

Action B2 - Onshore Power Supply (OPS) Workshop: 'Best Practice Guide & OPS Energy Scan'

MON-DESI

Simon Powell Marine South East Thomas Desnijder. North Sea Port

14:00 – 15:00 Rotterdam, 25 November 2021



OPS Team

- Marine South East
- City of Nijmegen
- North Sea Port
- DCMR
- Port of Antwerp
- University of Newcastle
- Flemish Government
- Helmholtz-Zentrum Hereon, Institute of Coastal Research
- State Office for Nature, Environment and Consumer Protection North Rhine-Westphalia (LANUV)
- CE Delft
- Agiplan GmbH

Participating in this workshop

- What is your interest in OPS?
- What would you like to take away from this session? •

SUSTAINABLE WATERWAY TRANSPORT, CLEAN AIR

Workshop Delegates - Introductions

· life ·

Mr	Arnout	Smit	Arnhem-Nijmegen Green Metropolitan Region	Policymaker
Mr	Thierry	Vleminckx	Binnenvaart Schipper - MS La Coruna BOVAG Energiesystemen en Revisie Bedrijven	Shipowner / barge skipper
Mr	Wijnand	de Geus	(BOVAG Energy Systems and Revision Company)	Trade Association
Mr	Remco	Hoogma	City of Nijmegen	Policymaker & CLINSH partner
Mr	Erik	Lubberding	City of Nijmegen	Policymaker & CLINSH partner
Mr	Koen van	Eig	Darel / Havenberdijf Rotterdam	Consultancy / Port
Ms	Sylke	Davison	DCMR	Policymaker & CLINSH partner
Mr	Th.	Wege	Dutch Ministry of Infrastructure and Water Management	Policymaker
Mr	Jasper	Beurms	Electri bv	Power Distribution
Ms	Theresia	Hacksteiner	European Barge Union EBU	Other
Mr	Simon	Powell	Marine South East Ltd	CLINSH partner
Mr	Henk	Nijhuis	Municipality of Nijmegen	Policymaker – air quality
Mr	Thomas	Desnijder	North Sea Port	Port & CLINSH partner
Ms	Irma	Kenter	PZH	Policymaker – Mobility & Environment





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Rijkswaterstaat





To outline the purpose, findings and recommendations of the CLINSH Onshore Power Supply Action, specifically the

'Deployment Scenarios & Best Practice Guide' & 'OPS Energy Scan'

Discuss issues raised by delegates and get feedback



- **Action Onshore Power Supply (OPS)** *Objectives:*
- Assess environmental and economic benefits of onshore power supply (OPS) for use of inland vessels
- Develop guidance for the provision of grid-connected and mobile OPS
- Demonstrate how OPS can improve air quality and aid compliance with emissior limits





Deliverables

- 1. Port characterisation & data collection of OPS and inventory of solutions
- 2. Market consultation and technical/economic review
- 3. Standards & regulation harmonisation.
- 4. Deployment scenarios and 'Best Practice Guide'

SUSTAINABLE WATERWAY TRANSPORT, CLEAN AIR

Port Characterisation and data collection of existing and planned Onshore Power Supply in the Netherlands, Flanders and North Rhine Westfalia

Contributors:

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- City of Nijmegen: Remco Hoogma, Erik Lubberding
- FG-MPW: Mohssine El Kahloun
- Port of Antwerp: Pieter Vandermeeren, Wim van Steelandt
- Energieagentur.nrw: Frank Köster, Omar Hattab

CLIN H SUSTAINABLE WATERWAY TRANSPORT, CLEAN AIR Most relevant characteristics for the business case of providing OPS:

- Type of berth (cruise, cargo and/or other)
- Frequency and duration of mooring
- Cost structure and pricing of OPS (price per kWh delivered)
- Capacity of OPS cabinets installed (power rating, number of ships to be served)
- Local governmental policy (willingness to invest in OPS, generator ban or not, enforcement)
- Attitude of freight shippers towards OPS at their private quays (possibly by obligation)



OPS Location Considerations

- (i) Where air quality and/or noise concerns are most pressing (near city centres and residential areas)
- (ii) Where there is highest potential that OPS will be used
- The highest priority locations are river cruise berths in home ports, ports of call and off-season (repair) ports. (Environmental impacts are highest near city centres and the business case is stronger due to the highest average power consumption per transaction, 4x cargo vessels)
- A small number of heavy OPS users (vessels) at a small number of berths and a small number of connections make up the vast majority of OPS transactions and energy consumption

"The difference is that river cruise has mooring as core business (to wait for the tourists who do their day trips), while cargo ships moor as short as possible because they earn their money by sailing."



Environmental Benefits

- Onshore power can significantly reduce diesel emissions from ships at dock
- In the Port of Antwerp, whilst using shore power:
 - NOx emissions reduced by 93%
 - PM10 emissions reduced by 99%
 - SO2 emissions reduced by 96%
 - CO2 emissions reduced by 91%





The Business Case for Providing OPS

- CAPEX is very dominant
- Need for cheaper solutions for OPS
- Adopt innovative technologies from EV charging?





