



Heating with wood

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People have been heating with wood since time immemorial. Yet, in spite of this, it is a fuel that is very much of the future and is even CO₂ neutral - at least, provided that its use goes hand in hand with sustainable reforestation. But, of course, the right technology is a must. Individual stoves can today be integrated into the 'smart' infrastructure of an existing or new heating system - and with clear, perceptible additional value in terms of energy consumption. Alongside this, local availability, security of supply and a cosy flame in the living room are all strong arguments for wood burners and their ilk.

Solid fuel appliances for individual requirements: wood burners, pellet burners or enclosed masonry and tiled stoves?

In view of increasing oil prices, the installation of a modern fireplace or wood burner can contribute to lowering heating costs and, at the same time, help in creating an atmosphere of well-being in the building.

Meanwhile, decisions have to be made between individual units, such as wood burners and pellet burners, or, on the other hand, masonry stoves that have been constructed by artisans on site.

Modern wood burners are production items made of steel or cast iron. They have one or more transparent panes, which enable the flames to be enjoyed. Often encased in sheet steel, natural stone or ceramics, they heat up very quickly and give out a pleasant warmth in a very short time. Wood burners can be installed in every home that has a suitable chimney.

Pellet burners can provide fully-fledged room heating and, at first glance, look like traditional wood burners or tiled stoves. In terms both of the way in which they are built and the technology involved, they are, however, fundamentally different, as the pellet burning stove is fuelled by small 'wooden sticks' that are made from compressed wood shavings and sawdust. The fuel is fed in automatically: the pellets are delivered to the combustion chamber from a storage tank, which is usually integrated into the stove, via screw conveyor and then lit electronically. A thermostat can control the amount of fuel and the inlet air, in order to achieve and maintain the desired room temperature.

Tiled stoves are constructed by the stove builder on site and each one is thus adapted to the individual home environment. The tiles are, however, not merely a decorative feature; because they create a ceramic jacket around the stove, they increase its capacity to store heat. This kind of stove falls into two distinct types: the floor-fired stove and the warm-air tiled stove. And there are also

solutions that involve a combination of the two. The floor-fired stove is built of solid masonry, using sometimes more than a tonne of ceramic material that stores heat well. The logs are burned directly on the floor of the combustion chamber. Because of its high thermal mass, the stove can retain heat for up to 24 hours.

The warm-air tiled stove is the modern version, as it heats up more quickly and delivers heat after only a short time. Inside there is an industrially produced firebox made of steel or cast iron. Combined with metal secondary heating surfaces, this provides rapid heating, or, with a ceramic heat store, it creates long-lasting heat.

A masonry fireplace, like a hot-air tiled stove, has a modern firebox with a transparent front pane, so that the focus is on being able to enjoy the fire. As well as various versions with just the one pane of heat-resistant glass, there are now see-through versions, which can function as a room divider. The firebox ensures that combustion is complete and, therefore, suitably good for the environment. It also ensures low emissions and minimal heat loss. At the same time, like the warm-air tiled stove, it can also be combined with supplementary heating surfaces.

Energy revolution in the home: heat pumps and wood fires

With a combination of heat-pump or solar-thermal installation and a modern fireplace, both space heating and hot water systems will be fuelled continuously by renewable and CO2 neutral energies.

In Germany, there are some 50 manufacturers offering over 1,000 different appliances and versions. Whilst wood burners and pellet stoves are free-standing individual units and can be quickly installed or removed, built-in fireboxes and tiled masonry stoves are, of necessity, individually designed units that are constructed and installed by hand by the stove builder. All solid fuel appliances can be operated in parallel to a heat pump or a solar-thermal installation and even combined into a single all-embracing system.

An air-source heat pump, which harvests the available heat from the surrounding outside air and transforms it into heating energy, is now installed in one in three new builds in Germany. The reason is simple: for every kilowatt of electricity, they produce, on average throughout the year, four times as much heating energy. The efficiency of these units, however, is dependent on the temperature of the environment and the heating levels required. At times of sharp frost – when the demand for heat is greatest – air-source heat pumps are no longer able to work efficiently. In such cases, an electric heating element switches on and provides heat for both the domestic hot water and the heating system, albeit that this leads to high electricity bills. If the external temperatures are low, then it makes particular ecological and economic sense to supplement the heating system with a wood-fired insert in the fireplace, a wood burner or pellet stove.

An efficient combination: solar thermal and solid-fuel wet systems

At our latitude, solar-thermal energy can cover all our requirements for hot water from May to September. In other months, we need to have recourse to supplementary heating systems. And this is precisely the time when individual wood burners are providing cosy warmth in living rooms and contributing to lower heating costs. Those willing to go one step further can opt for a wet system with their solid-fuel appliance and install a heat exchanger. As soon as the fireplace has heated up, the water that has been warmed by the flames is piped into the heating network and delivered to the hot water storage tank. If, for example, people let the fire go out at night, then a buffer storage tank takes over to provide the heat. The buffer storage consists of a tank filled with water that stores any excess, unrequired energy, in order to release it to the heating and domestic hot water systems later on.

Promoting wet systems based on pellet stoves, heat pumps and solar installations

Because, unlike the burning of other fossil fuels, heating with regenerative energies does not contribute to global warming, an ecological heating system has an important role to play in protecting the climate and therefore currently attracts state subsidy in Germany, for use in the modernisation of existing buildings.

ISH 2019 will be presenting the latest trends and developments in the sector in Halls 9.2 and 11.1. The Stove Forum in Hall 9.2. offers supplementary lectures on current major issues and trends, as well as on energy and climate policy.

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