Zero Emission Tug

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Zero Emission Tug

A new push barge concept for inland river transport focuses on achieving zero emissions by utilizing power barges equipped with battery-powered energy storage containers.

The entire barge configuration is wirelessly controlled from a command unit, ensuring seamless operation and coordination.

Key benefits of this concept include:

- Increased reliability through advanced propulsion and control systems.
- Low operational costs due to low energy and maintenance expenses.
- Emission credits for sustainable and eco-friendly transport.
- Lower maintenance costs compared to conventional diesel-powered systems.
- Cost-effective construction leading to a faster return on investment (ROI).
- Overall reduced lifetime costs, making it a viable long-term solution.

This innovative approach revolutionizes inland waterway transport by enhancing efficiency, reducing costs, and eliminating carbon emissions.

Example based on a conventional tug pushing two liquid barges from Houston to New Orleans:

Conventional Tug	Zero Emission Tug
11 500 gallons	**0 gallons**
> 30 000 USD	**> 1000 USD**
231 metric tons	**0 metric tons**

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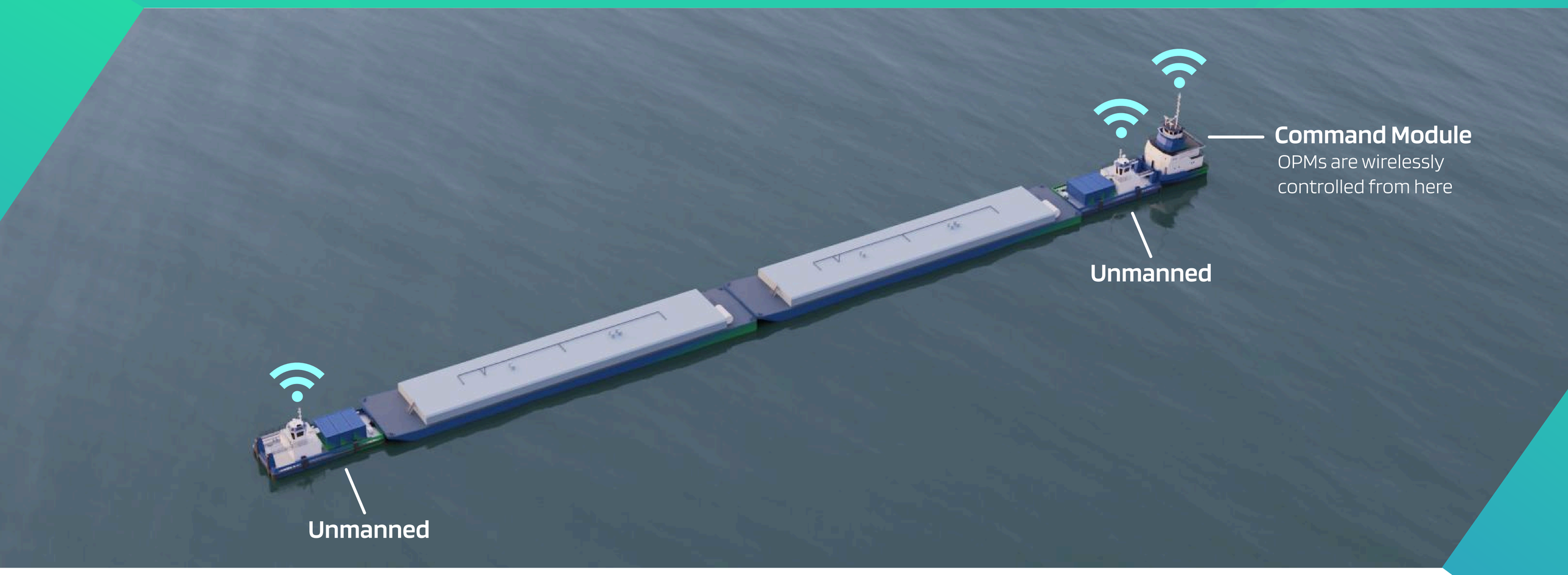

Vessel Control

The Command Module functions as both the vessel control center and bridge, equipped with a fully integrated accommodation unit for the crew and a pilot house featuring an advanced integrated bridge system. The unmanned OPM units are remotely controlled from the pilot house of the Command Module.

By utilizing unmanned OPM units to power the tow configuration, additional OPM units can be seamlessly added based on power requirements. This modular approach enhances maneuverability, efficiency, and adaptability to different towing needs.

Vessel and Sail Support Features:

- Vessel Advisory & Remote Monitoring – Real-time vessel oversight and operational insights.
- Automated Position Keeping (DP) – Ensures precise station-keeping and minimal drift.
- New Reference System – Advanced positioning for improved navigation accuracy.
- Collision Avoidance – Smart detection and evasion of obstacles.
- Object Tracking – Continuous monitoring of surrounding objects for enhanced situational awareness.

This system optimizes efficiency, safety, and environmental sustainability in maritime operations.

