



## DRYficiency - Waste Heat Recovery in Industrial Drying Processes

Johannes Rath, CTO

Clay Building Materials Europe, Wienerberger AG



# Drying

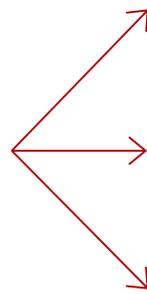
a very energy intensive process step in brick production



- About 25% of worldwide industrial energy demand is for drying processes
- The required temperature level therefore is 80-200°C
- About 85% of all dryers are convective air dryers fired with fossil fuels
- Only few dryers recover latent energy from the dryer exhaust air
- With the help of heat pumps it is possible to recover the evaporation energy and to reduce the specific energy consumption significantly



triple action @



**DryPump:** 2015 - 17, national funded R&D project

**DRYficiency:** 2016 - 20, European funded R&D project

**LEERS:** 2016 - 17, in-house financed project

# DRYficiency



## Purpose

Reduction of fossil carbon emissions by waste heat recovery to foster competitiveness, improve security of energy supply and guarantee sustainable production in Europe.



*Kick off meeting Sep. 6th 2016*

Period: Sept. 2016 - Sept. 2020

Budget: 6.4 Mill. EUR

Funding: 5.0 Mill. EUR

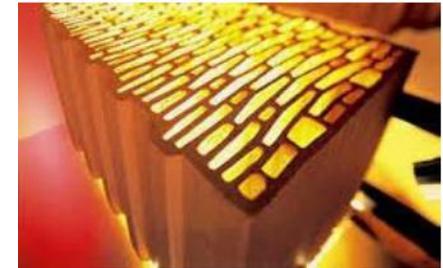


European project H2020 EE17

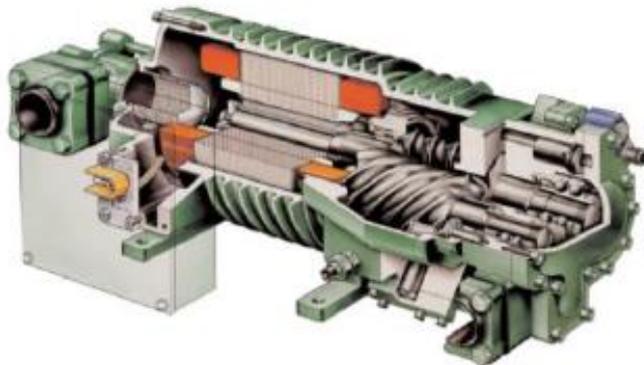
# Key goals of DRYficiency



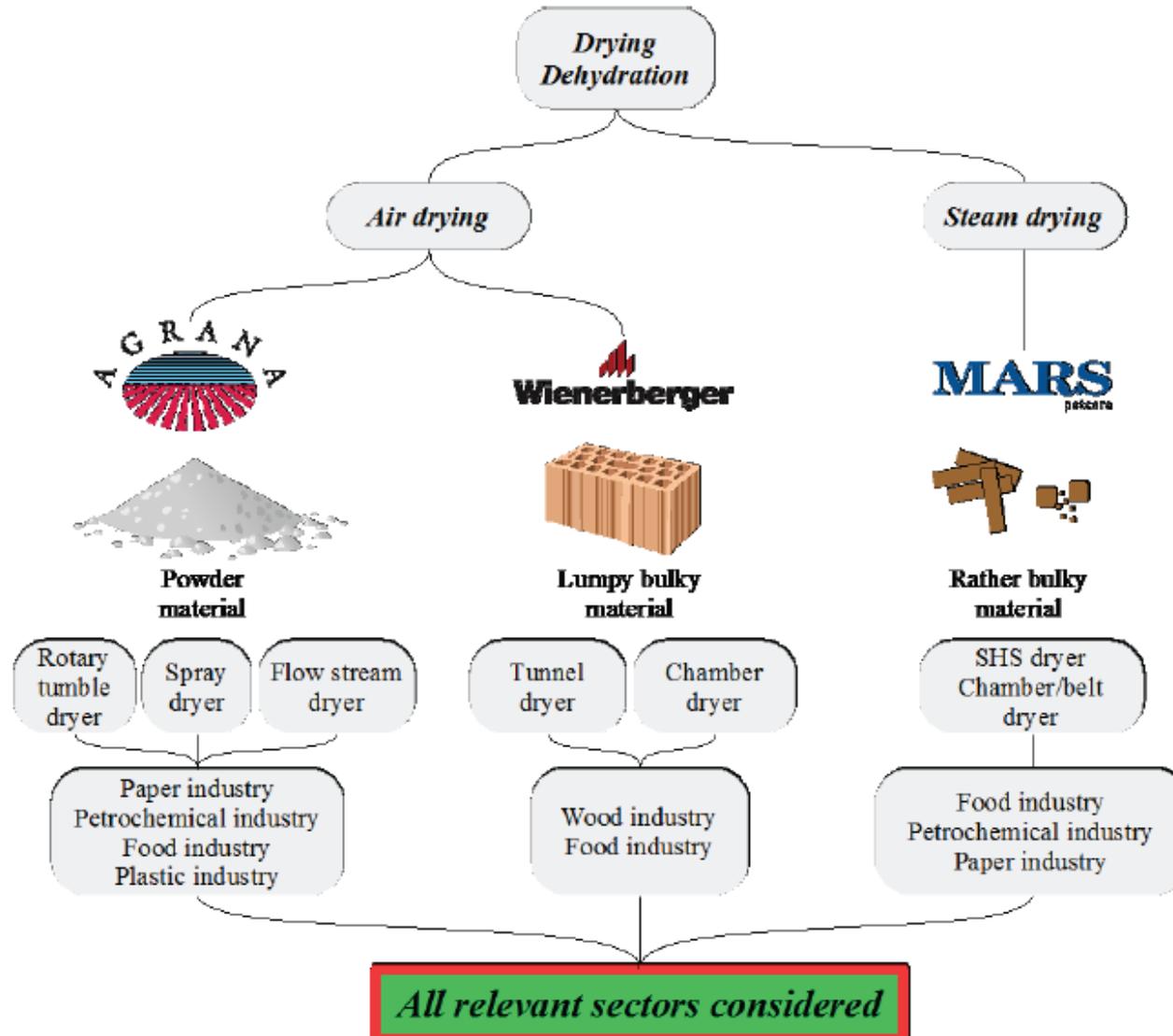
- **Reduction of specific energy consumption** for drying/dehydration/evaporation processes, by recovering of waste heat by 60-80 %
- Phase-in of renewable energy sources into thermal processes ideally resulting in **CO2-free production**
- Development of **cost-efficient high temperature industrial heat pumps** for industrial thermal processes with minimum global warming potential (GWP) & minimum negative environmental impact
- **Increasing competitiveness** of the European industry
- Become the **leading pioneers** by being the first to deliver to market



