

HULTSTEINS ✱

Diesel-free refrigeration

CONTROLLED AIR & ELECTRIC
THAT WON'T COST THE EARTH

OVERVIEW

- Current diesel engine TRUs
- Hultsteins - Company
- Hultsteins - Products manufactured
 - *Hydraulic fridge*
 - *Ecogen*

CURRENT TRU DIESEL ENGINES

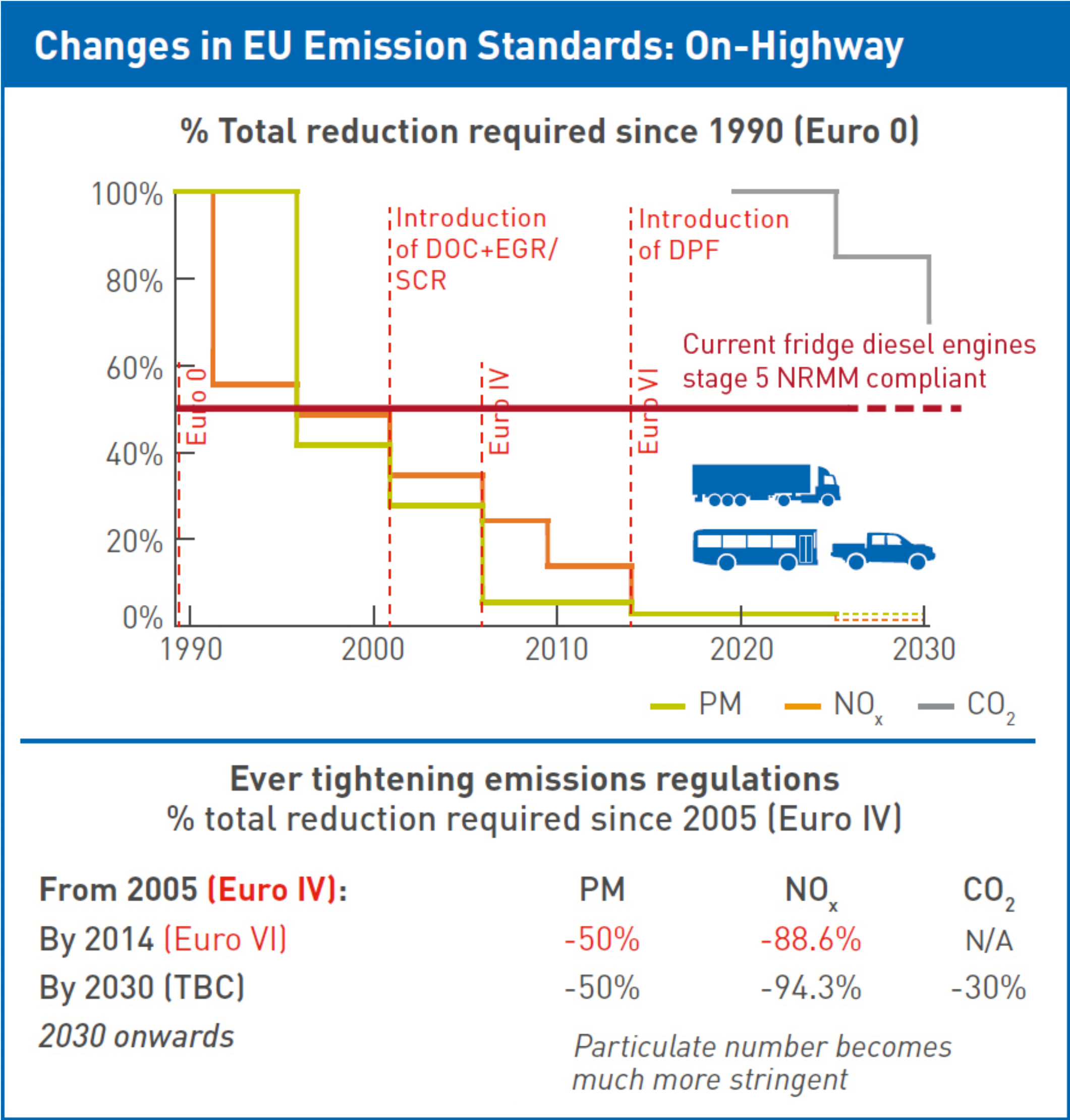
- ▶ TRU diesel engines are somewhere between 20 - 25% efficient.
- ▶ **Modern Euro 6** truck engines are somewhere between 43 - 45% efficient.
- ▶ **Diesel engines are noisy** and although some effort has been put into noise reduction. The majority of TRU diesel engines will not comply with PIEK low noise levels (60db measured at 7.5m).
- ▶ **Maintenance**- diesel engines will require more servicing and spare parts as the unit ages.

PARTICULATES AND EMISSION

- ▶ Most diesel TRU is in operation today have no facility for capturing DPM & NO_x and these are emitted into the atmosphere.

