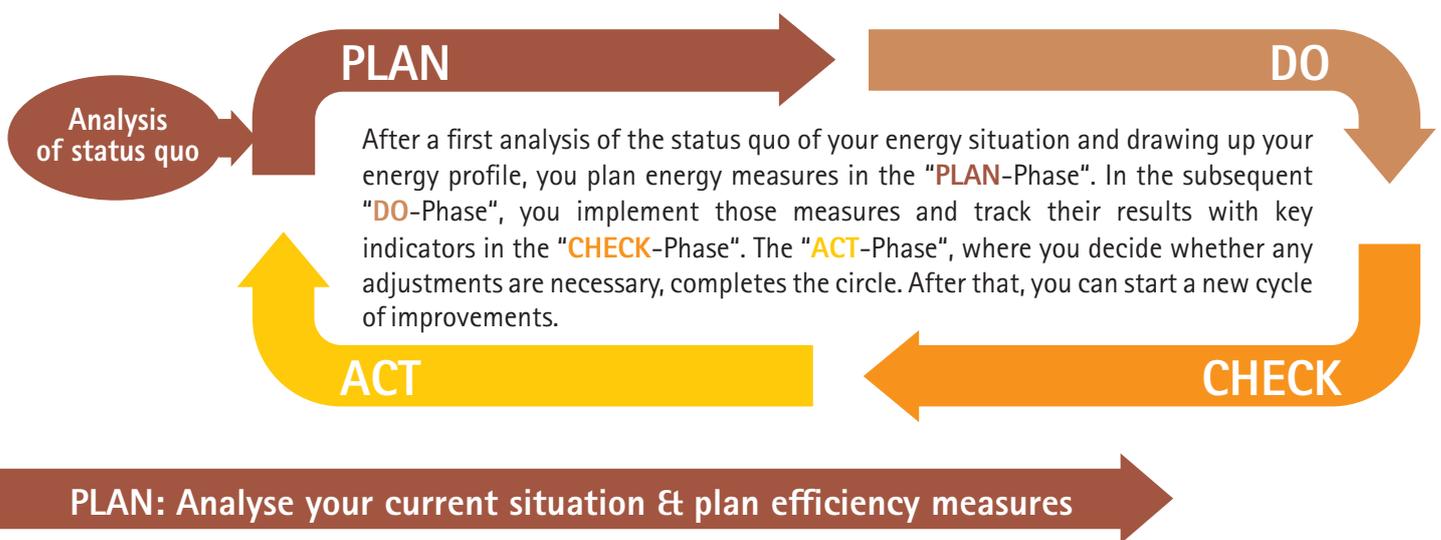




ENERGY EFFICIENCY FACT SHEET BAKERY

This fact sheet provides you with an overview of how to quickly and easily reduce the energy consumption in your business and how to become more energy efficient. The fact sheet is structured according to the four phases of a continuous improvement process:



STEP 1:

Collect energy data

Where do you find energy data for your business?

- Invoices for electricity, gas, district heating, diesel etc...
- Records of meter readings
- Additional data from energy provider, either upon request or via internet customer portal
- Possibly readings of individual devices or machines
- Estimations (based on equipment list)

STEP 2:

Develop an equipment list and identify your main consumers

Document the type and number of your main energy using devices with the following information per machine:

- Age
- Rated power
- Operating hours
- Actual power

In bakeries, most energy is commonly used in the following areas. You can focus on these first:

- Baking ovens
- Refrigeration
- Heating & hot water
- Electric motors and appliances
- Lighting
- Mobility

STEP 3:

Create your energy profile

With the help of indicators for your sector (see page 3), you can make a first estimation of whether potentials for improvement exist in your business. If your electricity supplier provides load profile data (e.g. 15-minute intervals), you can track energy guzzlers during off hours and optimise the connected load.

STEP 4:

Plan energy efficiency measures

You can find a list of measures that are often relevant for bakeries on page 2. An energy check or audit carried out by an external consultant can help you evaluate your overall situation, choose which measures are economical for your business and propose a suitable order for the implementation. Inform yourself about the availability of financial support for the consultant costs and for investments!

