

ATMO
sphere

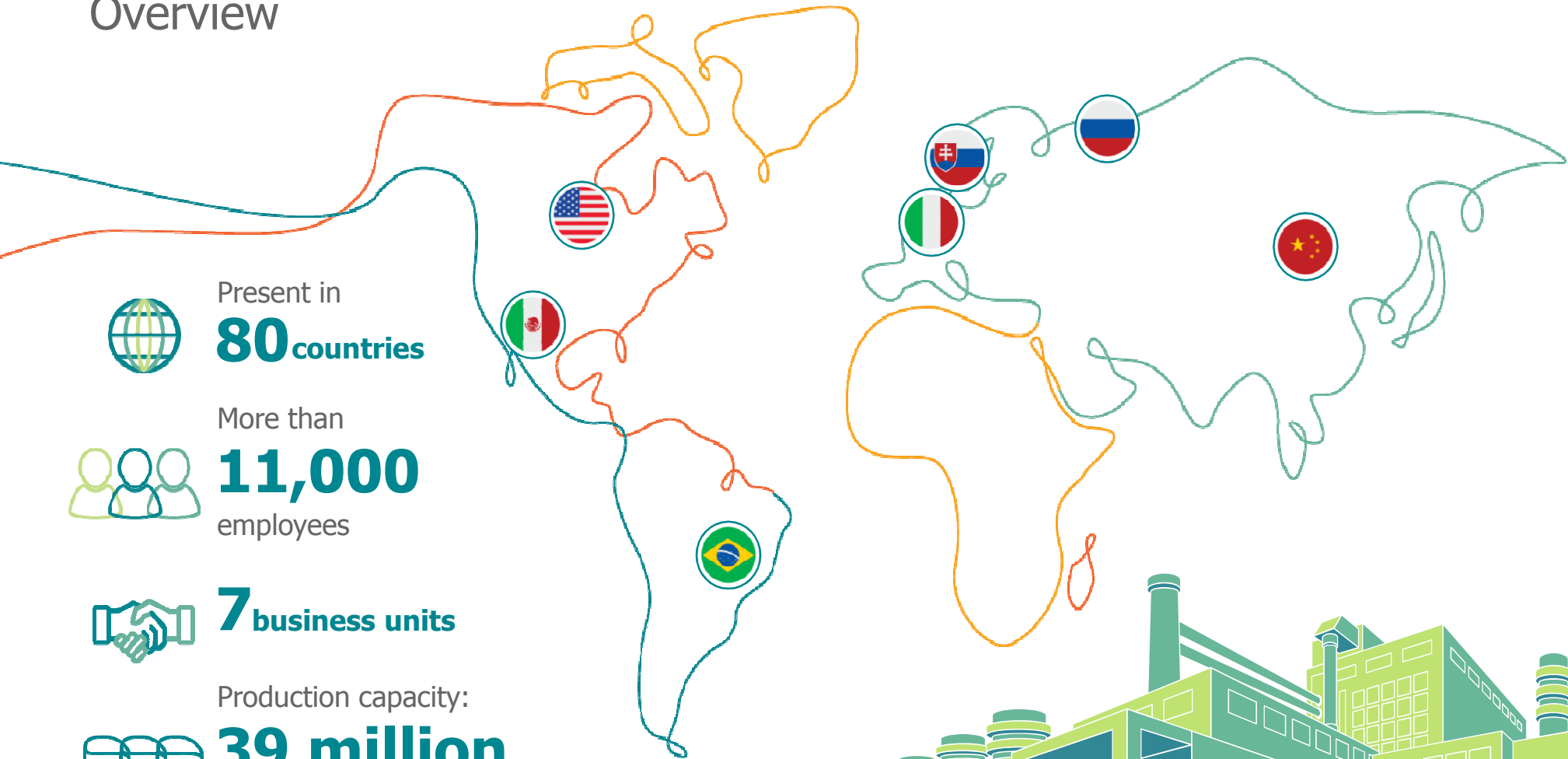
**How Can Embraco Help
Japanese Appliance Manufacturers
To Meet Future Energy Standards**

