1.044.120,00 kWh/y
Financial info	/



Partner: Sveareal
Building: Sämjan 2

GreenBuilding 2014

Project: Refurbishment

Address: Hasselgatan 6-8, 211-24 - Malmö

Country: Sweden

Building Description and Technical Measures

This project concerns the renovation of an industrial building. The ventilation system consists of a supply and exhaust unit equipped with a heat exchanger and a separate cooling unit for each store. The building's heating system is water-based and heat comes from district heating and ventilation. Hot water circulation systems are provided with several hot water heat exchangers: one for the radiators, one for hot water supplying the ventilation system and one for domestic hot water. Windows have been equipped with new energy efficient three glass pane.. In 2012 all components of the heating plant have been replaced. In 2013 old air handling units have been substituted with new ones.

Technical Data

Building use	Manufacturing & Industry
Area	9.419 m²
PEC before or reference value	130,40 kWh/m²y
PEC	96,00 kWh/m²y
Energy savings %	26 %
Absolute savings	324.013,60 kWh/y
Financial info	/





Partner: Telge Fastigheter AB
Building: Gravyren 22, Hovsjöskolan

GreenBuilding 2014

Project: New Building

Address: Penselvägen 1, 151 65 - Södertälje

Country: Sweden

Building Description and Technical Measures

The project concerns a two floor building designed for primary and secondary school operation. The building has a heated floor area of 6.900 m² and is heated with district heating. The heat is distributed via radiators and the heat flow is variable dependent on temperature. The insulation respects very high standards and has very low infiltration. The building is equipped with a mechanical ventilation system with heat recovery.

Technical Data

Building use	Education
Area	6.900 m²
PEC before or reference value	80,00 kWh/m²y
PEC	48,20 kWh/m²y
Energy savings %	40 %
Absolute savings	219.420,00 kWh/y
Financial info	/



Partner: Tenali Investments Sp. z o.o. "Silesia Business Park"

Building: SBP-A Silesia A

GreenBuilding 2014

Project : New Building

Address: Chorzowska 154, 40-101 - Katowice

Country: Poland

Building Description and Technical Measures

Silesia is an A-class building located at ul. Chorzowska 154 in the business district of Katowice, Poland. The Building offers 10,670 sq m of office space. Silesia Business Park complex consist of four buildings. There are two underground parking levels for 95 cars under building A and 30 surface parking spaces.

The building offers modern and practical office space designed and constructed according to the principles of business ergonomics and sustainable development. Each office unit features:

- a suspended ceiling,
- an air conditioning system with central humidity control,
- lighting with an illuminance of 500 lux,
- tilt windows
- a raised floor,
- a large clear height of the office (2700 mm),
- electrical wiring and telecom cables in floor boxes.

Technical Data

Building use	Office
Area	11.555 m²
PEC before or reference value	419,59 kWh/m²y
PEC	301,53 kWh/m²y
Energy savings %	28,1 %
Absolute savings	1.364.183,00 kWh/y
Financial info	/



Partner: Uppsala Science Park KB

Building: Kronåsen 1:1

GreenBuilding 2014

Project : Refurbishment

Address: Dag Hammarskjölds väg 42, 75237 - Uppsala

Country: Sweden

Building Description and Technical Measures

Kronåsen 1:1 is an office building, located at Dag Hammarskjölds väg 42 in Uppsala, Sweden. It was constructed in 2004 and the total area is approximately 11 894 m². Kronåsen 1:1 is supplied by district heating and equipped with a cooling machine. The lighting system is demand controlled. The measured energy is approximately 39 % below building energy regulations (BBR18).

Technical Data

Building use	Office
Area	11.894 m²
PEC before or reference value	107,00 kWh/m²y
PEC	79,90 kWh/m²y
Energy savings %	25 %
Absolute savings	322.327,40 kWh/y
Financial info	/



Partner: Vasakronan AB
Building: Bokhållaren 18

GreenBuilding 2014

Project : Refurbishment

Address: Kyrkogatan 44, Gothenburg

Country: Sweden

Building Description and Technical Measures

The four floor building, Bokhållaren 18, is located on Kyrkogatan 44, in the centre of Gothenburg. It was constructed in 1905 and rebuilt in 1987. The property was acquired by Vasakronan in 1997. The total heated area for Bokhållaren 18 amounts to 3.724 m2. The activity distribution in the building is the following (expressed as a percentage out of heated area):

- Office Premises: 45 %
- Retail premises: 23 %
- Storage and technical facilities: 32 %

The building is supplied by district heating and cooling. Focus has been put on optimizing the control and monitoring system to minimize the energy consumption in the property. Some of the old systems has been sub-standard and are replaced with new control and monitoring systems. We have also worked with smart systems that are controlled due to how the premises are used. For example less ventilation in the premises when the frequency of people are low, and higher ventilation during the time when a higher frequency of people are staying in the premises.

