

ATMO
sphere

Business Case for
Natural Refrigerants

04/09/2018 – Singapore



Heating and Cooling Solutions with CO2

Sphere Asia
Wynand Groenewald

Sphere.
ASIA



Sphere.

Who are we?



Sphere.
FARMING

Sphere.
ASIA

Who are we?

150+ CO2 Cascade Solutions

120+ CO2 Transcritical Solutions

3 x CO2 Training Facilities

Industrial sector

Commercial sector

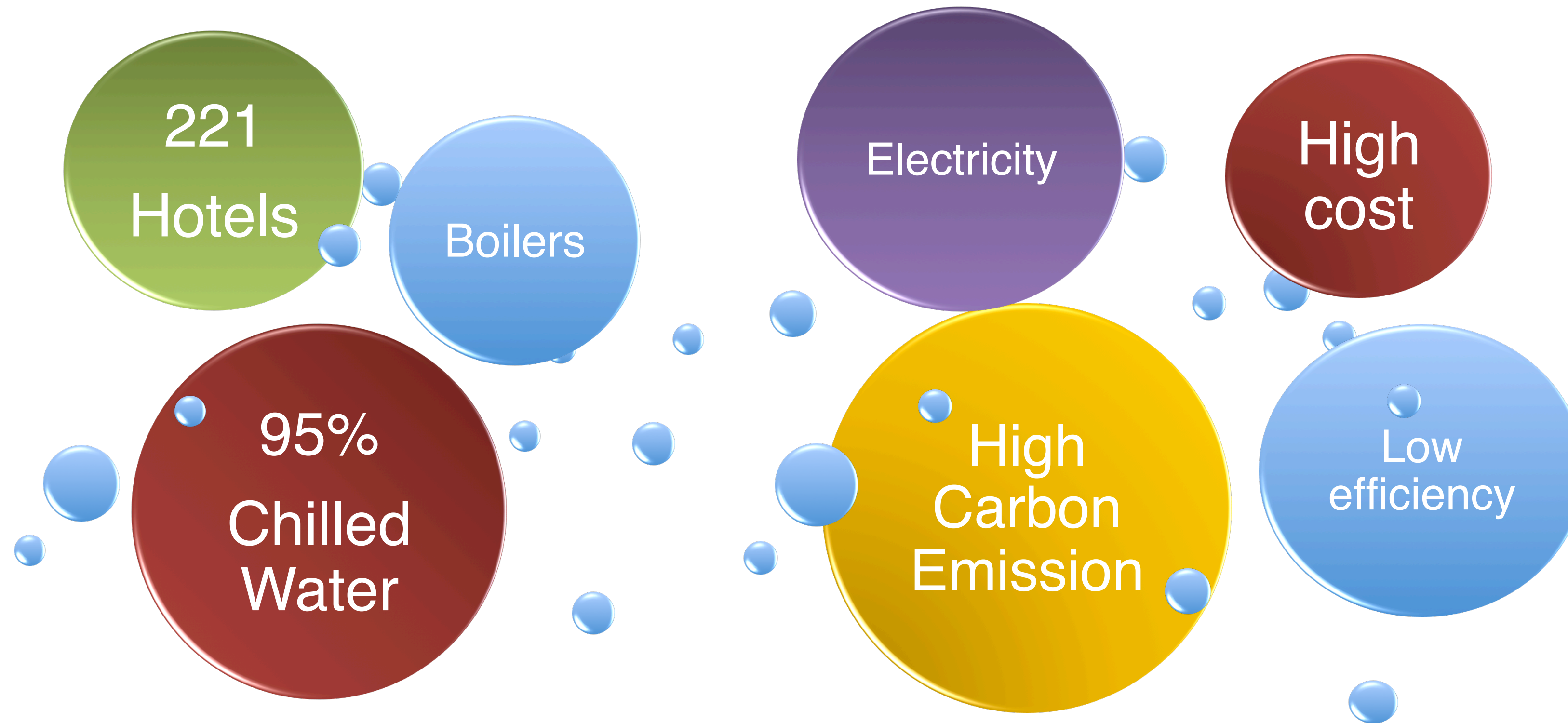
Hospitality sector

