CHILLVENTA

Chillventa Specialist Forums 2022
Chillventa Fachforen 2022

CONNECTING EXPERTS.

HOW TO COMBINE ECONOMY, EFFICIENCY AND REGULATION WITH A HEAT TRANSFER FLUID SYSTEM

Chillventa 2022

Pierre-Emmanuel Danet – Technical Support Manager

climalife®

climalife.com

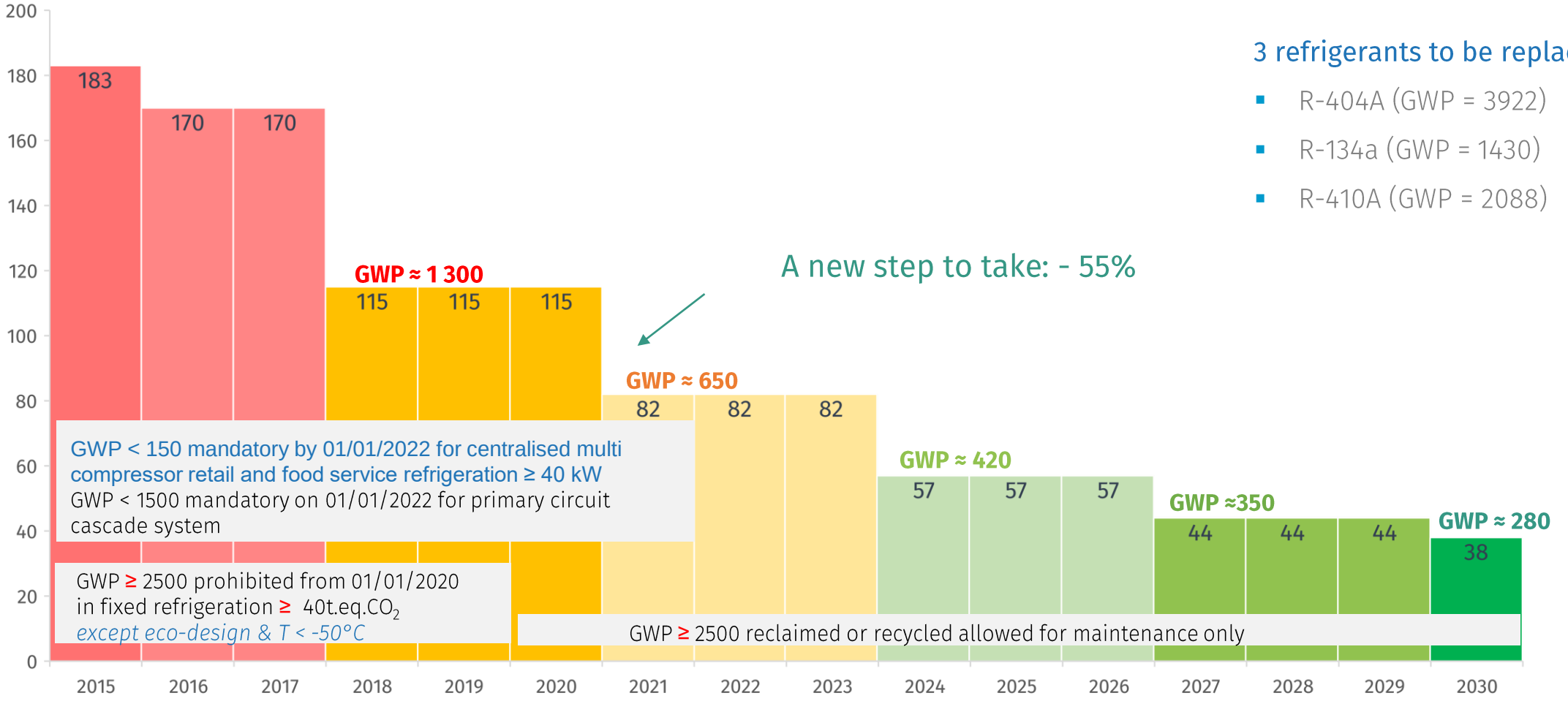
SUMMARY

- Regulatory situation in the refrigerant market
- Reconciling regulation and heat transfer fluids
- Reconciling economy, efficiency and regulation with a secondary system
- Different types of HTF
- Greenway® Neo N
- Customer testimonials

climalife®

REGULATORY SITUATION IN THE REFRIGERANT MARKET

What are the key next steps to be taken in Europe?



3 refrigerants to be replaced:

- R-404A (GWP = 3922)
- R-134a (GWP = 1430)
- R-410A (GWP = 2088)

climalife®

RECONCILING REGULATION AND HEAT TRANSFER FLUIDS

Do not confuse "non-harmful" with "food safe"

Non-harmful heat transfer fluids is not a food safe product.

To meet the needs of food industry, there is an NSF registration.

