



June 18-19, 2014 - San Francisco

CO₂ Booster MT and LT with parallel compression and total Heat Recovery in a meat factory

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About SCM Frigo

We are a leading company in the CO₂ systems production with more than 1000 units running all over Europe and more than 10 years of R&D in Natural Refrigerants (CO₂ and NH₃).

With more than 80,000 ft² production facility surface we have a large production potential of average 50 units/week.

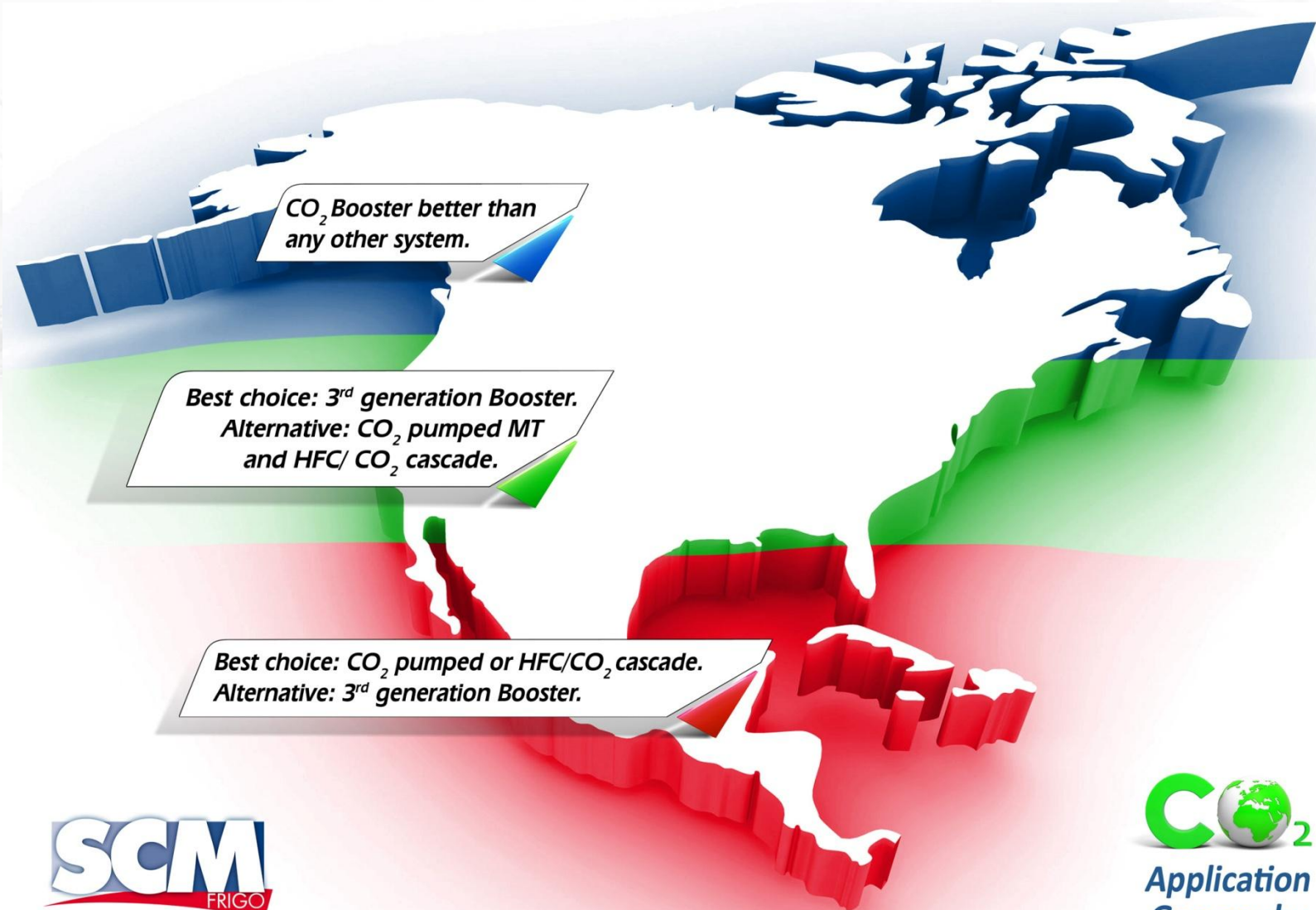
Actually CO₂ systems represent 60% of our total capability.

