

Journey towards autonomous ships in the ship intelligence era



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Digitalisation – disruptive change

Internet of Things

Industry 4.0

Big Data



U B E R

amazon.com



Digitalisation in the marine market



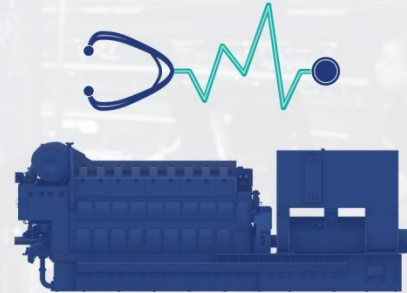
The dawn of the Ship Intelligence era

Shipping trends - management

"Total awareness"

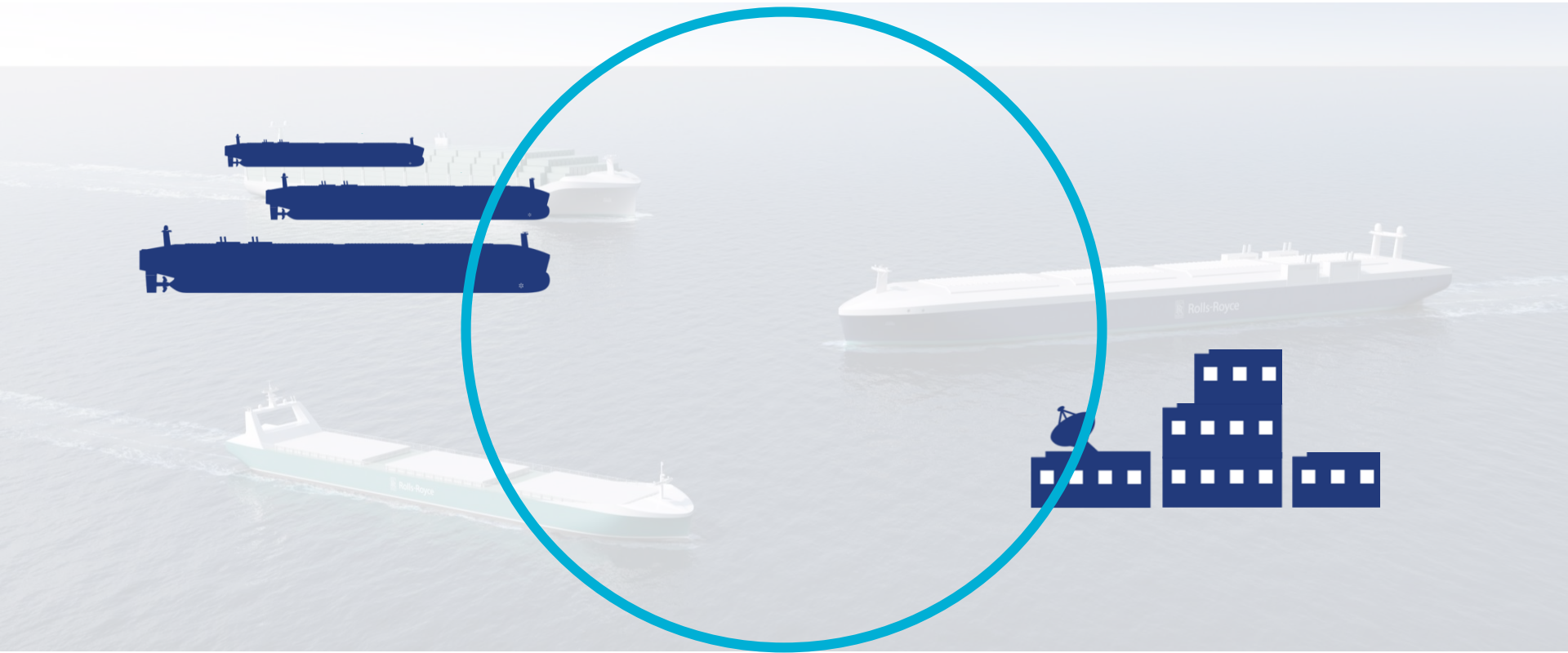


Asset management

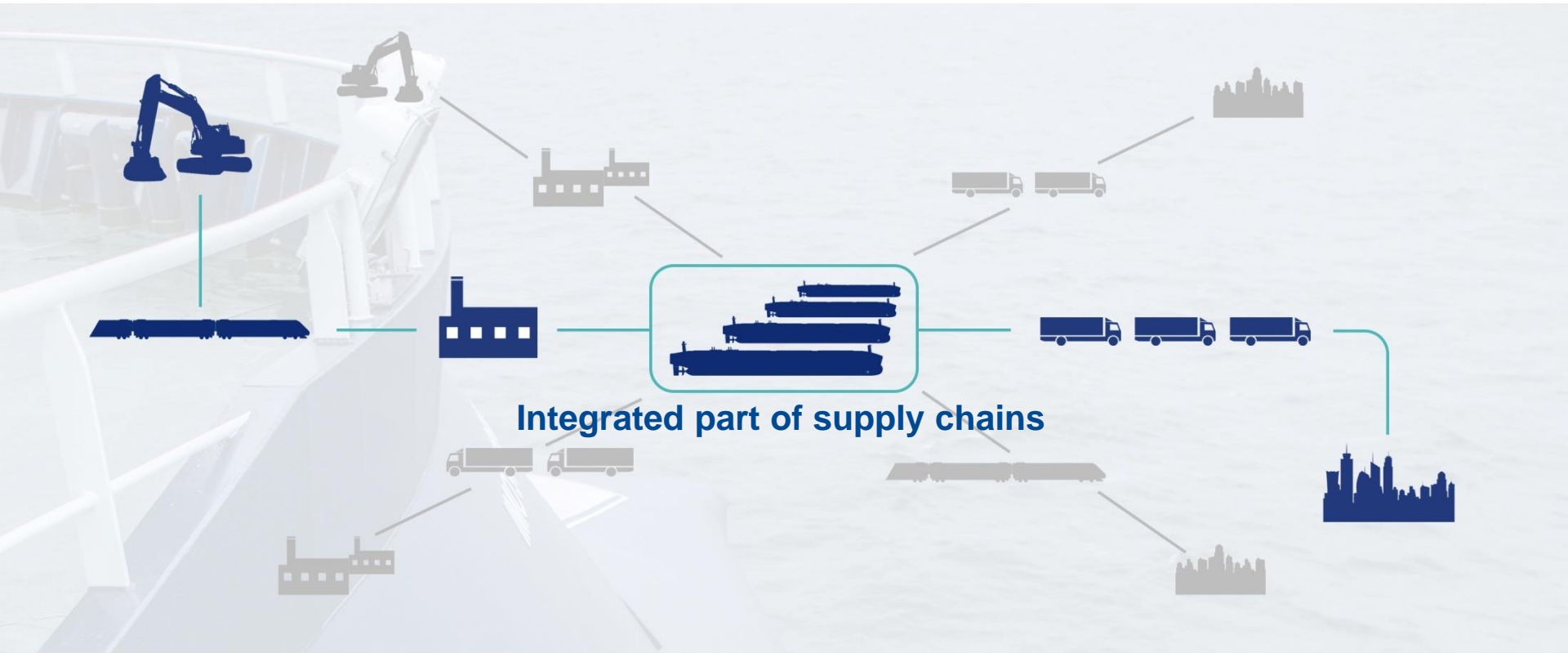


Health management

Integrating ship and shore

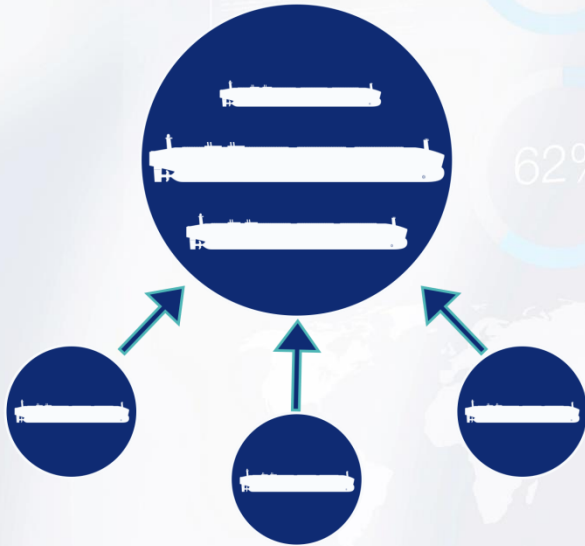


Shipping trends – operation



Shipping trends - business

Consolidation



New players and digital alliances



New players?