Marek Zgliczynski

embraco

Embraco

Overview



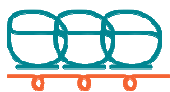
Present in
80 countries



More than
11,000
employees



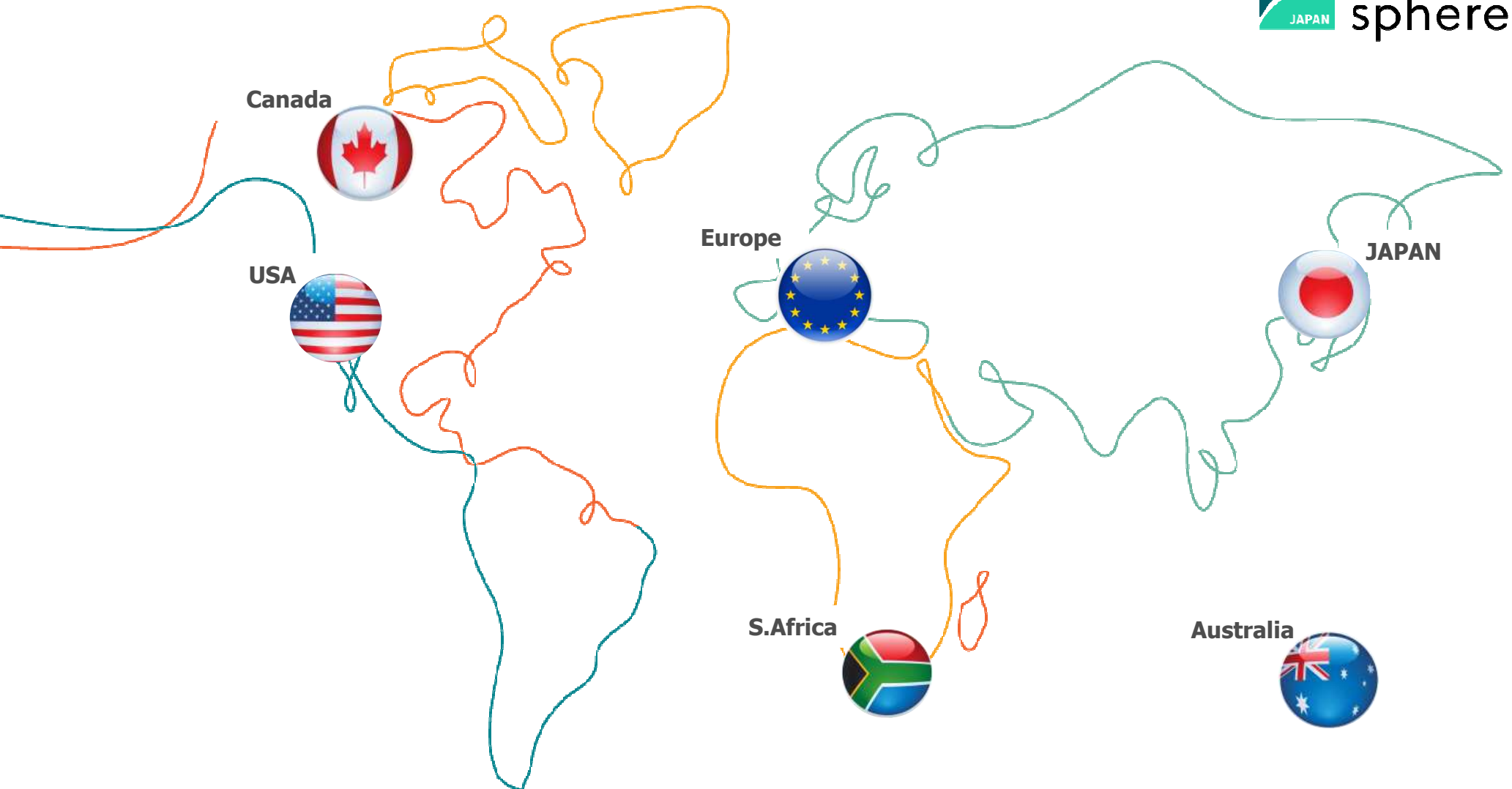
7 business units



Production capacity:
39 million
compressors/year

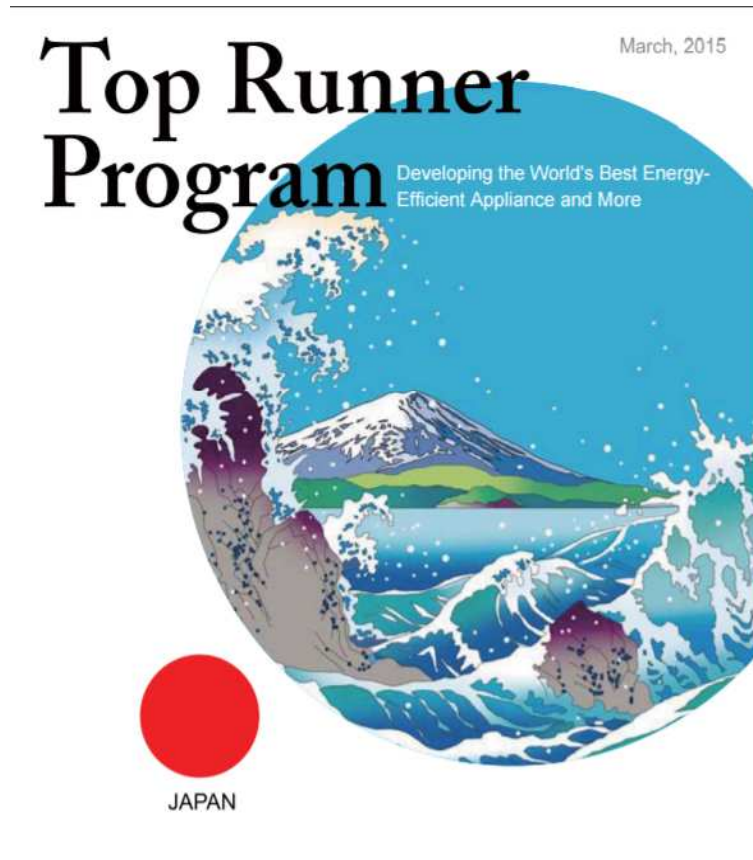


Energy Regulation For Commercial Refrigeration



ALL REGIONS HAS TO ADOPT MORE AGGRESSIVE ENERGY REGULATION TO MEET RECENT CLIMATE CHANGE ARGEEMENT OBLIGATIONS

Japanese Energy Regulations



TOP RUNNER PROGRAM for commercial refrigerators and freezer lead to more than 20% Energy Saving from 2007 to 2016

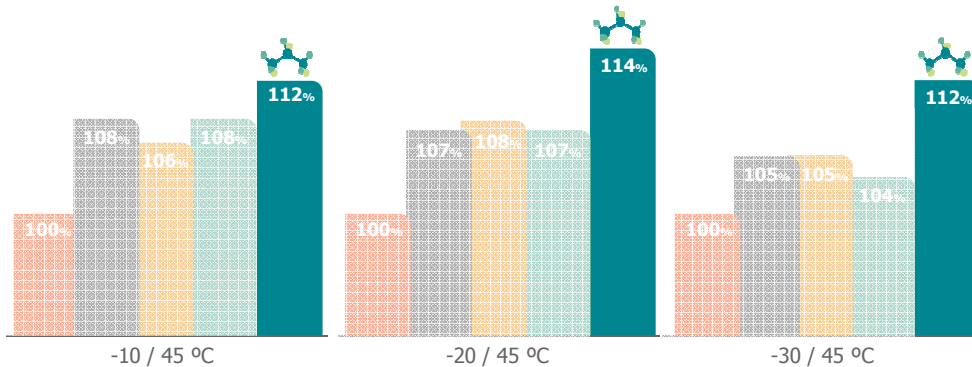
What is
the best option
for Household and Light
Commercial
systems in low GWP future ?

