



Pumps for alternative marine fuels

Robust, Efficient and Hermetically Tight Pumping Technology for Marine Engines

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11/11/2025, Greener Shipping Summit

Atlas Copco
Group



Contributing to decarbonization

Ammonia Powered Ships

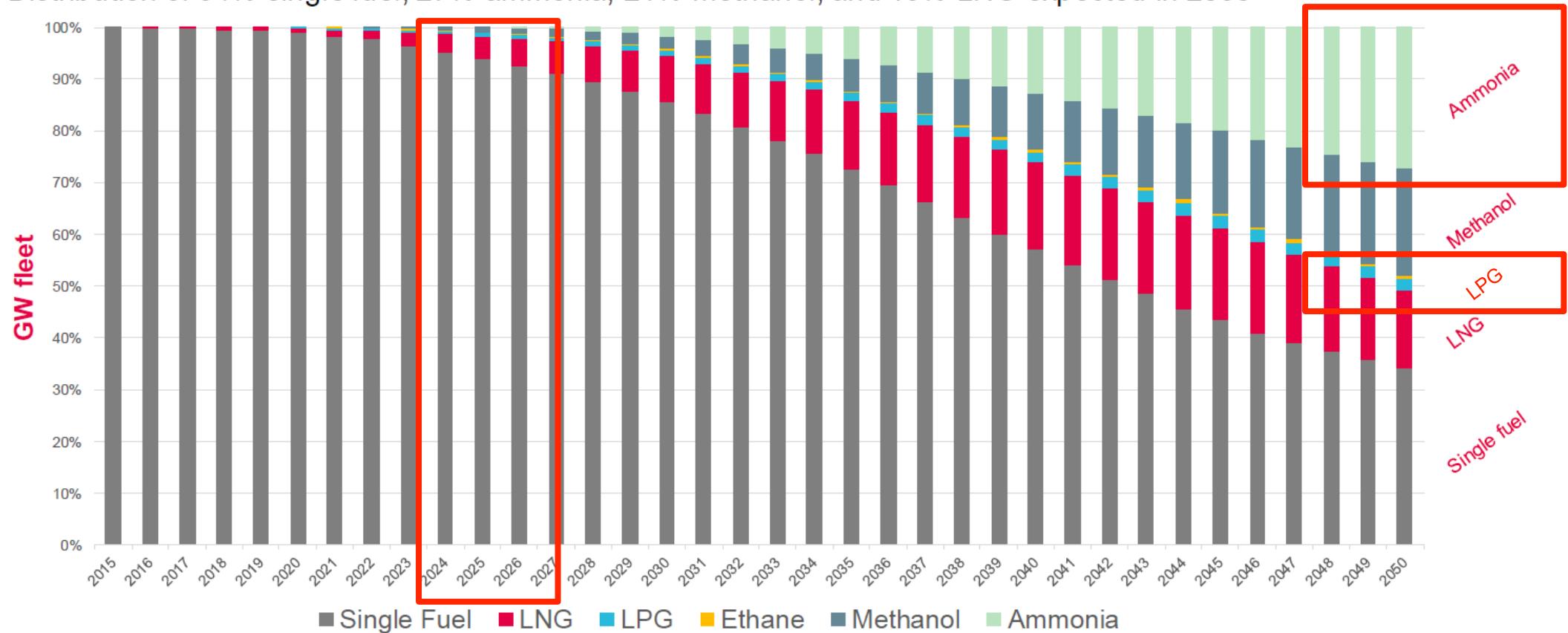
Ammonia is emerging as a potential fuel for large ships due to several key advantages that align with the maritime industry's goals for reducing emissions and improving sustainability.