Two NSF categories for HTF:

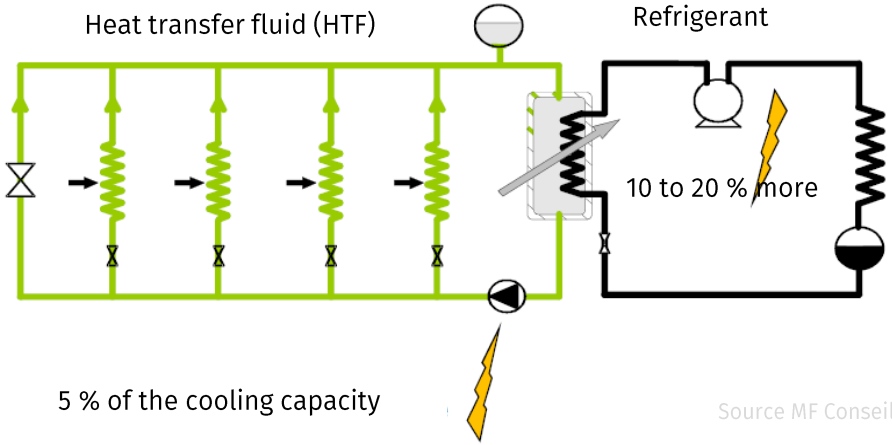
HT1 – incidental food contact.
HT2 – no food contact.

climalife®

RECONCILING ECONOMY AND EFFICIENCY WITH A SECONDARY SYSTEM

Reasonable or a contradiction?

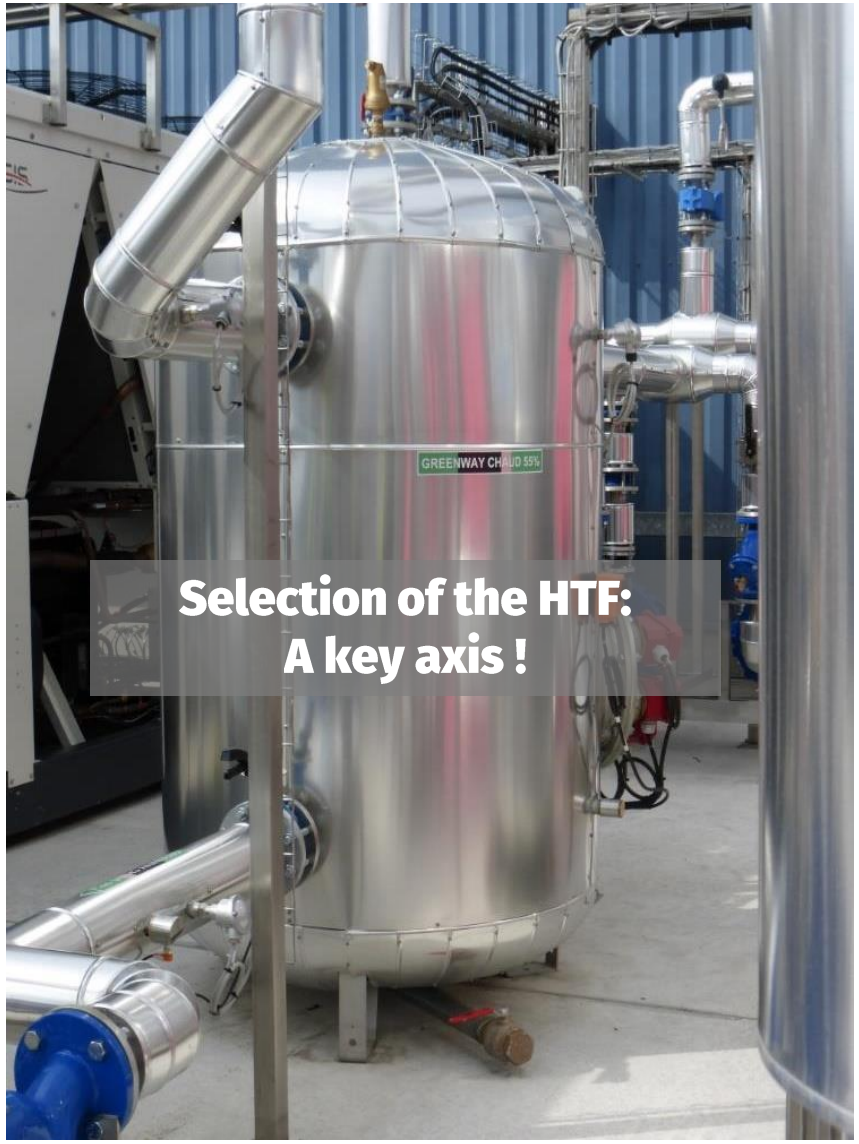
- A secondary system is more expensive (pump, intermediate exchanger, insulation, etc.).
- Higher consumption than a direct system.
- Energy loss during transfer compared to direct expansion +2% on average per additional degree to reach the same application temperature.