- To elaborate technically and economically **viable solutions for upgrading idle waste heat streams to process heat streams** at higher temperature levels up to 180°C
- Key elements of the solution are **two advanced high temperature vapour compression heat pumps**
  - => a closed loop heat pump for air drying processes and
  - => an open loop heat pump for steam driven drying processes



# Industrial sectors of DRYficiency



## Current status

Installation site:	Pottelberg, raw material pre-dryer (drum dryer)
Exhaust air conditions:	dewpoint temperature 55 - 65 °C
Target temp.:	93 - 120°C (hot water cycle)
Electr. capacity:	Bitzer compression heat pump 150-300 kW <sub>el</sub>

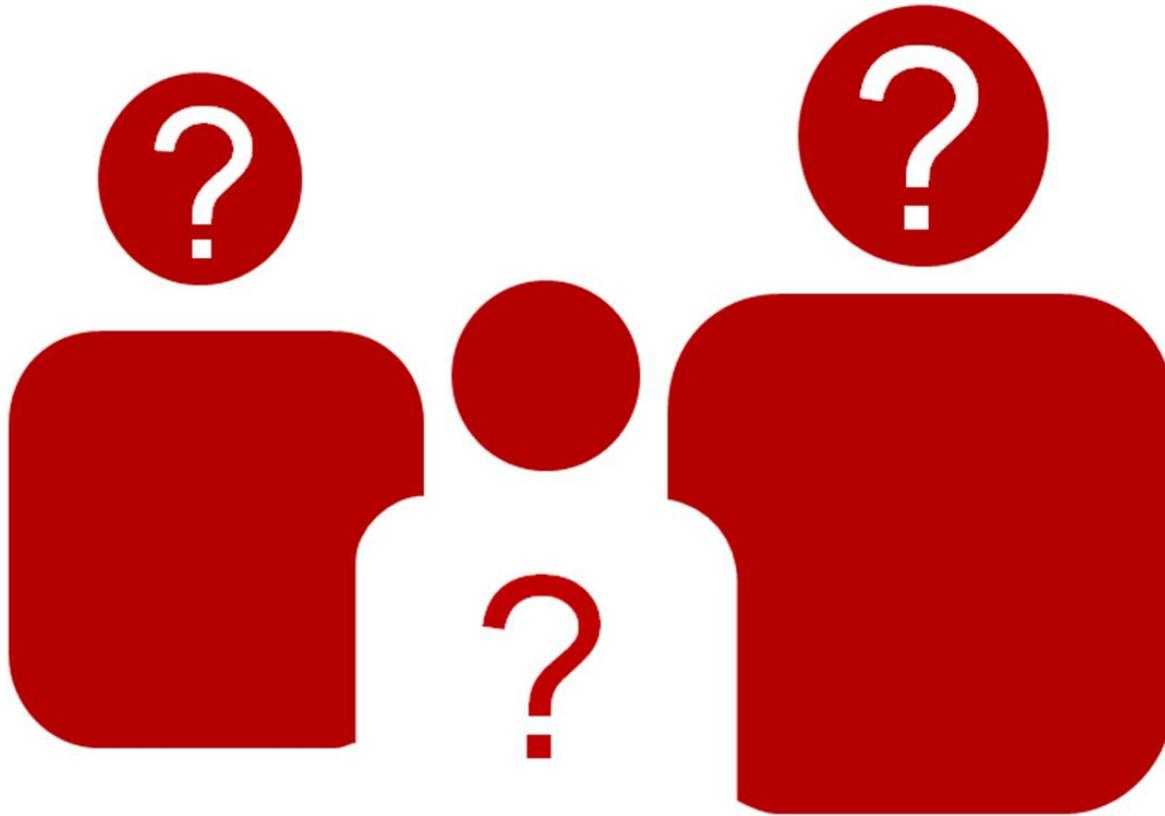


source: Allgaier GmbH

## Time table

Planning, engineering and construction:	Jan - Dec 2017
Delivery and installation of heat pump:	2017 / 2018
Demonstration phase:	2018 - 2020
Next action:	Identification of most appropriate heat sinks

Any Questions?



**Johannes Rath, Chief Technical Officer**  
Clay Building Materials Europe, Wienerberger AG  
A-1100 Wien, Wienerberg City, Wienerbergstrasse 11  
T +43 1 60 192 - 0 | [johannes.rath@wienerberger.com](mailto:johannes.rath@wienerberger.com) | [www.wienerberger.com](http://www.wienerberger.com)



Thank you.