Low GWP options assessment



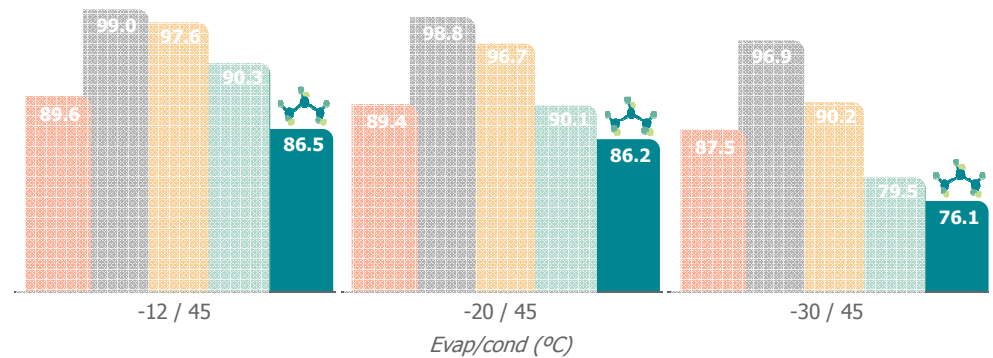
EFFICIENCY COMPARISON

% / Superheating 22.2 °C / Middle point based

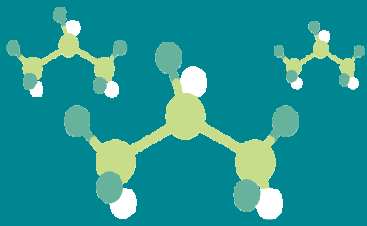


THERMAL REGIME EVALUATION

°C / Superheating 22.2 °C / Dew point based



■ R404A
 ■ A2L #1
 ■ A2L #2
 ■ A2L #3
 ■ R290

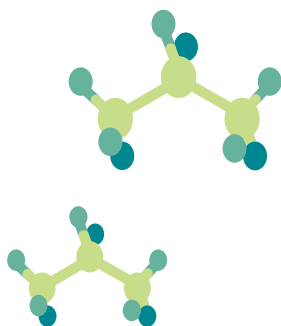


Propane (R290)
is the best in efficiency and in thermal level



Hydrocarbons

are the most sustainable choice
for future.



