Ecoliner

Shipping with the wind

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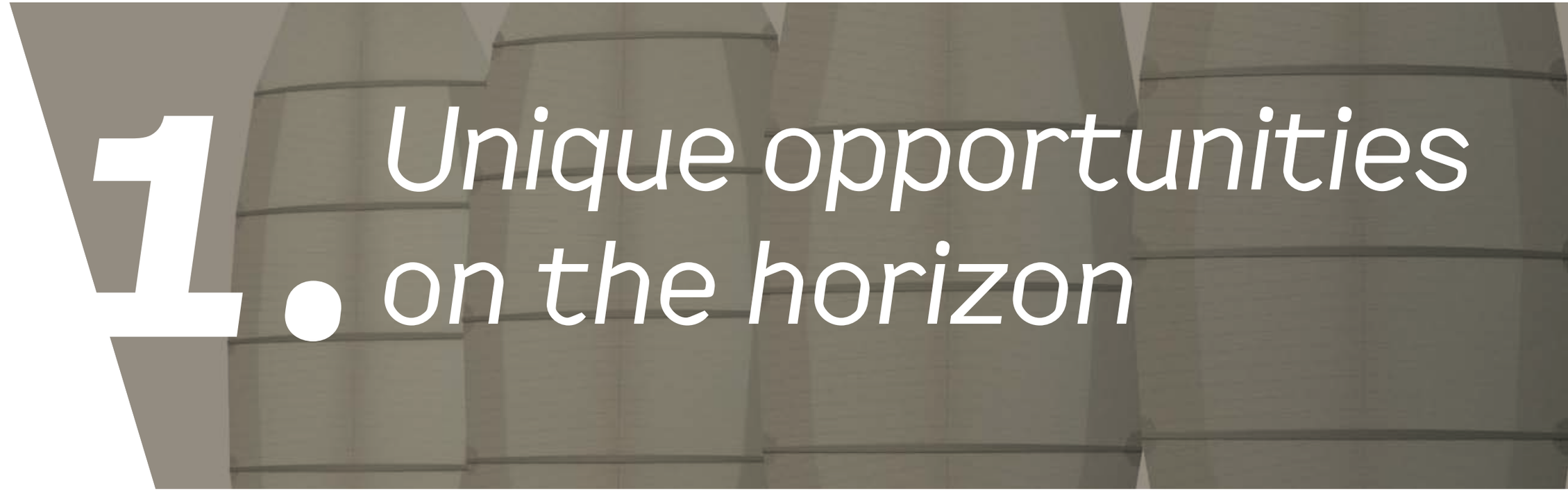


1. *Unique opportunities on the horizon*

The Netherlands, land of wind and water. Of ship builders and designers who took them to their best advantage, and built a world-wide commercial fleet of sailing ships. Until motor ships turned the tide and made them obsolete. Today, Dutch entrepreneurs take advantage of their innate feeling for shipbuilding to challenge the air-polluting motor ships with considerable reductions in oil consumption and CO_2 exhaust.

Clean shipping is not only possible but it is a huge improvement compared with the existing propulsion systems: it is fast, cost efficient and market induced.

Test set-up of the Dynarig system adopted by the Maltese Falcon sailing yacht

Eighty per cent of all goods are transported by motor ships. The air polluting gas emissions of these cargo ships are immense: fuel oil is barely refined and may be mixed with waste oil. On the basis of its study, the International Institute for Applied System Analysis (IIASA) reported that "from 2016 on shipping in European waters may surpass all the land-source air polluting emissions taken together".

The unflagging efforts to reduce the oil consumption of motor ships may contribute immensely to save the environment.

Impossible? Not if we turn to, wind energy, the oldest source of power. With new techniques and materials, and the application of modern operation system software we may realise a 50% reduction in CO_2 compared with similar motor cargo ships.

Consumers, governments and industries seek ways to meet future requirements for a clean environment. *Clean shipping* is not only possible, but is a great improvement compared with existing propulsion systems: it is fast, cost-efficient and market induced.

