Onshore Power Supply (OPS) – Project

Shore-side electricity • Shore-connected electricity supply • Shore power • Ship-to-shore • Cold ironing • Alternative Maritime Power (AMP)

Content of the presentation

- Introduction
  - The technology
  - Best practice
  - Pros and cons
  - The guidance document

- The OPS Project
  - Participating ports & Goal
  - The OPS website
  - Result from the questionnaire

- Conclusions

- How to get involved!

Susann Dutt, Port of Göteborg, Sweden
Environmental Controller, Coordinator of the OPS project within World Ports Climate Initiative
susann.dutt@portgot.se, +46 31 731 29 63

IAPH Africa/Europe Regional Meeting 2009, Hamburg, Germany
Introduction - The technology – high voltage

- OPS replaces onboard generated power from diesel auxiliary engines with electricity generated on-shore (high voltages).
- Growing interest for implementing OPS due to:
  - Bad air quality in port cities
  - The climate crises
  - Predicted rise of oil price

Connection principles
OPS with high voltage, for a ro/ro-vessel

Wikipedia
Cold Ironing is the process of providing shore-side electrical power to a ship at berth while its main and auxiliary engines are turned off. Cold ironing permits emergency equipment, refrigeration, cooling, heating, lighting, and other equipment to receive continuous electrical power while the ship loads or unloads its cargo.
Introduction – Best practice

- Port of Göteborg first port in the world to offer OPS high voltage for cargo vessels in year 2000, in close collaboration with Stora Enso
- About 10 vessels are connecting (ro/ro and ferries), >20 % of the calls
- Significant reduction in local air pollutants (NOx, SO2, PM, VOC)
- Additional benefits noise & working conditions
- When using a renewable energy source emissions of greenhouse gases can be kept to a minimum
- All new quays are prepared with canalization for OPS
- Vision to connect all ferries and roro vessels!
Introduction – Best practice

Ports
Göteborg, Lübeck, Zeebrügge, Ro/ro and/or
Kotka, Kemi, Oulu Ferries
Juneau, Seattle Cruise
Antwerp Container
Port of Los Angeles Container
Port of Long Beach Container
San Francisco, San Diego ...

Ship owner/Goods owner/Line Management
NYK, China Shipping, Evergreen, MOL,
Princess Cruise, Stena Line, Stora Enso,
Wagenborg, TransAtlantic, SOL, TransLumi,
Cobelfret ...

Suppliers
ABB, ESL, Cavotec, Siemens, SAM, Terasaki,
Patton & Cooke, Callenberg Engineering ...

Current cases using OPS (high voltage)
Ports planning/investigating for OPS

Source: Shore-side power supply, A feasibility study and a technical solution for an on-shore electrical infrastructure to supply vessels with electric power while in port, Master of Science Thesis, Patrik Ericsson, Ismir Fazlagic (2008)

Please help us to make the picture complete!
Introduction - Pros and cons

+ Significant reduction of local air emissions
+ Elimination of noise and vibration
+ Improved working conditions
+ When renewable energy or EU el mix is used greenhouse gases are reduced
+ Exemption from the requirement of using 0,1 % sulphur content fuel, 2010
+ Economic advantages if the oil price rise

- No environmental benefit during the journey
- Ports and vessels have to be retrofitted
- Converting 60 Hz / 50 Hz raises the cost significantly
- No existing standard, but under progress within ISO and IEC
Introduction - The Guidance Document

• **At World Ports Climate Conference in Rotterdam, July 2008**
  - A Guidance document – Onshore Power Supply

The content of the Guidance Document:
1. Background
2. Guidance for implementation (Plan, Do, Check, Act)
3. Best practices and case studies
4. Pros and cons
5. Frequently asked questions

[www.portgot.se](http://www.portgot.se) (Environment-World Ports Climate Initiative)
The OPS Project within WPCI

Overall goal –
Reduce local air pollutants and greenhouse gas emissions by stimulating as many ports, terminal operators and shipping lines worldwide to implement the technology of OPS where practical and useful.

Detailed goal –
To stimulate the further use of Onshore Power Supply (OPS) by designing and building a web based application, which provides practical guidance on OPS, available for all ports. The application should also contain information for other stakeholders such as terminal operators and shipping lines.

Project leader: Susann Dutt, Port of Göteborg, susann.dutt@portgot.se
Working group: Amsterdam, Antwerp, Göteborg, Hamburg + IAPH+CE Delft
# The OPS Website – Content

## 1. Environment & health
- Methods to measure/calculate and maximize the environmental benefits of OPS
- Air quality
- Climate
- Noise and vibration

## 2. Costs
- Methods to measure/calculate and maximize the cost effectiveness of OPS
- Operational costs
- Investments
- Technical solutions

- Important parameters to consider in each step of implementing OPS
- The standard (ISO)
- Legal framework/policies

## 4. Best practice/business cases
- Best practice/business cases (container, ro/ro, cruise..)
- Arguments for introducing the technology
- Commercial set ups
- How to approach/convince/sell the idea to a terminal operator/shipping company

## 5. General
Frequently asked questions    Glossary    Links to other websites with experience
Reference to other solutions to improve air quality in ports and control emission of green house gases
Library/further reading (feasability studies)
The OPS Website – Important criteria

Clean

Informative

Balanced

Modern

Green/blue

Easy to use/navigate

Something you would like to add?

