

Breathe freely with Wärtsilä

Preparations for 2020 global sulphur cap

MARINTEC 2019
SHANGHAI

CLEAN AIR

CLEAN OCEAN

CLEAN CONSCIENCE

NO_x

ACID RAINS

US ECA

TIER III

SO_x

ACID RAINS

0.1% IN ECA/EU

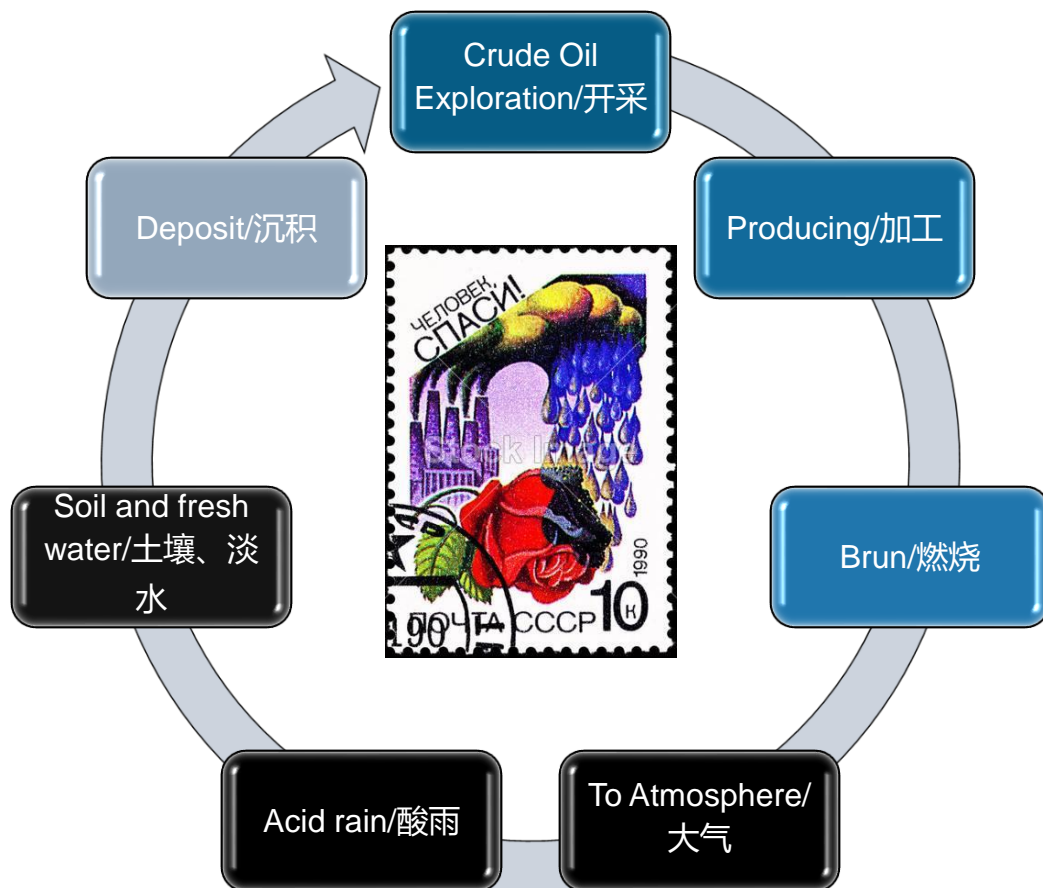
0,5% IN GLOBAL

CO₂ / PM

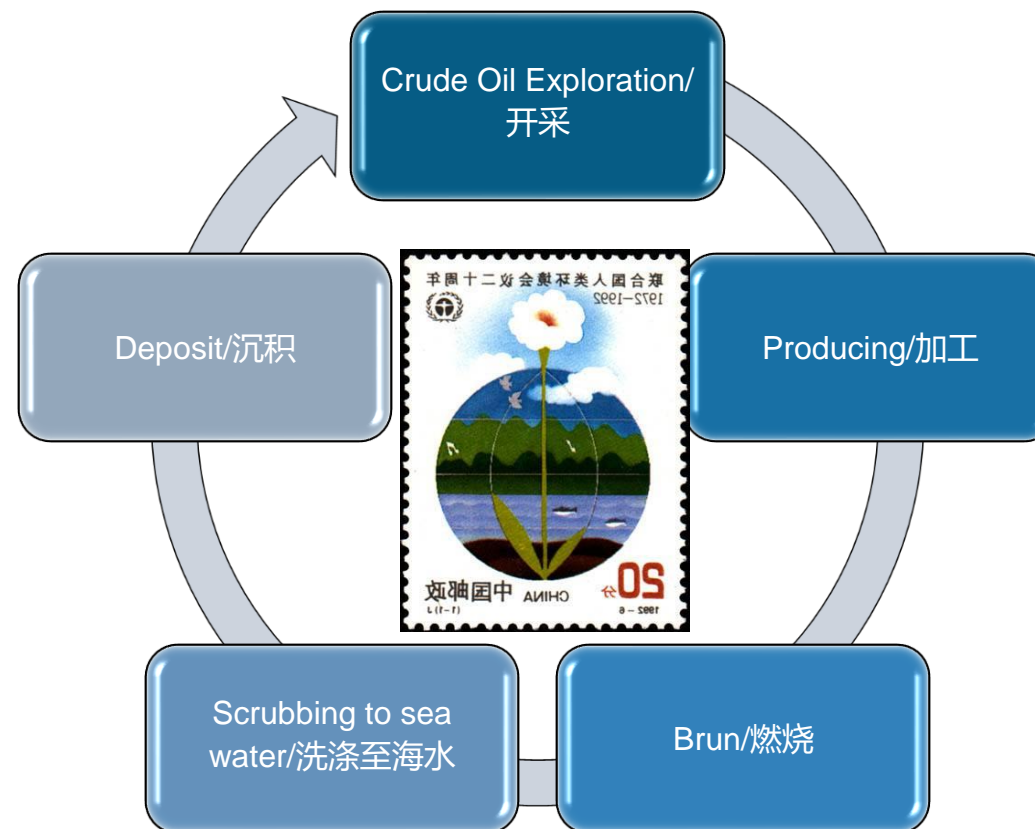
UNDER EVALUATION

PM RESTRICTION IN
SOME AREAS
AND FOR SMALLER
MACHINERY

