

# SUSTAINTECH IN FOCUS – Swedish project for truly sustainable shipping

**90%**  
reduction in  
emissions

The first vessel will be  
delivered at the end of  
**2024**

A transatlantic crossing will take around  
**12 days** (compared with today's crossings  
that take about 7 days)

The vessel will  
be able to carry  
**7000** cars

Estimated average  
speed: **10** knots

Five fixed wing sails approx.  
**80** metres in height

In its current design, the vessel  
is **200** metres long, **100** metres  
high and **40** metres wide

## LAUNCH IN 2024

- A 3.0 design in summer 2020
- The 7-metre-long model will have its sea trials in autumn 2020
- A 4.0 version will be unveiled at the World Expo in Dubai in 2021
- The first vessel will be delivered at the end of 2024

## TERMS AND CONCEPTS

- Primary energy source: wind
- Sustaintech concept for truly sustainable shipping
- Sailing cargo vessel
- A unique combination of rigging and hull
- Unique Swedish competence cluster



## wPCC is the sender

A name and a visual identity for the project will be available shortly.

Until then, always use the phrase the wPCC project with all three parties: SSPA, KTH Royal Institute of Technology and Wallenius Marine.

We can add the Swedish Transport Administration (Trafikverket) where applicable.

## THE COLLABORATION – an efficient Swedish cluster

wPCC is a Swedish collaborative project between Wallenius Marine, KTH and SSPA. It is supported by the Swedish Transport Administration, which is acting as a co-financier. It is an efficient cluster collaboration that draws together experts from the public and private sectors and academia. Wallenius Marine, which is the project coordinator, owns the concept and is also contributing design and logistics expertise. KTH is addressing the challenges within areas such as aerodynamics, sailing mechanics and performance analysis. SSPA is contributing with expertise within the development and validation of new testing methods, aerodynamic and hydrodynamic simulation methods and risk simulation.

This expertise will eventually be used to develop sailing vessels in other vessel segments.

wPCC is a flagship project for Swedish maritime research. The collaboration between three of the world's leading players is crucial to its success. Together, Wallenius Marine, KTH and SSPA provide knowledge and resources within vessel design incorporating wind propulsion. The project proves that cooperation between industry and academia can lead to significant innovations in our high-tech society. Together, we are not just developing the transportation technology of the future, but also the next generation of engineers. Working together, we enable sustainable growth.

## WHY – a paradigm shift for shipping

People have been sailing for thousands of years. A hundred years ago vessels powered by engines took over shipping and today shipping accounts for 90 % of global freight. Diesel engines have meant faster crossings but at the expense of the environment. With wPCC we are developing the ocean-going freighters of the future – with 80-metre-high sails.

wPCC reduces emissions by as much as 90%. The goal is to be able to operate freighters with zero emissions. A transatlantic crossing with wPCC will take around twelve days, compared with the seven days it takes conventional vessels.

wPCC shows that the maritime industry can bring about major change and that zero-emission shipping is possible, using wind as the main energy source.

## HOW – a unique combination of rigging and hull

wPCC is a technically challenging project where the rigging and hull work together as a single unit to harness the wind in the most efficient way possible. The hull has been designed for a large sailing cargo vessel and everything has been developed from this: speed, steering technology, hull shape and appearance, and the design and construction of the rigging. It is a mix of aeronautic and shipbuilding technology. We can evaluate performance and safety using a combination of computer simulations and physical experiments. When the first ship is completed, it will be the world's largest sailing vessel.

The wPCC concept is being developed for really large vessels; vessels designed to transport large, heavy cargoes over long distances for long periods. The sails are made of a mixture of metal and composite and will be almost 80 metres high, twice the height of those on the largest sailing vessels around today. It will be possible to 'reef' the sails, reducing their height to approx. 50 metres. The vessels will also be fitted with engines to enable them to manoeuvre in and out of port.

The concept also enables us to change current working methods and time requirements and to drastically reduce CO2 in the world's transport chains.

## Wallenius Marine – the initiator

**Wallenius** was founded in 1934 and has been working to reduce the environmental impact of all the vessels that the company designs, builds and operates since the mid-90s. It has so far designed and built around 70 vessels with a strong focus on sustainability, reflecting increasingly stringent sustainability requirements. As a pioneer in shipping, it was an early adopter of a zero-emissions target for vessels.

**SSPA** is an independent Swedish research institute, with a long history of research, development and innovation projects serving the maritime sector. The areas of expertise includes hydro and aerodynamic verification, safety, logistics and sustainability. SSPA supply maritime solutions for shipowners, ports, shipyards, manufacturers and maritime authorities worldwide. The company is fully owned by the Chalmers University of Technology Foundation.

**KTH** Royal Institute of Technology in Stockholm has since its founding in 1827 grown to become one of Europe's leading technical and engineering universities, as well as a key centre of intellectual talent and innovation. KTH are Sweden's largest technical research and learning institution and home to students, researchers and faculty from around the world dedicated to advancing knowledge. KTH is working with industry and society in the pursuit of sustainable solutions to some of humanity's greatest challenges: climate change, future energy supply, urbanisation and quality of life for the rapidly-growing elderly population. Naval architecture is one of the oldest fields of research at KTH. Modern specialization within the field incorporates wind propulsion and maritime robotics.