

電気ボイラと ハイブリッドボイラ

16 October 2026

ボイラ製品群ラインアップ

Oil fired, Combi and Dual Fuel boilers

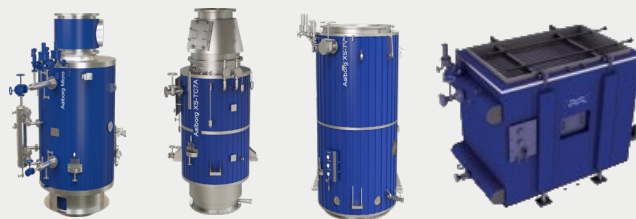
油焚、コンビジット、DF、ハイブリッドボイラ



- E-Ready and Hybrid Boilers
- Fuel Optimization
- DF LNG
- DF Methanol
- DF Ammonia

Waste Heat Recovery

排熱回収 (エコノマイザ)



Heat and waste heat recovery optimization

Power from Waste Heat

ORCシステム



Business case calculation

Thermal Fluid Oil systems

熱媒ボイラ



Electrical Steam Boiler

電気ボイラ



Oil Heater

油加熱器



FuelEU Maritime規則

Be prepared for the new regulations with electric elements installed or prepared for boiler changes later..

FuelEU Maritime – requirements to lifecycle GHG intensity of energy

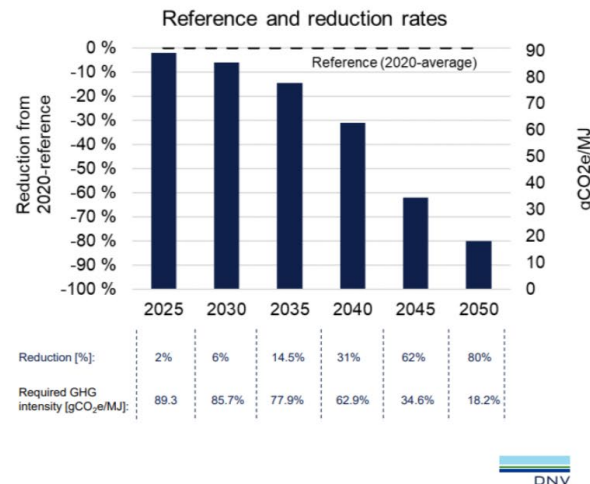
- **2025** - Requirement to the yearly **average well-to-wake GHG intensity of energy** used on-board

$$\text{Well to Wake GHG intensity} = \frac{gCO_{2eq}}{MJ}$$

- All ships **above 5000 GT** transporting passengers or cargo – will differ from ETS
- Includes **CH₄** and **N₂O** and electricity received, rewards for wind power
- Mandatory **2% RFNBO*** use from **2034**, if sector use in 2031 is less than 1%
- **2030** - Requirement to the **use of shore power for container and passenger ships** not using zero-emission technologies

* RFNBO: Renewable Fuels of Non-Biological Origin

7 DNV © JULY 2024



Who will be affected by the obligations of FuelEU Maritime?

- + **All ships in the EU** with a gross tonnage above 5,000 in commercial passenger transport or cargo regardless of their flag will be affected.
- + **A greenhouse gas (GHG) reduction target** applies to all energy used during voyages within the EU, while it applies to 50 percent of the energy used for voyages entering or leaving the EU.

