

Berlin aims to become a climate-neutral city by 2050. In comparison to the rest of the world's big cities, this is an ambitious target – and one that can only be achieved if political leaders, the business community and society pull together. Berlin is clearly on the right track, for over the past twenty-five years, its carbon emissions have already been reduced by about 30%. Berlin also lives up to its reputation as a creative, innovative city as far as climate change mitigation is concerned, with several hundred projects in recent decades showing how climate protection can be carried out on all scales.

This publication presents two important Berlin climate protection initiatives which have been in existence for several years. Climate Protection Agreements have caught on as a successful model for voluntary climate change mitigation. Important institutions and companies work together with the Senate to agree on binding targets and how they are to be achieved. And the fact that climate change mitigation is a responsibility of the private sector is the message of the Climate Protection Partners of Berlin – an alliance consisting of ten business chambers, trade associations and other institutions in Berlin's economy. The Climate Protection Partner of the Year competition held annually by the partners has singled out over forty outstanding projects since 2002. The winning entries from 2012 to 2015 are introduced here.



Documentation

## Working Together for Climate Change Mitigation in Berlin

**Working Together for**  
Climate Change Mitigation in Berlin



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## Berlin shows responsibility for climate change mitigation



Climate change mitigation has become one of the foremost issues in recent years. Urban conurbations have a particularly important role to play in combating climate change. Accordingly, the Berlin Senate has drawn up extraordinary climate protection objectives, such as making Berlin climate-neutral by 2050. The milestones towards this goal include a 40% reduction in CO<sub>2</sub> emissions by 2020 (compared to 1990) and cutting harmful emissions by 60% by 2030 – some of the most ambitious environmental targets in Germany and indeed internationally.

To achieve these objectives, backing is essential from all levels of society. For this reason, I am delighted to be able to set out the very different ways in which a wide variety of stakeholders are tackling climate change. The examples documented in this brochure are intended to demonstrate the high level of commitment already displayed by the business community and public organizations in Berlin in their efforts to achieve the climate protection goals. They are also intended to encourage others to follow their lead.

I hope you enjoy reading this booklet – and wish you every success in emulating these good examples!

**Christian Gaebler**

Permanent Secretary for Transport and the Environment



# Working together for energy efficiency and climate change mitigation

In October 1997, fourteen partners in Berlin's economy – business chambers, trade associations and commercial enterprises – forged a broad alliance for voluntary climate change mitigation. The 'Climate Protection Partners of Berlin' joined forces with the State of Berlin to agree on measures to cut CO<sub>2</sub> emissions and encourage the spread of solar power systems. The aim of this campaign was to show that voluntary, well-thought-out measures may be even more beneficial for the environment than related government decrees.

After the original agreement had successfully run its course and was terminated in 2002, ten of the partners decided to maintain their collaboration and continue demonstrating responsibility for climate protection and energy efficiency. By holding an annual 'Climate Protection Partner of the Year' competition, the members of the alliance have created a lasting platform for innovative climate protection in Berlin in which:

- attention is drawn to successful high-profile examples of climate change mitigation;
- the adoption of best practices is encouraged;
- pioneering, innovative flagship initiatives are highlighted;
- exemplary environmental achievements are recognized.

Since then, the competition has become the leading climate protection award in Berlin's economy. Of the some 300 projects demonstrating successful, voluntary climate change mitigation in Germany's capital, more than 40 projects have garnered awards.

This brochure gives winners from recent years a special opportunity to publicize their prize-winning achievements.

## Climate Protection Partners of Berlin



# Climate Protection Agreements



## The Climate Protection Agreements in Berlin

Sustainable climate change mitigation is only possible by harnessing innovation, new technology and high-tech solutions. To this end, investment decisions and economic activities must always take the environment and the climate into account. This challenge provides Berlin with an opportunity for broad economic development.

An important element of Berlin's climate change policy is therefore to persuade the businesses and organizations operating in Berlin to become active environmentalists. Climate Protection Agreements are signed with individual partners, such as Berlin's utilities, the housing sector, and various public corporations, which enter into binding mutual obligations. They have already been successfully implemented in recent years, as vividly shown by the examples outlined in this brochure.

In the Climate Protection Agreements, the signatories pledge to take concrete action in order to achieve the region's climate protection targets. These activities are enshrined in comprehensive action plans, which are periodically reviewed with the State of Berlin and if necessary revised. This enables concrete climate protection measures to be implemented within the partners' spheres of activity as well as the growing economic potential of climate change investment to be harnessed. This includes increasing the share of renewables in Berlin's energy mix.

In addition to investment, organizational measures are also agreed which lead directly or indirectly to the most economical use of energy. And by taking the lead, these enterprises inspire other companies and the general public to take similar action.





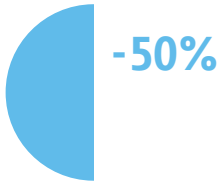
# BBU: Umbrella organization for housing in Berlin and Brandenburg

## Overview

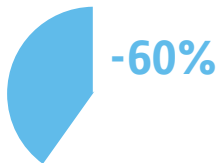
### Period

2011-20

### Successes since 1991 (base year)



Reduction of energy consumption



Reduction of CO<sub>2</sub> emissions

### Monitoring

The progress made in boosting the energy efficiency of housing is evaluated every two years.

**BBU Verband Berlin-Brandenburgischer Wohnungsunternehmen e.V.**

### Association

Approx. 350 member companies\*

Housing stock in Berlin:

About 670,000 dwellings (40% of all rented housing)\*

\*Figures from 2013

### Contact

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**BBU is an umbrella organization for 350 public, cooperative, private and church housing companies in Berlin-Brandenburg. Its members manage approximately 1.1 million homes, accounting for 40% of the rental housing stock in Berlin and 50% in Brandenburg.**

## Climate Protection Agreements

The objectives of the Climate Protection Agreements signed between BBU and Berlin between 1997 and 2010 have been exceeded. Compared to 1990, the housing stock of the BBU member companies now emits about 60% less CO<sub>2</sub>. And in another agreement, a CO<sub>2</sub> cap has been set for each signatory company for the period 2011–2020.

## CO<sub>2</sub> monitoring

The achievement of CO<sub>2</sub> targets is documented by BBU in its CO<sub>2</sub> monitoring programme. Every two years, the CO<sub>2</sub> emissions arising from the consumption of heating, hot water and domestic electricity in the housing stock of the BBU member companies are calculated.

## ALFA® – alliance for plant efficiency

ALFA® was set up in 2007 by BBU together with industry partners and skilled trade firms in order to boost the energy efficiency of the housing stock by means of low-cost measures, training and improved information. Since 2011, the project has been carried out in collaboration with the housing sector organizations in Hamburg, Schleswig-Holstein, Mecklenburg-Western Pomerania and Thuringia.

## Reduction of CO<sub>2</sub> emissions

In 2012, the housing stock of the BBU member companies in Berlin emitted around 1.3 million tonnes less CO<sub>2</sub> than in 1990, the Kyoto base year.

## Comparison

The CO<sub>2</sub> emissions of BBU's housing stock in Berlin in 2012 were about 1.6 tonnes per dwelling and year. According to figures from the GdW Federal Union of German Housing and Real Estate Associations, the average annual CO<sub>2</sub> emissions per home nationwide exceed 2 tonnes.



New Climate Protection Agreements were signed by municipal housing companies and the State of Berlin in 2012. © Ines Meier



White City, a UNESCO World Heritage Site, has been supplied with heat and power by its own CHP unit since April 2012. © Fotoarchiv der Deutsche Wohnen AG

# The municipal housing companies in Berlin

**The six municipal housing companies in Berlin – degewo, GESOBAU, Gewobag, HOWOGE, STADT UND LAND and WBM – take climate change mitigation very seriously. Their considerable success is based on voluntary Climate Protection Accords signed with the State of Berlin.**

## ‘Climate Protection 2.0’

The first Climate Protection Agreements between BBU and municipal housing companies as well as the State of Berlin concluded between 2006 and 2010 were followed by the signing of Climate Protection Accords – the first of their kind in Germany. In these pacts remaining in force until 2020, emission ceilings per dwelling were specified based on the overall CO<sub>2</sub> savings already achieved. On average, the CO<sub>2</sub> emissions per home are to be reduced by another quarter to 1.32 tonnes per year. Read on to find out about a number of example projects.

### degewo AG

Mariengrün is a green quarter being set up in the southern district of Marienfelde. By improving the energy efficiency of about 2,500 homes and having two CHP units built by GASAG, degewo will cut CO<sub>2</sub> emissions by over 4,000 tonnes every year.

