Green City Ferries

TECOW

With the contribution of the European Maritime and Fisheries Fund of the European Union. Grant agreement: 101038671. Project: TECOW

History

Green City Ferries began as a part of Echandia AB, a Stockholm based company specializing in heavy duty maritime batteries and fuel cells.

Formal Launch of Green City Ferries AB

2014

Launch of Movitz – the world's first supercharged passenger ferry. The ferry, which is still in operation, has provided vital insights on designing electric propulsion systems and operational requirements.

2016

Launch of the electric prototype vessel BB Green. This protype has significantly increased our knowledge about light-weight construction and battery chemistries for fast vessels.

2017-2018

Within the EU Project GFF (Green Fast Ferries) the new LTO battery system was developed to enable safe fast charging for the maritime industry.

2019

New Green City Ferries AB established by Hans & Fredrik Thornell.

2020

Strategic initiative to replace Stockholm's passenger vessel fleet with emission free vessels.

2021

- Design of the Beluga24
- New CEO and extended organization
- Winners of the UITP startup mobility challenge
- Establishment of GCF Production AB
- Awarded with SEK 82m in grants from Sweden and EU

2022

- Long term rental agreement of 10+ years with shipyard facilities
- Launch of investor rounds
- Production of the first two vessels starting in Q2
- Establishment of Green City Ferries Inc (USA)
- Building partnership with charging Infrastructure providers
- Entering second phase in our strategy with corporate development

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The Transition is Boosted by Politically Driven Initiatives

Maritime transport is responsible for about 2.5% of global greenhouse gas emissions. Waterborne commuting is today limited or unattractive in many cities because of high wakes and high emissions in high-speed.
National targets to decarbonize mobility creates an opportunity for new market leaders with zero-emission technologies.

Boat Plan Stockholm

The majority of Stockholm's passenger vessels currently in traffic are older than 40 years. The fleet emits as much as 50% of all public transport GHG emissions in the region. This is the reason behind the initiative called Boat Plan Stockholm.

Greece launches Gr-Eco islands

Greece's government has launched its Gr-Eco Islands Initiative, which aims to green the country's archipelago. The government is setting up an Island Decarbonization Fund to see the insular part of the country shift from carbon-based power to renewable energy sources and improve its environmental footprint. EU has contributed with EUR 1bn in grants to improve ferry transportation.

Biden's Build Back Better Agenda

As a part of Biden´s USD 1tn Infrastructure Bill is the Electric or Low-Emitting Ferry Pilot Program, amounting to USD 500m. This makes federal funding available to support the transition of passenger ferries to low or zero-emission technologies.

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New opportunities for attractive intermodality

High-Speed

Short travel time and high frequency is a prerequisite to attract commuters to leave the car at home and use public waterborne transportation instead.

Emission-Free

Traditional diesel-powered high-speed vessels are large polluters and therefore not a viable alternative for future waterborne commuting. Green electricity and green hydrogen are two of the cleanest fuels to facilitate the transition to new mobility on water.

Low Wake

Water disturbance and large wakes cause coastal erosion and are showstopper for efficient waterborne commuting. With the Beluga24 comes new opportunities.

Lower Cost of Operations

An energy efficient hull and light-weight design is vital. Weight has an unfavorable outcome on speed, power consumption, range, payload, wake signatures, and total cost of ownership.

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Making the transition by combining

