

Project HYDRO

Technical Overview

April 2024



Innovative LNG Hybrid power assets from reputable developer

eCap Marine (Engineering and Operations Manager)

Floating Assets (LNG Hybrid Power)



- Extremely silent (60db) operation at a significantly reduced level of harmful emissions (-20% CO₂, -88% NO_x).
- Capability of running each generator individually, enabling efficient load management and balancing in case of demand peaks.
- Current power supply at 50 Hz* allows versatile and international utilization, e.g. for power supply in the industry.
- Highly reputable German engineering company with extensive experience in clean power solutions for a safe, reliable and efficient power supply.
- In line with local energy laws, preventing state taxes, grid fees, etc. avoiding high costs for transmission operators.



Land-Based Assets (FEU PowerPacs)

- Highly flexible, environmentally friendly and grid-independent power supply for a broad range of applications without additional infrastructure investments.
- Versatile transport possibilities on truck, train or by ship due to compact size and solid construction.
- Simple logistics due to standardized container size - if required as two separate units.
- Easily refillable by truck at regular gas stations due to certification for commercial use.
- Extendable operating hours to c. 60 hours by positioning a second LNG-tanktainer on top.

*Upon request by investor, Hybrid FPB can be retrofitted to 60Hz at 11kV

The Hybrid FPB is a highly capable low-emission CHP unit



Operating Frequency

50 Hz



Noise

60 dBA / 10 m



Classification

B - Seagoing



Gas-Engines

5



Total Electrical Power Output

7.5 MW_{el}



Total Thermal Power Output

9.5 MW_{th}



CO₂ Reduction

22%



Voltage

11 kV



Dimensions

76.0m long, 11.4m wide



Capacity

2x 17 tons LNG

Anywhere electricity is USP of the containerized PowerPacs



Dimensions

2x40 ft container



Classification

CE-Certified



Total Electrical Power

1.5 MW_{eI}



Total Weight

60 tons (equipped)



Capacity

8.2 tons LNG



Gas-Engine

1



Voltage

6.6 kV



Operating Time

28-30 hours (90% load)



Operating Frequency

60 Hz

The Hybrid FPB is designed for maximum efficiency

The Hybrid FPB is the first floating non-propelled power barge, being developed by eCap Marine for supplying (off-grid) clean electrical and thermal power for various use cases (e.g. cold ironing). It combines high mobility and flexibility with maximum efficiency and reliability, even in remote areas.

The barge is rated with Class B - Seagoing - and has an ice-class approved hull.



Five efficient Caterpillar gas engines and frequency-flexible Leroy Somer LSA 53 generators generate a total output of 7.5 MW of electrical energy (10kV / 50 Hz*) and approx. 9.7 MW of thermal energy. The current setup is extendable with two additional bonnets, each with an individual gas engine (1.622kW (mech)).



The gas engines are designed to run either with liquified natural gas (LNG) or natural gas (NG). Each engine is equipped with a selective catalytic reactor to reduce NO_x emissions to less than 40 ppm (BimSchG conformity), equaling reduction of 80% and a CO₂ reduction of 20%.



For a maximum level of autarky from local power grids, the Hybrid FPB is equipped with a 269kw back-up diesel generator that is capable of pre-charging the onboard systems. Moreover, the barge is equipped with a sophisticated rescue set, incl. one life raft for 6 people, 7 life buoys, and 6 safety working vests.



Tank capacities:

- Fresh water: 103m³
- Ballast water: 373m³
- Bilge: 48m³
- Drain: 47m³
- Lube / waste oil, each: 5m³