Source MF Conseil

For application temperature = 0°C
T evap. in direct expansion = -5°C
T evap. indirect expansion = -15°C
T HTF heat exchanger outlet = -5°C
T HTF heat exchanger inlet = -10°C

Refrigerant charge
- 5 to 7 kg / kW for direct system
- 0.5 to 2 kg / kW for indirect system



An indirect system consumes about 15 to 25 % more than a direct system.

climalife®

RECONCILING ECONOMY, EFFICIENCY AND REGULATION WITH A SECONDARY SYSTEM

Characteristics to consider when selecting the heat transfer medium:

Safety

- Flamability
- Toxicity
- Compatibility with the application
- Impact on the environement : discharge and destruction

HTFs are technical fluids:

Metals	Greenway® Neo N	Standard limit value
	Mass loss - mg/platelet	ASTM D 3306
Copper [10 Max]	- 8.8	[- 10 ; +10]
Brass [10 Max]	- 8.6	[- 10 ; +10]
Welding [10 Max]	- 1.7	[- 30 ; +30]
Aluminium [10 Max]	- 1.0	[- 30 ; +30]
Cast iron [10 Max]	5.0	[- 10 ; +10]
Steel [10 Max]	0.3	[- 10 ; +10]

Normative references Test method: ASTM D 1384B

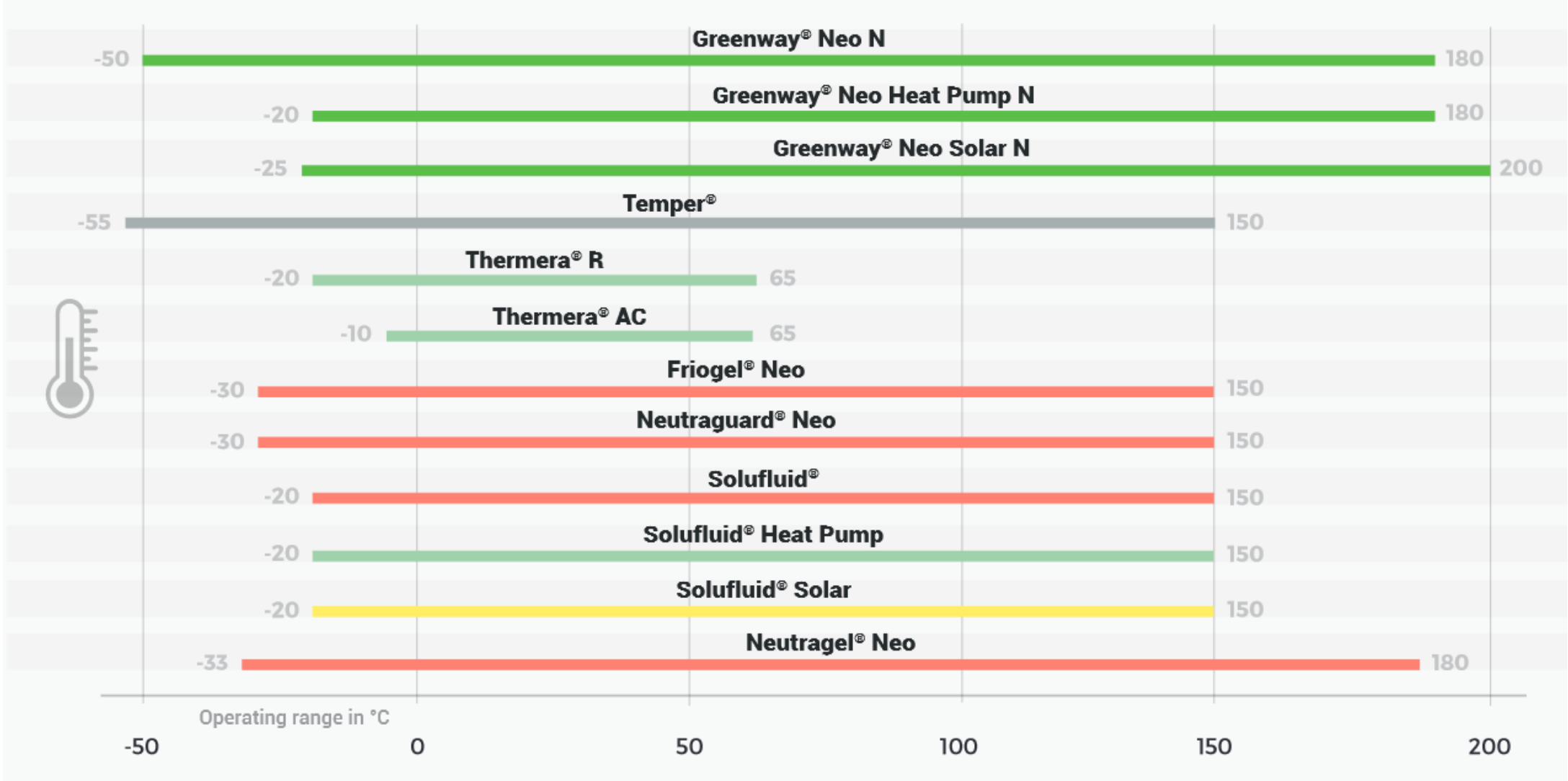
The corrosion test shows a clearly favourable behaviour on steel, aluminium and solder, the same on cast iron and more significant on copper and brass, but still within the limits.

