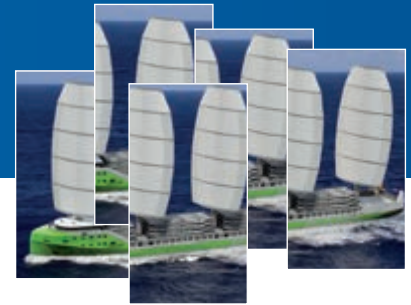




No. 3 - April 2015

NEWSLETTER



SAIL is an Interreg IVB North Sea Region project with 17 partners from seven different countries around the North Sea.

Leading vision and aim: Alternative propulsion systems for (freight) sailing, defined her as "hybrid sailing concepts", have high potentials, due to rising oil prices and environmental aspects. Develop and testing hybrid sailing concepts that lead to new business opportunities and a more sustainable future.

Project duration: from July 2012 to June 2015.

Budget: € 3.4 million

- 50% European funding
- 50% partner cofinancing

A new horizon for sustainable brands **Ecoliner: not if but when?**

Network meeting in Harlingen

On 5 July 2014, Alderman Mrs. Maria le Roy opened the networking meeting on board of the Clipper Stad Amsterdam in Harlingen. In a historic perspective, the era of fossil fuel use by maritime transport may be proven relatively short. The historic tall ships moored all around have formed the conclusive phase of wind powered transport.



DEAR READER

SAIL is now in a phase of consolidating and making public her results. We have enough credible technical and market performance data that are relevant for investors, shippers, ship owners, freight owners and ship operators. Calculation models about wind potentials, power generation, emission savings, investment cycles, market performance, rigging performance, hull performance, from different SAIL partners have been assessed and will be translated to accessible formats by the partners.

Conclusion

WASP is feasible in certain settings. Many conditions need to be considered for realizing a break even or profit Euro-scenario, from sustainability perspective there is always a profit. Some routes in the North Sea and routes to the West are attractive, because of best wind conditions. Combining these with existing freight streams would be best. From loading and unloading perspective the rigging can be an obstacle, a tanker would be the best solution.

Comparing a traditional 8.000 DWT with a Dyna Rigged three master 8.000 DWT, sailing at the same speed there is a considerable power generation: the average saving of fuel and emissions will be 50%, based on wind potential data from the past.

First explorations to the market were made, SAIL got in contact with investors, shippers, ship owners, freight owners and ship operators and a couple of them showed serious interest to get involved. With two investors we had negotiations and worked out business plans with them. These meetings gave us more focus on how to access these investors. With one investor we are still in touch and exploring opportunities.

We face some challenges now:

1. For the first ship a financial gap is expected.
-> We are looking for subsidies to close this gap.
2. We have credible calculations, but we do not know how a “real life trial”, would work out.
-> We are looking for ship owners, investors that are open for trials enabling us to convince the shipping world.
3. Risks for the first ship owner are quite high.
-> We are looking for ways to share risks.
4. Legislation.
-> Although aims to attain climate objectives are ok, legislation is not in line with them. At the same time directives are not controlled very severe, which enables ship owners to neglect many emission directives for example.

We have some opportunities as well:

1. More and more entrepreneurs understand the urgency of sustainable transport, they look voluntarily to opportunities and work them out.
2. Public awareness about climate change is raising and end consumers are willing to pay more for sustainable transport. Transport is just a small part in the price of a product and there fore a quick win in the production chain. Market transformation is a very important topic now; how to create a market for wind transported cargo, if there is a market investors will follow! (Maybe this item might be relevant for a SAIL follow up).
3. Once oil prices will increase there will be a ROI for WASP.
4. Techniques for WASP improve.



Participants from 30 different companies attended this meeting. Jan Lundberg is a former US oil analyst and currently works on the expansion of the Sail Transport Network from Greece which supports the transition the Ecoliner stands for. The innovation involved in the construction of a Ecoliner proves the leading role of the Dutch maritime sector. Similar initiatives around the globe currently compete for the same concept, but currently the SAIL 2

Jan Rotmans from the university of Rotterdam acknowledges the importance of anticipating on the energy transition. The transition away from fossil fuels is a major contributor to the wider global “reset” and shift of powers. The emergence of clean tech is the fastest growing industry of the world, not only in the west. China is following the example of Gulf states of diversifying the economy to be less dependent on fossil sources. It is investing massively in energy plants, also non-fossil fuel based.