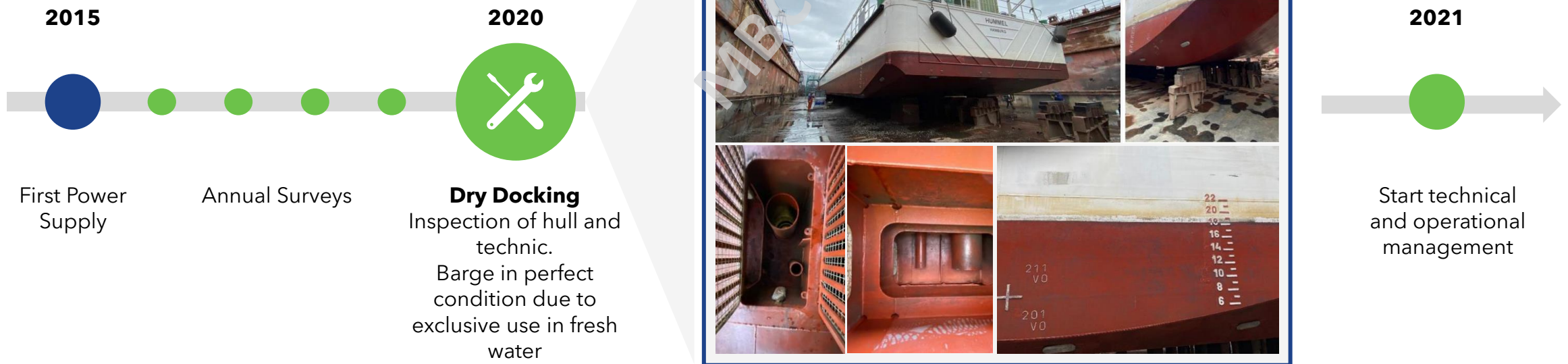
LNG storage:

2 x 40' container, abt. 2 x 15t

*60 Hz operation at 11kV is available upon request.

Barge shows perfect condition

The Hybrid FPB is certified according to the rules of the German flag and the classification society Bureau Veritas. Technical inspections are strictly and regularly performed as per class and flag requirements. During the dry docking in 2020, the barge showed its excellent technical and optical condition, resulting from the sole operation in fresh water.



All important certifications are still valid



Certificate



Expiry



Type

Class Certificate	13. May 2025	Definitive ✓
Load Line Certificate	13. May 2025	Definitive ✓
Safety Construction Certificate	13. May 2025	Definitive ✓
Safety Equipment Certificate	13. May 2025	Definitive ✓
Oil Pollution Prevention Certificate	13. May 2025	Definitive ✓
Sewage Pollution Certificate	13. May 2025	Definitive ✓
Air Pollution Certificate	13. May 2025	Definitive ✓
IEE Certificate		Definitive ✓
Anti-Fouling System Certificate		Definitive ✓

Watten Fährlinien provides necessary maintenance services

Watten Fährlinien

Watten Fährlinien GmbH - Schiffbrücke 11 - 26113 Husum

STATEMENT OF SUPERVISION

From 01.10.2021 Messrs. Watten Fährlinien GmbH acting as technical Managers for Owners of "Hummel" GmbH & Co. KG, technical Managers emphasize as follows.

Messrs Watten Fährlinien GmbH provides Manpower since 16.11.2020 for MV "Hummel" and was therefore involved in several operational and technical matters.

Reference is made to the present Class and Flag Status.

The vessel is presently in "Warm-Lay-Up Status" Hence - only the Annual surveys will be checked by class-, and flag surveyors.

Definition "Warm-Lay-Up":

1. Vessel engines are without Fuel/ Gas therefore:
 - a) Engines are fully conserved, cannot be turned/ started.
 - b) Gas supply lines, gas safety equipment cannot be checked.
 - c) Auxillary aggregates cannot be tested.
2. Vessel is electrical supplied ONLY via 400 V shore connection on Emergency Switchboard
 - a) Only light and control power available
 - b) Fans/ Venting systems cannot be started or tested.
 - c) Medium Switchboard only under control power, cannot be tested.

From 31.08.2023 Owners intend to change Vessels status from Warm to Cold-Lay-Up. The forthcoming Cold-Lay-Up procedure is in discussion with Class and Flag, enabling correct and certified conservation of Vessel and it's aggregates.

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Watten Fährlinien

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Present Status of aggregates maintenance:

As per attached Excel maintenance list, all Major overhauls of standing and running parts were done.
As Vessels operation was stopped Autumn 2021 only regular/ frequently checked due to non-appeared running hours are overdue.

For the sake of good order, a drydocking (bottom inspection) of vessel could be dealt with when "buyers" show real interests.

With best regards.

Sven Jürgensen
(Managing Director)

Husum, 15.08.2023

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Technical management for HFPB



From 01.10.2021, Watten Fährlinien GmbH has been acting as technical manager for the owners of the Hybrid FPB.



