

## ANALYZE ELECTRICITY CONSUMPTION – SAVE ON ENERGY COSTS

Comprehensive energy monitoring will be used to detect and prevent increased energy consumption in more than 700 Rewe International AG Billa shops in Bulgaria, Croatia, Romania, Russia, Slovakia, the Czech Republic and the Ukraine.

by Maike Schäfer

Energy monitoring was first launched in the Czech Republic – where more than 200 shops represent one of Billa's main markets in Central and Eastern Europe. The entire shop network has been connected to the system since late 2013 and new shops are continuously being integrated. By the end of 2014, energy monitoring installations are also planned for the 135 shops in Slovakia, while 98 shops in Romania will be connected in 2015. With an average sales floor area of 1,000 to 1,500 m<sup>2</sup>, the Czech shop network is very homogeneous in terms of technical installations. "Apart from utility bills, we have not had any reliable data on the energy consumption of individual shops up to now and therefore no comparative figures for the efficiency of the technology", explains Markus Sarg, project manager in Rewe's Export and Technology Department CEE/Italy. "Energy management is not possible without this type of data as we would never know where to apply energy saving measures and how to check the effects of such measures."

This situation will be remedied by the online system "ShopInsight" which has been developed by Hörburger AG and Device Insight GmbH and is used for the technical management and energy optimization of chain stores. The web-based system collects data from the individual shops and facilitates automatic data processing and analysis at a central location, thereby providing the retail chain

with a current and comprehensive representation of the network of integrated shops at all times. With the help of the online visibility feature, inefficient components can now be detected promptly, whereas in the past they remained hidden and produced unnecessary excess consumption. Local energy flows in the individual shops are visible and facilitate the calculation of life cycle costs of the technology used. In addition, technical inventories of the individual shops are taken in order to assess energy-saving potential. Based on the inventories, a catalog is developed which offers different energy saving measures and possible improvements.

### INTEGRATING ALL DATA

Before implementation of the system in the entire shop network in the Czech Republic, it was first tested in 18 locations. The conditions in the shops were analyzed and a precise determination was made about which data should be collected in the future. The modular concept of the system offers suitable solutions for retail chains in all sectors with any number of shops of any size. In the case of Billa, the overall energy consumption is collected first. Then, the energy consumption for cooling and sub-users is also recorded wherever it is required based on the power input situation. The system is designed with an open configuration making it possible to also record data on gas consumption, temperatures

and malfunctions at any time. Accordingly, operating and temperature data for the refrigeration systems are now also being recorded automatically by another automation system. "We thought it was important not to create a data graveyard. We therefore closely examined how much data we could actually process and realized that the total energy consumption alone can be used to draw a large number of conclusions, especially because electricity is the highest cost factor in Eastern Europe", explained Markus Sarg.

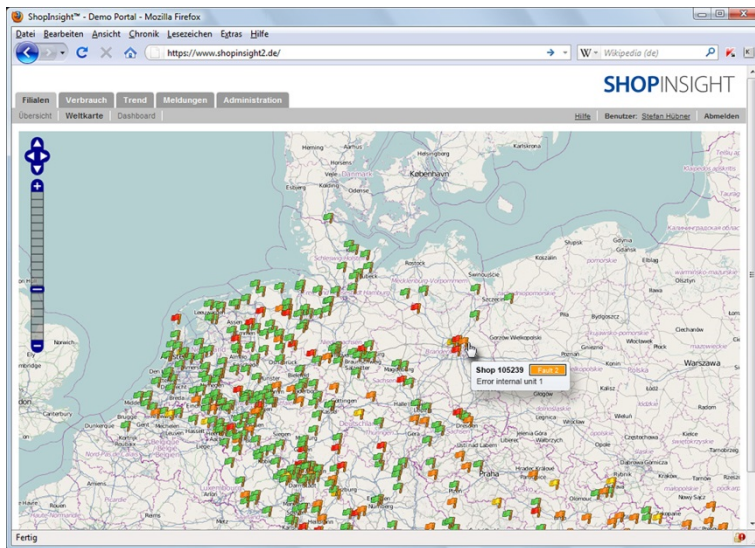
In the process, current electricity consumption is first constantly recorded for every shop over the course of four weeks. In addition to collecting the total consumption, this step also includes the recording of current peaks and any consumption irregularities. After these first four weeks, possible energy saving measures are assessed and implemented while the energy monitoring continues. The results of the four-week metering period serve as reference values which are used to better represent savings in energy and costs after the implementation of the measures. The goal is to achieve energy savings of at least 10 percent per shop. In addition to helping to determine organizational and technical energy saving measures for existing shops in the short term, the results are primarily used when new shops are equipped with the system. Precise consumption data collected from individual shops can help define energy optimization goals for new shops more easily. In this context, Billa pays attention to the proportionality of the measures and weighs them with regard to the local conditions.