- Carbon Emissions reduction
- Energy Density
- Existing Infrastructure

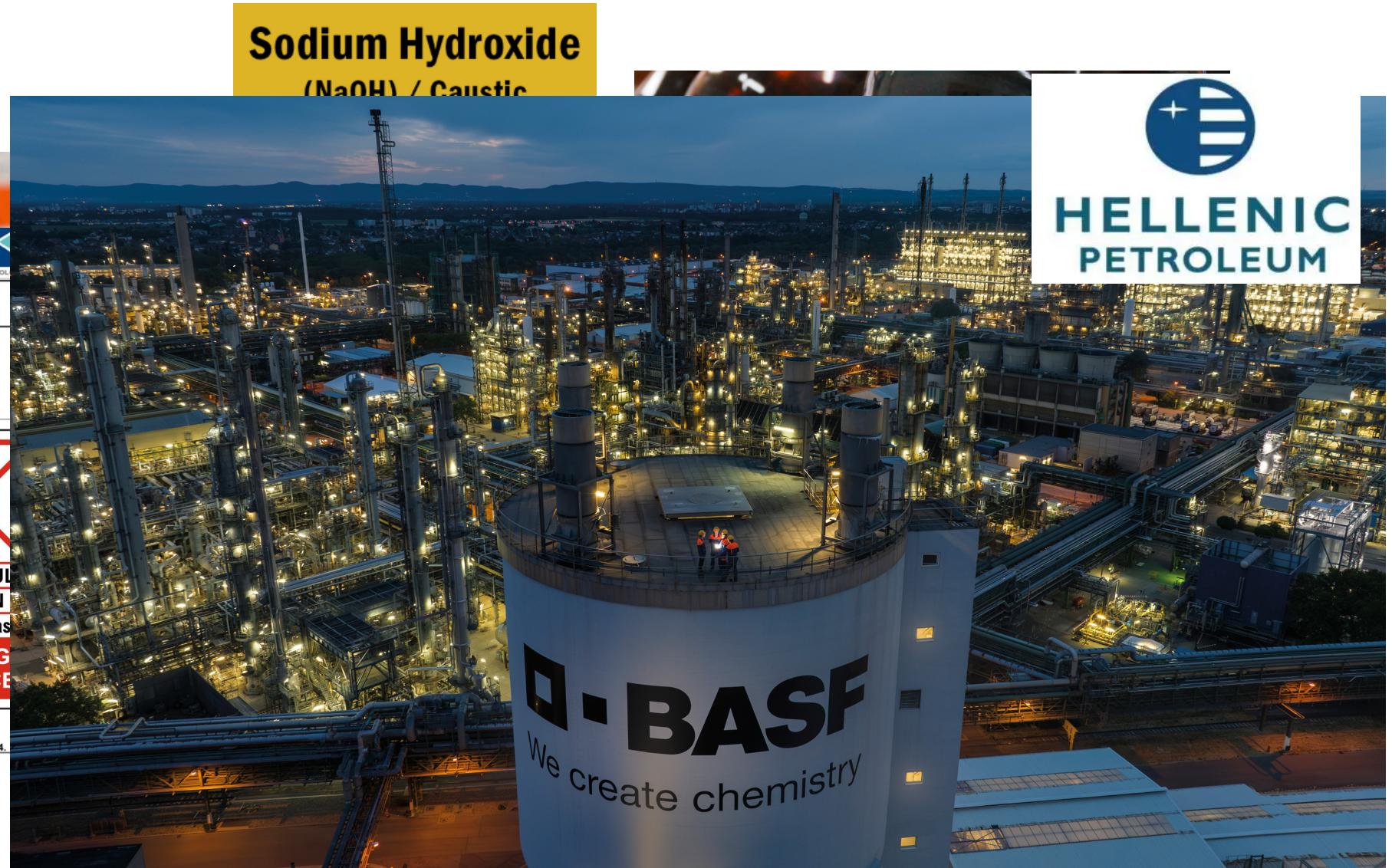
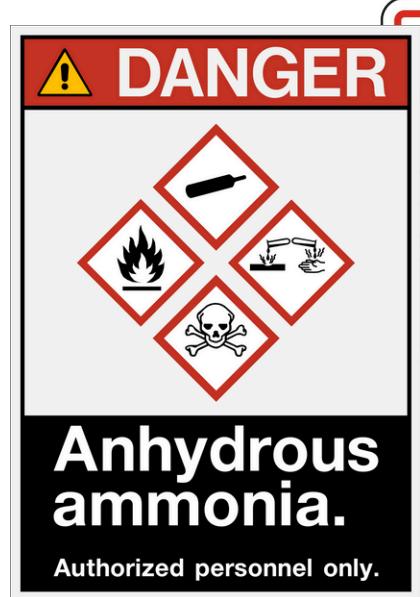
MAN forecast future fuel mix

Two-stroke fuel mix forecast towards 2050

Distribution of 34% single fuel, 27% ammonia, 21% methanol, and 15% LNG expected in 2050



Why LEWA?



