

מחנה
ליל

Let's talk about residential heat pump



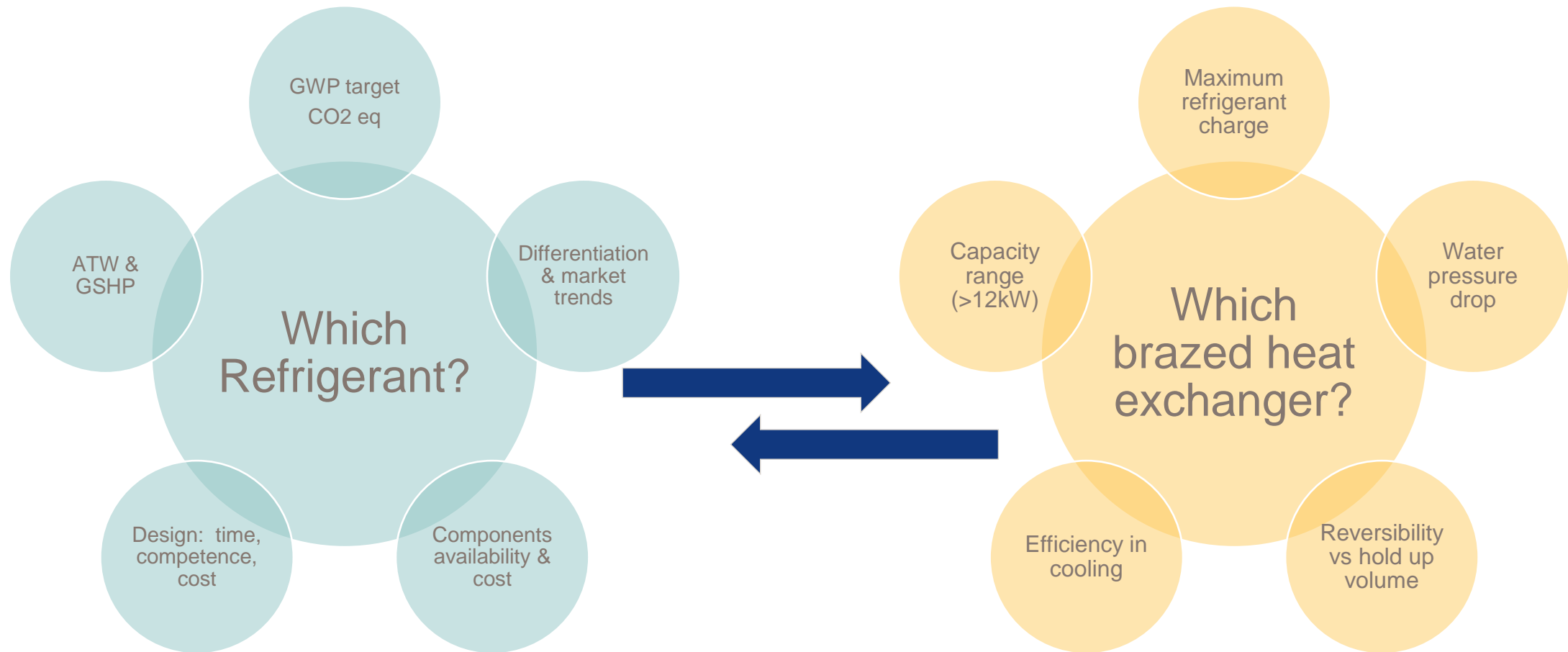
Matteo Munari

Today's topics



- A2L refrigerants
 - Difficult strategic decision !
 - We can support whatever decision is taken !
- Defrost cycle
 - how to measure the limits?