During 2009 air handling units were changed and completed with heat exchanger.



Technical Data

Building use	Office
Area	3.724 m²
PEC before or reference value	180,40 kWh/m²y
PEC	112,20 kWh/m²y
Energy savings %	38 %
Absolute savings	253.976,80 kWh/y
Financial info	/



Partner: Vasakronan AB

Building: Dragarbrunn 18:1

GreenBuilding 2014

Project : Refurbishment

Address: Gamla Torget 5, 753 20 - Uppsala

Country: Sweden

Building Description and Technical Measures

Dragarbrunn 18:1 is an office building, located at Gamla torget 5 in Uppsala, Sweden. It was constructed in 1990 and the total area is approximately 1.448 m². Dragarbrunn 18:1 is supplied by district heating and is equipped with a centralized cooling machine. The ventilation system has been upgraded with high efficiency heat recovery units which enable the building to save the 30% of energy.

Technical Data

Building use	Office
Area	1.448 m²
PEC before or reference value	166,20 kWh/m²y
PEC	116,30 kWh/m²y
Energy savings %	30 %
Absolute savings	72.255,20 kWh/y
Financial info	/



Partner: Vasakronan AB

Building: Dragarbrunn 19:10

GreenBuilding 2014

Project : Refurbishment

Address: Dragarbrunnsgatan 35, 75320 - Uppsala

Country: Sweden

Building Description and Technical Measures

Dragarbrunn 19:10 is an office building, located at Dragarbrunnsgatan 35 in Uppsala, Sweden. It was constructed in 1966 and the total area is approximately 4.876 m². Dragarbrunn 19:10 is supplied by district heating and a district cooling. The ventilation system has been upgraded with high efficiency heat recovery units. The measured energy end use has been decreased with approximately 30 %.

Technical Data

Building use	Office
Area	4.876 m²
PEC before or reference value	171,40 kWh/m²y
PEC	120,50 kWh/m²y
Energy savings %	30 %
Absolute savings	248.188,00 kWh/y
Financial info	/



Partner: Vasakronan AB

Building: Dragarbrunn 20:3

GreenBuilding 2014

Project : Refurbishment

Address: Dragarbrunnsgatan 38-40, 75320 - Uppsala

Country: Sweden

Building Description and Technical Measures

Dragarbrunn 20:3 is an office building, located at Dragarbrunnsgatan 38-40 in Uppsala, Sweden. It was constructed in 1965 and the total area is approximately 4047 m². Dragarbrunn 20:3 is supplied by district heating and equipped with a cooling machine. The ventilation system has been upgraded to a VAV-system and provided with heat recovery. Windows has been replaced with new efficient ones. The boiler room has also been upgraded with more efficient units. The measured energy end use has been decreased with approximately 35,0 %.

Technical Data

Building use	Office
Area	4.047 m²
PEC before or reference value	172,20 kWh/m²y
PEC	111,90 kWh/m²y
Energy savings %	35 %
Absolute savings	244.034,10 kWh/y
Financial info	/



Partner: **Vasakronan AB**

Building: **Gårdatorget / Gårda 18:24**

GreenBuilding 2014

Project : Refurbishment

Address: Gårdatorget 1-2, Gårda, Göteborg

Country: Sweden

Building Description and Technical Measures

The five floor building, Gårdatorget, is located in the district Gårda, in the central of Gothenburg. It was constructed in 1991. The total heated area amounts to 5 059 m². The activity distribution in the building is the following: (expressed as a percentage out of heated area):

- Office Premises: 64 %
- Restaurants: 9 %
- Office hotel 4%
- Storage and technical facilities: 23 %

The building is supplied by district heating and cooling. The project focused on optimizing the control and monitoring system to minimize the energy consumption in the property. It has also ensured the precise functionality to make operating images clearer and create conditions that make easier to manage them. Some of the old systems were founded sub-standard and have been replaced with new ones like for control and monitoring equipment. New smart systems are controlled due to the premises use. For example less ventilation is provided in the premises when the frequency of people is low and higher ventilation during the time when there is a higher frequency of people.