[www.degewo.de](http://www.degewo.de)

### GESOBAU AG

The phased modernization of Märkisches Viertel, a large housing estate in the district of Reinickendorf, will be completed in 2015. Following the conclusion of this € 440 million project, its primary energy consumption will have been reduced by 70% and its heating demand by 50%.

[www.gesobau.de](http://www.gesobau.de)

### Gewobag Wohnungsbau-Aktiengesellschaft Berlin

One of the main areas of investment in its Climate Change Accord was the energy efficiency upgrade of Haselhorst, a listed housing estate. As a result, Haselhorst has now been refurbished in line with its protected status and in a socially acceptable manner.

[www.gewobag.de](http://www.gewobag.de)

### HOWOGE Wohnungsbau-gesellschaft mbH

The energy efficiency upgrade of approximately 2,300 homes in the district of Buch will reduce CO<sub>2</sub> emissions by about 1,750 tonnes per year – and hence contribute to reaching the State of Berlin’s climate protection targets.

[www.howoge.de](http://www.howoge.de)

### STADT UND LAND Wohnbauten-Gesellschaft mbH

The John Locke Estate in Lichtenrade, which was built in the 1960s and contains about 1,800 dwellings, is currently being refurbished in its entirety by STADT UND LAND. This will save about 2,500 tonnes of CO<sub>2</sub> annually. The estate will be one of the modernization priorities over the next few years.

[www.stadtundland.de](http://www.stadtundland.de)

### WBM Wohnungsbaugesellschaft Berlin-Mitte mbH

The company is continuing its extensive modernization schemes successfully launched in the 1990s in support of climate change mitigation. In doing so, it is constantly aware of its special responsibility in maintaining the heritage of East German modern architecture.

[www.wbm.de](http://www.wbm.de)



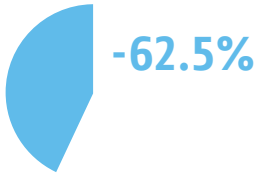
## GASAG: Berlin's gas utility

### Overview

#### Period

2011–20

#### Successes and targets



CO<sub>2</sub>-reduction compared to 1998 (base year)

- Achieved in 2012: 1.25 million t/a
- Target for 2020: 2 million t/a

#### Activities

- Encouraging the modernization of heating systems
- Using renewable energy and decentralized CHP
- Mobility strategies
- Environmental education

### GASAG Group

#### Facts and figures

Employees: 1,545\*

Customers: 700,000\*\*

\* At 31 December 2014

\*\* All products and energy services

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[www.gasag.de](http://www.gasag.de)

Dating back almost 170 years, GASAG (Berliner Gaswerke AG) is an integral part of Berlin's energy utilities. The company is well aware of its associated responsibility for the city and its inhabitants, and is committed to delivering energy efficiency and green energy in order to do its bit to cut CO<sub>2</sub> emissions in Berlin.

### Ullsteinhaus: Green energy for architectural heritage

Beloved by architectural enthusiasts from all over Berlin, this historic building complex with its imposing red clock tower is Tempelhof's best-loved landmark. And since 2014, the listed Ullsteinhaus has also been a compelling showpiece for the eco-friendly use of energy. As the expressionist brick façade and the numerous interiors – including the historical boiler room in the basement – could not be altered, individual solutions and a string of meetings with Berlin's heritage department were required when it came to modernizing the heating system. The results are impressive. The floor space totalling roughly 80,000 square metres is now heated by a high-performance, highly efficient CHP unit. Working together with GASAG Contracting on the energy efficiency upgrading of the building, the owner also opted for a carbon-neutral solution using biomethane. The carbon dioxide emissions saved equate to the total CO<sub>2</sub> given off by

750 single-family detached houses. What's more, an ultra-modern, environmentally friendly heart now beats in the old building's boiler room!

### Tegel South: Locally generated electricity

Thanks to GASAG and the modern technology of combined heat and power (CHP), tenants in Tegel South now receive green electricity generated at low cost in their own basements. In 2014, GASAG replaced the old cogeneration units with six brand new larger ones to supply 843 homes on the estate with heat. However, CHP also generates electricity, which can be offered to tenants as environmentally friendly 'district power' even more cheaply than the standard tariff. The idea of 'power from their own basement' goes down well with tenants – and is great for the environment since the amount of CO<sub>2</sub> saved every year totals an impressive 300 tonnes.



Ullsteinhaus, Berlin © GASAG



Gewobag estate in Tegel South. © GASAG

# Free University of Berlin



**Being an International Network University with nearly 33,000 students, more than 4,200 employees and 200 buildings, all aspects of sustainability are relevant to the Free University of Berlin. Consequently, in addition to addressing sustainability in its research and teaching, it also ensures that its infrastructure complies with today's expectations of sustainability.**

## Energy-efficient, sustainable campus management

Between 2000/01 and 2014, the Free University of Berlin managed to cut its primary energy consumption by over 30%, despite increasing its floor space. Like-for-like, its primary energy consumption in the same period would have declined by as much as 33%. CO<sub>2</sub> emissions were reduced by 27% (or 30% like-for-like). Final energy consumption declined by 24% (26% like-for-like). Despite the increase in floor space, this saves €3.8 million every year on the university's budget.

## Water management

Between 2004 and 2012, total water consumption at the university was reduced by a third. These savings were achieved by a combination of organizational and technical measures as well as behavioural changes. Alongside the use of a continuous energy monitoring and controlling system installed in 2001, the main elements are the technical

and structural energy efficiency programme enacted in 2003–11, and the bonus scheme for saving energy introduced in 2007, under which faculties stand to financially benefit from behavioural and organizational improvements. Wastage is penalized with surcharges, providing an incentive to save energy.

## CHP units

Other aspects of sustainable campus management at the Free University of Berlin include the Green IT Action Programme launched in 2009, the use of now three CHP units, and the closure of the university for a fortnight every Christmas and New Year since 2012.

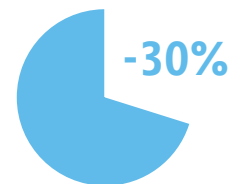
## Sustainability and Energy Department

In 2014, the Free University of Berlin began setting up a systematic sustainability management scheme which will continue to devote high priority to energy efficiency and climate change mitigation. The main aims are to improve the integration of sustainability-related tasks and activities in research, teaching and campus management, and to strengthen international networking. The new Sustainability and Energy Department directly attached to the Vice Chancellor's office officially came into being on 1 January 2015.

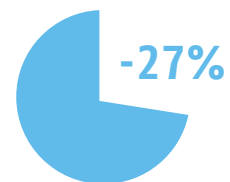
## Overview

**Period**  
seit 2001

**Successes since 2001 (base year)**



Reduction of primary energy consumption



Reduction of CO<sub>2</sub> emissions

## Monitoring

Report based on methods agreed with the State of Berlin to be submitted by 30 June 2016

## Free University of Berlin

### Facts & figures

Employees: 4,200  
Students: 33,000  
Buildings: About 200

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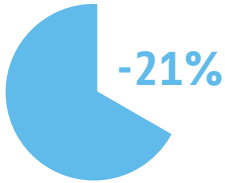
Berliner Immobilienmanagement

## Overview

### Period

2009 – 15

### Targets by 2017



Reduction of CO<sub>2</sub> emissions related to the consumption of electricity, heating and cooling by about 23,000 t

### Monitoring

Report based on methods agreed with the State of Berlin to be submitted by 31 December 2015

## BIM Berliner Immobilienmanagement GmbH

### Facts & figures

Employees: 460  
Buildings: About 4,500

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[www.bim-berlin.de](http://www.bim-berlin.de)

The environmental management system is kindly supported by:



# BIM GmbH

**'Sustainably using the resource of space' is one of the adages of BIM, a property management firm. Since plenty of energy can often be saved in buildings, this government-owned property company bears special responsibility when it comes to climate change mitigation. Therefore, back in 2009 it signed a Climate Protection Agreement with the State of Berlin in which it pledged to protect the environment and to use energy economically.**

## Environmental management system

By introducing a qualified environmental management system (EMS), BIM championed the integration of environmental protection in its political and commercial decisions. BIM was ISO 14001 certified in 2014, meaning environmental standards are firmly rooted in all areas of property management from letting and procurement to construction management. The framework for climate and environmental protection at BIM was derived from the EMS. Its aims include raising the environmental awareness of tenants, employees

and decision-makers. The introduction of the EMS was supported by Berlin Environmental Relief Programme II with funding from the European Regional Development Fund (ERDF) and the State of Berlin.

