

Chillventa Specialist Forums 2022 **Chillventa Fachforen 2022**

**CONNECTING
EXPERTS.**



Presenter

Jakob Elmoose

Product manager, Compressors and Chillers

Industrial Refrigeration EMEA

Denmark



Working for Johnson Controls since 2012

With the responsibility within reciprocating-
and screw compressors as well as
packaged chiller solutions.



135 Years
of innovation experience

100,000+ Experts globally



150 countries offering
a local service from
2000 locations



more than
8,700 Active Patents

4+million
Customers globally



\$78 million
in charitable contributions
in the past **5 years**



40+
Named in 40+ leading
sustainability indices

We are in
90%
of the world's most
iconic buildings



Delivering outcomes in

Airports
Campuses
Data Centers
Healthcare
Hotels
Life Sciences
Schools
Sports & Entertainment



We have delivered over
26M Metric tonnes
of CO₂ reduction

Over **\$3.9** billion
Energy savings
and more than
\$2.1 billion
Operational savings



316,000+
Volunteers Hours



Solutions built on industry leading products

We are a leading OEM supplier of reciprocating and screw compressors, chillers for standard and low temperature applications, heat pumps, and control systems.



The power behind your mission



Food and beverage



Chemical and petrochemical



Utilities



Pharma and healthcare



Distribution and storage



Leisure and sports



High-tech



Other industries

Need actions – No time to waste

We need to reduce our carbon and environmental impact within all sectors and industries. Refrigeration as a business hold a huge responsibility to drive this transformation

With 7,9 billion people and a population growth of 83 million a year the worlds carbon footprint is heavily excessing all tolerable limits.

20% of the worlds electricity consumption is used for cooling purposes...



Are we able to change

Is it possible to reduce need for cooling?

- Without refrigeration our world and our level of civilisation would have been very different
- Refrigeration is basically driving our civilisation

Is it possible to reduce the energy needed for cooling?

- Yes we have technologies instantly ready to improve systems

Can we reduce the environmental impact for the generation to come?

- Yes we have multiple solutions to reduce our climate impact



Refrigerants

Sabroe celebrated this year our 125 years anniversary – the first compressor in 1897 was for natural refrigerant and natural refrigerants is still the majority of our business.

Throughout the long history, many different refrigerants has been used, but natural refrigerants has always been present and today more than ever.

Do we believe in chemical refrigerants > 10 years

- Global Warming Potential, GWP
- Ozone Depletion Potential, ODP
- PFAS, TFA, “forever chemicals”

We have alternatives, we have a choice.

Utilizing natural refrigerants represents sustainable technology now and in the future.



Natural choices:

- Ammonia
- Carbon dioxide
- Water
- Air
- Propane
- Butane
- Isobutane
- Pentane
- Isopentane
- Propylene
- Ethane
- Etc....