Fact:
Ecoliners have the same cruising speed as motor ships.

Fact:
Ecoliners are safer than motor ships.

Fact:
At fuel prices from $ 80/barrel, Ecoliners are more cost-effective than motor ships of comparable performance.

Fact:
Contrary to other forms of energy conservation (electric cars, wind mills and solar energy) the Ecoliner earns money per ton CO_2 exhaust.

Fact:
The Ecoliner is environmental friendly shipping.

2. *The Ecoliner: an introduction*

The Ecoliner is the world's first competitive cargo ship in commercial shipping. Designed by the best Naval architects, with the latest technology, and surprisingly safe.

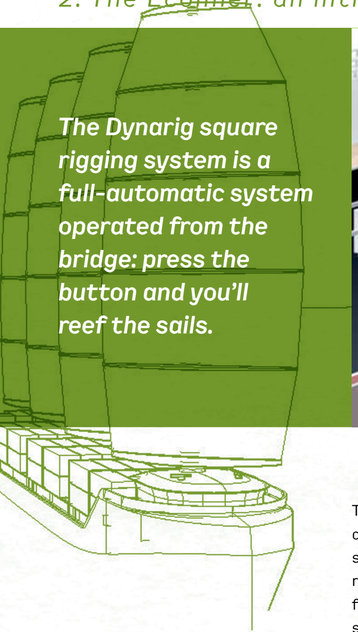
The optimised aerodynamic profile of the Dynarig rigging system makes it highly efficient compared with traditional square rigging.

The Ecoliner is suitable for the shipping of project cargo such as windmill parts.

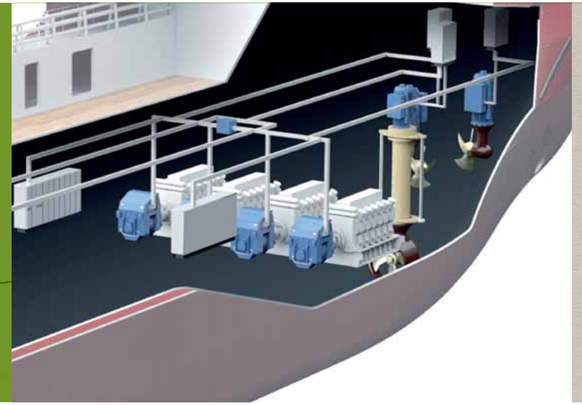
A sailing cargo ship: a unique and economic way to save energy and to substantially contribute to reducing CO_2 emissions and other polluting gasses.

Many years of research and tests in practice have resulted in the construction of a sailing ship that is competitive in commercial shipping. The Ecoliner is built with the newest materials, technology and operating systems software. Designed in cooperation with Dykstra Naval Architects & Van Oossanen, and Vuyk Groningen - highly successful naval architects of international acclaim-, and in close consultation with manufacturers of ship motors and large ship yards, makes the ship competitive with motor ships of comparable tonnage.

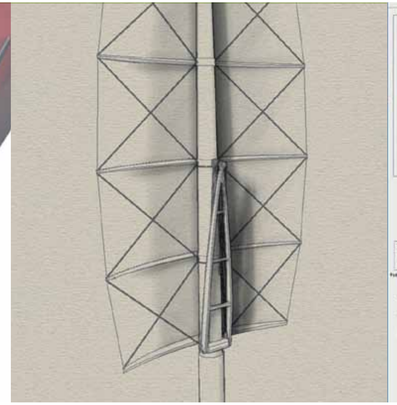
The team behind the Ecoliner combines technical expertise in sail-, mast- and underwater ship design with many years of experience both in sailing and commercial shipping. We dare guarantee, therefore, a ship of keen design and performance with revenues that outstrip increasing oil prices.