## LED technology

During the EU project Energy Saving Outdoor Lighting (ESOLi), BIM examined the lighting systems installed in a number of large properties under its management, including multiple buildings used by the police on Ruppiner Chaussee in Reinickendorf and on Charlottenburger Chaussee in Spandau. In conjunction with the Berlin Energy Agency, a survey of the lighting systems was conducted, and the costs of modernization using outdoor lighting were calculated. BIM then decided to test LED technology at the site on Charlottenburger Chaussee. Lights made by various manufacturers were trialled on police premises for a few weeks alongside conventional lighting. The findings were so compelling that BIM replaced around 500 outdated exterior and walkway lights with modern, efficient LEDs. As a result, power consumption was reduced by about 76% on Ruppiner Chaussee and as much as 89% on Charlottenburger Chaussee. These measures save around 145 tonnes of CO<sub>2</sub> and almost €50,000 per year, and were funded under the Environmental Relief Programme (UEP).



© Berliner Netzwerke, Doris Poklekowski

# Vattenfall



**Vattenfall provides a reliable power supply in Berlin along with the dependable, climate-friendly supply of heating and cooling from cogeneration. In its wide-ranging Climate Protection Agreement with the State of Berlin, the corporation vowed to halve its CO<sub>2</sub> emissions in Germany's capital by 2020 compared to 1990.**

## Modernization of generating facilities

One crucial step in reducing Vattenfall's CO<sub>2</sub> emissions is the modernization of the CHP stations in Berlin. Accordingly, a new, efficient and flexible combined cycle CHP plant with a thermal capacity of around 230 MW, an electrical output of 300 MW, and a price tag of €500 million is currently under construction in Lichterfelde. Moreover, the coal-fired Reuter C power station will be shut down in 2020 along with the lignite-fired unit at Klingenberg CHP station. Meanwhile, however, the gas-fired CHP unit there is being modernized to meet east Berlin's district heating requirements, and a new combined cycle plant due to be erected in Marzahn is being put out to tender.



© Vattenfall

## Increasing the use of biomass

Vattenfall intends to significantly increase the share of gas and biomass in its generation mix, which will make an important contribution to reducing CO<sub>2</sub> emissions. For example, a new biomass CHP station has been built in Märkisches Viertel. This new plant produces energy from natural wood chips in a highly efficient cogeneration process and supplies around 30,000 households with environmentally friendly district heating. Moabit CHP plant has been converted to enable the greater use of biomass in co-combustion.

The use of biomass in Vattenfall's CHP plants is extremely efficient. It doesn't require energy-intensive processing, and carbon-neutral biomass directly replaces fossil fuels, thus achieving substantial CO<sub>2</sub> reductions. Furthermore, producing energy using the more eco-friendly process of cogeneration ensures the optimum utilization of natural fuel, and the renewable energy is delivered efficiently to the building stock in the form of district heating.

The sustainable sourcing of biomass is ensured by a supplementary agreement with the State of Berlin and a corresponding monitoring scheme.



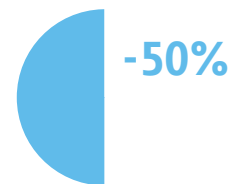
© Vattenfall

## Overview

### Period

2009–20

### Targets by 2020 (base year: 1990)



Halving CO<sub>2</sub> emissions of Vattenfall's generating facilities

### Monitoring

Annual emissions published by the DEHSt (German Emissions Trading Authority). Interim report on the status of implementation published in 2014. Final report due at the end of the period.

## Vattenfall in Berlin

### Facts & figures

Employees: 5,000  
Trainees: 300

### Vattenfall Europe Wärme AG

11 CHP plants  
50 CHP units  
District heating network with a length of 1,900 km  
Heating for 1.2 million homes

### Stromnetz Berlin GmbH

36,000 km of power lines  
760 transformer stations  
2.3 million connected households and businesses

### Vattenfall Europe Sales GmbH

Primary power provider for Berlin.  
Renewables make up over 43% of the overall generation mix.

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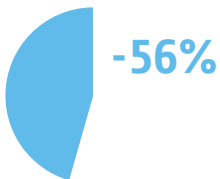
## BSR: Sanitation for Berlin

### Overview

#### Period

2011-15

Targets by 2015 (base year: 2010)



Reduction of landfill gas emissions by 3,360 t methane

- Introduction of recycling bins for non-packaging
- Production of biomethane at biogas plant equating to 2.5 million litres of diesel

#### Monitoring

Report based on methods agreed with the State of Berlin to be submitted by 30 April 2016

### Berliner Stadtreinigung

#### Facts & figures

Employees: 5,300

Municipal solid waste disposed of:

1.2 million t

Roads and pavements cleaned:

1.5 million working km

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**Safe, ecological waste disposal, clean streets, and ensuring road safety (especially in winter) are all tasks carried out by the approximately 5,300 employees of BSR (Berliner Stadtreinigung). The strategy of this sustainably managed enterprise includes a pronounced ecological and social dimension.**

### Energy from biowaste

Since 2013, the biodegradable waste collected by BSR has undergone anaerobic digestion at its new Biogas West plant in Spandau. Food and green waste are microbially decomposed in hermetically sealed containers. Methane forms during digestion along with liquid and solid digestate. None of the plant's products go unused: methane is treated to create pure biogas, and the digestate is employed as natural fertilizer in gardening and farming. Exhaust air at Biogas West is filtered in a number of stages in order to minimize the harmful emissions discharged into the atmosphere. Every year, about 60,000 tonnes of biowaste is recycled to produce energy and fertilizer. BSR purifies the raw gas and

converts it into up to 4.4 million cubic metres of clean biomethane annually. This biogas directly benefits the company's carbon footprint by being used as diesel substitute to power the some 150 low-noise, climate-friendly dustcarts, which collect 63% of Berlin's residual and biodegradable waste.

### Environmental benefits

The digestion of biowaste saves the environment around 12,000 tonnes of greenhouse gases annually – firstly because 2.5 million litres less diesel fuel is required, and secondly because the digestate replaces mineral fertilizer. What's more, unlike the fermentation of forage maize, the biogas produced does not compete with food.

### Sustainability award for BSR

In 2012, BSR's concept for the recycling of biowaste was nominated as one of 'Germany's most sustainable initiatives' in the German Sustainability Awards. And in 2014, BSR was declared Biogas Partner of the Year by the German Energy Agency. Crucially, however, the new concept can only succeed if it is accepted by the residents of Berlin. The more rigorously everyone separates digestible organic waste from other refuse at home, the more energy-rich gas can be produced – and the higher the contribution to climate change mitigation and achieving a circular economy.



© BSR



# Vivantes



**Berlin hospital operator Vivantes takes an ecological approach to commercial management which helps the environment and also cuts its spending. For Vivantes only uses green electricity – and thus avoids CO<sub>2</sub> emissions on a grand scale.**

## Continuing to protect natural resources

In 2009, Vivantes Netzwerk für Gesundheit GmbH (Vivantes Network for Health) signed a Climate Protection Agreement with the State of Berlin due to run until 2015. The agreement continues the Vivantes Network's successful efforts in previous years to conserve natural resources. The aim of the climate agreement is to cut CO<sub>2</sub> emissions by 2015 by at least 18% compared to 2007, when they amounted to approximately 90,000 tonnes.

## The municipal healthcare provider

Vivantes operates nine hospitals with a net floor space of 960,000 square metres and 5,500 beds. It also runs thirteen nursing homes and two retirement homes with about 1,900 inpatient care places.

## Energy is managed

Vivantes operates an energy management system to optimize its overall consumption of natural gas, electricity, heating oil and district heating as well as water. Thanks to its successful climate change mitigation action, the healthcare company has already reduced its CO<sub>2</sub> emissions by 22% or 25,000 tonnes annually.

## CHP unit cuts CO<sub>2</sub> by 30%

Vivantes' hospital in Spandau generates its own electricity and heating at its internal CHP unit, which went on-stream in mid-December 2009. Since the efficient cogeneration plant produces about 30% less CO<sub>2</sub>, it's an important step towards meeting Vivantes' Climate Protection Agreement.