They meet a number of requirements:

- Anti-corrosion / Material compatibility
- Chemical stability
- Surface tension
- Inhibitors - low impact on energy transfer, easy to control, no biological action in the system

climalife®

THE CLIMALIFE HTF RANGE COVERS A WIDE RANGE OF TEMPERATURES



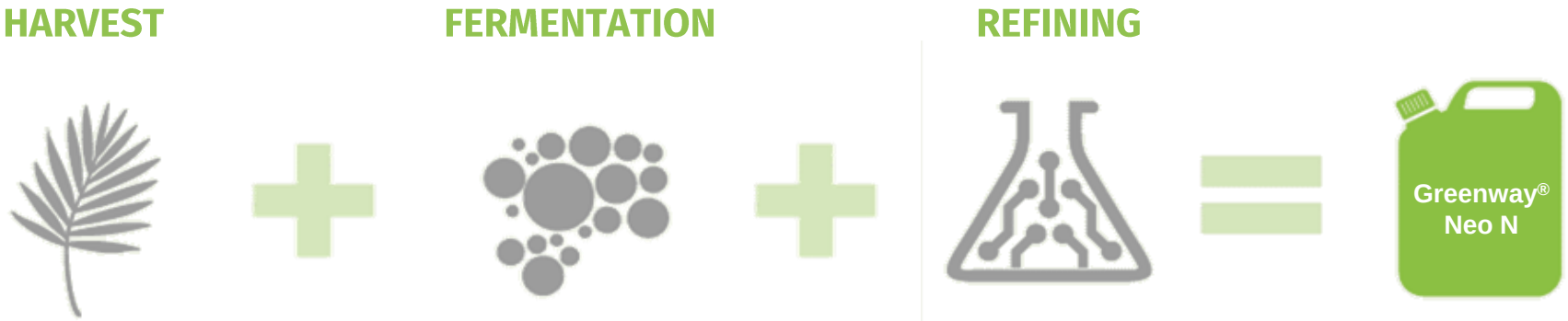
climalife®

THE NEW HTF RANGE: GREENWAY® NEO N

The ecological and environmentally friendly alternative

- Avoiding the use of fossil resources
- Expanding the use of the heat transfer fluid to other applications
- Maintain or improve energy efficiency
- For refrigeration, air conditioning, heating and domestic hot water