- *A diesel TRU emits approximately 200 times more fine particles of DPM per mile driven in comparison to a Euro 6 engine.**
- *A Euro 6 truck with a diesel TRU running will emit approximately 400% more NO_x per mile driven than one without.**
- *Carbon - 1 litre of diesel = 2.65 kgs of carbon.**

**Low C^{VP} report. Development of emission. Testing for TRUs, june 2019.*



Standards according European Steady State Cycle.
Source: Chevron

RED DIESEL BEING ABOLISHED IN 18 MONTHS

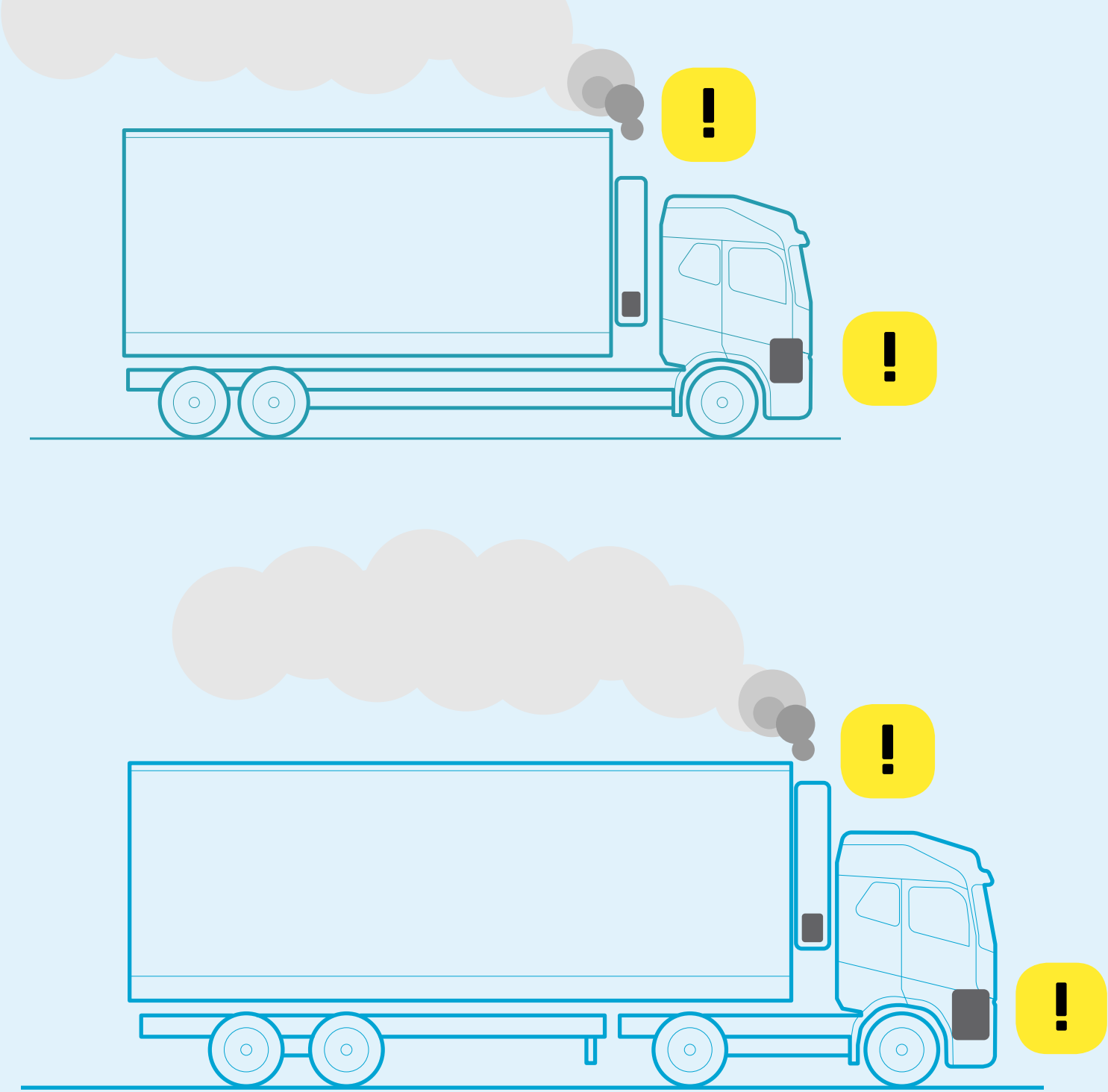


HMRC- abolish red diesel on 1st April 2022
- users will see costs increase by 100%

What options do we have to remove the diesel engine from TRUs ?

