The most complete Marine Offering on earth
Market trends and drivers

- Development of the global economy drives marine trade and transportation growth
- Development of oil & gas prices stimulates investments in exploration and production of offshore oil & gas
- Environmental regulations drive demand for environmental solutions and LNG as a marine fuel
- Increasing focus on energy efficiency and environmental performance

"The development of efficient vessels, environmental solutions and gas technology will be our priority in meeting your evolving needs."
Wärtsilä’s strategy for the marine and oil & gas market

To be recognised as the leading provider of innovative products and integrated solutions in the marine and offshore oil & gas industry.

- **Energy efficiency**
- **Gas and dual-fuel solutions**
- **Environmental solutions**

**THROUGH OFFERING**
- Lifecycle solutions for ship owners and operators
- Integrated solutions for the shipbuilding industry, owners and operators
- The most competitive products and delivery process for the marine industry
Why do our customers choose us?

The fundamentals has not changed just the order of importance

Wärtsilä does:
• Continuously responsive to customer needs, competent and reliable
• Integrated system supplier, total solution provider
• Provide high-quality life-cycle power solutions, maintenance and service suitable to customers
• Enhancing customers’ business through superior energy, operational and environmental efficiency

Customer needs:
• Customer understanding
  - Understands customers business and needs
  - Matching offering that suits the needs
• Trustworthy partner
  - Has good references
  - Reliable
  - Takes responsibility
• Customer management
  - Easy to work with
  - Competent personnel
  - Response time
• Efficient systems
  - High quality
  - Innovative

Trusted partner
This is what we bring to the market

**Project services**
- Marine lifecycle services
- Ship design and naval architecture
- Financial services
- Integration engineering
- Project transport & logistics
- Project management
- Site management and supervision Commissioning

**Comprehensive product portfolio**
- Environmental technologies
- Engines and gensets
- Propulsion equipment
- Power distribution
- Automation & Control
- Power drives
- Pumps and valves
- LNG liquefaction and regasification

**Operational support**
- All maintenance (schedule & unscheduled)
- Performance optimization
- Fixed & variable pricing
- Performance guarantees
- Lifecycle cost guaranteed

Support during project development and execution
THE MOST COMPLETE MARINE OFFERING ON EARTH

Automation
Ballast Water Management
Compressors
Engines & Generating Sets

Exhaust Gas Cleaning
Gas Systems
Gears
Inert Gas
Integrated solutions

Marine Lifecycle Solutions
Oil Separation
Power Electric Systems
Project Management
Propulsors

Pumps & Valves
Seals, Bearings & Stern Tubes
Services
Ship Design
Waste & Fresh Water Management
The most complete Marine Offering on earth
The only player in the market with a truly global presence and capability to service customers 24/7 on all continents

Every second ship in the world is equipped or served by Wärtsilä
Market drivers and Competitive landscape
Market drivers

Environment
- Emissions legislation (Nox) 2015-2016 postponed (sulphur still to be implemented)
- Financial impact for owners & increased uncertainty with fleet renewals/upgrades

LNG
- LNG bunkering availability
- Wärtsilä proven technology
- Fuel types being used

Offshore
- Deepwater requiring more power
- High oil price
- Brazil and China

Merchant
- Fleet supply and demand volatility
- Low cost manufacturing
Increasing environmental regulation and alternatives for decreasing emissions

Wärtsilä is offering a multi-solution approach to meet requirements for different owner needs, ship types and operating profiles.

**NO\textsubscript{x}**
- Acid rains
- Ozone depletion
- Tier II (2011)
- Tier III in ECA* (2016)

**SO\textsubscript{x}**
- Acid rains
- 3.5% (2012)
- ECA 0.1% (2015)
- Global 0.5% (2020)

**PARTICULATE MATTER**
- Impact on air quality
- Along with SO\textsubscript{x} reduction

**GREENHOUSE GAS**
- Global warming
- Under evaluation by IMO

**BALLAST WATER**
- Damage to local eco-systems
- Global ballast water convention

**LNG**
- Simultaneous reduction of GHG / SO\textsubscript{x} / NO\textsubscript{x} / PM
- Market: mainly ships with regular routes and limited autonomy requirements operating in ECAs
- Infrastructure development is needed for larger uptake
- Conversion solution available

**HFO**
- NO\textsubscript{x}: SCR or wet methods
- SO\textsubscript{x}: Scrubbers
- Market: mostly merchant ships operating a significant time in ECAs

**MGO**
- NO\textsubscript{x}: SCR or primary methods
- Market: ships operating a limited time in ECAs, small ships

*Emissions Control Areas*
Regulation

2012 Jan 1: Europe confirmed draft changes to sulphur in fuel directive.

2014 Jul 1: Ecdis mandatory for newbuilding cargoships (>3,000gt and <10,000 gt).

2014 Jan 1: IMO ballast water convention applies to vessels built pre 2009 (implies treatment technology needs installing on vessels with ballast capacity 1,500 gt to 5,000 gt).

