

FACT SHEET ZERO EMISSION SERVICES

Zero Emission Services (ZES)

Why, what, how

To achieve the targets set out in the Paris Climate Agreement, the cooperation of the inland shipping sector is indispensable.

Today, the Dutch transport sector is collectively responsible for 21% of all carbon dioxide (CO₂) emissions in the Netherlands. Within the transport sector, inland navigation makes up 5% of carbon dioxide emissions. With a transformation to fully electrically powered transport, the inland shipping sector is taking an important step towards realizing climate agreement goals.

ZES is taking the lead in this transition with a new energy system for sustainable inland shipping: 100% green energy, and no emissions of CO₂, nitrogen or particulate matter.

This will be realized with emission-free navigation infrastructure that is accessible to everyone. Clean, climate-neutral and ready to compete with fossil fuels. ZES offers a complete range of products and services, based on interchangeable battery containers (ZESpacks) charged with renewable power, charging stations, technical support and an innovative payment concept for ship owners.

Through a cross-sector collaboration with parties from throughout the supply chain, ZES aims to break out of the 'catch-22' interdependency of ships, ZESpacks and charging locations.

The only way to bring about a system change, is not to wait for the other to invest, but to work concurrently with all parties involved.



Facing this hurdle, ZES has managed to initiate its first docking station, ship and ZESpacks simultaneously with support from the Ministry of Infrastructure & Water Management (DKTI and Green Deal). Underlining this approach is the fact that ZES itself is the fruit of a cross-sector collaboration: ZES was founded by the companies ING, energy and technical service provider ENGIE, maritime technology company Wärtsilä and the Port of Rotterdam Authority.

How does it work?

The ZES concept explained

ZES supplies interchangeable energy containers for new and existing inland vessels. These containers – called ZESpacks – are charged using renewable power. Skippers can quickly exchange a depleted container for a full one at exchange and loading stations. These stations are standardized and equipped with an 'open access' network. ZES offers users a future-proof solution. In the future, ZESpacks will also be able to work with hydrogen, for example.



Impact

The effect of ZES on economy and climate



- Sustainability:** ZES aims to **reduce CO₂ emissions** in the sector with 400-480.000 tons per year in 2050. Additionally, ships sailing with ZESpacks **emit no NOx and produce no PM or sound**, contributing to clean and silent cities and national parks, and **greener ports**.



- Employment:** both the operational and innovative character of ZES **create employment opportunities** – operational jobs as well as highly educated positions concerning the scale up of ZES.



- Dutch economy:** ZES will actively contribute to the (inter)national image of an **innovative and sustainable Dutch logistic sector**, which works as a stimulant to other industries of attracting investments. The knowledge gained in ZES complements and challenges other sustainable shipping initiatives, accelerating progress.



- Other effects:** As ZES taps into the corridor and shuttle approach and uses innovative software and data to make sailing more efficient, ZES contributes to **reducing port congestion** and supports the modal shift from road to water. Additionally, ZES docking stations can function as **Energy Hubs** for different modalities and can also be used to stabilise the electricity grid. As ZESpacks are mobile, they can meet temporary local demand for electricity, facilitating **clean event or construction sites**.

Ambition

Goals for the future

ZES envisions clean and climate neutral inland shipping. It aims to enable the transition to zero emission inland shipping, both by setting the standard for battery-electric shipping and initiating the system change this requires. ZES aims to power 400 electric ships with 650 ZESpacks, on 40 routes via an open-access network of 20 docking stations in 2050. The growth ambitions per phase and results in terms of CO₂ and NO_x reductions are visualized below.

ZES growth	Proof of Concept	Green Deal (I&W)	Scale Up	Mature Business
# (cum) year	2021	2023	2026	2050
Routes	1	6	20	40
ZES ships	1	8	45	400
ZESpacks	2	14	76	637
Docking stations	1	8	14	20
CO ₂ avoided (tons)	1.250	10.000	56.250	400-480.000
NO _x avoided (tons)	9	85	383	3.723

Current position

Where are we now

- Launching customer:** Shipper HEINEKEN and carrier CCT; long term commitment with 10-year contract
- Financial support** from Ministry of Infrastructure & Water Management for ZES concept and first ship.
- First two ZESpacks being assembled.
- First ship (the Alphenaar) ready for retrofit.
- Construction of first docking station at CCT site in Alphen aan den Rijn nearly completed.