Conference Ports and the City smart & healthy
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Vlaanderen is mobiliteit & openbare werken

DEPARTEMENT MOBILITEIT & OPENBARE WERKEN
EXPERTISE IN BEWEGING

Shore Power in Flanders

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European Commission

Medegefinancierd door de Europese Unie
Trans-Europees vervoersnetwerk (TEN-T)

A. TEN-T project "Shore Power in Flanders"

Action N° 2012-BE-92063-S

Start: 01/04/2013
End: 30/12/2015
Budget : 2.244.000 EUR

Port of Antwerp
Waterwegen en Zeekanaal NV
DEPARTEMENT MOBILITEIT & OPENBARE WERKEN
EXPERTISE IN BEWEGING
nv De Scheepvaart
PORT OF GHENT

1. Overall & specific objectives of the project

The overall objective is to establish shore power network including a management & payment system on a larger scale in Flanders

Specific Objective SO-1
Pilot project: installing/adapting Shore power supply at tree locations in Flanders

Installation of shore power boxes at three locations
Monitoring the management & payment system

Specific Objective SO-2
Design web application and an management & payment system

Design of an management & payment system
Design and implementation of a web application

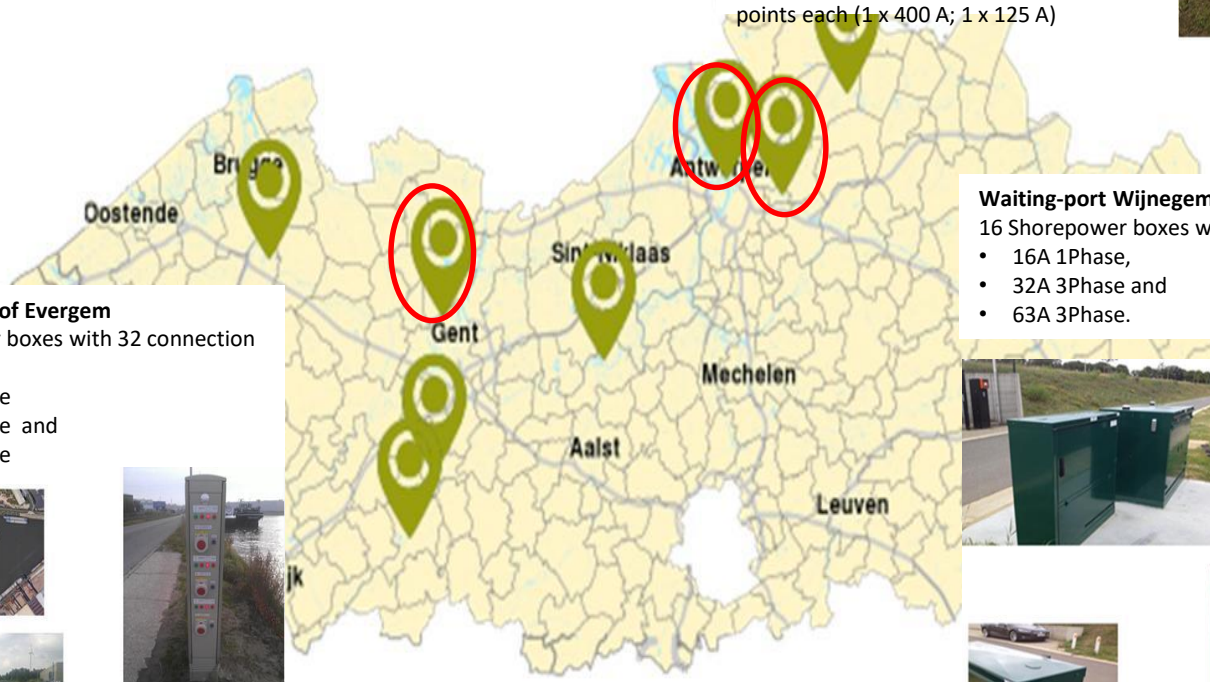
Specific Objective SO-3
Strategy to stimulate the expansion of the shore power network

