

NL-COMPH3EAT

Publieke samenvatting / Public summary

Aanleiding

To reach the Netherlands decarbonisation targets of 2030 (49% reduction CO₂, relative to 1990), new technologies for industrial process heating are needed which reduce the current dependency on fossil fuels. Heat pumps are a technology which can

- Transition the industry to a sustainable energy source in the form of renewable electricity
 - Uptake waste heat, making the supply of heat more circular
 - Lower final energy consumption and CO₂ emissions
- Heat pumps are now widely being proposed for supplying heat in industry to 200°C. Despite this, heat pumps are currently widely commercially available only up to temperatures of 90°C. To support the decarbonisation of the Dutch industry, developments are needed to establish heat pump technology at temperatures >90°C. The compressor is the core component of heat pump equipment and is the primary aspect limiting temperatures >90°C. Specifically, challenges need to be overcome relating to material capabilities, interaction with hydrocarbon working fluids and lubrication system design.

Doelstelling

The overarching goal within the NL-COMPH3EAT project is: To establish GEA as a Dutch player on the world market in 2025 for the supply of safe, reliable and easy to integrate steam producing heat pumps for delivery temperatures between 120°C and 150°C using own piston compressor technology and hydrocarbons as a working medium.

Korte omschrijving

Within this project, the consortium works towards

Projectinformatie / Project information

Projectnummer / Project number

TIND23-03473551

Subsidiebedrag / Grant amount

€ 499.712,00

Algemene informatie / General information

Penvoerder / Secretariat

GEA Refrigeration Netherlands N.V.

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establishing new industrial heat pump technology in the Dutch and European markets. Firstly, a study will be conducted on the existing piston compressor of GEA to establish the required modifications that are needed for high temperature applications. Based on this study, a prototype compressor is developed which is then integrated into a steam producing heat pump skid. The heat pump is delivered to TNO, where it is connected to a specially designed test rig. The prototype heat pump will be tested under representative industrial conditions and its performance characterised. This is done firstly using butane ($T=130^{\circ}\text{C}$) as a working medium and secondly using pentane ($T=150^{\circ}\text{C}$). Based on the learnings from the characterisation of the heat pump, two parallel activities are taken towards commercialisation of the developed technology. The consortium will assess the integration opportunities at the end-user location of MARS and subsequently define a pilot project to be targeted at the conclusion of the project.

Resultaat

The successful completion of the project will establish a Dutch manufacturer of compressor technology for the industrial heat pump market up to 150°C . This manufacturer is also uniquely placed as it is further able to develop turn key heat pump skids (up to 10 MW) for industrial end-users. The compressors and heat pumps have large application potential in Dutch and European industry (export potential). The project therefore leads to strengthening of the Dutch manufacturing sector, stimulating economic growth and job creation. The information and knowledge on the performance characteristics of the heat pump technology are made accessible to a broad range of end-users, leading to increased end-user confidence in the technology. The expected uptake of heat pumps by industry will lead to significant energy and CO₂ reductions, increasing the sustainability and competitiveness of the Dutch industry.

De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.

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