Technical Data

Building use	Office
Area	5.027 m²
PEC before or reference value	114,90 kWh/m²y
PEC	74,00 kWh/m²y
Energy savings %	36 %
Absolute savings	205.604,30 kWh/y
Financial info	/



Partner: Vasakronan AB

Building: Snusmalaren 6

GreenBuilding 2014

Project : Refurbishment

Address: Östra Hamngatan 35, Göteborg

Country: Sweden

Building Description and Technical Measures

The four floor building, Snusmalaren 6, is located on Kungsgatan 50, in the centre of Gothenburg. It was constructed in 1850. The latest renovation was made in 2003. The property was acquired by Vasakronan in 1998. The activity distribution in the building is the following (expressed as a percentage out of heated area):

- Retail Premises: 43 %
- Office Premises: 33 %
- Storage and technical facilities: 24 %

The building is supplied by district heating and cooling. The project focused on optimizing the control and monitoring system to minimize the energy consumption in the property. Some of the old systems were found substandard and were replaced with new control and monitoring systems. Lighting system is equipped with motion detectors.

Technical Data

Building use	Office
Area	5.027 m²
PEC before or reference value	114,90 kWh/m²y
PEC	74,00 kWh/m²y
Energy savings %	36 %
Absolute savings	205.604,30 kWh/y
Financial info	/



Partner: Vasakronan AB

Building: Strömshuset

GreenBuilding 2014

Project : Refurbishment

Address: Kungsgatan 27, Göteborg

Country: Sweden

Building Description and Technical Measures

The 6 floor building Strömshuset, is located on Kungsgatan 27, in the centre of Gothenburg. It was constructed in 1936. Latest renovation was made in 2006. The property was acquired by Vasakronan in 1998. The total heated area for Strömshuset amounts to 11.509 m2. The activity distribution in the building is the following (expressed as a percentage out of heated area):

- Retail Premises: 35 %
- Office Premises: 39 %
- Storage and technical facilities: 26 %

The building is supplied by district heating. Special attention has been given to the optimization, the control and monitoring system to minimize the energy consumption in the property. Some of the old systems were found substandard and were replaced with new control and monitoring systems. A smart system controls ventilation through an occupancy link.

Technical Data

Building use	Office
Area	11.509 m²
PEC before or reference value	222,40 kWh/m²y
PEC	110,60 kWh/m²y
Energy savings %	50 %
Absolute savings	1.286.706,00 kWh/y
Financial info	/





Partner: Västtrafik AB

Building: Alingsåsterminalen

GreenBuilding : 2014

Project: Refurbishment

Address: Stationsgatan 1, 441 30 - Alingsås

Country : Sweden

Building Description and Technical Measures

Alingsåsterminalen is the central bus station of the city of Alingsås. In 2011 the ventilation system was replaced from Constant Air Ventilation (CAV) to Variable Air Ventilation system (VAV). Adjustment of the heating system was performed as well as improvements of the control of entrance. The ventilation system is also equipped with heat recovery. The heating system has been change to electrical one to district heating. The lighting system is provided of T5- lights.

Technical Data

Building use	Transport Infrastructure
Area	492 m²
PEC before or reference value	413,00 kWh/m²y
PEC	179,00 kWh/m²y
Energy savings %	57 %
Absolute savings	115.128,00 kWh/y
Financial info	/





Partner: Västtrafik AB

Building: Mölnlycketerminalen

GreenBuilding : 2014

Project: Refurbishment

Address: Åvägen 2, 435 44 - Härreda

Country : Sweden

Building Description and Technical Measures

Mölnlycketerminalen is a bus station situated in Härreda. Measures taken to improve energy efficiency are the following: renovation of the existing geothermal heat pump (including optimization of the control system and an extra accumulator cistern), new LED lighting, sealing of the walls to avoid heat losses, new turbine fans that forces down the hot air cumulating under the ceiling and adjustment of the floor heating system. All these changes were made between 2011 and 2012.