Our aim is to be successful in the US market as we are today in Europe with our reliable CO₂ systems.

This presentation wants to demonstrate how today CO₂ refrigeration technology can be applied in different climate conditions in a reliable and efficient ways.

The study considers an industrial installation in the south of France as an area with the typical US climate.

#2



Design information:

Cooling Capacity 43 TR for medium temperature cold rooms at 32° F

Cooling capacity 3 TR for low temperature cold rooms at -13° F

37 TR Heat recovery for cleaning operations with water outlet temperature 140° F

Outdoor installation with design ambient temperature 95° F in summer time and -23° F in winter time



Technical solution:

CO2 Booster with integrated gas cooler for outdoor installation

MT realized with 4 compressors operating @ $-17,6^{\circ}$ F SST →

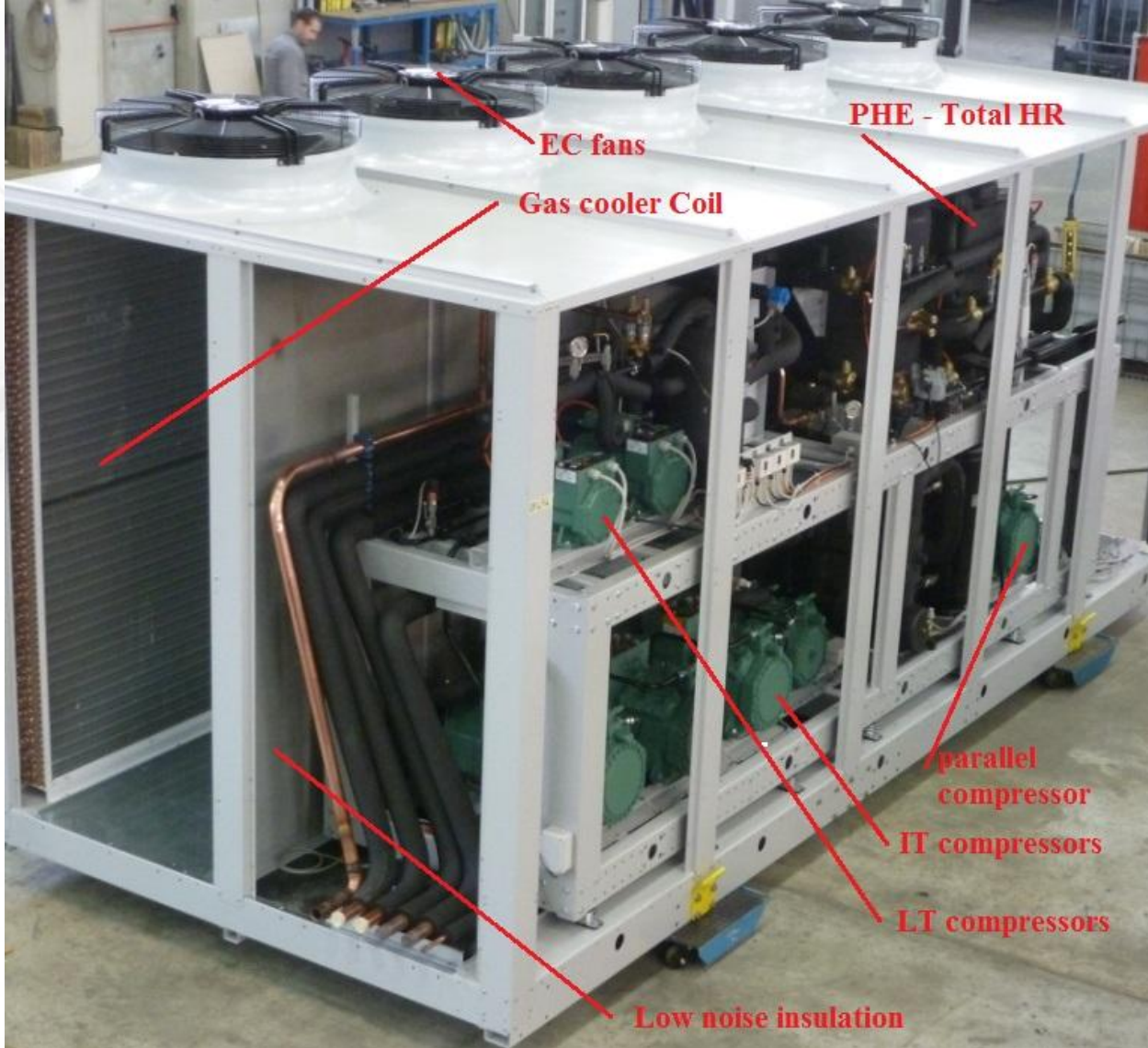
Low temperature with 2 compressors operating @ -31° F SST