Also, compare offers of different energy suppliers!

DO & SAVING TIPS: Get active, implement measures

Experts recommend first implementing the so-called "low hanging fruit" measures. These are mostly organisational measures that are associated with relatively small changes in system settings, processes or staff behaviour. They often require little or no investment (e.g. optimisation of settings in the refrigeration system, or ensuring quick closure of cold room doors). They can serve as a basis for further improvements that require investments.

The following energy saving measures address major energy uses in bakeries:

Baking ovens

- Avoid unnecessary heating and idle times by optimising operating times
- Optimise the production process (sequencing of products) and the utilisation of the baking surface
- Use residual heat for baking goods with low temperature requirements
- Ensure regular maintenance and cleaning of burners, of heat-transferring parts and of the intake grille for the combustion air
- Reduce steaming to the necessary minimum

Refrigeration

- Ensure regular cleaning of evaporator, cooling fins and condensation drains as well as regular maintenance
- Optimise load
- Minimise times that cold room door remains open and lights on
- Choose correct location for condenser (away from heat sources, well ventilated)
- Check and, if necessary, add insulation
- Refrigerated display cabinets etc.: cover with viewing window and with insulating plates after opening hours

Lighting

- Ensure regular cleaning of lamps and fixtures
- Enable separate lighting of specific zones and task lighting
- Use lighting control strategies such as scheduling, occupancy sensors, dimming etc. to turn lights off or down when not needed
- Make greater use of daylight
- Install reflectors
- Install energy efficient lamps (change to T5-Technology, electronic ballasts, LED)

Heating

- Optimise the temperature level
- Optimise settings according to operating times (summer & winter, weekend, night set-back)
- Respect the periodic service intervals for the heating system
- Check the heating system (e.g. dimensioning, insulation of pipes)
- Use thermostatic radiator valves
- Separate heating circuits, if required, and control them individually
- Use circulation pumps with speed regulation
- Choose heating system according to company's needs
- Consider draught proofing windows and doors or replacing them with energy efficient ones, as well as insulating the top ceiling

Mobility

- Optimise travel routes for deliveries
- Implement staff training on fuel-saving driving (up to 10% savings possible!)
- Check and adjust tyre pressure regularly
- Evaluate using different vehicles for deliveries, depending on distance
- Fleet optimisation regarding use of load space
- In case new vehicles are purchased: take alternatively powered ones (electric, hybrid, CNG, LPG, biofuels) into consideration

Organisational measures

- Consider energy efficiency as a criterion for all new purchases. (The initial purchase price of an electric motor, for instance, accounts for less than 10% of its life cycle cost, operating costs including energy make up 90%!)
- Train and motivate employees to save energy
- Compare prices and terms offered by different energy suppliers

Waste heat

- Install a waste-gas-valve to reduce flue gas loss
- Consider heat recovery from baking ovens or cooling systems to support hot water generation or heating.

CHECK: Identify your indicators

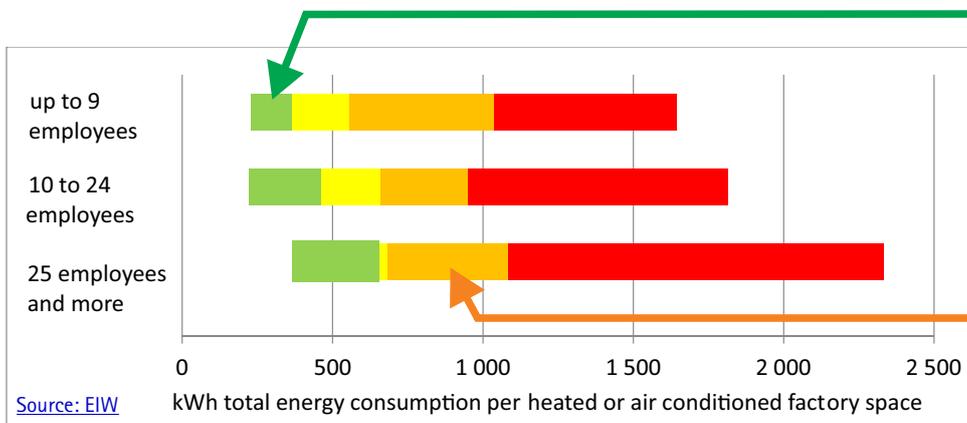
Sectoral benchmarks or indicators allow you to make an initial comparison of the energy consumption of your business with that of other bakeries. Later, you can track the development of your own indicators over time and thus measure the results of your energy efficiency efforts.

