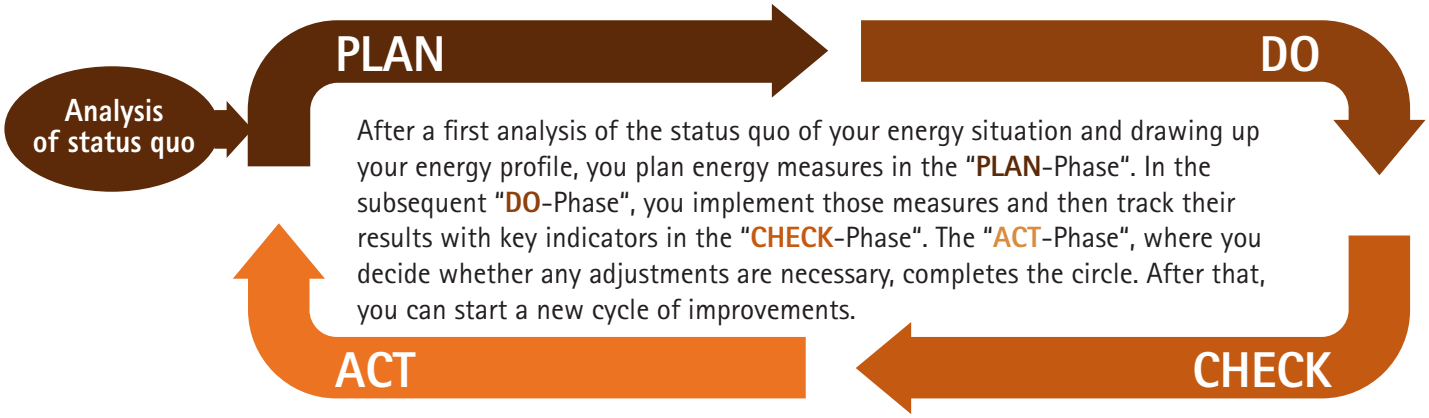
EUREM plus
European EnergyManager

ENERGY EFFICIENCY FACT SHEET
CARPENTERS & FURNITURE MANUFACTURING

This fact sheet gives you an overview of how you can 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 improvements

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 machines or devices
- Estimations (based on equipment list)

STEP 2:
Develop an equipment list and identify your main consumers

Document the type and number of your main devices with the following information per machine:
- Age - Rated power - Operating hour - Actual power

In carpenters' workshops, most energy is commonly used in the following areas. You can focus on these first:
- Heating - Electric motors and drives - Compressed air
- Shavings and dust collection / extraction - Lighting
- Process heat (e.g. paint shops) - Different electronic devices
- Vehicles

STEP 3:
Create your energy profile

With the help of indicators for your sector (see page 3), you can make an initial estimate of whether potentials for improvement exist for 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 efficiency measures

You can find a list of measures that are often relevant for carpenters or furniture manufacturers 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 as well as for investments! Also, compare offers from different energy suppliers!

DO & SAVINGS 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 the temperature level in the heating system or of pressure in the compressed air system, switching off equipment when not in use). They can serve as a basis for further improvements that require investments.

The following energy saving measures address major energy uses in carpenters workshops and furniture manufacturing:

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 control
- Consider using waste heat from compressed air system or paint shop
- Choose heating system type and size according to needs

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)

Compressed air
- Use lowest pressure level possible while still fulfilling your requirements
- Regularly check for leaks and have them repaired
- Ensure the system is shut off outside production hours
- Ensure short and straight piping system with low-loss coupling
- Select compressor size according to business needs

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

Mobility
- Implement employee training on fuel-saving driving (up to 10% savings possible!)
- Check and adjust tyre pressure regularly
- In case new vehicles are purchased: take alternatively powered ones (electric, hybrid, CNG, LPG, biofuels) into consideration

Collection / extraction system for wood chips and dust
- Dimension the system components correctly
- Ensure needs-based control and regulation of the power unit
- Install auxiliary equipment such as a fan inverter to improve energy efficiency

