Green Inland Ports

Good Practices

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Installation of onshore power supply

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1.1 Description

Onshore power supply (OPS) is a term used to indicate that a ship uses a connection to the shore power network. While sailing, ships use their generators to generate electricity[1]. Ships also need electricity for hotel power when they are at berth in the port. Using OPS at berth allows ships to turn off their diesel generators and receive the required electricity from a cleaner source. OPS has been identified as one of the most viable routes to reduce greenhouse gas (GHG) emissions and other air pollutants, such as NO_x, SO_x and PM (Winkel, R. et al., 2016). In addition, it reduces noise in the port.

1.2 The aim of OPS

OPS aims to reduce the emissions from ships at berth. This leads to both reduced GHG and air pollutant emissions as well as a reduction of noise. Ports can encourage the use of OPS by ships by providing OPS in their ports. However, ships need a shore power connection onboard to use OPS when they are at berth.

1.3 Parties that have implemented OPS

- Bayernafen
- Bremerhaven
- Syndicate Mixte Docks Seine Nord Europe Escaut
- Den Oever Port
- Port of Strasbourg
- Port of Nijmegen
- Compagnie Nationale du Rhône (port of Lyon)
- Port of Arnhem
- C-Port Kuestenkanal / Zweckverband Interkommunaler Industriepark Küstenkanal
- Groningen Seaports
- Port of Den Helder
- Port of Rotterdam
- Niedersachsen Ports
- Port of Karlsruhe
- Port of Switzerland (Basel)
- Port of Dörpen
- DeltaPort (Wesel)
- Port of Belgrade
- Minden Port
- Port of Giurgiulesti
- Port of Mannheim
- HAROPA Port
- KOTUG
- Van Berkel Logistics
- Chinese ports Yangtze River

1.4 Stakeholders

- Port authority: The port authority can make the decision whether to offer OPS. Within this decision, they can be forced or stimulated by legislation or subsidy.
- Ships and shipowners: Ships are currently not required to use OPS when the ships are at berth. Older ships need to be retrofitted to become compatible with OPS, which is a choice to be made by the ship owner.
- European Commission and national government: They are responsible for European and national legislation regarding inland shipping, with which both the port authorities and the shipowners must comply.
- OPS suppliers: They are responsible for the delivery and installation of OPS infrastructure and ensuring that electricity can be delivered through the grid.

1.5 Voluntary or mandatory

It is currently still voluntary for inland port authorities to offer OPS to ships. However, for European seaports, tit is obligatory. The Alternative Fuel Infrastructure Regulation (AFIR) imposes obligations regarding shore power facilities to seaports of the core TEN-T network and to seaports of the extended TEN-T network. EU member states must ensure that these seaports have OPS facilities available for container ships and seagoing passenger ships by 31 December 2029 at the latest.

1.6 Realised/potential impact

Groningen Seaports states in the "Port Environmental Review System 2023-2025" that there is a rising demand in general for shore power (Groningen Seaports, 2022). Stolz, B. et al., (2021) showed that 2.2% of the total shipping of CO_2 emissions could be reduced by the deployment of shore-side electricity if the electricity is supplied from national grids and as much as 3.7% if the shore-side electricity is supplied from renewable energy.

1.7 Possible obstacles

- The demand from shippers for OPS is still relatively limited. This can be explained by the fact that it is also quite expensive to retrofit ships to connect to OPS (Williamsson, J. et al., 2022).
- No specific legislation has yet been developed in Europe for the provision and use of OPS in inland ports.
- Retrofitting a ship to use OPS brings high investment costs. The high investment costs will also occur for ports, as they must realise the infrastructure around OPS within the port area. Lack of uniform standards, weak legislation, and absent or inadequate subsidies are obstacles to realising this infrastructure (Williamsson, J. et al., 2022).
- In many places, the grid power is not sufficient to supply electricity to large ships. Limited grid access limits both potential use and actual benefits, putting pressure on energy management and the application of smart grid solutions (Williamsson, J. et al., 2022).
- The interviews indicate that many relatively small ports are taking a 'wait-and-see' approach because there is not yet a uniformed system for OPS. Ports prefer to wait to be sure which system to adopt before investing in the technology. Williamsson, J. et al., (2022) states that it is also still unclear who should invest and own the OPS infrastructure.

- Many different ships arrive at the berths within the ports. Each ship has its own energy needs. The energy needs of the different ships must be identified or estimated. Based on this information, the port can determine how large the capacity of the OPS should be. However, this can be difficult, because the port/terminal does not often have insight into the amount of power ships need at berth (and which the ships normally generate itself using its own generators).
- The use of OPS in passenger terminals is more challenging than the use of OPS in cargo ports/terminals, because passenger ships normally require more power.
- The extent to which inland ports consider this good practice to be difficult to implement varies greatly. The inland ports that have not yet implemented OPS are highly interested.

1.8 Key learnings

- OPS is a good option to reduce emissions at berth, because ships do not have to use their own auxiliary engines when they are at berth.
- There is currently no single unified OPS connection. This leads to a 'wait-and-see' attitude of many ports.
- Governmental efforts are lacking, making OPS relatively low on the agenda of inland ports.
- Inland ports indicated that the demand for OPS from ships is relatively low if the use of OPS is not mandatory or if there are insufficient benefits for the ship.

1.9 Sources

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