Premium vessels

Charging

Pre-studies

Financing

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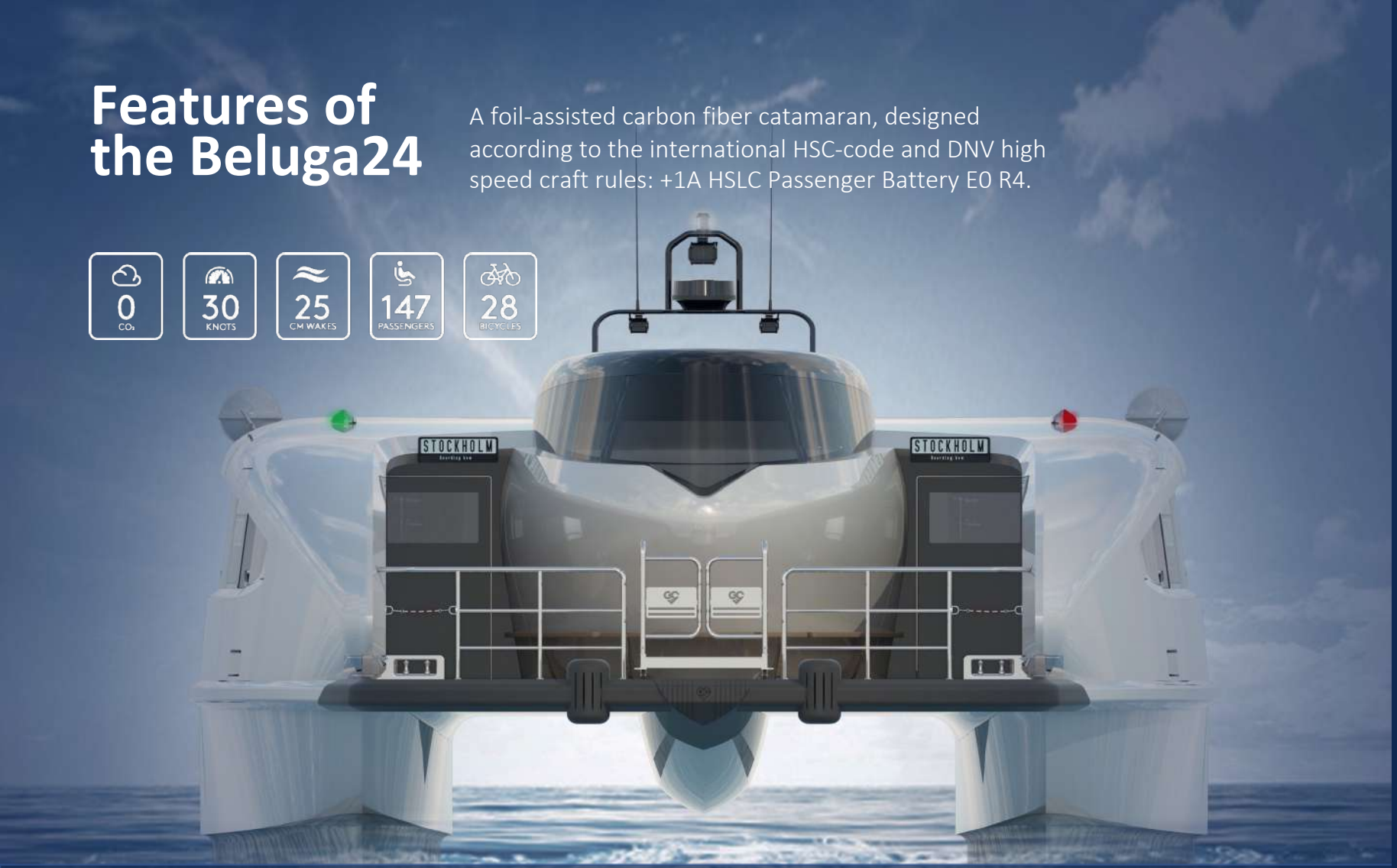
Features of the Beluga24

A foil-assisted carbon fiber catamaran, designed according to the international HSC-code and DNV high speed craft rules: +1A HSLC Passenger Battery E0 R4.



Freeboard	Freeboard Offshore	Maximum draft with foil	Max height	LOA (length overall)	Beam
1.5 m (4.92 feet)	2.2 m (7,2 feet)	1.35 m (4.3 feet)	4.6 m (15.1 feet)	25.8 m (84.6 feet)	9.5 m (31.2 feet)

Low Structural Weight

The hull and superstructure are built from carbon fiber composite, resulting in 30 % reduced weight compared to a conventional aluminum design.

Emission-Free Power

The power system is supplied by Echandia and is offered in two versions;

- Battery power for urban commuting comprising a lightweight, high-performance battery system using Toshiba's LTO (Lithium-Titanium-Oxide) cells.
- Hydrogen power for longer range comprising the HyCMax fuel cell system.

Wave Piercers

Advanced wave piercing bulbs are integrated in the hulls ensuring good seakeeping and a comfortable ride.

Foil-assisted Hull Technology

A hydrofoil is fitted midships. Hydrodynamic forces raise the vessel partly out of the water, thus reducing drag and power consumption up to 30%. Another benefit is the low wake.

Waterjet Propulsion

Quad installation of latest Hamilton Jets provide highest propulsion efficiency and outstanding maneuverability.
A robust solution for commercial applications.