Investors

Digital market place

Asset management



Disruptive change



Autonomous ships

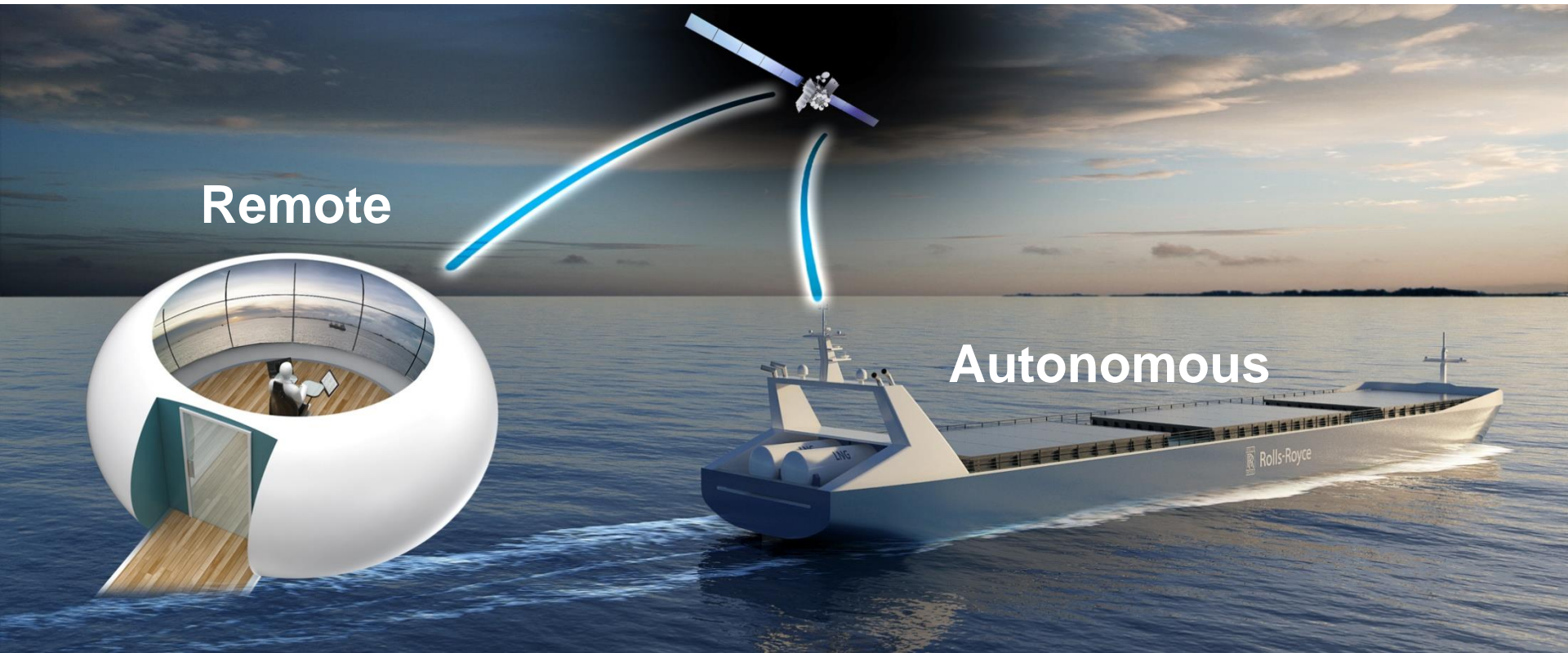


Unmanned trend in society



It is not IF, but **WHEN...**

Remote and autonomous operation



Safety

Safer than before

Fewer accidents

Human error factor

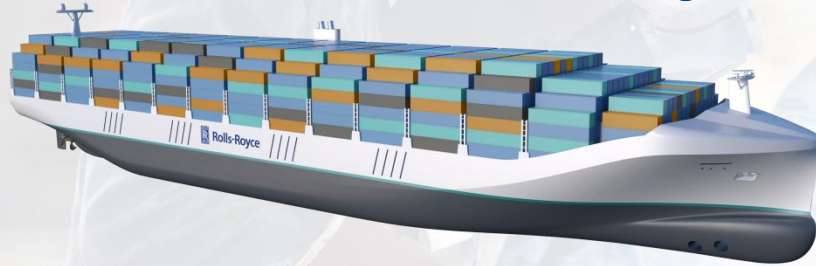
No piracy victims

Humans out of harms way



Remote controlled ships - features

More cargo



Lower power demand

No hotel systems

No deck house

Redundant machinery



Energy reduction

Lower operating speed?