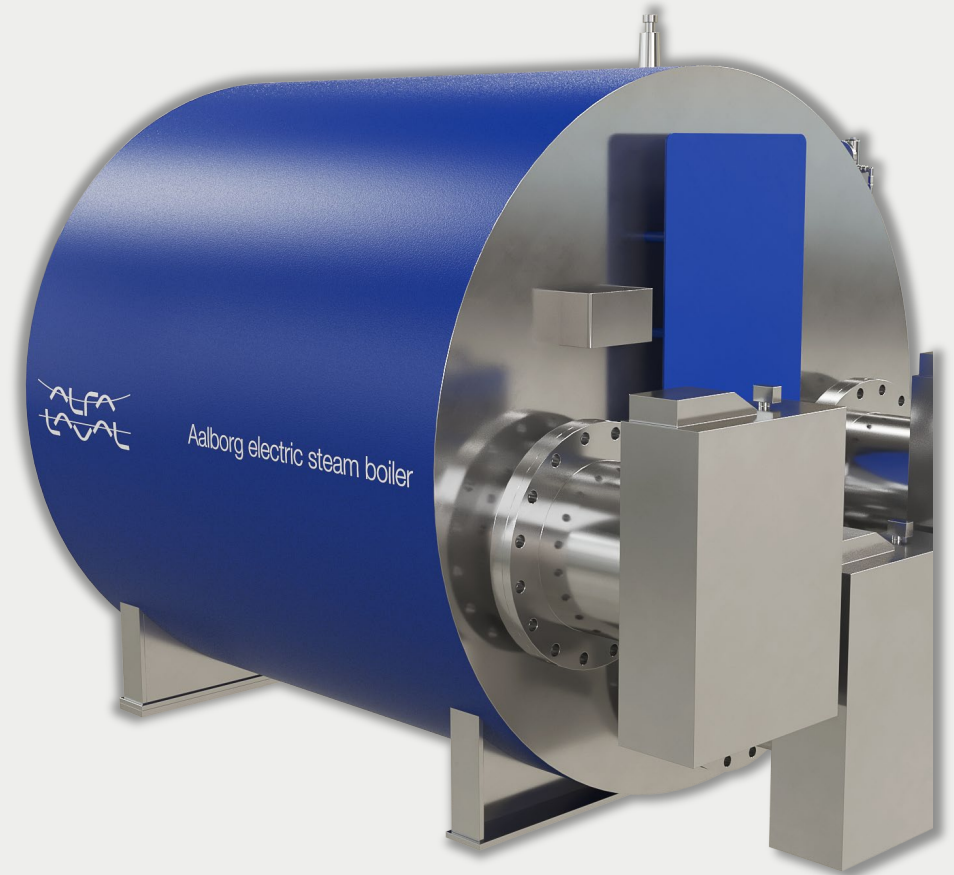
- + **Exemptions** include small islands (<200,000 residents), public service obligation (PSO) connections between islands and mainland, outermost regions, transshipment ports, and ice-class ships navigating icy waters.



