

# We make climate protection possible

## Energy efficiency in buildings



**ABB**

## Making optimum use of energy efficiency potential

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*A must, both economically and ecologically*

Climate protection is one of the greatest challenges of our time, and one which will affect the existence of future generations.

Increased use of renewable energy is unavoidable, yet we also need to focus on using energy as efficiently as possible – and there is huge potential for optimisation.

Today, just 20% of the primary energy employed is actually used, for example as light or heat. This level of efficiency is far too low and must be improved.





### What does "energy efficiency" mean?

Dealing with energy efficiently means:

1. using less energy to achieve the same result;
2. using the same amount of energy to produce a better result. Or, to put it mathematical terms:

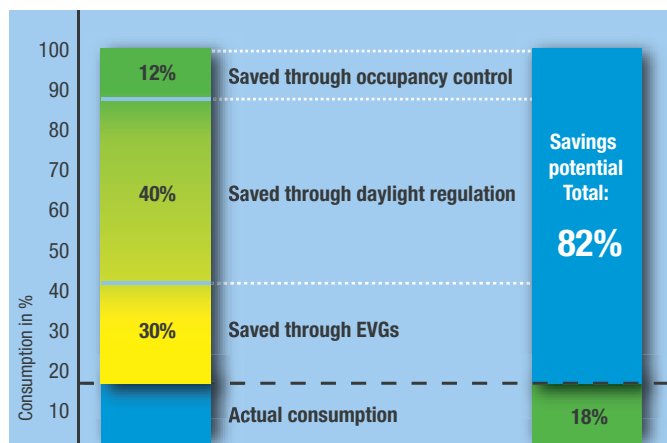
$$\text{Energy efficiency} = \frac{\text{energy used}}{\text{energy supplied}}$$

This formula and its consequences are also becoming increasingly important from an economic viewpoint. The costs for electrical energy will increase considerably in future, both in private buildings and in commercial and functional buildings – as such, investments in energy efficiency will depreciate faster and faster through lower running costs.

### Comfort is all part of the package!

The call for optimised energy efficiency doesn't mean you have to miss out on comfort – on the contrary. Both aspects harmonise with one another, complement each other and ensure human well-being, even in terms of hard cash. Lighting conditions adjusted to the current use of the room or heating controls tailored to your requirements are just two examples.

The overall savings potential generated by cross-sectional systems engineering, for example in the area of lighting, can be as much as 82% – and this isn't based on some futuristic technology, but on long-standing expertise!



Source: Fördergemeinschaft Gutes Licht

ABB is one of the leading global specialists in the efficient use of energy. We give competent answers, from electricity generation, to transfer and distribution, to consumption control in industry and buildings.

This brochure gives a specific overview of the last points.

## Lighting and shading

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*Where there's a lot of light, there can also be shade*

The energy-saving potential for electrical energy in buildings can be tapped with modern electrical and installation systems. And this technology is already available in the form of the standardised KNX bus system (the only global open standard for house and building installations) – tried, tested and efficient throughout the world.

The topics of "lighting/shading" and "heating/ventilation" can make particularly significant contributions to energy efficiency with KNX technology.



### **Bright ideas for energy savers**

According to a ZVEI study, energy consumption for building lighting can be reduced by up to 58% using modern KNX control.

Values of this magnitude can also be achieved in functional buildings and larger commercial buildings.





## Lighting control options

### Presence-dependent lighting:

The simplest way to control lighting to meet your requirements is based on the presence of users in the room. The room is only lit automatically when someone is there.

**Natural light dependent control:** Light sensors detect the level of light outside; the indoor lighting is then adjusted to the desired level via a dimmer.

**Combination of outside light, indoor light and blind controls:** An ambitious solution, but one which is highly effective in terms of energy conservation. Blinds are controlled to provide the necessary lighting and shading depending on the outside light. When outside light levels are low, indoor lighting is automatically switched on.

### Saving energy with blind control

During the heating season, the blinds are lowered at night to conserve the valuable warmth in the room. In summer, they close to keep out the strong sun and reduce the need for air-conditioning. At night, the blinds open to release heat.