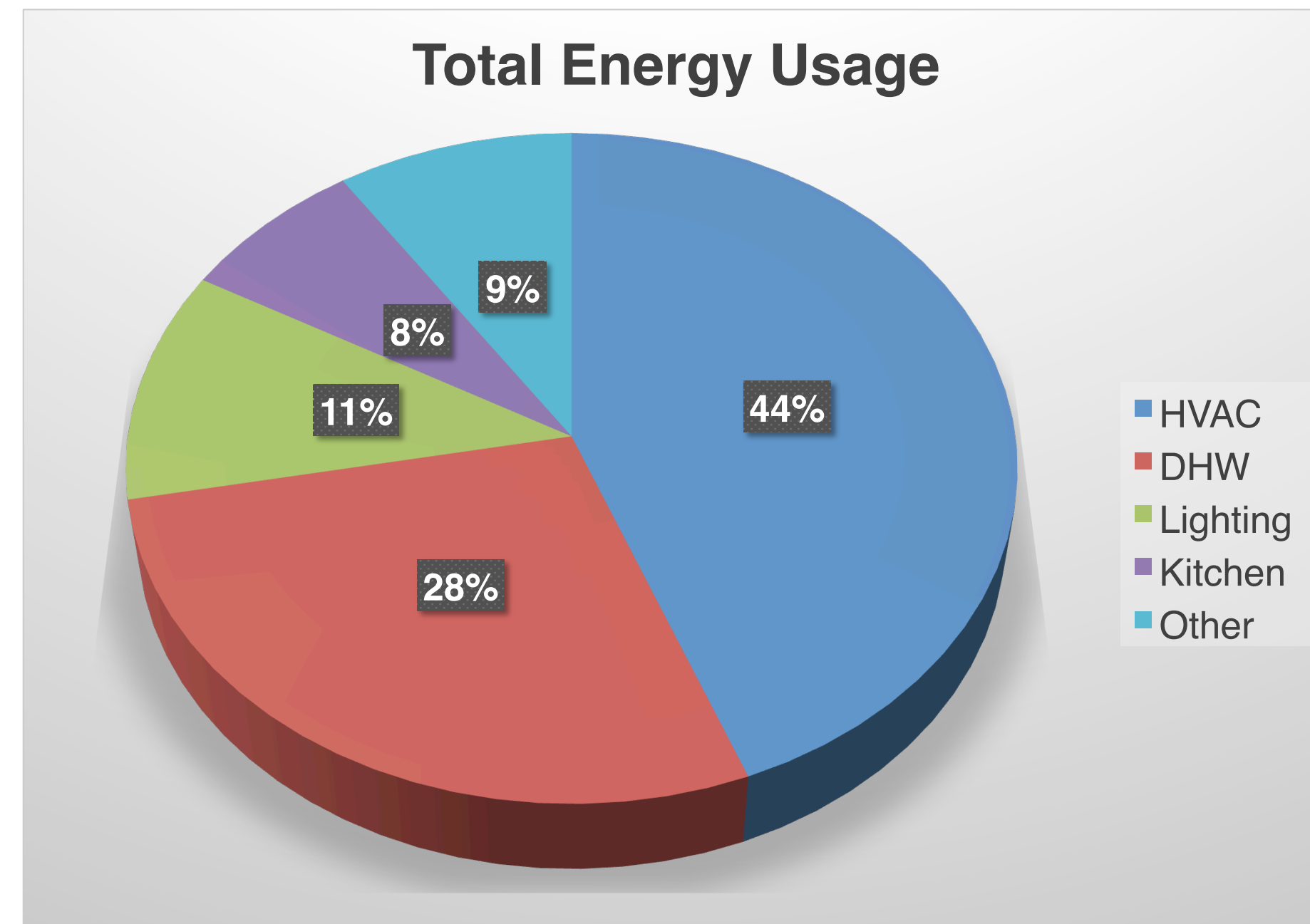
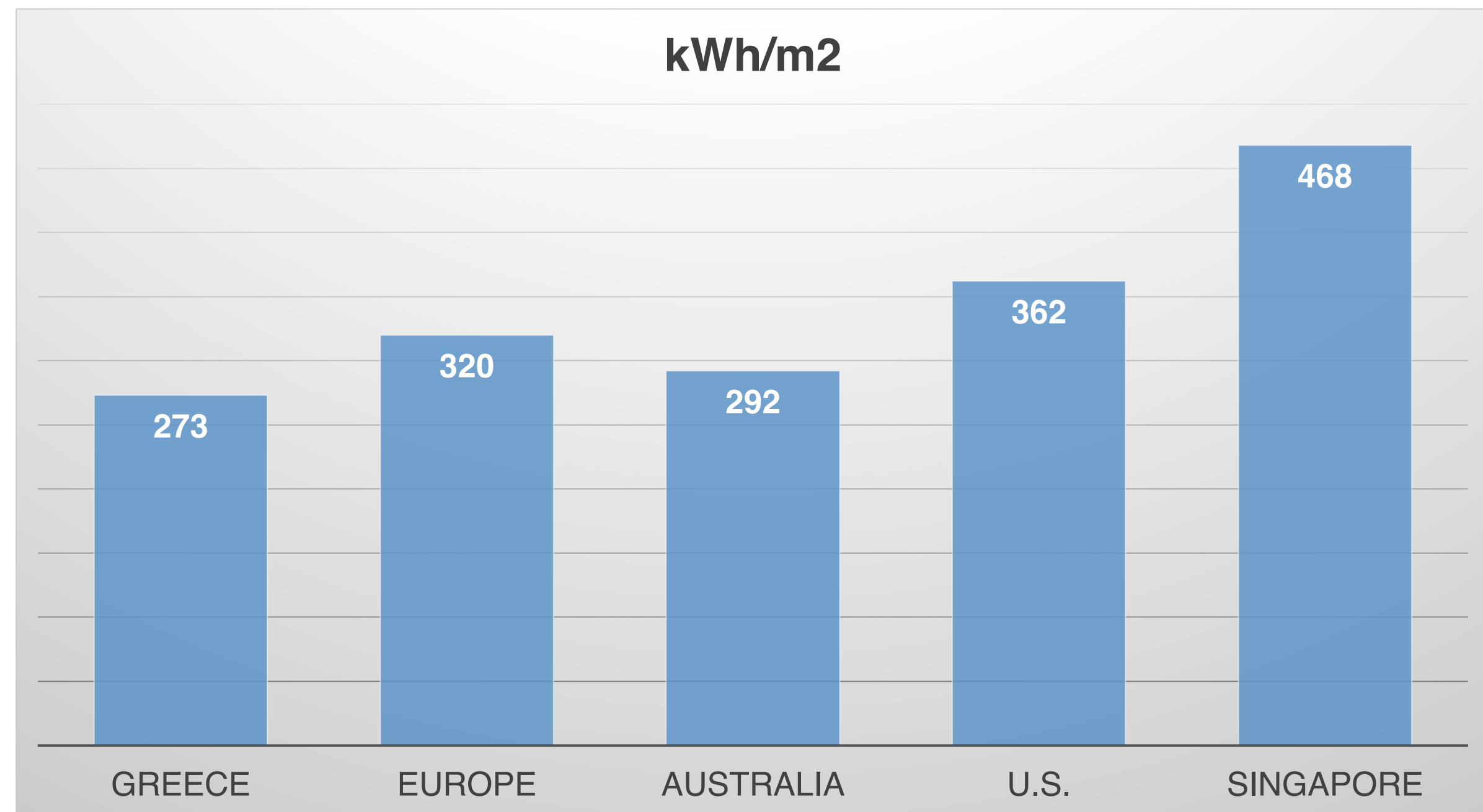
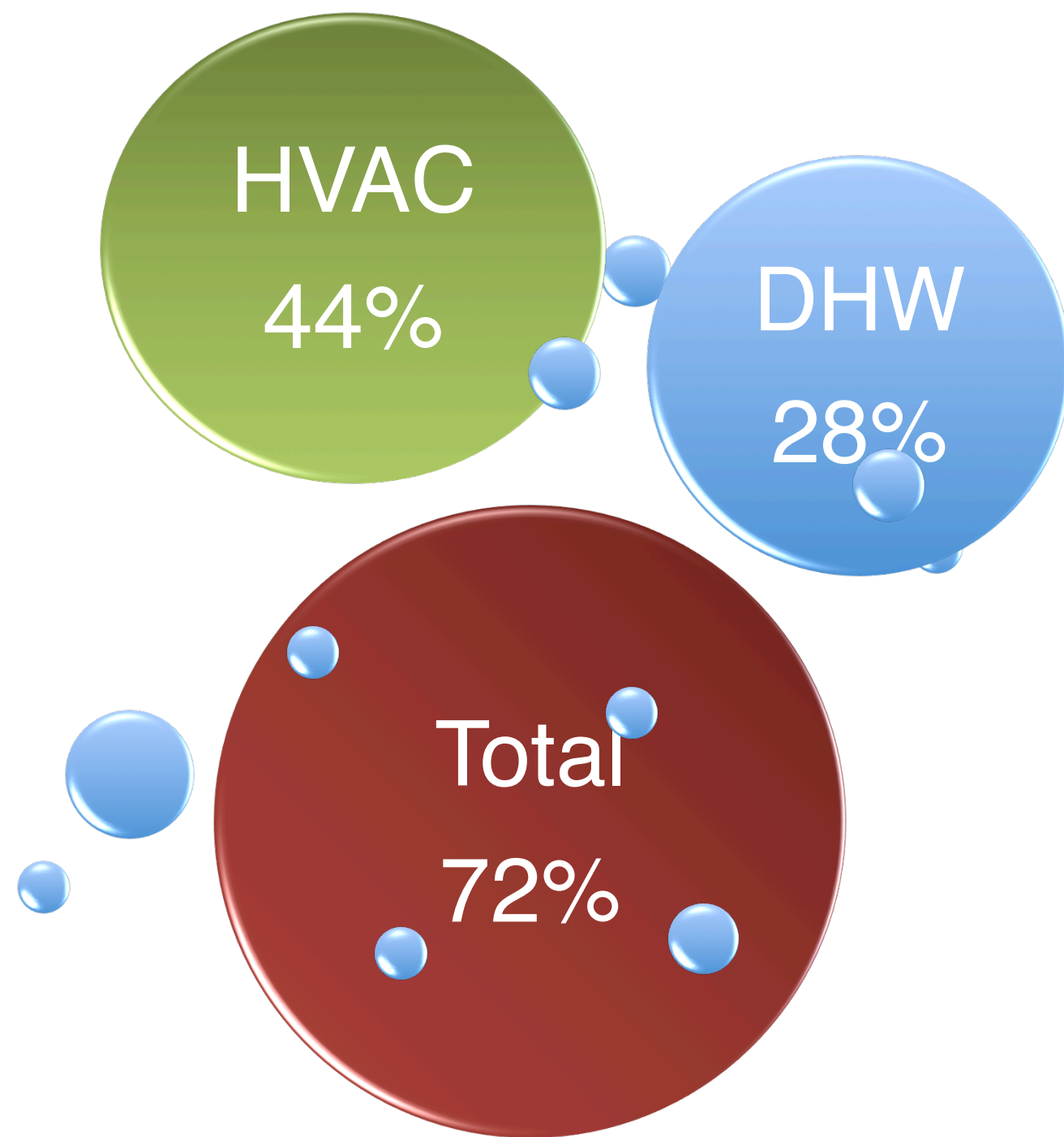
Solution driven

