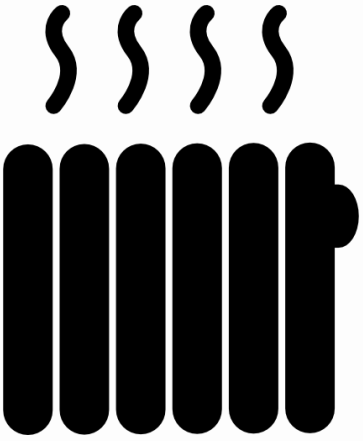
HEATING TODAY VS. HUNDRED YEARS AGO



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How was the fire created and discovered?

Fire and fires have existed almost since the beginning of the earth. Lightning and volcanic activity can cause forest fires at any time. Therefore, our forefathers must have known fire as a destroying force of nature. But it was only much later that they began to control fire and use it for their own purposes. Which people they were - for that we must go back to the Stone Age.

When exactly our forefathers began to use fire is a matter of debate between scientists. Probably Homo Erectus (Latin: "the erect human") started using it, which was added as another prehistoric species 1.8 million years ago. However, researchers today believe that humans were not yet able to light fires themselves at that time. Matches and lighters did not yet exist. Our forefathers did, however, keep a naturally occurring fire alive as a campfire.

Stone Age - that already changed a lot

Stone Age people were now able to cook their food, they could strengthen vessels made of clay by firing them. Above all, heating the food made a big difference for people: some roots only became edible through cooking, many things became more digestible and easier to stomach. This meant that the stomach and intestines had less work to do, and people could absorb more energy through their food. The brain benefited from this - it grew larger and larger over the course of the following thousands of years.

And then, 32,000 years ago, it was invented: the first lighter. People discovered that a spark was created when they struck two certain stones against each other. One contained the mineral pyrite (also called sulphur gravel) and the second was a flint. The spark could be used to make brushwood or tinder sponge glow. "It burns like tinder", we still say today - referring to a mushroom called tinder sponge, which grows on tree trunks and is particularly good for making fires. It is, so to speak, the first barbeque lighter

flint

sulphur gravel

On the way to modern heating

The first hot water heating with gas was developed in 1716 by the Swede Marten Trivald and used for a greenhouse. It took almost another 150 years until the first wealthy citizens had such hot water heaters installed in their villas and castles. For everyone, hot water heating then became very popular around 1900.
At that time, the type of heating differed greatly from region to region. In densely wooded regions, heating was mostly wood-fired, whereas in the Ruhr region, coal was increasingly used as a fuel.

The great breakthrough and the birth of central heating was basically the end of the Second World War. During this time, people in the western industrialized nations increasingly switched from solid fuels such as wood or coal to oil and gas. It was now possible to heat individually. Previously, heating had tended to be uniform over a fixed period of time.

In the 50s and 60s of the 20th century, energy was sold very cheaply. Oil and gas were to be had in comparison to today for smallest money. Only the first oil crisis in 1979 raised the awareness of energy-efficient technology. If you look at heating technologies from the years before, you will see that they were anything but economical and efficient with resources. The nuclear reactor catastrophe of Chernobyl also sensitized people to the fact that generous and wasteful heating with electricity is also not a lasting solution.

Since the 1980s, oil and gas heating systems with condensing boiler technology have become increasingly popular. For a long time, however, not only fossil fuels have been used. Wood pellets and also logs are also frequently used in modern boilers.

Our personal heating system

At my home (Dilara) we are heating with Minergie. Minergie buildings are equipped with controlled air exchange, which ensures a uniform and draft-free air exchange. In addition to fresh air, optimal air quality also means that excess moisture, odors, pollutants and CO2 are removed.

In Minergie houses, the windows must be consistently shaded during the day. In addition, heat can be dissipated at night or in the early morning hours by window ventilation, preferably cross-ventilation.

The heating demand would be about this much for our apartment:

5 kW heating capacity x 2000 h/a = 10,000 kWh, a heating demand
125 m2 living space = 80 kWh/ m2a

Oil heating – In my Apartment (Soumaya), we use oil heating.

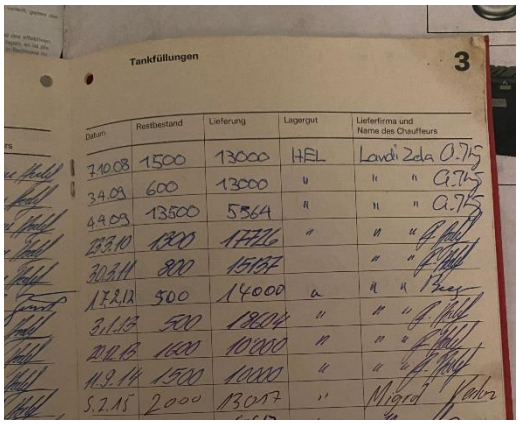
The way an oil heating system works is (comparatively) simple:

1. The heating oil is pumped from the oil tank to the oil burner in the boiler and preheated there, because heating oil only burns at 55 degrees Celsius.

2. A nozzle sprays it into the combustion chamber, where it is ignited.

3. The resulting heat heats the heating water, which a circulation pump pumps into the radiators of the house or into the buffer storage tank.

Here, the heating oil in this pipe is felt up - this happens once every half year. This is written down in this book



All the heating oil is processed here in this room

Calculation example

Heating 100 liters of water from 10 °C to 60 °C requires an amount of energy of 5.82 kWh. To calculate this, you need the mass (100 liters = 100 kilograms) and the temperature difference (50 Kelvin) as well as the specific heat capacity of water. In the following calculation, this corresponds to the letter c or the value 4.187.

$Q = m \times c \times dt = 100 \times 4.187 \times 50 / 3600 = 5.82$ kWh

Formula for calculating the energy demand for water heating

For heating oil, the calorific value is about 9.8 kWh per liter or about 11.4 kWh per kilogram.

Since energy is expressed in kilowatt hours (kWh), we end up dividing by 3600 (seconds). To convert an amount of energy from kWh to liters of heating oil, we divide the number by the 10 kWh of energy contained in one liter of heating oil.

Solution: To heat 100 liters of water from 10 °C to 60 °C, 0.58 liters of heating oil are needed - almost 6 deciliters.

Sources

(1) Geschichte der Heizung (was-war-wann.de)
(2) Gesellschaft & Religion (srf.ch)
(3) Die Wärmepumpe (heliotherm.com)
(4) Vom Lagerfeuer zur Zentralheizung (fischerfutureheat.de)
(5) History of heating timeline (qssupplies.co.uk)

Sources

Dilara and Soumaya