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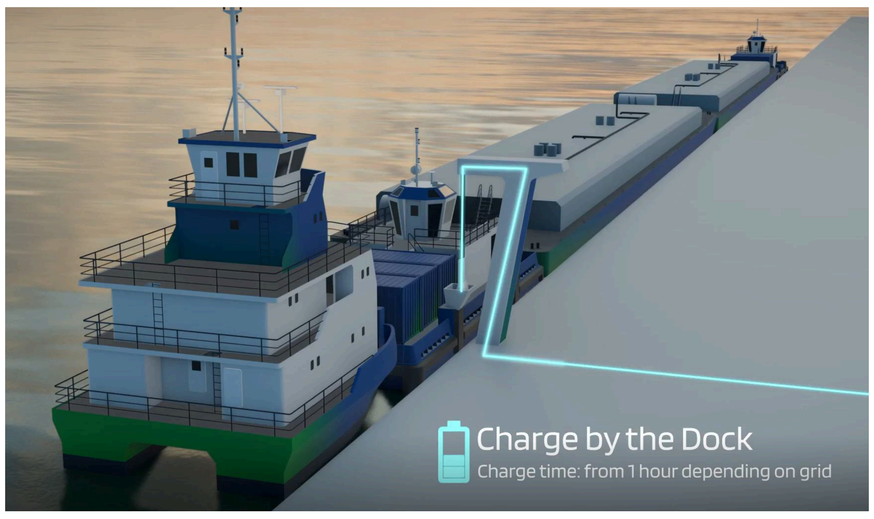
Energy Storage and Charging

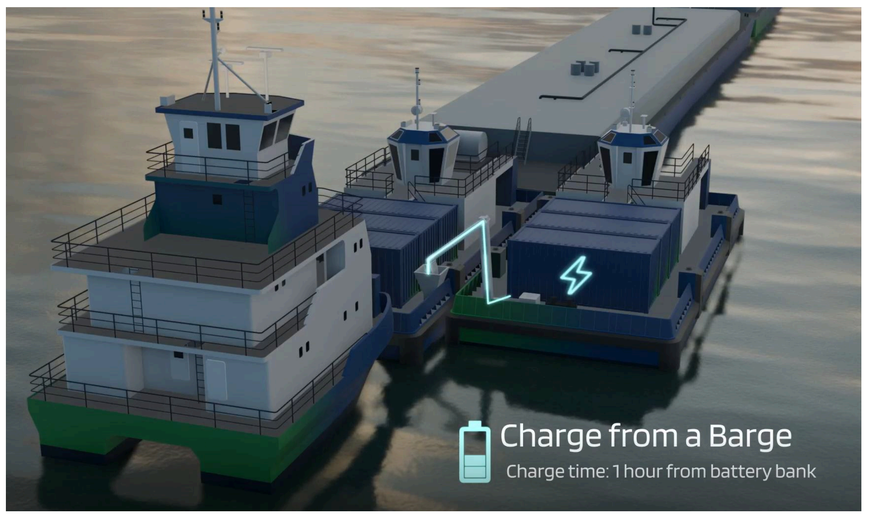
The OPM can be powered by a fully zero-emission solution using battery containers, or by a hybrid solution such as LNG, hydrogen, or ammonia.

Battery size and power source can be adapted to charging points along the route or specific power requirements.

OPM - Omnidirectional Propulsion Module

Standard OPM can be equipped with thrusters from a few hundred to a few thousand Hp in size.





Charging of battery containers can occur from the dock, from the barge, or by swapping containers.

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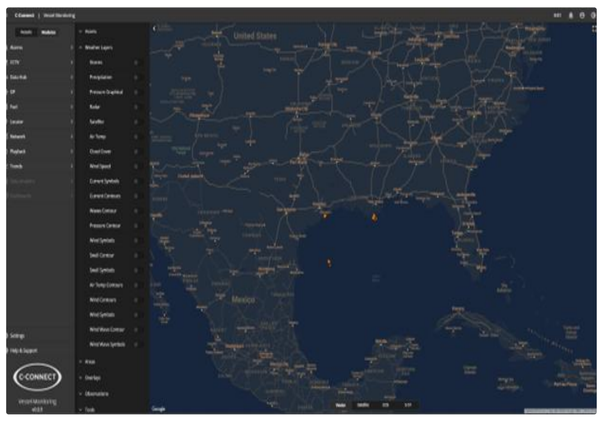
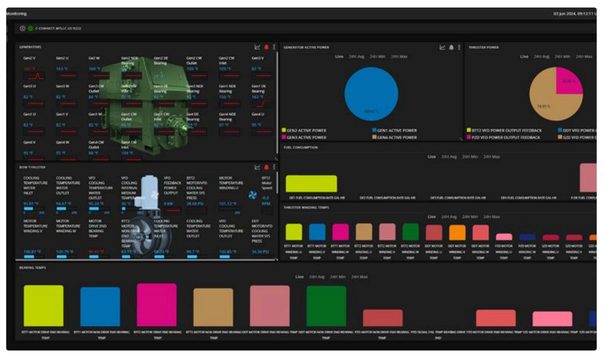
Vessel Monitoring

Monitor vessel systems, power usage, and critical operations with advanced power management, vessel and object tracking, and real-time alerts. Leverage trending analysis, notifications, and playback functionality to enhance situational awareness. Utilize machine learning for proactive maintenance and fleet optimization, ensuring increased safety, reliability, and operational efficiency. Enable secure remote monitoring with online condition monitoring and digital twin technology to streamline vessel operations and maximize uptime.





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About Marine Technologies

Marine Technologies (MT) specializes in advanced vessel control and communication solutions for a wide range of vessels, from offshore specialty and wind-field service vessels to tugboats and luxury yachts. MT provides type-approved DP systems across all classes, along with joystick and simplified DP solutions.

The company also develops turnkey systems for data collection, vessel monitoring, risk assessment, condition monitoring, machine learning, and emissions tracking.

As a technology-driven company, MT prioritizes R&D and innovation to address challenges in offshore operations. With a strong focus on offshore wind and autonomy, MT continues to drive advancements in maritime technology.

About Green Technologies

Green Technologies LLC (GT) is a leading innovator in power management and automation solutions for vessels of all sizes. With years of expertise in switchboards, automation systems, battery technology, charging solutions, and alternative power sources, GT is dedicated to advancing sustainable and efficient energy solutions for the maritime industry.

Committed to reliability, innovation, and environmental responsibility, GT delivers cutting-edge systems that enhance vessel performance, safety, and operational efficiency.

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