5000GT以上のコンテナ船、旅客船は、2030年以降EU内の港湾係留では陸上電源の使用が求められる（一部の例外措置を除く）

Aalborg電気ボイラ

陸上電源または船上余剰電力による蒸気生成



Aalborg電気ボイラー特長

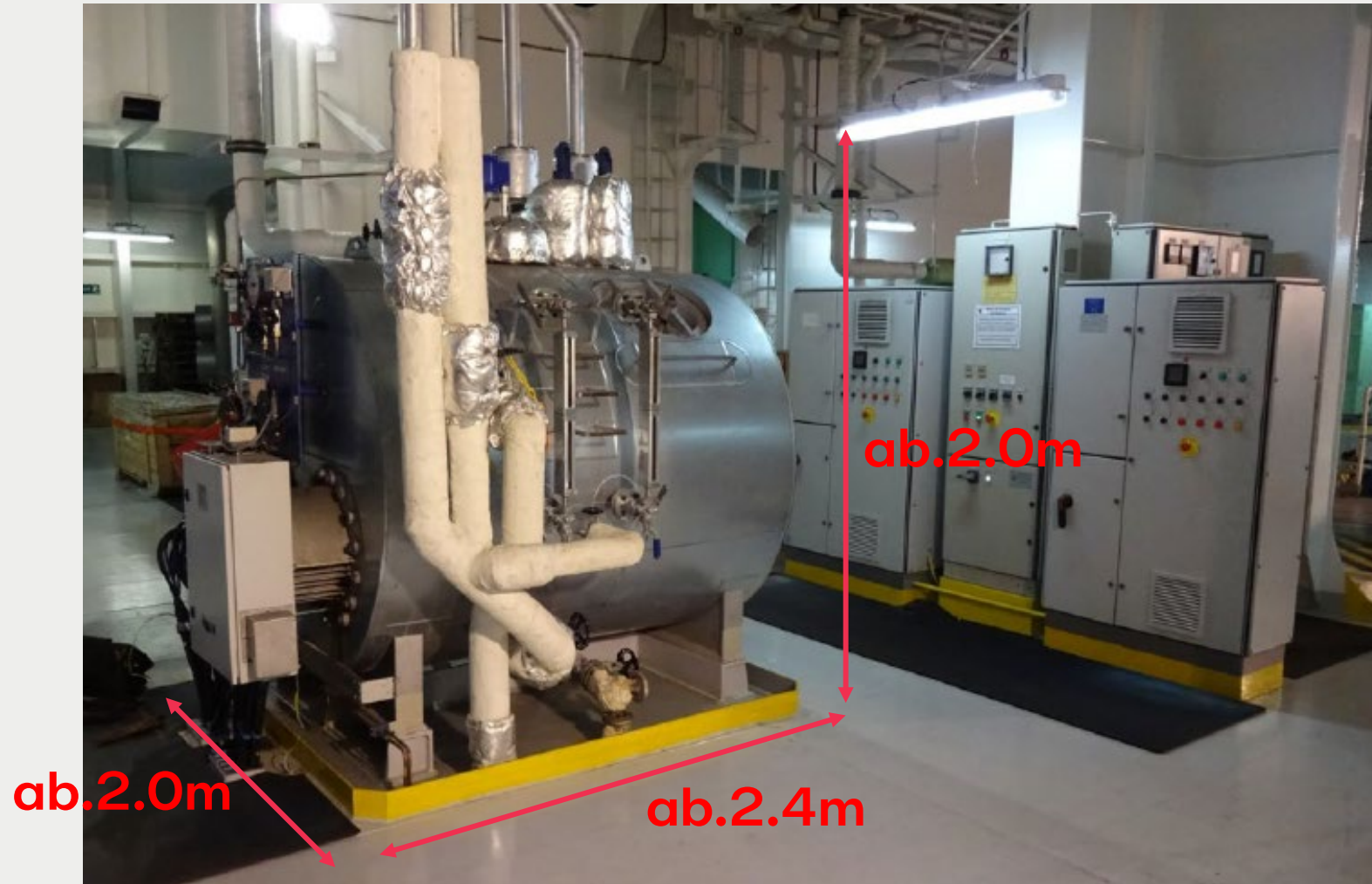
- 陸上電源使用の地域規制要求に対応
- 船上からのエミッション削減に寄与
(陸電の場合)
- バーナー追焚きの代替手段、余剰蒸気を抑制
- コンパクトなデザインにより据付容易
- シンプルな操作性
- 燃料取扱い無用の為、保守の負荷低減



Technical data

Model	AESB 600	AESB 1200	AESB 1800
Capacity	600 kW	1200 kW	1800 kW
Design	Cylindrical Horizontal	Cylindrical Horizontal	Cylindrical Horizontal
Normal working pressure	8-10 bar(g)	8-10 bar(g)	8-10 bar(g)
Max. allowable working pressure	12 bar(g)	12 bar(g)	12 bar(g)
Feed water temp.	80°C	80°C	80°C
Hydrostatic test pressure	18 bar(g)	18 bar(g)	18 bar(g)
Weight excl. water	2.1 t	2.3 t	3.0 t
Weight incl. water	3.9 t	4.1 t	5.8 t
Length	2335 mm	2335 mm	2487 mm
Height excl. mountings	1822 mm	1822 mm	2190 mm
Diameter incl. isolation	1550 mm	1550 mm	2000 mm
Heating elements	1 x 600 kW JEV1 electrical	2 x 600 kW JEV1 electrical	3 x 600 kW JEV1 electrical
Control	Relay-based	Relay-based	Relay-based
Supply voltage	380, 440 or 690 V, 3 phases, 50-60 Hz		
蒸発量	約750kg/h	約1500kg/h	約2250kg/h