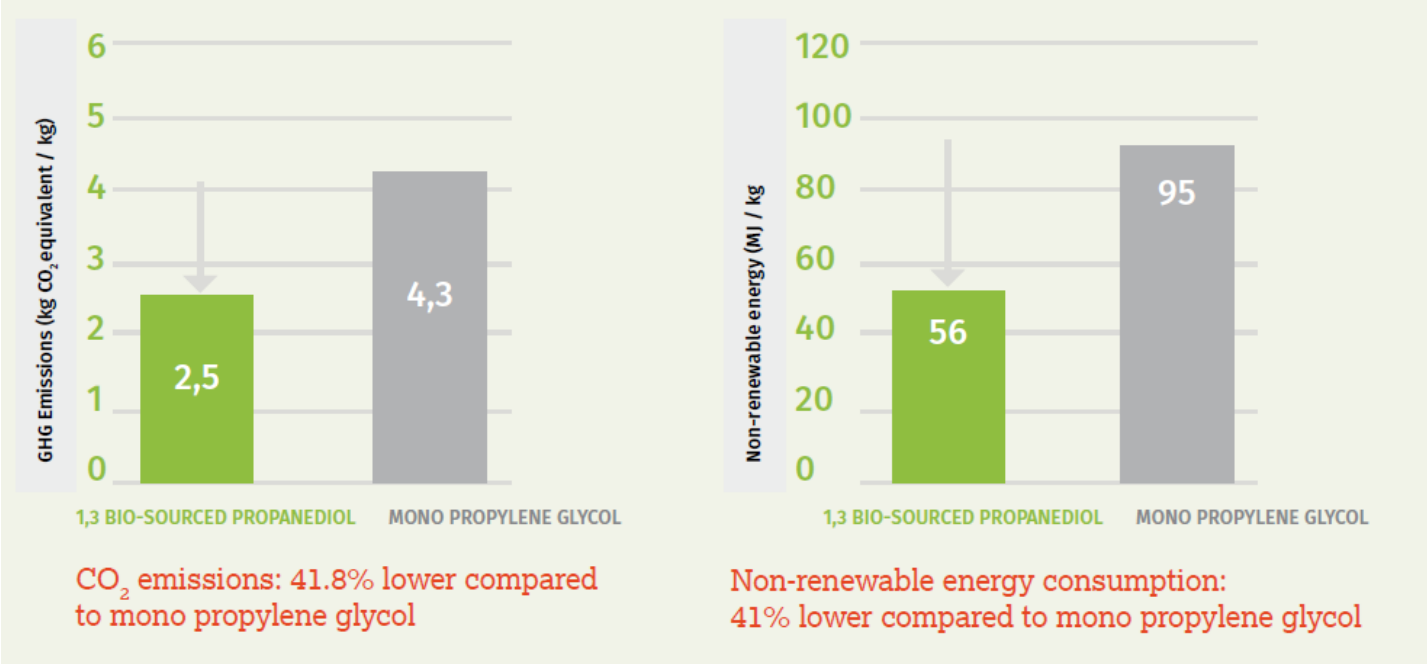
Production of bio-based 1,3 propanediol



climalife®

1,3 BIO-BASED PROPANEDIOL: LIFE CYCLE ASSESSMENT

The environmental footprint of Greenway® Neo N is reduced by 40% compared to a traditional MPG



Environmental impact assessment from raw material extraction to post-production delivery

Source: DuPont Tate & Lyle Bio Products

climalife®

SPECIFIC FEATURES OF THE GREENWAY® NEO RANGE N

Biodegradable

- Reduced risk of soil pollution in the event of a leak.
- Ideal for geothermal systems.

Powerful hybrid inhibitors

- Anticorrosive formulation H-OAT (neutralised carboxylic acids) without nitrite or amine.
- Excellent corrosion protection (tested according to ASTM D1384).

Bacteriostatic

- The formula of Greenway® Neo N, prevents the development of bacteria and avoids moulds, fungi or algae that alter the flow and heat exchange in the networks (bacteriostatic according to the international standard ISO 11930).

OECD 302B - **primary intrinsic biodegradability, 90% to 100% in 28 days**, tested and validated by SGS*.

ISO 11930 standard - **bacteriostatic** from a concentration of 30% by volume**.**

** The disposal or treatment of waste must be **submitted to the local authorities.***

climalife®

GREENWAY® NEO N RANGE : APPLICATIONS / MARKETS / INDUSTRIES

Applications

- Refrigeration
- Air conditioning
- Solar thermal
- Hot water production
- Heat pumps
- Central heating
- Sprinklers
- Underfloor heating
- District heating
- Fire protection
- Geothermal energy
- And more...

Industries

Food processing

Health / Wellness

Building

Other

Energy

climalife®

GREENWAY® NEO N

Food production - Refrigeration

GREENWAY® NEO N : REGISTERED NSF HT1*

The 1st bio-sourced 1,3-propanediol heat transfer fluid registered NSF HT1*

Ideal for Food & Industrial applications

Formulae adapted to the safety of professionals and users

Greenway® Neo N is registered by NSF International (National Sanitation Foundation) for use in secondary refrigeration systems, where there may be a risk of accidental contact with food products.

The **Greenway® Neo N** is :