Standard builds

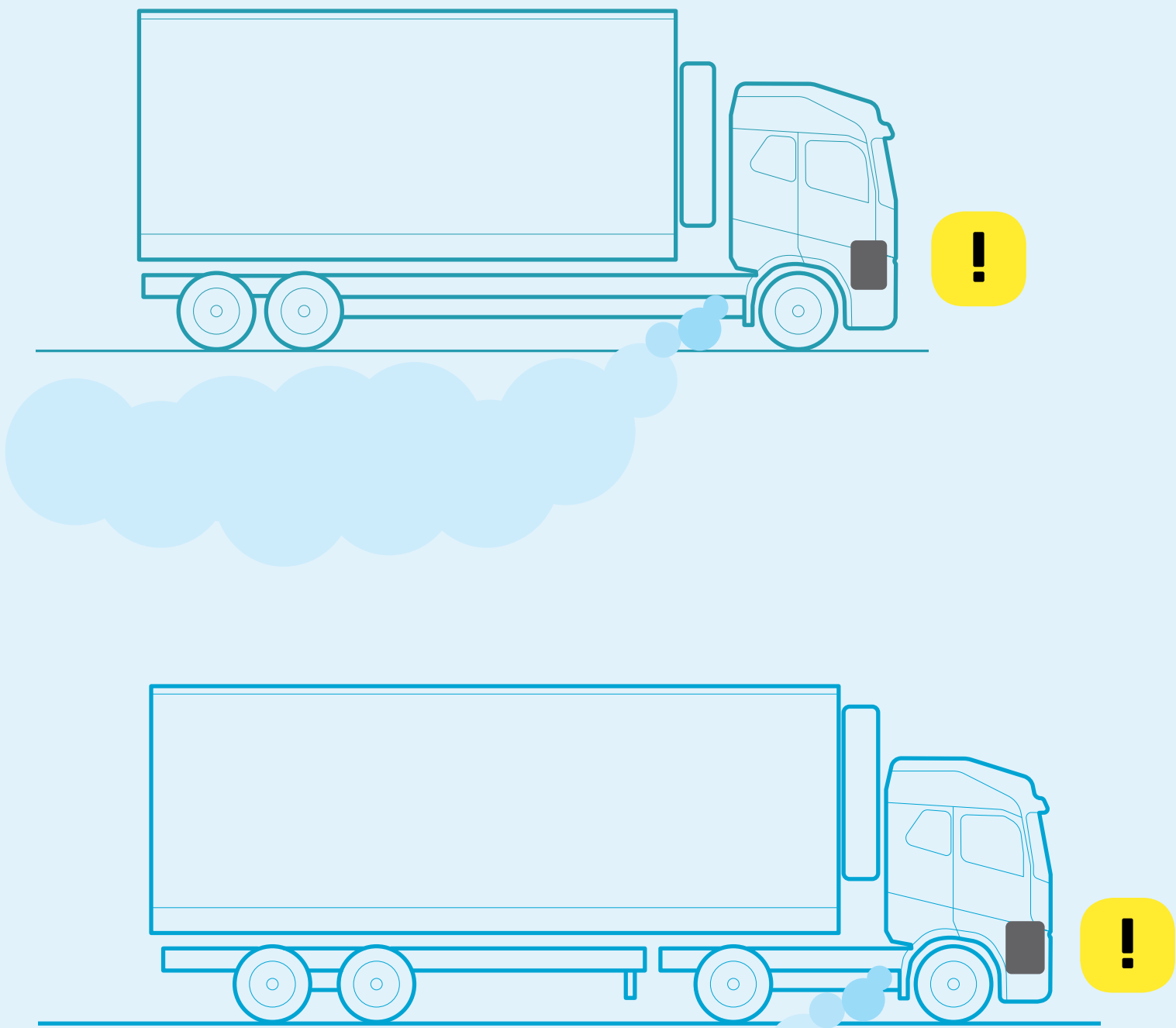
TWO-ENGINE TECHNOLOGY



Unregulated emissions emitted from diesel systems at a high level pollute the surrounding area.

Hultsteins vision

ONE-ENGINE HULTSTEINS TECHNOLOGY



Euro 6 - regulated emissions are less harmful and dispersed at ground level.

HYDRAULIC SINCE 1962

- | | | | |
|-------------|--|-------------|-------------------------------------|
| 1944 | Company started by Filip Hultstein. | 1990 | Launch Slimline fridge. |
| 1959 | Manufacturing of the first TRU. | 2005 | Multi temp - range of fridges. |
| 1962 | Manufacturing of the first hydraulic TRU. | 2008 | Intelli Start™ system. |
| 1979 | Electronic control system as standard on all TRUs. | 2014 | Holtback Group acquires Hultsteins. |
| | | 2017 | Launch of Hultsteins UK. |

"We are passionate about designing and manufacturing the best emission free fridge units"