## Overview

### Period

2009–15

### Targets by 2015 (base year: 2007)



Reduction of CO<sub>2</sub> emissions by at least 18,000 t

## Monitoring

- Regular meetings to share experience in the implementation of the agreement
- Final report: 2015

## Vivantes

### Facts & figures

Employees: 14,714

Number of beds: 5,571

Annual turnover\*: €1.028 billion \*2014

### Contact

Vivantes Netzwerk für

Gesundheit GmbH

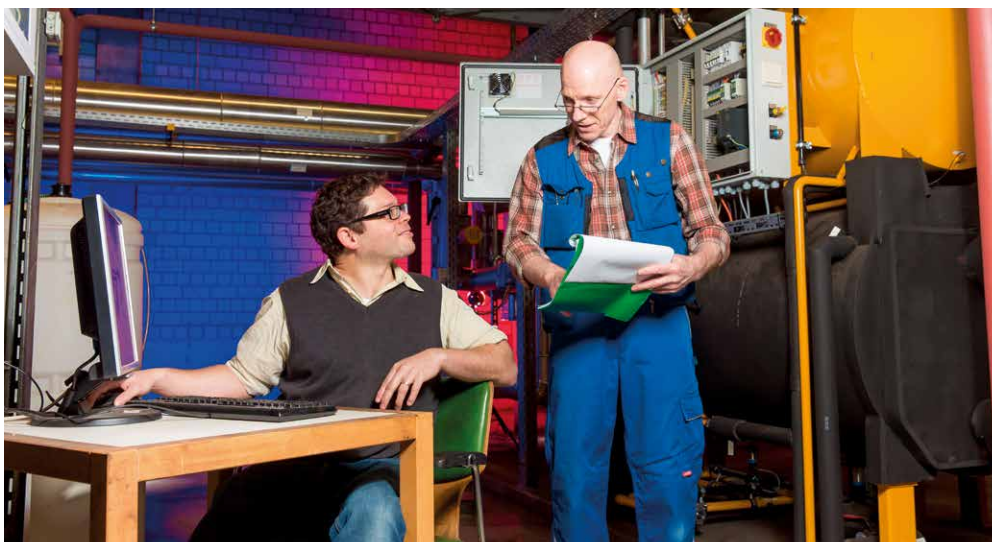
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Email: info@vivantes.de

[www.vivantes.de](http://www.vivantes.de)



Trigeneration at Spandau Hospital. © Vivantes



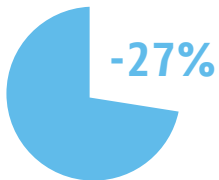
## IT Service Centre Berlin (ITDZ Berlin)

### Overview

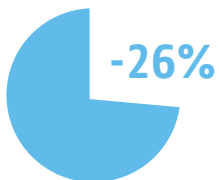
#### Period

2010–15

Targets by 2015 (base year: 2008)



Reduction of annual energy consumption by 2,070 MWh\*



Reduction of CO<sub>2</sub> emissions\* by 920 t CO<sub>2</sub> annually

\* Compared to 2008

#### Monitoring

- Annual internal energy monitoring reports
- 2013: Interim report for the Senate Department for Urban Development and the Environment
- 2016: Final report

### IT-Dienstleistungszentrum Berlin

#### Facts & figures

Employees: 563

Annual turnover (2013): € 128 million

Locations served: 528

Workstations served: About 70,400

Servers and mainframes: 1,362

#### Contact

IT-Dienstleistungszentrum Berlin

Tel: +49 (0)30 902220

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[www.itdz-berlin.de](http://www.itdz-berlin.de)

**ITDZ Berlin supports Senate departments, district offices and public amenities in the capital and is one of Germany's top IT service providers. Being a competent interface between administration, business and science, ITDZ Berlin develops cutting-edge solutions and supports the State of Berlin in not only IT projects but also the procurement of hardware and services.**

### Climate Protection Agreement between ITDZ Berlin and the State of Berlin

Under its Climate Protection Agreement with the State of Berlin, ITDZ Berlin is making an active contribution to reducing energy consumption and hence CO<sub>2</sub> emissions. Current studies demonstrate just how important the issue of climate change mitigation has become for the IT sector. In fact given the rapid growth of IT applications, the increase in energy consumption can only be limited by consistent efficiency measures.

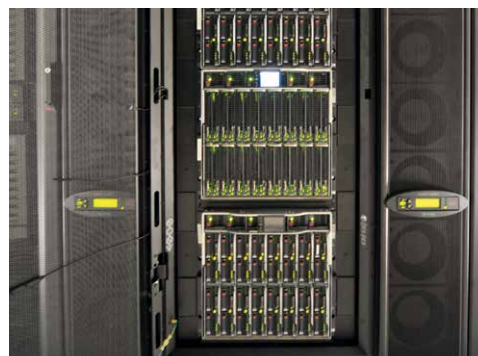
Since 2010, ITDZ Berlin has only purchased green power with zero CO<sub>2</sub> emissions via the State of Berlin. The overriding aim of its environmental commercial management is to consistently save natural resources.

ITDZ Berlin has pledged to conserve on average 2,070 MWh of electricity and heating annually and hence to cut its energy consumption by 27%. With the Climate Protection Agreement running from 2010

until 2015, the overall savings total 12,420 MWh. To achieve this objective, the innovative IT service provider's main activities are as follows:

- At its High Secure Data Centre, ITDZ Berlin has limited the increase in electricity consumption by measures such as consolidation, virtualization and the use of blade servers. Modern air conditioning and improved air circulation in the server rooms has led to annual average electricity savings of 1,400 MWh.
- The procurement of Green IT workstations for the local authority in Berlin means that a model is now available which exceeds the current environmental standards for PCs. Offered as a basic model at no extra cost, it consumes around 26% less electricity than an average workstation.
- Thermal insulation fitted in existing buildings and the energy efficiency upgrade of its courtyard building have led to additional energy savings of up to 560 MWh per year.

Being an ecologically minded company and an innovative service provider, ITDZ Berlin is already working today for tomorrow's climate change mitigation.



Blade servers at ITDZ Berlin data centre. © ITDZ Berlin

# Berlin's water utility



**As Berlin's integrated drinking water and sewage utility, Berliner Wasserbetriebe bears a special responsibility for sustainable development. By consistently optimizing its systems and processes, the company contributes to reducing CO<sub>2</sub> emissions – and hence supports the State of Berlin's climate protection objectives.**

## Developing an energy self-sufficient sewage treatment plant

Delivering water and treating sewage in Berlin require a large amount of energy. In recent years, Berliner Wasserbetriebe has continued to optimize its energy demand for the operation of waterworks, sewage treatment plants and pumping stations. Apart from the efficient use of energy, an important role is played by the internal generation of power and heat. The utility's declared aim is to develop an energy self-sufficient sewage treatment plant.

## Eco-friendly sewage treatment

There are many ways of generating alternative energy in sewage treatment. Sewage sludge produces sewage gas, 95% of which is used to generate power and heat. At Schönerlinde sewage treatment plant, a major step has already been taken towards energy self-sufficiency. By building three wind turbines with a capacity of 2 MW each as well as two micro gas turbines to complement the CHP unit, some 84% of

the energy required is produced internally – and up to 13,000 tonnes of CO<sub>2</sub> annually is saved.

## Fertilizer from sewage sludge

Experts estimate that the earth's phosphorus reserves will be exhausted in less than a century. Therefore, ways of recycling phosphorus are urgently being sought. Back in 2008, Berliner Wasserbetriebe developed a patented process for the recovery of phosphorus from sewage sludge – a technique which is now employed at other sewage treatment plants in Germany and the Netherlands. In this method, a MAP salt consisting of magnesium, ammonium and phosphate is produced which has proven to be a high-quality mineral fertilizer for plants.

## Own-brand fertilizer

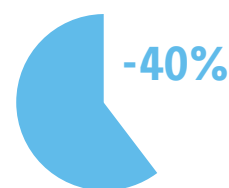
The utility now sells the fertilizer made at the sewage treatment plant in Wassmannsdorf in the surrounding region under the brand name 'Berliner Pflanze' ('Berlin Plant'). Used in horticulture and agriculture, the valuable plant nutrients and trace elements it contains ensure magnificent blooms and healthy growth. In 2015, 'Berliner Pflanze' won the Greentec Award for environmentally friendly recycling products.

## Overview

### Period

The Climate Protection Agreement expired in 2010. A new agreement is currently being drafted.

### Targets (as specified in the climate protection targets of the State of Berlin)



Reduction of CO<sub>2</sub> emissions by 40% by 2020 compared to base year (1990)

### Monitoring

- Annual performance monitoring to demonstrate the savings achieved
- Submission of a report on the implementation of planned activities and the CO<sub>2</sub> balance at the end of the period

## Berliner Wasserbetriebe

### Facts & figures

Employees: 4,523 (female: 1,415; male: 3,108)  
Proportion of trainees: 6.8% (271)  
Investment in fixed assets: €274.3 million

### Contact

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Schönerlinde sewage treatment plant is heading for energy self-sufficiency. © Berliner Wasserbetriebe



Berliner Wasserbetriebe won the 2015 Greentec Award for its fertilizer. © Berliner Wasserbetriebe

## BBB: Swimming and more

### Overview

#### Laufzeit

2008–12\*

\*Duration of Climate Protection Agreement (excluding swimming and diving pools at Europa Sport Park)

#### Targets by 2012 (base year: 2007)



Reduction of primary energy demand by 8,500 MWh



Reduction of CO<sub>2</sub> emissions by 1,900 t

#### Successes by 2012

- Primary energy reduced by 8,186 MWh (6.0%)
- CO<sub>2</sub> emissions reduced by 5,567 t (17.2%)

### Berliner Bäder-Betriebe

#### Facts & figures

Employees: 717

Buildings and properties: 62

Visitors in 2014: 5.8 million

#### Contact

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[www.berlinerbaeder.de](http://www.berlinerbaeder.de)

Being the largest operator of swimming pools in Europe, BBB (Berliner Bäder-Betriebe) runs 62 indoor and outdoor swimming pools and bathing beaches which are ideal for regular training and fitness. Apart from swimming facilities, the company also maintains saunas and organizes training courses at several swimming baths. In addition, some of the baths are enhanced by spectacular historical architecture. Maintaining indoor swimming pools calls for large amounts of energy and water. BBB has therefore enshrined the responsible use of these resources in its mission statement.