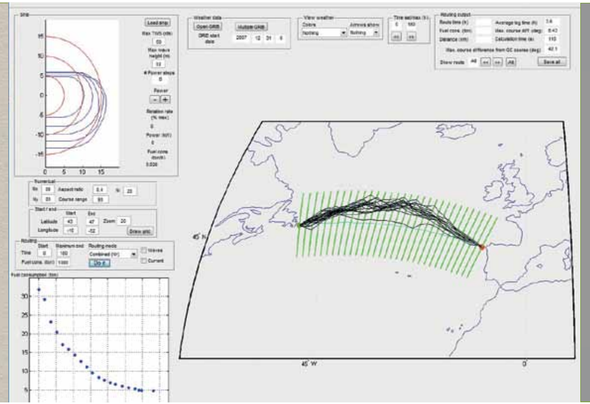
The Dynarig square rigging system is a full-automatic system operated from the bridge: press the button and you'll reef the sails.



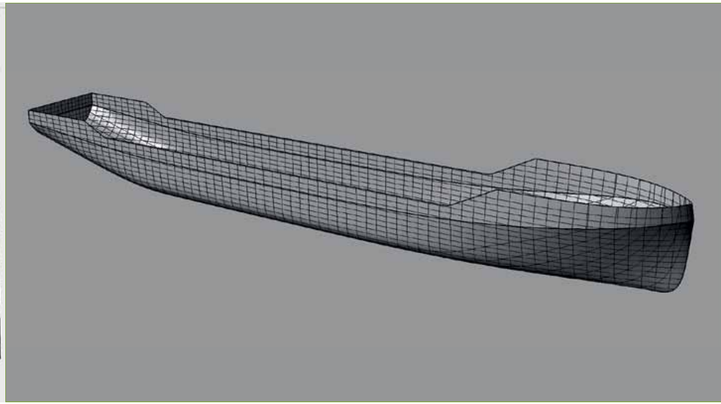
Impression of the engine room.



The original Dynarig system designed by Wilhelm Prölss.



Newly developed routing software calculates the optimum route as to cost and fuel efficiency.



Optimal hull design: the form of the hull is optimised to meet minimum resistance under slight incline.

Thanks to innovative sailing technology, the Ecoliner can do with the same number of crew members as a motor ship of comparable performance. The Dynarig square rigging system is a fully automatic system operated from the bridge: press the button and you'll reef the sails. This system has proved its worth since the launch in 2006 of the Maltese Falcon, one of the largest privately owned sailing yachts in the world. Designed by Dykstra Naval Architects, the yacht has successfully sailed the world's oceans and won several prestigious prices for "the best sailing yacht over 36 m" and for "the highest technical achievement in a sailing yacht".

The ship has an auxiliary diesel-electric propulsion system to guaranty an optimum level speed of 12 knots, even during calm spells. The additional routing software, specially designed for hybrid sailing, calculates the fastest and most efficient route on the basis of wind and current charts. These complementary units enable the ship to take routes which are beyond reach of traditional sailing ships.

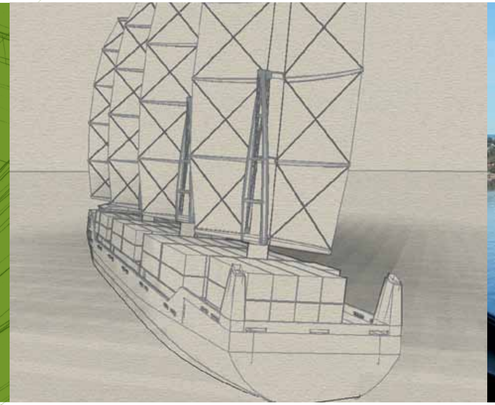
The ship's length and the shape of its hull are fully tailored to its sailing power with the masts' height and desired tonnage as leading principles. The chosen vertical clearance accords with Panamax (62,5 m). The number of masts is adjusted to the desired tonnage, while the ship's length and beam comply with international stability standards.