Turnkey projects



Hotel Industry Singapore





Hospitality Solution

CRS-KAV CO2 Water to Water Heat Pump

Designed by Klaas Visser

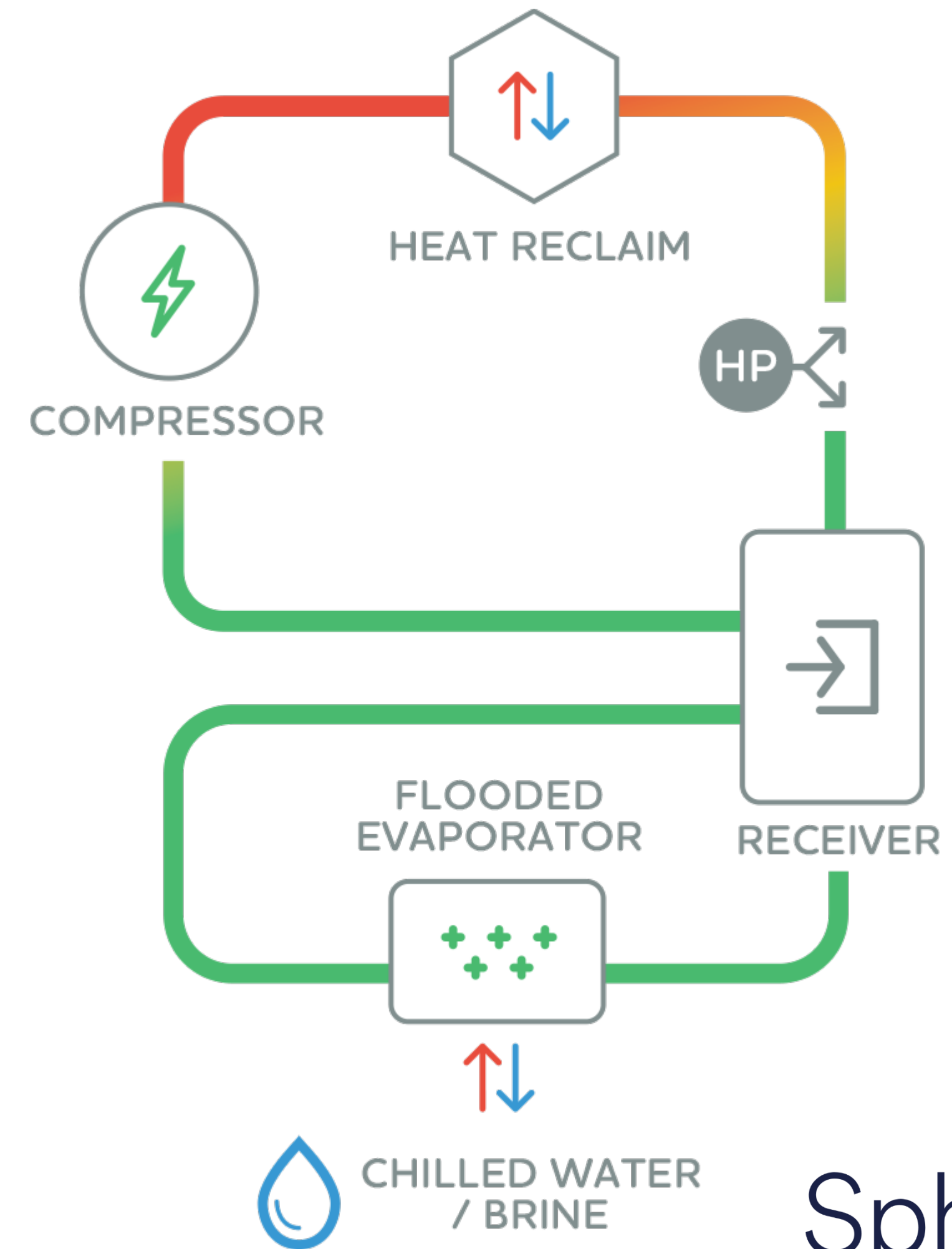
Manufactured by CRS

Using chilled water return as heat source

Utilizing supercritical CO2

Reduced Energy Cost

Reduced Carbon Footprint



Hospitality Solution

Chilled Water Return = Heat Source

Hot Water Temperatures of up to 80°C

COP = 7-8

CRS-KAV:

20-1000kW (Heating)



Case Study

Hotel: Electrical replaced by CRS-KAV Heat Pump

133kW Hot Water Required ($T_{in} = 25^{\circ}\text{C}$; $T_{out} = 60^{\circ}\text{C}$)

103kW Chilled Water Delivered ($T_{in} = 13^{\circ}\text{C}$; $T_{out} = 6,7^{\circ}\text{C}$)

