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# Zero Emission Services: first emission-free inland shipping vessel on energy containers



6 September 2021 – Zero Emission Services (ZES) commences today with the *Alphenaar*, the first Dutch inland vessel to use interchangeable energy containers for propulsion. The *Alphenaar* sails between Alphen aan den Rijn and Moerdijk transporting beer for HEINEKEN, ZES's first end customer.

This makes the commissioning of [the innovative ZES energy system for inland shipping a fact.](https://innovation.engie.com/en/news/video/testimony/startup-story-zero-emission-services-ZES/25938) (<https://innovation.engie.com/en/news/video/testimony/startup-story-zero-emission-services-ZES/25938>) The energy containers – 'ZESpacks' – are standard 20ft containers filled with batteries, which are charged with green electricity.

The first two ZESpacks are loaded and exchanged at the first charging station at the CCT terminal in Alphen aan den Rijn. ZES's ambition is to scale up in the short term and aims to realise 30 zero-emission shipping routes by 2030. [The company was founded last year by ENGIE, ING, Wärtsilä and the Port of Rotterdam Authority with the support of the Ministry of Infrastructure and Water Management](https://innovation.engie.com/en/news/medias/green-mobility/zero-emission-services-emission-free-navigation-solution-for-barges/18159) (<https://innovation.engie.com/en/news/medias/green-mobility/zero-emission-services-emission-free-navigation-solution-for-barges/18159>), thereby taking an important step in the transition to emission-free inland shipping.

## System change of inland shipping

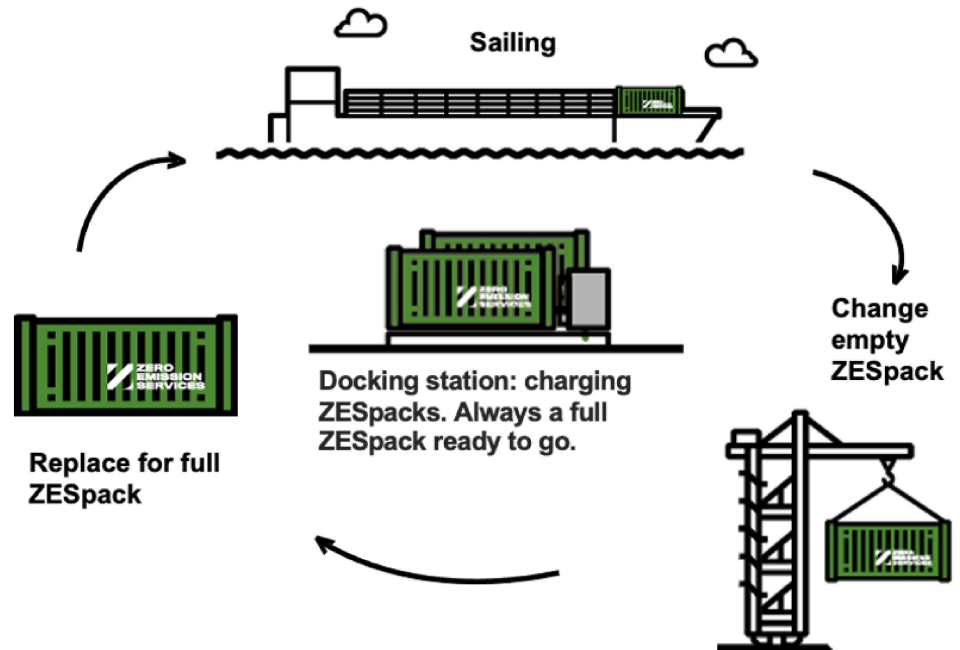
Inland shipping plays an important role in reducing environmental emissions. Within the transport sector, inland shipping makes up 5% of CO2 emissions in the Netherlands. In addition, 11% of the total Dutch NOx emissions are caused by inland shipping. To achieve the goals set in the Climate Agreement, the Green Deal for Sea Shipping, Inland Shipping and Ports aim to reduce emissions in inland shipping by 50% by 2030.

Achieving this goal requires a transition to fully electrically powered waterborne transport. ZES provides the solution to put this system change into effect; a complete service package based on exchangeable energy containers with green energy, open-access charging infrastructure and a pay-per-use payment concept for vessel owners.



