

## Technology: Hybrid heat pump

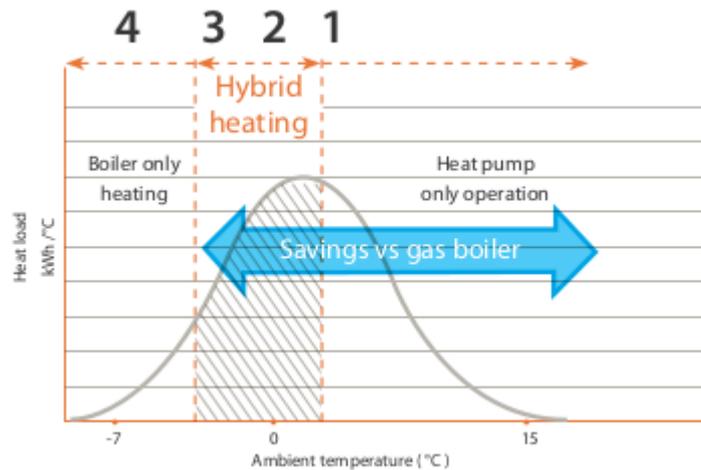
### What?

*Hybrid heat pumps* are in principle a combination of a boiler and a heat pump. They are controlled by smart hybrid logic, automatically selecting the most cost-effective heating mode at any time. It therefore takes into account external temperatures and internal heat and hot water demand and even the relative cost of gas and electricity. The smart logic selects one of four available operating modes to ensure the most economical performance [1]:

1. Heat pump only: ideal in mild temperatures. Heat pump capacity and efficiency is high enough to satisfy total demand;
2. First hybrid mode: operational when outdoor temperature drops. Heat pump efficiency falls but continues to operate. Boiler provides additional heat required;
3. Second hybrid mode: comes into use when the outdoor temperature drops further and the heat pump efficiency reduces. The unique flow control automatically regulates the variable speed pump to slow the flow rate. This raises the heat pump efficiency for as long as possible before switching totally to boiler mode;
4. Boiler only: When the outdoor temperature is very low, the system temperature requirement is highest. In these conditions, the pump is less economical, so only the boiler operates.



Heat pump water heaters from Bosch (left) and Remeha (right)



### Why?

The hybrid heat pump always selects the most efficient working mode, and when the system is working as a heat pump, it is more efficient compared to a classical gas fired boiler. The system can also be used as an air-conditioner in summer, by reversing the direction of the refrigerant flow.

### Cost

They are relatively expensive as they contain both a heat pump as well as a boiler. Cost can vary between 4300€ and 9600€ per unit, depending on type, power, ....

### Where?

Hybrid hot water heaters can perfectly replace gas and oil fired boilers as well as electrical boilers for all domestic hot water purposes.

### Manufacturers:

- Bosch (Compress 3000)
- Daikin (Altherma)
- Remeha (Calora Tower Gas, Tzerra, Hera)

### Want to learn more?

[1] <http://www.daikin.co.uk/minisite/hybridheatpump/hybridtechnology/index.jsp>