**Further reduction of energy
consumption is possible**

Thanks to

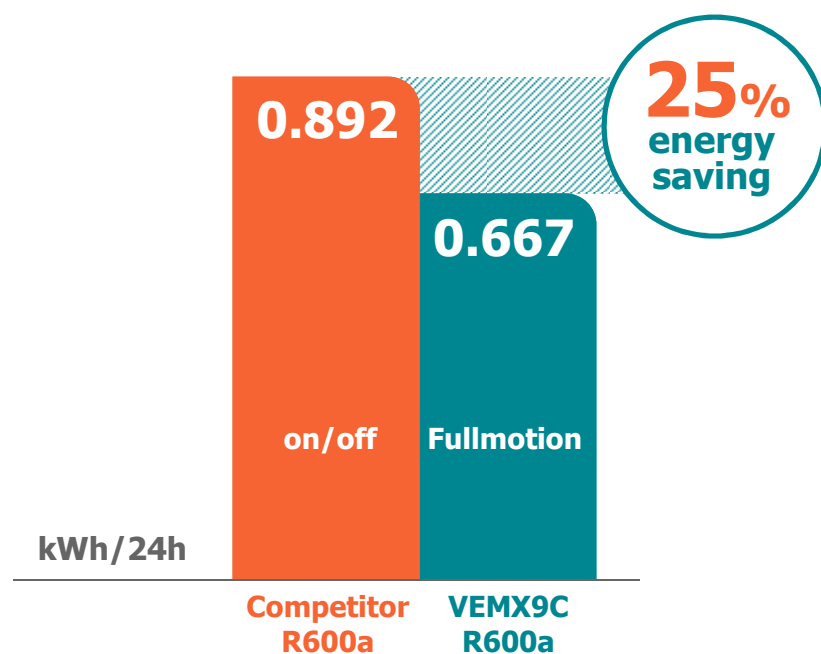
FULLMOTION

Inverter Technology



HO R600a refrigerator ON/OFF vs. Fullmotion compressor

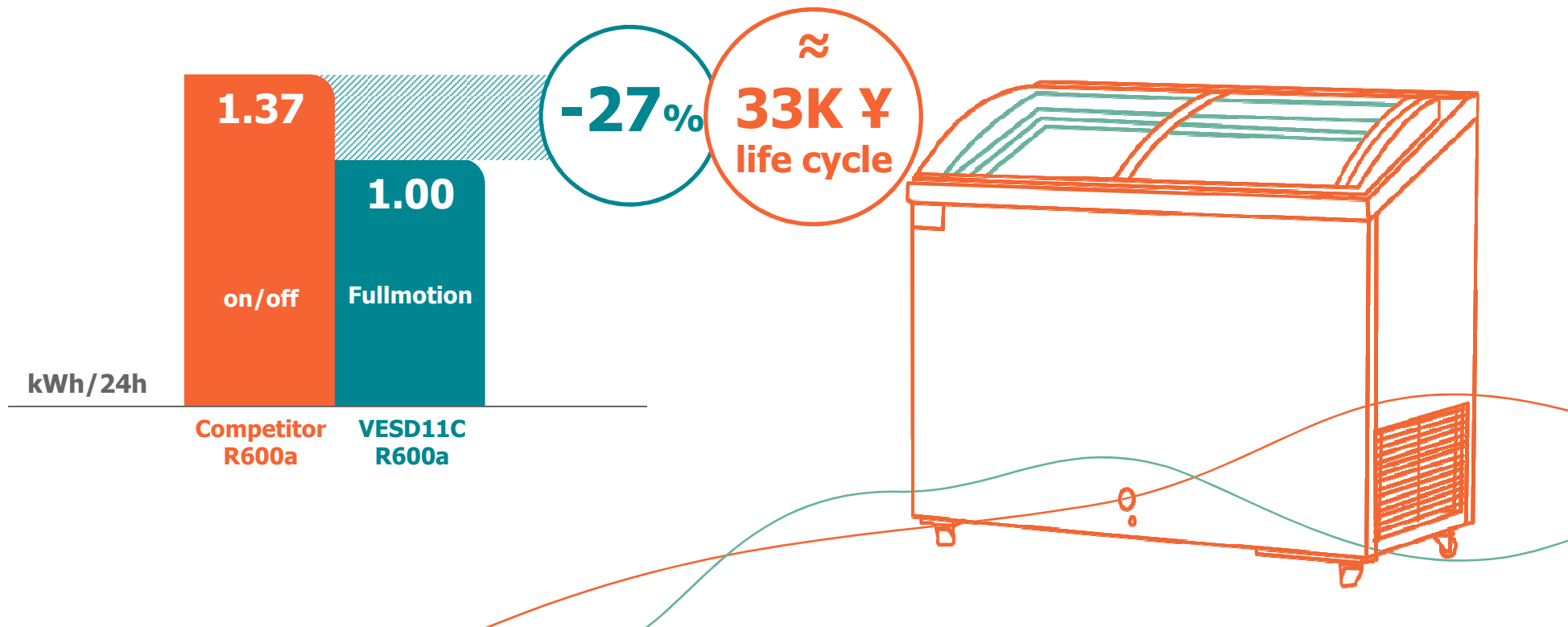
Already Standard for every A+++ household refrigerator



KEEP PREMIUM

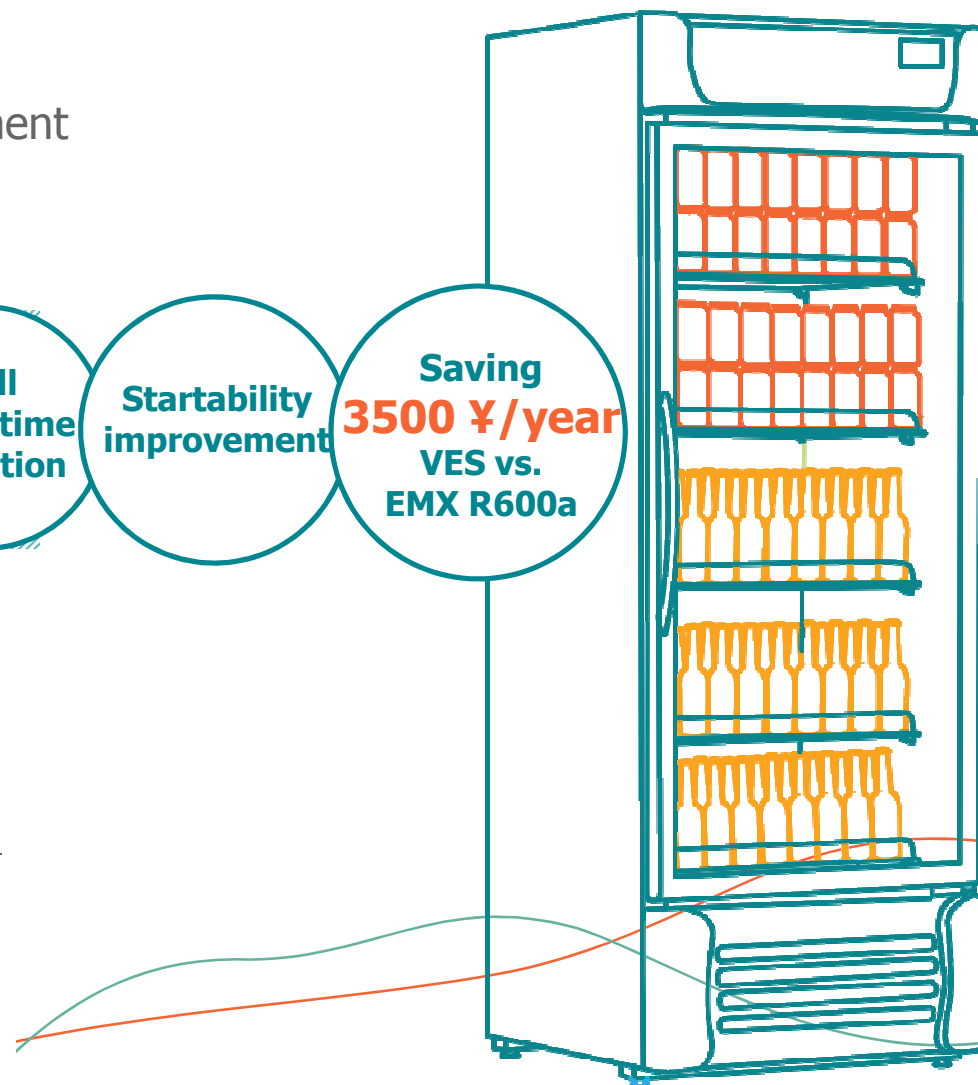
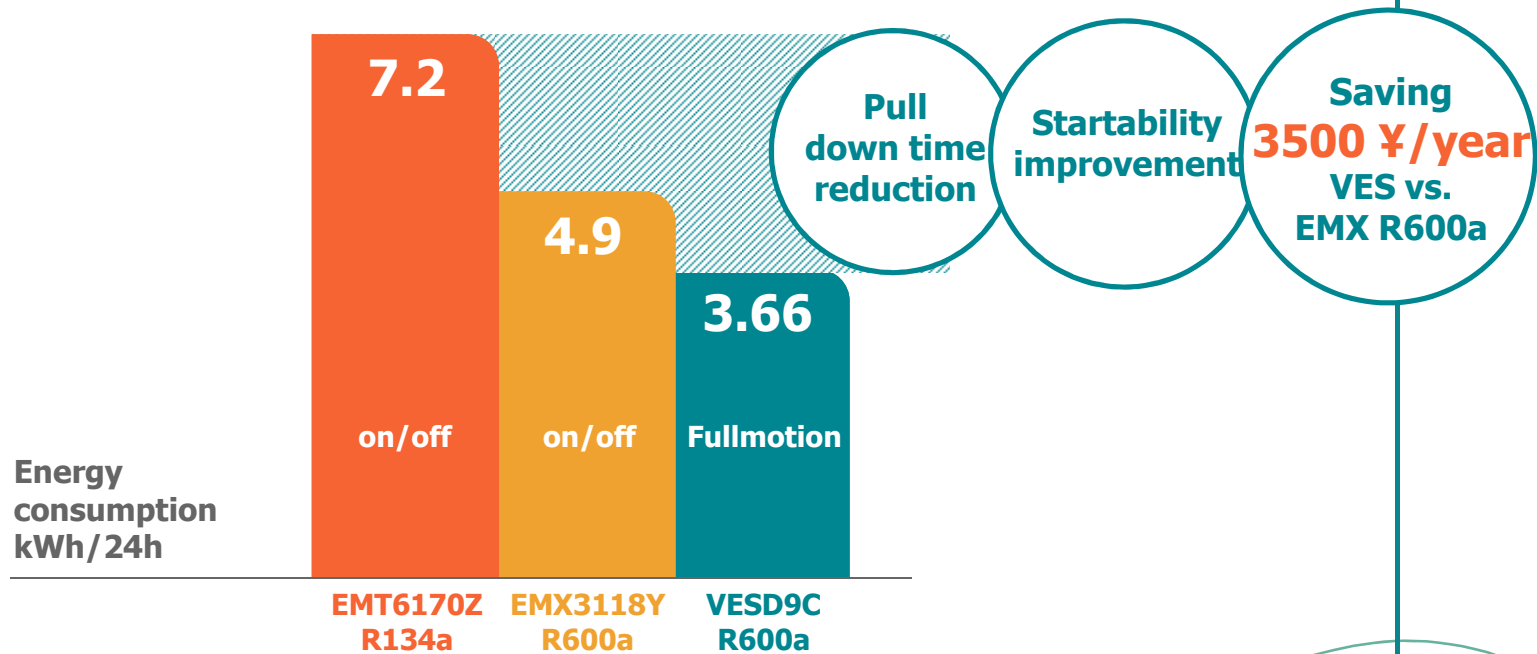
Ice cream freezer, 300L top efficiency