Börje Axelsson MD

HULTSTEINS – PRODUCTS

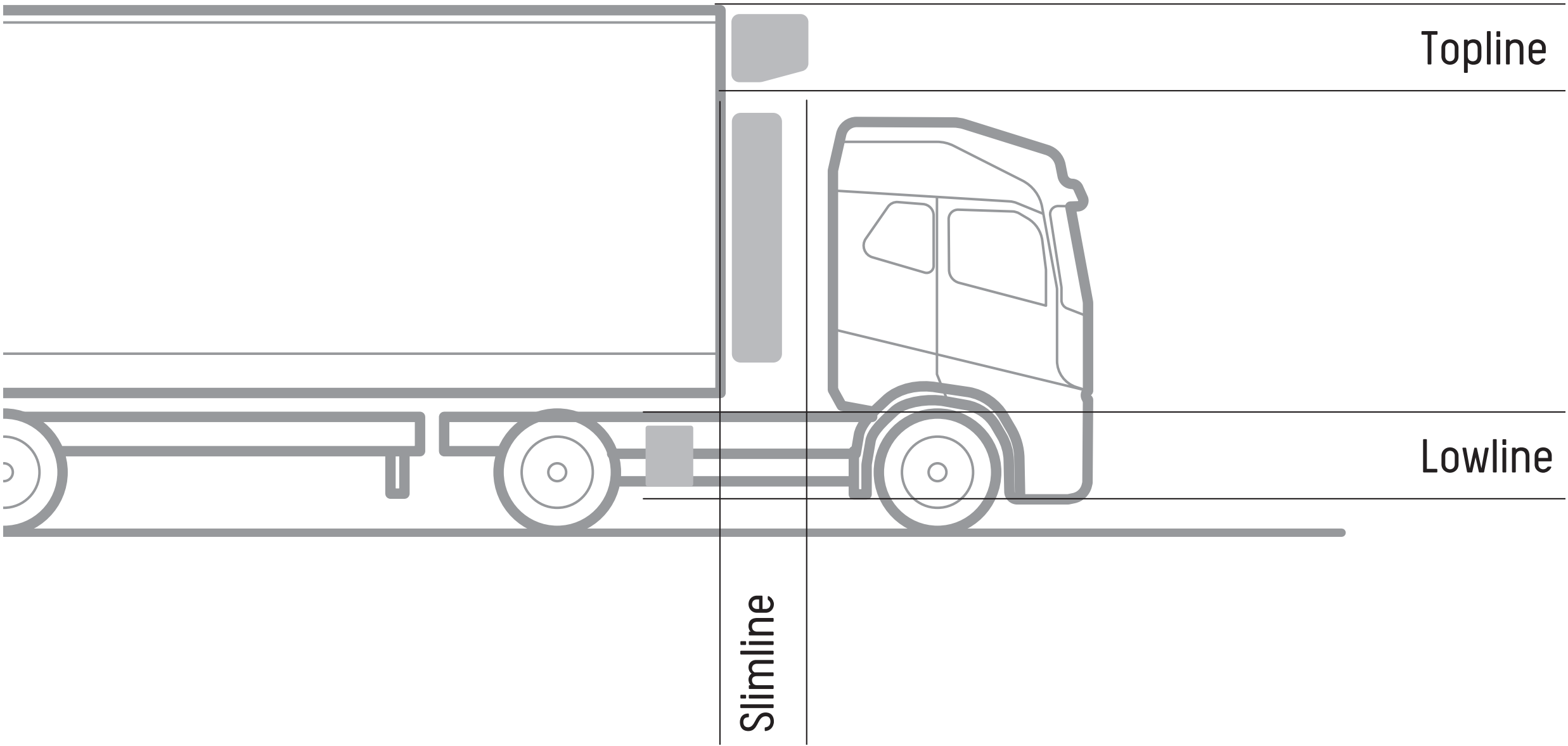
Hydraulic driven Fridges



Ecogen



FRIDGE RANGE



Topline



Slimline



Lowline





ECOFRIDGE SLIMLINE

Additional benefits

- ▶ **Designed** in the 1990's to keep body heights low .
Been a firm favourite ever since.
- ▶ **Improved aerodynamics** - Every 10 cm height reduction equates to 1% fuel saving.
- ▶ **Long working life** - Superior protection from elements.
- ▶ **Easy to install.**
- ▶ **Easy to maintain.**
- ▶ **Safe** - no working at height.

