

WÄRTSILÄ MOSS AS – FØRST DER FARTØY FLYTE KAN



OUR ENVIRONMENTAL RESPONSIBILITY

Environmental Solutions

WÄRTSILÄ MOSS AS

Inert Gas Systems

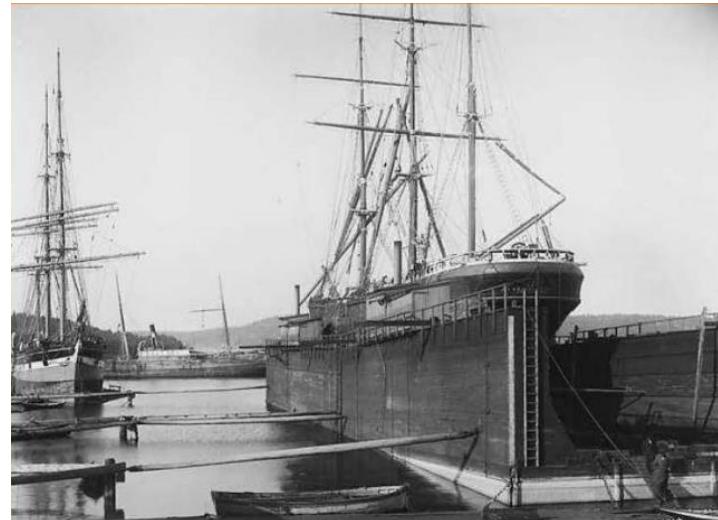
Exhaust Gas Cleaning Systems

26 APRIL 2016

SIGURD JENSSSEN
ERIK TAULE
GEIR HELLUM

SOLID BAKGRUNN

- Skipsverft 1870 to 1986 (1.100 ansatte i 1975)
- Inert Gas – utviklet til separat virksomhet



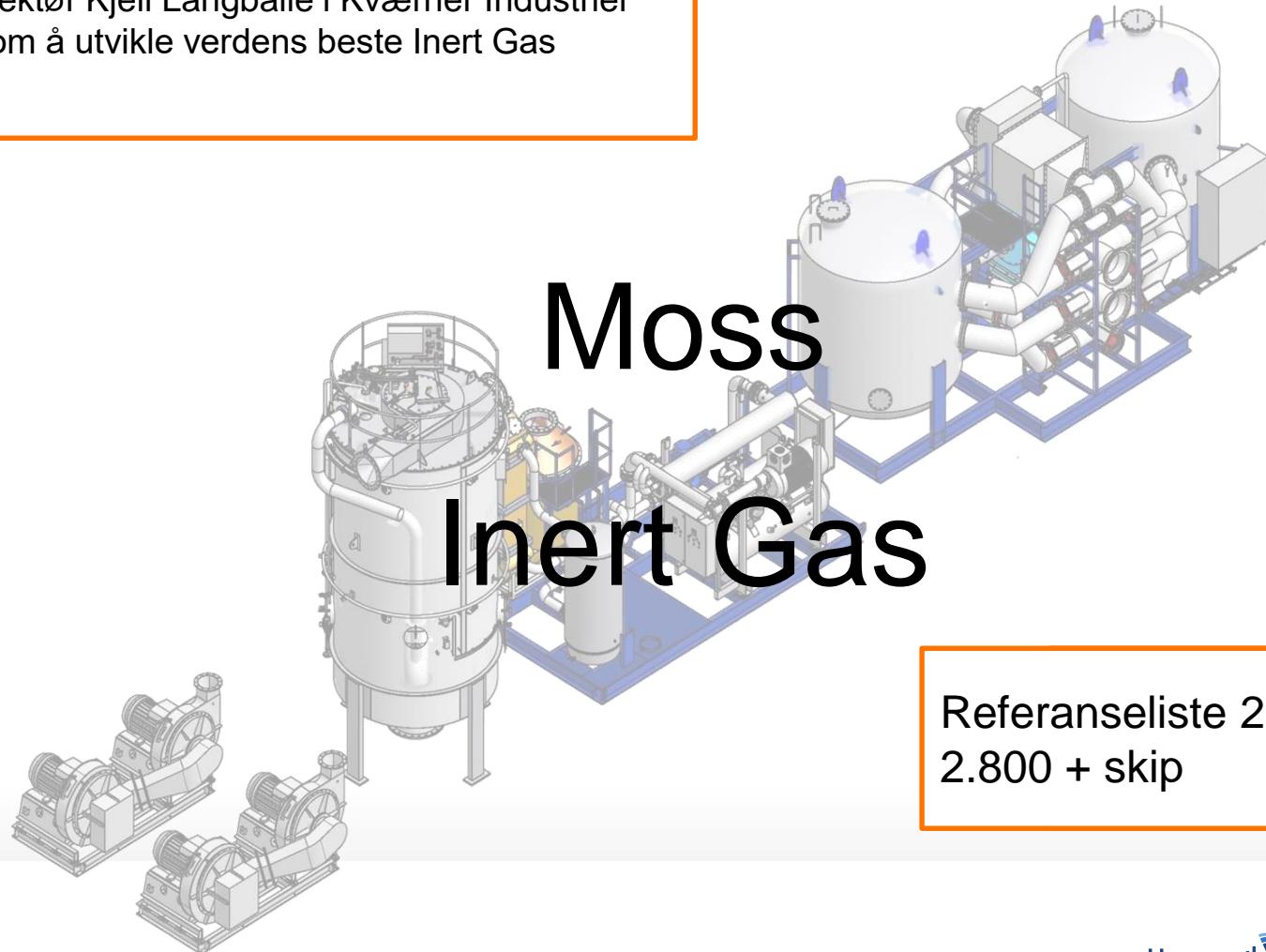
«MOSS» LNG tanker
World Wide Known Invention

- J. & J. H. Vogt, Moss Skibsværft
- A/S Moss Værft
- A/S Moss Værft & Dokk
- Moss Rosenberg Verft A/S
- Moss Fredrikstad Verft A/S
- Moss Verft
- Kværner Moss
- Kværner Ships Equipment Moss
- Hamworthy Moss AS
- Wärtsilä Moss AS

MYE VAR ENKLERE FØR?