Keeping pace with toughest energy requirements coming from Specifiers every new season

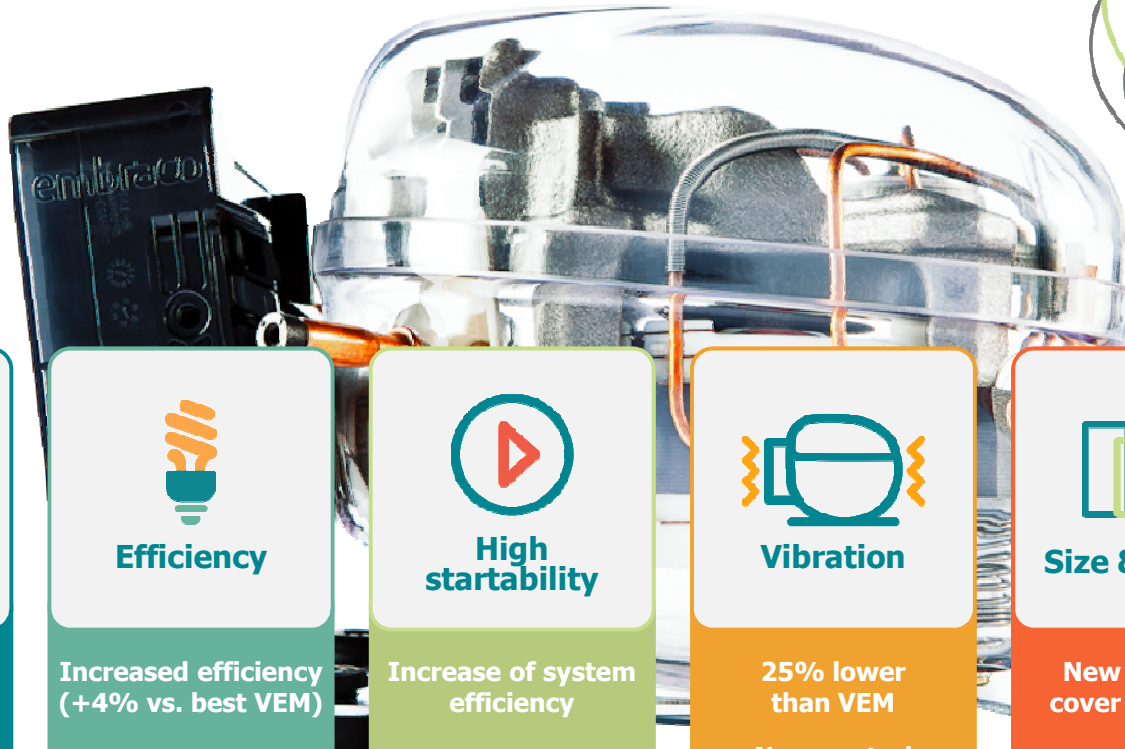


Embraco Fullmotion in a bottle cooler

Variable speed coming to Bottle Cooler segment



VES



Noise level

2 db lower than VEM with new suction muffler

Less restrictive to flow
New shell design



Efficiency

Increased efficiency (+4% vs. best VEM)

