

CLIMATE PROTECTION

The World Needs Smart Houses

With their energy checks, experts from Bayer Technology Services help make “dumb” buildings more “intelligent” in terms of energy consumption. Modern technology offers them valuable support.

The Bayer “Kasino” is ablaze. Bright red flames flare from the windows of the building closely knit with the history of the company’s headquarters in Leverkusen. Oliver Krug aims the thermographic camera at the entrance hall of the complex housing the company’s hotel and guest restaurant. “In this case, red stands for a high energy loss,” he says, explaining the image on the display.

Krug is carrying out an “energy check,” which he and his team have been offering in-house and external customers since 2008. With long-term effects: “We help optimize buildings in terms of their energy consumption, which in a way is making them more intelligent,” says the architect about the service of the Civil, Structural & Architectural Engineering team of Bayer Technology Services. Indeed, many buildings are urgently in need of an efficiency test. Most of them achieve average grades at best in terms of energy consumption.

To make “unintelligent” buildings smart, Krug’s team of experts investigates the situation using special scientific methods. They analyze energy efficiency/consumption and determine the potential for savings. By the end of the analysis, they are ready to propose recommendations for improvements – resulting in a building that equally protects the climate as well as the wallet of the owner.

This is also the hope of Rolf Mehrwald, who is responsible for operational maintenance and planning of the restaurants of the Bayer Gastronomie GmbH Restaurants. “We have our building evaluated by experts to implement proper

maintenance measures.” The team from Bayer Technology Services is still in the early stages of its work. The first step is to collect all the relevant data pertaining to the energy consumption of the building. This includes information related to the heat transfer “shell,” which means, for example, the material and structure of the outer walls, the quality of the windows and the condition of the roof. Another important aspect is the ratio of the surface area to heated or cooled air volumes as well as the position and alignment of the rooms. For instance, rooms that are facing south heat up faster due to the direct sunlight.

Details of the technical systems and uses are also crucial. How is the building lighted and heated? How does the ventilation system work? How are the rooms used, and how does the use influence the energy-engineering demands?

“The diversity of the Bayer Kasino’s uses is huge,” says utilities engineer Jan Bäuscher, who, together with his colleague Christian Stahl, was involved in the check. The complex includes just about everything imaginable – from the industrial kitchen to hotel rooms, from the reception hall to conference rooms, from the wine cellar to the canteen. All in all some 9,500 square meters of usable area.

But the team has already sure about one thing: the casino does not get such bad marks in terms of energy consumption. “As with many other Bayer buildings, our building is heated with steam from the company’s own power station,” Mehrwald explains. “We use the residual heat left over in the condensate for our warm water heating.”

