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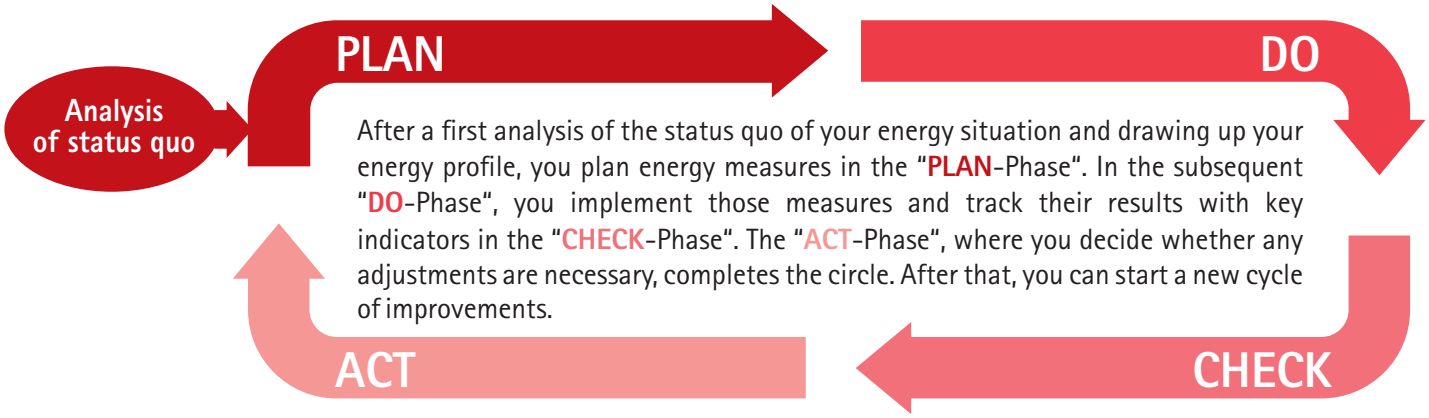
European EnergyManager

ENERGY EFFICIENCY FACT SHEET MEAT PROCESSING

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:



PLAN: Analyse your current situation & plan efficiency measures

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

- Process heat (cooking, steaming, boiling)
- Heating
- Electric motors
- Cooling
- Hot water
- 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 meat processing 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 meat processing:

Heating
- Optimise the temperature level
- Optimise system 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
- Consider draught proofing windows and doors or replacing them with energy efficient ones, as well as insulating top ceiling and external walls
- Choose heating system according to company's needs

Refrigeration
- Ensure regular cleaning of evaporator, cooling fins and condensation drain, as well as regular maintenance
- Minimise times that cold room door remains open and lights on
- Optimise placement of goods in cold room
- Improve insulation of cold room if necessary
- Refrigerated display cabinets etc.: cover with viewing window and with insulating plates after opening hours
- If possible, optimise conditions for cold rooms (away from heat sources) and condenser (low ambient temperature, well ventilated, low dust and pollen load)

Electric motors and drives
- Switch off outside production hours
- Switch motors on and off according to needs (with control)
- Use appropriate control strategy, e.g. variable speed drives
- Ensure regular service and maintenance
- When purchasing new motor: mind the engine efficiency, dimensions, power, transmission losses and possibilities for variable speed control

Hot water
- Heat to max. 60°C
- Ensure regular decalcification of hot water generator
- Consider using recovered waste heat, e.g. from cooling system

Mobility
- Optimise travel routes for deliveries
- Check and adjust tyre pressure regularly
- Implement staff training on fuel-saving driving (up to 10 % savings possible!)
- 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 (For instance, the initial purchase price of an electric motor accounts for less than 10% of its life cycle cost whereas operating costs including energy make up more than 90%!)
- Compare prices and terms offered by different energy suppliers
- Train and motivate employees to save energy

Process heat, e.g. cooking, steaming, boiling, simmering
- Keep water content of cooking vessel as low as possible
- Avoid keeping doors and lids open
- Lower cooking temperature as much as possible
- Optimise processes to avoid unnecessarily maintaining certain temperature levels for too long

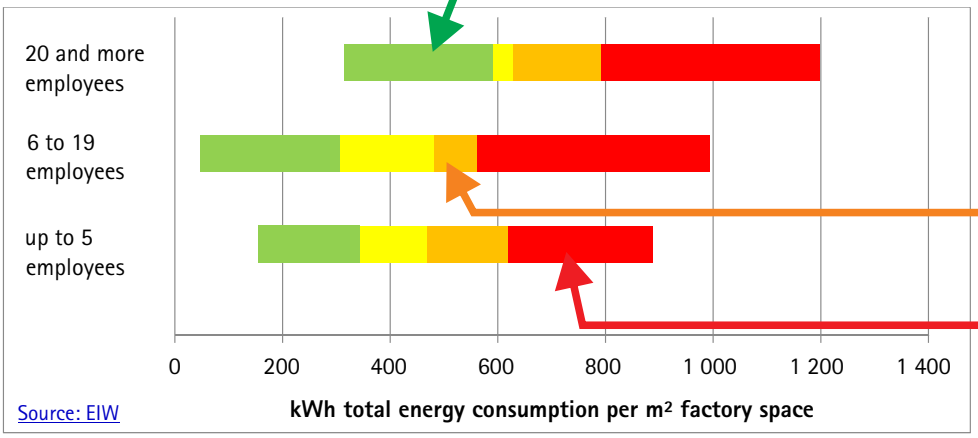
Sectoral benchmarks or indicators allow you to make an initial comparison of the energy consumption of your business with that of other meat processing businesses. Later, you can track the development of your own indicators over time and thus measure the results of your energy efficiency efforts.