Lower weight: 700 – 1.000 ton

Wind resistance: ~1% saving

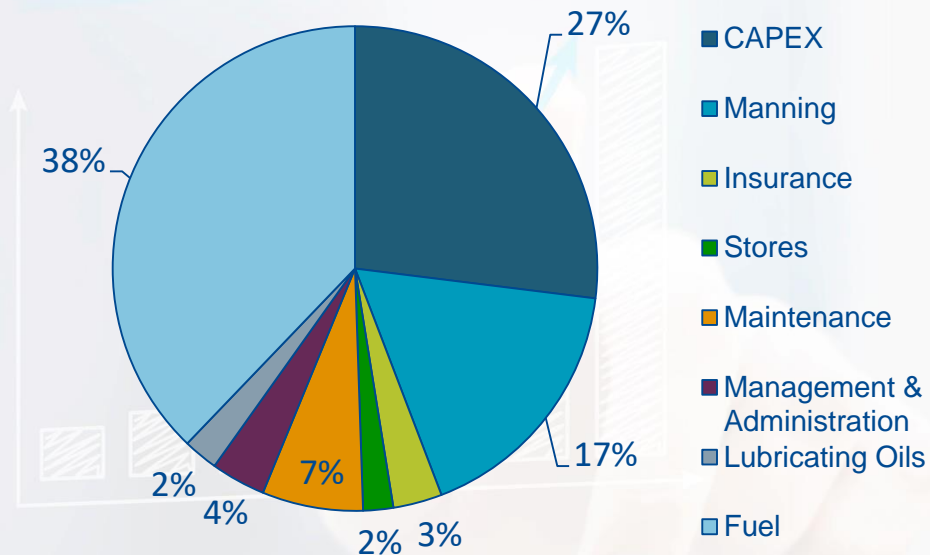


Reduced hotel load: 200 – 270 kW

Cost structure

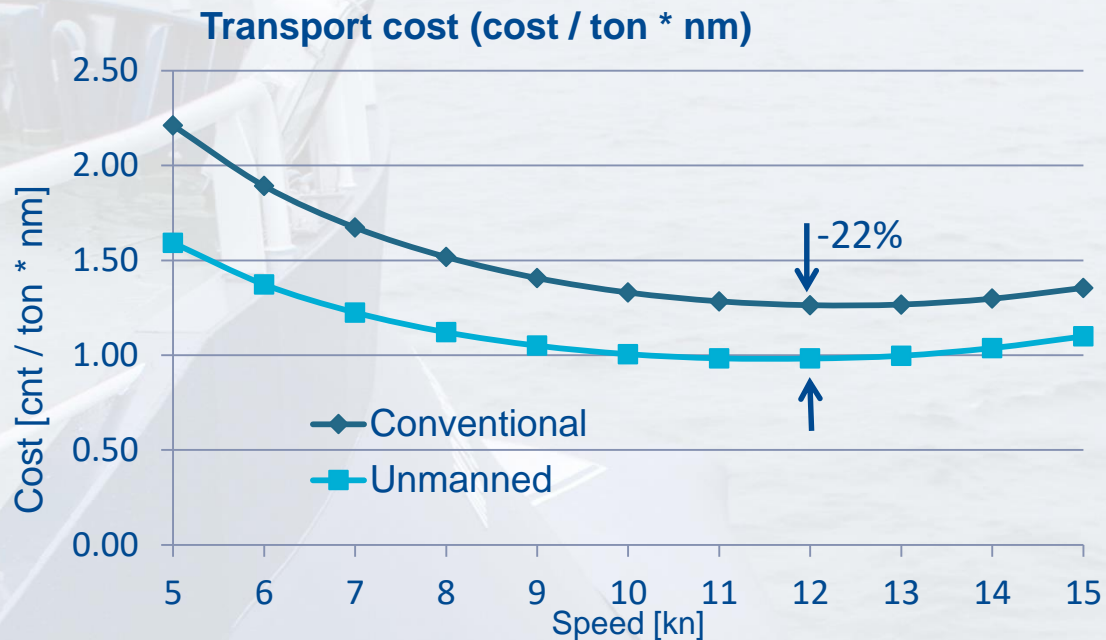