The energy concept that ZES is launching on the market contributes directly to the reduction of emissions by saving around 1,000 tonnes of CO<sub>2</sub> and 7 tonnes of NO<sub>x</sub> per vessel per year. In addition, vessels sailing with ZES do not produce particulate matter

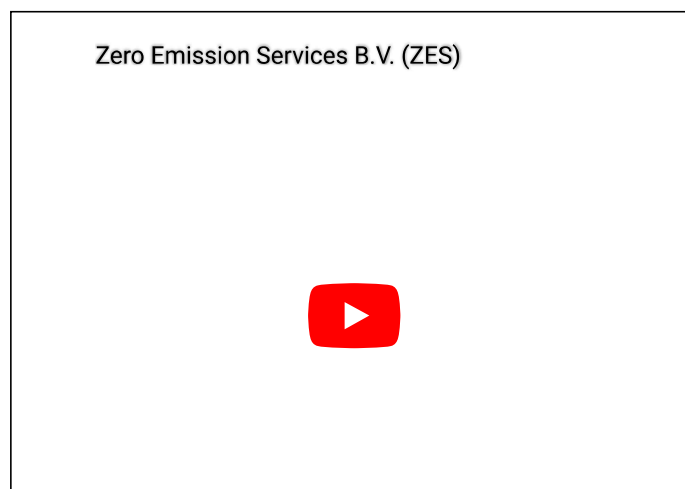
*Willem Dedden, CEO of ZES*



The charging stations can act as energy hubs that can stabilise the grid during peak loads and where other vehicles can also charge. Thanks to their mobility, ZESpacks can be used to supply and store energy at all kinds of locations, such as construction sites and festivals.

## A truly green solution for authorities and businesses

'The energy concept that ZES is launching on the market contributes directly to the reduction of emissions by saving around 1,000 tonnes of CO<sub>2</sub> and 7 tonnes of NO<sub>x</sub> per vessel per year. In addition, vessels sailing with ZES do not produce particulate matter and noise,' says Willem Dedden, CEO of ZES. The concept also includes the organisation of the required charging infrastructure and a pay-per-use construction that enables skippers to pay only for the use of energy. The investment in ZESpacks is for ZES's account. This setup makes ZES very user-friendly and scalable. Dedden: 'ZES actually offers authorities and companies a ready-made solution for increasing sustainability.' One of those companies is HEINEKEN, which, together with CCT shipping, is the first ZES customer with a ten-year contract. ZES originated from a Green Circles project to realise a climate-neutral container shuttle between the Heineken brewery in Zoeterwoude and the Port of Rotterdam.



## To standardise is to accelerate

Dedden: 'In addition to directly contributing to the realisation of emission-free inland shipping, ZES is setting a standard that accelerates the transition to emission-free inland shipping. We are laying the foundation with our ZESpack (a standard 20ft container) and a standard connector (the 'plug'). In combination with the financing and pay-per-use package devised by ING, ZES offers skippers an

accessible, future-proof open access innovation. The ZESpack system adapts as technology advances: the ZESpack currently uses work with lithium-ion batteries, but in the future this could also be hydrogen, ammonia or something else. The ZESpack always fits on the connection, regardless of the type of energy in the container.' For this reason, ZES is releasing the profiles for the connector without rights, so that the market can work with various suppliers of energy containers.

## From construction to speed

Wärtsilä, supplier of the first ZESpacks, has been working in recent months on assembling and testing the energy containers, which are equipped with safety and communication systems, and 45 battery modules totalling 2 MWh – comparable to the capacity of around 36 electric cars. The ZESpack is completely tailor-made for ZES. The interchangeability of the containers, which until now have been stationary installations, is particularly unique. The ZESpacks are charged with certified green energy at the first ZES charging station on the Alpherium, CCT's container terminal in Alphen aan den Rijn. This charging station, developed in by ENGIE, was delivered in April. In July, the Alphenaar was converted and fitted with, among other things, the standard plug connection for receiving the ZESpacks. The first successful sea trail took place at the end of August. With operations up and running, ZES will start gaining user experience to achieve completely emission-free shipping as soon as possible.



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## Upscaling

ZES's ambition is to scale up in the short term to eight vessels, eight loading stations and fourteen ZESpacks. The company aims to realise 30 zero-emission shipping routes by 2030, which can save up to 360,000 tonnes of CO2 and 2,800 tonnes of NOx. In order to really compete with fossil fuels, simultaneous action and commitment from the government, ports and terminals as well as the business community are required. ZES is working closely with national, regional and local authorities and forward-thinking carriers such as BCTN to contract the next vessels and develop the associated network of charging stations, starting in Rotterdam, Moerdijk and Alblasserdam.



Source: [Fully electric inland vessels to develop emission-free navigation solution](#)