→ Critical Fluids and Processes is
our daily Business!

LEWA

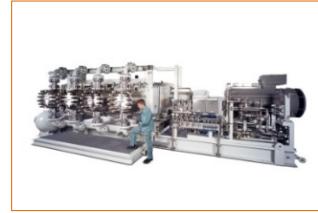
LEWA Milestones



Company Foundation



First ACHEMA



G4T – biggest process diaphragm pump



G3M developed: Participation in LNG high pressure pumps for ship propulsion systems



More than 40 diaphragm process pumps installed on vessels for LPG FGSS



Establish dedicated segment organization
More than 140 pumps on order
All first mover orders for Ammonia secured

1952

1954

1955

1984

2003

2005

2006

2012

2017

2022

2024

2025



First Patent



LEWA triplex



LEWA ecoflow



Deutsche Beteiligungs AG
DBAG and Quadriga Capital acquire LEWA



LEWA triplex for MAN testbed in Copenhagen (LPG)



Atlas Copco Group



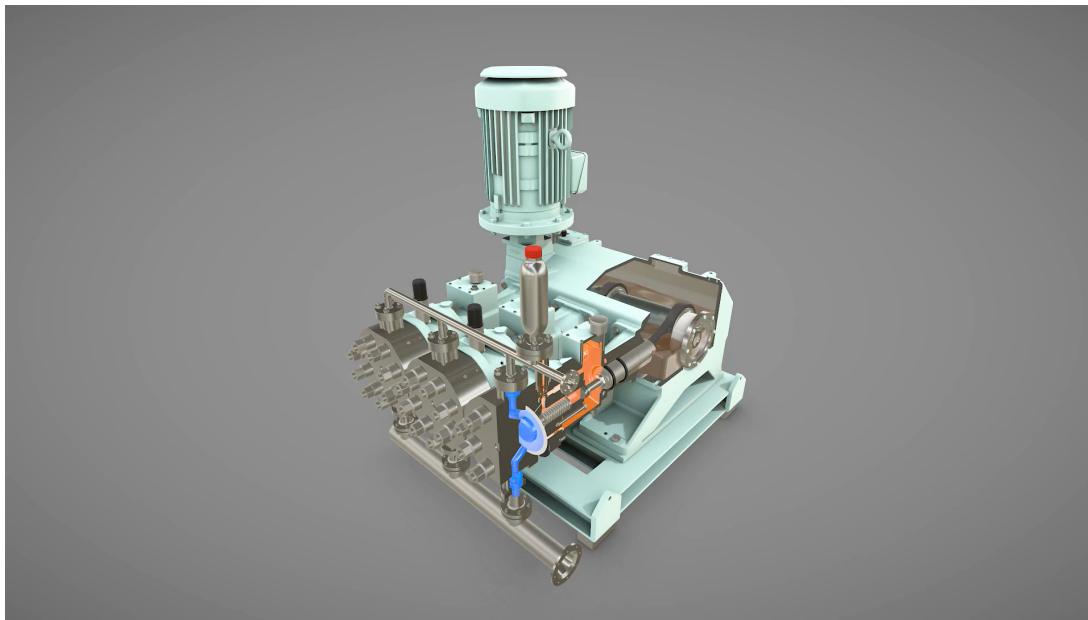
First order for Ammonia
In total, more than 100 pumps sold for FGSS