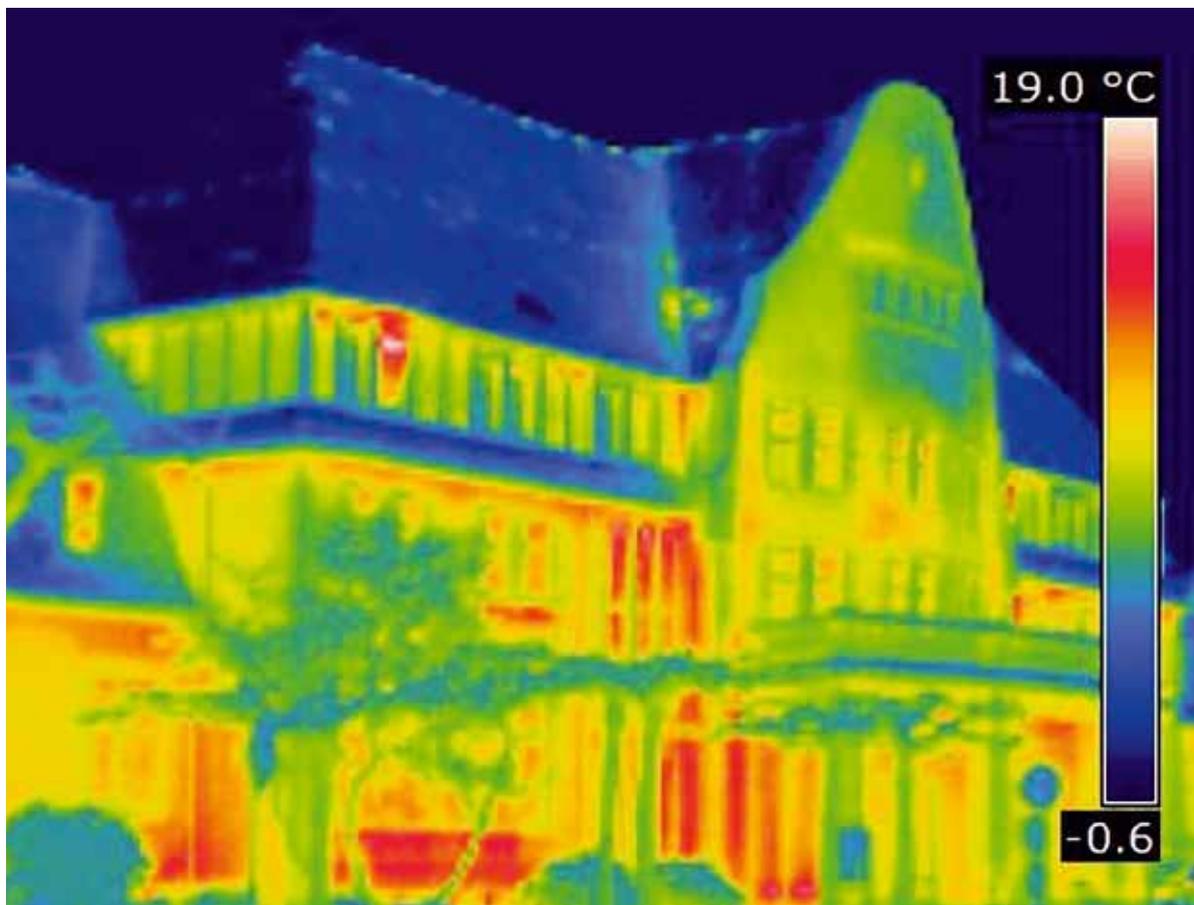
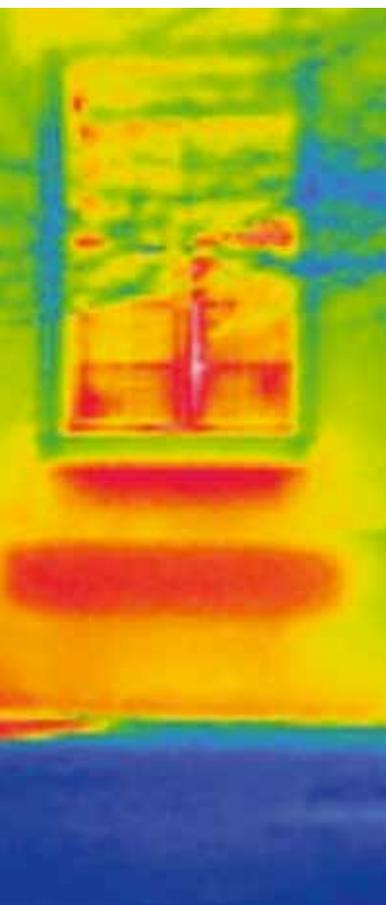
However, with the know-how of the energy efficiency team the building can be

The More Clever Climate Check

Bayer Technology Services also checks industrial facilities in order to optimize their energy efficiency and climate footprint.

The company first developed the “Bayer Climate Check” back in 2007 to inspect production facilities. The production process and the building itself are evaluated, as well as energy and resource consumption, which is coupled with the raw materials used and their logistics. The ultimate outcome is a catalogue of measures, which may, for instance, include replacing a pump or converting the production method to an alternative process. More than 100 Bayer facilities have been checked so far.

The suggested improvements will be implemented by the year 2013 with the aim to reduce CO₂ emissions by 10 percent.



The Bayer Kasino, closely knit with the history of the company headquarters in Leverkusen, in the focus of the thermographic camera: the energy check carried out by Bayer Technology Services assesses the energy efficiency of the huge complex.

made even more exemplary. In the next few weeks Krug, Stahl and Bäscher will produce a computer image of the building complex with special software that shows its energy efficiency. The experts will then simulate various optimization measures using the virtual model and calculate the respective potential for savings of each one. For example, it can be a matter of renewing the roof insulation, replacing the windows or installing a new ventilation system.



Team manager Oliver Krug performs the energy efficiency check.

“When it comes to energy savings, most people immediately think of insulation,” says Christian Stahl. But there is also great potential for savings in the building’s service facilities. Many installation options for heat recovery systems are available – especially for industrial complexes. The heat is transferred from the used air inside the building to the air coming from outside, thus keeping the thermal energy in the building.

The team will soon propose a catalogue of measures to Rolf Mehrwald: category A will list the “small changes with a big effect.” “These changes may not cost much, but save a lot of energy, for example, reducing the room temperature at night,” says Jan Bäscher.

Category B includes measures that may be technically more complicated and do not bring savings as quickly, such as insulating cellar ceilings or roof areas. Category C consists of measures that only offer long-term results, such as insulating whole frontages. But the important thing is that for every suggestion they calculate when the implementation is amortized. In the case of the huge Bayer Kasino complex the calculations will no doubt turn out to be particularly substantial. We will carefully assess the potential for savings of each measure, says Mehrwald. After all, nothing should be squandered – neither energy nor investments.