Lighting and blind control are of prime importance in the KNX systems from ABB. We supply all necessary actuators, dimmers, detectors, light sensors, automatic switches, timer switches and operating elements.

## Heating and ventilation

*Energy saving is warmly recommended!*

**The second major consumer of energy in buildings is heating. And ABB shows impressive figures in this area, too.**

The annual energy consumption for heating and ventilation can be cut by up to 45%.

The simplest method is individual room temperature control combined with moderately reducing the room temperature. Energy savings of up to 6% can be made by lowering the temperature by 1°C according to heating requirements and presence.



### **Multiple possibilities ...**

There are several options available in addition to individual room temperature control:

- Time-dependent heating control
- Presence-dependent heating control
- Heating control dependent on the outdoor temperature
- Heating control dependent on the window position

### **... for control**

Opening windows when the heating is on is a huge drain on energy. You can put an end to this by monitoring the window position and incorporating this into the temperature control for each room.

A basic control of the heating in the building records the different heating requirements of the individual rooms and keeps the temperature constant in keeping with the time of day and requirements.

The measures are controlled and monitored via a user-friendly "on-board computer".

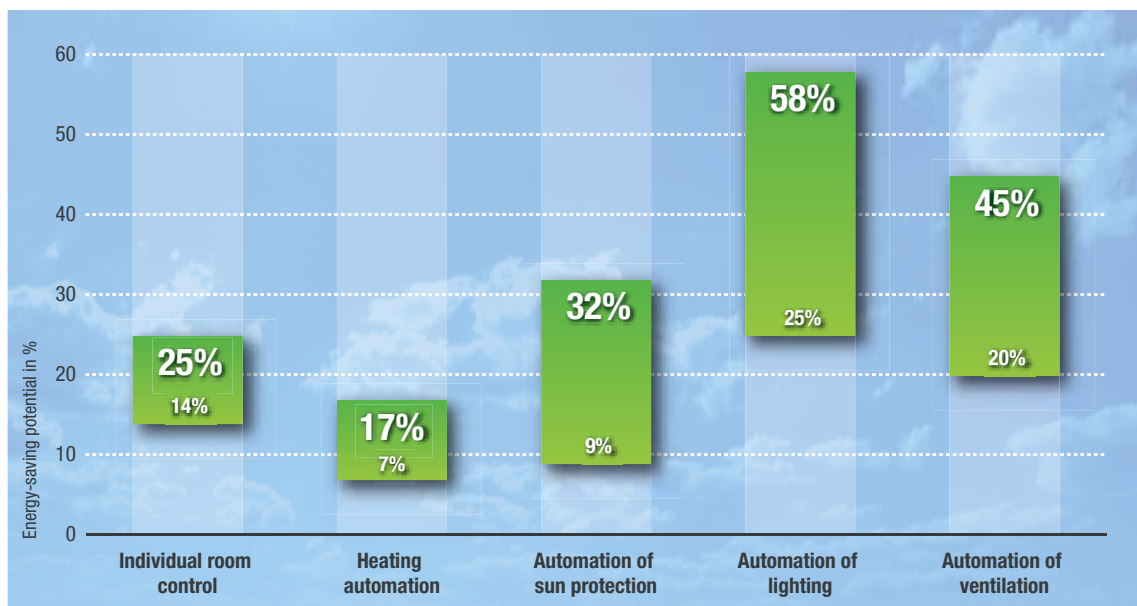




## Energy-saving potential with house and building installations



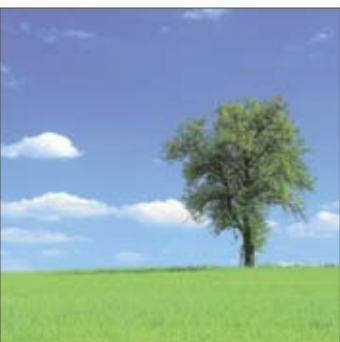
Upper and lower mean values of the study findings