Regime change

The first penguins to adapt have shown up and will be joined by others, examples are hybrid cars, solar panels, etc. All these initiatives have been promoted from outside the ruling regime. Change does not come from within existing systems: no turkey goes to the grill voluntarily. But major change also appears not to come from niches.

The approach of regime change –from fossil to clean tech- can be captured in certain trends. Research shows we have received the tipping point stage. A lot of chaos is experienced within the energy system. After Fukushima, the recent uplift

of nuclear power appears to be over, the USA is exporting gas instead of importing for years. It will be the adaptive companies which will be able to survive the chaos. The change towards renewable appears to be an autonomous process. Over 50% of the investments in clean tech is done by private individuals.

Financing an Ecoliner

Because there is no existing market there is no apparent asset base to approach. An asset base consists of multiple replicable companies (e.g one sector). This means searching for a very limited amount of potential investors. The potential of crowdfunding is very limited, apart from Kickstarter for very clear consumer or goal oriented products.



Go to market challenge

None the less, a reduction of 25% fuel price is low hanging fruit. Private companies do feel that this is the direction the maritime sector needs to develop in. More aspects should be considered when it comes to financing, it is better to take little steps.

Next steps

The Ecoliner needs a go to market plan and needs either freight or financing. The other one will follow. The missing link is the big picture of the market and a closed business case. The question to follow-up on new contacts is : how do we get parties involved given their current economic business structure and distribution network? An Ecoliner not if but when?

The market proposition of the Ecoliner

1. Approx. 50% fuel, SOX, NOX and CO2 reduction on sea at common boat speeds.
2. Disruptive innovation in an environment dominated by the enlargement of vessels and diminishing cruising speeds.
3. Meeting new stringent SOX reduction standards in the North Sea and around the US in 2015
4. Large sustainable gains against low costs, considering the entire supply chain.
5. A solution (hybrid sailing vessel) showing big exposure possibilities when marketing products.
6. First to market with a sustainable sea transport solution

For the full article and a summary of the SAIL conference see the website of SAIL.



Thesis Jethro de Vries

Is an application of the Magnus-effect in a hybrid sailing concept invest worthy in comparison with a conventional ship by equal operational profile?

This is the main question of the thesis written by Jethro de Vries. Jethro, a student from the NHL (University of Applied Sciences) graduated on this topic at C-Job Naval Architects. This independent design and engineering company is a partner in the inter-regional SAIL project providing the knowledge on shipdesign and knowledge on sustainable shipping.

The answer to the main question has been obtained through the comparison of two suitable propulsion systems, the Flettner rotor and the Turbosail. Both systems make use of the Mag-

nus-effect to gain lift from axial rotation. Both systems have been implemented in a numerical concept design with an emphasis on specifying the hull form in relation to the cargo capacity, stability criteria and the cost estimation.

This numerical calculation and the final result have been compared with the conventional motorized general cargo ship, the AMELAND. This 7610 deadweight design sails at a ship velocity of 13 kts. These parameters have been used as criteria points for this thesis and the calculation. Through the use of the performance data as provided by Charrier et al. the Flettner rotor and the Turbosail have been compared in the calculation on multiple lift coefficients, ranging from 2 to 8 for the Flettner rotor and from 2 to 6 for the Turbosail.

From these performance data follows the determination of the

beam of the ship and the best suitable length solution by comparing multiple solutions of mast height, quantity of masts and the design lift coefficient. This results in a hull form that differs from the AMELAND by showing a lower Length-to-Beam ratio but with very low dimensionless hull coefficients. This reduces the resistance of the concept in relation to that of the AMELAND, which is necessary to gain the maximum lift coefficient for both concepts.