### Renewal of the heating and ventilation systems in the baths in central Berlin

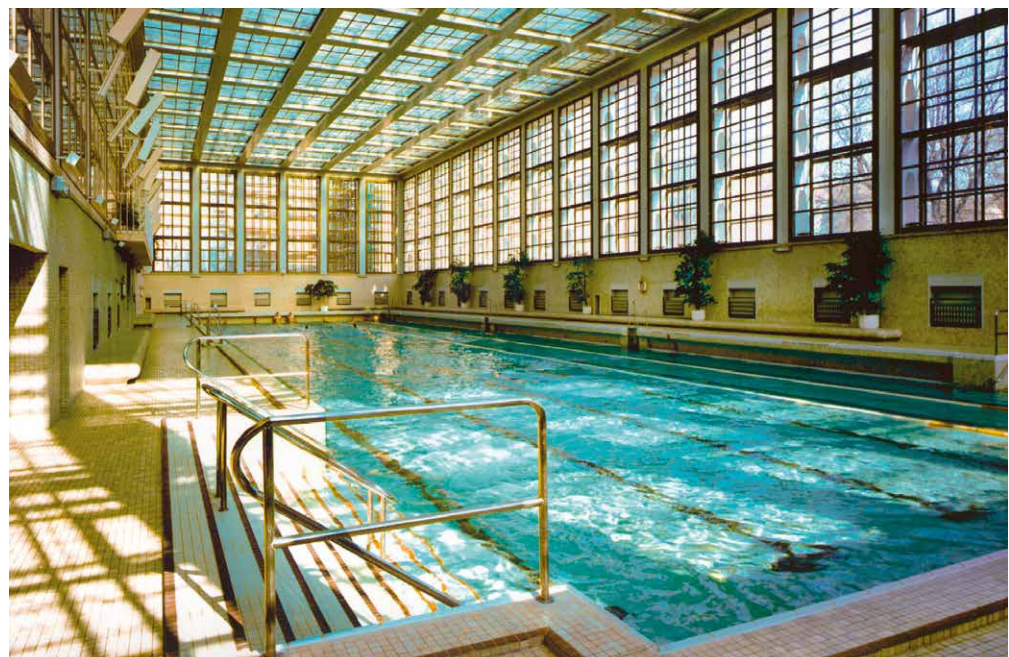
When the heating and ventilation systems were replaced at the indoor swimming pool in central Berlin in 2009/10, a pioneering concept was implemented. The heating baseload is now provided by a 50 kWel CHP unit with paraffin-based latent heat storage. Heating for the ventilation systems is delivered by a cascade of four gas absorp-

tion heat pumps. Their efficiency is greatly improved by the use of residual heat from the exhaust air of the swimming pool and the adjoining rooms as a form of green energy compared to operation solely with external air.

The renewal of the heating and ventilation systems was augmented by improving the energy efficiency of the listed windows and a glass shed roof.

The work was funded under the Building Refurbishment Programme operated by national, regional and local government.

The energy balance after four years' operation showed average annual primary energy savings of 620 MWh and a mean CO<sub>2</sub> reduction of 138 tonnes per year.

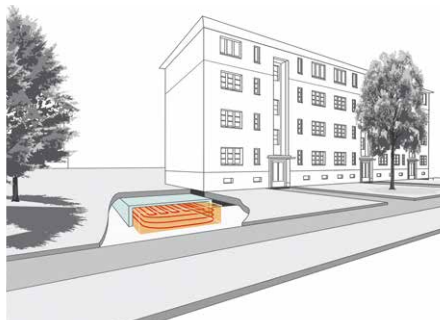


James Simon Baths in central Berlin. © Berliner Bäder-Betriebe





# 'Climate Protection Partner of the Year' Award winners 2012-15



Centre: Jury of the Climate Protection Partner Awards

## The Climate Protection Partner of the Year competition: enduring, pioneering climate protection

After the agreement with the Berlin Senate on voluntary climate protection had expired, in 2002 the Climate Protection Partners of Berlin – an alliance which currently consists of ten business chambers, trade associations and other institutions in Berlin’s economy – decided to continue providing a platform for outstanding contributions to climate change mitigation in Berlin by singling out the best projects annually.

Since then, every year the Climate Protection Partners of Berlin have presented awards to pioneers, practitioners and lateral thinkers who have planned or implemented exemplary climate protection projects in Berlin. The awards ceremony is always held at Ludwig Erhard House and has become a regular fixture on the capital’s energy and climate policy calendar. Details of all the projects are displayed at the Berlin Energy Show and then made publicly available in an online database.

Companies, individuals, development communities, architects and engineers can all enter for the award as long as their entries are projects based in Berlin. They must have an exemplary character for climate change mitigation and substantially exceed current regulatory standards. In addition, projects should feature a smart blend of different

energy-saving, climate-friendly technologies and structural measures or an especially energy-efficient technology with a high degree of innovation. Awards are presented in three categories:

- Category A: Successful projects
- Category B: Promising, innovative ideas and planning
- Category C: Recognition Award for Outstanding Public Institutions

The winners over the past fourteen years have been as diverse as Berlin itself, ranging from fuel cell powered waste collection, zero-emission houses, underground heat storage, climate protection in Berlin clubs and a CO<sub>2</sub>-neutral ice cream factory to school students acting as energy managers and numerous ultra energy-efficient residential and commercial buildings. In addition to admirably implementing the combination of energy-saving and climate-friendly measures required by the jury, they have one more thing in common: they have shown that climate change mitigation can be innovative, exemplary and economical all at the same time.

[www.klimaschutzpartner-berlin.de](http://www.klimaschutzpartner-berlin.de)

# Award winners 2012–15



# Energy efficiency upgrade of a 1965 apartment block

**1892 eG, a Berlin construction and housing cooperative, gave 304 of its flats built in 1965 a complete energy efficiency upgrade. Carried out in two phases, the aim of this project was to achieve the status of a KfW Efficiency House 100 as defined in the Energy Conservation Regulations 2009.**

## Cooperative electricity

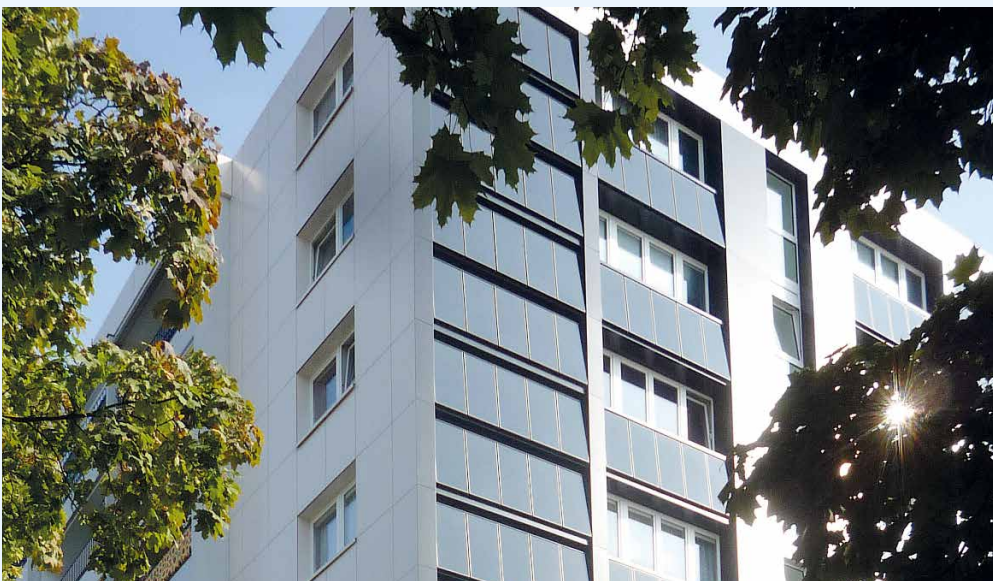
These apartments are located near another 972 homes belonging to 1892 eG which are already served by a central district heating plant. The 304 apartments were connected to the heating plant without having to expand the boiler system itself. Instead, to achieve the necessary primary energy factor of 0.89, a CHP unit with a thermal capacity of 500 kilowatts and an electrical capacity of 400 kilowatts was built. The power generated by the CHP unit is offered to residents by project partner BTB as cheap cooperative electricity. In the second phase, a photovoltaic system was installed on the façade of the tower block at Arnulfstrasse 93. Instead of being fed into the grid, the current produced powers an electric filling station, where a cooperative electric vehicle which can be used by residents is recharged.