Source: Zentralverband Elektrotechnik- und Elektroindustrie e.V. (ZVEI)

### Energy efficiency is

- Responsibility for conserving resources and climate protection
- Cost-effectiveness with significant savings potential, in private buildings as well as in commercial and functional buildings
- Increasingly shorter amortisation times
- Improved comfort in virtually all areas
- Of benefit to everyone – the environment, consumers, planners, specialist companies



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## Perfect control



### Comfort switch

*Saves electrical energy by automatically switching off the lighting after you leave the room.*



### Dimmer

*Saves electrical energy by manually dimming the indoor lighting.*



### Room thermostat

*Saves heating energy by reducing the room temperature as required.*



### Presence detector

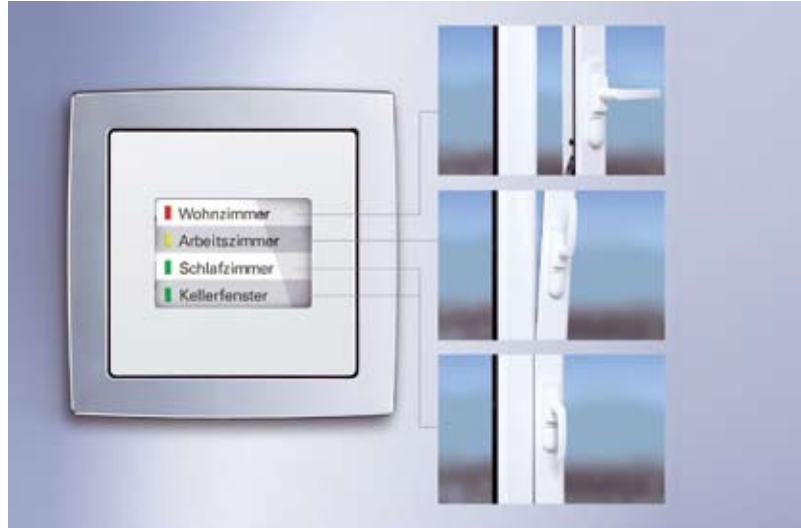
*Detects presence and light level in the room, and saves heating and electrical energy by lowering the room temperature and dimming the indoor lighting.*