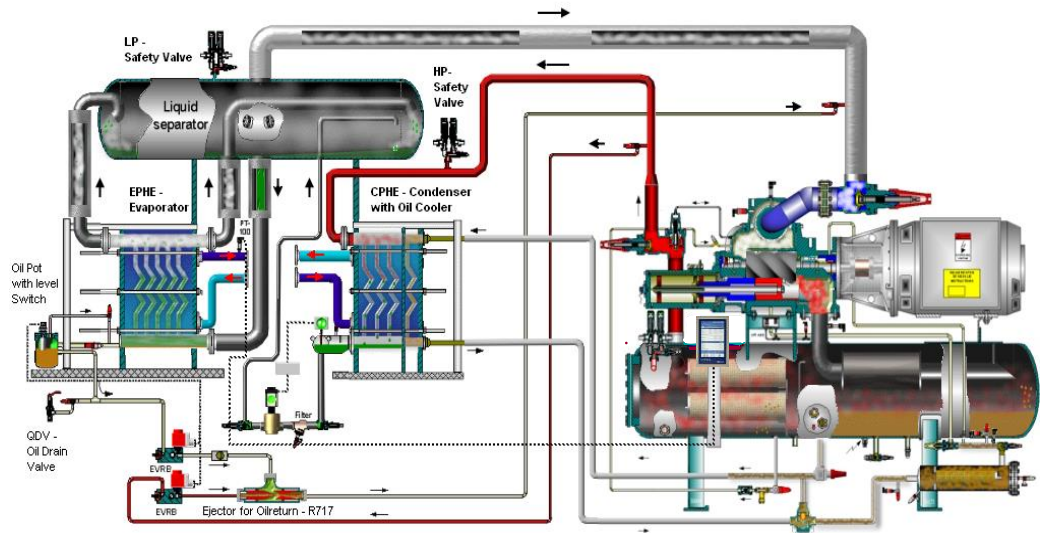
Energy efficiency

Energy consumption of a typical chiller system:
approx. 80% is used for compression.

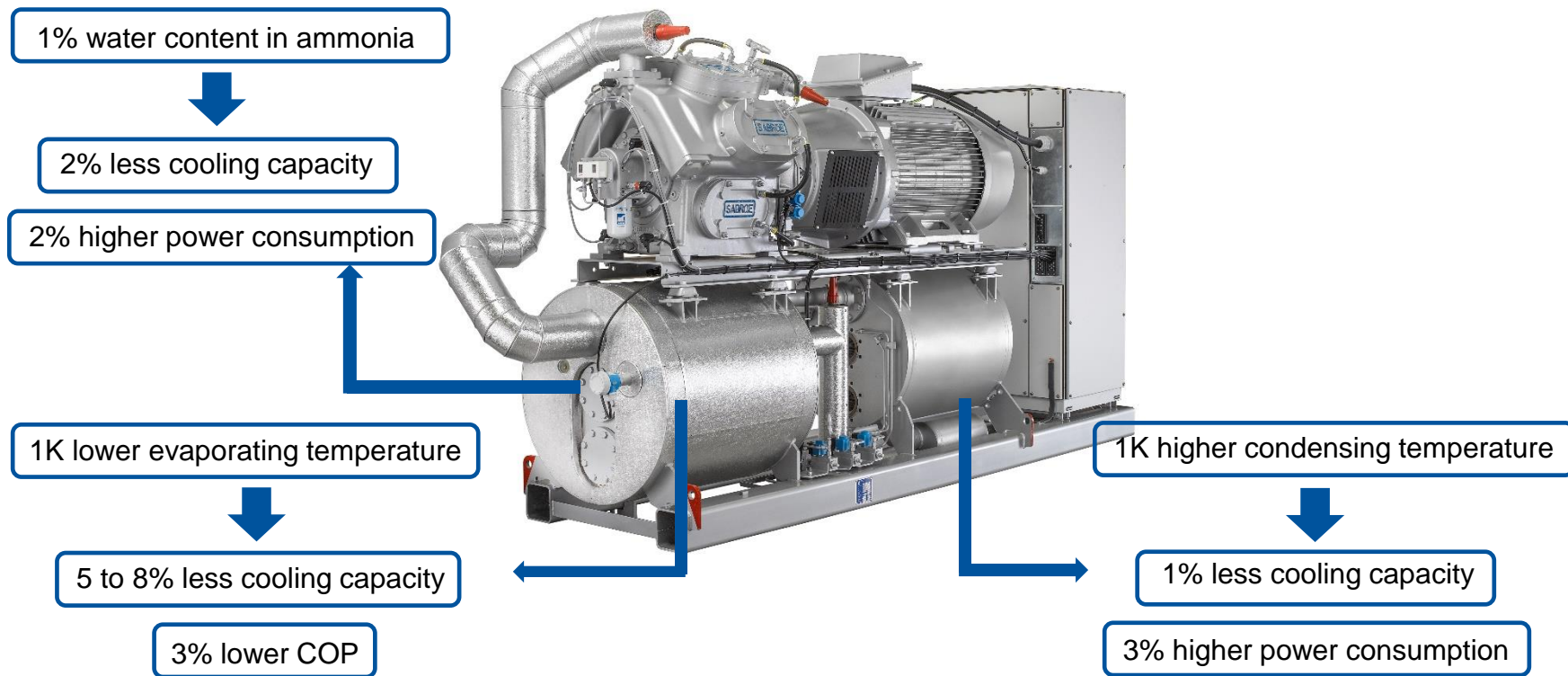
The rest is mainly used for evaporator/condenser
fans, pumps, etc.