- Non-toxic
- NSF and FDA compliant composition

** NSF certification provides evidence that commercial food equipment meets the requirements of the US FDA Food Code.*

***Food and Drug Administration (FDA).*

climalife®

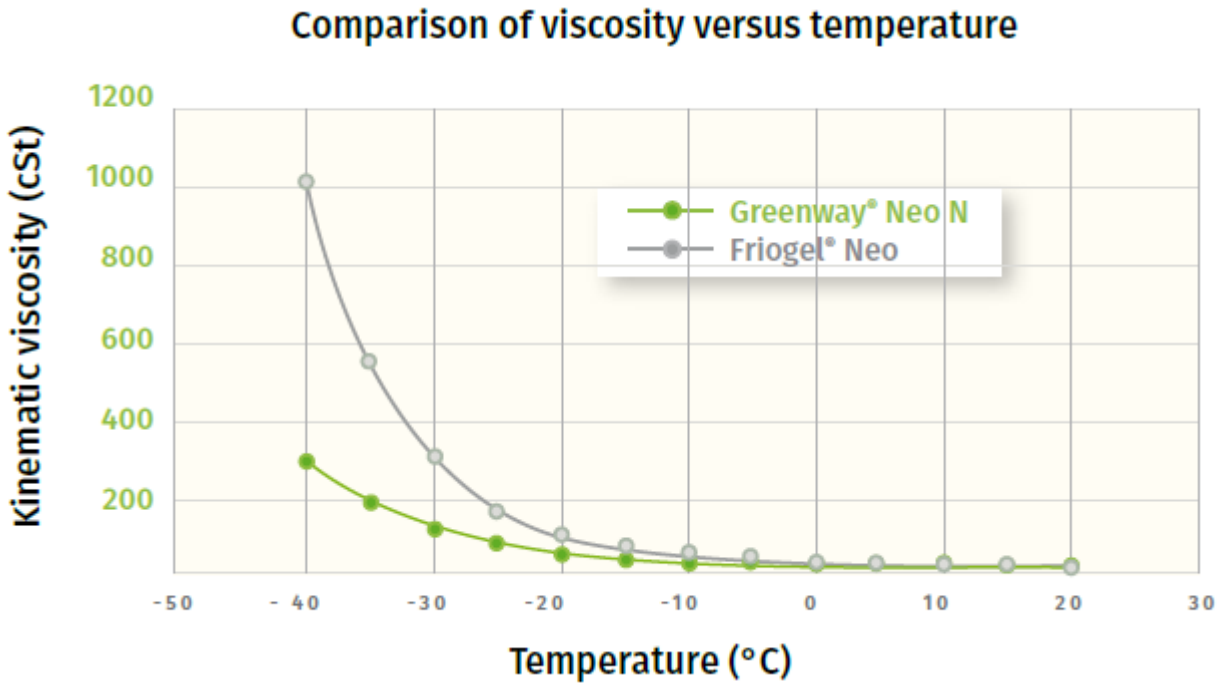
ADVANTAGES: THE VISCOSITY OF GREENWAY® NEO N

Greenway® Neo N

This coolant has a lower viscosity than MPGs and can be used at very low temperatures, unattainable with MPGs.

Low viscosity of the Greenway® Neo N offers better performance:

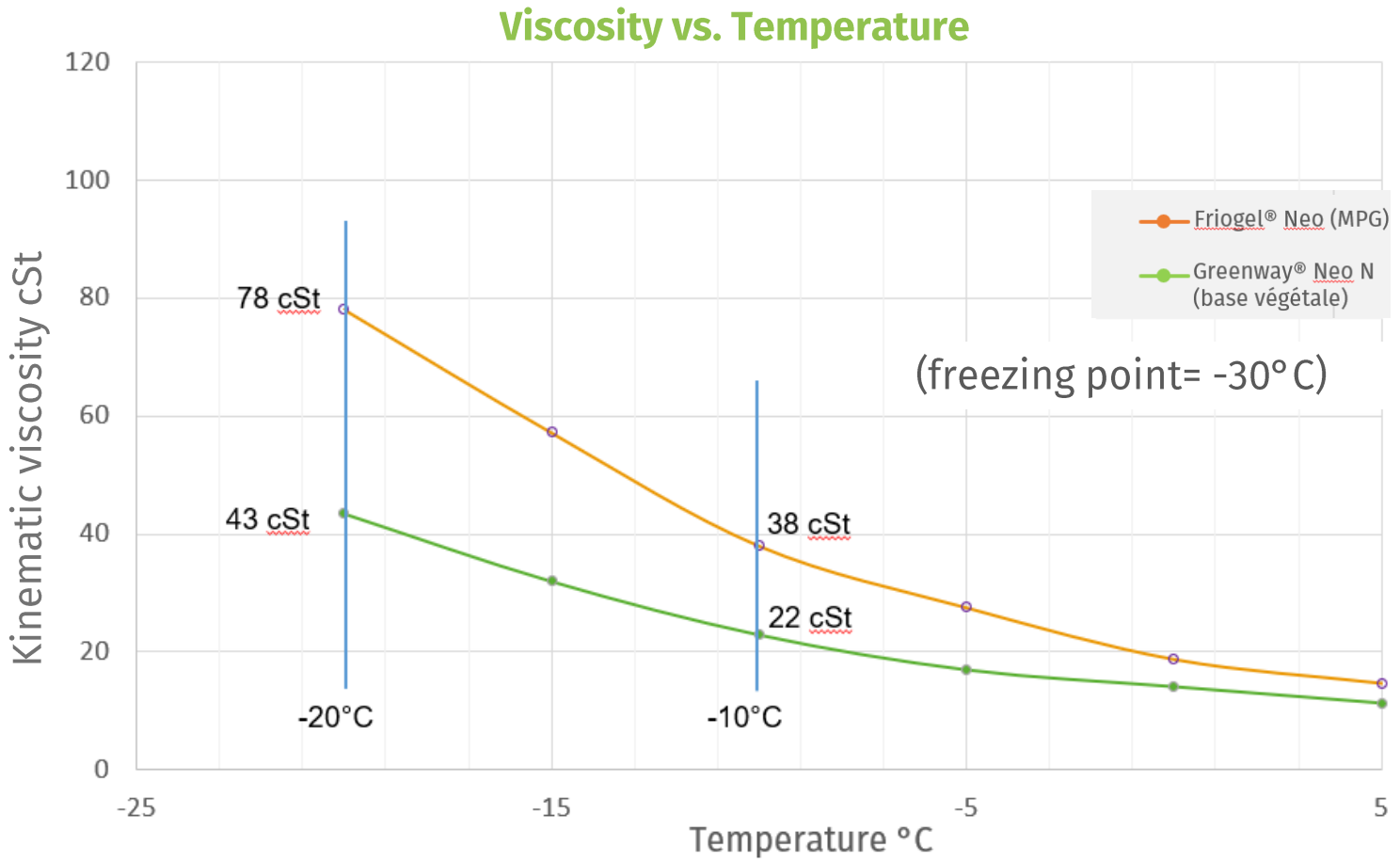
- Reduced power consumption due to improved energy efficiency.
- Lower cost design using smaller pumps and reduced pipe diameters.
- A reduction in the noise level of the pumps.