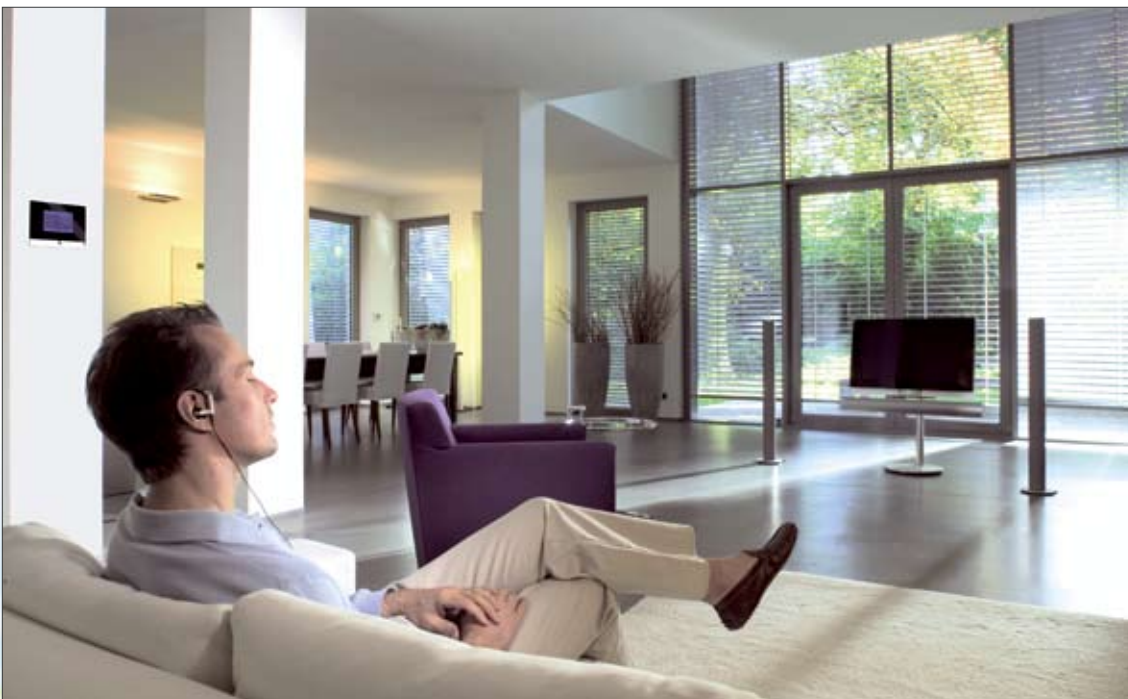
**Smart touch**

*Saves heating energy by reducing the room temperature as required. Saves electrical energy by dimming the indoor lighting manually or via individual timer programmes.*



**Remote control**

*Saves heating energy by turning down or switching off the heating when the windows are open.*



# We make climate protection possible

## Visualise – control – configure

### The electronic household meter (EHM)

Detecting and optimising energy consumption.

The electronic household meter sets a new standard for household meters, providing you with different ways of efficiently using and saving energy. Together with a data gateway, the EHM forms the basis for smart metering. The aim behind this is to record all the energy consumption data for a customer system, query this data via remote reading and ready it for processing. The meter cupboard is therefore transformed into the building's communication centre.

For the first time ever, the entire energy consumption of a building can be made completely transparent. In the "energy house of the future", the innovative meter will be coupled with a display for showing energy data. Clear and simple graphical displays allow you to easily read off and quickly optimise the consumption values.

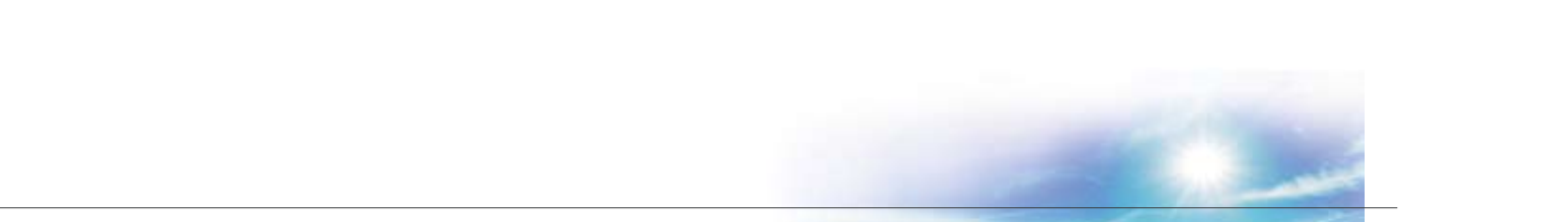


### Electronic household meter for measuring working energy for billing purposes

- Ready for smart metering
- Designed in line with the VDN specification "Electronic household meters", version 1.02
- One or two tariffs
- With internal real-time clock

### Graphical display of the consumption values in the Busch ComfortPanel





**Blind actuators**

Used for blind control and movement of the blinds depending on the position of the sun.

Shades whichever rooms you wish and saves heating energy in winter and air-conditioning energy in summer.



**FanCoil actuator**

Used for air-conditioning together with a room thermostat.

Saves valuable heating and air-conditioning energy by optimally controlling the room temperature.



**Thermoelectric valve drives**

Control heating and air-conditioning devices together with the FanCoil actuator.



**Lighting controller**

Used for light control at workplaces in offices, or for hallways and corridors.

Detects the natural outdoor light and saves electrical energy by dimming the indoor lighting.



**Switch/dim actuator, DALI gateway**

Used for controlling EVGs with 1-10 V control inputs or DALI EVGs.

Saves electrical energy by dimming the lighting and controlling the light scene.



**Weather station with weather sensor**

Used for recording the current weather situation.

Saves energy by reporting the weather situation to devices for heating/air-conditioning/shading/lighting control.



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