



Belimo Energy Valve™ at the Institute of Forestry at the University of Macedonia

Energy efficiency through transparent system monitoring

The Belimo products “Energy Valve” and the room controller “CR24-B1” were the protagonists of a Macedonian pilot project in Skopje for the determination of the energy efficiency of buildings. The experimental set-up at the Institute of Forestry was able to demonstrate that, with the implementation of meaningful renovation measures, the consumption of primary energy could be reduced by 20 percent by the year 2020 in comparison with the expectations projected for 2007 — as outlined by the 2012/27/EU Directive. Thanks to the Belimo Energy Valve™ also the current energy consumption values and the optimisation potential of the system are known at all times.

Building type	Schools / Universities
Project type	Renovation
Trade	HVAC
Products	Belimo Energy Valve™ Room controller CR-24-B
Commissioning	February 2013

Initial situation

In addition to forestry subjects, the Institute at the "St. Cyril and Methodius" University also performs research on aspects of environmental and energy efficiency. In the case of this pilot project, the intention was to investigate potential heating energy savings in the Institute's own building. The basis for the experimental set-up was the international standard ISO 50001:2011, which describes systems and processes for improving energy efficiency.

Project requirements

Two points were defined as conditions:

- Energy consumption can be analysed and regulated in accordance with work conditions (working hours, working days, room temperature etc.).
- The energy consumption of the current month is known at all times, in contrast to the retrospective invoice data of the operator.

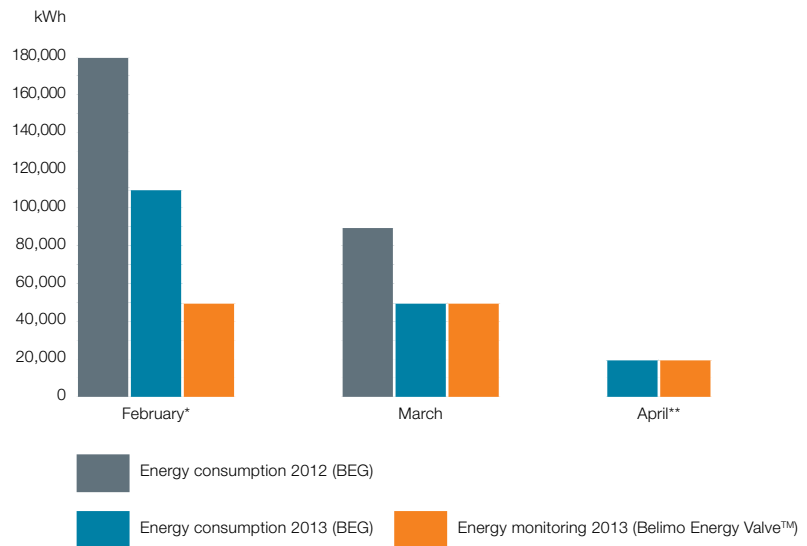
Belimo solution

These customer requirements correspond exactly to the features of the Belimo Energy Valve™. It measures, regulates, balances and saves all measurement values. Because a web server is integrated in the valve actuator, the data can be viewed and analysed for a period of 13 months through any Internet connection with the Belimo Energy Valve™ Tool. The 2-way control valve that was previously used in the primary part of the heat supply facility was therefore replaced with the Belimo Energy Valve™ in the DN65 dimension. The valve is controlled with a room controller CR24-B1 (master controller with PI response) that is installed in a reference room. The nominal room temperature of 21 °C was lowered to 16 °C on weekdays after 3 pm and on weekends. From 7th February to the end of April 2013, the Energy Valve then used sensors to continuously measure, balance and control the flow and temperature values in the supply and return lines. Thanks to this transparent energy monitoring, it was possible to analyse where and in which amounts the energy in the heating system was being used. The optimisation potential was quickly determined: the available energy can be used according to actual requirements and energy consumption can be reduced significantly.

Customer benefit

- The optimisation of the heating periods and temperatures with the aid of the Belimo Energy Valve™ led to energy savings of $\geq 30\%$, as could be seen on the invoices of the local heating supplier (Balkan Energy Group BEG).
- The specifications of the EU Directive 2012/27/EU were fulfilled.
- The customer has transparent energy consumption values at his disposal at all times and can project budgeting for the coming heating season.
- Installation of the Belimo Energy Valve™ and the room controller CR-24-B is possible with a manageable technical outlay.

After three months, the evaluation of the energy consumption values revealed considerably improved economic efficiency for the converted heating system:



* The clear imbalance between these consumption values is probably due to the fact that the actual energy consumption in January 2013 was not recorded. The energy supplier had charged a flat-rate amount for this period and then corrected it once again in February 2013.

** BEG values not yet available at the end of the experiment.

Customer satisfaction

After the heating period was over, the experimental results achieved with the Energy Valve at the Institute of Forestry were analysed and presented to university management. The expectations of the responsible officials were thereby greatly exceeded. Vice-Rector Prof. Dr. Nikola Vasilevski emphasised that the use of modern, energy-efficient technologies was of great value for his facility. It is for that reason that he would like not only to continue cooperation with BELIMO Automation AG in this area but also to extend it further. Based on this pilot project, the budgeting of a project is now being planned that involves the equipping of all 22 Institutes with Belimo Energy Valves™.



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