Jon P. Hole – ung, nyansatt ingeniør i 1968:

Generaldirektør Kjell Langballe i Kværner Industrier
‘ga ordre’ om å utvikle verdens beste Inert Gas
anlegg.....



Referanseliste 2016-04-26
2.800 + skip

INERT GAS – HVORFOR

- Berge Istra 30 desember 1975
- Berge Vanga 29 oktober 1979



- Regelverk fra 1980 – Inertgass om bord på alle båter over 20.000 dwt
 - Myndighetsovervåkning – ANLEGGET MÅ FUNGERE



AFTER SALES

INERT GAS - OFFSHORE

Products – Inert Gas System for FPSO / FSO

Floating - Production, Storage & Offloading



INERT GAS → EXHAUST GAS CLEANING

INERT GAS SYSTEM - IGS

- EKSOS GASS (FORBRENNING + EKSOS RENSING)
- NITROGEN GASS (SEPARASJON AV MOLEKYLER I LUFT)

IMO REGLER FRA 1980

EXHAUST GAS CLEANING - EGC

- EKSOS RENSING

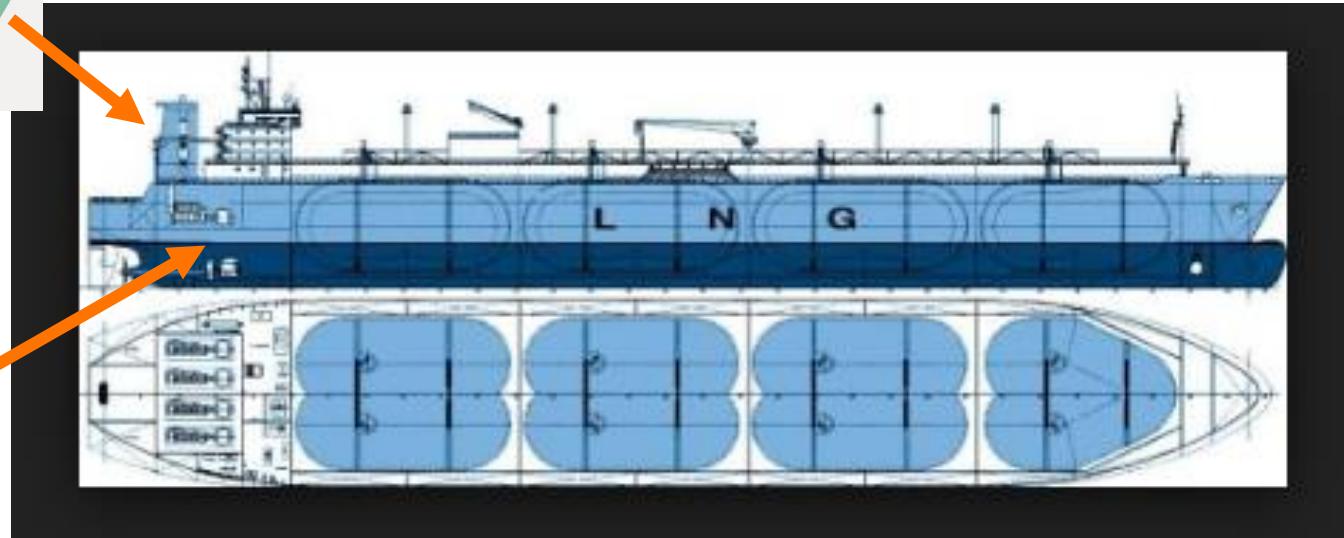
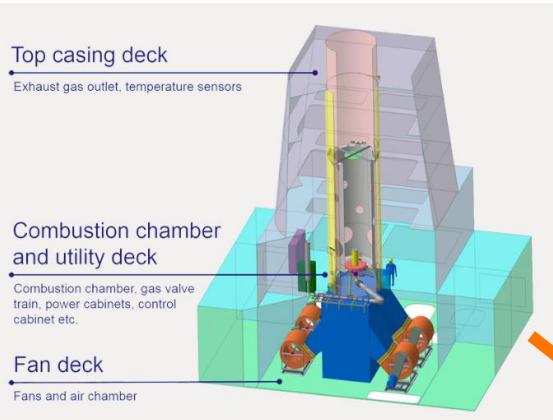
IMO REGLER FRA OKTOBER 2008