COP = 7,2

318,896 kgCO₂E emission reduction per year



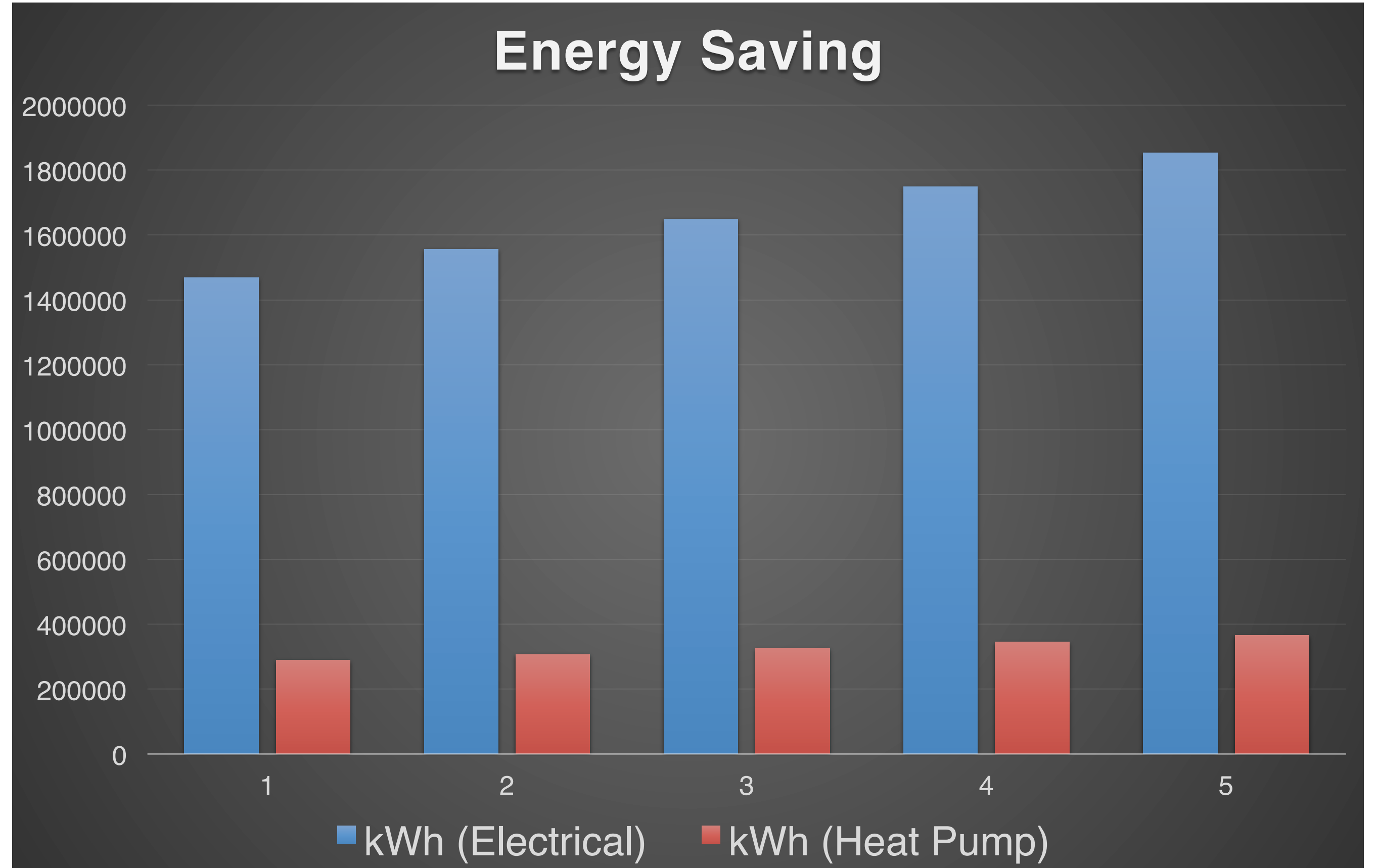
Case Study

80,3% Reduction

1,178,662 kWh reduction year 1

Water saving

ROI < 2 years





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Thank you for listening!