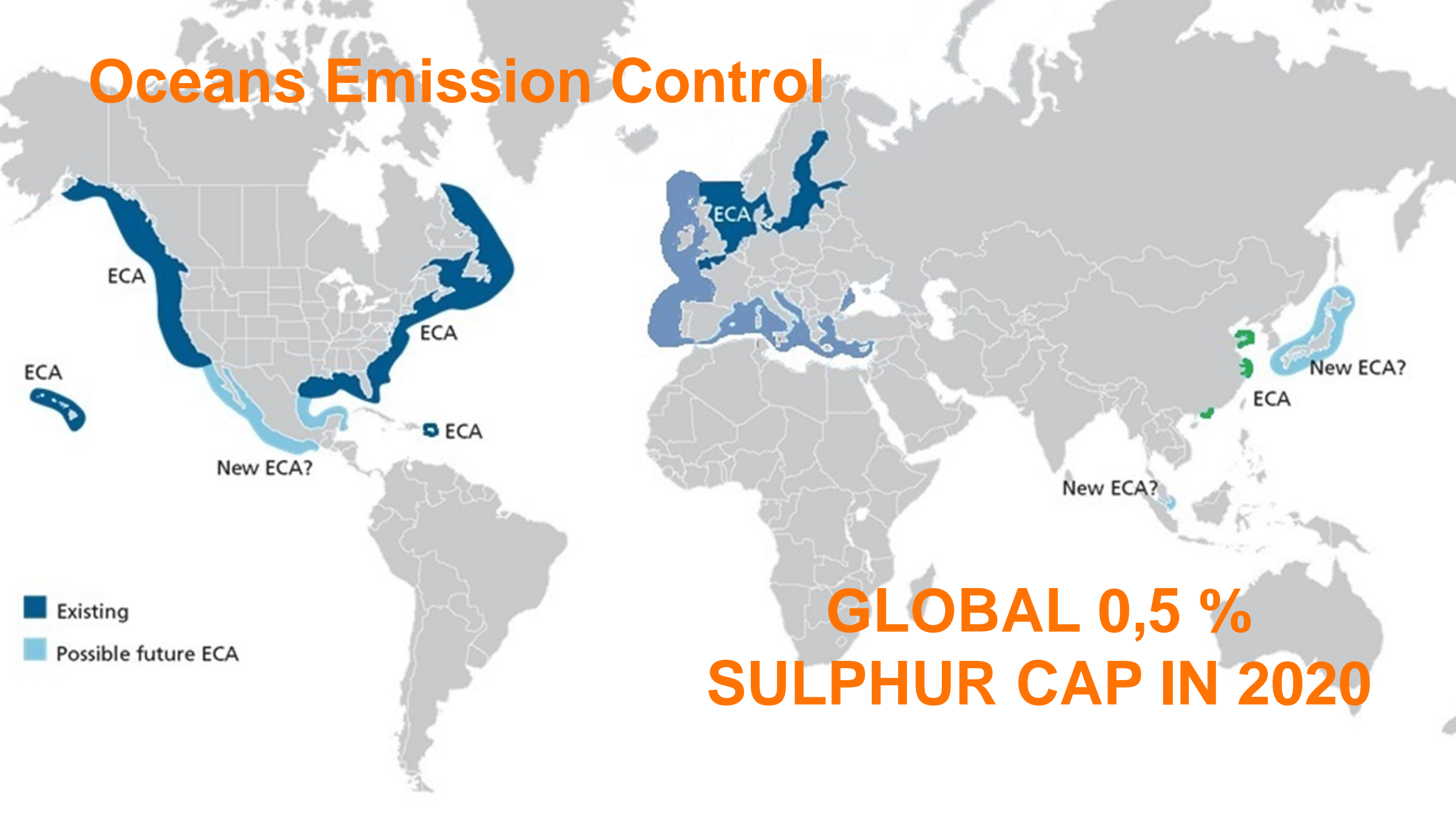
NORMAL CIRCLE FOR SULPHUR IN OIL



Circle for sulphur in oil with scrubber



Oceans Emission Control



**GLOBAL 0,5 %
SULPHUR CAP IN 2020**

WÄRTSILÄ SCRUBBER SOLUTIONS



Wärtsilä I-SOx

1 – 18MW



Footprint

Wärtsilä V-SOx

1 – 20MW



Efficiency and PM

Wärtsilä V-SOx multiple

20 – 35MW



Efficiency and PM

Wärtsilä Q-SOx

40 – 70MW



