

HEAT RECOVERY - USE WASTED ENERGY



How does heat recovery work in industrial companies?

The most important benefits of heat recovery

High energy efficiency

Reducing energy costs and using wasted heat

Long-term financial savings and CO₂ emission reduction

Heat recovery technologies allow for the beneficial use of wasted heat. Particularly in industrial companies where drying, baking, casting takes place or where furnaces, compressors or boilers are used, recovery has the potential to bring huge savings. The recovered heat can be reused in the process or used to heat other media - air or water.

Heat recovery technologies

Heat exchangers

Heat exchangers are one of the most popular heat recovery methods in industry. They operate by transferring heat from one medium (e.g. exhaust gases, cooling water) to another medium (e.g. utility water, air) in order to use this heat for other processes. The type of heat exchanger is selected depending on the media and the required operating parameters.

- **shell-and-tube heat exchangers** work well where a large heat exchange surface is necessary, for example with high-temperature exhaust gases. In this type of device, heat is transferred through pipes through which a medium, such as air or water, flows;
- **plate heat exchangers**, on the other hand, are used in installations with limited space, where a compact solution is important. Their design is based on a system of arranged plates that ensure effective heat transfer between media.

Heat pumps

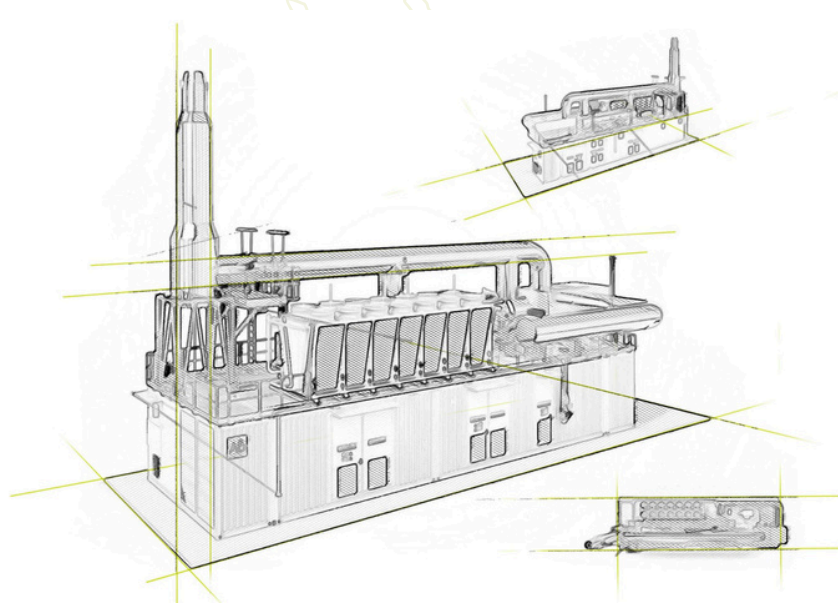
Heat pumps are devices that allow the transfer of heat energy from a lower temperature medium, such as waste heat from industrial processes, to a higher temperature medium, such as a heating system. Using a small amount of electrical energy, a heat pump can efficiently extract a large amount of heat even from low-temperature waste sources.

Heat regeneration from exhaust gases

Heat recovery from exhaust gases involves using the energy contained in exhaust gases that are produced during industrial processes, such as furnaces, boilers or gas turbines. This heat can be recovered using installations such as heat regeneration systems, which capture some of the energy from exhaust gases. This allows for reducing fuel consumption and improving the energy efficiency of the entire process.

Cogeneration

Cogeneration is a process of simultaneous production of electricity and heat, used in industrial plants that need both forms of energy. Waste heat generated during the production of electricity, e.g. in a combustion engine, can be reused in various processes, such as heating buildings, producing steam or heating water, which increases energy efficiency and reduces energy losses.



Example of heat recovery application

Annual thermal energy savings amount to over 7,600 MWh, which is equivalent to the annual energy consumption of over 4,200 Polish households.

Heat recovery in the automotive industry

In an automotive company producing components for passenger cars, we conducted an energy audit, during which we **identified 19 actions that could cost-effectively improve the plant's energy efficiency**. One of the solutions analyzed was the use of waste heat from the cooling process of cast iron components after casting, which require lowering the temperature to ambient levels.

Previously, castings were cooled automatically. To assess the potential of wasted heat, **our engineers conducted a test that showed that 1 rack of castings is able to boil 1 m³ of water in 40 minutes!** Using this heat to power the absorption cooling unit, the production of chilled water used in the technological process is more efficient and uses less electricity.

Annually the customer saves

7 600 MWh

Annually the plant will reduce emissions by

2 300 tons of CO₂



THIS AND OTHER EXAMPLES OF HEAT RECOVERY CAN BE FOUND ON OUR WEBSITE IN THE PROJECTS TAB.



Where will this work?

Waste heat is generated in many industries where technological processes generate high temperatures.

- **chemical industry** - using heat to heat a semi-finished product or heat being a side effect of chemical processes;
- **metallurgical industry** - where furnaces and the product manufactured in them reach very high temperatures;
- **food industry** - cooking, drying, pasteurization, baking bread;
- **paper industry** - paper production, in particular the drying and pre-treatment stages;
- **cement industry** - clinker production involves very high temperatures, and waste heat can be recovered for further use.
- **glass and ceramic industry** - glass melting and ceramic firing processes;
- **textile industry** - dyeing, drying and finishing of fabrics;
- **pharmaceutical industry** - synthesis and processing of active substances.

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industrial projects

We help medium and large industrial companies become part of a zero-emission future. We want to co-create factories that we could have right outside our doors. We advise, design, implement and finance energy efficiency activities. This is decarbonization that pays off.

EUR 1.3 bn

value of completed projects

9.8 TWh

total reduction in energy consumption

EUR 512 mln

annual savings of our customers

Decarbonization that pays off