



Energy Systems

Modular Floating Offshore Energy Systems UG

"Blue Ocean Principle"

Short Presentation



The Paradox of the Offshore Wind Industry

The open ocean holds the world's most powerful winds — yet it remains commercially untapped.

Limited Space

Fixed-bottom wind farms are confined to shallow coastal zones (<50m) — the most congested, contested, and politically sensitive areas of the ocean.

Untapped Potential

Deep-water areas (>50m) host the strongest, most consistent winds on earth. Technically accessible — but still commercially out of reach without the right solution.

The Missing Piece

Floating foundations are technically proven and deployment-ready. The only remaining obstacle to unlocking vast deep-water wind resources is economic viability.

Global Potential of Floating Offshore Wind

Floating offshore wind has a technical potential that can cover global electricity demand many times over — making it one of the strongest levers of the energy transition.

- Stronger and more consistent winds on the open ocean
- No land-use conflict in deep-water areas (50–1,000m depth)
- Lower social resistance due to distance from coastlines
- Only obstacle to date: economic viability of floating foundations



80%

of global offshore wind potential lies in deep water (>50m)

Water Depth Zones



Shallow water (<50m)

Fixed-bottom wind — limited and congested



Deep water (50–1,000m)

Prime floating zones — vast and untapped



Ultra-deep (>1,000m)

Beyond current commercial use

MFO Systems Solve This Problem

Simultaneously addressing three decisive challenges

- 01 Shared costs, double value
- 02 Ocean depth becomes a resource
- 03 Factory instead of offshore construction site

1. Shared Costs, Double Value

A floating foundation is expensive – in development, construction and operation. MFO systems use that same floating platform as an integrated storage foundation.

Three core advantages that make MFO economically compelling:

01

Shared Infrastructure

Infrastructure costs are split between wind turbine and energy storage — what was once a pure cost factor becomes a shared value-creation platform.

02

Fundamentally Changed Economics

The entire project calculation is fundamentally transformed — the cost of the floating foundation is no longer allocated to wind generation alone.

03

Dual Revenue Streams

The platform generates revenue from both electricity generation and energy storage services simultaneously, dramatically improving the business case.

2. Ocean Depth Becomes a Resource

What made floating offshore expensive and difficult – water depth – becomes the central competitive advantage in the MFO concept.

Three further advantages that make MFO economically compelling:

04

Physics as an Asset

The mechanical storage system uses water depth as a physical energy source: gravity, buoyancy and vertical kinetic energy — the deeper, the more efficient.

05

Longer Stroke = More Energy

The greater the available stroke distance, the more efficient the system. Deep water directly translates to higher storage capacity at no additional cost.

06

Zero Curtailment

Energy is stored directly, with minimal losses and without grid stress. Curtailment becomes a thing of the past — every kilowatt-hour of wind is captured.

3. Factory Instead of Offshore Construction Site

Complex offshore assembly becomes an industrial manufacturing process.

Three further advantages that make MFO economically compelling:

07

Full Onshore Pre-Assembly

Complete pre-assembly on land using a production-line approach — controlled conditions, precision manufacturing, quality at scale.

08

Weather-Independent

No exposure to offshore weather risk, no specialist vessels required at sea. Assembly happens in a controlled factory environment.

09

Drastically Lower Costs & Timelines

Dramatic reduction in project costs and construction timelines — transforming offshore installation from a bottleneck into a repeatable process.

The Second Step

*Self-Sufficient Economics through the
MFO-H2 Combined Solution*

MFO-H2 Combined Solution: Fully Autonomous Energy System

Direct, offshore-integrated production of green hydrogen — right where the electricity is generated

Hydrogen below €4/kg? — What makes this possible:

- No detours through the grid — direct electrolysis from offshore wind generation
- No land infrastructure required — novel logistics concept using H2V containers
- Continuous hydrogen production despite wind variability — mechanical buffer ensures constant operation

<€4/kg

Target H2 cost

0 kWh

Grid dependency

24/7

Production continuity

100%

Wind utilization

Target: Green hydrogen at under €4/kg — cost-competitive with fossil alternatives, produced entirely offshore without land-side infrastructure.

MFO-H2 Combined Solution: Maximum Resilience and Operating Logic

The system operates stably and autonomously in all weather conditions.