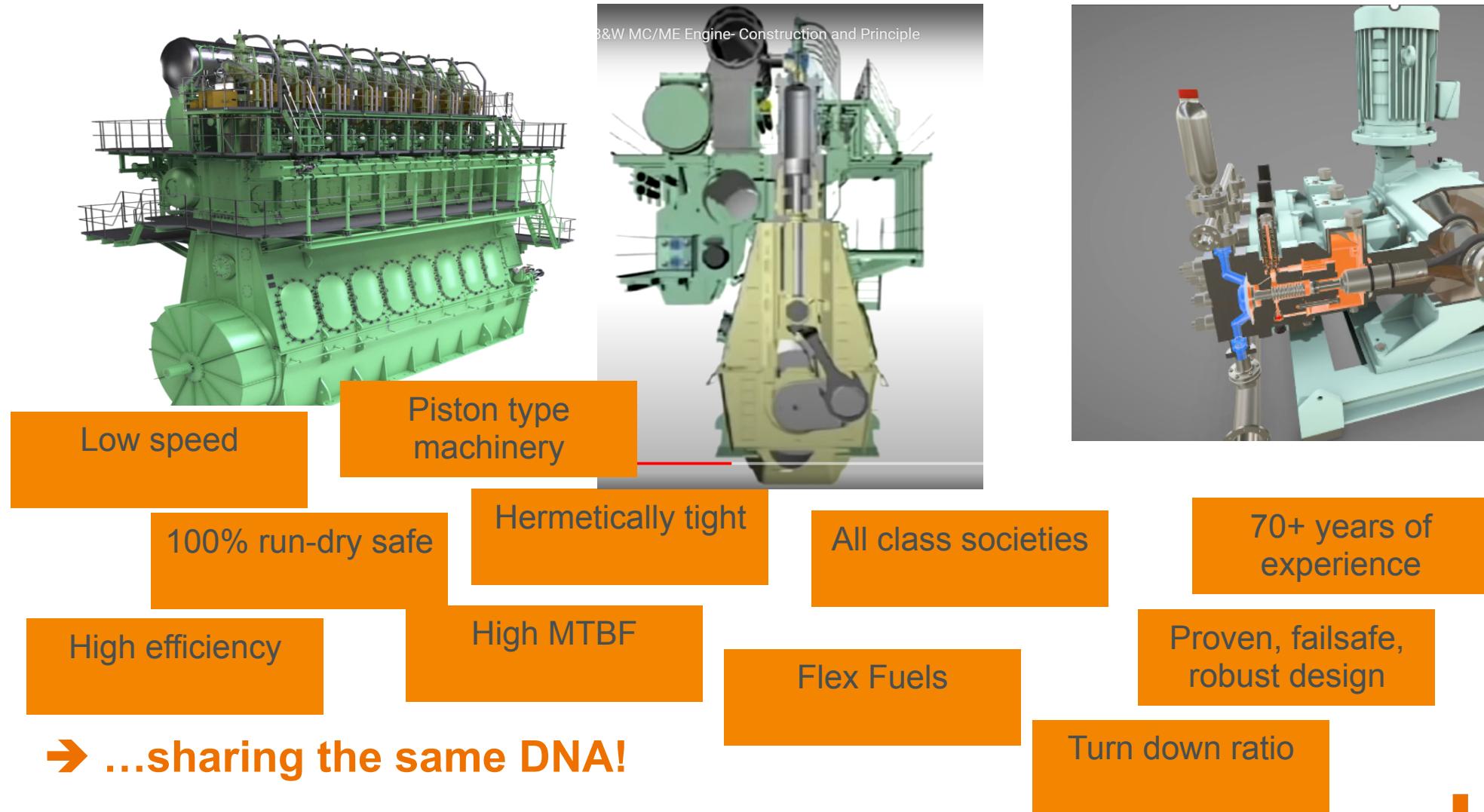
General Design of Process Diaphragm Pump