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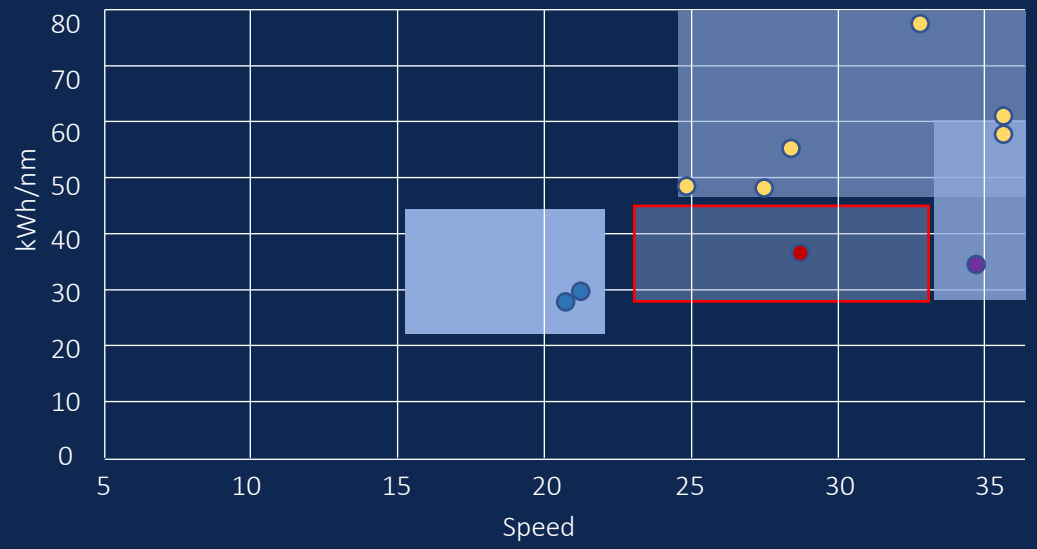
Energy Efficiency is the Key

Our USP's are based on making the combination possible between high-speed and emission-free with our energy efficient hull and light-weight construction



The diagram above shows the Beluga24 efficiency curve compared to conventional diesel driven catamarans at their max speed vs power consumption.

Foil-assisted catamaran – The Beluga24

Beluga24 is a high-speed catamaran and has its sweet spot at 28 knots and is 40% more energy efficient than competitors.

High speed catamarans

- Most high-speed vessels are in this segment
- Less energy efficiency, means need for more power
- Existing vessels are difficult to retrofit into electric

Foil vessels

- First pilot vessel planned in 2025
- Higher price and much more sensitive to debris
- Depth draft up to 3,4m

Monohulls or slow speed catamarans

- Large wakes when speed over 15kn
- Almost same energy consumption.
- Not in the high-speed segment.

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2 vessels in Stockholm from 2024

The Beluga24

1 Electric battery driven for a short commersial commuter route , 16nm

2 TECOW

Electric hydrogen driven vessel for a longer commercial route in the archipelago, 150-200nm. Green and local hydrogen produced on an island with an electrolyser and windmill.

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Strategic Alliances with Proven Technology

Bringing together world class state-of-the-art technology enables Green City Ferries to create an innovative and unique design with unrivaled performance

The Foil Technology

With well over 150 vessels in operation around the world, Teknicraft's designs demonstrate a fine balance between stability, low resistance and ride comfort. Great research and engineering efforts have been spent to create a low-wake signature and environmentally safe design. GCF has world-wide exclusivity and owns the design & IP of the Beluga together with Teknicraft.

Carbon Fiber Construction

The hull and superstructure will be built by Vaxholm Komposit. The carbon fiber system used on the Beluga24 is similar to what was developed for the Swedish Navy's Visby class corvettes already in the 1990s and is in-house competence at GCF.

Heavy Duty Batteries

Echandia delivers heavy-duty LTO battery systems and integrated fuel cell solutions for applications in maritime and industrial use. Echandia's systems are built to the highest standards with a proven track record. The company is a frontrunner in the commercial maritime sector.

