



Business Case for
Natural Refrigerants

JUNE 17-18, 2019
ATLANTA





Mechanical subcooling of R744 processes with R718 in industrial and commercial applications

Juergen Suess, Florian Hanslik
Efficient Energy GmbH

#GoNatRefs

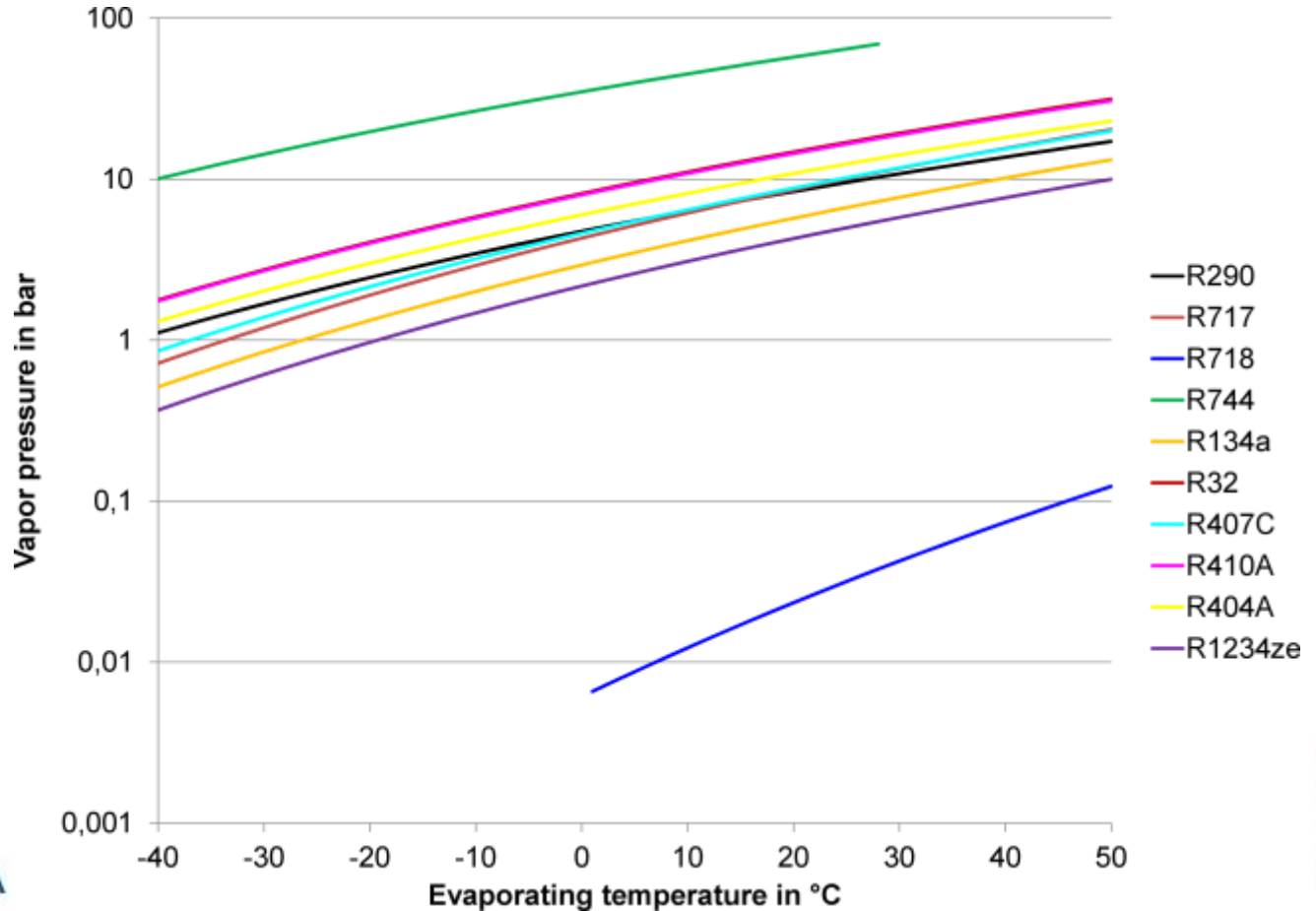
R718 + R744 = Dream team