WÄRTSILÄ MOSS AS

Inert Gas Systems

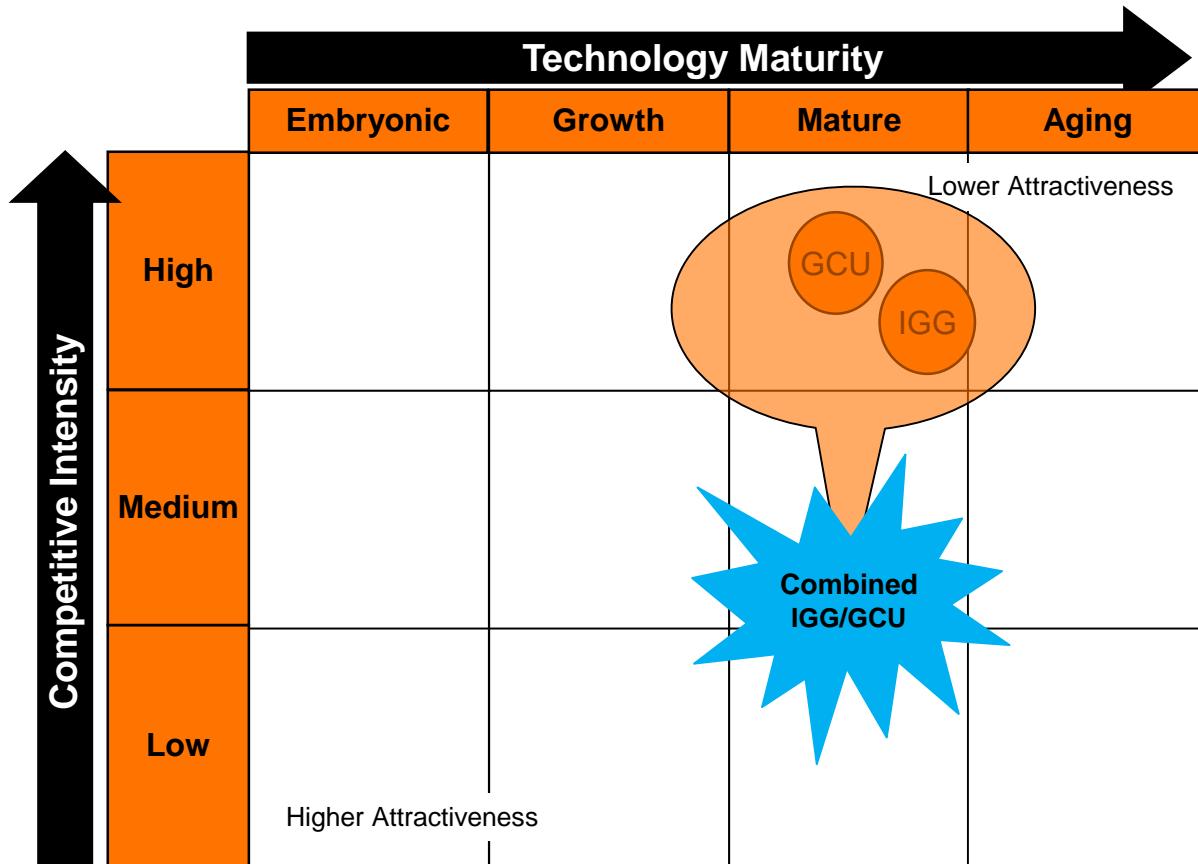
IGG/GCU story

Create edge by combining applications



IGG/GCU story

Create edge by combining applications



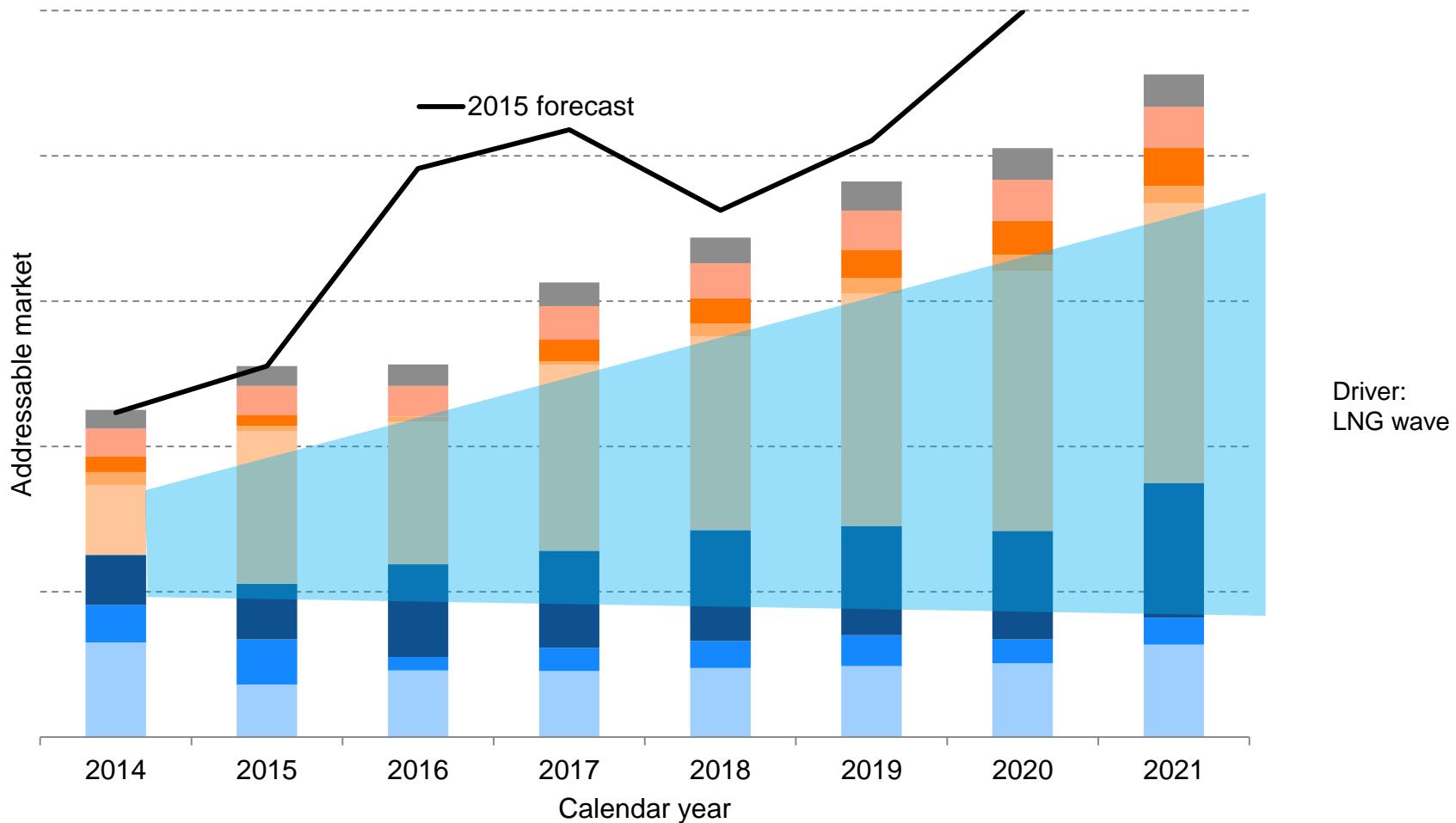
2015 market share:
68% of new LNG carriers