From the dimensions a construction cost calculation and an estimation of the operational costs in terms of fuel costs can be derived. After estimating the cargo profit the ROI of both

the Flettner rotor and the Turbosail have been compared. From this comparison follows that both systems have a longer ROI than that of the AMELAND with a distinction between the systems in favour of the Flettner rotor. Than the invest worthiness has been compared by looking at total profit after 15 years of service. Although both WASPs have an almost equal ROI, even in comparison to the conventional ship, the Flettner rotor has this profit at its maximal performance, while the Turbosail must sail with a minimal lift coefficient. The maximum profit with the Flettner rotor shows enough revenue to build a new ship. Therefore the main thesis can be answered with yes, if a Flettner rotor would be installed on a 7610 tonnes dwt design.



Exciting times for Bonduelle, Rynikiewicz and NeumannECEEE Summer Study

Antoine Bonduelle, Christophe Rynikiewicz (EE-consultant/WP4) and Daniel Neumann (WP3/HZG) had their paper accepted for the European Council for an Energy Efficient Economy (ECEEE) 2015 Summer Study. Their article Hybrid sailing: an efficient way to reduce the use of fossil fuels in the maritime transportation sector builds on the work performed in the SAIL project and the IRENA Technology Brief (2015) on renewable energy for shipping or the recent IMO GhG Study (2014).

Since the first traditional eceee Summer Study was held in 1993, this biennial, interdisciplinary, cross-sectoral conference has developed into the most important energy efficiency event in Europe. It is here the trends of our future policies can be spotted first.

The Summer Studies are the backbone of ECEEE's ambition to deliver comprehensive evidence-based information on all aspects of energy efficiency. The Summer Study offers a mix of quality peer-reviewed paper presentations more than 400

participants from industry, energy suppliers, governments, research, consulting, and the NGO sector meet to formulate tomorrow's energy policies.

More on ECEEE Summer Study (1-6 June 2015) under the motto 'keeping energy efficiency on the top of the agenda', Toulon/Hyères, France on eceee.org/summerstudy.

Wednesday, 22 April 2015

Final SAIL-conference and working session

- Meeting venue: Deltares, Delft, The Netherlands
- <http://www.deltares.nl/en/contact/offices>
- From: 9.00 to 13.00

The Interreg IVB North Sea project SAIL is finished. We are happy to inform you about our findings in Technical performances, Economic feasibility, Hybrid sailing, emission reductions and policy and entering the market. There is world wide attention for this project, being the biggest EU project aiming at exploring and promoting merchant wind assisted sailing. We invite first movers in freight and ship owners, shipbuilders to this final SAIL conference. Free of charge.

Register by sending an e-mail to info@nrsail.eu

Part 1: looking back on the project

Opening by Mrs. Netelenbos of the Royal Association of Netherlands Ship Owners

Facts and Findings SAIL project in four pitches

Part 2: future

Identify stepping stones Sailing into the future;

Creative co-makership.

This SAIL conference is integrated in the BlueWeek 2015, from 20 to 22 April 2015. The BlueWeek is hosted by Deltares in Delft and co-organized by MARIN. It provides a platform to discuss sustainable energy in shipping and offshore. We recommend you to join the Public seminars regarding 'Marine Renewable Energy' and 'Natural Propulsion' on Tuesday 21 April



Wind Assisted Hybrid Shipping presented GST Lloyd's Register and European Cargo-owners Congress

By Edo Donkers (Sustainable Transport Consultant to SAIL WP6)

On 11 March 2015 the annual Green Ship Technology Conference by Lloyd's Register was held in Copenhagen. On Day 1 of the conference, a public panel discussion in wind assisted shipping was held for an audience of about 200 maritime stakeholders. Practically all representatives of wind-assisted technologies participated in the discussion: B9 shipping, Norsepower, Vindship, Propelwind, Magnuss. Edo Donkers participated on behalf of SAIL and the Dynarig / Ecoliner developments. In a sharply moderated discussion, brief business case options for all mentioned technologies were discussed. The existing misconceptions about Dynarig sail powered hybrid shipping (need for 3 to 4 extra crew members, sails can be put on ships of any size)



were corrected, and the concrete business opportunities were clarified. Cargo streams along trade wind routes and smaller ship size in bulk, project cargo and tanker ship categories are most suitable for ships like the Ecoliner.