Optimal sailing performance: four Dynarig (square rigging) masts power the ship under sail. The sails are fully automatic, operated from the bridge and always produce optimal power at a maximum inclination of 10 degrees. Experience learns that this gives the crew room to move comfortably for a prolonged time.

With its hybrid character the Ecoliner is one of the most reliable and safest ships in the world. In the exceptional case of sailing or motor problems either of the two systems takes over.

The Ecoliner may accommodate 12 passengers who will get an exclusive glimpse of the world of sailing cargo shipping. The unique character of the ship guarantees a good occupation rate which is an interesting asset for exploitation.

Clean shipping is not only possible, it is a vast improvement over current methods: it is clean, it is dependable, it is fast, it is cost-effective, it is necessary.



The reintroduction of wind energy propulsion is a main issue in international shipbuilding.

Guest passengers get an exclusive glimpse of the world of sailing cargo shipping.

Tres Hombres, the driving power behind the Ecoliner concept.
Left to right: Arjen van der Veen, Andreas Lackner en Jorne Langelaan.

The question is how sustainable the product is if its manufacturing is sustainable but its transport is not.

Captain Arjen van der Veen, Fairtransport

Both feet on the ground

The Ecoliner is in good company. International efforts to reintroduce wind energy propulsion in shipping comprise the Japanese NYK which works on the Super Eco 2030, and the University of Tokyo which has made a concept design for a sailing cargo ship. In Kiel, Germany, the construction of a ship with Flettner Rotors is underway, and in Hamburg SkySails develops a kite sailing system for ships. B9Shipping in England sticks to the Ecoliner concept, a concept that keeps close to the well-proven techniques which, adjusted to the latest innovative ideas, offer fantastic revenues.

The oil crisis

As early as 1970s and '80s, during the first and second oil crisis, new ventures explored the feasibility of sailing cargo ships. 40 years of progress in technology and IT in combination with the prospect of ever increasing oil prices makes a cost- effective introduction of hybrid shipping viable.

Clean Shipping

The environment needs the Ecoliner. International requirements for shipping will become tighter in the coming years. As a consequence, emission restrictions for CO_2 and other emissions will considerably reduce the revenues of polluting ships. Consumers, too, become more and more critical and demand responsible entrepreneurship. The Ecoliner offers a good alternative to meet the demands.

Tres Hombres

Arjen van der Veen, Jorne Langelaan and Andreas Lackner, known as the *Tres Hombres*, are the driving power behind the concept of the Ecoliner. Three men with a long-held dream till 2009 - when they took the first step to realise their dream. In this year they launched a sailing cargo ship, the Tres Hombres. Today, the ship succeeds in carrying a variety of goods CO_2 neutral all over the world. Favourably reviewed in the (inter)national press, the initiative has won several prices.

Now the time is ripe for step two: the comeback of commercial sailing cargo ships based on new technology. In the meantime several dedicated professionals of great expertise, necessary to make the Ecoliner dream come true, joined the Fair Transport Team of the three men. By comparison, the Ecoliner is at a far advanced stage of development of what is, at the moment, the best possible concept of hybrid sailing.

Technical specs:

- **Total length:** 138 m
- **Width:** 18,20 m
- **Draught:** 6,50 m
- **Capacity:** 8210 ton, 459.100 cft or 476 TEU
- **Propulsion:** 4000 m² sail area
  3000 Kw diesel electric transmission
- **Service speed :** 12 knots

Type of ship:
The first Ecoliner will be a multipurpose ship which can transport all kinds of cargo. The ship in the picture is a container ship.

Main Propulsion:
The ship has four Dynarig type (square rigged) masts to power the ship under sail. The sails are fully automatic , operated from the bridge and always produce optimal power at a maximum inclination of 10 degrees.