Investigation on how the shore power network can be expanded

2. SO1: Installation of shore power boxes at three locations

Port of Antwerp
K75:
- 7 Shorepower boxes with 4 connection points each (1 x 63 A; 2 x 32 A; 1 x universal socket of 230 V)
- 2 Shorepower boxes with 3 connection points each (2 x 63 A; 1 x 125 A)

K15: River Cruises
2 Shorepower boxes with 3 connection points each (1 x 400 A; 1 x 125 A)

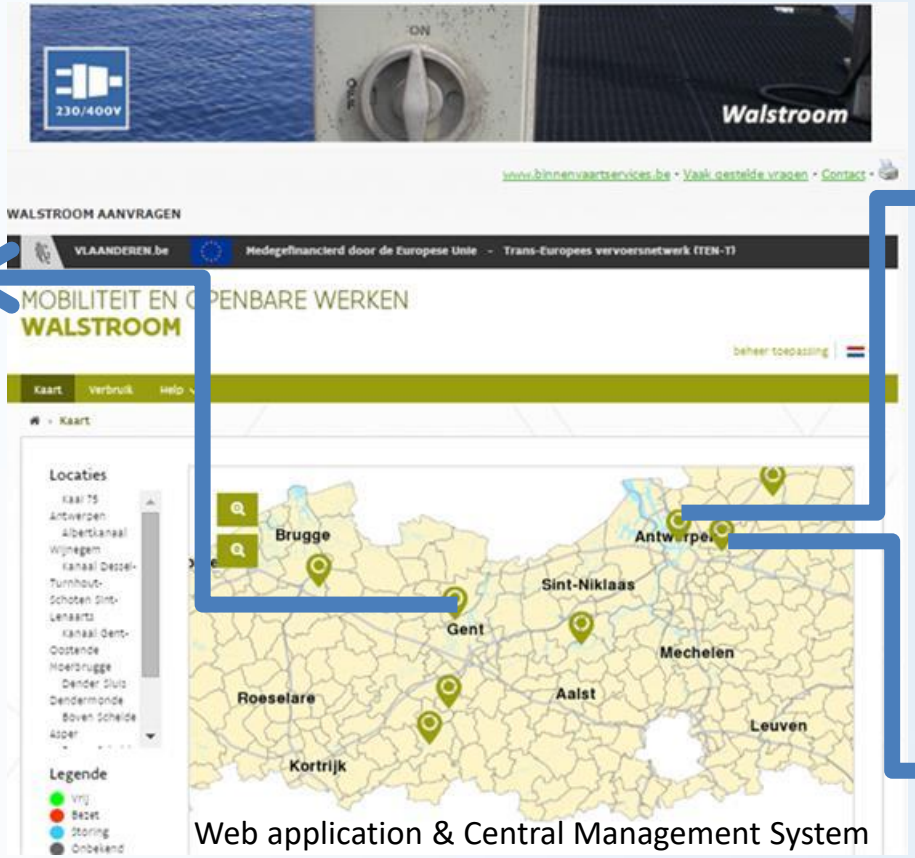
Waiting-port of Evergem
6 Shorepower boxes with 32 connection points:
- 16A 1Phase
- 32A 3Phase and
- 63A 3Phase

Waiting-port Wijnegem
16 Shorepower boxes with 32 connection points:
- 16A 1Phase,
- 32A 3Phase and
- 63A 3Phase.