Efficiency, footprint and robust

SYSTEM ARRANGEMENTS

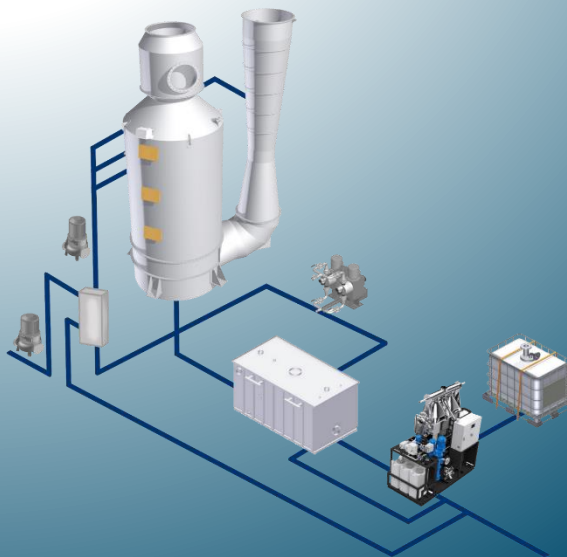
Open loop

Ships operating in waters with sufficient alkalinity and no restriction on discharge water.



Closed loop

Ships operating in low alkalinity waters or operating in zero discharge zones.



Hybrid

Ships operating in all types of waters or requiring full operation flexibility.