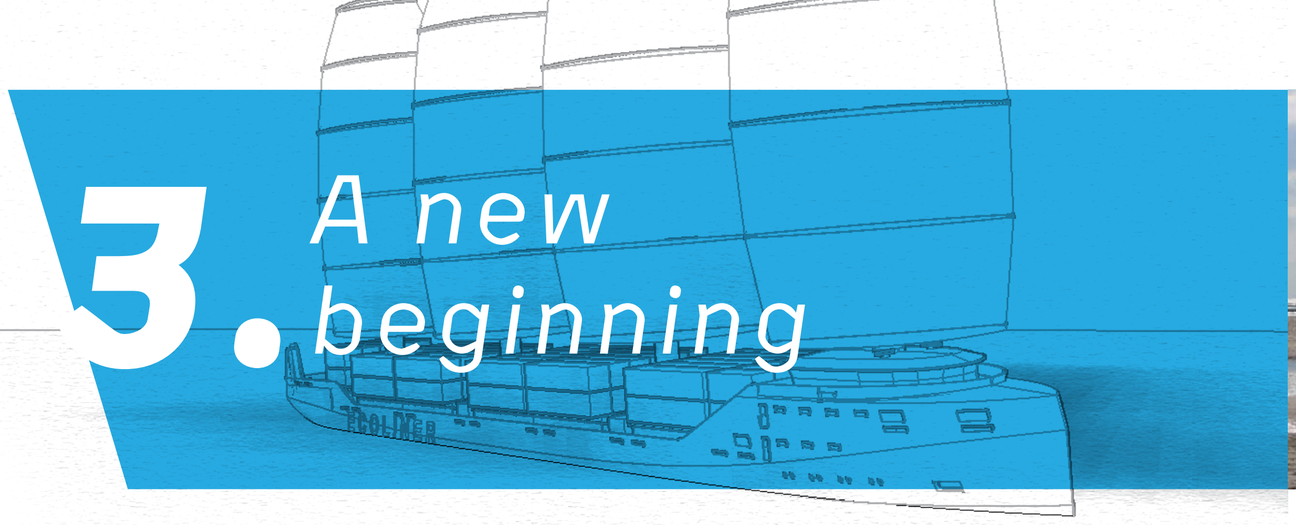
Auxiliary propulsion:
In a light breeze or headwind, the diesel electric propeller propulsion, in combination with a number of generators, provides sufficient extra power to maintain the guaranteed cruising speed. As the generators run on almost any fuel, the customer has a wide choice.

Power supply:
The energy generated by the propeller when the Ecoliner is under sail will be returned to the board net and so reduce fuel consumption.

Shape of the hull:
The shape of the hull is fully tailored to the ship's sailing properties. Due to the long waterline and stretched verticals the ship has a lower resistance than motor ships of similar length.

Efficiency:
The positioning of the bridge on the fore ship gives a full view which makes the raising of the bridge redundant. Moreover, the location of the crew quarters in the fore ship makes the most of the cargo hold and deck space.

3. A new beginning



The Ecoliner uses 50% less fuel than a comparable multipurpose ship and so reduces its CO_2 emission at least by half. In fact, the ship may sail 100% CO_2 neutral depending on the kind of fuel and the speed of the ship chosen by ship-owner and shipper.

Clean shipping. A dream comes true. The Ecoliner stands at the beginning of a revolution in shipping. Sustainable entrepreneurship has the future.