climalife®

ADVANTAGES: THE VISCOSITY OF GREENWAY® NEO N

Viscosity of Greenway® Neo N vs. MPG



AT -10°C :
Greenway® Neo N = 22 cSt
MPG = 38 cSt
Difference 42%.

AT -20°C :
Greenway® Neo N = 43 cSt
MPG = 78 cSt
Difference 45%.

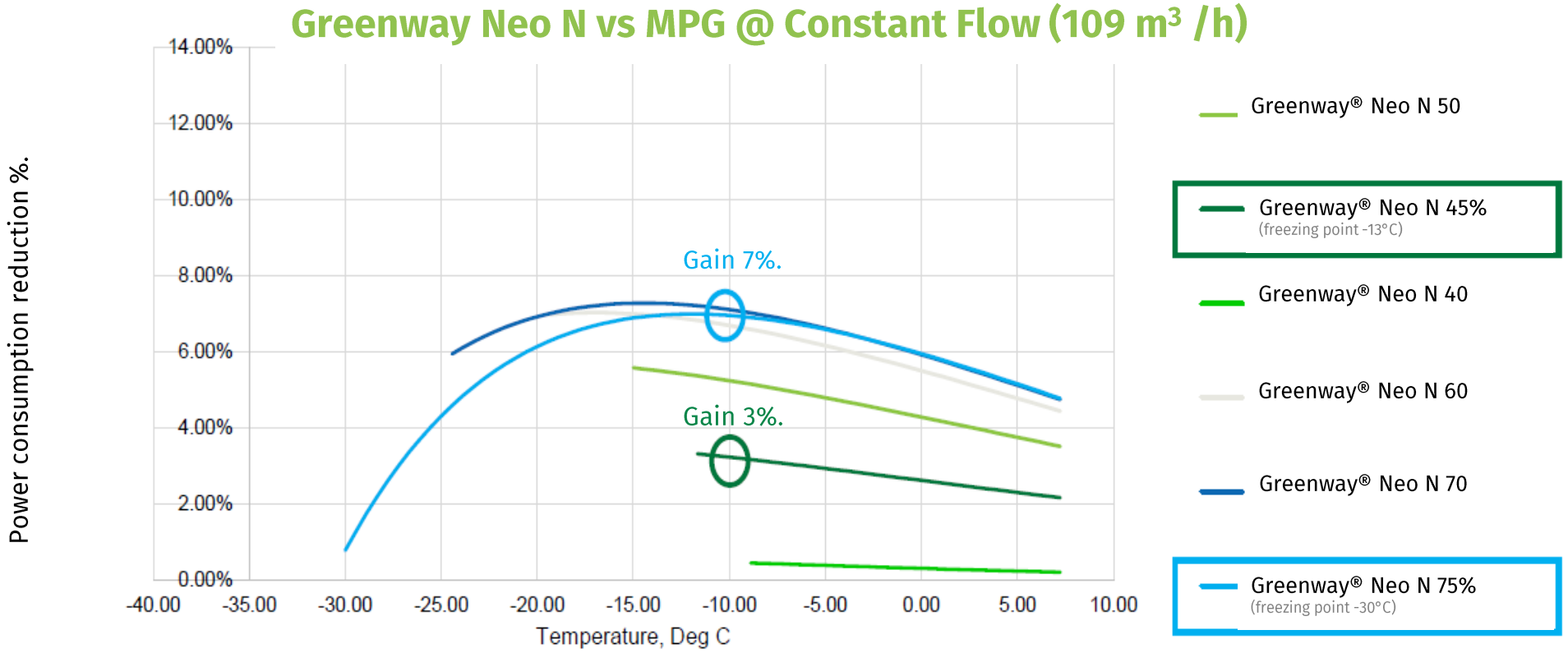
climalife®

ADVANTAGES: REDUCED FLOW & POWER CONSUMPTION

At constant temperature -10°C

Greenway® Neo N (45%) **3.23%** reduction in power consumption vs. MPG solution (30%)