How to calculate an indicator is explained below, illustrated by two indicators that are based on a sample of Austrian small and medium sized bakeries. You can find additional indicators here: <http://eurem.net/display/eurem/Bakeries>.

To calculate your total annual energy consumption, add up the consumption of the individual energy sources (electricity, natural gas, heating oil, diesel etc...). Make sure you always consider the same period and convert to the same units (kWh).

TOTAL ENERGY CONSUMPTION PER FACTORY SPACE

$$\frac{\text{yearly total energy consumption in kWh}}{\text{heated or air conditioned factory space in m}^2}$$



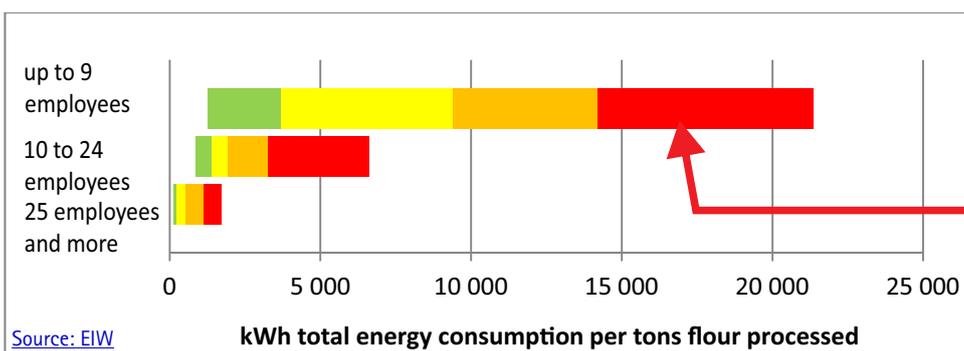
If you are in the **GREEN** area, then you probably use energy efficiently. You have no immediate need for action, but think about further improvements nevertheless.

If you are in the **YELLOW-ORANGE** area, then you probably have savings potentials. Inform yourself and plan efficiency measures.

Example: Your total annual energy consumption amounts to 600 MWh, your factory space is 400 m². This results in 1,500 kWh total annual energy consumption per m² factory space. For a business with 10 to 24 employees, this would mean that the value is rather high compared with similar sized companies in the sample and that potentially big savings are available. Keep in mind, however, that factors such as product range, capacity utilisation, or climatic conditions affect these values and that therefore they can only serve as a first rough comparison value!

