

Reduce the flow temperature outside of usage periods

If the flow temperature of your heating system is the same outside of usage hours (at night and weekends) as during the day, heat losses are being increased unnecessarily.

Action

Reduce the flow temperature for the heating system or individual heating circuits outside of usage periods.

Requirement

The building has little insulation, and has a heat generator with power reserves. (For details, see the section on “Determining the potential for reduction” overleaf.)

In old buildings, a night-time temperature reduction can save between 5 and 10 per cent of the energy consumption.

What to do

1. Define the rooms and times

Define the rooms where the temperature should be reduced, and the times when the reduction should occur. This can relate to the entire heating system or only to individual heating groups.

2. Reduce the flow temperature

It is best to optimise the heating at a night-time outside temperature in the region of 0 °C:

- On the heating controller, reduce the flow temperature by a maximum of 2 °C for the defined reduction period.
- Document the changes in the logbook.
- Observe the changes for at least three days. Are the room temperatures maintained when operation finishes and begins (closing and opening times)? Are there condensation problems because the air humidity is too high (see overleaf)?

3. Repeat step 2

Repeat step 2 until you can no longer maintain the temperatures, or until condensation problems



occur. At this point, increase the flow temperature again by the value of the most recent reduction (i.e. reverse the last step).

Costs – effort

Your own labour: 2 to 3 hours

Please note!

- For heating systems in very well insulated new buildings and heat pumps designed for maximum efficiency, it makes little sense to reduce the flow temperature temporarily (see overleaf).
- It is also possible to reduce the temperature of the relevant heating groups in one part of the building only (e.g. in the factory hall).
- During holidays (e.g. over Christmas and New Year), the temperature of the entire heating system should be reduced insofar as possible. To do this, select the “Constant night” setting on the heating controller. Please note: After doing this, expect a longer heat-up phase of one to two days.

Additional explanations

Determining the potential for reduction

Poorly insulated buildings (e.g. old buildings that have not been refurbished) lose large amounts of energy through the building envelope during the night. The greater the difference between indoor and outside temperatures, the greater these energy losses will be. When the room temperature falls, the temperature difference also decreases. It is best to determine the potential for the reduction on a night when the outside temperature is 0 °C.

- Measure the room temperature in the evening (e.g. at 5 pm).
- Check whether all the windows are closed.
- Switch the heating off completely.
- Measure the room temperature next morning (e.g. at 7 am).

If the room temperature has fallen by more than 3 °C during the night, a night reduction is worthwhile.

Take response times into account

On account of the heating system's inertia and long response time, the flow temperature can already be reduced 1 to 3 hours before the end of operation (closing time). However, it must also be increased again 1 to 3 hours before operation begins (opening time). The response times of heat delivery systems with radiators are 1 to 1½ hours – considerably shorter than the response times for underfloor heating, which are 2 to 3 hours.

Do not reduce the temperature below 16 °C

In rooms where the setpoint temperature is 20 °C, do not reduce the room temperature below 16 °C during the night. At lower temperatures, there is an increased risk of damp spots and mould. Observe the windows. Condensation water on the edges is a sign of high air humidity (see the fact sheet on ventilation: 02 Airflows).

Take the type of heating system into account

Fossil-fuel and wood-fired heating systems

Gas and oil-fired boilers as well as pellet and woodchip boilers are highly suitable for night-time temperature reduction. These are high-performance

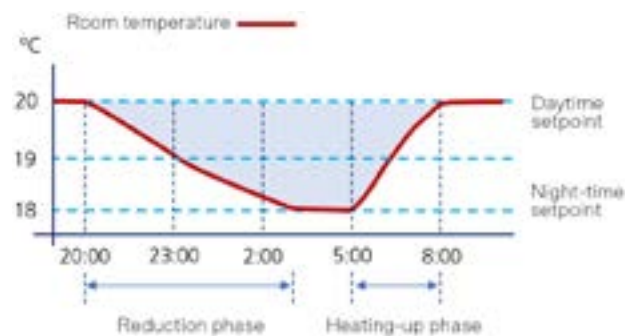
systems that deliver higher flow temperatures in the heat-up phase again without major losses of efficiency.

Heat pumps (with underfloor heating systems)

It is often necessary to examine whether a night reduction makes sense for heat pump heating systems with underfloor heating. If the flow temperature is increased in the morning to reach the room temperature setpoint, the heat pump runs at a less efficient operating point. This can cancel out the energy savings achieved by the reduction, or can even cause additional costs.

The effect of reducing the temperature at night

The effect of night reduction is proven. If the room temperature is lower at night, the heat losses from the building are also reduced. In the illustration below, the heating is turned down at 8 pm after the end of the operating period, and is turned back up at 5 am, so the room temperature has reached the setpoint again when operations resume at 8 am. This saves around 3.5 per cent of the overall energy consumption (area coloured blue).



Additional information

- [Energy manual for caretakers](#)