With that in mind ...

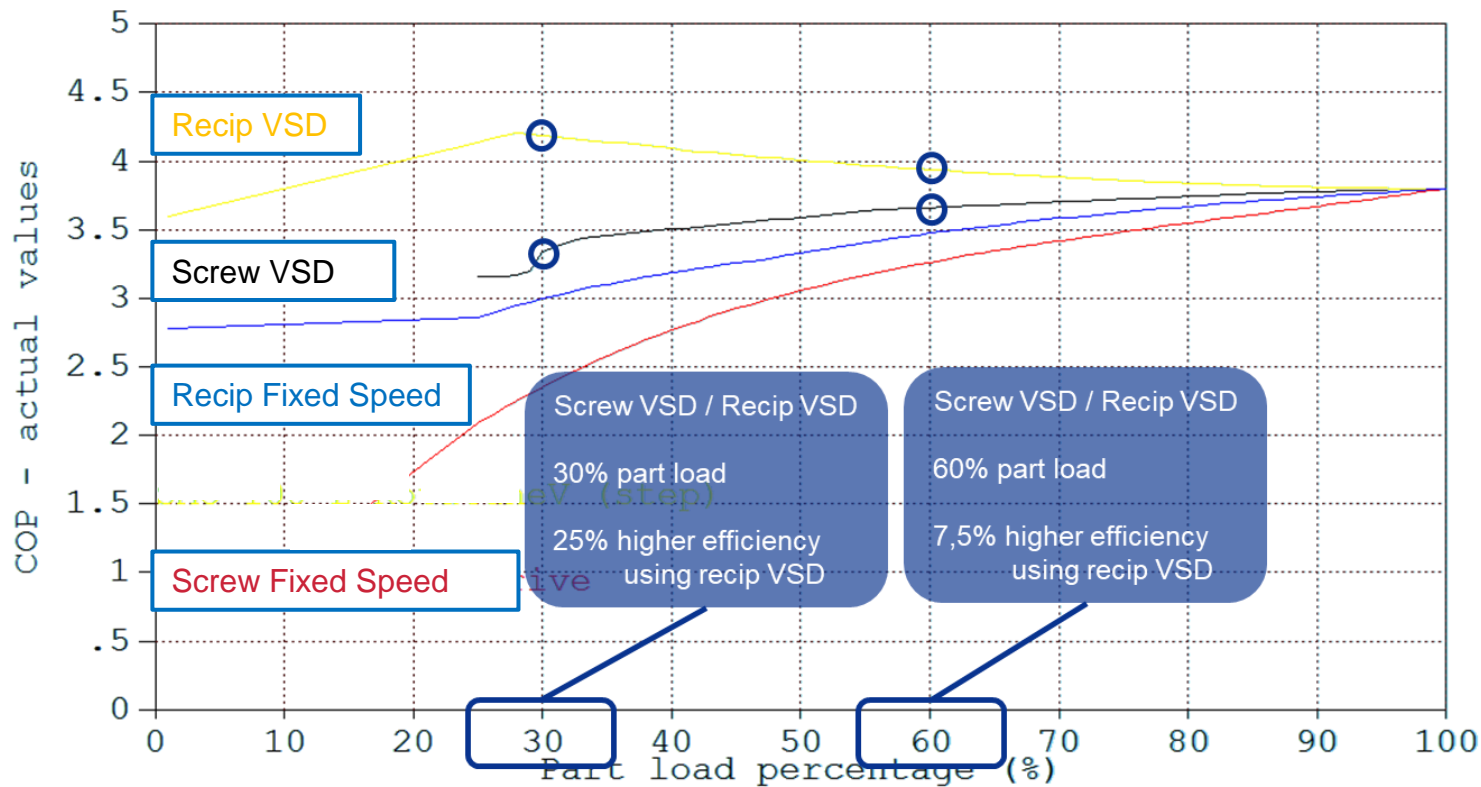
It is of highest importance to choose the right system
configuration to achieve the absolute best
efficiency, which will benefit the environment as well
as the energy expense.