New control routines
Minimum speed to reach 1200 rpm



High startability

Increase of system efficiency

HST – High Starting Torque
Stop valve



Vibration

25% lower than VEM

New control routines
Optimized suspension



Size & Weight

New shell and cover (139 mm)

Optimized motor
New inverter (smaller box)

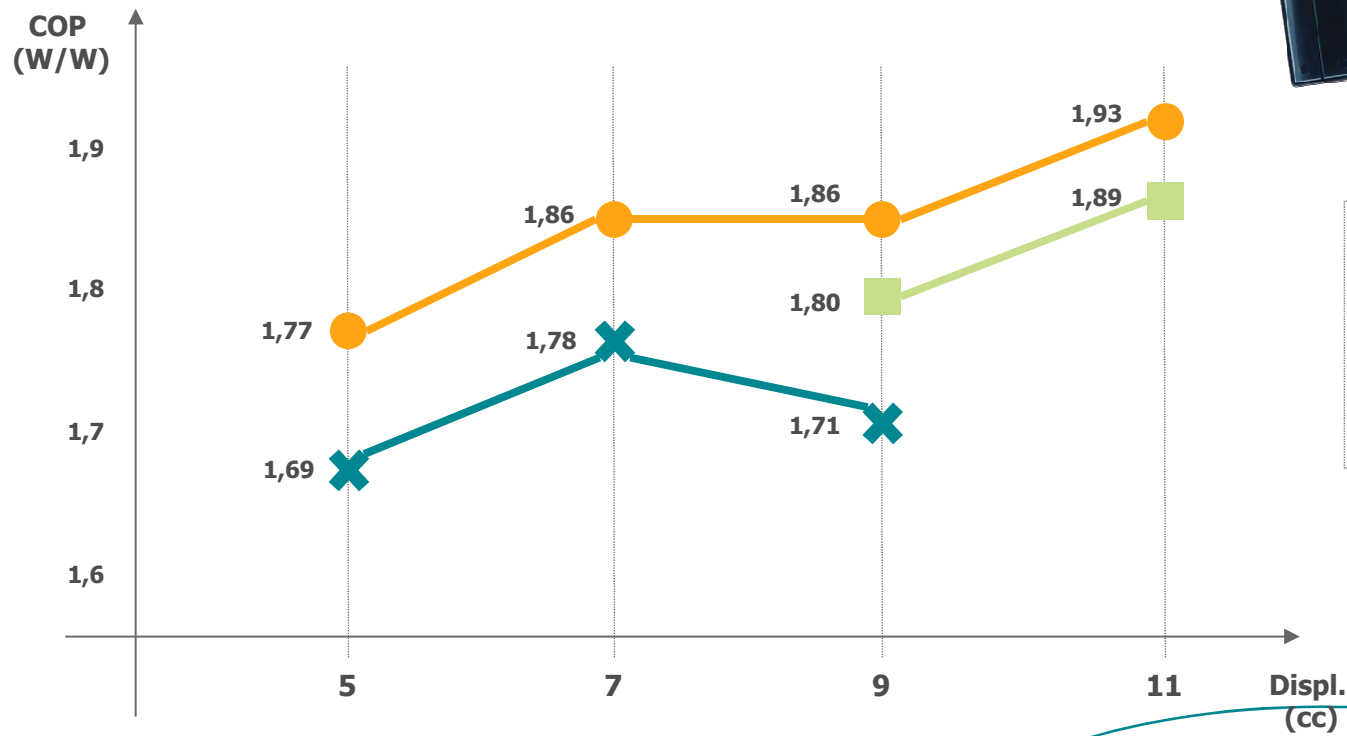


Pulsation