TOTAL ENERGY CONSUMPTION PER TON OF FLOUR

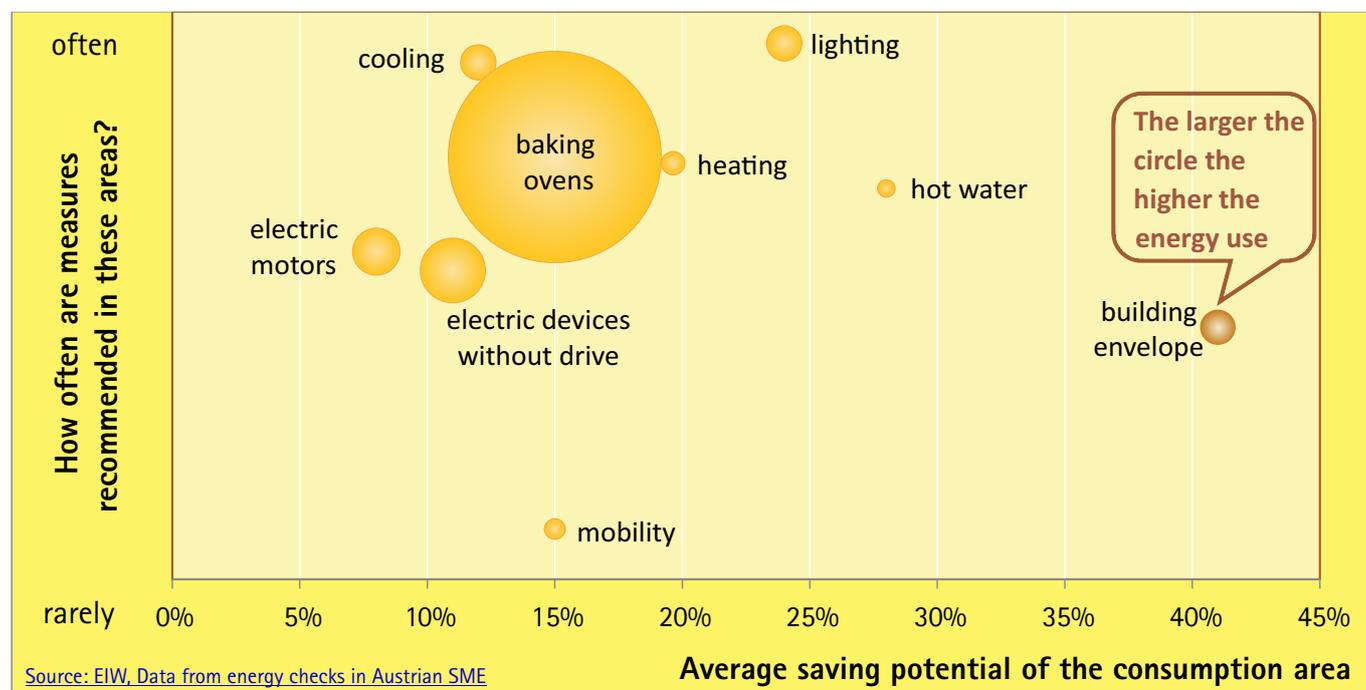
$$\frac{\text{total annual energy consumption in kWh}}{\text{flour used in t}}$$



If you are in the **RED** area, then this could be an indication of high potential savings. Localise inefficiencies in your business and implement concrete measures.

ACT: Adjustments & further improvements

When you have successfully implemented the chosen activities, decide whether further measures or adjustments are needed. The following graph shows how often experienced energy consultants have recommended measures in which areas as well as the average savings that were expected in these individual areas. For example: measures in lighting were very often proposed, the saving potential here was on average 24 percent of the energy used for lighting. The small diameter of the circle illustrates, however, that lighting only accounts for a small part of total energy consumption.



The involvement of your employees is essential for an efficient operation of your business. Value internal communication highly: inform about energy saving behaviour and about reasons for any changes in procedures, invite suggestions, check compliance, communicate and provide recognition for successes. This helps to ensure that efficient use of energy becomes routine and energy consumption is reduced in the long term.

Additional information

- For additional, more detailed, sector specific resources, including success stories of businesses that have saved energy and costs, please visit the Sector Corner at: <http://eurem.net/display/eurem/Bakeries>
- To find out more about opportunities to improve your energy situation, you can also contact the EUREM Provider in your country (<http://eurem.net/display/eurem/Training+Providers>), or an energy agency (http://managenergy.net/energy_agencies) near you.

This factsheet is also available in Czech, Greek, and Romanian with country-specific additional information and contacts at the online [Sector Corner](#).

Published in 2015 as part of the [EUREMplus project](#) by [Energieinstitut der Wirtschaft GmbH \(EIW\)](#) and the EUREMplus project partners.

The sole responsibility for the content of this factsheet lies with the authors. It does not necessarily reflect the opinion of the European Union. Neither the EASME nor the European Commission are responsible for any use that may be made of the information contained therein.



Co-funded by the Intelligent Energy Europe Programme of the European Union