Overview

- Motor
- Pump head
- Drive unit in compact monoblock design



General Design of Process Diaphragm Pumps for FGSS



Low speed

Piston type machinery

100% run-dry safe

Hermetically tight

All class societies

70+ years of experience

High efficiency

High MTBF

Flex Fuels

Proven, failsafe, robust design

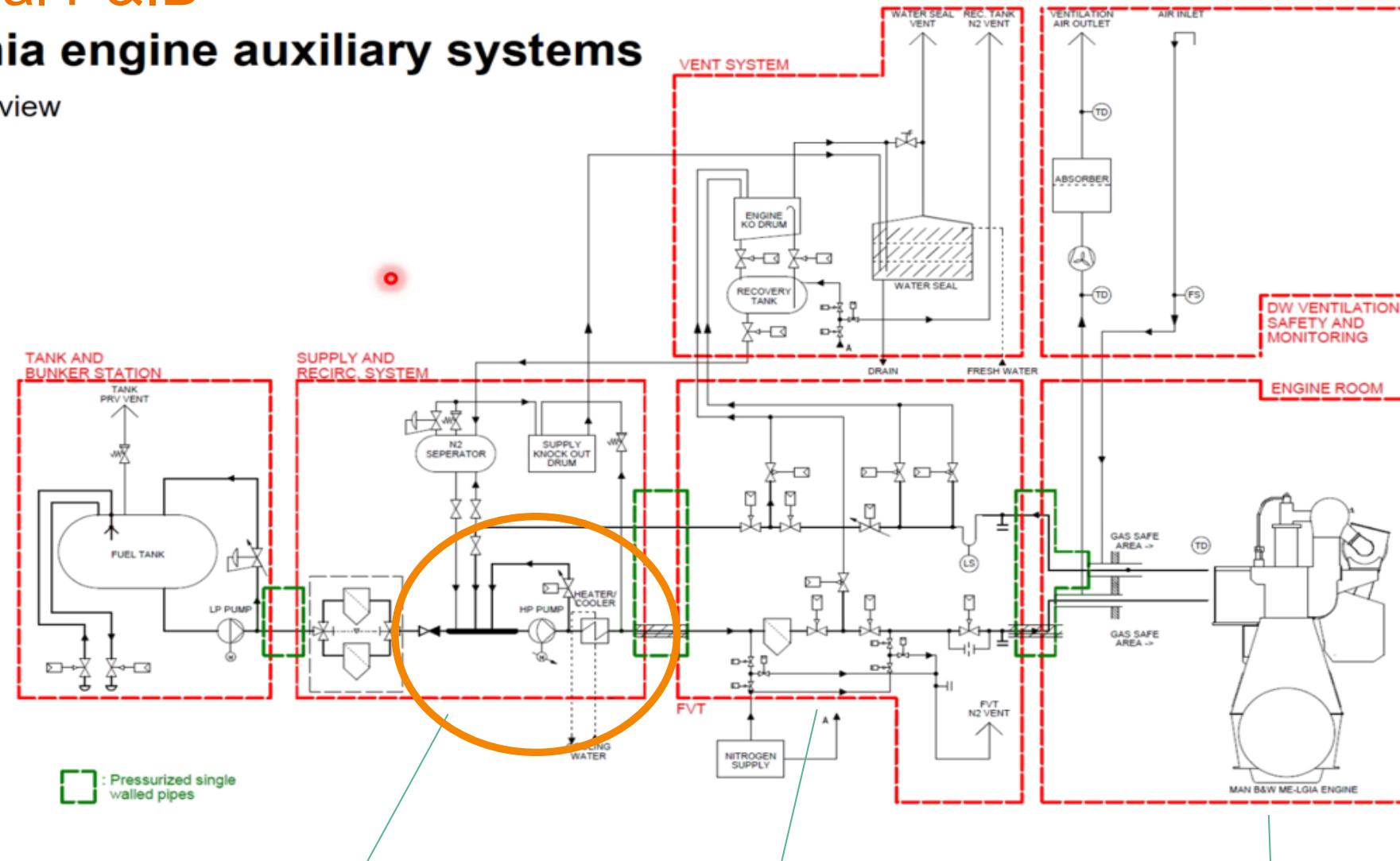
Turn down ratio

→ ...sharing the same DNA!