Aalborg電気ボイラー施工例



Alfa Laval Aalborg Electric Steam Boiler

Aalborg電気ボイラ - 実績表

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Shipowner	Shipyard	Vessel Type	No. of vessels	Class
-	Hanwha Power Systems	145k m3 FSRU	1	DNV
-	Samsung Heavy Industries	165k m3 LNGC	1	BV
-	Samsung Heavy Industries	170k m3 LNGC	1	DNV
-	Samsung Heavy Industries	103k Shuttle tanker	1	DNV
-	Samsung Heavy Industries	103k Shuttle tanker	1	DNV
-	Aker Yards Oy	Passenger	1	
-	Samsung Heavy Industries	129k Shuttle tanker	1	DNV
-	Samsung Heavy Industries	129k Shuttle tanker	1	DNV
-	Samsung Heavy Industries	129k Shuttle tanker	1	DNV

ハイブリッドボイラと E-Ready



ハイブリッドボイラ/E-Readyのコンセプト

- **選択肢の多様化**：電力ソースの選択肢が加えられる。将来的な規則変更・強化への備え
- **燃料の取扱作業低減**：電気ボイラ運転の場合、燃料ハンドリング不要
- **優れたターndダウン**：電気ボイラ運転の場合、最小蒸気生成量135-150kg/h
- **コンパクトなデザイン**：ハイブリッド/E-Ready仕様にしても缶体デザイン変更を最小化



The E-boiler will allow for easy installation or retrofitting of one or more electrical elements

When included in the initial boiler design a plug and play retrofit solutions will not require any modifications to the boiler

ハイブリッドボイラ/E-Ready 缶体デザイン

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Location of the electrical elements to be installed – Examples below

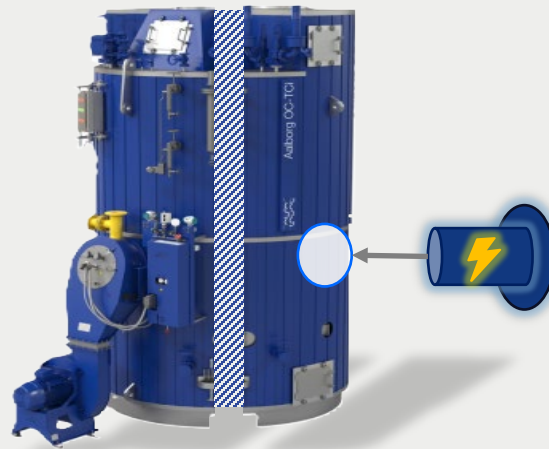
Aalborg OS-TCi Example

電気ヒーターを缶体中央部に設置
(初期導入・後付け対応)



Aalborg OC-TCi Example

缶体中央部に電気ヒーターを配置
(初期導入・レトロフィット対応)
排ガス部のスペースを確保



Aalborg OL Example

缶体下部に電気ヒーターを配置
(初期導入・レトロフィット対応)



ハイブリッドボイラ/E-Ready仕様

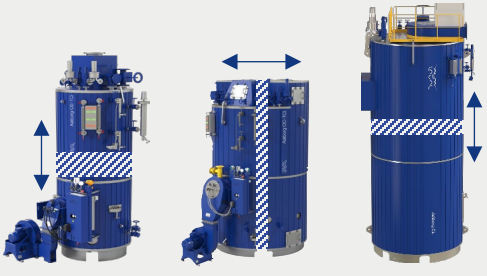
燃料焚



OS-TCi OC-TCi OL

1 - 8.0 t/h	1.2 - 6.5 t/h	10 - 55 t/h
Oil/Gas fired	Composite	Oil/Gas fired
Bio fuel & Oil		
Dual Fuel or Ready for..		
LNG		
Methanol		
Ammonia - TBA		