50% of IGS newbuild backlog

How did it happen?

- Technology and market knowledge
- Combining available technologies into new applications
- Strong value proposition
- Close co-operation with market leading yard: DSME
- Owners are buying in

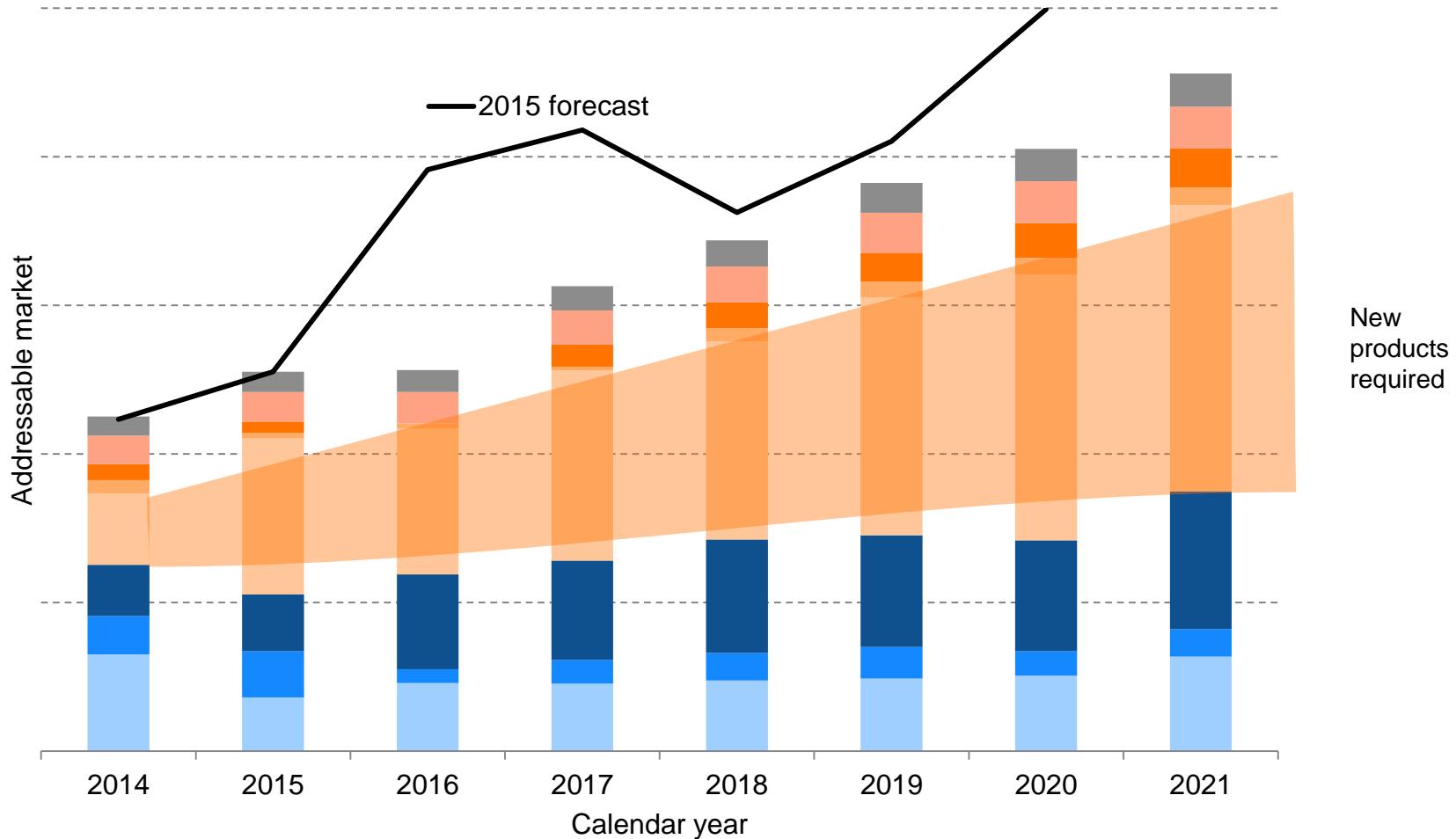
Market: Slow down in general Growth in LNG



Source: [Clarkson march report & market knowledge]