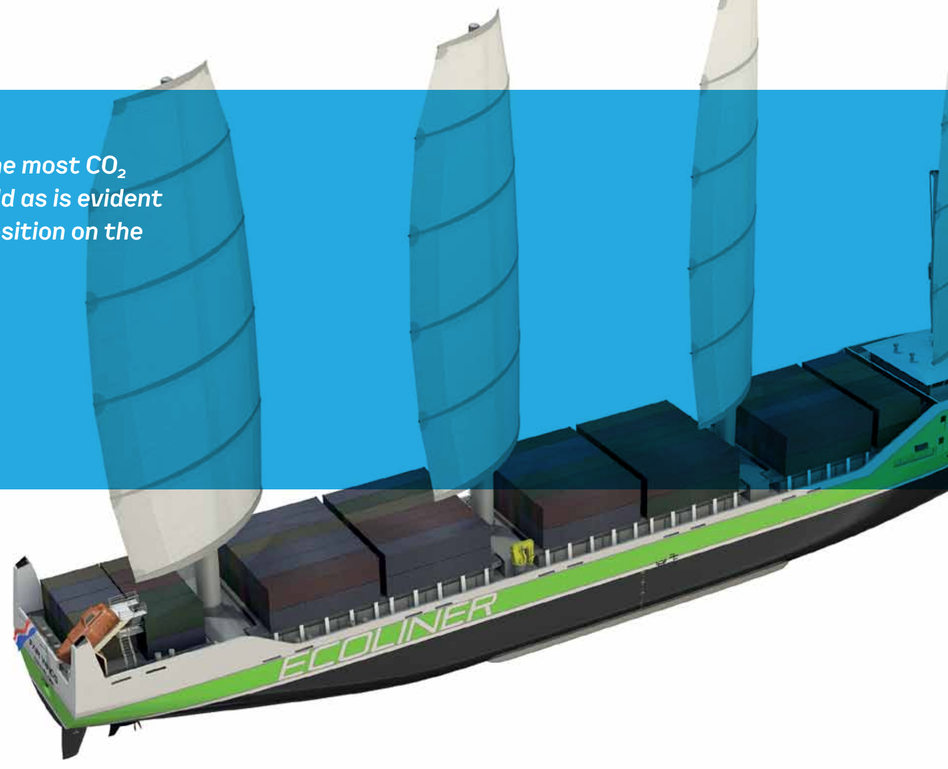
A ship of comparable performance uses about 10.000 litres fuel oil per day and so produces about 7.2 million kilos CO_2 per year, equivalent to 2.400 cars. On a global level shipping produces 4% of the total annual CO_2 emissions, i.e. a total of 1 billion ton CO_2. Moreover, fuel oil is heavily polluted with sulphur, nitrogen and heavy metals. The 16 largest container ships jointly emit as much sulphur as all the cars in the world.

But unavoidably, time will come that we have spent our natural resources; in fact, they are already on the verge of depletion. Not only uses the Ecoliner 50% less fuel and thus emits at least 50% less CO_2 in comparison with a multipurpose ship, but it may even sail 100% CO_2 neutral depending on the fuel the ship-owner chooses.

How? Because we opt for a diesel-electric propulsion unit which is highly fuel-efficient and use generators which are more economical and cost-efficient than conventional propulsion.

The clean Shipping Index, a list of cargo ships which reduce pollution to a minimum level.
The Ecoliner will be the number one on the list. For information see **www.cleanshippingproject.se**

The Ecoliner is by far the most CO_2 friendly ship in the world as is evident from its number One position on the Clean Shipping Index.



The Ecoliner is in the good company of various large, international enterprises and shippers who joined the Clean Shipping index, a list of cargo ships which reduce pollution to a minimum level; shippers on this list are, amongst others, Scania, H&M, and Akzo Nobel. The index is a perfect opportunity to create a market strategy profile of environment minded enterprises. The Ecoliner will be the number one on the Clean Shipping Index.
For more information: www.cleanshippingindex.nl.

4. The Ecoliner: a good cause

Choosing for the Ecoliner is opting for a good cause. In a world economy which demands responsible entrepreneurship, the Ecoliner has many assets compared with traditional container ships. A summary.

Compared with its competitors, the Ecoliner has the following advantages:

Advantage:
The Ecoliner safeguards against increasing oil prices.

Advantage:
The Ecoliner is ready to meet future tough eco-standards for shipping.

Advantage:
The Ecoliner is perfectly reliable.

Advantage:
Transport by Ecoliner is an excellent marketing tool.

On the competitive market of cargo shipping the Ecoliner matches comparable cargo ships: she has the same cruising speed (or higher) and keeps to reliable shipping schedules. The Ecoliner can adjust its speed to ETA (Estimated Time of Arrival). Furthermore, keen routing software guides the ship to areas with favourable wind conditions and limits the use of the hybrid motors.