Typical P&ID

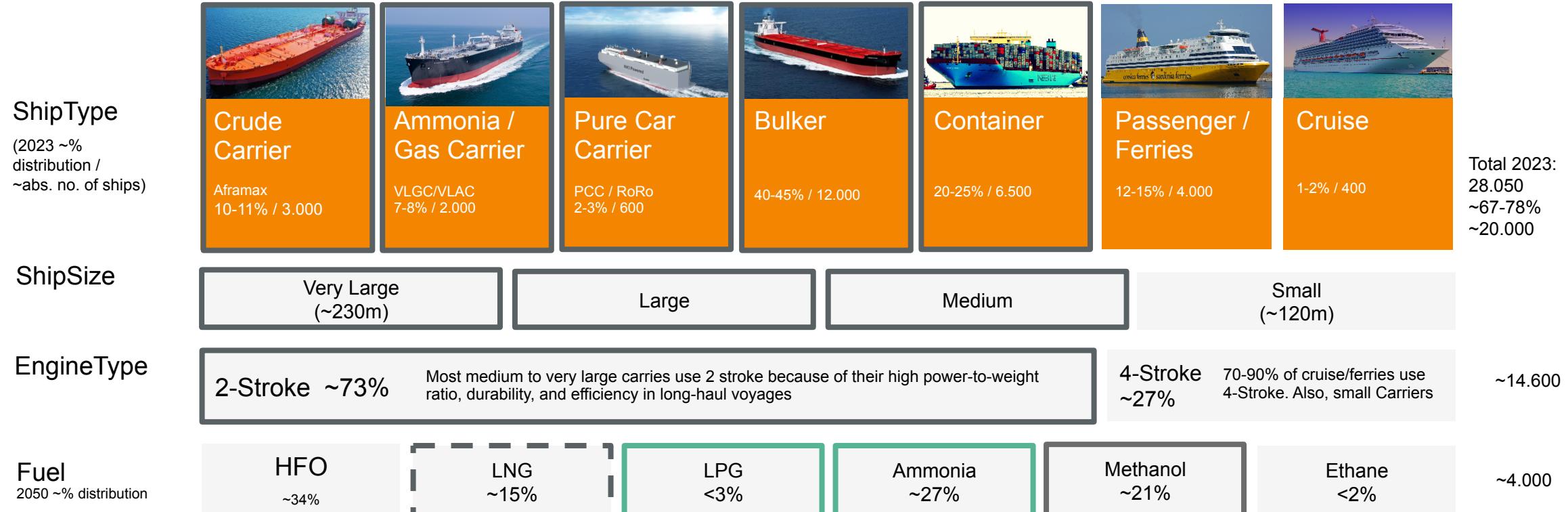
Ammonia engine auxiliary systems

System overview



FGSS (Fuel Gas Supply System) | Sweet spots

Based on existing global fleet

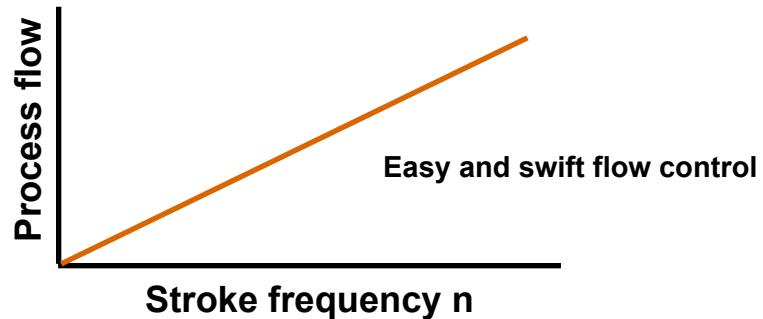


- Sweet spot in scope
- Tough competition
- Simple technology sufficient

Process Diaphragm Pumps in LPG and NH₃ - FGSS

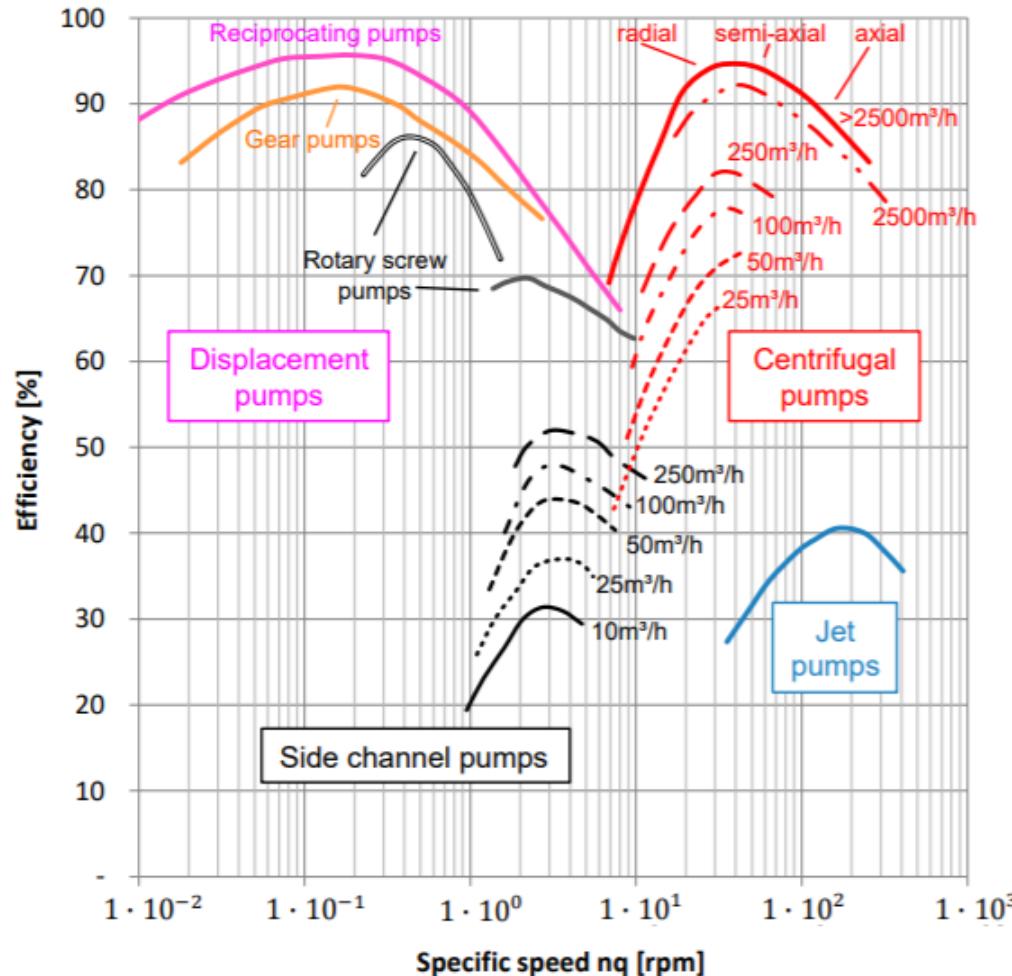
■ FGSS for LPG and NH₃ engines

- LEWA process diaphragm pumps can handle LPG or NH₃ with nearly identical configuration
- More than 700 diaphragm pumps delivered for NH₃ into chemical industry
- 50 of these pumps are triplex process diaphragm pumps with
 - flowrates up to **22 m³/h**
 - discharge pressure up to **320 bar**
 - larger flowrates and pressures are possible



- LEWA triplex process diaphragm pump

When do I use “process“-diaphragm pumps?



Selection criteria

- Flow rates → up to 200 m³/h
- High discharge pressures → 20 to 1000 bar
- For dangerous fluids → Pump is hermetically tight → no dynamic sealing → Zero leakage
- Run dry safe 100%
- High efficiency → 85-90%
- Easy maintenance – possible on board
- Very high operational safety
- Very high availability/up time
- Ideal for marine applications and installation on seagoing vessels
- Certification according to DNV, ABS, Lloyds, KR, NK etc. are possible