26 April 2016

Product portfolio to fit market

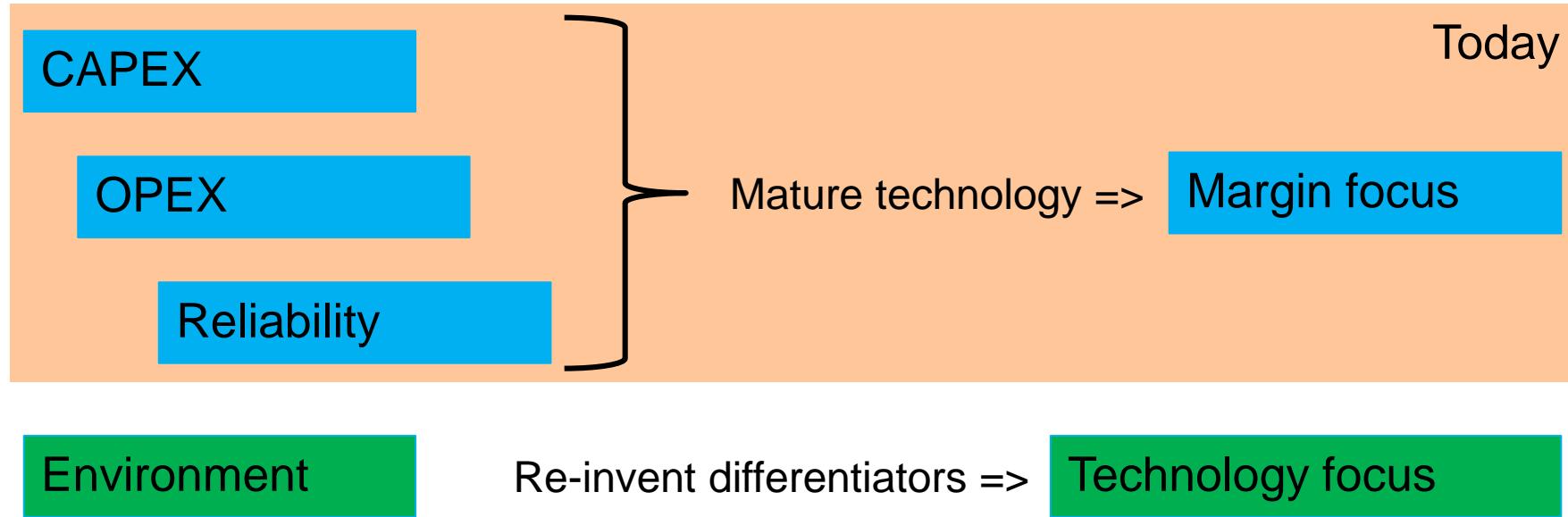


Source: [Clarkson march report & market knowledge]

26 April 2016

C-O-R-E

CAPEX - OPEX – Reliability - Environment



Success criteria:

- Competence
- Industrial community
- Flexible workforce
- Long term commitment

Our view of the future

Moss Avis

Tirsdag 26. April 1963

**Moss Værft lanserer nytt
system for LNG tanker**



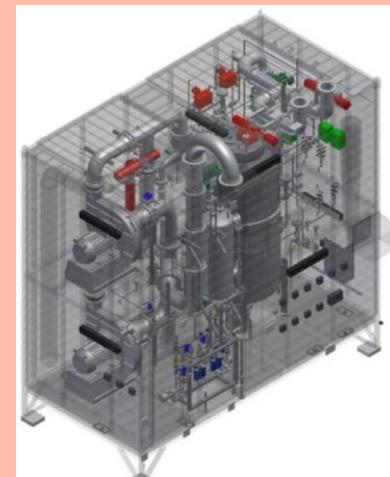
+ 60 år

Moss Avis

Nyheter Debatt Sport Kjøp billett

Tirsdag 26. April 2023

**Wartsila Moss har lykkes
med global nylansering**



WÄRTSILÄ MOSS AS

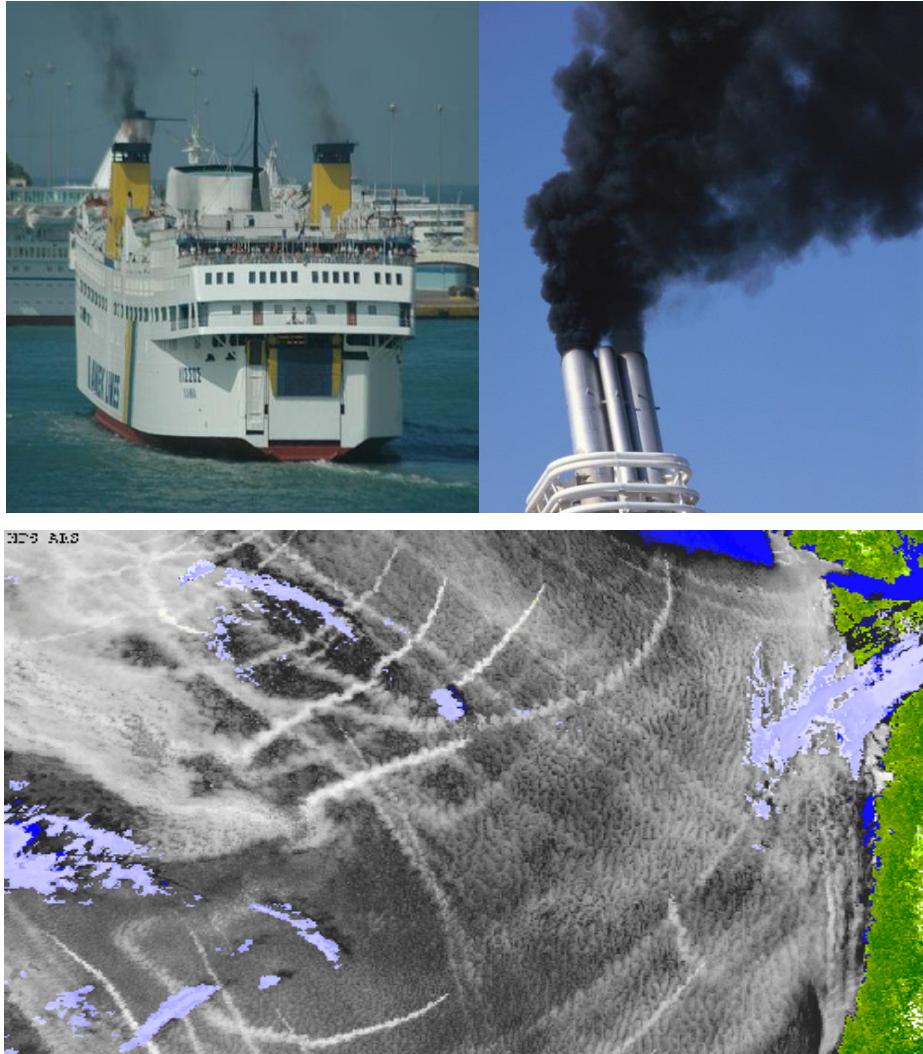
Exhaust Gas Cleaning Systems

Exhaust Gas Cleaning - Why

- Shipping is the most environmentally friendly means of transportation
- Primarily uses Residual fuel/HFO
- Lowest CO₂ footprint per goods km
- Still room for improvement
 - CO₂
 - SO₂
 - NOx
 - Particulates

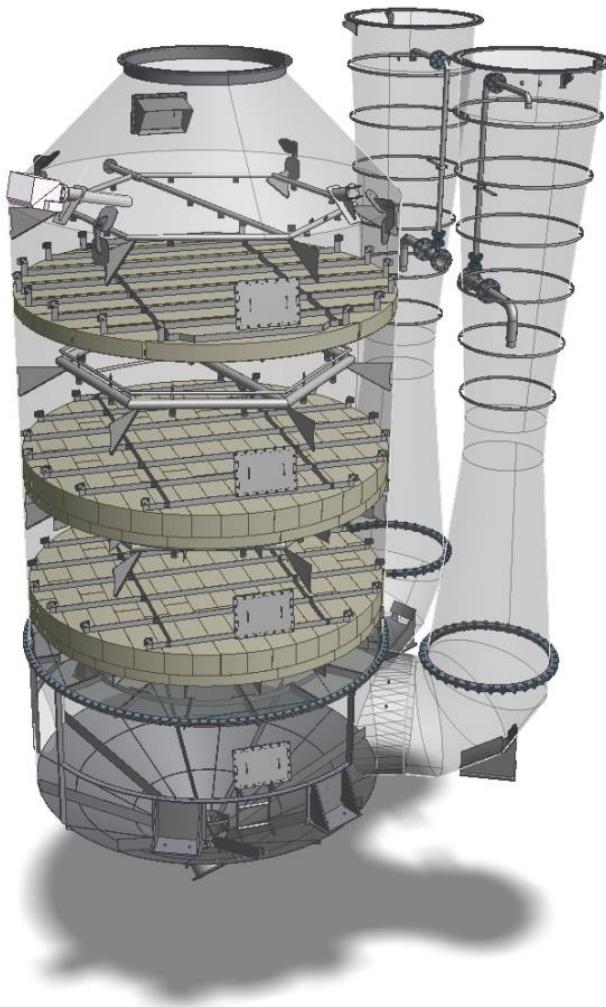
⇒ Emission Regulations in:

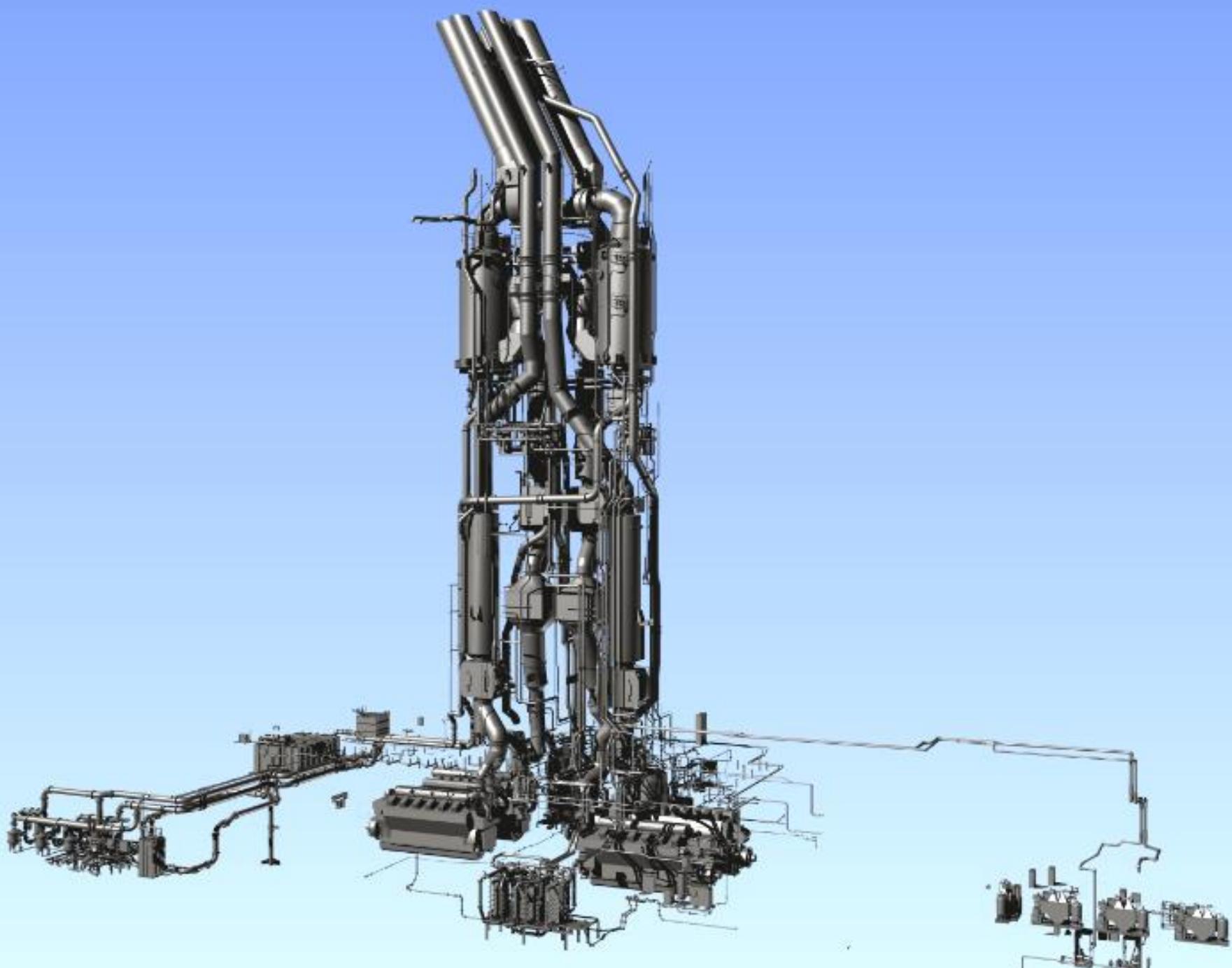
- North Sea and Baltic
- North America
- China
- European waters
- Global