Technical Data

Building use	Transport Infrastructure
Area	485 m²
PEC before or reference value	136,00 kWh/m²y
PEC	96,00 kWh/m²y
Energy savings %	29 %
Absolute savings	19.400,00 kWh/y
Financial info	/





Partner: WA Business & Service Center GmbH

Building: aspern IQ

GreenBuilding 2014

Project : New Building

Address: Seestadtstraße 27, 1220 - Vienna

Country: Austria

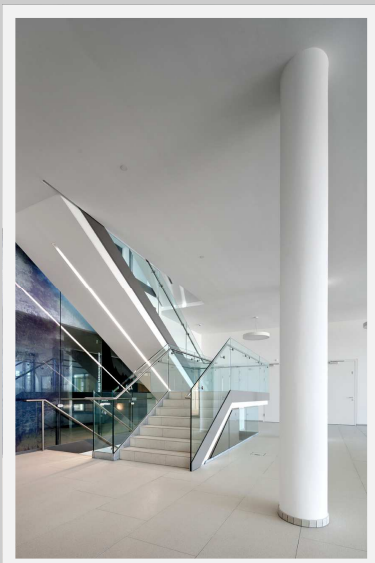
Building Description and Technical Measures

With 240 hectares and a projected population of 20,000 residents and workers, the Seestadt Aspern is not only Vienna's largest current urban development project but also one of the largest in Europe. At the end of August 2012, phase one of the "aspern IQ" Technology Centre was completed by the Vienna Business Agency on the development area's first building plot. The first finished building of the Seestadt Aspern was designed by ATP Architects and Engineers to Plus Energy standards and should act as a flagship project, showing how a Plus Energy building which is adapted to local resources can offer the highest possible levels of user comfort while fulfilling all sustainability requirements. ATP Architects and Engineers of Vienna won an EU-wide open realisation competition for the three-phase "aspern IQ" Technology Centre (IQ stands for Innovation Quarter) in 2010.

*Value in final energy

Technical Data

Building use	Office
Area	8.816 m²
PEC before or reference value	81,19* kWh/m²y
PEC	11,45 kWh/m²y
Energy savings %	85,9 %
Absolute savings	/
Financial info	€ 1.296.500,00





Partner: Wallenstam AB

Building: Krokslätt 20:6

GreenBuilding 2014

Project : Refurbishment

Address: Mölndalsvägen 81, 40184 - Göteborg

Country: Sweden

Building Description and Technical Measures

The property has been converted into offices and classrooms. It was originally built as a factory for the manufacture of lightweight products.

This renovation is a tenant customization, in large parts of the house. Ventilation systems, control systems and cooling systems have been updated and renovated. The electrical system was changed so that the whole house has one subscription. Electricity is delivered from electricity supply company Wallensta Natural Energy AB. Today, producing 100% from renewable energy: wind and hydropower. Ventilation has variable flow, adapted to the need of offices and meeting room's occupants, as well as reduced flow in winter. The cooling system that is active during autumn and spring has a heat recovery system on heating and hot water.

Technical Data

Building use	Office
Area	3.826 m²
PEC before or reference value	171,00 kWh/m²y
PEC	104,00 kWh/m²y
Energy savings %	39 %
Absolute savings	256.342,00 kWh/y
Financial info	/





Partner: **Wihlborgs Fastigheter AB**

Building: **Östra Torn 27:12**

GreenBuilding 2014

Project : New Building

Address: Lunds Kommun

Country: Sweden

Building Description and Technical Measures

MAX IV will be a national laboratory with the University of Lund as host university. MAX IV will be the most advanced Synchrotron research facility in the world. The research facility demands a great amount of energy for this operation. The facility has been designed very energy efficient so that energy consumption is just a fraction of what a conventional synchrotronlight facility consumes. The excess heat generated will be recycled and will supply the whole research centre and sold to the district heating network. This project covers building E which is the facility's office building.

Technical Data

Building use	Office
Area	4.695 m²
PEC before or reference value	100,00 kWh/m²y
PEC	61,00 kWh/m²y
Energy savings %	39 %
Absolute savings	183.105,00 kWh/y
Financial info	/



Partner: Wiener Netze GmbH

Building: Smart Campus

GreenBuilding 2014

Project : New Building

Address: Lot 1193-30, 1110 - Wien

Country: Austria

Building Description and Technical Measures

Smart Campus is the new centrepiece of the company grounds of Wiener Netze GmbH, Austria's largest hybrid net operator for gas, district heat, electricity and optical fibre nets. The building shall support smart interaction between users, infrastructure and energy supply. The office part of the building is the largest office building in passive house standard, the operational part of the building is a low energy building. Shading systems to reduce solar heat gain will be installed. Heating and cooling is mainly provided by geothermal energy. Furthermore a solar thermal system generates hot water and a PV system generates electricity onsite. At least 30% of the total final energy consumption will be generated by renewable energy systems. To improve the efficient use of the building a control systems that informs and integrates users will be installed.