General cargo annual costs



Cost - transport

20.000 dwt general cargo vessel



Development areas



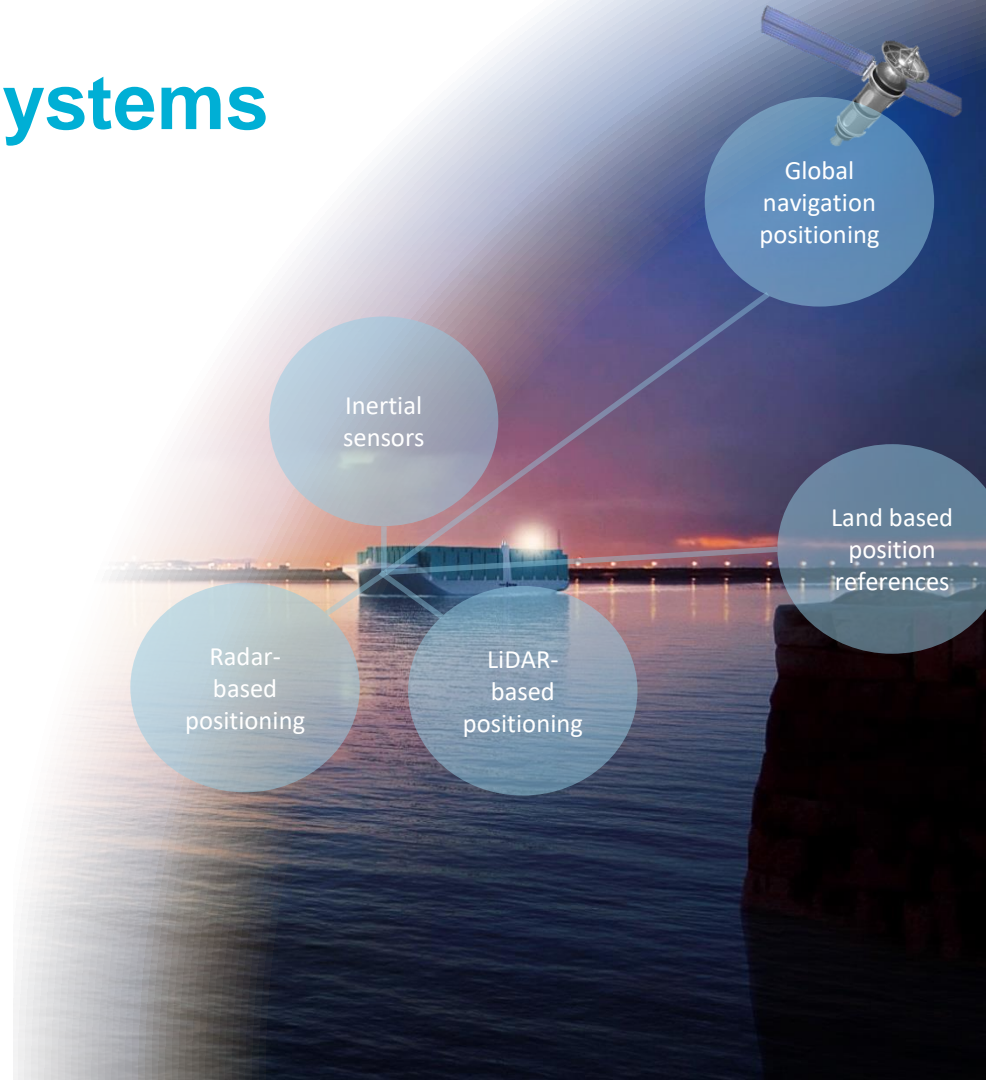
Example: positioning systems

Features:

- Various positioning systems
- Full redundancy

Key criteria:

- Integrity
- Security
- Accuracy



Rules and regulations



SOLAS

Legal aspects

Marine liability



Product liability

Roadmap

2020

**Reduced crew with remote support
and operation of certain functions**

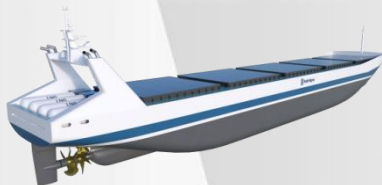


**Remotely operated
local vessel**



2025

**Remote controlled
coastal vessel**



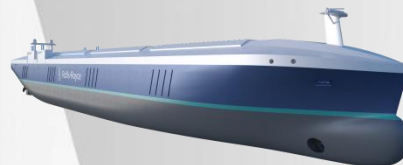
2030

**Remote controlled
ocean going ship**



2035

**Autonomous
ocean going ship**



Autonomous ships will start with local applications!

Finnish Ecosystem for Autonomous Ships

DIMECC Ecosystem for Autonomous Ships

Finland aims to operate world's first autonomous ship system in 2025

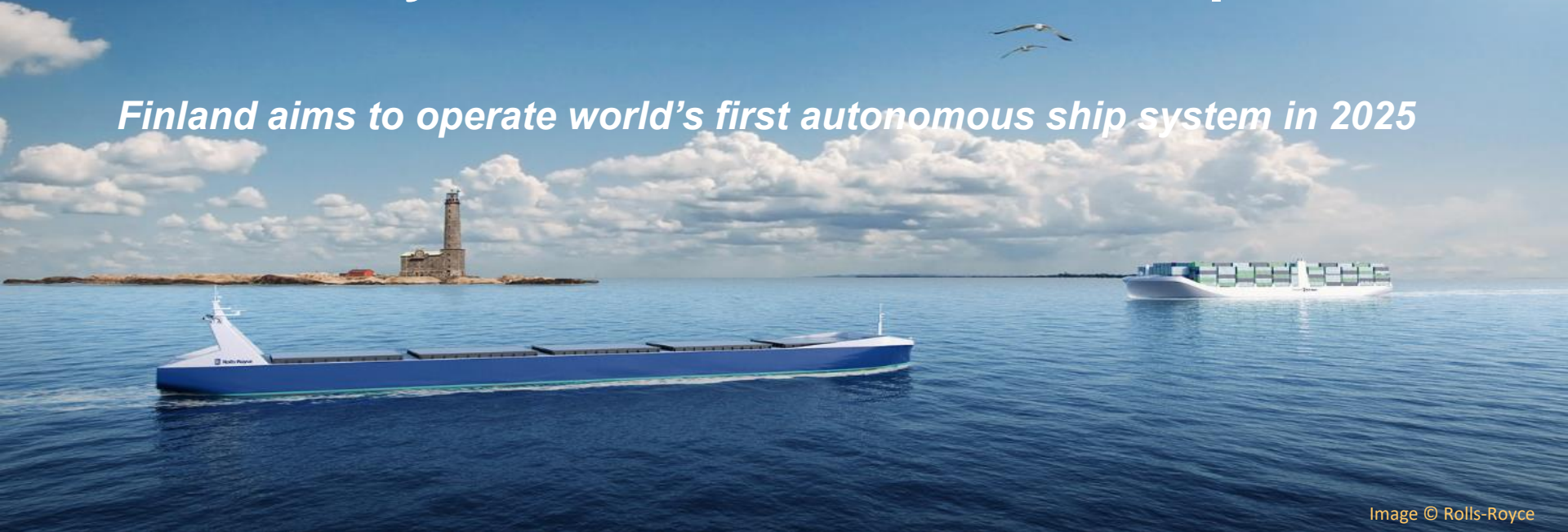


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Norwegian Forum For Autonomous Ships



Redefining shipping!



” The best way to
predict the future

is to **create**
the future”



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