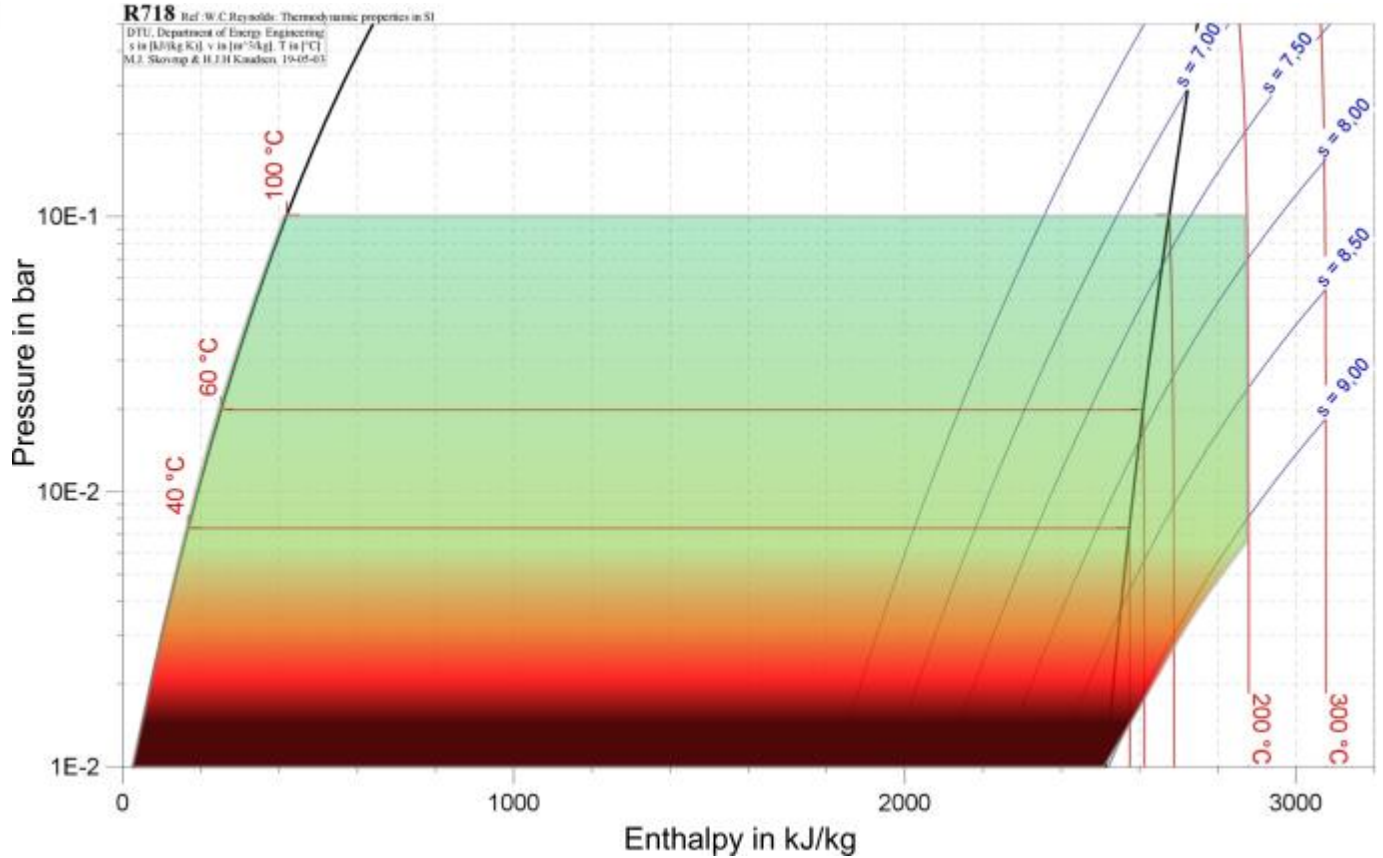
June 17-18, 2019 - Atlanta, GA

Mechanical subcooling installation at efficient energy laboratories

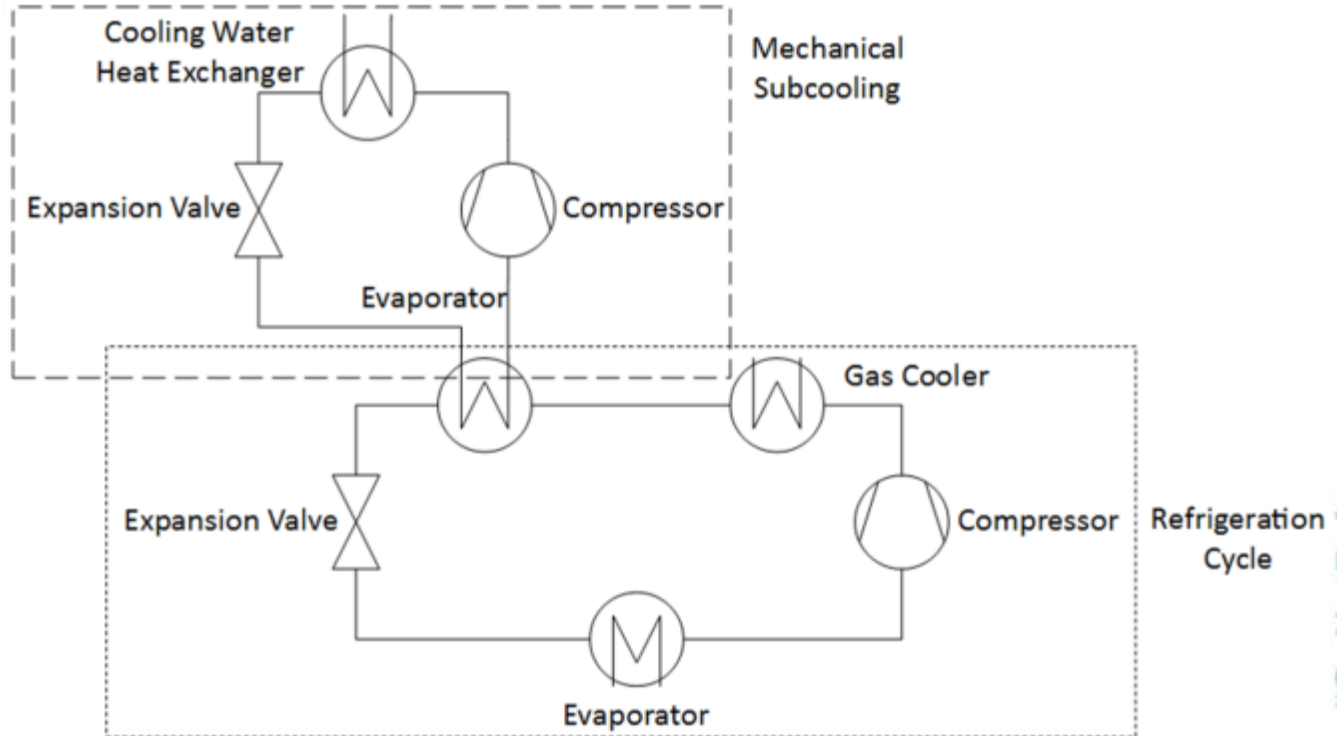