If the ship is under sail she can reach 20 knots, without wind the speed is at least 12 knots (i.e. the mean cruising speed of comparable motor ships). If the shipper so wishes, the latter speed may be increased but this reduces fuel savings.

In sum, the Ecoliner matches a conventional cargo ship in every respect.

5. An opportunity for shippers and investors

Chief Executives Believe Overwhelmingly That Sustainability Has Become Critical to their Success, And Could Be Fully Embedded Into Core Business Within Ten Years

UN Global Compact, http://bit.ly/dBOC95

ING Equity markets sees third industrial revolution: responsible & sustainable

Steward Red Queen, http://bit.ly/GRuRTc

Consument vraagt om duurzame producten (Consumers demand sustainable products.)

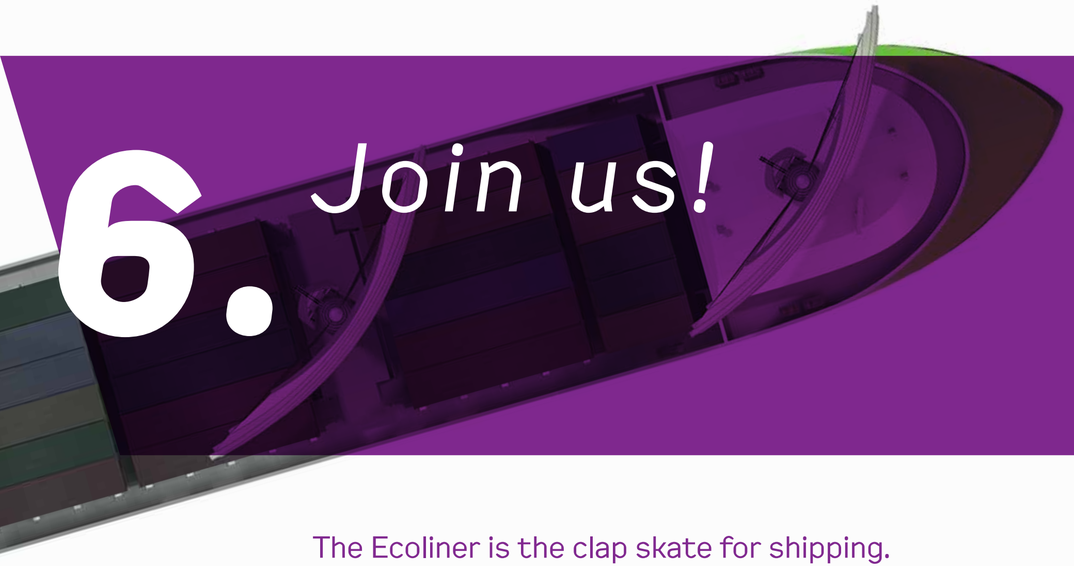
Volkskrant, http://bit.ly/GR7VFQ

To remain competitive, enterprises should look ahead. Early participators may customise their Ecoliner.

The customers' increasing demands for sustainable goods compel entrepreneurs to take their responsibility; the newspaper headings above show that the message was heard. Since there are no options for sustainable transport yet, now is the time to take the opportunity to join.

Industries must jump on the bandwagon to remain relevant and competitive. Investment is a significant link in the production process and not only offers you practical and possibly financial advantages, but also vouches for your responsibility. Opting for the Ecoliner is sharing the consumers' concerns.

Each Ecoliner may be customised to the wishes of the customer. The ship is suitable for bulk, tanker and container transport, and available as Ro-Ro. If so wished, one large cargo hold can be created. For our own future shipments we will use standard 8000 DWT multipurpose ships.



6. Join us!

The Ecoliner is the clap skate for shipping.
An invention that will change the world. Join us?
Please, come aboard.