Paint shop
- Use intake and exhaust air systems only during painting process
- Install a switch on the suspension bracket of the spray gun for the activation of the fans to automatically ensure the need-based use of ventilators

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%!
- Train and motivate employees to save energy
- Compare prices and terms offered by different energy suppliers

CHECK: Identify your indicators

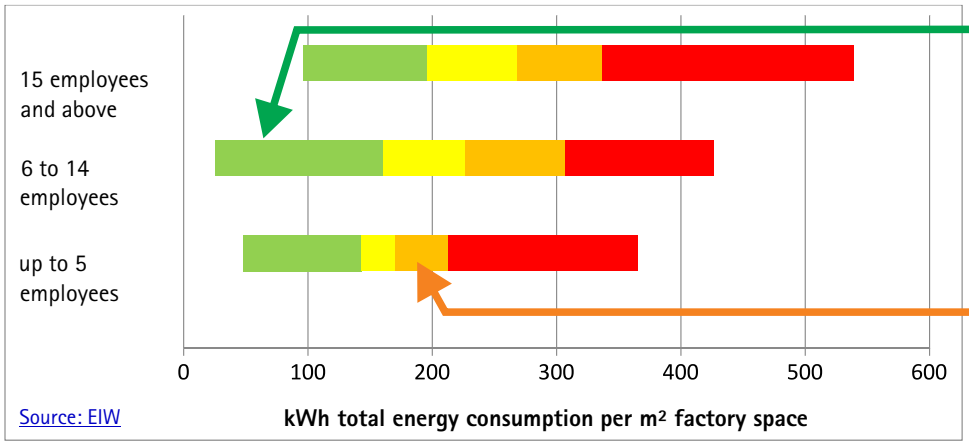
Sectoral benchmarks or indicators allow you to make a first comparison of the energy consumption of your business with that of other carpenters or wood furniture producers. Later, you can track the development of the indicators of your own business over time and thus measure the results of your energy 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 carpenters or furniture manufacturers. You can find additional indicators here: http://eurem.net/display/eurem/Wood+Furniture.

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

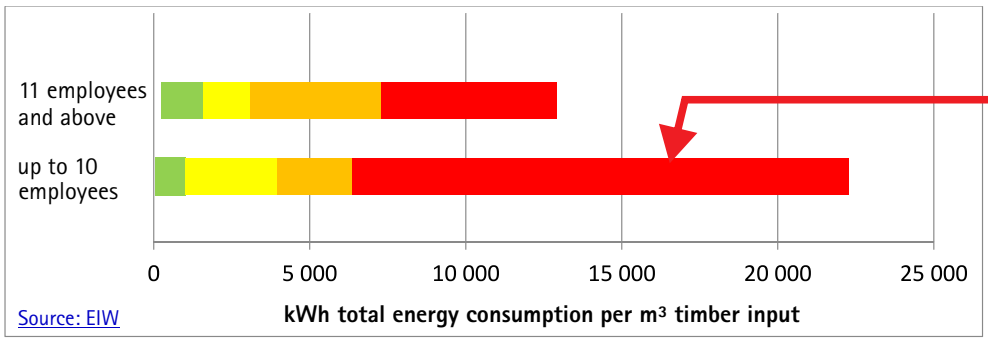
If you are in the GREEN area, then you probably use energy efficiently. You have no immediate need for action, but think about further improvements nevertheless.

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

Example: Your total annual energy consumption amounts to 300 MWh, your factory space is 1000 m². This results in 300 kWh total annual energy consumption per m² factory space. For a business with 6 to 14 employees this would mean that the value is rather high compared with similar sized companies in the sample, and that savings potentials probably exist. Keep in mind, however, that factors such as subsector and product range, climatic conditions, or capacity utilization affect these values and therefore they can only serve as a first rough comparison value!

