

Making it easier to save energy

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Fraunhofer scientists are developing programs that help show at a glance how much energy devices are consuming. At the GSMA Mobile World Congress in Barcelona, the researchers will be showing how a cell phone can help save energy.

Each device is given a power plogg, which is a small adapter located between the power plug and the power outlet. It reports the [power consumption](#) at any given time to a PC via a [radio signal](#). People can tell which device is guzzling the most [energy](#) by taking a look at the computer monitor. But the FIT experts have also provided a far more convenient way to access the information: "Using a [cell phone](#) as the display and control unit allows people to check the energy consumed by their devices or appliances," explains Dr. Markus Eisenhauer, who developed the system. "For example, it can be used to display the consumption by room, switch devices on and off, and dim lights." And there is another special attraction: The cell phone's camera can be used as a "magic lens". Point the camera at the device in question, and the power consumption at the moment is shown.

Everyone wants to save energy, but there are few individuals who can tell you exactly how much energy the devices in their homes consume. For example, which consumes more power - the dishwasher or the television? To answer such questions and to give consumers a sense of where the energy guzzlers hide, the Fraunhofer Institute for Applied Information Technology FIT in Sankt Augustin, Germany has developed an application that demonstrates the [energy consumption](#) of individual devices in the household. The basis for this is the "Hydra" middleware

developed by the institute which is extended by an energy protocol. A middleware reduces the workload of programmers: in Hydra's case, by administering the communication between devices.

The technology behind this feature is complex: A server stores pictures of the individual devices, taken from a number of directions. When the function is activated, the cell phone sends the picture taken to the server, which then compares the picture with the ones in its database. As soon as it has recognized the device, it determines the power consumption at the time as reported by the associated power plogg, and sends this information back to the cell phone.

The result is a multitude of options that allow people to analyze the power consumption of their devices: The total energy consumed by a device is a calculation of its power and the respective time that it is in use. In addition to the power at any given time, it is also possible to examine a device's total consumption, for example, extrapolated across the average time in use during a year. This even makes it possible to detect energy guzzlers in the household that are not always turned on, such as the oven.

Various other scenarios can also be run through. Eisenhower's colleague Marc Jentsch reports that "it is possible, for example, to try out the room lighting with energy-saving bulbs and compare this consumption with conventional light bulbs to see the impact on the electric bill." A display of the current energy consumption along with the energy and cost savings per year facilitates this comparison. Similarly, it is possible to compare the energy used to play DVDs on a PlayStation with that when a DVD player is used.

The system is already equipped for the future. The cost of electricity could soon depend on the time of day, and this system allows people to save money by waiting until the electricity is cheap and then using their

cell phones to switch on the washing machine.

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