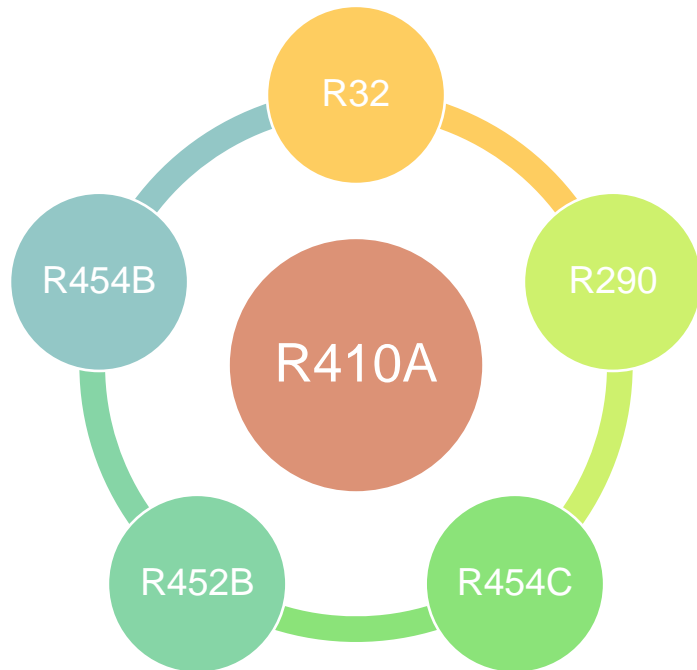




Heat pump

- Which refrigerant?

- During last **2 years** a massive redesign of the Heat pump ranges has occurred.
- The main challenge has been: **which refrigerant should I use?**



All new refrigerants:

- Have **lower GWP** impact
- Are **flammable** or mildly flammable

And:

- They are **not** considered as **final** solution

Heat pump

- What are the challenges?



There is no perfect refrigerant:

- GWP is still above 650 for **R32 / R452B**
- **R454B** has -3% capacity but higher efficiency
- **R454C** is <150 but 6K of glide
- **R290** is limited on indoor application up to 150g with some uncertainty on local legislation.

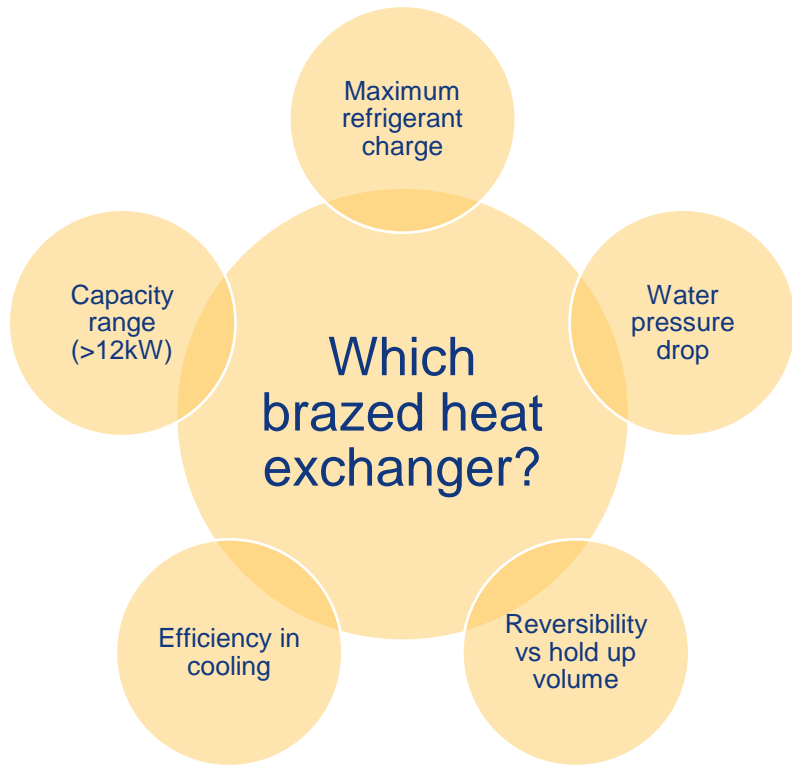
ALL REFRIGERANTS ARE POSSIBLE

YOUR challenge is to decide your **HP strategy** which can lead to the decision of using **more than one refrigerant**.

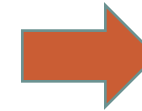
OUR challenge is to support your decision with the right **optimized heat exchanger!**

Heat pump

- What are the challenges?