Watten Fährlinien has been providing manpower since 2020 and was involved in various operational and technical matters.

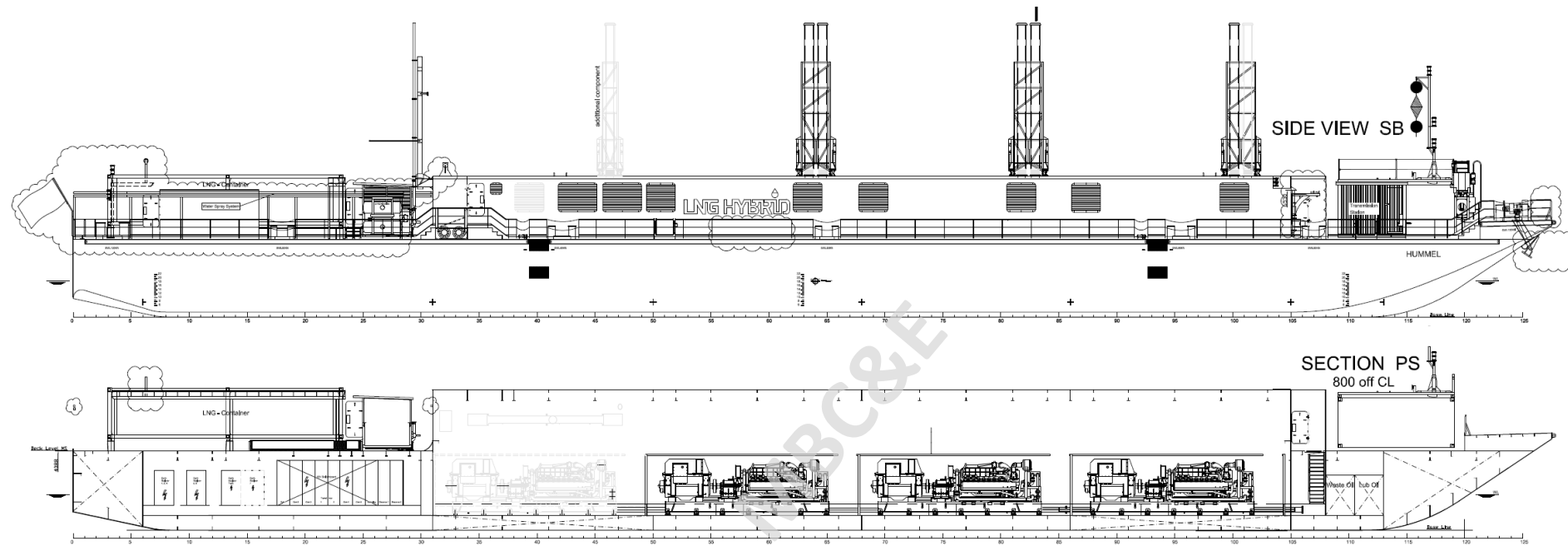


The company handles all maintenances, including dry dockings and overhauls.



In case the Hybrid FPB is sold, Watten Fährlinien is committed to maintaining the partnership with the new investor to ensure seamless continuation of operations and required maintenance and repair services.

