



INDTECH2018

Innovative industries for smart growth

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PILLAR 1

Session 1.2

Industrial heat pump systems for waste heat recovery to save energy in industrial drying processes

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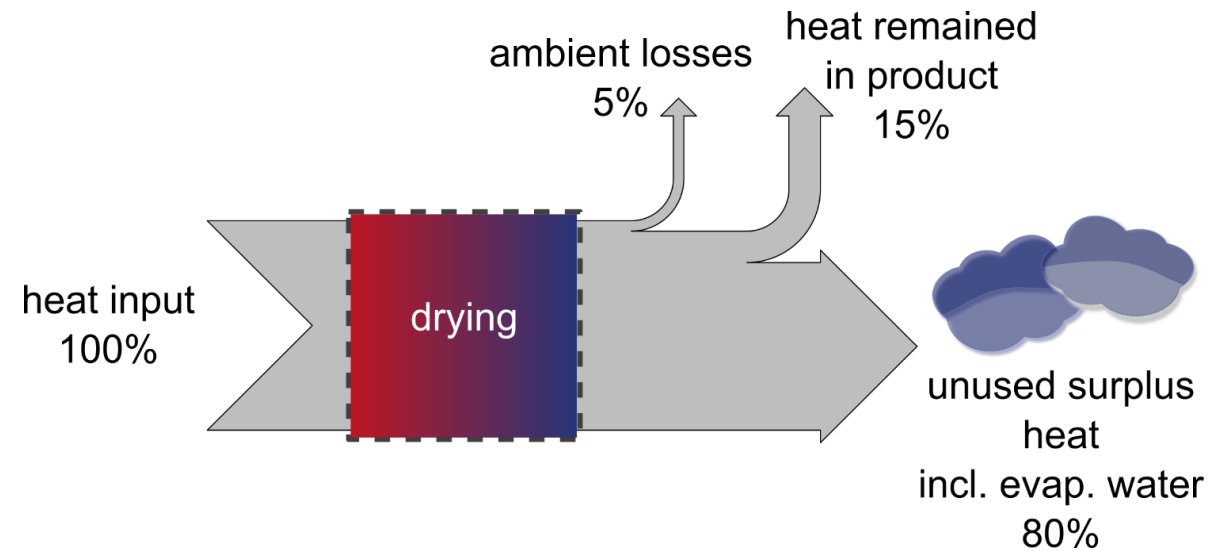


Heat Pumps for industrial drying processes



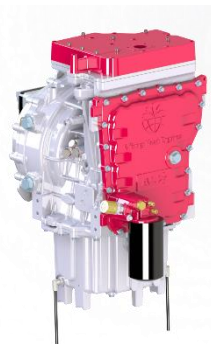
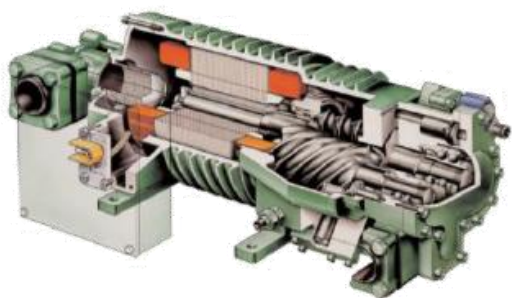
Drying & dehydration processes are

- wide-spread in a number of industries
- primarily **fossil-fired**
- generating large volumes of **low grade waste heat** that are not or only minimally utilized
- offer large potential for improving energy efficiency and emission reduction



DryFiciency: Research Approach

- Develop viable solutions for upgrading idle waste heat streams to process heat streams at **higher temperatures up to 160°C**
- Key elements of the solution are **three advanced high temperature vapour compression heat pumps**
 - => two closed loop heat pumps for air drying processes and
 - => one open loop heat pump for steam driven drying processes



DryF

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Chemours™

Bitzer

ROTREX

FUCHS



Viking Heat Engines

EPCON®
Evaporation Technology AS



Wienerberger

SINTEF

ehpa
European
heat pump association

RTDS
GROUP



DryFiciency demonstration sites for the closed loop heat pump

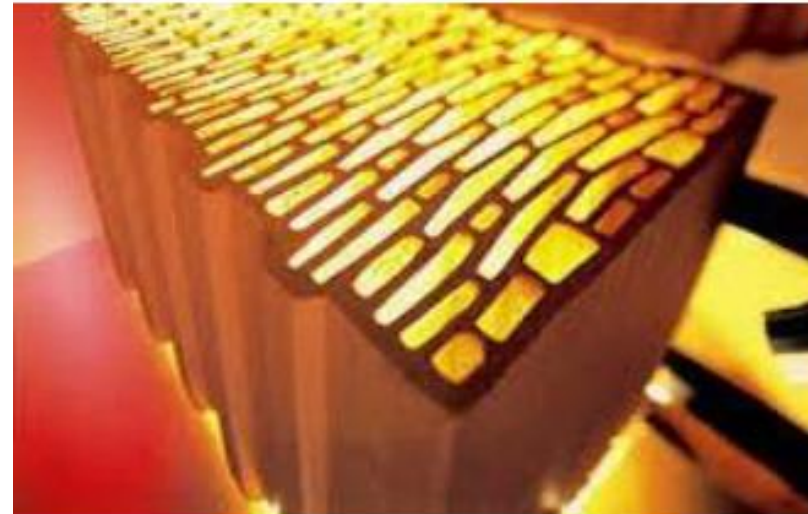


STARCH



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DryFiciency: Key Goals



- **Reduction of specific energy consumption by 60-80%** for drying/dehydration/evaporation processes by recovering of waste heat
- Phase-in of renewable energy sources into thermal processes ideally resulting in **CO₂-free production**
- Development of **cost-efficient high temperature industrial heat pumps** for industrial thermal processes with minimum GWP & minimum negative environmental impacts
- High **multiplication potential** in various industries
 - Paper industry
 - Petro-chemical industry
 - Food industry
 - Plastic industry
 - Wood processing industry
 - ...