Recommendations from Port Characterisation Study

- Invest in OPS where air quality and/or noise concerns are most pressing
- Invest in OPS where the cost effectiveness, in terms of air quality, is highest
- Top-5 types of locations identified
- Business case for the ship owner should be at last neutral
- Impose and enforce an auxiliary engine ban wherever OPS is available
- Promote the use of OPS among ship owners
- Use TEN-T funding for OPS

Recommendations validated in a market consultation exercise

CLIN H SUSTAINABLE WATERWAY TRANSPORT, CLEAN AIR Market consultation and technical/economic options review for onshore power supplies



OPS Suppliers and Port Authorities identified in market research interviews

- Grid connected systems are the most common at present and are likely to remain the most costeffective for the foreseeable future.
- As demand increases these grid connections will probably need to be buffered by energy storage units
- As the cost of technologies decrease, the feasibility of cost-effective, emission-free OPS, utilising renewable energy to generate hydrogen for fuel cells, improves but an increase in the cost of diesel would also be needed.
- For future OPS installations, there needs to be careful planning:
 - · location of the cabinets close to waiting areas
 - standardisation of connectors
 - convenience of payment methods and booking apps



End User Observations

- OPS users claim that more berths and more OPS connections on ships are needed
- When ships are side-by-side connecting to an OPS cabinet is especially difficult and sometimes for safety reasons not allowed
- More OPS connections would allow increased use of the service. The initiative lies with ports and local governments.



Standards and Regulations

- Standardisation of OPS supply equipment is a prerequisite to enable ships to connect, independent of the port at which they dock.
- Technical and operational factors to improve the utilisation of OPS:
 - International and EU-wide standards are developed for maritime shipping but are lacking for inland navigation, problematic for cross border routes.
 - Voltage standard is currently in place, but no standard connector, those in the Netherlands and Belgium may differ from those used in Germany.
 - Better cooperation between ports and policymakers in different countries needed, the EC can play a crucial role
 - To encourage take-up, operational convenience and ease of use are important:
 - Reserving OPS connection point
 - Starting and ending electricity supply
 - Payment for service. (eg the free 'Walstroom power and water app)



SUSTAINABLE WATERWAY TRANSPORT, CLEAN AIR CLINSH proposed actions in response to EU OPS recommendations

- Ports are the focus of EU regulations to deploy OPS that result in high investment requests to ports.
 - OPS is not justifiable from a financial perspective.
 - To make investments in OPS possible, public grants are necessary
 - Policy makers should give greater visibility to OPS in their financial instruments
- Incentive regulations

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- Tax reduction on electricity used for OPS. These have limited effectiveness whilst shipping fuels are exempt from taxation
- EU's Energy Taxation Directive should play a central role in guiding such initiatives.
- EC proposal in July 2021 will alter taxation of energy products, removing exemptions and incentives for the use of fossil fuels. The most polluting fuels will be taxed the highest.
- Other policy instruments required:
 - Legislation and/or a market to trade carbon credits
 - Port authorities consider discounted port fees for the use of OPS
 - Culture change needed, inland shipping sector is resistant to obligation to use OPS and a generator ban. Policy makers should communicate the user friendliness and environmental benefits of OPS to end users
 - Member States should promote awareness of OPS to local authorities.
- EC encourages Member States to consider using financial instruments to facilitate OPS for ships in port
 - Current incentives do not always cover all costs and do not support companies equally. Governmental support is needed to
 ensure a broader implementation of OPS technology

CLIN H SUSTAINABLE WATERWAY TRANSPORT, Onshore Power Supplies 'Best Practice Guide'

Incorporates findings from:

- Port Characterisation report
- Market consultation on and technical/economic options review for OPS
- Report on Standards and Regulations

• Address to download a copy will be circulated



CLEAN INLAND SHIPPING



- To assist stakeholders, including ports and local authorities, make the decisions concerning the deployment of Onshore Power Supply in Inland Ports
- Guide includes deployment scenarios
- To illustrate best practices case studies are included

CLINH III SUSTAINABLE WATERWAY TRANSPORT, CLEAN AIR OPS Conclusions

- The energy tax should be removed from OPS electricity. This brings it in line with the untaxed diesel supplied for inland vessels
- OPS connectors are generally standard in each country but is not internationally. Standardisation is desirable on cross-border connected waterways,
- Payment systems need to be convenient for skippers. Could link berth booking with OPS, port dues, freshwater, and waste
- Booking system could collect information such as OPS cable length, allowing the allocation of berths to maximise the utilisation of OPS cabinets
- Generator bans should be introduced and enforced in ports



Technology Available

- The Best Practice Guide reviews technical options for the provision of either fixed or mobile OPS.
 - Grid connection simplest with best business
 - Other options include hydrogen fuel cell or renewable energy systems, which could offer emission-free OPS
 - As all-electric or hybrid inland waterway vessels become more common, expanding the MV grid in ports or buffering of the grid supply to provide rapid charging facilities is likely to be necessary with batteries often being the more economic option



Status of OPS Today – Case Studies

- Arnhem Nijmegen city region Best Practices
 - OPS solutions for (mainly) river cruise vessels and hibernating vessels
 - Examples of OPS solutions on private quays
 - OPS on Container terminals
- North Rhine-Westphalia
 - Ports of Duisburg and Neuss











OPS Energy Scan

- A programme of 26 energy and shore power scans of inland ships
- Performed in the first half of 2021, covering the Port of Antwerp, North Sea Port, De Vlaamse Waterweg and Mow Vlaanderen
- Conducted by ENPROVE BVBA on behalf of the CLINSH project







Umwelt und Verbraucherschutz Nordrhein-Westfalen