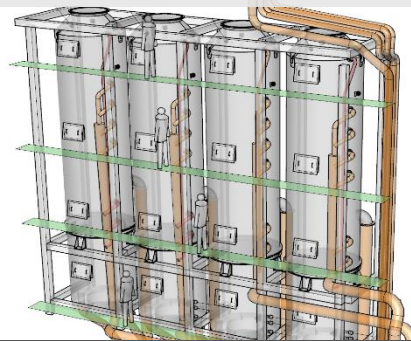
EQUIPMENT ONLY



SITE ADVISORY



ENGINEERING

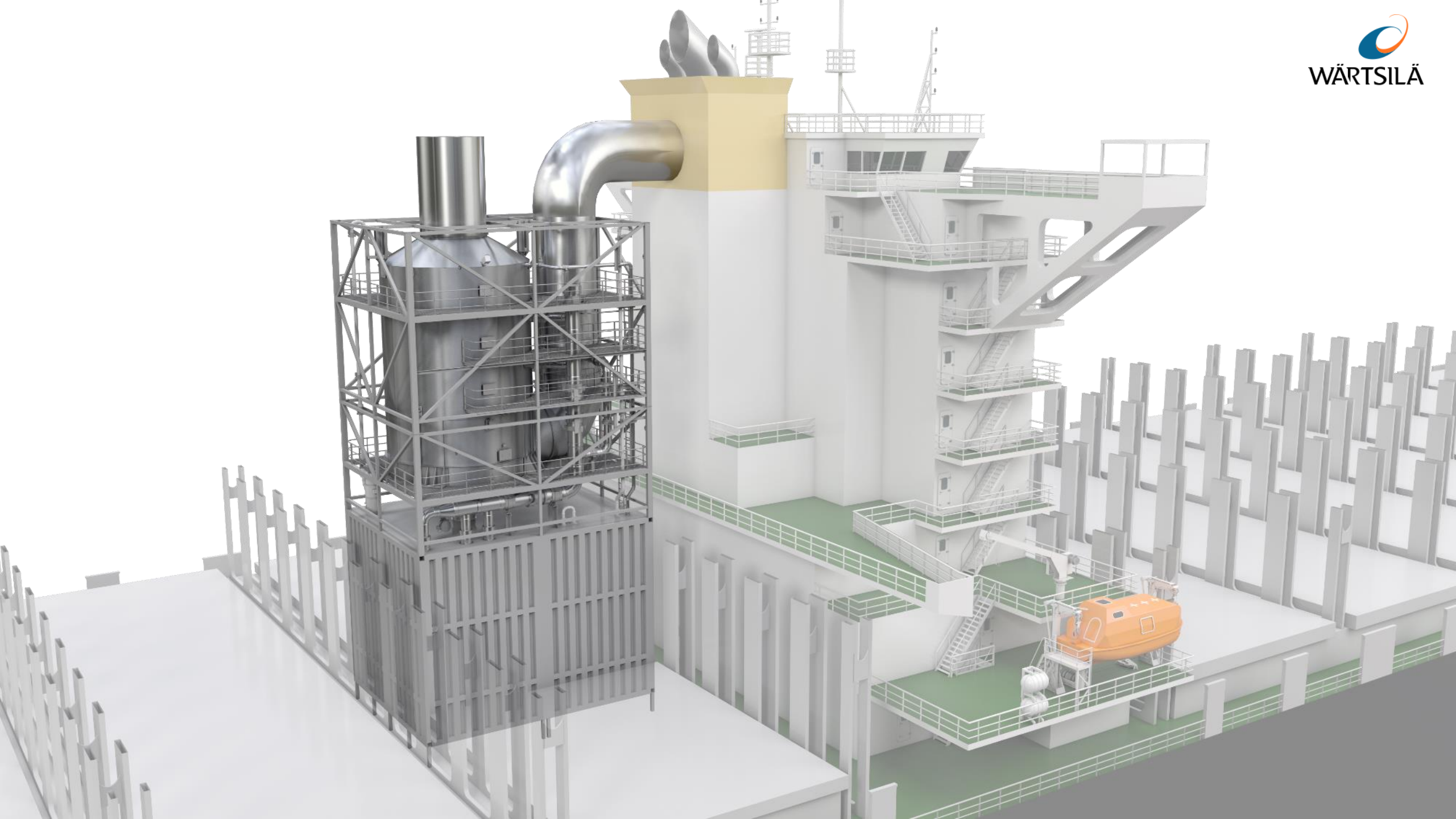


INSTALLATION

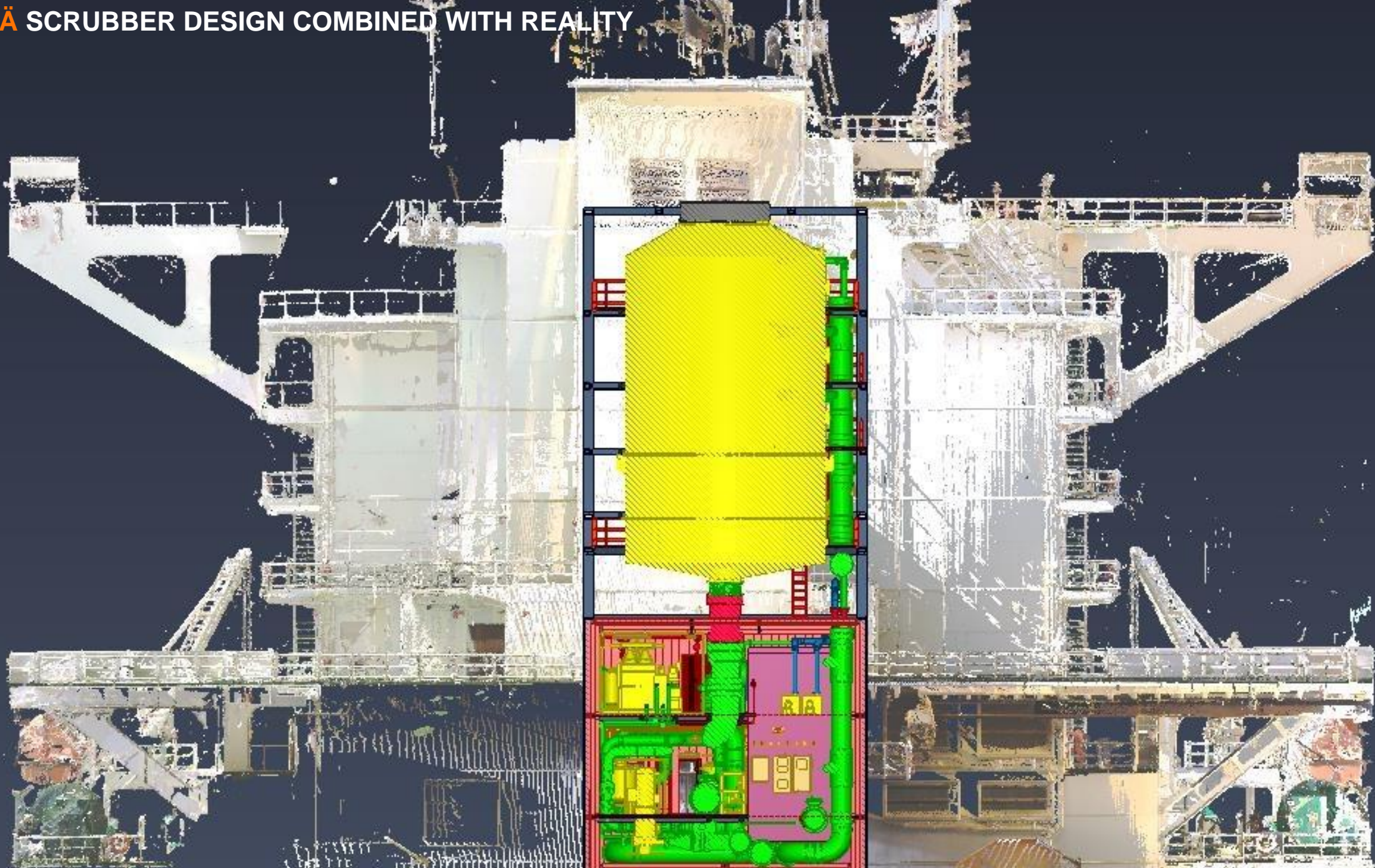