TOTAL ENERGY CONSUMPTION PER RAW MATERIAL PROCESSED

$$\frac{\text{yearly total energy consumption in kWh}}{\text{sawn timber input in m}^3}$$

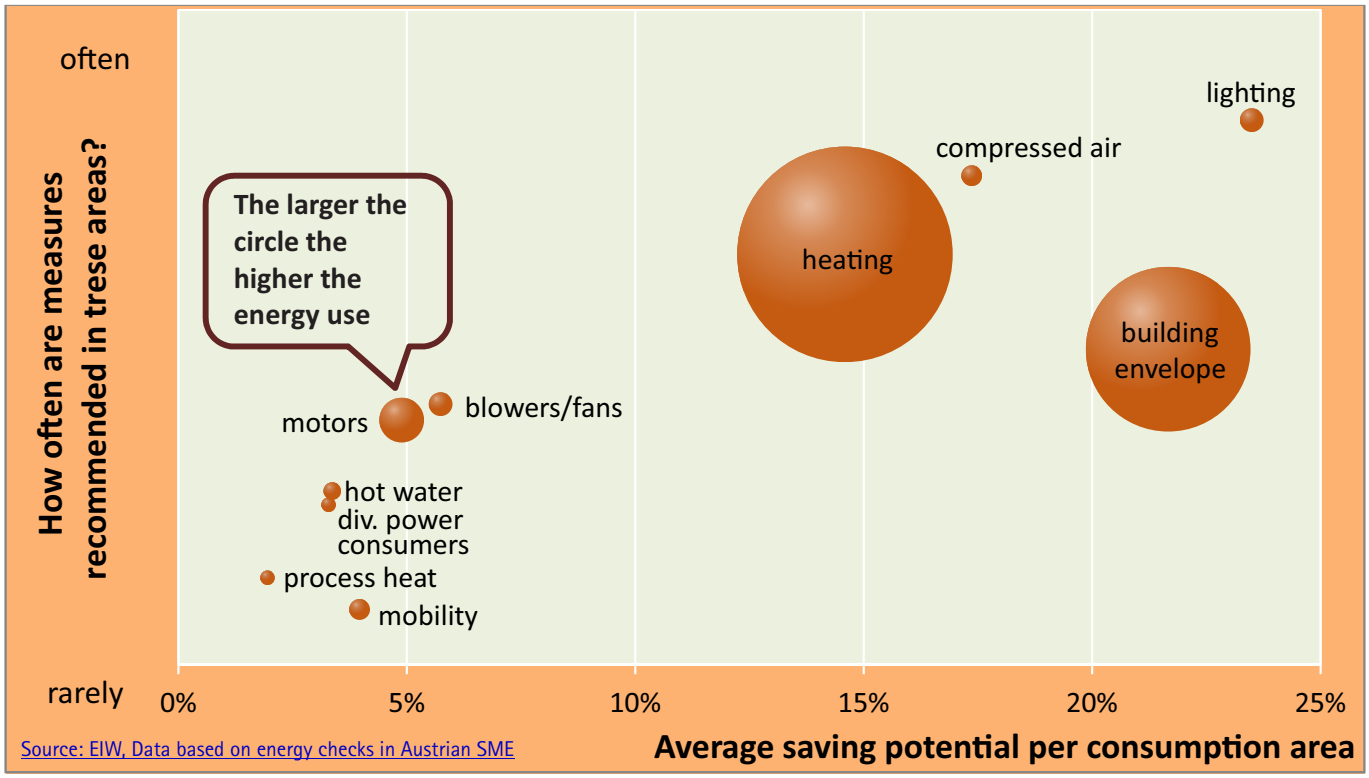


Source: EIW

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 required. 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 23 percent of the energy use 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 and provide recognition for successes. This helps to ensure that efficient use of energy becomes routine and that 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/Wood+Furniture
- 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, Czech, German, Polish, and Romanian with country-specific additional information and contacts on the Sector Corner.

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