

# Germany

## Power-to-heat in oil-fired hybrid heating systems: Effectively combining the power and heating markets

### Why?

The German government targets to increase the share of electricity produced from renewable energies to 80% by 2050. In 2017, 38% of German electricity was already derived from renewable sources. However, wind turbines and photovoltaic systems deliver fluctuating amounts of electricity, depending on the weather. Due to a lack of line capacities and energy storage units, wind turbines or photovoltaic systems must be curbed or switched off. Due to the fact that in the near future the grid will not be expanded according to production capacities of renewable energies, and the fact that storage units are expensive and therefore not economical, it makes sense to combine the power and heating markets and utilize the excess energy in power-to-heat systems – with positive effects in using renewables in a fully automated manner and without any inconveniences for the user.

### Outcome

- Power-to-heat technology has proven successful in field tests.
- All components are commercially available.
- Easy and economical when it is done as part of a heating system modernization project.
- To make the use of surplus energy attractive, adjustments of tariffs are needed.
- The digitalization of equipment technology will facilitate the use of power-to-heat in the future.

### What?

As part of the „Power-to-heat in oil-based hybrid heating systems“ project, the German Institute for Heat and Oil Technology (IWO) is researching the use of excess electricity from renewable energies to provide residential buildings with heat.

For the practical test run, three buildings have so far been equipped with oil-fired condensing boiler technology, an electrical heater system and a communication box connected to the power market. Electricity was always used for heating in the test run when it was enabled and remunerated through the balancing energy market. If there is no excess energy available in the grid, the oil burners take over and provide reliable heat.

Homeowners benefit twofold from this option: They receive income on the market for balancing energy and save heating oil when the electric heater provides heat. The extent to which the existing potential can be used primarily depends on the structure of the electricity market in the future.

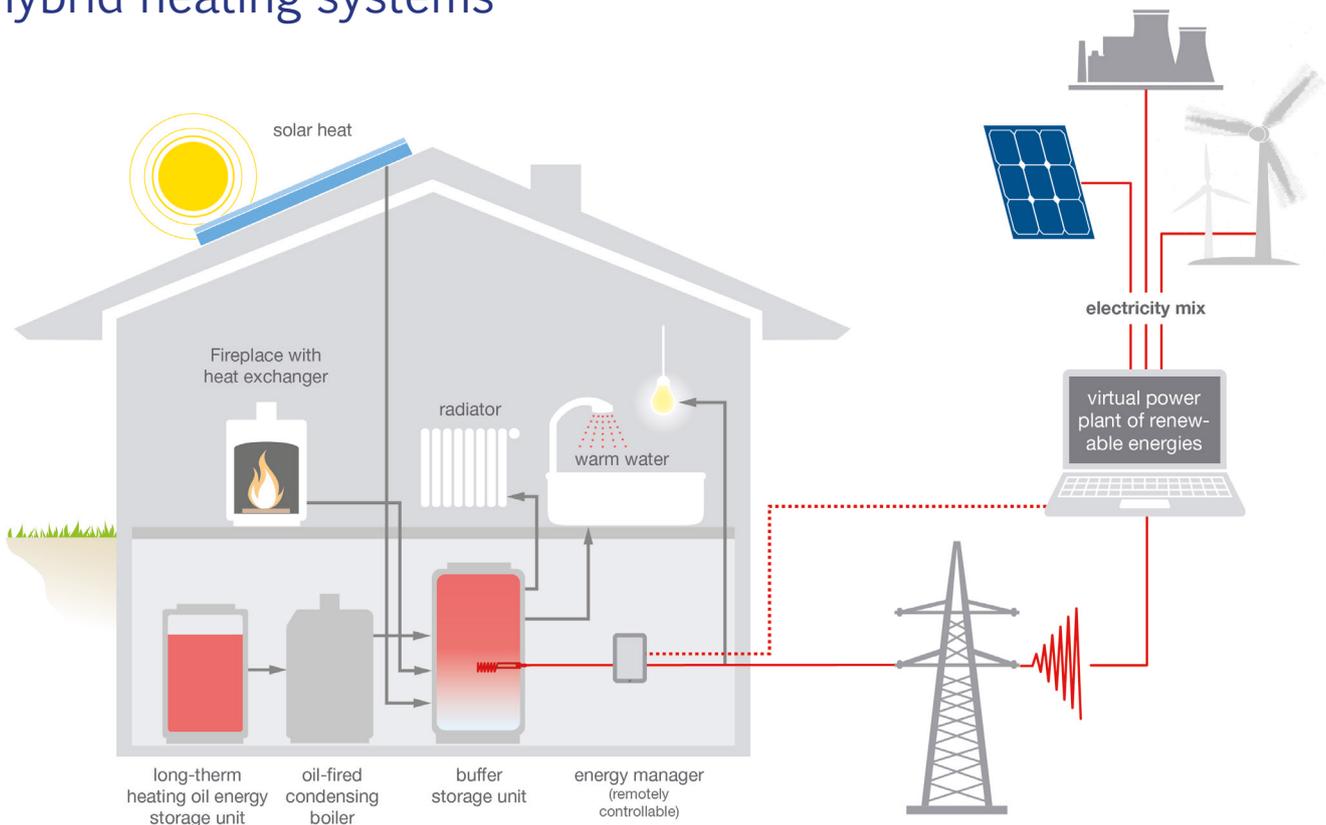
The tests generally prove that: Power-to-heat can be implemented in private households with commercially available components. In addition, their functionality and efficiency were confirmed.

### Contact

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## Connecting the power and heat markets in oil-based hybrid heating systems



## Market opportunities für Power to Heat – today and in future