Energy optimization – Rules of thumb

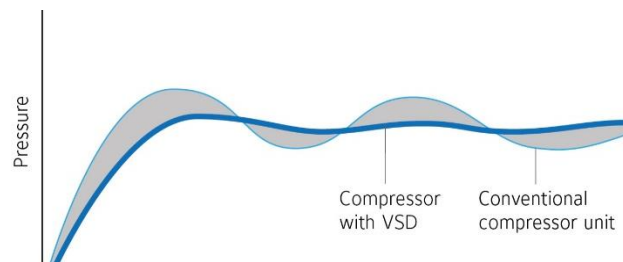
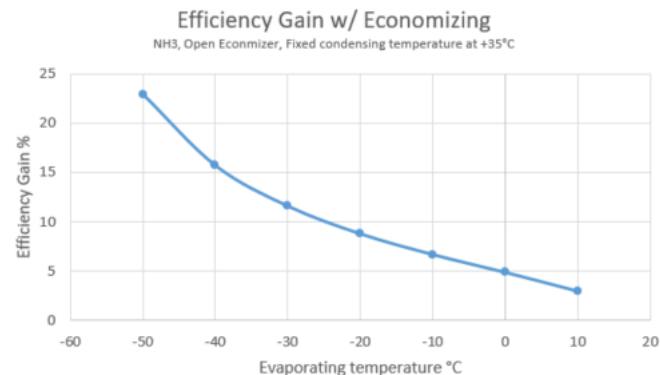