ECOFRIDGE TOPLINE



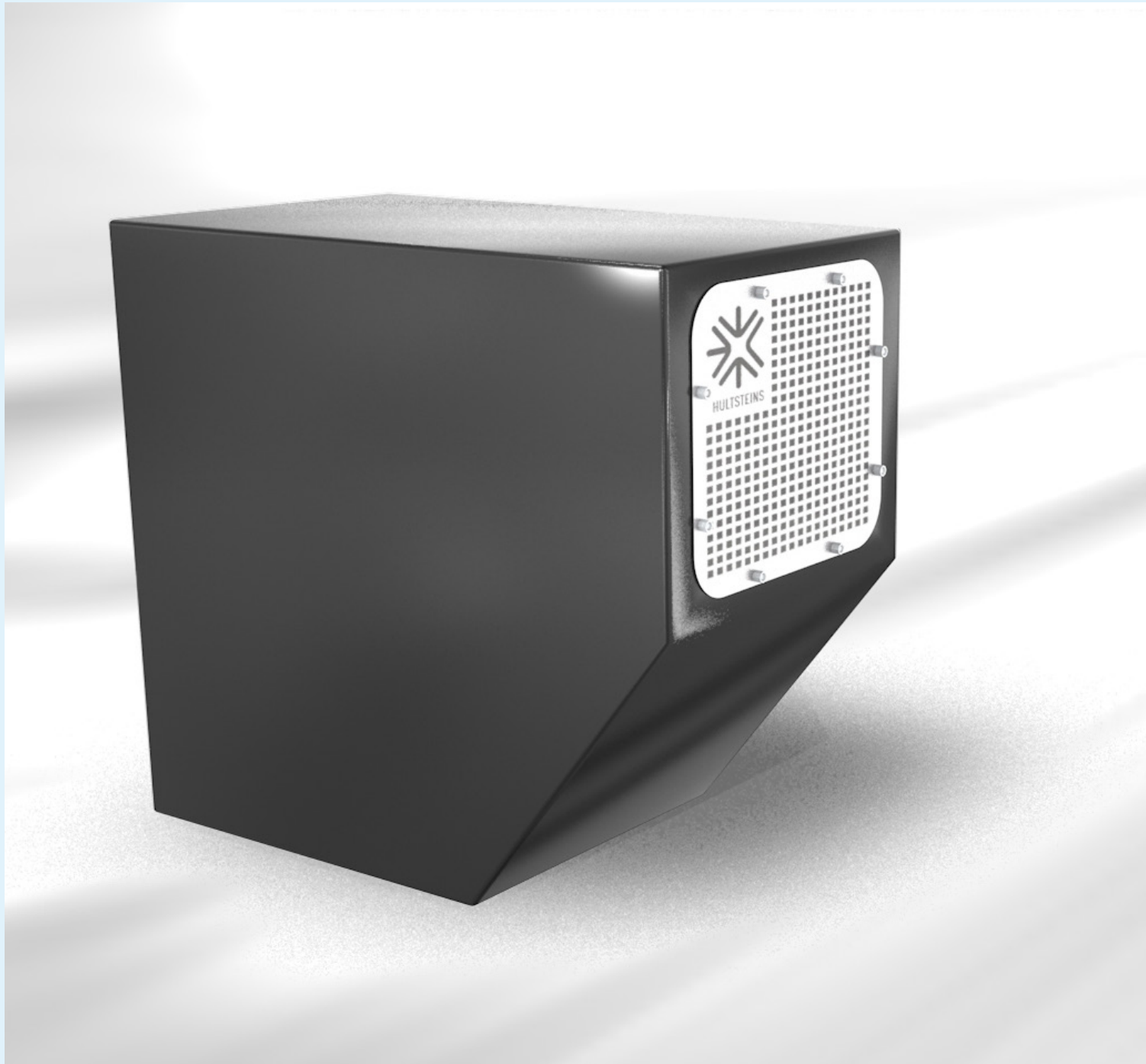
ECOFRIDGE LOWLINE



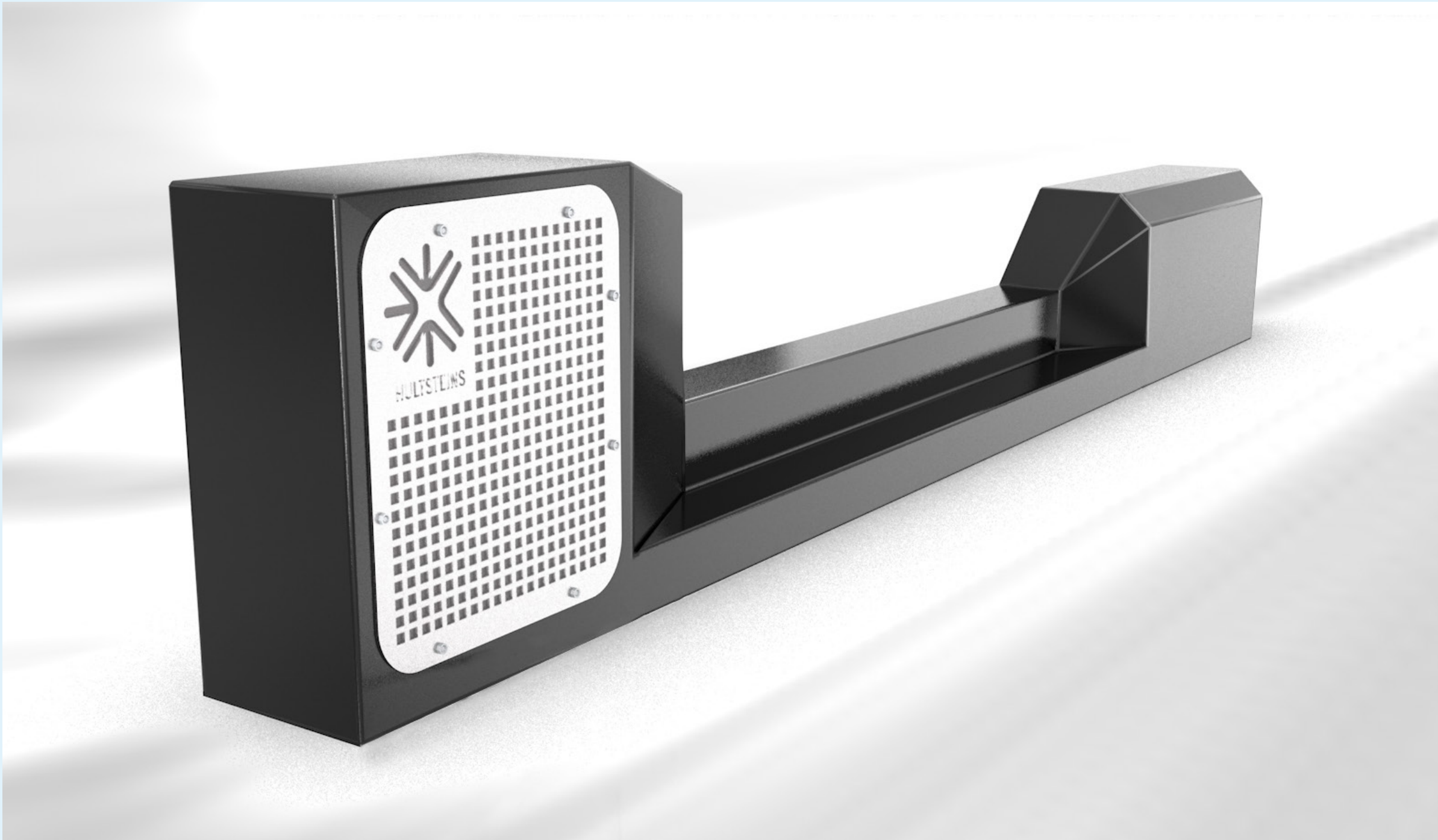
FEATURES AND BENEFITS OF HYDRAULIC DRIVE FRIDGE

- ▲ **100% cooling capacity** – even at idle.
- ▲ **Up to 85% fuel saving.**
- ▲ **Over 95% reduction in emissions.**
- ▲ **Constant temperature:** Hultsteins “Intelli Start™” – automatically starts and stops the truck engine to maintain temperature set point.
- ▲ **Clean air:** Emissions governed to Euro 6 standard.