Greenway® Neo N (75%) **6.95%** lower power consumption vs. MPG solution (50%)



Source DuPont Tate & Lyle

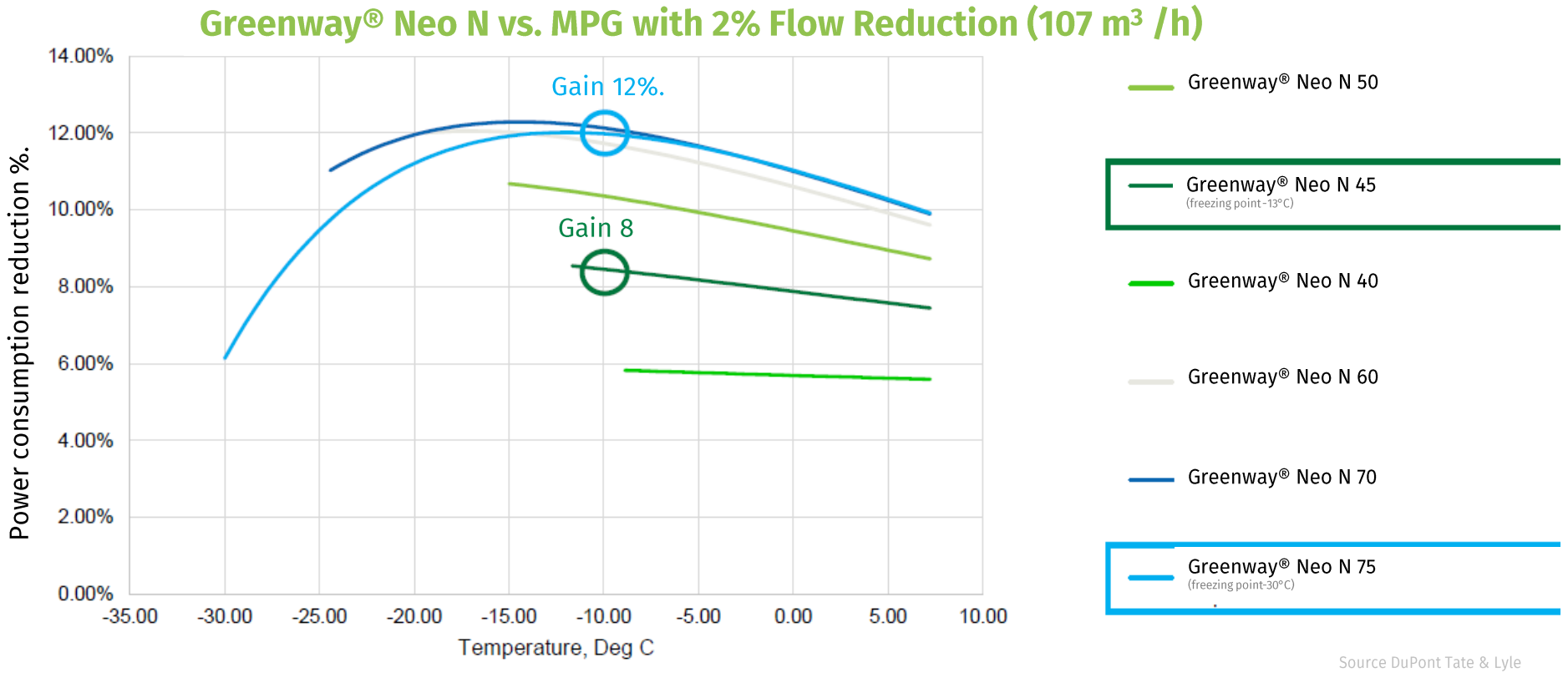
climalife

ADVANTAGES: REDUCED FLOW & POWER CONSUMPTION

At constant temperature -10°C

Greenway® Neo N (45%) **8.46%** reduction in power consumption vs. MPG solution (30%)

Greenway® Neo N (75%) **11.98%** lower power consumption vs. MPG solution (50%)



Source DuPont Tate & Lyle

climalife®

CUSTOMER TESTIMONIALS

Proxifresh chose Greenway® Neo heat transfer fluid for its energy efficiency and environmental friendliness.

Fresh fruit and vegetables - Mauritius

Energy savings, smaller pump sizes and compliance with ISO 14001 and 50001 standards

Danone – Blédina – Baby Food - France

Saving energy and improving productivity

Comerándalus - Soup production - Spain

climalife®

THANK YOU FOR YOUR ATTENTION

The expert in eco-efficient solutions for industry

www.climalife.com

CHILLVENTA

Chillventa Specialist Forums 2022
Chillventa Fachforen 2022

CONNECTING EXPERTS.