## Energy façades and LEDs

In addition, the façades also underwent an energy efficiency upgrade, the windows were renewed, and the doorways and stairways were revamped. Once again, attention was paid to harnessing practical technology to prevent harmful emissions. Instead of using conventional lighting such as incandescent lamps and switches, sensor-activated LED lighting was installed, saving an additional 57,488 kg CO<sub>2</sub> emissions every year. Refurbishment was intended to show that appealing architecture is still possible despite compliance with both the German Energy Conservation Regulations and the eligibility criteria for financial support from the KfW development bank. The action taken enables CO<sub>2</sub> emissions to be reduced by 84% (1,717,195 kg) every year.

[www.eco-plan.net](http://www.eco-plan.net)

**2012  
award winner  
Category A:  
Ecoplan GmbH**



© Ecoplan



## Zero-emission building at Boyenstrasse 34/35, Berlin-Mitte

2012  
award winner  
Category B:  
Deimel  
Oelschläger  
Architects

**LUU Boyenstrasse GbR, a partnership of developers, constructed the first seven-storey zero-emission building in Berlin. Erected on the edge of Berlin's government district, the project demonstrates how the energy transition can be put into practice in residential construction. The building produces hardly any CO<sub>2</sub> and has a positive primary energy balance. The secret lies in its efficient mix of energy conservation and generation partly achieved through solar and CHP.**

### Primary energy demand two-thirds below Energy Conservation Regulations

Twenty-one apartments ranging in size from 60 to 145 square metres were built in a seven-storey passive structure in conjunction with a multi-generational group of developers. The hybrid building has a solid core and a wooden curtain façade. Heating in the passive building requires just 10 kWh/m<sup>2</sup> annually. The generation of the remaining energy required is CO<sub>2</sub>-neutral. The primary energy demand is less than a third of the maximum consumption allowed in new buildings under the Energy Conservation Regulations. In fact, in-

stead of about 100 kWh/m<sup>2</sup> annually, the residents consume less than 20 kWh/m<sup>2</sup>. Electricity is generated by a photovoltaic system on the roof and a natural gas fired cogeneration unit in the basement.

A semi-central ventilation system with heat recovery was installed. The efficiency of the heat recovery system is 85%. Very few radiators are needed.

### 'Front-to-back' apartments which can later be subdivided

A greywater system was also fitted to recycle shower and bath water. Meanwhile, the principle of front-to-back apartments creates interiors which can be used in a variety of ways. As a result, even small flats seem spacious. One key principle of multi-generational living is being able to adapt apartment layouts to different phases of residents' life-cycles, and so the large apartments and maisonettes were designed with future subdivision in mind. And thanks to their superb energy standards, the running costs are about 30% lower than those of comparable new-build structures.

[www.deo-berlin.de](http://www.deo-berlin.de)

Roadside façade of Boyenstrasse 34



© Andrea Kroth

# Waste collection powered by a fuel cell

**The Berlin-based Heliocentris Fuel Cells AG teamed up with FAUN Umwelttechnik GmbH & Co. KG and local sanitation utility BSR (Berliner Stadtreinigung) for a research project to develop and test a hybrid waste disposal vehicle with significantly reduced noise and exhaust emissions.**

## Quieter and more efficient

The waste collection vehicle has an on-board energy system running on a hydrogen-powered fuel cell. This means that the diesel engine can be switched off during rubbish collection and is only used to move the truck from A to B. At the loading point, the lifting unit can lift the rubbish containers purely electrically. The waste compaction drum with a capacity of 20 cubic metres can also be operated quietly by electricity. The conventional hydraulic unit normally used for loading and compaction (by rotating the drum) has been replaced by a much more efficient electrical drive. In addition, the electricity generated by the 32 kW fuel cell unit can be stored in supercapacitors ready for peak loads.

The hydrogen storage system consists of two 350 bar pressure tanks and can hold up

to 10 kg of gaseous compressed hydrogen.

## Vehicle tests

conducted between 2011 and 2013 under actual operating conditions. The system cuts the energy consumed by a conventional vehicle by a quarter, which on BSR's test routes equates to up to 20 litres of diesel per day. Moreover, emissions of CO<sub>2</sub>, NOx and particulate were all reduced by a similar amount.

The research project concluded with the successful vehicle trials. BSR is currently exploring the possibility of using fuel cell technology in other machinery with high energy consumption such as large sweepers.

[www.bsr.de](http://www.bsr.de)

**2012  
award winner  
Category C:  
BSR**

**This award winner has a Climate Protection Agreement with the State of Berlin.**



© Steffen Siegmund, BSR

Refuse collection vehicle with a fuel cell at the hydrogen filling station on Holzmarktstrasse.

## Heat recovery from the air

2013  
award winner  
Category A:  
HOWOGE

**Gas absorption heat pumps now used in regular service are an innovative element of the climate change mitigation and sustainability strategy of housing company HOWOGE mbH. From late 2009, the method of heat absorption from the air using rooftop heat pumps was trialled at HOWOGE's residential building at Manetstrasse 45 in the district of Lichtenberg.**

### Ambient heat for domestic heating

Since March 2012, the two gas absorption heat pumps have been used in regular service to provide the energy required to supply 120 homes with hot water and heating in spring and autumn. The system works by 'pumping' ambient heat extracted from the air up to a higher temperature. However, this only works at temperatures of at least 3°C. To cope with peak demand – and also when the outdoor temperature drops below 3°C – a modern condensing boiler kicks in. Interestingly, the heat pumps are powered by gas instead of electricity. In connection with the condensing boiler and a modern building management system, the entire

system has an annual capacity factor of over 100%, higher than the 95% typical of conventional gas-fired condensing boilers. The advantage for the environment is that, because gas consumption is cut by about 275,000 kWh or 24,700 cubic metres annually, CO<sub>2</sub> emissions are reduced by about 49 tonnes per year. The proportion of primary energy saved is about 20% – enough to heat 55 homes with a size of 60 square metres for a year. The volume of CO<sub>2</sub> emissions avoided corresponds to the emissions of about twenty-five mid-range cars with an annual mileage of 12,000 km. About 4,500 pine trees would have to be planted in order to temporarily trap this CO<sub>2</sub>.

### Energy efficiency upgrade almost complete

HOWOGE began systematically upgrading the energy efficiency of its housing stock back in the 1990s and has so far spent €1.4 billion. It has already completed 95% of its total housing stock (53,000 apartments), including 98% of its core portfolio in Lichtenberg. Other projects have also been initiated, such as a refurbishment programme in the district of Buch where carbon emissions are to be reduced by 1,150 tonnes annually. And a Climate Protection Agreement covering HOWOGE's entire portfolio has been signed with the State of Berlin, under which by 2020 each home will only emit 1.12 tonnes of CO<sub>2</sub> per year into the atmosphere.

HOWOGE gas absorption heat pumps on the roof of the apartment building at Manetstrasse 45 in Lichtenberg.



© HOWOGE

[www.howoge.de](http://www.howoge.de)



## Energy-plus lakeside conversion for a multi-generational building group

**Even with problematical buildings, the energy-optimized repurposing of property harbours economically and sustainably attractive potential for ambitious building groups keen to create owner-occupied housing.**

This conversion project on Schlachtensee (a lake in south-west Berlin) involves adapting and optimizing a combination of known and novel principles of sustainable construction and community-based housing at a specific building in Berlin's public property bank.

- Conversion > Use of existing buildings, attention to CO<sub>2</sub> footprint
- Energy-plus > Minimization of losses, use of solar power and heat with seasonal storage
- Multi-generational housing in a community-orientated building group
- Shared social and ecological mobility

The architects examined the building's suitability as an example and pilot project for

the socially responsible, sustainable repurposing of existing buildings with a viable energy balance for a community of prospective owner-occupiers interested in developing energy-plus buildings. They concluded not only that conversion would be economically advantageous, but that its low energy consumption would meet the Energy-Plus Standard while its flexibility made it appropriate for the building group.

The surplus renewable energy can be used to improve residents' mobility, e.g. by means of the shared use of electric vehicles and public transport for residents who don't have their own cars.