2014 Jan 1: US ballast water requirements for existing ships (ballast Water capacity less than 1,500 cu m or greater than 5,000 cu m).

2014 Jul 1: Noise levels: The code on noise levels onboard ships will come into effect when the new regulation enters into force.

2013 Jul 1: Ecdis mandatory for newbuilding cargoships (> 10,000 gt).


2013 Jan 1: US ballast water requirements start for newbuildings.

2015 Jul 1: Ecdis mandatory existing tankers (>3,000 gt).

2015 Jan 1: SOx ECA limits sulphur in fuel drops from 1.0% to 0.1% (SOx in emissions should be equivalent if post combustion exhaust gas cleaning technology is used).

2016 Jan 1: IMO NOx tier III rules in force (newbuildings operating in an ECA).

2016 Jan 1: US ballast water requirements for existing ships (ballast Water capacity less than 1,500 cu m or greater than 5,000 cu m).

2018 Jan 1: IMO mandatory existing cargo vessels (<20,000 gt).

2018 Jan 1: IMO ballast water convention applies to all other vessels (implies treatment technology needs installing on vessels with ballast water).

2018 Jul 1: IMO low-sulphur fuel availability survey completed (to determine if 2020 global reduction to 0.4% should be deferred to 2024).

2019 Jan 1: European rules on sulphur in fuels forces drop to 0.5% regardless of IMO 2018 availability study.

2020 Jan 1: Potential start of market-based measure to further curb CO2 emissions from shipping (and contribute to the UNFCCC initiated climate

2020 Jan 1: Sulphur in fuels global limit drops from 3.5% to 0.5% (2018 survey pending).

2024 Jan 1: Sulphur in fuels global limit drops from 3.5% to 0.5% (2018 survey pending).

Source: Lloyd’s List.
ECDIS=Electronic chart Display and Information system, EEDI=Energy Efficiency Design index.
The competition has changed

E&A

Propulsion

Gas Systems

4-stroke medium speed

Flow Systems

2-stroke

Environmental solutions

SHIP POWER

Major Shipyards

Local pumps makers

MARIC

Ship Design

SIEMENS

ABB

Conver

Rolls-Royce

SHIPSERB

Mitsubishi

Mani

IGS

Rolls-Royce

Kongsberg

Conver

Rolls-Royce

MARIC

CSSC

CSSC

Haoyu

Deltamarin

Rolls-Royce

Ulstein

Bestway

Skiptekniske

Mitsubishi

Cascor

Coldharbour

RWO

OceanDoctor

HydeMarine

GEA

MAHLE

Hyundai

Optimarin

Panasia

OceanSver

Tycheros

Wärtisilä

LGE

excelerate

TGE

GL Marine

CHS

Almamer

S

Shinko Ind.Ltd.

MarFlex

Desmi

TDK

SEALPLUS

EGCS

Dupont

Green Tech Marine

Couplet Systems

Clean Marine

CPL

Prudential Marine

Wärtsilä

ABB

Kawasaki

Naniwa

Principium

PIE

Global

ECS

Fanuc

Imara

JG

IEC

Mar sollen
Our expertise in the gas value chain

- Exploration & development
  - Exploration & Drilling
    - LNG fuel gas systems for OSVs
  - Production & liquefaction
    - On- & Offshore small scale liquefaction
    - Antiflaring/VOC
    - Oil separation
    - Gas FPSO
  - Transport & storage
    - LNG fuel gas systems
    - LPG, LEG & LNG cargo handling
  - Receiving terminals & regasification
    - Jetty & Floating regasification
    - Bunkering & barges
    - Receiving terminals
  - Distribution & transport to the users
    - Gas/LNG distribution/logistics
    - Feed gas to Power plants

- Distribution & transport
  - LPG/LEG/LNG tanker
  - LNG receiving terminal
  - LNG carrier
  - FPSO
  - Flare recovery
  - Oil separation
  - LNG terminal & Regasification (FSRU/JRU)