Exhaust Gas Cleaning - How

1. Spray exhaust with water – a lot of water!
A scrubber washes up to 98% of the SOx and particulate matter from the exhaust.
2. Remove and collect contaminants from water
3. Measure emission levels
4. Measure water discharge levels





Exhaust Gas Cleaning - Market

Two market drivers:

1. Actual oil price
2. Price difference compared to compliant fuels:

Regulations apply to all vessels, both newbuilds and sailing ships.

Savings directly correlate with fuel consumption

- Cruise
- Ferries
- Short Sea Shipping

Owner- driven

European/North American focus

IFO380 IFO180 MGO LS380 LS180 LSMGO



Exhaust Gas Cleaning – Wärtsilä

Market leader -Why?

- Sales focus
 - Portfolio
 - Technology ownership and know-how
 - R&D focus
 - Risk management
 - Financial and organisational «muscle»
- => Expansion from a known base



WÄRTSILÄ

Exhaust Gas Cleaning - Future

- Oil price?
 - Alternative solutions?
 - Regulations?
 - Competitors?
 - After Sales
-
1. Oil price – The new normal
 2. Alternative solutions – threat and opportunity
 3. Regulations – more not less
 4. Competitors – keeps us on our toes
 5. After sales – opportunity and challenge

Research, Development and Innovation is key

- EGR for NOx reduction
- Alternative water cleaning technologies
- Alternative chemicals