More recently, on 20 March 2015, Dijkstra Naval Architects, Eelco Leemans (North Sea Foundation/WP 6) and Edo Donkers attended the annual sea freight congress of the EVO (European Shippers Organisation) in Zoetermeer, The Netherlands. The Ecoliner design was shortly presented for a wide group of Dutch and Belgian shippers of cargo-owners, shipping lines ship owners. The potential for low emission shipping was also discussed

in a wider context with stakeholders like DSM, the Dutch Ship-owners Organisation (KVNR) and by active responses from the audience. It became clear that 'the overall business case of low emission shipping' is gaining support throughout the maritime sector. Particularly, the cargo owners sector are forerunners to stress the need for a more ambitious environmental agenda in the shipping sector. To formulate a successful business case, the audience agreed that, besides the existing successful examples of 'business to business' initiatives, the consumer has to be included. More awareness of the importance of transport and cleaner alternatives is urgently needed.



Seminar at Aalborg University

Sailing into a Sustainable Future

By Carla K. Smink, Roberto Rivas Hermann & Edo Donkers

On 12 March 2015 a seminar was organised by Carla Smink and Roberto Rivas Hermann from the Department of Development and Planning at Aalborg University (AAU) and Edo Donkers the consultant from Sustainable Transport.

The aim of the seminar was to discuss how different maritime stakeholders evaluate solutions for environmental issues in the shipping industry from a regulatory point of view. In the morning some presentations were given. Roberto talked about how the Sulphur Emission Control Area in Northern Europe can be a driver for Eco-innovation. Edo looked at regulatory developments in the maritime industry and particularly the role of IMO, the EU and ports and the potentials for hybrid shipping. Finally, Carla presented the results from a study carried out in Denmark about the role of public-private partnerships in the Danish maritime sector.

In the afternoon the participants had to analyse how different stakeholders (a short sea ship liner, a fashion retailer, an Environmental Protection Agency, a Port and a maritime equipment manufacturer) will act to make implementation of current and (possible) future SOx and NOx and CO2 reduction targets successful, but it has also been discussed which reasons each actor might have not to cooperate. The discussion in the afternoon showed the regulatory dilemma in which the stakeholders in the shipping industry are trapped. Most stakeholders prefer to cooperate, but they have good reasons to believe the other stakeholders will deliver the opposite. The result is a loose-loose situation.

The seminar ended with a short presentation of the eco-liner and the attendants discussed about the challenges and opportunities of this type of technology.



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| 1 - Province of Fryslân | 11 - Ameland Shipping |
| 3 - Plymouth University | 12 - NHL Northern University of applied sciences |
| 4 - Jade Hochschule | 13 - MARIN |
| 5 - Helmholtz-Zentrum Geesthacht | 14 - E&E consultant |
| 6 - Aalborg University | 15 - Avel Vor Technology |
| 7 - North Sea Foundation | 16 - Port of Oostende |
| 8 - Fairtransport Trading and Shipping | 17 - ECO Council |
| 9 - Municipality of Harlingen | 18 - World Maritime University |
| 10 - C-Job | |

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SAIL is now in a phase of consolidating and making her results public. That is why we organize our final conference in Delft, together with MARIN's Blue week. The place where our stakeholders are present.



We will present the outcomes as we have enough credible technical and market performance data that are relevant for investors, shippers, ship owners, freight owners and ship operators.

Explorations to the market were made, SAIL got in contact with investors, shippers, ship owners, freight owners and ship operators and a couple of them showed serious interest to get involved.

As professor Rotmans - present at the meeting in Harlingen July 2014 - expects big transitions, but changes will not come from existing systems. We will face a chaos where adaptive companies will survive, the Ecoliner-concept fits in that one.

The province of Fryslân will end this project knowing there are some opportunities for hybrid shipping for the future: More and more entrepreneurs understand the urgency of sustainable transport, they look voluntarily to opportunities and work them out.

Public awareness about climate change is raising and end consumers are willing to pay more for sustainable transport. Transport is just a small part in the price of a product and there fore a quick win in the production chain. Market transformation is a very important topic now; how to create a market for wind transported cargo, if there is a market investors will follow! (May be this item might be relevant for a SAIL follow up.)

Once oil prices will increase there will be a ROI for WASP. and also techniques for WASP will improve. The province of Fryslân was happy to be Lead Partner in SAIL and wishes all future activities to help the hybrid shipping all the best.

Hans Konst