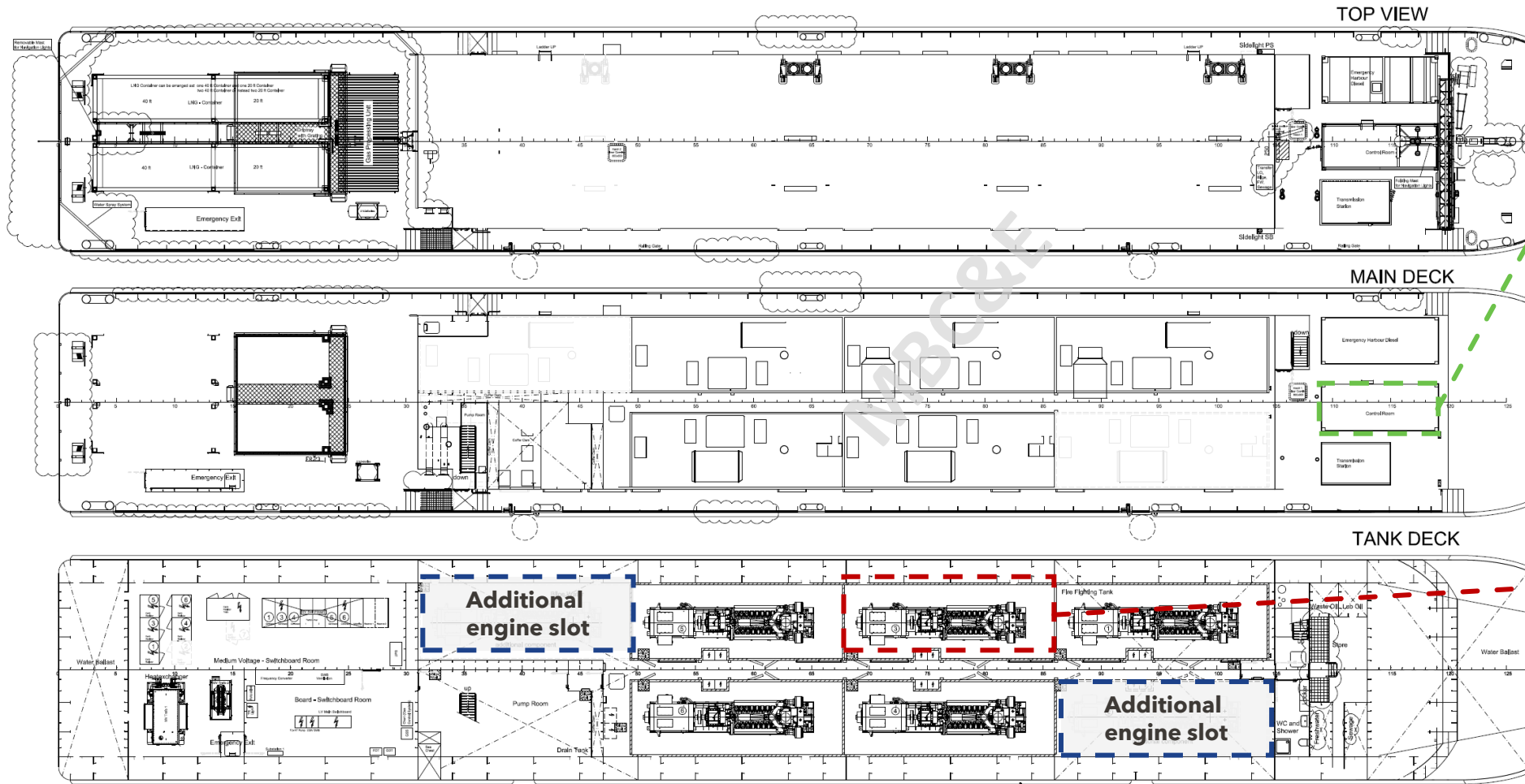
Specification overview



Ship data		Main dimension		Generators		Gas engines	
Type	Barge - Special Service	Length	76.7 m	Type	Leroy Summer	Producer	Caterpillar
Flag	German	Breadth over all	11.9 m	50 HZ Operation	1,935 kVA/1,500 rpm	Type	G3516C
Port of registry	Hamburg	Breadth moulded	11.4 m		Cos phi 0.8/10,000 V / 50 Hz	Rating	1,622 KW (mech) / 1,500 rpm
Owner	eCap Marine GmbH	Depth to main deck	4.0 m	60 HZ Operation*	1,931 kVA/1,800 rpm	Fuel	Liquified Natural Gas (LNG)
Delivery date	2014-09-10	Design draught (mid.)	1.85 m		Cos phi 0.8/11,000 V / 60 Hz		Natural Gas (NG)
Operating noise	60dBA / 10m	Light weight (incl. 5 engines)	1,076 t				

* The Hybrid FPB is currently operated on a 50 Hz frequency. 60 Hz at 11kV can be retrofitted upon request of the new investor.

Hybrid FPB - first impressions





HUMMEL
HAMBURG

HYBRID
POST ENERGY

Weltpremiere: umweltfreundlicher als ein Diesel- oder Gasantrieb

LNG-HYBRID.COM

MAX

GROSSE FREIHEIT