FAIR TRANSPORT

TRES HOMBRES

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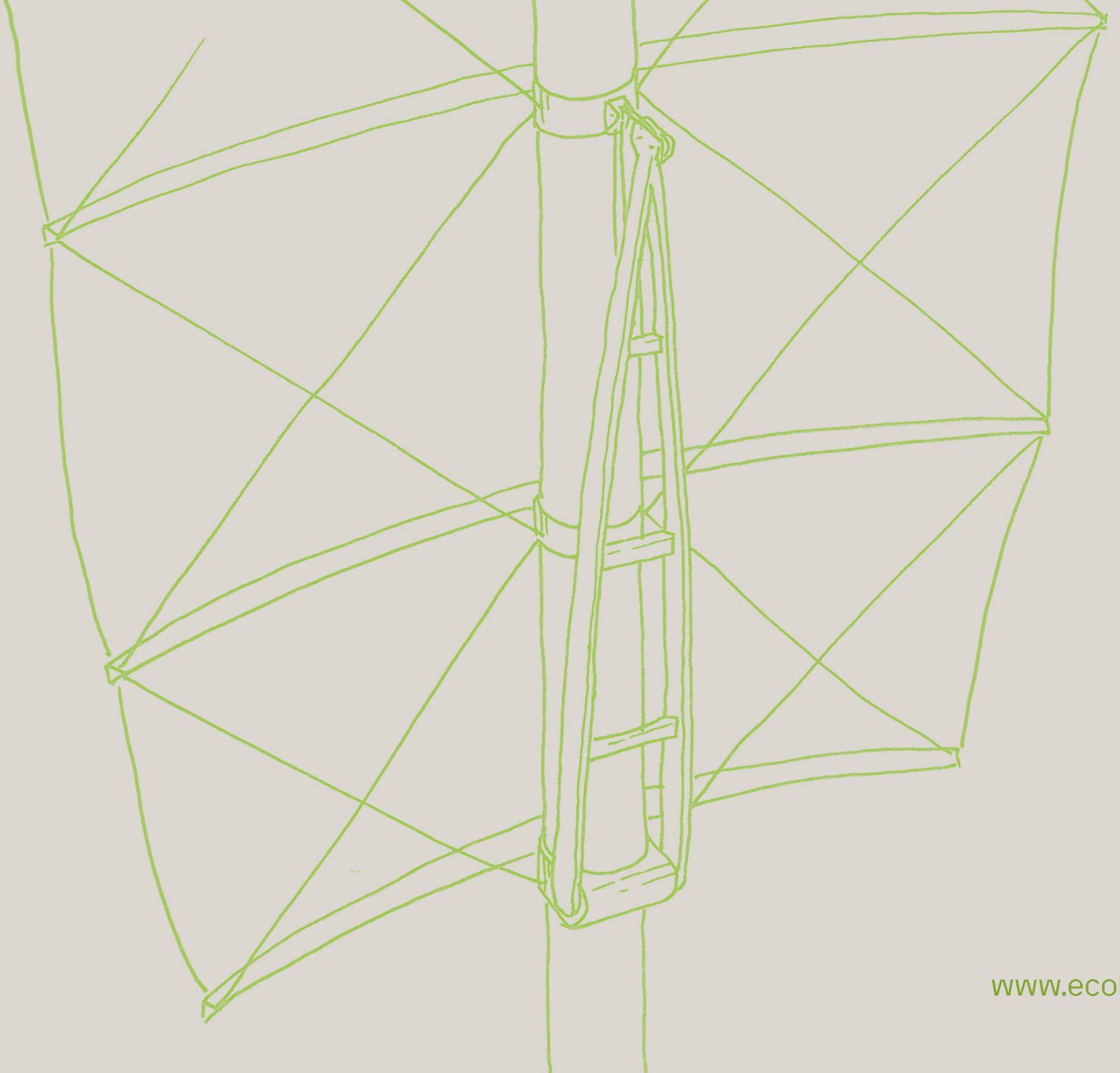

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