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EXPERT KNOWLEDGE

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Industrial Heat Pumps

What does industrial heat pump actually mean? What expectations does it create for the actual business? What are the drivers and what are the barriers? Researchers, technicians, product developers, decision-makers and consulting engineers, component manufacturers and suppliers, designers and architects, refrigerant plant and heat pumps operators need to be able to understand the possibilities and challenges of IHPs in the industrial processes.

Securing a reliable, economic and sustainable energy supply as well as environmental and climate protection are important global challenges of the 21st century. Increasing the production and use of renewable energy and improving energy efficiency are the most important steps in order to achieve these goals of energy policy.

While the residential heat pump market may be satisfied with standardised products and installations, most industrial heat pump (IHP) applications need to be adapted to unique conditions. In addition a high level of expertise is crucial. The main goal is to overcome still existing difficulties and barriers for the larger scale market in industrial applications. IHPs are active heat-recovery devices that increase the temperature of waste heat in an industrial process to a higher temperature to be used in the same process or another adjacent process or heat demand.

The IEA Implementing Agreement on Heat Pumping Technologies has contributed with four Annexes* since the 80s of the last century in the field research and introduction of heat pumps for industrial applications:

Annex 09: High Temperature Industrial Heat Pumps (before 1990)

Annex 21: Global Environmental Benefits of Industrial Heat Pumps (1992-96)

Annex 35: Application of Industrial Heat Pumps (2010-2014). [Link](#)

Annex 48: Industrial Heat Pumps Second Phase (2016-19). [Link](#)

*Annex will be called the work which covers a lot of collaborative research, development, demonstration and deployment projects. See also [Link](#)

Whereas the first two Annexes contribute in a broad variety on research and development activities to the technology of IHPs, the last two Annexes focus more on the practical application and integration of IHPs in many different industries around the globe.

The aim is to understand the worldwide activities of industrial heat pumps which have to contribute actively to the reduction of energy consumption and greenhouse gas (GHG) emissions through the increased utilization in industry.

You will find an interesting lecture about the decarbonisation of industrial and commercial sectors in India using heat pumps on the European Heat Pump Summit 2019. [Link](#)

The goal of the last Annex 48 is to concentrate on the development and distribution of condensed and clear information materials for policy makers, associations, and industries.

Waste heat as heat source

Industrial heat pumps offer various opportunities to all types of manufacturing processes and operations. They use waste process heat as the heat source, delivering heat at higher temperatures for use in industrial processes, heating or preheating, and industrial space heating and cooling. IHPs can significantly reduce fossil fuel consumption and GHG emissions in a variety of applications, such as drying, washing, evaporation, and distillation processes. Industries that can benefit from this technology extend over a wide field such as food and beverage processing, forest products, textiles, machinery, and chemicals. On the last Chillventa CONGRESS you

will find the lectures about these applications from [Austria](#), [Japan](#), [Switzerland](#), [United Kingdom](#), and [Denmark](#).

The latest outcomes of the work are the results from the members of these countries: More than three hundred good practices have been collected from all samples. Japan, as example, has selected as the best practice:

Simultaneous heating & cooling system in food production line
Simultaneous heating & cooling in cutting and cleaning process
Introduction of hot gas heat pump in dry laminating process of package film.

You will find on the Foyer-Expo of the European Heat Pump Summit 2019 an overview of these outcomes of the Annex work on the IZW e.V. information booth.

The European Heat Pump Summit will cover also a lot of new examples for the successful use of Heat Pumps in industrial processes:

High temperature heat pumps for industrial processes [Link](#)

Very High Temperature Heat Pump (120°C) Installed at Ghent, Belgium, Heating District Network [Link](#)

Flexible operation of heat pumps in district heating systems to unlock synergies between the heating and power sector [Link](#)

Energetic optimization possibilities of industrial drying processes [Link](#)

Three concepts for high efficient, high economic ammonia heat pumps for industrial applications up to 95°C [Link](#)

Further results are:

One of the main barriers for application of IHPs is the very different situation concerning the energy prices in the countries. Especially the ratio of electricity/gas price is important. Sweden, Finland, Netherlands, and France have favourable price ratios; Germany, Ireland, and UK have inconvenient price ratios.

The “drying process” is one of the very prominent applications for IHPs: The quality of the process could be improved and also energy cost and the GHG emission could be reduced.

Industrial heat pumps are today successfully integrated in a wide field of industries. The results of the HPT TCP Annex 48 are the basic for a database

which can provide decision makers with information and knowledge about the installation of IHP technologies.

Learn more about the issues on the European Heat Pump Summit 2019. All in all, the European Heat Pump Summit provides an international platform for professional dialogue and discussion, where industry networks can be built up and cultivated. [Secure your ticket now!](#)

For more information please visit: <https://hp-summit.de/en>

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