- Transport
  - Small-scale LNG plants
  - LNG fuelled vessels

- Production
  - LNG liquefaction & terminal

- Oil tanker with VOC
  - Oil tanker with VOC

- LNG bunkering & barges

- Power generation

Wärtsilä Ship Power
Clear leadership in dual-fuel applications

<table>
<thead>
<tr>
<th>Segment</th>
<th>Power Plants</th>
<th>Merchant</th>
<th>Offshore</th>
<th>Cruise and Ferry</th>
<th>Navy</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>DF Power Plant</td>
<td>• 67 installations</td>
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<td></td>
<td>• 354 engines</td>
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<td>• Online since 1997</td>
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<td>LNGC</td>
<td>• 141 vessels</td>
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<td>• 567 engines</td>
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<td>Multigas Carrier</td>
<td>• 5 vessels</td>
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<td>• 20 engines</td>
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<td>Conversion</td>
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<td>OSV's</td>
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<td>• 9 FPSO’s</td>
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<td>Conversion</td>
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<td>• 8 engines</td>
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<td>LNG Cruise ferry</td>
<td>• 1 vessels</td>
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<td>• 4 engines</td>
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<td>LNG ferries</td>
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<td>• Complete gas train</td>
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<td>Coastal Patrol</td>
<td>• DF-propulsion</td>
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<td>• DF main and auxiliary engines</td>
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<td>TUG</td>
<td>• 2 vessel</td>
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<td>• 2 engines each</td>
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<td>• Mechanical drive</td>
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<tr>
<td>Guide Ship</td>
<td>• 1 vessel /engine IWW</td>
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<td>• 2 vessel</td>
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<td>• 3 engines</td>
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</tbody>
</table>

→ 6 segments → > 1’000 engines → > 9’000’000 running hours
R & D

2S DualFuel engines

New 4S engine portfolio

Wärtsilä 3C

New generation X engines

Medium voltage power drive

WST – 45U

LNGPac™ ISO

BWMS aquarius

System Integration at its best Evergas

EGC

Gas reformer
Shipping outlook
Shipbuilding has moved to Asia
China has gained the top merchant builder position

In 2012, Chinese yards won back some of the contracting share they lost to South Korea in 2011. This continued in 2013.

Source: Clarkson Research Services
Shipping and shipbuilding demand depends on global economy

Political and economic issues continue to limit growth in the short-term. The global economic outlook for the medium- to long-term is more positive due to more robust growth projections for developing economies and the concurrent recovery of western economies.

Source: IMF, Clarkson Research Services
Contracting activity development

- Contracting activity improved in 2013
- Finance and poor freight markets are clouding recovery
- The contracting product mix has been spread across the various vessel sectors
- Regulations and fuel prices driving towards eco designs and gas as a fuel
  - Accelerated demolition creating additional demand
- High proportion of contracts with options attached in 2013
  - Owners wanted to take advantage of the attractive newbuilding prices in a rising market

Source: Clarkson Research Services
Earnings dropped in January from December highs, however remain in an improved level. VLCC rates fell dramatically during the last week of January bringing average earnings down by 58% w-o-w to $20,387/day.

Newbuilding prices increased steadily during 2013 across all sectors.
Issues of fuel efficiency and impending environmental regulations are making owners increasingly conscious of more ‘eco’ designs. In addition the owners may increasingly wish to scrap more inefficient tonnage at an age below the historical norm.

Source: Clarkson Research Services, Consensus Economics Inc.
As LNG gains a more substantial share of the gas market, it is expected that the traditional oil indexed long term gas transportation contracts are likely to switch to an independent, hub or spot based pricing method.

The effects of this movement in the gas markets are expected to lower gas prices, as the differential between current oil and gas prices increases and individual gas futures markets help to mitigate risks associated with the spot market, increasing the attraction of gas as a fuel versus coal and oil.
Offshore outlook
Strong growth in LNG supply and demand

- Natural gas is becoming an increasingly popular fuel for power generation offering a relatively safe (compared to nuclear); cheap (compared to oil); and clean (compared to coal) energy source.
- Demand for natural gas to increase by 55% over the next 20 years
- 30% of global gas imports are via LNG
- Lack of new LNG export capacity limited trade in 2012 and 2013
- Growth supply in recent years driven by Middle East, demand driven by Asia
- Significant project delays and cost overruns
- Large Australian projects coming online
- Potential future supply from Russia, US shale gas, W & E Africa & Mediterranean
- CAPEX on FLNG expected to increase significantly
- Asia will dominate FLNG regas projects as domestic gas demand grows.

**Wordl LNG exports and imports 2012**

**CAPEX on FLNG Liquefaction vessels**

Source: Douglas-Westwood, Petroleum Economist, SP BI
The offshore oil and gas industry is recognised as a key growth area for the future of oil production and fleet growth. Whilst some oil producing areas are in long term decline, this has only encouraged exploration in less conventional areas, resulting in a need for more specialised and technologically advanced structures.

The long-term forecast requirement for structures engaged in the offshore oil and gas business is based upon analysis and modelling of future fields coming online.

Offshore mobile contracting is expected to total 537 in 2014, slightly up from 2013.


Despite the supply-side growth in the OSV and rig sectors, demand is still expected to increase significantly, leading to further contracting in these sectors.

The expectation for offshore supply-side expansion is supported by the future field developments, notably by those in the deep water.

Source: Clarkson Research Services, OFC September 2013
Contracting update
LNG Carriers

LNG Carrier Contracting activity

- Medium- and long-term new build potential are promising - long liquefaction and regasification project list
- Short term overcapacity - export project delays
- Closure of nuclear plants and environmental issues associated with coal use in Asia and Europe bring good news to LNG market

Source: Clarkson Research Services, SP BI
Contracting Activity Development – All vessels

Source: Clarkson Research Services, Contracting activity as per 3rd of February 2014
Thank you!