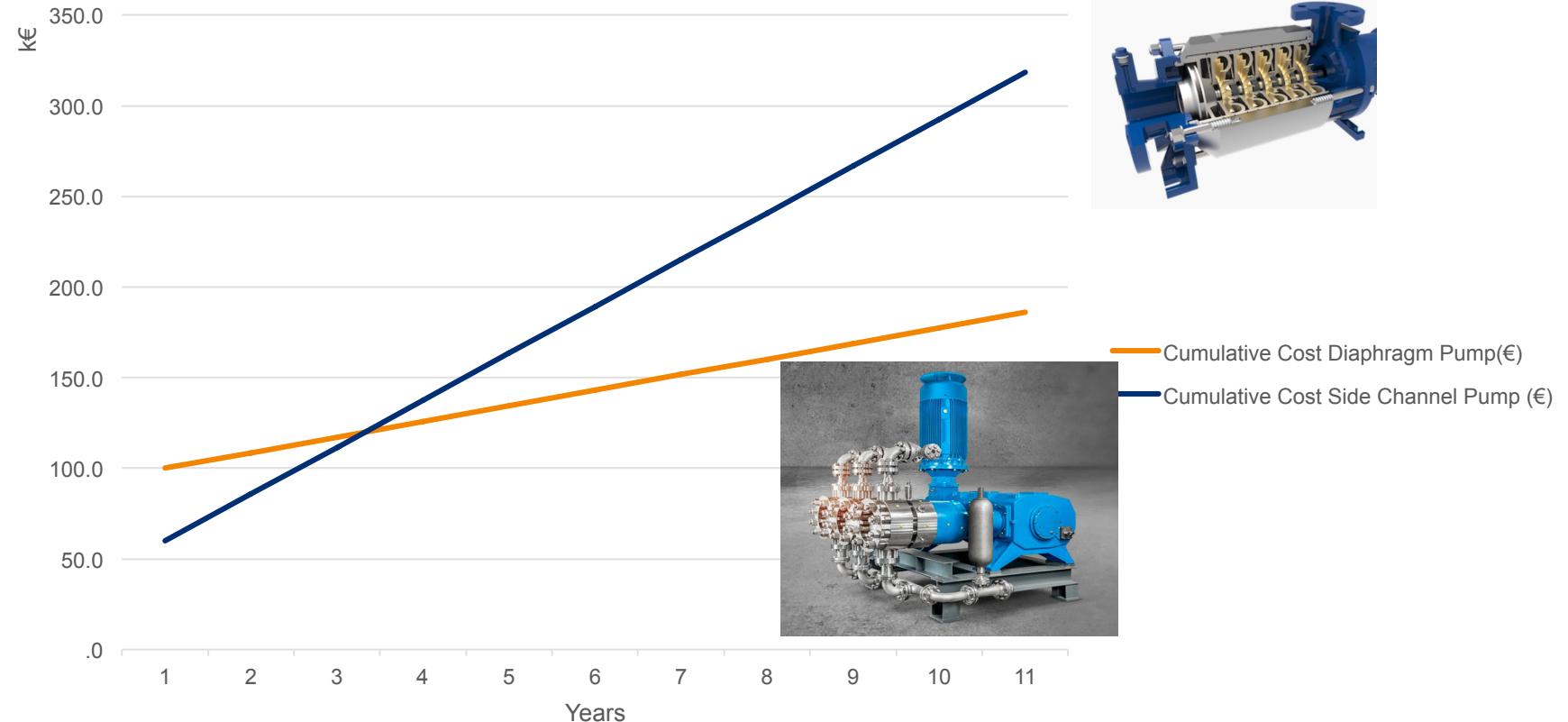
Figure 1. Maximum efficiency depending on specific speed and flowrate [2].

Payback Period



VLGC/VLAC FGSS
6000 operating hours
Flow rate: 10m³/h
Injection pressure: 53bar
HFO price: 429 USD/t
9.5 €-Cent/kWh

Amortization of invest



✓ Amortization after 3 years with LPG, after 2 years with ammonia (85bar inj. Pressure)

Overview of LEWA Certified Workshops (2025)



Geveke (NL)

- Authorized Service Center

5

LEWA Italy

- Professional Workshop
- 320 sqm repair shop

2

LEWA USA

Houston:

- Premium Workshop
- 900 sqm

Holliston:

- Modular Workshop
- 300 sqm

5

2

LEWA Brazil

- Modular Workshop
- 200 sqm repair shop

1

LEWA GmbH (Leonberg)

- Premium Workshop
- 250 sqm repair shop
- Serviced products: LEWA, Nikkiso

10

LEWA Austria

- Modular Workshop
- 150 sqm repair shop

2

LEWA Middle East

- Professional Workshop
- 220 sqm repair shop

5

LEWA Singapore

- Modular Workshop
- 200 sqm repair shop

4

LEWA Korea

- Modular Workshop
- 150 sqm repair shop

1

LEWA Spain

- No certification
- 20 sqm repair shop

1

LEWA France

- Modular Workshop
- 700 sqm repair shop

2

LEWA Switzerland

- Modular Workshop
- 80 sqm repair shop

*as part of the Lewa aftersales network 4 service engineers and 6 service technicians are based in China



LEWA Process Diaphragm Pumps

the beating heart of safe and efficient
FGSS onboard ships

and the key to safe Ammonia systems
for carbon free shipping





Your  partner in Greece

Atlas Copco
Group