Use technology right

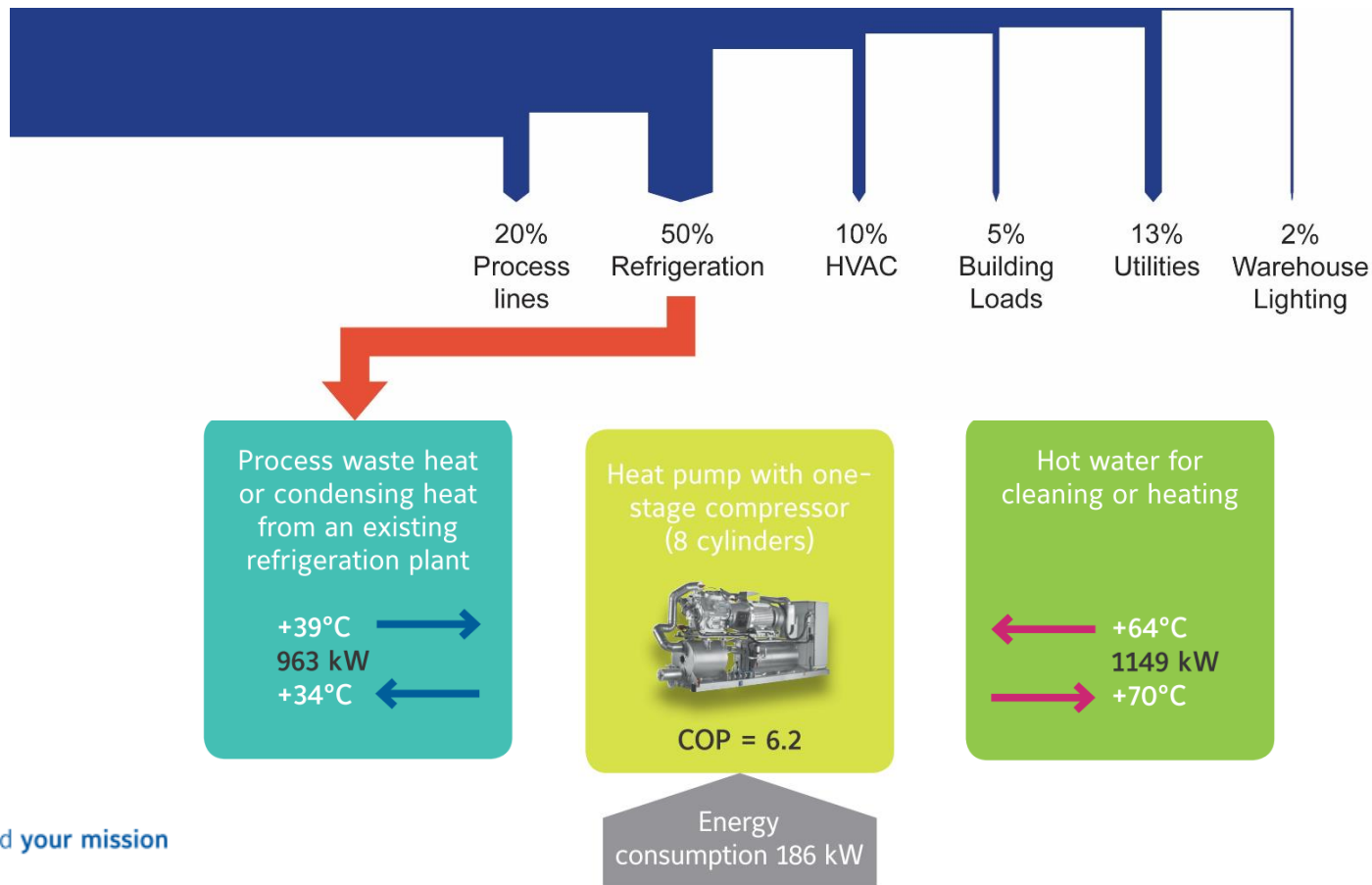


Options to increase energy efficiency

- For screws check the option for adding an economizer system
- Partload regulation
 - Speed regulation vs. fixed speed
 - Sequencing (MultiSAB), Load sharing and optimization
- Seasonal adjustments
 - VI regulation and type of VI
 - Regulating condensing temperature
- Plant optimization
 - Design the plant for highest possible evaporation temperature
 - Purchase equipment according to load profile of your system
- Recover heat from the cooling process
 - Heat recovery from compressor oil cooling system
 - Install heat pump to boost temperature and reuse the energy



Use the energy twice



Sabroe products line card



SabroeRecip



SMC 100



CMO 20-30



HPC 100



HPO 20



HPX 700



SabroeScrew



SAB screw small



SAB screw large



HP Screw 40



SabroeChill



ChillPAC



ComPAC



PAC recip



PAC screw



ChillPAC Air



SabroeFreeze



CAFF



SabroeHeat



HeatPAC



HeatPumps SGC



DualPAC



Heat pump 273



SabroeControl



UniSAB III



Chiller & heat pump Plant Control



Panels



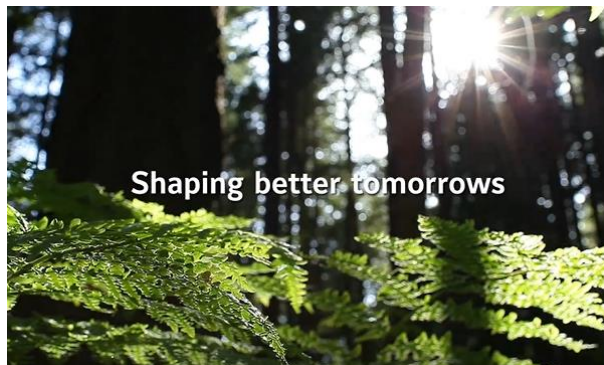
Vibration monitoring



ISAC

The power behind your mission

Sustainable solutions



Sustainability, reliability & safety – it's in our DNA

The Sabroe product portfolio has the highest aims:

- Use of natural refrigerants – future safe
- Best-in-market COP/ESSER values
- Market leading on service intervals
- Constantly improved and updated designs
- Robust constructions
- Thoroughly tested at the factory and in the market
- Proven and documented efficiency at End-of-line test center

All available via your local Johnson Controls / Sabroe sales office

OR – visit us Hall 7, booth 329

Want to know more? Visit us at booth 329 in hall 7

Specialist forum: Wed 11:40-12 Hall 9 Booth 9-550

District heating with R-717 heat pumps
using river water

Specialist forum: Wed 15-15:20 Hall 4A Booth 4A-401

Driving decarbonization with Sabroe heat
pumps



Specialist forum: Thu 11:40-12 Hall 7A Booth 7A-616

How you can use digitalization in
industrial refrigeration to reduce
carbonization and total cost of
ownership

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