Please let me know in the Coffee Break!
The OPS Website - General

Goal:
Stimulate the further use of Onshore Power Supply (OPS) by providing relevant and practical guidance on OPS via a website

Target group:
Primarily ports
But also terminal operators, shipping lines and other stakeholders
Not the electrical experts, they will have the standard!

Time schedule:
Second draft of website ready for comments mid January 2010
Ready for release by end of February 2010
Promotion of the website via IAPH, ESPO, Ecoports ….

Challenge:
How to keep the website updated/maintained in the long run
Language
Electronic questionnaire on OPS

- Spring/summer 2009

- Aim:
  - To get an idea about the current status and future plans regarding OPS
  - To give important input to the upcoming work within the OPS project
  - Be reference information when evaluating the project

- Was sent out to alla WPCI members + port community via ESPO, Green Port Journal, WPCI website, Port of Göteborg website and via different Port Associations.
Result from OPS questionnaire (1)

- 53 ports, Europe (41), North America (4), Asia (3), Australia/Oceania (3), Africa (2)
- 24 out of these 53 ports were WPCI members:
  - Europe (14), North America (4), Asia (3), Australia (3)
- 17 provide OPS today, 6 high voltage and/or 14 low voltage
- 85% answer yes or maybe on the question if they plan to introduce/expand the technology within 5-10 years
- A majority, 86%, will invest in OPS high voltage
- Main arguments for introducing/expanding the technology:
  - Environmental benefits (85%)
  - Reputation/goodwill (63%)
  - Benefit for the society (48%)
  - Customers (35%)
- 18 ports are planning to introduce/expand OPS for Container, 14 for cruise, 21 for ro/ro and 16 ports for other kind of ships.
Main arguments when introducing OPS (17 ports offering OPS today):

- Environmental benefits
- Customers
- Reputation/goodwill
- Benefits for society
- Local citizens
- Environmental authority
- Economical benefits for the port
- License to operate

WPCI = 9 ports
Is your port planning to introduce/expand the technology to more quays within 5-10 years?

All ports = 53/53
All ports not offering OPS today 36/36
WPCI = 24/24
Reason for not introducing the technology (8 ports):

- No feasibility study has been carried out
- Cost effectiveness is too low
- Lack of enough power
- Technological problems
- Environmental benefit is too low
- Lack of interested stakeholders
- Lack of information
- Difficulties in convincing the ship owner
- Difficulties in convincing the terminal operator
- Other reason

[Bar chart showing the percentage of each reason]
If you answered yes/maybe what is the main argument/s to introduce/expand the technology?

- Environmental benefits
- Reputation/goodwill
- Benefits for society
- Customers
- Environmental authority
- Local citizens
- License to operate
- Economical benefits

WPCI = 22/23
Is your port considering other measures to improve the environmental performance from shipping while at berth?

59% of the ports offering OPS are considering other measures, 10 out of 17
70% of the responding WPCI ports are considering other measures, 16 out of 23

Other measures:
Environmental differentiated harbour dues to stimulate the clean shipping,
Alternative fuels, scrubbers, non-grid based power supply, ESI study,
AMECS, environmental ship indexing system,
energy efficient equipment in the port....
Result from OPS questionnaire (2)

- About 80% of the corresponding ports would like to share experience with the OPS project.
- All except one port would like to be informed about the progress within the WPCI Onshore Power Supply project.
- Other comments from the questionnaire:
  "The lack of standards for the connection has to be solved"
  "In my opinion standardisation of connectors on ship and shore as well as frequencies need to be achieved before any significant take up of shore power will occur"
  "Regarding introduction of OPS we will continously make efforts to collect information on the trend of the national government and other ports in Japan"
Conclusions

• Great interest in the technology

• Main arguments are: Environmental benefits (85%) Reputation/goodwill (63%) Benefit for the society (48%)

• **Mainly dealing with local air pollutants**, but greenhouse gases could be kept to a minimum when using alternative energy

• One alternative out of many to grow green, should preferably be combined with other measures

• The OPS project - *about reducing local air pollutants and greenhouse gas emissions by stimulating as many ports, terminal operators and shipping lines worldwide to implement the technology of OPS where practical and useful.*

• A **balanced website** with good information on OPS will be set up and ready for launch February 2010.

• Great interest in the OPS project as well as sharing experience
How could your port get involved?

- Take part of the Guidance document
- Share your own experience
- Keep yourself updated at www.portgot.se www.wpci.nl
- Be a pilot port in January 2010 for the website Bremen, Oslo, POLA, IAPH Tokyo, Valencia, Marseilles

- susann.dutt@portgot.se
+ 46 31 731 29 63

Thank you for your attention!