- ▲ **Maximum reliability:** All Hultsteins fridge units are designed for simple yet reliable operation + long working life.
- ▲ **Universal compatibility:** Works with any truck fitted with a PTO (Power take-off) from 7.5 to 26 tonne.
- ▲ **Noise reduction:** All Hultsteins fridges are quiet and are ideal for night time deliveries.
- ▲ **Heating option:** Supplied by truck engine coolant system.

ECOGEN



Ecogen Lowline [20/30/50 KVA]

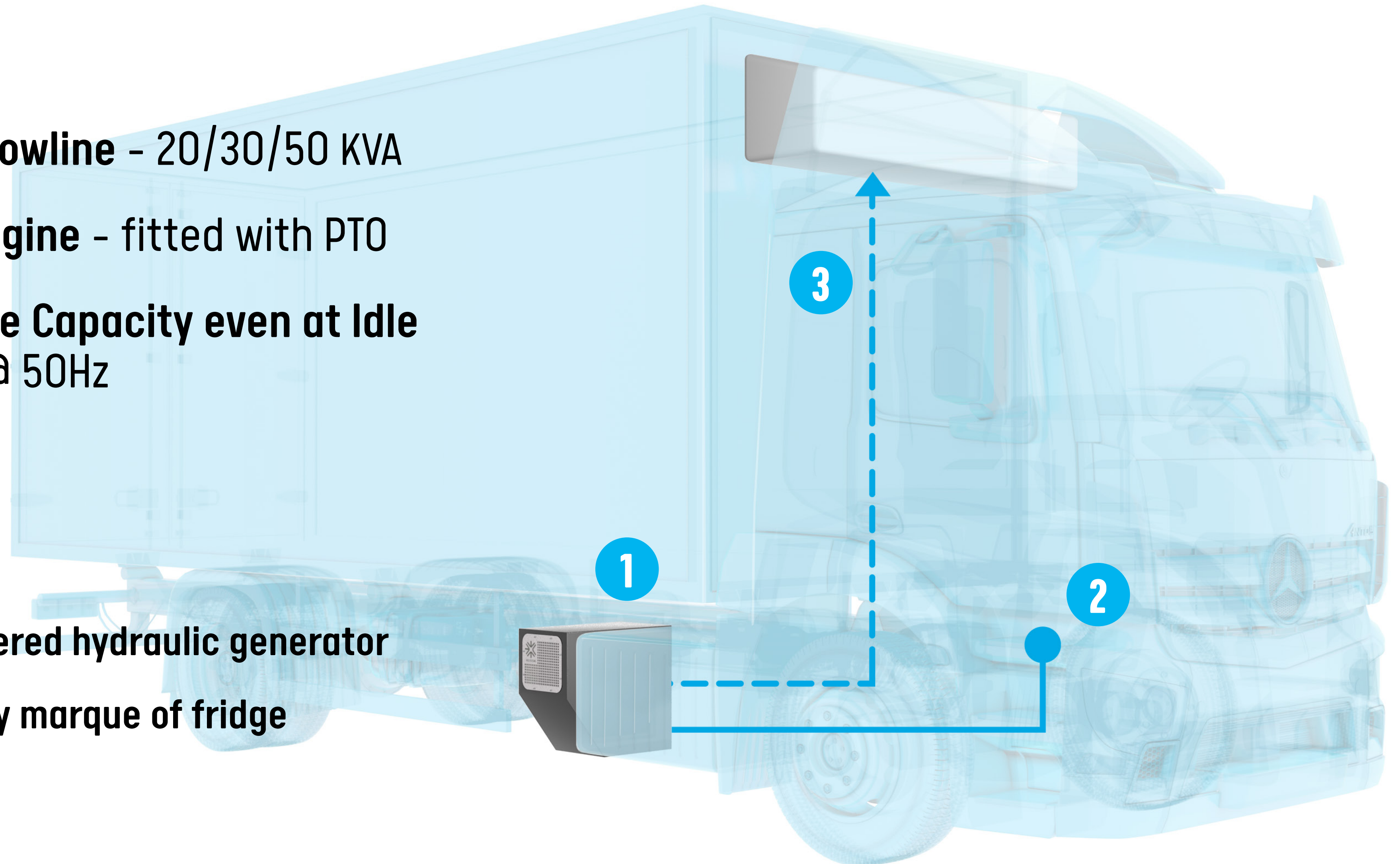


Ecogen Slimline [30 KVA]