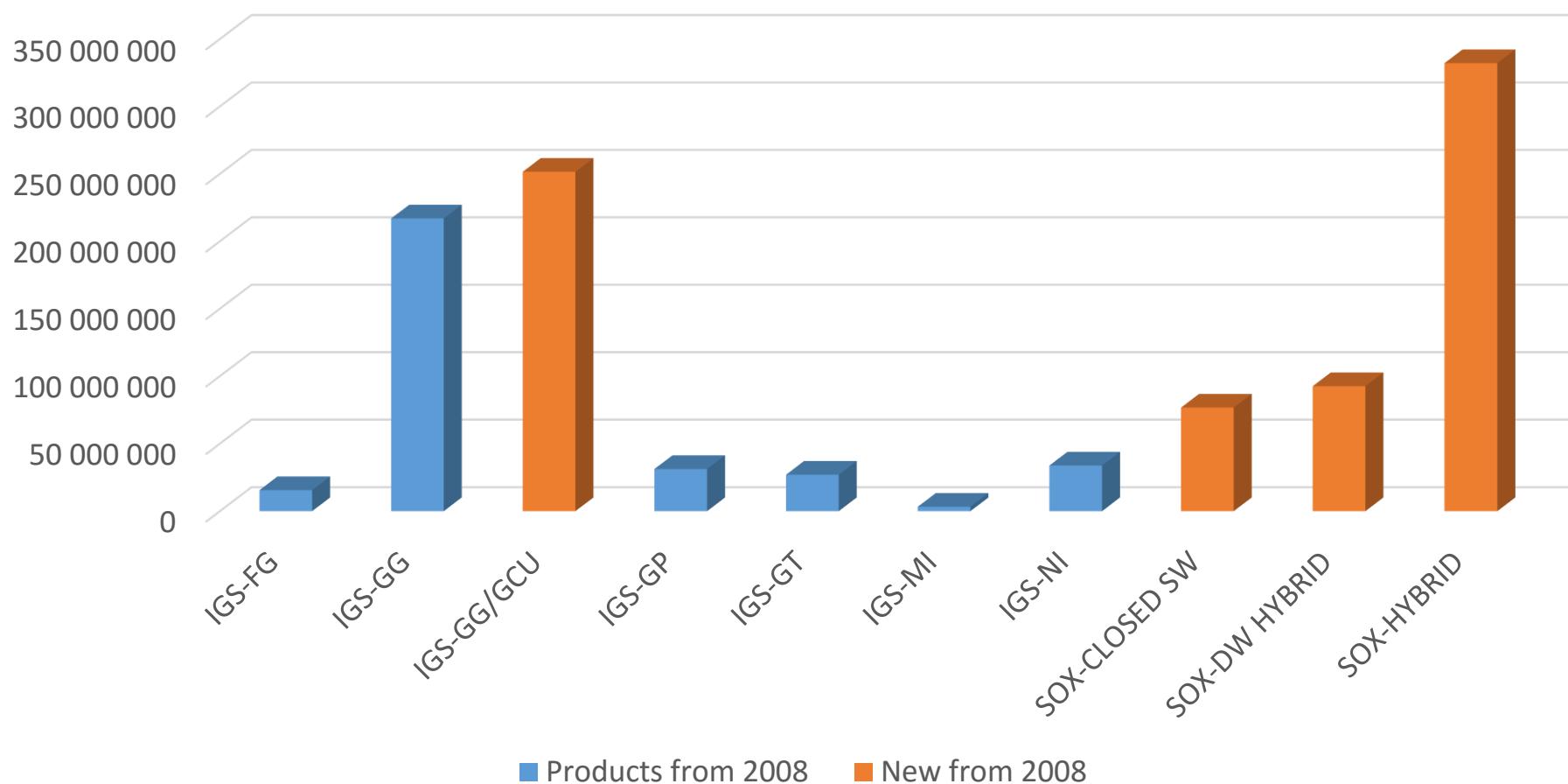
WÄRTSILÄ MOSS AS

Tallenes tale

Med og uten R&D

Order stock 2016 : 1.056 mill. NOK

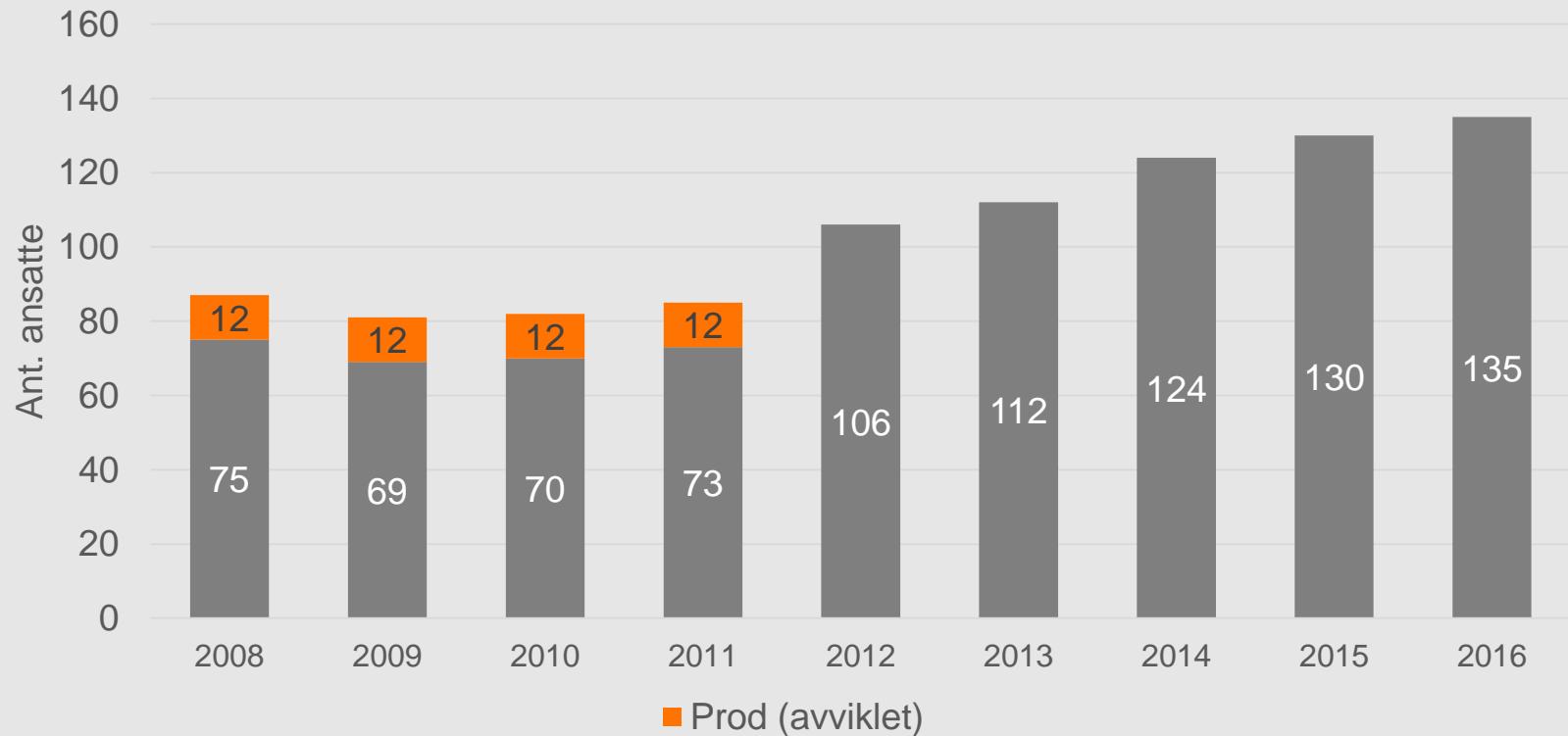
Products from 2008: 304 mill. NOK



Utvikling i omsetning 2008-2016



Utvikling i antall ansatte 2008-2016



-den som gir seg er en dritt.