#### SWITCHING OFF "PERMANENT USERS "

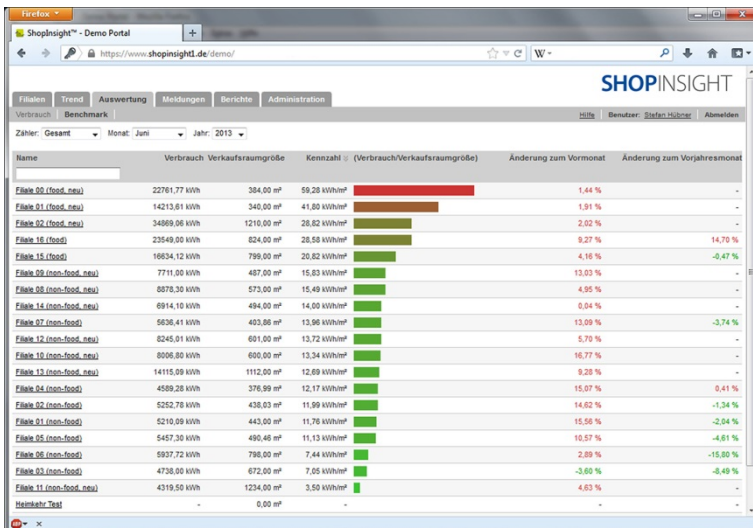
Permanent energy consumption can be illustrated by the example of an initial four-week monitoring of a shop which revealed that the lights in the parking garage below the shop were constantly switched on, day and night. The 8,000 watt garage lighting system was switched on for an average of 8,760 hours a year and created enormous additional costs. "In order to reduce energy consumption we removed half of the lights and installed automatic timers as well as light sensors (day/night recognition). Together with some additional measures in the shop we were able to reduce consumption by 30 percent", said Markus Sarg.

Apart from centralized recording of energy consumption, Billa emphasizes the importance of staff training in the local shops. "With the help of workshops, we try to raise awareness in the staff members of the local shops because they are the ones who operate the technology. Visualizing energy consumption enables us to make our colleagues aware of the topic of energy efficiency and to prevent operating errors," explains Markus Sarg. As the process of energy management continues, the system in the individual shops can be expanded with control functions, for example in order to directly control electrical devices or temperature settings as needed. The web portal is also continuously being expanded, incorporating customer wishes in the process. New developments range from analysis and benchmarking functions to automatic early detection of system errors which could otherwise lead to gradual excess consumption.

[www.billa.at](http://www.billa.at)



The individual graphs can be used, for example, to determine how much energy is consumed by the respective shops.



The screenshot shows the ShopInsight web interface in a Mozilla Firefox browser, displaying a table of energy consumption data. The table is titled 'SHOPINSIGHT' and includes a search bar and a 'Benutzer: Stefan.Hübner' indicator. The table has columns for 'Name', 'Verbrauch', 'Verkaufsraumgröße', 'Kennzahl', 'Änderung zum Vormonat', and 'Änderung zum Vorjahresmonat'. The data is filtered by 'Zähler: Gesamt', 'Monat: Juni', and 'Jahr: 2013'. The table lists various shops with their respective energy consumption and area values, along with percentage changes.

Name	Verbrauch	Verkaufsraumgröße	Kennzahl	Änderung zum Vormonat	Änderung zum Vorjahresmonat
Fliese 00 (food_neu)	22761,77 kWh	384,00 m²	59,28 kWh/m²	1,44 %	-
Fliese 01 (food_neu)	14213,61 kWh	340,00 m²	41,80 kWh/m²	1,91 %	-
Fliese 02 (food_neu)	34969,96 kWh	1210,00 m²	28,82 kWh/m²	2,62 %	-
Fliese 16 (food)	23549,00 kWh	624,00 m²	28,58 kWh/m²	9,27 %	14,70 %
Fliese 15 (food)	18634,12 kWh	799,00 m²	20,82 kWh/m²	4,16 %	-0,47 %
Fliese 09 (non-food_neu)	7711,00 kWh	487,00 m²	15,83 kWh/m²	13,03 %	-
Fliese 08 (non-food_neu)	8878,36 kWh	573,00 m²	15,49 kWh/m²	4,95 %	-
Fliese 14 (non-food_neu)	6914,10 kWh	494,00 m²	14,00 kWh/m²	0,04 %	-
Fliese 07 (non-food)	5636,41 kWh	403,68 m²	13,96 kWh/m²	13,09 %	-3,74 %
Fliese 12 (non-food_neu)	8245,01 kWh	601,00 m²	13,72 kWh/m²	5,70 %	-
Fliese 10 (non-food_neu)	8006,80 kWh	600,00 m²	13,34 kWh/m²	16,77 %	-
Fliese 13 (non-food_neu)	14115,09 kWh	1112,00 m²	12,69 kWh/m²	9,28 %	-
Fliese 04 (non-food)	4589,28 kWh	376,99 m²	12,17 kWh/m²	15,07 %	0,41 %
Fliese 02 (non-food)	5252,78 kWh	438,03 m²	11,99 kWh/m²	14,62 %	-1,34 %
Fliese 01 (non-food)	5210,09 kWh	443,00 m²	11,76 kWh/m²	15,56 %	-2,04 %
Fliese 05 (non-food)	5457,30 kWh	490,48 m²	11,13 kWh/m²	10,57 %	-4,61 %
Fliese 06 (non-food)	5937,72 kWh	798,00 m²	7,44 kWh/m²	2,89 %	-15,00 %
Fliese 03 (non-food)	4738,00 kWh	672,00 m²	7,05 kWh/m²	-3,60 %	-8,49 %
Fliese 11 (non-food_neu)	4319,50 kWh	1234,00 m²	3,50 kWh/m²	4,63 %	-
Heimkehr Test	-	0,00 m²	-	-	-

Comprehensive energy monitoring provides a continuous overview of the entire shop network.