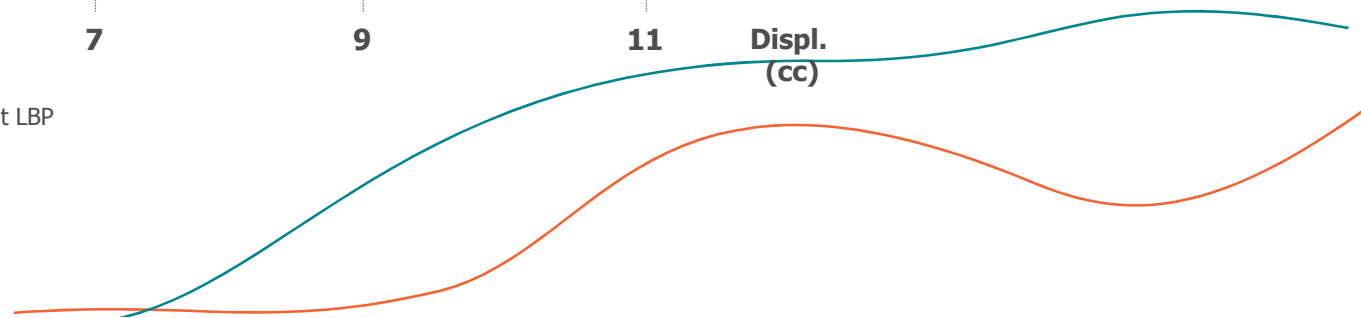
New crankcase and discharge filter

Second order filter

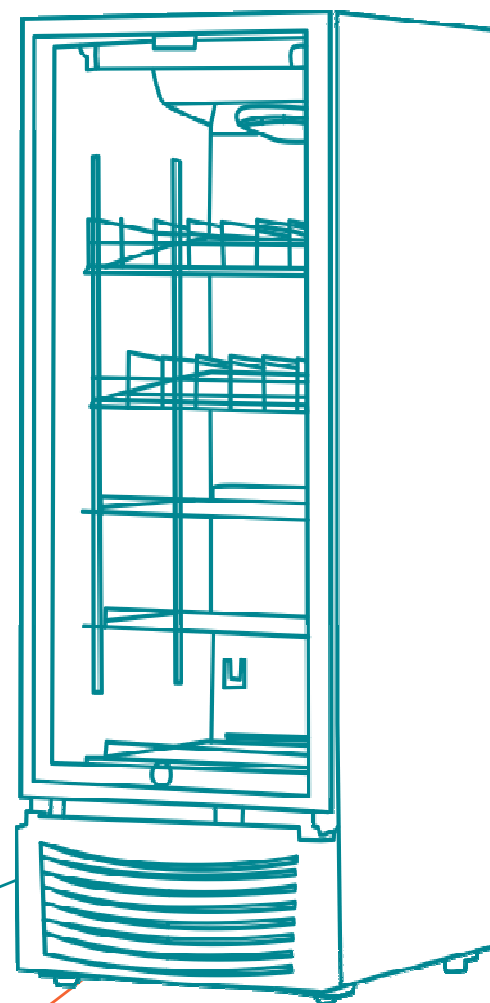
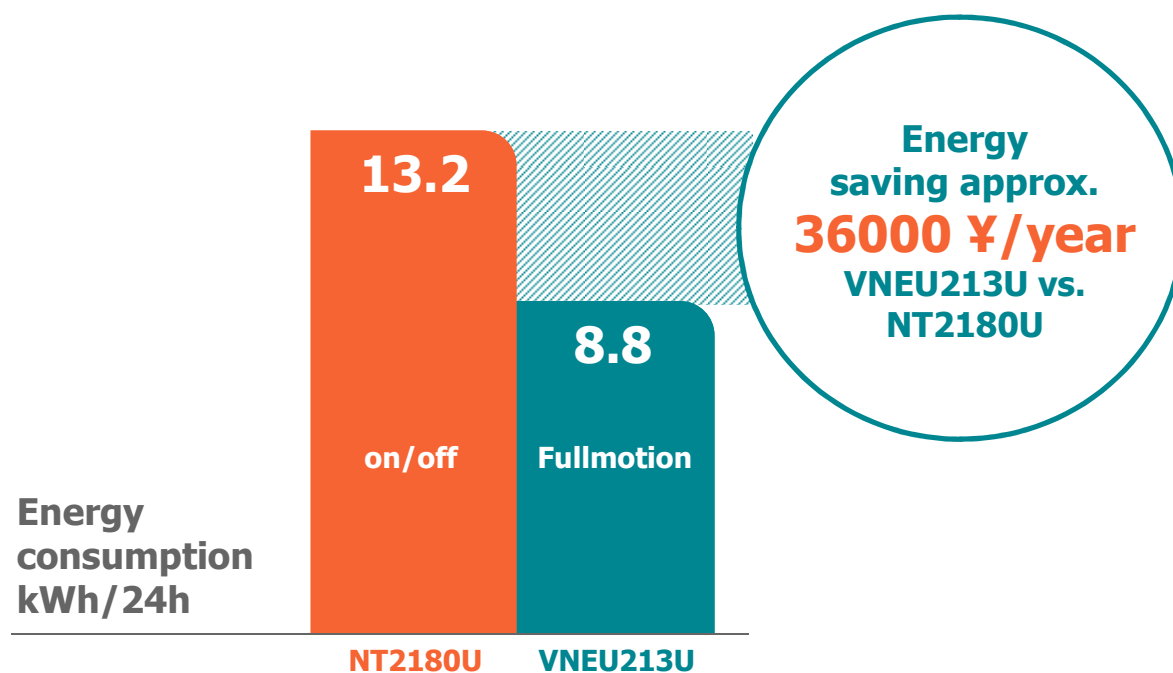
VES Compressors



*performance @ EN12900 rated point LBP

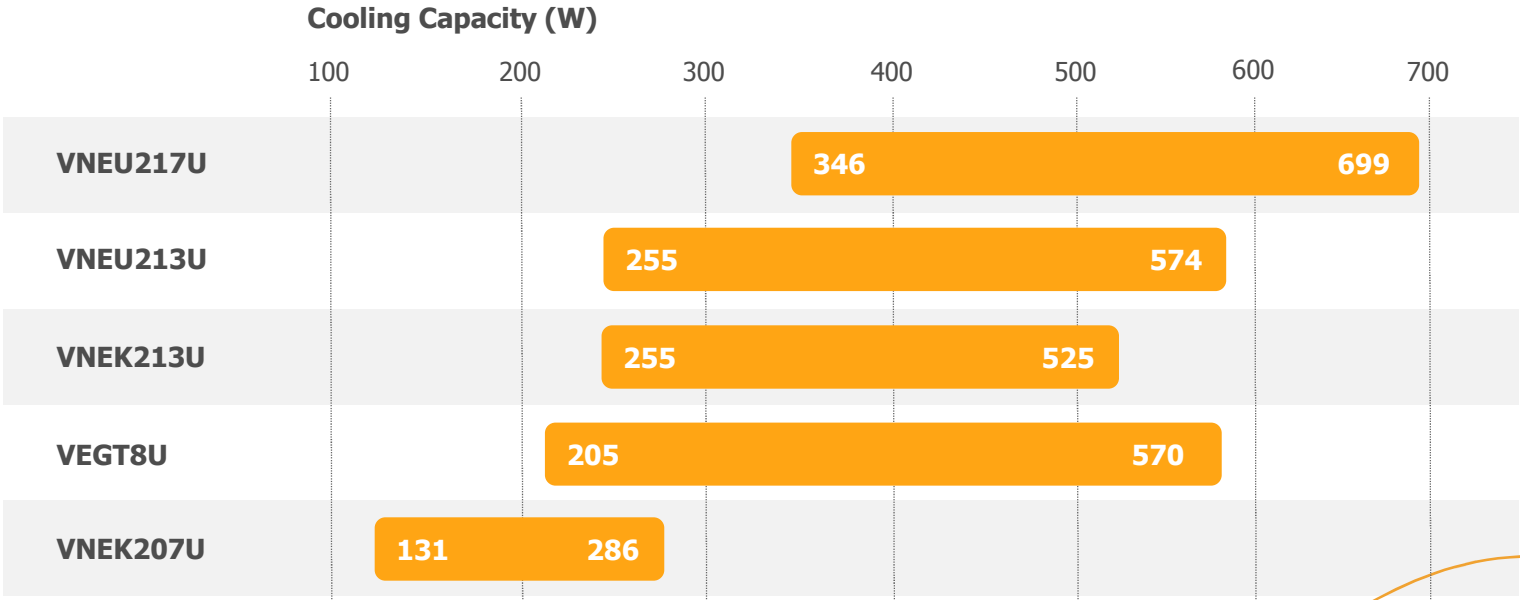


Fullmotion technology and R290 improve energy efficiency in vertical freezer application



