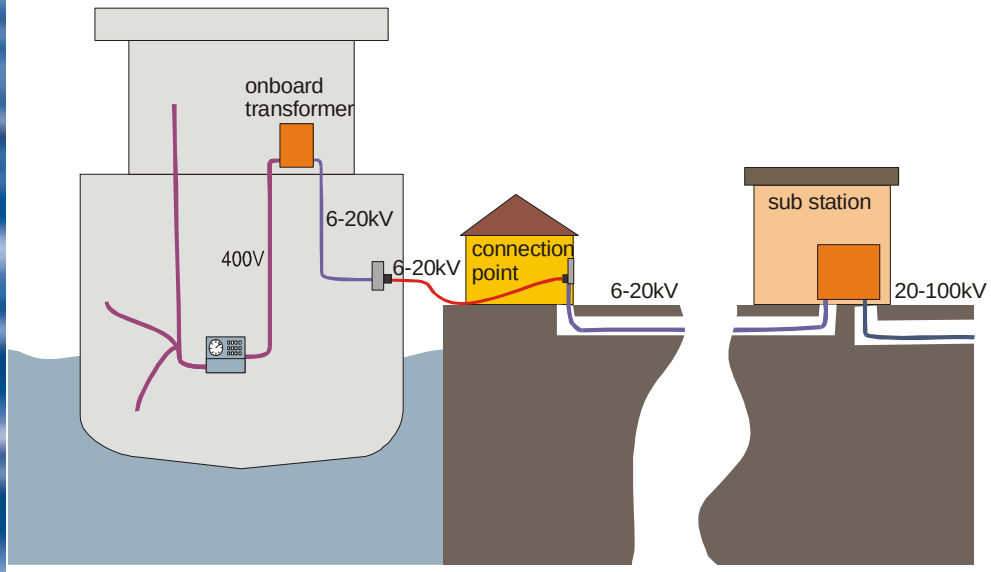
Onshore Power Supply (OPS)

Implementation in Ports

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



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

Ø Guidance document
- Background
- Guidance for implementation
- Best practices and case studies
- Pros and cons
- Useful links
- Frequently asked questions
- Contact details

Ø Conclusion

In partnership with Port of Los Angeles and Port of Shanghai
Valuable comments from Port of Oslo, Port of Rotterdam, Clinton Climate Initiative, Stena Line

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Background

Connecting a Ro/ro-vessel in Port of Göteborg

- OPS replaces onboard generated power from diesel auxiliary engines with electricity generated on-shore (high voltages)
- Emissions from production of electricity is significantly lower than emissions from auxiliary engines from a non-abated ship
- Possible to use a renewable energy source and reduce greenhouse gases
- There are few examples around the world of ports/vessels equipped for OPS (container, ro/ro, ferries, cruise)
- The interest for implementing OPS is increasing
- Guidance and co-operation!

Guidance for implementation

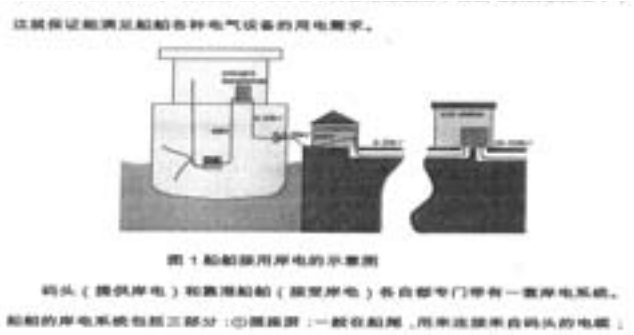
Include important stakeholders
potential shipping lines, suppliers of the technology, local power supplier, port operator/port authority …

Plan	Plan your implementation of OPS by doing a feasibility study	(7 steps)
Do	Implement your OPS project	(7 steps)
Check	Measure the results	(2 steps)
Act	Do potential improvements	(7 steps)

Best practices and case studies

Container terminal, Port of Los Angeles

Port of Göteborg, photo The New York Times/Dean Cox



Offering OPS with high voltage today

Göteborg, Lübeck, Zeebrügge,	Ro/ro and/or
Kotka, Kemi, Oulu	Ferries
Juneau, Seattle	Cruise
Port of Los Angeles,	
Port of Long Beach	Container,
	(tankers)

Considering to start/carrying out studies

Bergen, Dubai, Oslo, Pasir Panjang, Rotterdam, Shanghai, Visby…

Ongoing work

ISO - International Organization for Standardization
IEC - International Electrotechnical Commission
PIANC - International Association for Navigation

Suppliers

ABB, Cavotec, Siemens…

…please help us to make the list longer!

Pros and cons

The energy for OPS in Port of Göteborg comes from two wind mills

+ Significant reduction of local air emissions
+ Elimination of noise and vibration
+ Improved working conditions
+ When renewable energy is used greenhouse gases are reduced
+ Economic advantages for shipping lines

- No environmental benefits during the journey
- Ports and vessels have to be retrofitted
- Converting 60 Hz / 50 Hz raises the cost significantly
- None existing standard, but under progress within ISO and IEC

Conclusion

Photo from IAPH´s Tool Box

Thank you for your attention

- OPS will cut emission efficiently in ports but is one among other measures
- Co-operation needed
- Implementation of OPS means
  - supporting “green” shipping lines
  - supporting cost concerned shipping lines
  - showing your concern about the people living and working around the port
  - if starting now you will be a pioneer and benefit from good publicity
- Connecting ports will show that the sector is not just the key to good economy but also **the key to sustainability**