Heat Recovery @ 95° F / 140° F

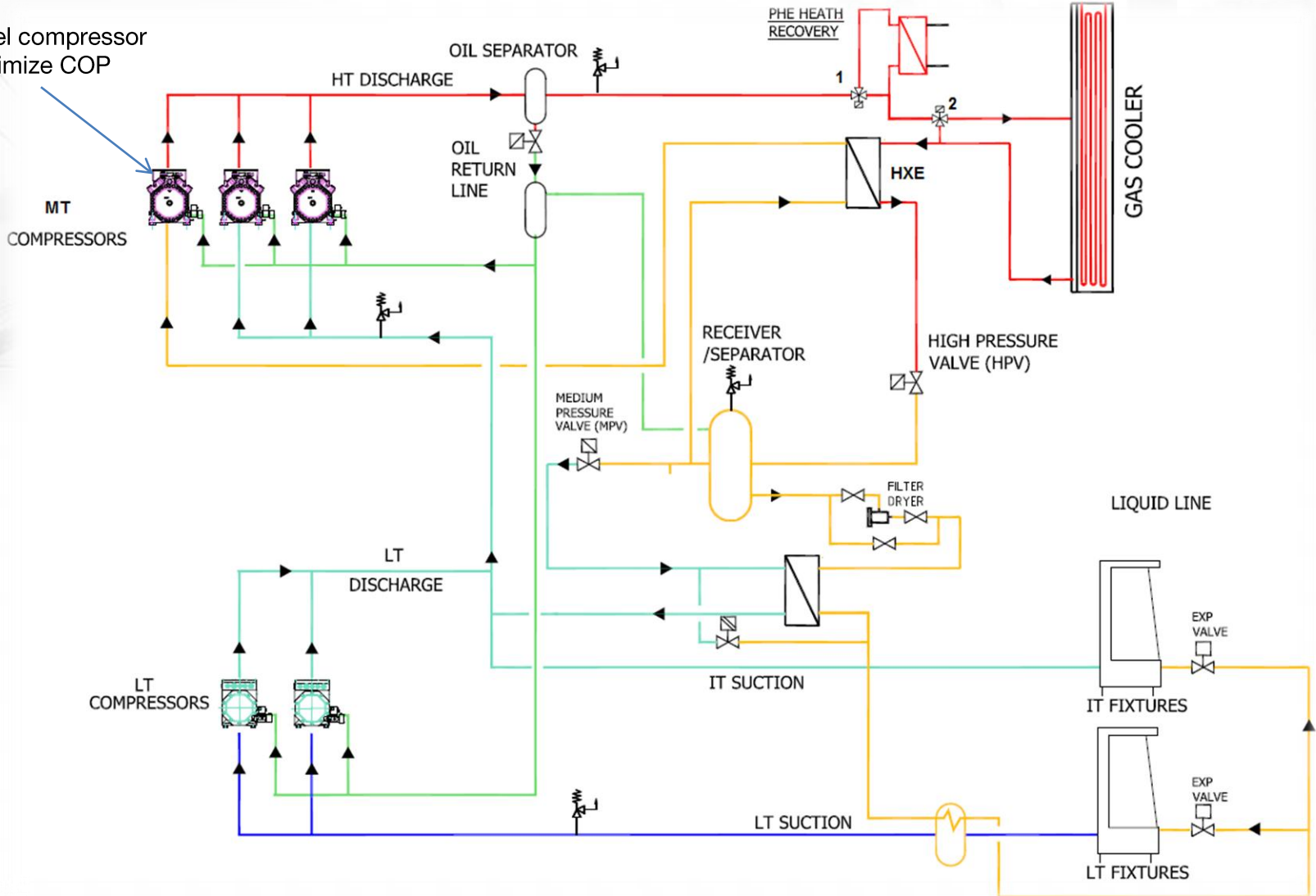
Parallel compressor operating at $+38^{\circ}$ F SST to optimize the COP during hot ambient conditions and HR operation