Air to Water HP



Wide channels

Ground Source Water HP

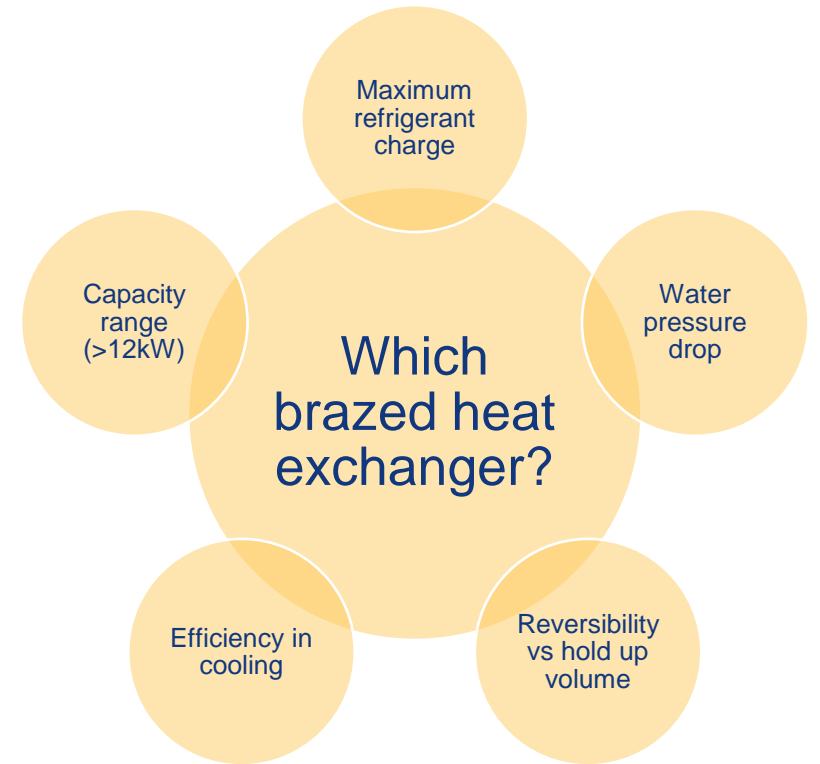
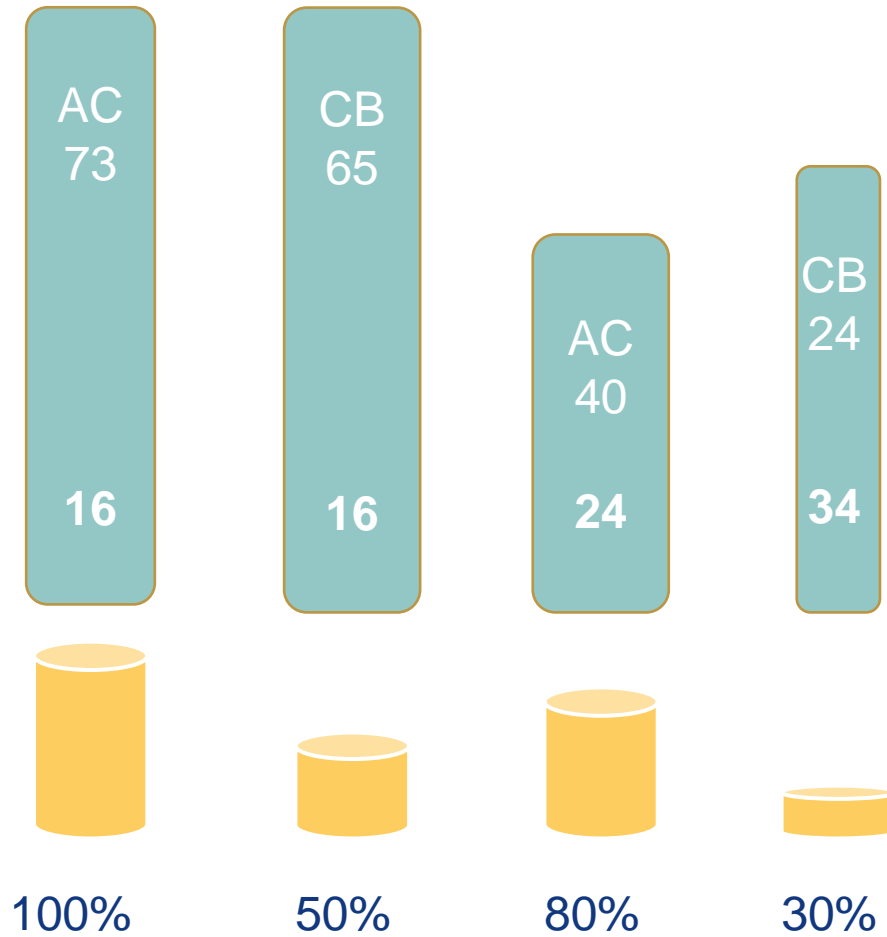


Narrow channels

Great portfolio variety



HTA
1 m²



DEFROST CYCLE, how to measure the freezing limits

Defrost Resistance

- The goal is to reach the minimum evaporation temperature where **no ice formation** can be seen, measured as increase of pressure drop on the water side.
- **Controlled parameters** during the defrost test:
 - entering water temperature
 - the compressor's capacity (Hz)
 - water flow per channel
- The best anti-freezing design principle is “**do not oversize**”