ECOGEN BRIDGING THE GAP TO AN ELECTRIC FUTURE

- 1** Ecogen Lowline - 20/30/50 KVA
- 2** Euro 6 Engine - fitted with PTO
- 3** Full Fridge Capacity even at Idle
- 400 V @ 50Hz

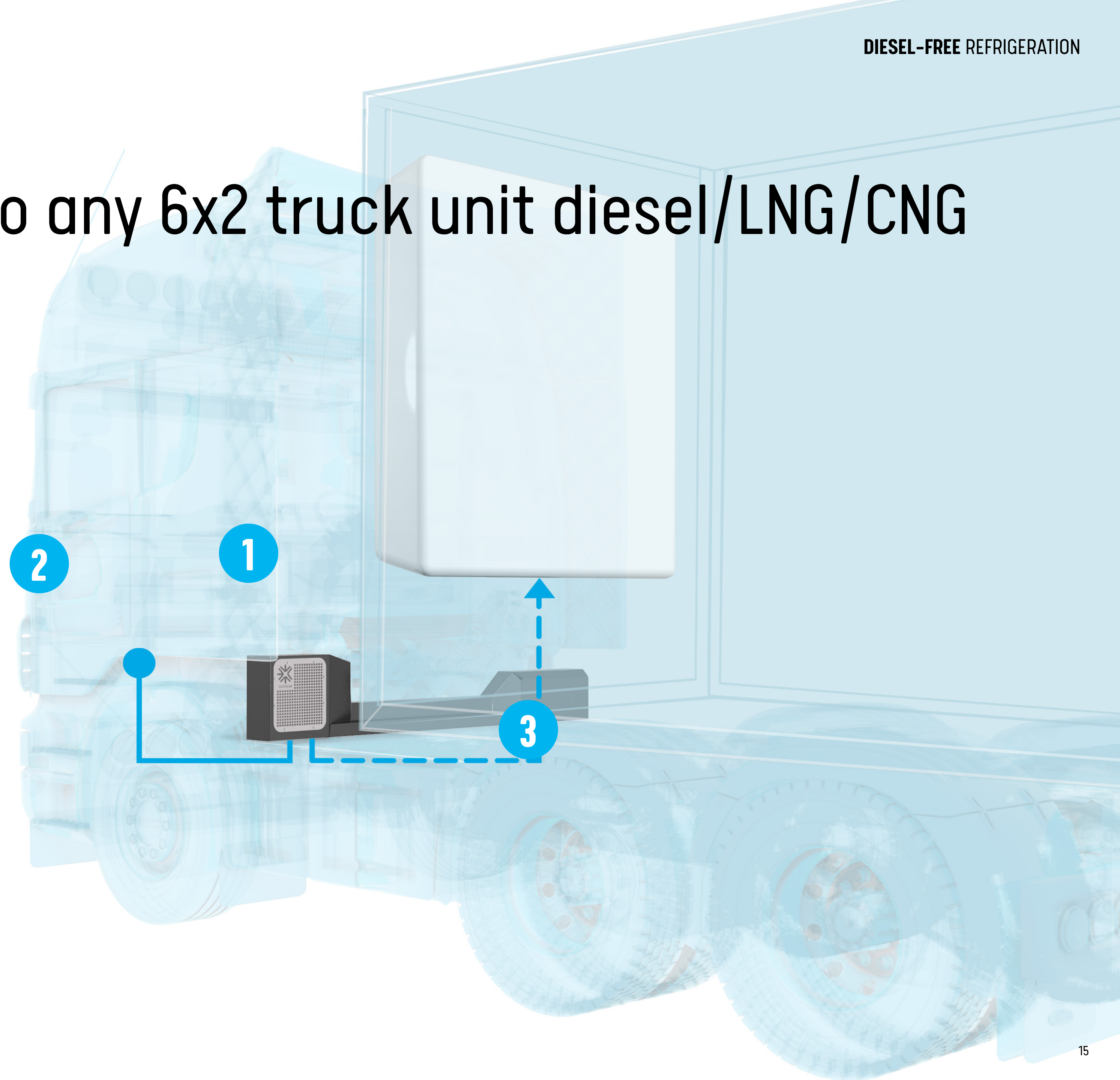
- ▶ Truck powered hydraulic generator
- ▶ Powers any marque of fridge