ハイブリッド/E-Ready



Height increase Width increase Height increase

OS-TCi OC-TCi OL

-4.5 t/h	- 4.5 t/h	10 - 55 t/h
4.5 - 8.0 t/h	4.5 - 6.5 t/h	

* ボイラ缶体サイズを変更

電気ヒーターエレメントと蒸発量

Boiler body required



→ 2.5+ t/h
→ 4.5+ t/h
→ TBD

Boiler body required



→ 2.5+ t/h
→ TBD

Boiler body required



→ 10+ t/h
→ 10+ t/h
→ TBD

Options →	1 x 600 kW	2 x 600 kW	3 x 600 kW
Total kW	600 kW	1.200 kW	1.800 kW
Steam per 100 kW	135-150 kg/h		
Pressure	7-9 bar(g)		
Total performance	810 - 900 kg/h	1620 - 1800 kg/h	2430 - 2700 kg/h

ハイブリッドボイラ/E-Ready実績表

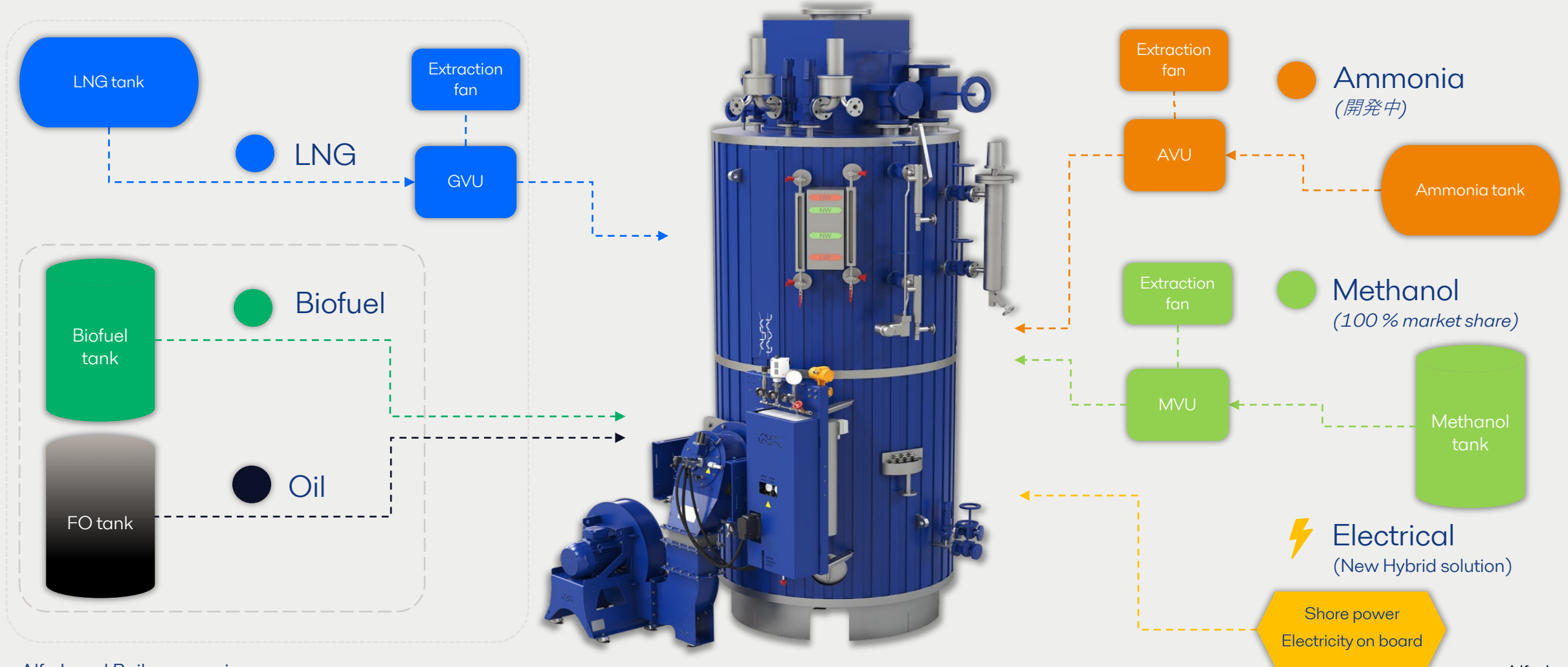
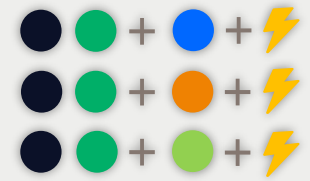
Shipowner	Shipyard	Vessel Type	No. of vessels	Boiler Type	Class
-	New Times Shipbuilding	17kTEU Container	12	Aalborg OS-TCi	DNV
-	New Times Shipbuilding	157kdwt Tanker	6	Aalborg OC-TCi (*)	LRS
-	Jiangsu New Yangzi Shipbuilding	9.2kTEU Container	12	Aalborg OS-TCi	DNV
-	Guangzhou Shipyard International	8k TEU Container	4	Aalborg OS-TCi	LRS
-	China Merchant Jinling Shipyard	4.5k CEU PCTC	4	Aalborg OS-TCi	DNV
-	China Merchant Jinling Shipyard	9.3k CEU PCTC	8	Aalborg OS-TCi	DNV, KR
-	China Merchant Jinling Shipyard	11.7k CEU PCTC	4	Aalborg OS-TCi	DNV, KR
-	China Merchant Jinling Shipyard	11.7k CEU PCTC	2	Aalborg OS-TCi	DNV, KR
-	China Merchant Jinling Shipyard	RoRo	16	Aalborg OS-TCi	