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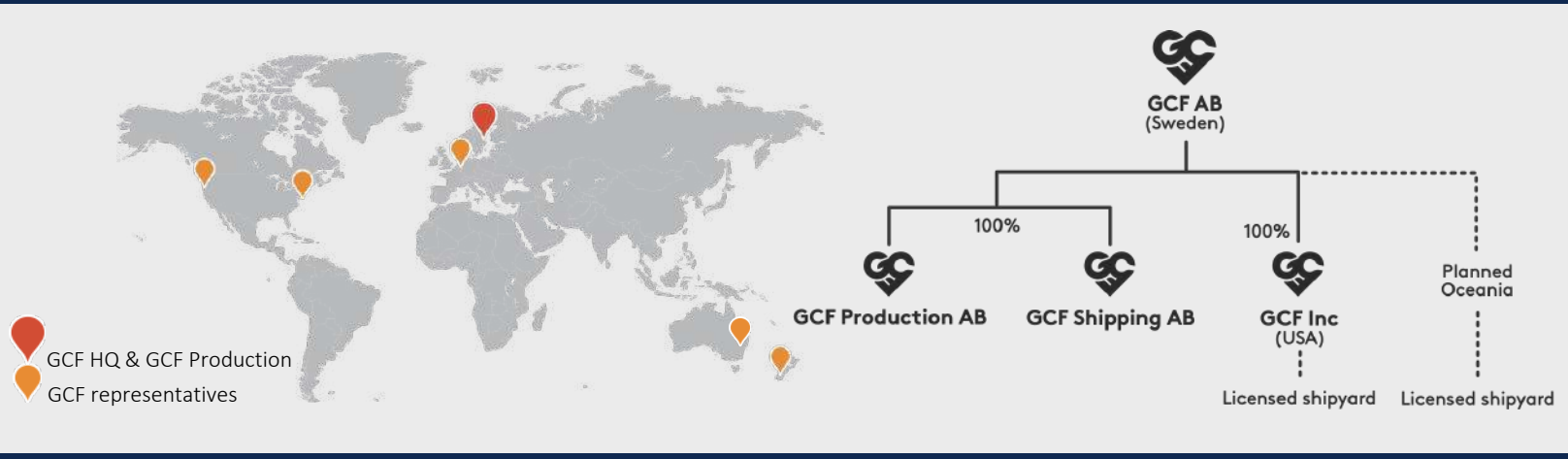
GCF in a **Nutshell**

Our primary focus is asset-light growth through sales representatives in our target markets, and scale-up production through license partners.



Green City Ferries AB

Our headquarter is in the old town of Stockholm, in the well known ”Seafarer house” designed by the crown architect Nicodemus Tessin in the 17th century.

Green City Ferries Inc (USA)

USA is the largest high-speed vessel market in the world. To expand in USA and because of the Jones Act and By American Legislation we need to have a US based company with local production. GCF Inc will be set up during Q2 2022 with local representatives in Seattle & New York

Sales Representatives

In addition to our headquarter in Sweden, we will have sales representatives in our target markets. We aim to facilitate organic growth by strengthening the representative network case by case.

Scaling-up the production

Outside Sweden, production capacity will initially be increased through license production in strategic locations. Enabling asset-light upscaling and creating jobs locally.

Aftermarket Service

Flawless operation and uptime is key for any commercial operator. Technical support will be provided to our clients by a growing network of external service providers.

Production – Capacity and Productivity

”Serial production and standardisation in our own production facility to control capacity, productivity & quality”

Asset Light

Production will be “asset light” with a core organization comprising management, team leaders, logistics and administration. Engineering services, hull production and outfitting will initially be outsourced to strategic partners.

Strategic Location

The location next to the E4 route on the east coast in the center of Sweden makes it a strategic location. The area has access to skilled labor and a network of sub-contractors. Housing supply is good and cost levels are more reasonable than in Sweden’s major city regions.

Maritime Cluster

The RISE “Research Institute of Sweden” together with the municipality and schools of Härnösand have plans for a maritime cluster and test site which will attract other maritime businesses.

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Team References

Green City Ferries' team has hundreds of years' accumulated experience from the marine industry

1. Green City Ferries *team references*

Movitz, world's first first supercharged ferry

BB Green, world's fastest battery driven ferry

Supervising production of Swedish vessel Yxlan

Serial production of 250+ Swedish Combat Boats

Design management of a Coast Guard vessel

Carbon fiber structural design, Visby Corvettes

2. Vaxholm Komposit

Manufacturing of a submarine for JFD

Manufacturing for X-shore in composite

Manufacturing private boats in composite

Manufacturing for Candela in composite

3. Teknicraft, Pure Design & Echandia

Teknicraft has a vast reference list with many foil-assisted catamarans. The latest are Lady Swift and Reliance using the same technology as the Beluga.

Carbon fiber design for Emirates team NZ in Americas cup.

Battery system for a Swedish submarine & LTO batteries in Copenhagen ferries

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Contact information

Financing and Indicative terms

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