[www.kolbripke.de](http://www.kolbripke.de)

**2013  
award winner  
Category B:  
Kolb Ripke  
Architects**



© Kolb Ripke Architects; produced on 25 April 2013

MAT48\_Vision\_Plus\_Energie



## Sustainable new offices with CO<sub>2</sub> compensation

**2013  
award winner  
Category C:  
EWDE (social  
welfare arm of  
the Protestant  
churches)**

**EWDE (the social welfare and development organization of Germany's Protestant churches) combines the development expertise of charity Diakonie Deutschland and relief organization Brot für die Welt ('Bread for the World'). It moved into its new joint headquarters in Berlin in 2012. Certified gold by the German Sustainable Building Council, the seven storeys have floor space totalling over 18,800 square metres and accommodate 750 employees. The design and construction of the office building incorporate an overall ecological strategy.**

### Energy-optimized building structure

The building materials are environmentally friendly and come from regional and sustainable production. Thermally active ceilings are used for cooling in summer and for heating in winter. The temperature remains constant at about 21°C while the mechanical ventilation system with heat recovery ensures a steady supply of fresh air. The interior benefits from plenty of natural light throughout thanks to the atrium, large windows, and glass elements in the office walls. It's complemented by presence-controlled automatic lighting. The

exterior windows are automatically shaded depending on the temperature and brightness to partly keep the heat and cold out. On the roof is a photovoltaic system with a module area of 316 square metres and a maximum output of 64 kWp. The electricity produced covers much of the building's basic electricity demand. Relocation has resulted in electricity demand per square metre being reduced by 12% and heat consumption by over 60%. Primary energy consumption per square metre is now about 41 kWh per year. Rainwater is collected on the green roof and used for watering plants and outdoor cleaning. And since June 2013, the building has also been home to four bee colonies, which are looked after by volunteers.

### Avoiding harmful emissions

As planned, the underground car park accommodates 160 bicycles but only has 29 parking spaces. The building enjoys good public transport links thanks to stops at Nordbahnhof station and the Museum of Natural History. EWDE compensates for the CO<sub>2</sub> emissions generated in the operation of its new headquarters by means of Gold Standard climate protection projects.

Avoiding harmful emissions is a major goal of environmental management. Therefore, flights to destinations less than 700 kilometres away are only permitted in exceptional circumstances. Under EWDE's procurement policy, products with a minimal ecological footprint and with high social standards in manufacturing are preferred. And 60% of the items on the menu in the cafeteria come from organic and/or regional agriculture.

[www.diakonie.de](http://www.diakonie.de)  
[www.brot-fuer-die-welt.de](http://www.brot-fuer-die-welt.de)

EWDE shortly before staff arrived in late September 2012.



© Diakonie, photographer: Hermann Bredehorst

## Cleverness not coal!

**The district of Pankow is breaking new ground in energy management with its ‘Cleverness not Coal!’ strategy. Responsibility for controlling heating at schools (which previously lay solely with the caretaker or the school management) has been handed to entire schools in a number of stages:**

- From Year 4, two or three students per class become qualified as ‘energy managers’ after undergoing training and passing an examination. They receive a certificate and their qualification is included in their school report.
- Using a computer connected to the heating control system, the students analyse the current settings and evaluation graphs in order to identify areas where savings can be made.
- Energy managers only make changes to the heating settings in consultation with teachers and classes. They also explain the heating system to other pupils, including the links between indoor temperature, energy demand, and climate change mitigation.
- In order to spot any equipment failures, the energy managers take measurements inside rooms and on the radiators. This method enables any faulty parts (such as thermostatic valves) to be quickly discovered. Other problems such as leaky windows, poor insulation and a lack of ventilation are spotted in this way and discussed with the head teacher and the school’s administration at energy conferences.
- The air quality is also monitored by means of CO<sub>2</sub> measurements. Suggestions are made to classes for effective and simultaneously energy-saving ventilation.
- The energy managers’ findings, proposals and the results of their activities are logged and published. To encour-

age other school students to take an interest, information is displayed on wall newspapers, posters, and on a large screen in the school foyer.

This programme has now been introduced on a permanent basis at twelve primary schools and one high school in Pankow. The CO<sub>2</sub> problem has proved to be a good way to get students and teachers involved. The next goal is to fit all classrooms with suitable measurement displays.

For the first time, a system for the long-term optimization of energy consumption has been made possible in which school students no longer feel excluded. The training programme and the project work are part of students’ scientific and technical education, and also help them develop their methodological and social skills.

[www.stratum-consult.de](http://www.stratum-consult.de)

**2013  
award winner  
Special Prize S:  
stratum GmbH**

The use of data loggers and measurement displays in classrooms is encouraged by the young ‘energy managers’ as a way of involving their classmates in developing an energy-efficient strategy.



© stratum GmbH 2013

## Making ice cream from the sun

2014  
award winner  
Category A:  
Florida-Eis  
Manufaktur

**Florida-Eis Manufaktur's products are available nationwide and also sold online. This long-standing company from Berlin uses innovative technology for the carbon-neutral manufacture of ice cream. Its climate strategy 'Making ice cream from the sun' has been realized through the following measures:**

- In collaboration with the University of Bochum, the entire cold store (464.5 square metres) was built without floor heating on a foundation of glass foam granulate using the 'permafrost' principle. Glass foam granulate consists of granules made entirely out of recycled glass with excellent insulating properties.
- A new generation of refrigeration technology is used featuring economical rotary compressors integrated into a heat recovery and heating system.
- The shock frost tunnel in the last stage of the production process is operated using waste nitrogen from the steel industry.
- Solar cooling using adsorption technol-

ogy enables the factory to harness the surplus heat produced for individual air-conditioning in each production room. This method cuts both operating costs and CO<sub>2</sub> emissions.

- Electricity is used from 100% renewable sources.
- Apart from the adsorption unit with a capacity of 55 kW, a photovoltaic system with an output of 172.25 kWp and about 2,878 square metres in size has been installed on the green flat roof. The energy generated is delivered to the production and freezing process, while the surplus electricity is fed into the grid.
- The deep-freeze delivery vehicles are fitted with a built-in 'eutectic plate cooling' system, which is recharged during the night. Using this energy-efficient technology, the vehicles achieve a delivery temperature of -37 °C the next morning. Once they have completed their deliveries by the evening, the temperature never rises to any higher than -22 °C, even with an outside temperature of 35 °C.
- Wood-pellet heating is used to enable continuous production in the winter.
- The green factory is completed by a scenic compensation area.

[www.floridaeis.de](http://www.floridaeis.de)



© Florida Eis Manufaktur



## FLEXIM's new headquarters

**FLEXIM is a Berlin-based company operating on an international scale and specializing in the development and manufacture of ultrasonic flowmeters. The company has acquired a plot of land for its future headquarters in the district of Marzahn.**

### Courtyard concept

The planned building is based on a courtyard concept to be executed in a number of phases in order to keep up with annual expansion of about 20%. In the first phase, a compact building with two courtyards is planned. The economical hybrid construction will feature partition elements with above-average insulation. Whenever possible, carbon-neutral building materials such as wood and cellulose will be used. Planning is based on a low-tech approach in which the envelope is optimized and building engineering services are substantially reduced.

The frame will combine wooden columns and beams with a centre distance of 4 metres in the façade surface with concrete supports for the offset centre axis.

### Ventilation

The outer wall is designed as a highly-insulated wooden structure comprising a timber frame with cellulose insulation. The rear-ventilated wooden façade will create a breathable outer wall construction. The ribbon façade is broken up by a regular arrangement of opaque ventilation elements enabling natural ventilation and night-time cooling of the building. The basement façade will consist of continuous translucent cladding with integrated windows providing ventilation and natural light for the basement rooms. Internal rooms in the basement and the cafeteria area will be ventilated mechanically by a system employing heat recovery. The general ventilation of the building will take

the form of 'natural ventilation' via openable windows, some with automation. Much of the flat roof will be greened and a photovoltaic system is also planned.

### Heating

The upper floors will consist of prefabricated wood-concrete composite elements and be fitted with an underfloor heating screed. In the basement, the floor slab will comprise a raw floor with industrial panel heating.

There is an option for about 80% of the heating to be obtained from municipal wastewater using a heat exchanger about 100 metres long installed in a sewer.

To optimize daylighting and reduce energy consumption, daylight and thermal simulations have been carried out. The results show that the building's energy consumption will be about 30% below the level permitted under the Energy Conservation Regulations.

[www.zrs-berlin.de](http://www.zrs-berlin.de)

**2014  
award winner  
Category B:  
Ziegert | Roswag |  
Seiler Architects  
Engineers**

External view showing the entrance.