3. SO2: Design web application and an management & payment system

Local Management System
LOBES of Waterwegen en Zeekanaal NV

- Registration
- Login
- Statute of shore power boxes
- Technical support
- User electricity consumption
- Payment



Web application & Central Management System CEBES

Local Management System
LOBES of Port of Antwerp

- Registration
- Login
- Statute of shore power boxes
- Technical support
- User electricity consumption
- Payment

Local Management System
LOBES of nv Scheepvaart

- Registration
- Login
- Statute of shore power boxes
- Technical support
- User electricity consumption
- Payment

4. SO3: Strategy to stimulate the expansion of the shore power network

Most relevant tasks to achieve SO3 were:

- A. Survey to determine the needs and concerns of the users
- B. Investigating the most appropriate locations for new shore power installations
- C. Strategy to continue the expansion of shore power network in Flanders

4. SO3: Strategy to stimulate the expansion of the shore power network

A. Survey to determine the needs and concerns of the users

- ✓ Price (27 ct/kWh): The sector doubts whether shore power is cheaper than using diesel generators. Note: this argument does not take into account total cost of ownership to adapt his ship to OPS: Consumption differ between shipping companies and shippers, differ between old/new ships… high cost of ownership to adapt ship to OPS…
- ✓ No security by insufficient number of connection points (double berths). Connections should be practical, easy-to-use and have a stable technical performance
- ✓ Avoiding the vibrations or noise of diesel generators – despite its health benefits - does not prove to be a strong argument in favour of shore power;
- ✓ The sector is reluctant of any obligation to use shore power and of a possible generator ban;
- ✓ When choosing a moorage, the supply of shore power is not a leading argument for the inland shipper;
- ✓ The sector considers itself to be very environmentally conscious; the social advantage of lower emissions by using shore power is not a decisive factor over the financial argument.

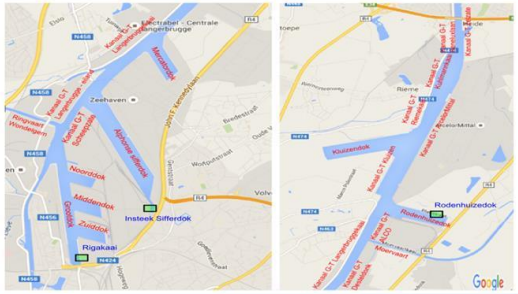
4. SO3: Strategy to stimulate the expansion of the shore power network

B. Investigating the most appropriate locations for new shore power installations

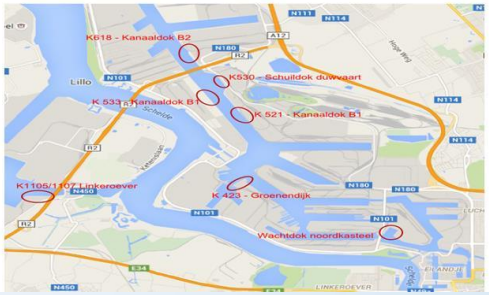
OPS most appropriate locations for W&Z

OPS most appropriate locations for Scheepvaart

OPS most appropriate locations for Port of Gent



OPS most appropriate locations for Port of Antwerp



Conclusion:

- Strictly taking into account the return in terms of OPS project cash flows, it appears no positive results are booked for any waterway/port segment. In other words, in order to make the necessary or desired investments possible, grants will be inevitable and/or existing financial reserves will have to be addressed.

- Environmental benefits of OPS should be an incentive to invest in OPS

4. SO3: Strategy to stimulate the expansion of the shore power network

C. Strategy to continue the expansion of shore power network in Flanders

Phase 1: Convincing and fine tuning both demand and supply. This means the following for every shore power supplier:

- **fine tuning the currently available business cases**. This demands a serious investment in data gathering in order to avoid making indirect assumptions about the need for shore power.

- the development and the **communication** of a shore power vision and strategy, ideally set within the framework of a **general communication strategy referring to the user friendliness and the ecological soundness of electricity when being on shore**.

- actively seeking and tightening **mutual collaboration under the co-ordination** of the dMOW. Ports and waterway authorities share the explicit wish to collaborate in:
  - ✓ the further development and maintenance of the Management & payment system.
  - ✓ the launch of project proposals in order to obtain investment grants for shore power infrastructure.
  - ✓ marketing and communication initiatives promoting the use of OPS in order to reinforce the market position.