Vapor curves of various refrigerants



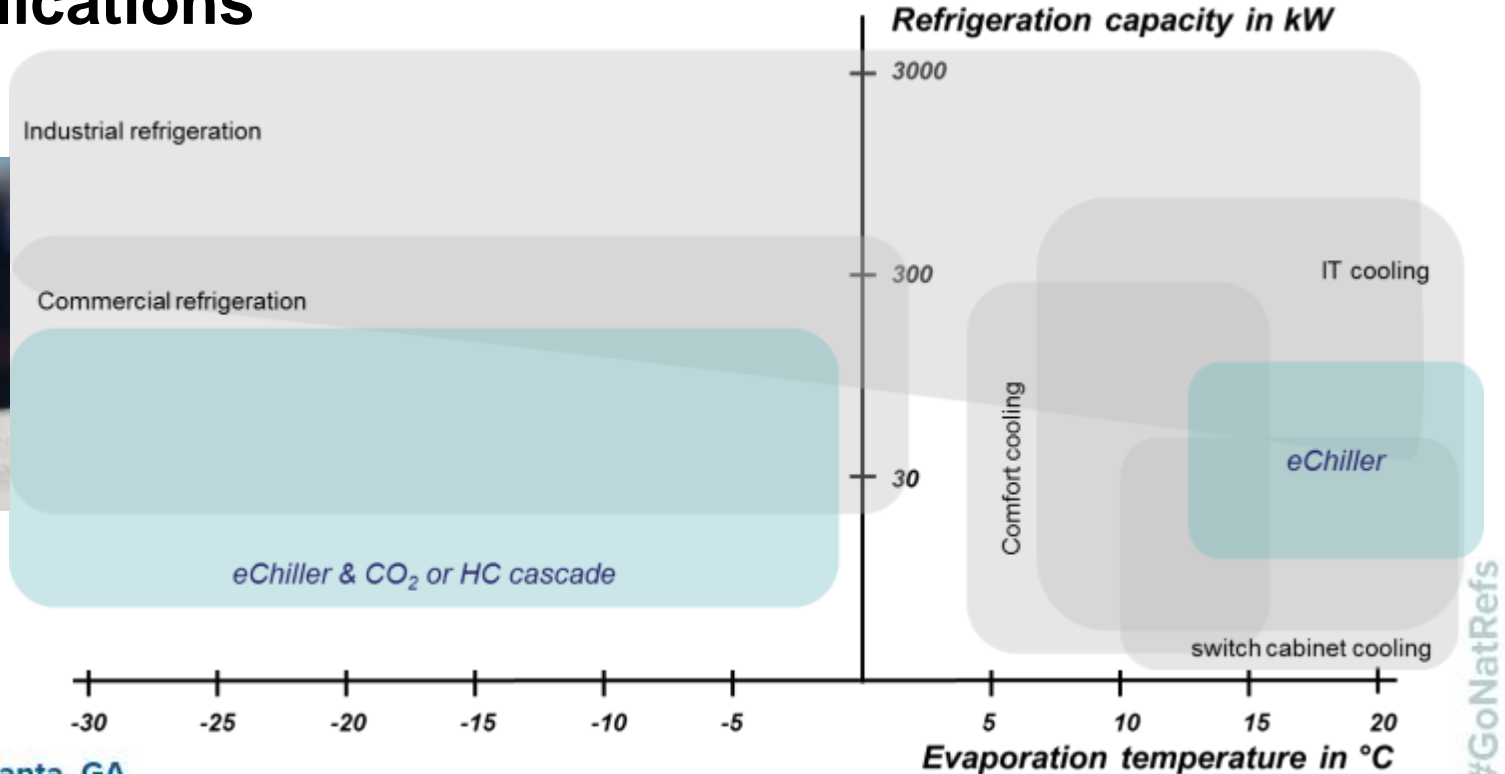
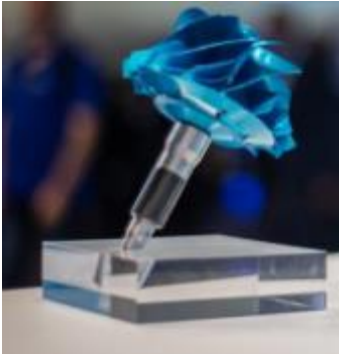
Where to use R718



