MeteoViva

Case Study

The „Greenest“ University in the Netherlands

The HAS Hogeschool is the scientific center of the food and agricultural industry in the Netherlands with its nearly 2,500 students. The university is not only an international pioneer in the research of new approaches and methods in this area – it also is taking an innovative, green approach to the energy supply of its campus.

Property
Campus at Den Bosch

Customer
HAS Hogeschool

City
‘s-Hertogenbosch/Den Bosch (Netherlands)

Service
Optimized climate control with MeteoViva Climate

Area
150,695 sq ft

Technology
19 heating circuits with radiators, floor heating, ceiling radiation panels and warm air curtains, six ventilation units with heating and one with heating and cooling, ten zones, 108 data points

Savings
Gas costs: 12.3 percent,

Electricity costs: 17.8 percent

Amortization
2 years

The Project

The diverse usage and building structure at the university campus at Den Bosch is a mix that is typical of educational and research institutions. Along with three main buildings, built between 1995 and 2001, it also has a 6,458 sq ft atrium as well as a 10,764 sq ft greenhouse with separate climate cells. Here, students research the optimal cultivation of vegetables under LED lighting – so-called city farming. HAS Hogeschool was on the search for a clever and sustainable solution for the building management system that would help make heating and air-conditioning at the university more efficient. The new solution should also offer greater transparency regarding the energy flows of the individual units.

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„We are aware of our responsibility towards future generations and are making an effort to act in an environmentally sustainable manner. Particularly as a ‚farm' for young talent in the green sector, we want to set a good example."

Joost Veldman,
Manager Facility Services and Housing at HAS Hogeschool

The Assignment

Due to multiple conversions, the campus uses many different technologies for heating, cooling and air-conditioning. Both of the older buildings are heated with radiators while the laboratories also have radiation panels. Air-conditioning is provided via ventilation units. In the third building, several heating circuits with radiators are installed as well as a ventilation unit with a cooling function. The roofed courtyard between the buildings is climatized via two fans and curtain air heaters. The greenhouse and the bordering rooms each have their own heater, while the climate cells have a completely separate air-conditioning system. The energy consumption of the entire system is measured via a gas meter and two power meters.

With the help of a new, innovative building management system, the temperature in the various rooms should be better regulated and the use of fossil energy minimized. The aim was also to ensure an optimal indoor temperature. Facility Manager Joost Veldman therefore wanted a solution that disclosed the energy flows so that necessary usage modifications could be made in a second project phase. After evaluating various offers, HAS Hogeschool decided for a joint solution from Rensen Regeltechniek, responsible for the building management system, and Crijns Energiecontrolling (CEC) in 2012. CEC was tasked with implementing MeteoViva Climate to optimize operation of the existing air-conditioning systems.

Implementation

In order to establish a potential diagnosis, CEC assessed the building and A/C technology in the process of making its offer. The calculations were based on the MeteoViva Climate simulation model. The model uses self-learning algorithms that consider the key influencing factors on indoor climate such as local weather forecasts, the physical properties of the building and how a building is used to generate optimal control data for the system. The diagnosis showed an energy cost savings potential of more than 30 percent, though 15 percent were assigned to the new building management system.

For the system launch, a total of 108 data points were identified in ten independent climate zones. MeteoViva Climate uses these to measure and influence the individual components of the air conditioning system. This method also supplies comprehensive documentation of the operating data and thus provides the desired transparency regarding energy flows.

Conclusion

Thanks to the optimized operation of the air-conditioning units via MeteoViva Climate, HAS Hogeschool saved 12.3 percent on gas costs in the first year and nearly 18 percent on electricity costs. The risk of implementing a technology that was new to the Netherlands in MeteoViva Climate paid off for Joost Veldman: „This option not only proved to be the most sustainable, but also the most cost-effective solution."

In 2014, the university started the second project phase. Under the motto, „Fit-for-Use", the usage of the buildings is being modified. The university is also applying for the country's „Frisse School" (Fresh School) seal. The seal recognizes compliance with strict set of criteria for indoor climate control. Crijns Energiecontrolling is also involved here – and meeting those criteria shouldn't be a problem thanks to MeteoViva Climate.