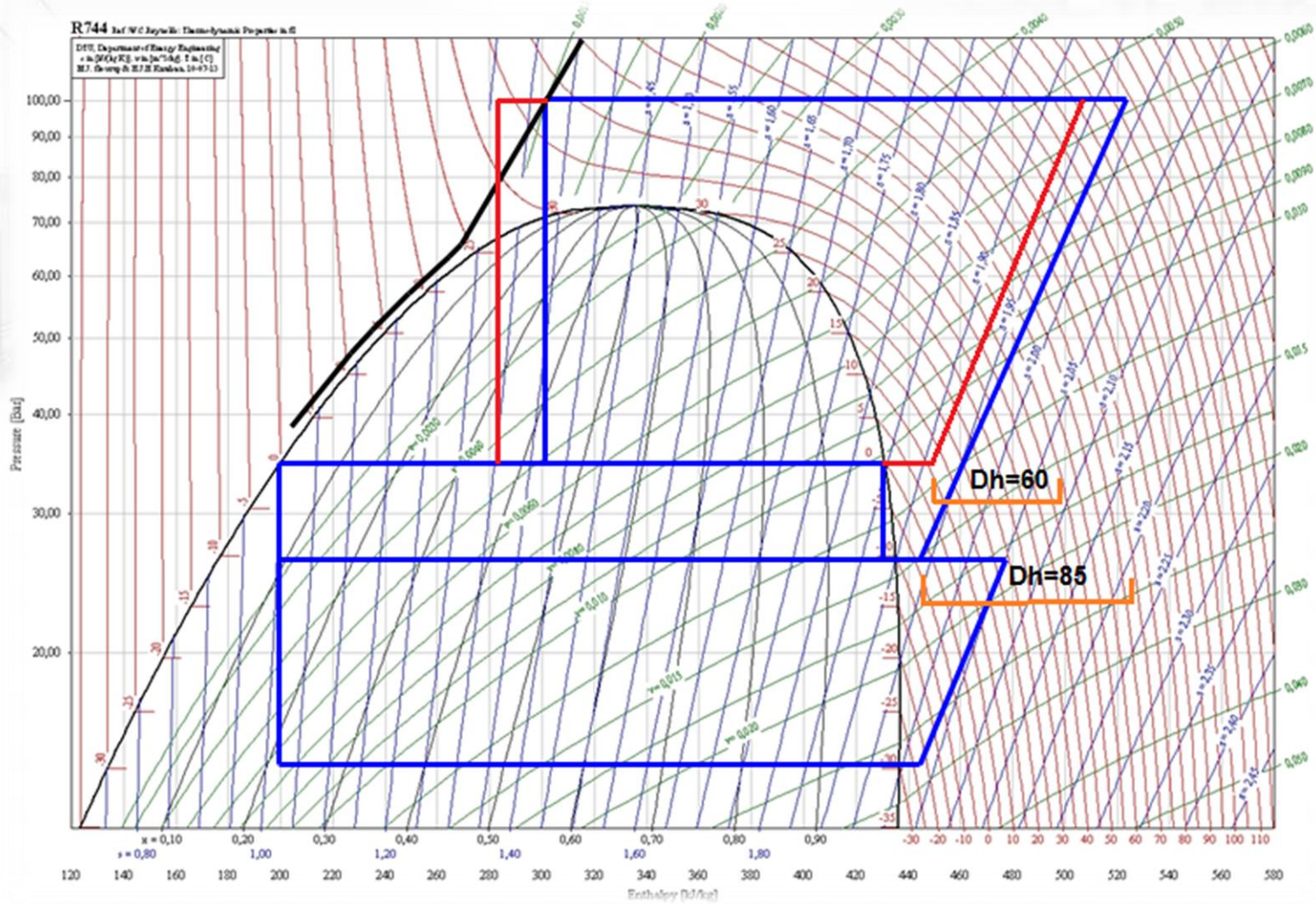
Integrated Control system (Carel) to manage the unit and HR operation