Fullmotion Commercial Compressors

R290 Portfolio



*performance @ EN12900 rated point LBP

NEW INVERTER MAIA (1 kW)



Feature	Specification
Market	All
Nominal Input voltage	115/230V
Maximum output power	1000W
Control mode	Drop in / Frequency / Serial
Compressor Family	VNEU/K + VEGT +FMFT
Insitute approval	UL60730-1/IEC60335-2-34
Input NTC	Optional
Relay Output	Optional

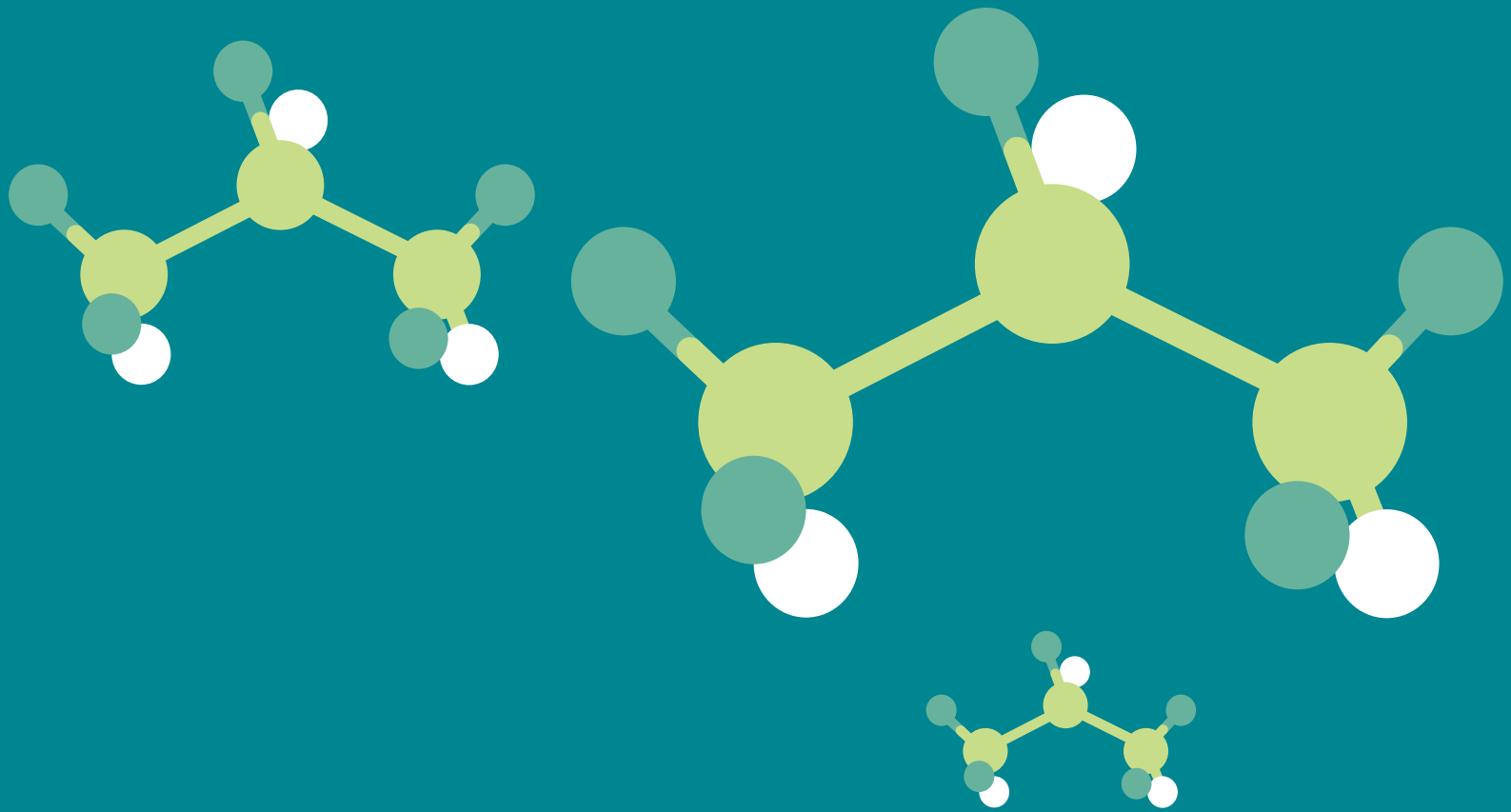
New compact Inverter Maia 1kW
offers **Bivolt version** (1ph 115/230V- 50/60Hz)

Conclusions

- Safety Concerns, International Legislation, Local Rules and Service Technicians Training Are Still Barriers For Larger Diffusion Of Hydrocarbons
- In Majority of Cases There Is No Any Cost Penalty When Using Hydrocarbons and Significant Saving of Energy Cost Allows Quick Payback of the Higher Cost Of Variable Speed Drive
- **More than 35%** of Embraco Sales for Light Commercial Segment is Using Already Hydrocarbon Refrigerants (R600a and R290) And They Are Growing Rapidly
- **The best option** For Household And Light Commercial

Refrigeration Is Combination of **HC refrigerants and Fullmotion technology** Minimizing And Indirect Impact To Global Warming





embraco

THANK YOU!