© Roswag Architekten



## Clubmob.Berlin

2014  
award winner  
Special prize:  
Clubmob.Berlin

**With medium-sized clubs emitting on average 70 tonnes of CO<sub>2</sub> every year, energy consumption in the nightclub sector is enormous. However, the costs of a comprehensive energy efficiency upgrade are also very high. And this is where the CLUBMOB initiative kicks in ...**

High costs and CO<sub>2</sub> emissions can often be saved by making small changes involving low investment in energy-efficient lighting and cooling systems as well as by reducing water consumption and consistent waste disposal. The idea is based on the 'Carrot-mob' principle, i.e. on selected party nights, with the evening's profits of the participating clubs being entirely invested in energy- and resource-saving measures. In addition, the clubs undertake to sign up for green electricity. Beforehand, they receive professional energy advice free of charge, with energy-saving consultants from the CLUBMOB initiative showing club managers specific ways to save energy and compiling a list of measures with them.

So far, four CLUBMOB parties have been held at the legendary SO36, MIKZ, Fuchs & Elster, and Yaam. The CLUBMOB initiative

assists the clubs until the selected (and feasible) measures have been implemented, and publicizes the projects on its website. The CLUBMOB initiative hence provides reliable initial support and guidance in the jungle of energy efficiency.

CLUBMOB is already up and running in Berlin, Frankfurt and Munich – and other cities are set to join shortly.

[www.clubmob.de](http://www.clubmob.de)

Fuchs & Elster:  
Manager Robin Schellenberg (left) and  
the CLUBMOB team.



© Lena Ganssmann, the CLUBMOB team

# Energy efficiency upgrade in South Lichterfelde: Innovative and socially sustainable

Since 2014, the Märkische Scholle housing cooperative has been redeveloping 841 apartments with a total floor space of 47,000 square metres. The goals of rehabilitation are to preserve, refurbish and improve the building stock, to harness renewable energy, to make the flats more energy-efficient, and to create homes suitable for families and the elderly.

## Recovery and storage

During refurbishment, façades and basement ceilings are being insulated, and thermal solar energy systems, buffer storage, photovoltaic arrays, exhaust heat pumps, long-term solar heat storage systems, generating systems, domestic water stations and ventilation systems are being installed. The energy for the buildings will in future come primarily from solar energy and heat recovery from exhaust air (e.g. from showers, waste heat from appliances, occupants and lighting) as well as from passive solar radiation heating homes through the windows and walls. The innovative energy concept developed by Märkische Scholle with the Berlin engineering firm eZeit revolves around the eTank

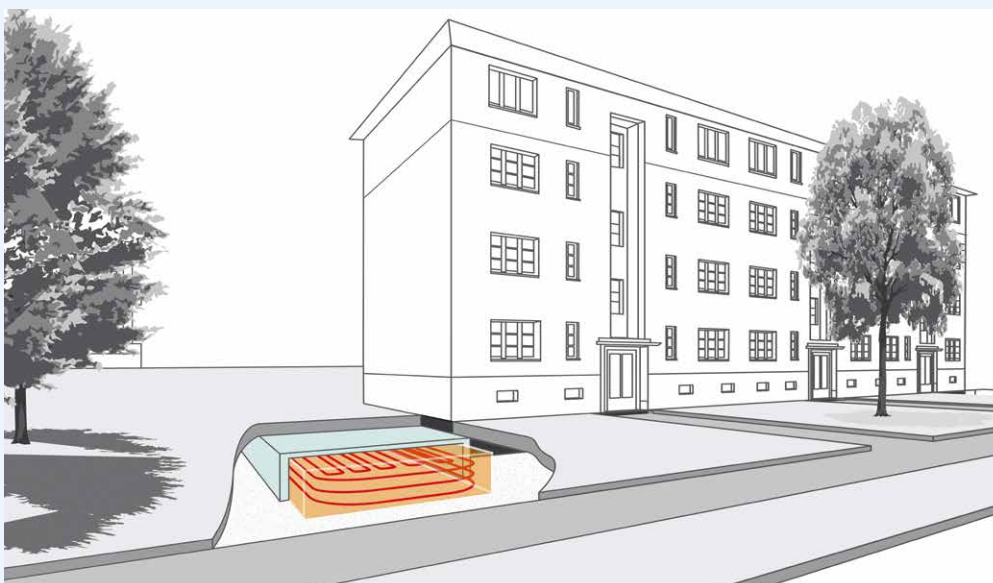
geothermal reservoir, which is used as a geothermal source, and a dynamic energy manager. Energy which is not directly required is stored in the ground outside and returned to the buildings as heat when needed. Unlike other thermal energy storage systems, the capacity of the eTank is not determined by its volume. Instead, it is open at the bottom, providing contact with the adjacent soil, and insulated on top and to the sides to prevent heat losses. Once the eTank has reached a certain temperature, the soil underneath is also heated up.

## Low costs for tenants

The main advantage for tenants in future is that they won't have to pay for the majority of their energy. And thanks to the almost completely self-sufficient electricity and energy supply, residents will hardly be affected by rising energy prices.

[www.maerkische-scholle.de](http://www.maerkische-scholle.de)

2015  
award winner  
Category A:  
Märkische  
Scholle eG



© Märkische Scholle Wohnungsunternehmen eG

Loft conversion and eTank

## Newton Building Group: Passive buildings with energy-plus

**2015  
award winner  
Category B:  
Newton Building  
Group**

**At the end of 2015, construction work is to begin on three buildings containing thirty-nine accessible, flexibly customizable apartments ranging in size from 50 to 150 square metres in the Berlin district of Adlershof. Another six buildings are to be added to this energy-plus estate in the next few years.**

### Swapping electricity for heat

The multiple-dwelling units will produce more energy than they consume. Solar energy will be trapped on the roofs and the façades and converted into electricity and hot water. Therefore, the passive buildings will need hardly any external heating. The solar thermal energy system will be used to produce hot water in summer. The considerable surplus solar electricity will be transferred to local district heating network operator BTB mbH. In return, an equivalent amount of district heating will be received from the BTB network in winter. Apart from the low provisioning and maintenance costs, heating and hot water will hence be free of charge.

This concept is currently unique in municipal housing and will serve as a case study for the district heating networks of the

future. The project is being monitored by Dresden University of Technology.

### Photovoltaics

Furthermore, the external power demand will be minimized by the use of a photovoltaic system with a capacity of 85 kWp, probably supplemented by a battery.

The planning of this system is being scientifically supported by Ostfalia University of Applied Sciences. The extremely low consumption of electricity and heating as a result will help reduce service charges, making this housing especially attractive to low-income groups such as the elderly. The experience gained in this project will be very relevant to future ecological, energy-saving construction. This explains why the project is also being supported by research institutes and with funding from the DBU (German Federal Environmental Foundation).

[www.newtonprojekt.de](http://www.newtonprojekt.de)



© Baugemeinschaft Newton GbR

# Energy-efficient, sustainable campus management

After 2003 and 2008, the Free University of Berlin received the Recognition Award for Outstanding Public Institutions for its longstanding, diverse, holistic energy management activities for the third time in 2015. Compared to 2001, it has managed to reduce its CO<sub>2</sub> emissions despite increasing its floor space by more than 27%. Three selected key instruments of sustainable campus management are outlined below.

## Bonus system

The faculties of the Free University of Berlin have been directly contributing to saving energy since 2007. If they lower the energy consumption of their buildings below the agreed baseline, they receive 50% of the energy costs saved. On the other hand, any additional consumption is charged on to them in full. The bonus system has prompted increased energy-saving activities and learning processes among the faculties.

## Green IT

In 2009, the university launched a project to counter the ever-increasing power consumption in the IT sector. A Green IT action plan was drafted in 2010 based on

a survey. The foremost measures include structural improvements with respect to procurement, the modernization of cooling systems for the two data centres, and the enforcement of needs-based PC and data centre operation.

## University Alliance for Sustainability

Based on a four-year project funded by the DAAD (German Academic Exchange Service) after a competition process, the Free University of Berlin joined forces with its four strategic partner universities in Jerusalem, St Petersburg, Beijing and Vancouver in 2015 to establish the University Alliance for Sustainability. The network is intended to become a platform for joint research projects and courses and also to enable contact between students, researchers and employees regarding all aspects of sustainability.

[www.fu-berlin.de/nachhaltigkeit](http://www.fu-berlin.de/nachhaltigkeit)

2015  
award winner  
Category C:  
Free University  
of Berlin

This award winner has a Climate Protection Agreement with the State of Berlin.



© CO<sub>2</sub> balance (Free University of Berlin)

CO<sub>2</sub> emissions 2000–14 in '000 tonnes



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