Technical Data

Building use	Office
Area	70.300 m²
PEC before or reference value	154,99 kWh/m²y
PEC	110,96 kWh/m²y
Energy savings %	30 %
Absolute savings	3.095.309,00 kWh/y
Financial info	/





Partner: Ytterbygg AB

Building: Backa 194:4

GreenBuilding 2014

Project : New Building

Address: Aröds Industriväg 10, 42243 - Hisings Backa

Country: Sweden

Building Description and Technical Measures

"Aröds Bilhall" is a one floor building primarily used as a car dealership with a workshop for fixing activities. The measures taken with the goal of energy efficiency are the followings:

- Mechanical ventilation with efficient heat recovery (80%)
- Installed demand control system for ventilation
- Free cooling during summer
- Well insulated and airtight building envelope

Technical Data

Building use	Wholesale & Retail
Area	2.235 m²
PEC before or reference value	100,00 kWh/m³a
PEC	71,20 kWh/m³a
Energy savings %	29 %
Absolute savings	64.368,00 kWh/y
Financial info	/





Partner: Zürich Versicherungs-Aktiengesellschaft

Building: Office Building Mariahilfer Strasse 20

GreenBuilding 2014

Project : Refurbishment

Address: Mariahilfer Straße 20, 1070 - Vienna

Country: Austria

Building Description and Technical Measures

This building was erected in 1969 and just equipped, for some spaces, with cooling facilities. It has been thermally refurbished floor by floor; the facade was turned down and replaced by a new, fully insulated one with the goal to reduce energy consumption and cost of energy. Besides the total thermal refurbishment of the building a smart and energy efficient replacement of the mechanical and electrical services took place. Therefore the following actions have been taken: upgrade of the almost 40 years old central cooling system with a new cooling devices equipped with a highly energy efficient TURBOCOR chiller (total power 600 kW), in combination with hybrid adiabatic dry cooler; possibility of free cooling at low outside temperatures (100 kW); installation of new VAV air handling units (separate for office spaces and for shops) with highly efficient heat recovery systems ; new heating radiators and new ceiling induction HVAC devices for cooling, driven by the before mentioned AHU for offices, together with central control; implementation of reed contacts within the windows to stop supply of heating or cooling energy when windows are opened; automatic control of outdoor shading to out-door conditions; substitution of the lighting from existing "dumb" 36W luminescent screen tubes to smart LED lighting (including daylight and presence control); exchanging the existing central sanitary hot water generation storage tank and circulation piping (big losses because of permanent water circulation) to a 5 litres stand-alone electric driven water boilers in each sanitary cabinet (total installed = nominal electric power = 162 kW) and in addition to that installation of a 85 m2 photovoltaic plant on roof top (13 kWp).

Technical Data

Building use	Office
Area	9.743 m²
PEC before or reference value	230,25 kWh/m²y
PEC	109,40 kWh/m²y
Energy savings %	53 %
Absolute savings	1.176.954,00 kWh/y
Financial info	€ 490.000,00



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European Commission

EUR 27001 EN – Joint Research Centre – Institute for Energy and Transport

Title: The European GreenBuilding Projects Catalogue 2014

Author(s): Paolo Bertoldi, Barbara Cuniberti, Andrea De Luca

Luxembourg: Publications Office of the European Union

2014 – 141 pp. – 21.0 x 29.7 cm

EUR – Scientific and Technical Research series – ISSN 1831-9424 (online), ISSN 1018-5593 (print)

ISBN 978-92-79-44658-0 (PDF)

ISBN 978-92-79-44659-7 (print)

doi:10.2790/765654

Abstract

In 2005 the European Commission launched the GreenBuilding Programme (GBP). GreenBuilding is a voluntary programme aiming at improving the energy efficiency of non-residential buildings in Europe on voluntary basis. The programme addresses owners of non-residential buildings to realise cost-effective measures which enhance the energy efficiency of their buildings in one or more technical services. The programme covers both existing and new buildings.

In a number of participating countries, a so called GreenBuilding National Contact Point (NCP) is established for aiding organisations who consider participation in GreenBuilding (see the NCPs). In countries where no NCP is established, the Joint Research Centre assists the potential participant.

The GreenBuilding Programme is managed by the Joint Research Centre.

JRC Mission

As the Commission's in-house science service, the Joint Research Centre's mission is to provide EU policies with independent, evidence-based scientific and technical support throughout the whole policy cycle.

Working in close cooperation with policy Directorates-General, the JRC addresses key societal challenges while stimulating innovation through developing new methods, tools and standards, and sharing its know-how with the Member States, the scientific community and international partners.

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