

The Heat is On

Publieke samenvatting / Public summary

Aanleiding

For industries like agrofood, paper industry and specialty chemicals, some 40-80% of the CO₂ emissions is related to the energy that is needed for heat driven processes like separation and drying. Heat is now mainly generated from fossil fuels and cascades through processes from high to low temperature. Heat integration is a balancing act between heat generation and use/reuse. As a result, a small change to achieve more energy efficiency in one part of the process, can have substantial effects. A recently finished 6-25 study shows that this industry can save at least 0,9 Mtons of CO₂ emissions over the next 5 years by applying commercially available energy-saving techniques.

Doelstelling

To achieve Climate Agreement goals a much higher CO₂ reduction is required. For this, the heat system must be converted to a system with maximum application of circular heat, upgrading instead of emitting to the environment, and primary generation must come from 100% sustainable sources. For the vision year 2030, the innovations are aimed at accelerating the applicability of heat pump technologies through a case-based approach for integration into the existing industry. This requires parallel efforts to be made to increase process efficiency in unit operations, through efficient separation and drying processes that decrease the amount of water to be evaporated and increase the heat upgrading potential and smart process optimisation and control through digital twins. THIO applies a case driven system approach integrating these three innovations to achieve a

Projectinformatie / Project information

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MOOI42009

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Algemene informatie / General information

Penvoerder / Secretariat

Stichting Ispt

Publicaties en materialen / Publications and attachments

- 23.11.2022

Voortgangsrapportage 1

MOOI42009

- 31.01.2024

Voortgangsrapportage 2

MOOI42009

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significant savings in the amount of heat needed. THIO does not intend to develop (completely) new processes, but instead explores, selects, adapts, improves and integrates the possible technological solutions to the industrial cases.

Korte omschrijving

To obtain an optimal integral approach, the project innovations are organized from two perspectives: - Increasing the technological readiness levels: Technology development teams will develop required individual dewatering and drying technologies, methods and concepts needed. - Increasing the innovation readiness levels: Case development teams focus on the realization of the impact at the industry partners, by integration of the technological solutions in the total heat reduction plan, ensuring appropriate business models and energy infrastructure, trained personnel, process control, etc. This integrated system is supported and accelerated by a third perspective: - Increasing the operational readiness levels: An Exploitation and impact team aims to accelerate the uptake and implementation of insights from the project by professionals and students by an online learning environment and organisation of Learning Communities.

Resultaat

- Efficient dewatering and drying using high solids technologies that result in 10% less water to be evaporated/dried and subsequent energy reduction
- Combined heat integration + drying innovations concepts that result in 50% less fossil fuel consumption for drying
- Smart manufacturing solutions that result in 10% energy savings due to improved process control
- Case agrofood: Innovative process design for dewatering, drying and heat integration yielding 50% energy reduction in 2030
- Case Paper industry: Innovative process design for dewatering, drying and heat integration yielding 60% energy reduction in 2030
- Case specialty chemicals industry: Innovative process design for dewatering, drying and heat integration yielding 15% energy reduction in 2030
- Collaboration community on heat innovations -

Exploitation: Propose pilot or demonstration projects

Expected impact: 30% energy reduction in 2030 on average in the 3 industry sectors (paper, agrofood and specialty chemicals); > 3,0 Mton CO2 reduction in 2030 when implemented by all.

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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