



## This is how the Free University of Berlin saves energy. A lot of energy.

It is well known that many people have a blind spot that time and again prevents them from saving energy to counteract climate change and the shortage of resources. Time pressure, convenience or the feeling of not being able to get anything done all by yourself all too often stand in the way of the best intentions where climate protection is concerned.

Can an institutional **energy management system** shed light on this blind spot? How important are **energy-efficient laboratory equipment** in terms of **energy saving**? AtmoSAFE takes a look at the energy projects of the Free **University** of Berlin to search for answers there.



Every individual can support **climate protection** by saving energy

## Energy management makes climate protection more likely

“The smallest movement is significant for the whole of

nature; the whole sea changes when a stone is thrown into it “, wrote the famous mathematician, physicist and philosopher Blaise Pascal in his Thoughts. Environmental organisations today still like to use this quote to emphasise the significance of every individual person where **climate protection** is concerned. The father of probability calculation, however, who throughout his life was aware of both the infinite complexity of the universe and the unpredictability of human action, would probably have had misgivings about whether programmes on **energy conservation** and action plans would be sufficient to cope with this great challenge to humanity. Andreas Wanke is in charge of the department for energy and the environment at the Free **University** of Berlin, and monitors a non-representative random sample of more than 31,000 students distributed among some 200 institutional buildings.



More **energy efficiency** with the introduction of an **energy management system** at the Free **University** of Berlin

“If you want to save, you have to invest.” This is Andreas Wanke’s most important finding from seven years of environmental management. Because not only **energy-saving** behaviour is crucial, but also optimising the energy aspects of the technical infrastructure. This includes **energy-efficient** heating, ventilation and air conditioning, conversion to natural gas-based condensing boiler technology, the elimination of energy-related weak points in the shell of the building, as well as the optimisation of the operational organisation, for example by modifying operating times to requirements, and performing regular maintenance. Almost 90% of heating systems have been modernised since the introduction of **energy management** and, along with other **energy efficiency** measures such as improved insulation, these investments were of great success in terms of **climate protection** (as of February 2009): The use of heat was reduced by 28%, power consumption by 10%. This corresponds to a reduction in energy costs of €2,4 million annually (taking the 2008 rates) and a reduction in CO2 emissions by more than 8,700 tons per year.

**Energy efficiency in the laboratory helps to protect the climate**

### The influence of humidity on paper

At the Labelexpo in Brussels, the constant climate chamber demonstrates the dimensional stability of an eco-friendly backing paper, at different degrees of humidity, providing sustainable climate protection due to its energy-efficient Peltier technology...

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**The influence of humidity in storage**

Using the example of **laboratory** operation, Andreas Wanke explains the challenge. “There is no philosopher’s stone for **energy saving**, but ultimately many small stones make up a mosaic. From our perspective, operating the **laboratories** as closely as possible to requirements with a specially adapted control technology is the crucial factor.” In plain text: Switch off ventilation and air conditioning if no one is in the room or if the air quality is good, dim the lights if there is sufficient external light, turn down heating as external temperatures rise and turn heating right down outside working hours. Choosing **energy-efficient** IT and **laboratory equipment** can contribute significantly to lowering energy consumption.

## **Incentives for good behaviour as a part of energy management**

“Jimmy, switch the light off!” If personal appeals within the family for **energy conservation** and **climate protection** do not work unreservedly, then it is almost impossible to enforce this in an institution with thousands of employees and students. According to Andreas Wanke, wide open or tilted windows, computers left running outside working hours, energy-consuming appliances or just rooms with heating, ventilation and lights left on unnecessarily all too often mean that, despite all the modernisation steps, an additional savings potential at the Free **University** of Berlin of an estimated € 1 million is still going begging. So how can people be motivated into becoming more aware of the environment and of costs? In 2007, the executive board of the Free **University** of Berlin decided to introduce an incentives system to conserve energy, whereby financial rewards were initially offered if the **energy consumption** in a faculty dropped below a baseline established beforehand. 50% of the annual cost reductions were refunded, but if the baseline was exceeded, the increase in consumption had to be paid in full by the institutes and faculties.

## **Perseverance is the key to energy conservation**

The **constant climate chamber** with energy-saving **Peltier technology** has an assignment in the field of hard metal research. The Fraunhofer-Institute for Ceramic Technology and Systems IKTS Dresden is studying the extent to which humidity can negatively influence technical processes, and therefore the end properties of the product...

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### **Bee cultivation in the IPP Peltier-cooled incubator**

Climate protection has its place in zoology as well. The BEEgroup at the University of Würzburg is breeding bees for basic research in almost vibration-free and energy-saving cooled incubators and constant climate chambers...

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Andreas Wanke takes stock of the situation: "Some considerable achievements have been made. In 2007 three faculties still showed an increase in consumption, which means they were liable to extra-payment, but last year the outcome was almost perfect. All faculties received bonuses for reducing their **energy consumption** below the baseline. But there still is a lack of integration and consistency, and the work involved in coordination and communication is quite considerable." Blaise Pascal might have commented on this by saying that all the fine principles in the world are worth nothing if they are not applied.

#### equipment with Peltier technology

- Constant climate chamber HPP
- Peltier-cooled incubator IPP
- Cooling unit for waterbaths

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