ハイブリッドボイラ/E-Ready

多様燃料仕様との組合せ

Dual fuel and electrical options
(Combined solutions)

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Alfa Laval Boilers overview

Alfa Laval

Alfa Laval Test & Training Centre

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Aalborg - Denmark



Alfa Laval Test and Training Centre

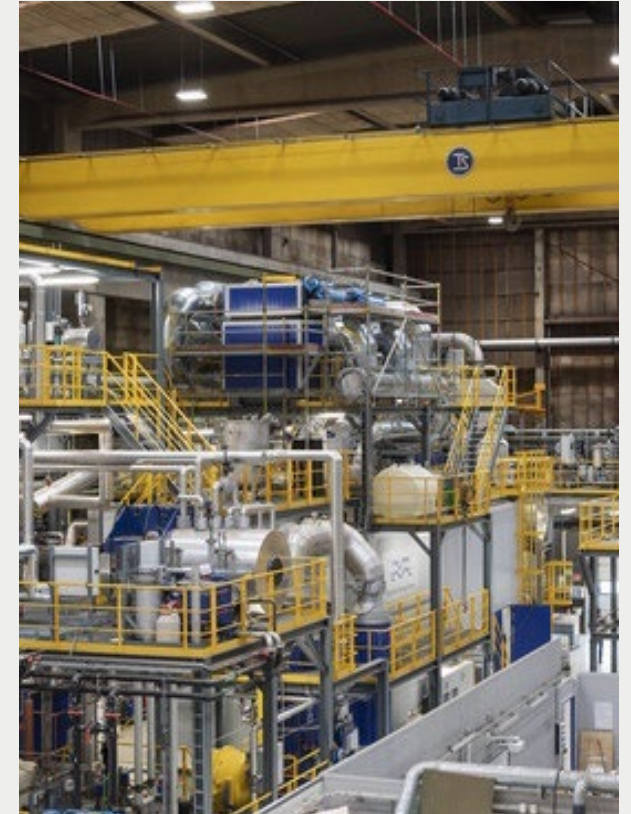
Alfa Laval

Alfa Laval Test & Training Centre

実機規模での技術開発と検証

開発・共同研究のためのテストセンター

- 2800 m² の試験スペース
- 主要なプロセスラインを組み込んだ実寸大の機械室シミュレーション
- 中央監視・制御システム
- バイオ燃料、メタノールを含む幅広い船用燃料に対応



Q&A