Hydrogen below €4/kg? — What makes this possible:

- Mechanical buffer for short- to medium-term fluctuations
- H2 long-term reserve for extended low-wind periods (Dunkelflaute)
- Staged response to energy surplus or deficit

Operating Modes

Normal Operation

Mechanical storage buffers wind variability for continuous electrolysis — stable H2 production at full capacity.

Wind Surplus

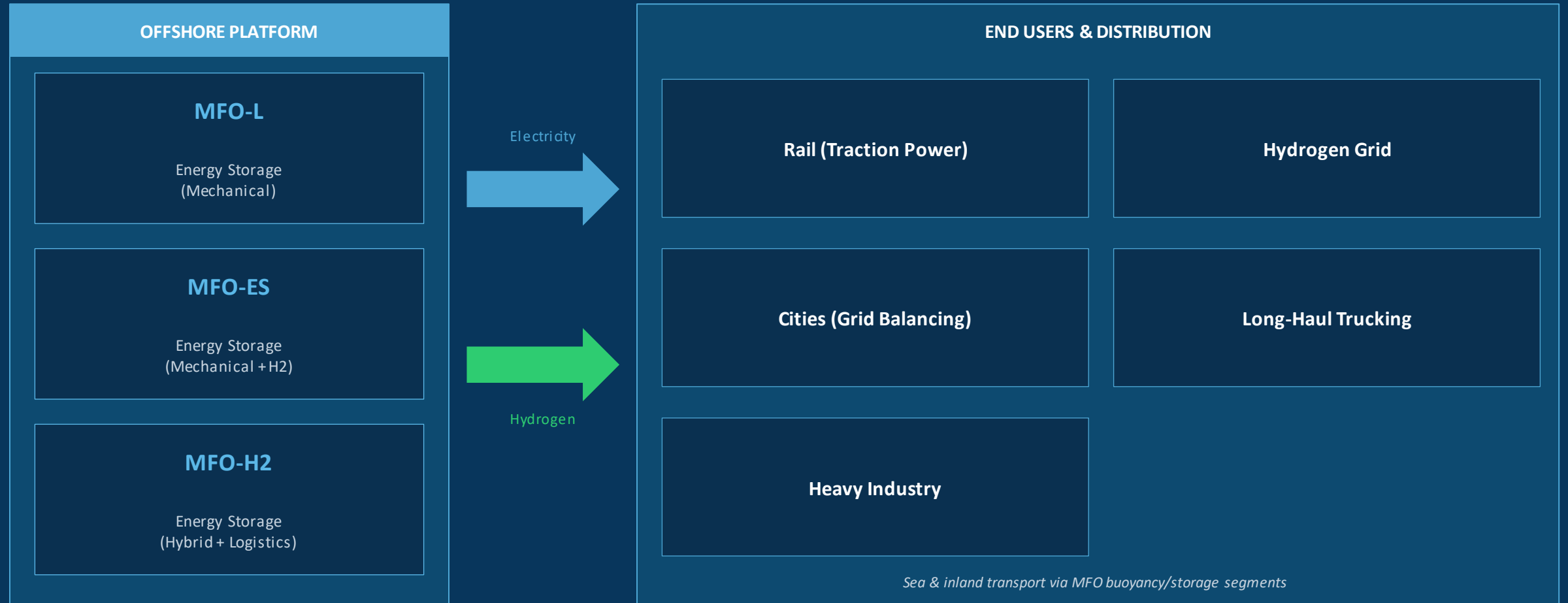
H2 production is ramped up and stored as long-term reserve — zero curtailment, maximum efficiency.

Wind Deficit

H2 production is maintained at full capacity via the mechanical reserves — uninterrupted output regardless of wind.

MFO-H2 Combined Solution: System Overview

Integrated offshore energy generation, storage and hydrogen logistics



A Technology That Redefines a Market

How do you make the open ocean economically viable?

MFO systems integrate offshore wind energy, mechanical storage, hydrogen production and logistics into a single system — robust, scalable and highly economically profitable.

01

Offshore Wind

Deep-water access means consistent, high-capacity generation — no curtailment, no grid congestion.

02

Mechanical Storage

Gravity and buoyancy-based storage with a >30-year lifespan and minimal operating expenditure.

03

Green Hydrogen

Offshore electrolysis enables green hydrogen at under €4/kg — competitive with fossil fuels.

04

Smart Logistics

H2V container system enables sea and inland transport without new infrastructure buildout.

The Blue Ocean is Waiting. MFO Energy Systems Has the Key.

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