R718 and R744 cascade system layout



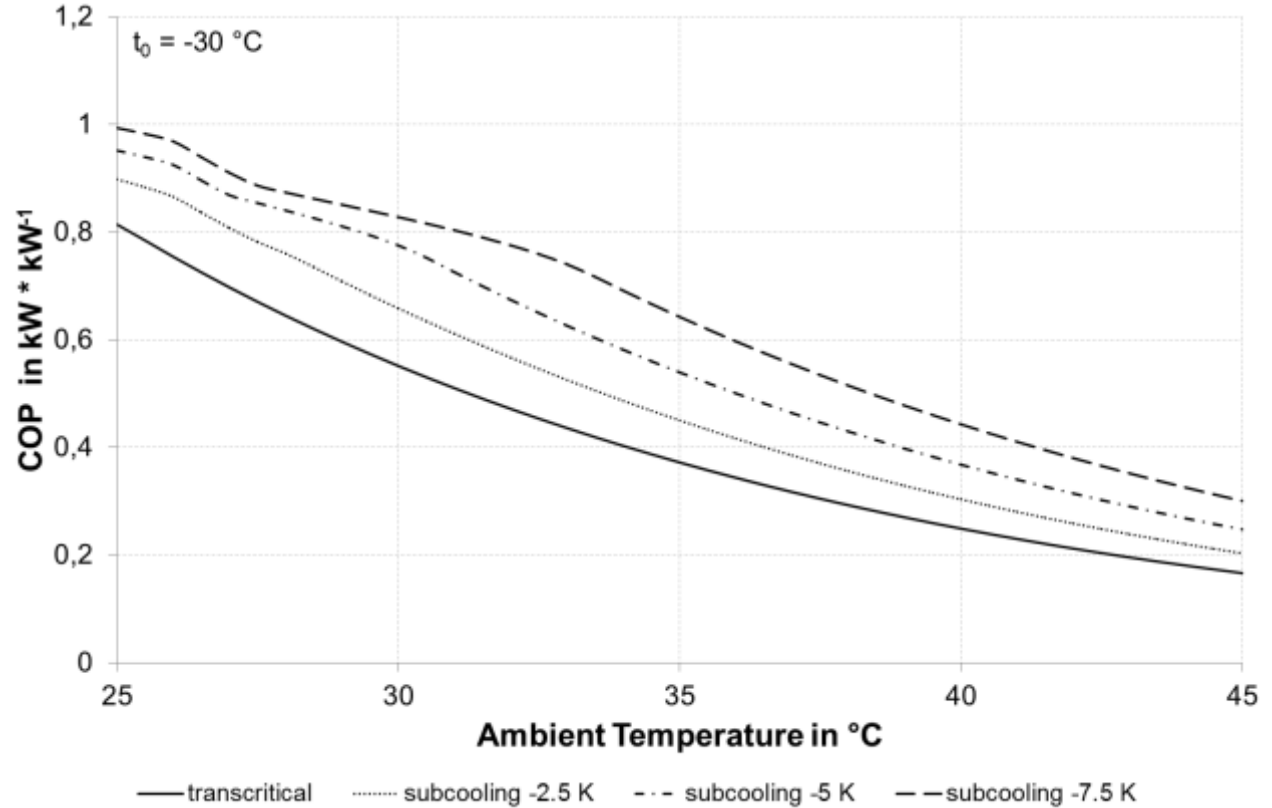
R718 Applications



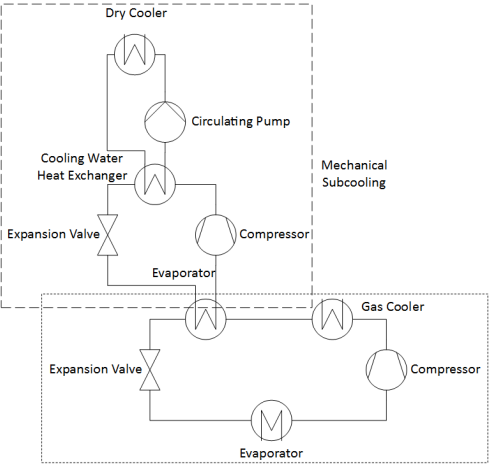


Mechanical sub cooling of CO₂ with water to freeze apple pastries

Efficiency enhancement



#GoNatRefs



Summary



- Both R718 and R744 are safe and natural refrigerants
 - No critical limitations for global applications to be expected
 - Cascade systems increases the COP of the CO₂ process significantly at high ambient temperatures
 - No added complexity of the R744 process required
- The combination of both refrigerants will contribute to the CO₂ equivalent reduction of the HVAC&R industry.



Business Case for
Natural Refrigerants

**Thank you
for listening.**