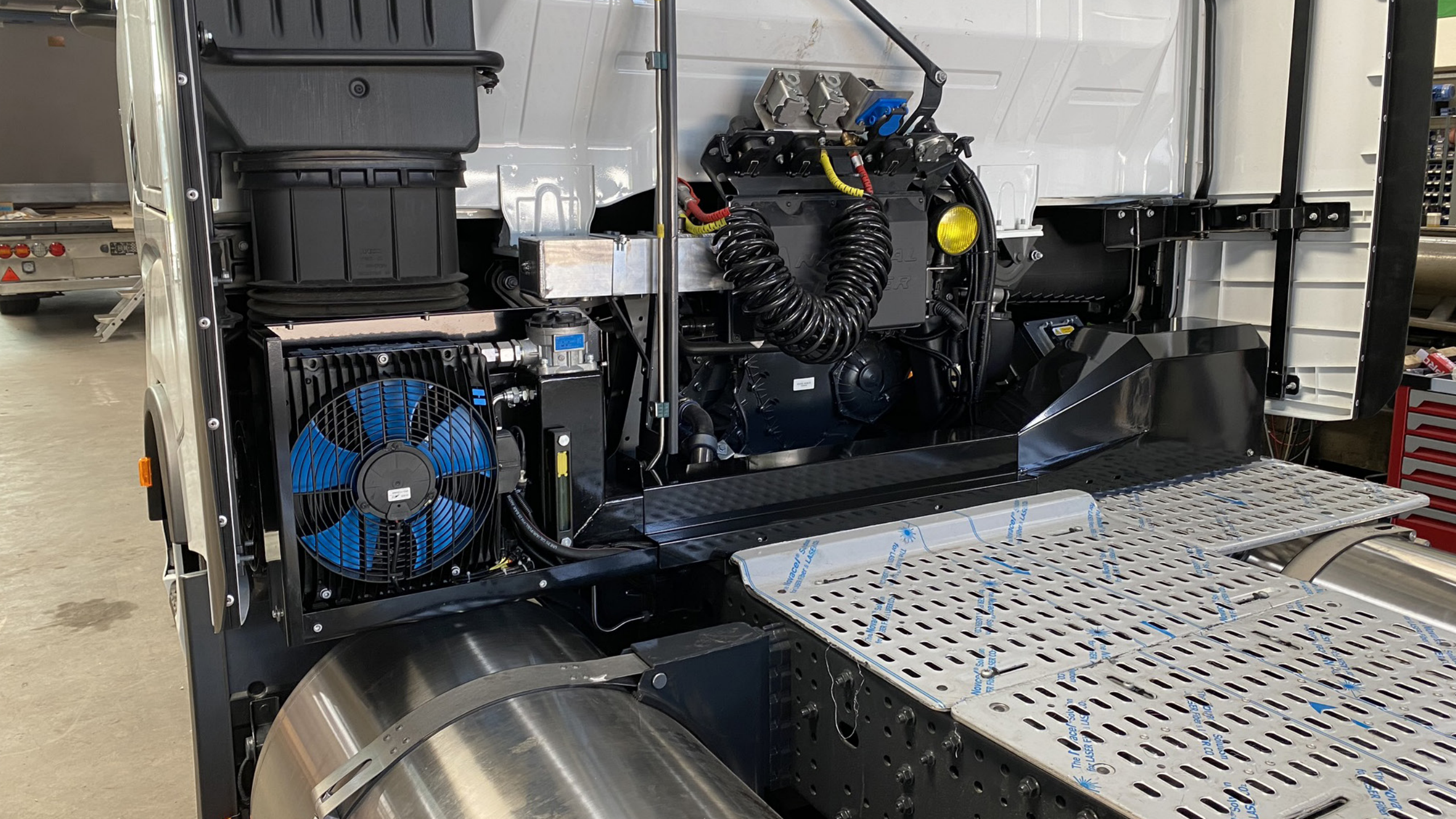


ECOGEN SLIMLINE – fits to any 6x2 truck unit diesel/LNG/CNG

- 1 Ecogen Slimline – 30 KVA**
- 2 Euro 6 Engine – fitted with PTO**
- 3 Full Fridge Capacity
even at Idle – 400 V @ 50Hz**

- ▶ **Truck powered hydraulic generator**
- ▶ **Powers any marque of fridge**





HULSTEINS 2021

- **Launch Electric range** of slimline fridge units.
- **Hultsteins – Lithium power packs for trailers**
 - Modular 3 or 6 hours run time.
- **Charged from ECOGEN.**

SUMMING UP

EXISTING DIESEL TRU'S

- ▲ **High pollution levels.**
- ▲ **High carbon emissions.**
- ▲ **Inefficient diesel engine.**
- ▲ **Noisy**
- ▲ **Expensive to maintain.**
- ▲ **Diesel TRUs fitted to trailer**
will remain standard fit for
foreseeable future.

WHY CHOOSE HULTSTEINS HYDRAULIC DRIVE FRIDGE

- 1. 100 % cooling at Idle
- 2. Lowest emissions
- 3. Direct Replacement
- of diesel engine TRU
fitted with Intelli Start™



- 4. Lowest noise levels
- 5. Low cost of operation
- 6. Full range to suit trucks
from 7.5 - 26 tonne
- 7. Fits to all truck makes*

* Fitted with Engine PTO

ENGINE PTO

- ▶ **Why operators** should specify engine PTO on all new equipment?
 - Retro fit Ecogen to run fridge on electric.

HULTSTEINS

- ▶ **Specialists for over 40 years** in diesel free fridge transport.
- ▶ **If you would like to discuss in more** detail the specific cost and emissions reductions for your operations.

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HULTSTEINS



ECO TRUCK FRIDGE



Never Costing the Earth



Thanks!

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