EPC

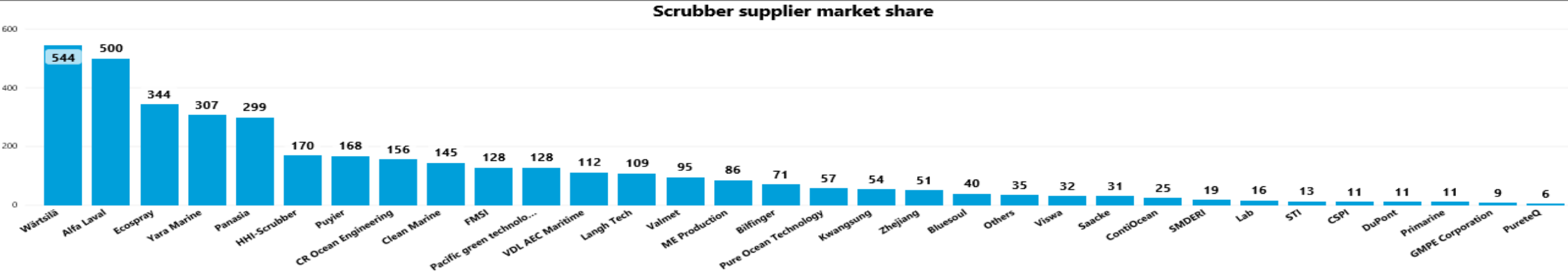
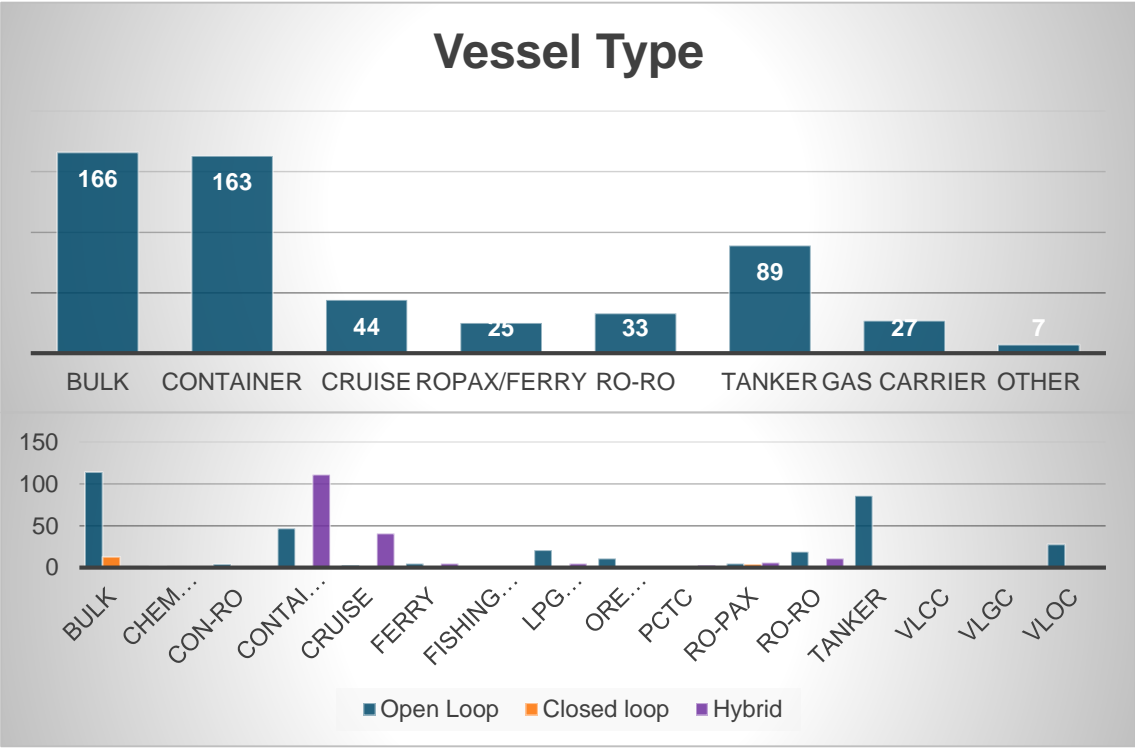
+ POSSIBILITY FOR SCRUBBER INVESTMENT FINANCING



WÄRTSILÄ SCRUBBER DESIGN COMBINED WITH REALITY



719 scrubbers
554 vessels (300+ delivered)
...and counting
4% closed loop systems
33% Hybrid systems
63% Open loop Systems







WÄRTSILÄ