Phase 2: Possible implementation of a second wave of investments, at the same time coupled with a relevance check taking into consideration the external uncertainties of shore power in the long term.

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1. Background & method

Conclusion from TEN-T project:

Convincing demand a general communication strategy referring to the user friendliness and the environmental soundness of electricity when being on shore.

CLINSH:

Environmental benefit:

Use data of Port of Antwerp from TEN-T project to assess environmental benefits of OPS

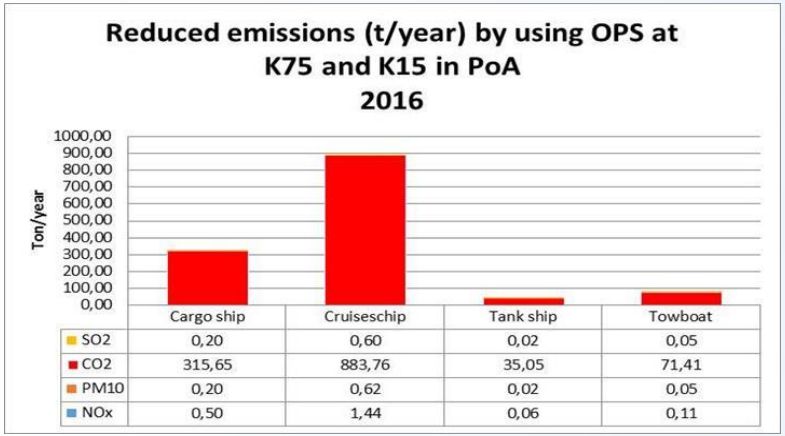
LOBES-Data on electricity consumption by a specific ship in 2016 at quay K75 and at quay K15 in PoA used to estimate emission reductions (NOx, SO2, PM and CO2) by using OPS.

A: Net reduced emissions through the introduction of OPS (kg) = B – C

B: Emissions through the use of auxiliary engines (kg) = Number of ships x Time at berth (h) x Power (kW) x Specific fuel consumption (kg fuel/kWh) x Emission factor (kg/kg fuel).

C: Emissions through the use of OPS (kg) = consumption OPS-electricity (kWh) x emission factors for electricity production in Flanders/Belgium.

2. Key results & conclusions



Type ship	NOx (%)	PM10 (%)	CO2 (%)	SO2 (%)
Cargo ship	98,74	99,95	98,25	99,42
Cruise ship	92,69	99,72	89,86	96,63
Tank ship	98,69	99,95	98,19	99,40
Towboat	98,02	99,92	97,26	99,09

Conclusions:

- OPS can result in significant environmental and societal benefit.
  - ✓ NOX can be reduced by about 93%
  - ✓ PM10 can be reduced by 99%
  - ✓ SO2 by more than 96%
  - ✓ CO2 can be reduced by more than 90%.
- River cruises have higher electricity demand providing a better business case for OPS for inland navigation and a better prospect for market development. Also the environmental benefit of OPS for River cruises is very convincing.
- Results should be used in a communication strategy to convince end users of the environmental soundness of OPS.
- Policy makers could produce more net environmental benefit at larger scale by implementing incentives and mandates to encourage more shift toward OPS.

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C. Future possibilities for the expansion of OPS

In Flanders

Opening project call BENEFIC – European grants for infrastructure of clean transport:
February – May 2018.
Financial support amounts to max 20% of the eligible costs for infrastructure works.
13 OPS for inland navigation (10 in Flanders and 3 in Brussels).

Potential collaboration between BE-NL-DE
(CEF-TEN-T, Interreg-European Territorial Co-operation, Life… project calls)

- Return in terms of shore power cash flows is not very convincing for investment. In order to make the necessary or desired investments possible, grants are inevitable.
- Common marketing and communication initiatives promoting the use of OPS in order to reinforce the market position in Western Europe.
- Harmonisation of OPS management & payment systems in Western Europe

Thank you for your attention !