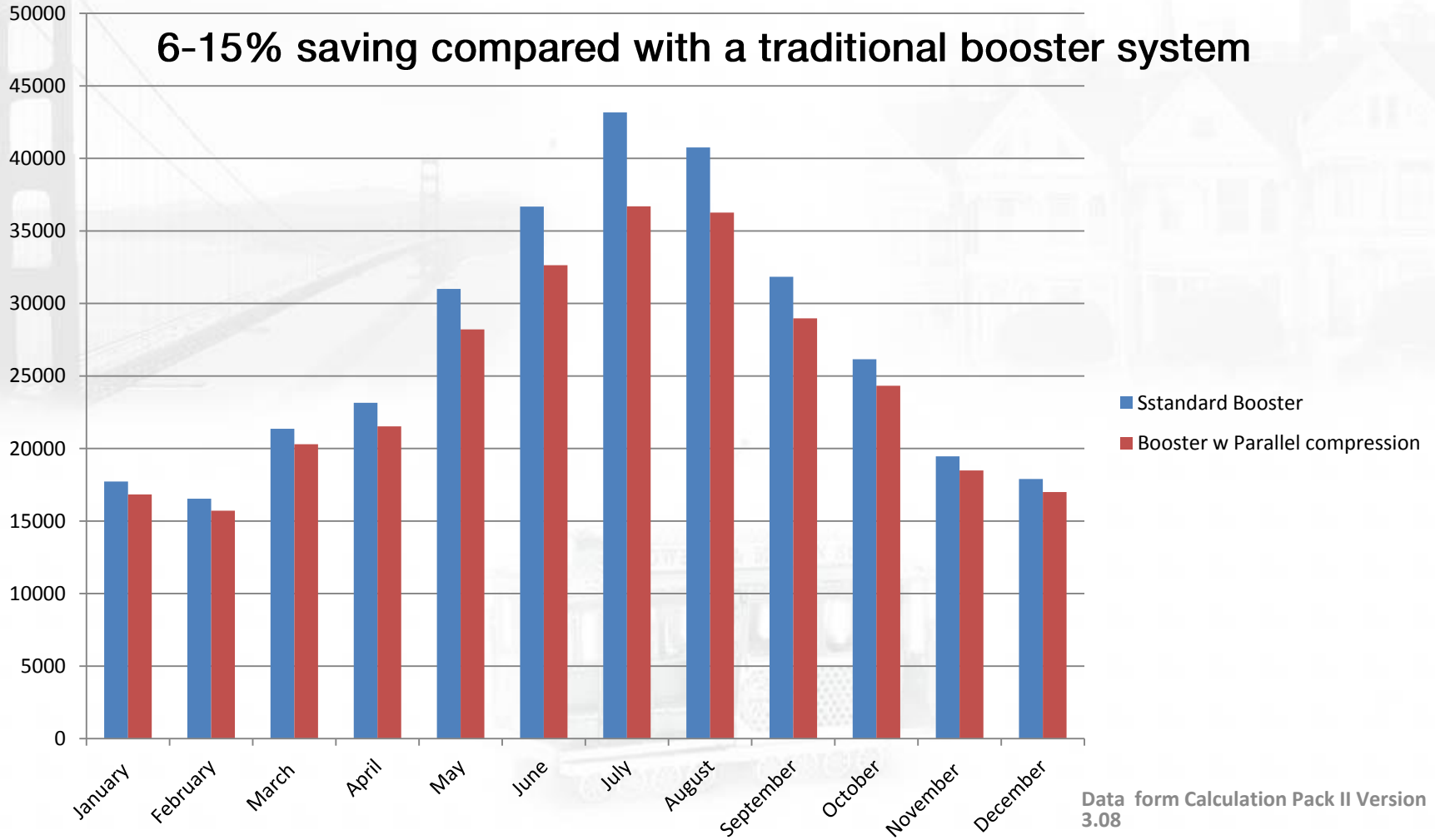


Parallel compressor
to optimize COP





6-15% saving compared with a traditional booster system



Conclusions:

The use of CO₂ as refrigerant allows to combine Cooling and heating demand in one unit.

The parallel compression application:

Increase the efficiency of the system up to 15% in warmer climates (US)

During HR mode in winter time help to maximize the system performance with an increasing up to 6% compared with a traditional HR application.

Additional AC heat exchanger installation is possible to meet specific requirements of the plant.

Lower carbon footprint of the installation compared with traditional HFCs

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sphere
business case
natural refrigerants

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Thank you very much!

