



NORTHERN SKAGERRAK, N-O-S

DIESEL POWER	VOLVO D113MH 368kW/ 1800 RPM X 2
PHT MODEL	PHT420A101 X 2 ratio 1.7
HESP MODEL	HESPD08/2 145kW E-MACHINES X 2

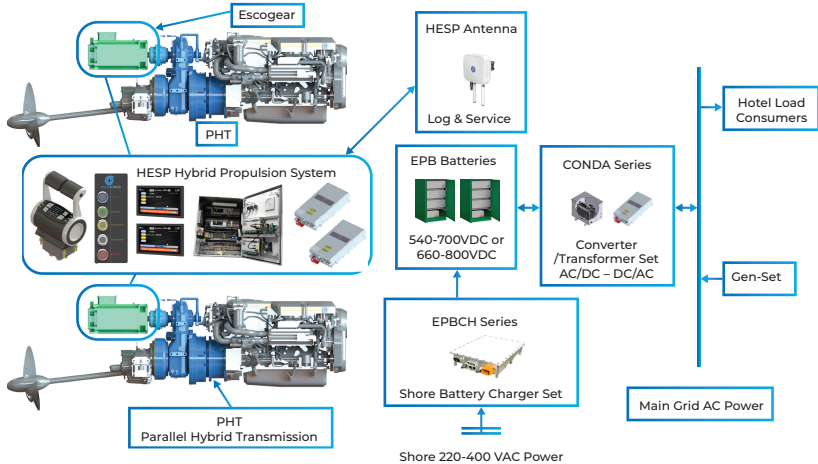
46M BUNKERING TANKER REBUILT TO HYBRID WITH ESCO POWER PARALLEL HYBRID SYSTEM

Northern Skagerrak is a 46m tanker vessel collecting oil engine room waste, sludge, from ships arriving at the Port of Gothenburg, around 6.000 incoming ships each year. The vessel has undergone conversion from conventional diesel propulsion to parallel hybrid and is expected to save 680 tons of carbon dioxide contributing to the Gothenburg Port of Authority plan to reduce carbon emissions at the port by 70% by 2030. The main goal is for the vessel to operate with zero emissions in the harbor of Gothenburg.

The vessel receives a complete Esco Power parallel hybrid solution with Parallel Hybrid Transmission PHT, characterized by its exclusive built-in ratio allowing to bring all the installed electric power down for the propulsion, and from the Hybrid Electric Solution Package HESP with high-efficiency electric machines and tailor made for the user propulsion modes.

With hybrid propulsion, the vessel is able to use the electricity stored in batteries or generated by the auxiliary engines to propel the vessel, and the other way around, it enables the main engines to generate electricity and recharge the batteries.





Parallel Hybrid Solution by Esco Power

PHT	Parallel Hybrid Transmission, to be installed between marine diesel engine and marine gear, brings diesel and electric power on one driveline
HESP	Hybrid Electric Solution Package, Complete hybrid command, control & command system, including E-machines, frequency drives, control & command screens, command station, mode select panel, software with various modes: electric, automatic, generation single and cross-mode, includes commissioning
HESP Antenna	Optional feature to ensure remote access & system updates and service
Escogear	Flexible Coupling to connect PHT secondary output to E-machine
EPB Batteries	Battery system, including BMS with operational voltage matching offered E-machines: 540-700VDC or 660-800VDC, with rack or frame mounting solution, power & communication cables, includes commissioning
EPBCH Series	Battery Shore Charger Set
CONDA Series	Converter/Transformer Set, to install between our EPB Battery System and the vessel grid 230/400VAC, making the batteries system available for on-board consumers as to charge it with Gen-set & shore charger connected to the on-board grid