How to calculate an indicator is explained below, illustrated by two indicators that are based on a sample of Austrian small and medium sized meat processing businesses. You can find additional indicators here: http://eurem.net/display/eurem/Meat+Processing.

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

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



Source: EIW

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.

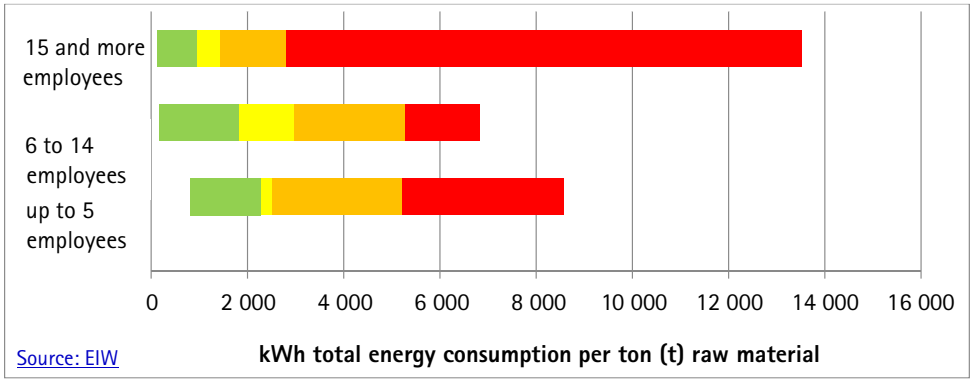
If you are in the YELLOW-ORANGE area, then you probably have savings potentials. Inform yourself and plan efficiency measures.

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

Example: Your total annual energy consumption amounts to 720 MWh, your factory space is 900 m². This results in 800 kWh total annual energy consumption per m² factory space. For a business of 6 to 19 employees, this would mean that the value is rather high compared with similar sized companies in the sample and potentially big savings are available. Keep in mind, however, that factors such as product range, capacity utilisation, or climatic conditions strongly affect these values, and that therefore they can only serve as a first rough comparison value!

TOTAL ENERGY CONSUMPTION PER RAW MATERIAL INPUT

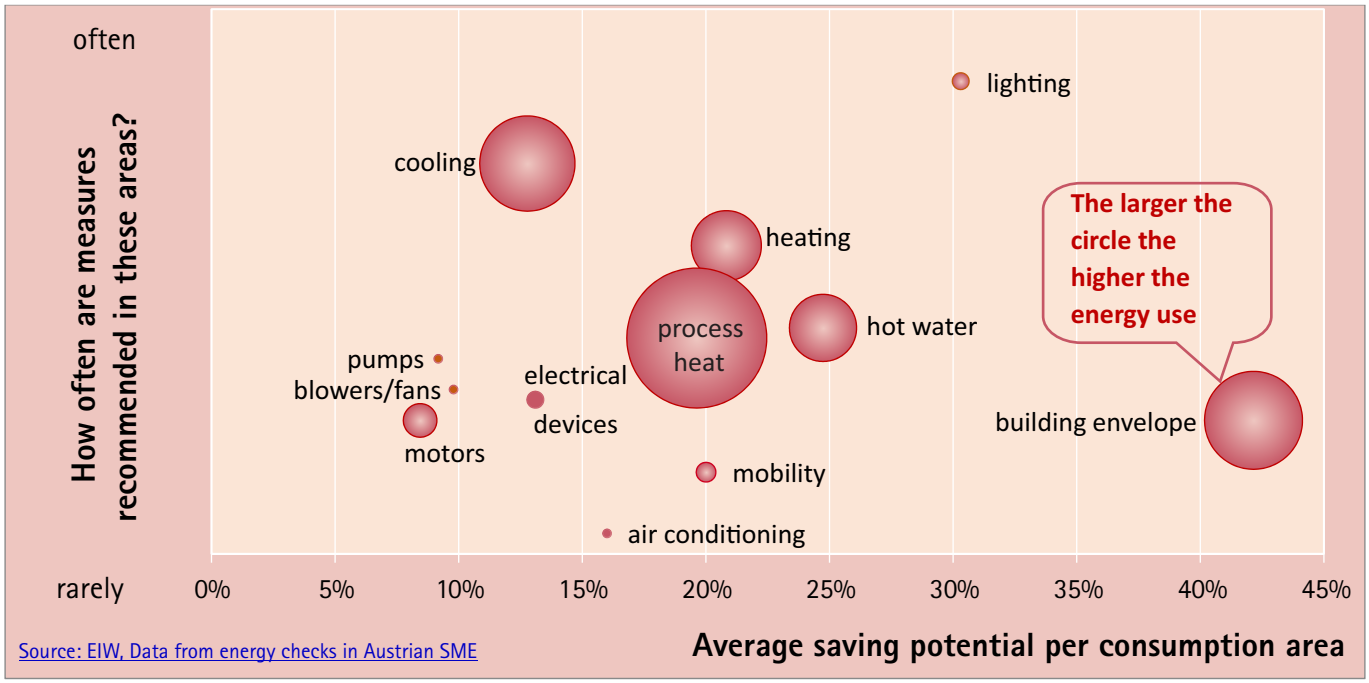
$$\frac{\text{yearly total energy consumption in kWh}}{\text{raw material in t}}$$



Source: EIW

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 30 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 energy-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 successes and provide recognition for them. This helps to ensure that efficient use of energy becomes routine and energy consumption is reduced in the long term.

Additional information

- For additional 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/Meat+Processing.
- 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 Bulgarian, Croatian, Czech, and Polish with country-specific additional information and contacts at the online Sector Corner.

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