Institute for Sustainable Process Technology

Cost reduction industrial heat pumps (CRUISE)

Summary

Energy use in the industrial sector is dominated by the use of heat from fossil fuels. A low carbon economy requires transition to more sustainable sources. This can be achieved by recycling of waste heat, using heat pumps to upgrade the temperature level. Presently, the CaPex of heat pumps is too high to fit into companies reasonable pay back times of less than 5 years. The broad implementation of heat pumps in the Dutch industrial sector can annually save a staggering 87PJ of energy.

The objective of this project is to develop 50% less expensive heat pump technology that generates heat in an economically feasible way for industrial applications, using waste heat and (renewable) electricity. This technology can be applied cross sectoral and offers large energy savings. The cost target range is between 150-200 €/kWth.

The overall work program consists of 6 work packages with the whole business chain involved. The project starts with identifying the specific needs of the industrial end-users and the specific requirements of heat pump integration, by close cooperation between industrial end-users and technology providers. Options for cost reduction are identified by the technology providers and ECN and assessed in a separate work package. Two heat pump concepts (compression, thermoacoustic) will be manufactured and tested that meet the cost objective of this project. Testing of both concepts will be carried out by ECN A separate work package is devoted to defining the market potential, including dissemination, carried out by ISPT and FME. Finally, overall project coordination and program management is carried out as a separate work package.

The results of the project will be two heat pump concepts that will make industry more competitive and energy efficient with a wide support from the different sectors. At the same time, technology suppliers develop these new products for a (worldwide) market, which enables them to be more competitive and extend their product portfolio. Based on the information that is obtained early in the CRUISE project, the program will be further developed for a full-scale compression heat pump, meeting the cost targets. This ensures that momentum is maintained. The CRUISE project covers TRL7 for the compression heat pump and TRL5-6 for the TA system.

Partners

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