Ports Energy and Carbon Savings

**WP1 Meeting – Output 3
Workshop D 1.6.2 on D 1.6.1
"Report about energy savings in ports"**

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PECS – May 2019

WP1 – Outpout 3
State of affair

- D 1,5,1 – General method to assess the option for energy savings in ports: complete

- D 1,5,2 - Tool to calculate energy savings potential : complete

- D 1,5,3 - Methodology to calculate energy savings: complete

- D 1,6,1 - Report about energy savings in ports – experimentation by partner ports: draft complete, sent to all partners

- D 1,6,2 - Workshop about the experimentation of the method in partner ports – Now !

- D 1,6,3 - General report of the method, based on D1,6,1 and D1,6,2 – to be done after this meeting

WP1 – Outpout 3
State of affair

- Summary of the former events:

  - The D1,5,2 Tool to determine energy savings in ports was tested by the ports of Oostende, Hellevoetsluis, Ijmond and Portsmouth.
  - The D1,6,1 Report is the synthesis of all these feedbacks. It was sent to all partners – No remarks until now.

- What we need now :

  - **The point of view of each partner (knowledge partners and ports) on the report about energy savings options**

Energy savings

The results seems to allow drawing the following conclusions:

- Ports are very diverse, also regarding their potential of energy savings.
- Insulation and control devices on heating and cooling seems to be a levy common to all ports to induce energy savings, even if the efficiency of this measure is not the same for all ports.

Energy savings	Hellevoet.	Ijmond	Oostende	Porthmouth				
Lightings								
Switching for LEDs	0%	5%	2%	0%	of energy savings on electricity			
Using controls and sensors	18%	15%	0%	8%	of energy savings on electricity			
De-lamping and daylight	3%	2%	1%	1%	of energy savings on electricity			
Heating and cooling								
Insulation	19%	28%	11%	28%	of energy savings on the heating and cooling bill			
Heating system	12%	4%	15%	0%	of energy savings on the heating bill			
Cooling system	1%	20%	0%	19%	of energy savings on the heating and cooling bill			
Control devices	10%	26%	6%	23%	of energy savings on the heating and cooling bill			
Fuels								
Reducing time in port	0-2%	0%	2%	8%	savings on fuel used by shipping operation in port			
On shore power supply	0%	95%	0%	95%	savings on fuel used by ship at berth			
Eco-driving	0-10%	0%	10%	10%	savings on fuel used by the company's vehicules			
Specific equipment								
From hydraulic to electric sprea	0%	0%	0%	0%	energy savings on energy used by spreaders			
From Diesel RTG to e-RTG	0%	0%	0%	0%	energy savings on energy used by RTG cranes			
From Diesel STS to e-STS	0%	0%	0%	0%	energy savings on energy used by STS cranes			
Installing a roof shade	0%	0%	0%	12%	energy savings on energy used by reefer containers			
Other considerations								
Potential for a district heating :	no	no	no	no				
Potential for a district cooling :	no	no	no	no				

Weakness and difficulties

For each ports, weakness and difficulties are summarized:

Example for Oostende

Oostende
Way of using the tool
Easy to use, the experimentation is on an 1 year period (2018) and the area is limited (blue area on the map below).
Strengths
Easy to use, results are clear
Weaknesses and difficulties
The port of Oostende has about 5 significant office buildings, 9 different warehouse buildings and multiple sanitary blocks. Some were built more than 50 years ago, some are brand new. Same for the heating installations inside. It is impossible to fill only one table for all that kind of building, and making a new document for every building seems like a lot of work and will scatter the results. Maybe different tabs for office, warehouse and sanitary blocks, with in each tab the provision for e.g. 10 buildings could be an improvement of the tool.
Remarks

Energy savings at company level

To go further, Ijmond determine the potential of energy savings at company level

Relevant options

Measure	Production/savings	Investment	Yearly revenue/savings	Environmental benefit (CO_2)
LED lighting	1.629.000 kWh/yr	€285.000	€243.000	578 tons
Solar PV	15.343.000 kWh/yr	€17.911.000	€2.429.000	5.447 tons
Heat pumps	462.000 m³	€1.735.000	€192.000	638 tons
Roof insulation	303.000 m³	€1.759.000	€177.000	540 tons
Façade insulation	145.000 m³	€812.000	€85.000	259 tons
Glazing	28.000 m³	€246.000	€17.000	50 tons
Heat recovery installation	209.000 m³	€121.000	€121.000	371 tons

Total investment: €23.321.000
Total average payback time: 7 years
Total CO2 emission reduction: 7.883 tons

Current conclusion

- Experimentation of this tool has been done in four different ports of the project, allowing to estimate the possibility and the kind of energy savings.

- In addition, the main feedback of this experimentation is the <u>difficulty to have data</u> or the <u>difficulties to use the tool with different kind of data available in different areas of the ports</u>.

- This tool should be considered as a guide to determine which global type of energy savings is possible in a port and need further investigations. Indeed, increasing the accuracy of this tool should be approached with care because of the <u>correlated rise of data collection that is the major barrier to a large diffusion of the tool</u>.

- The <u>Current complexity level of the tool seems to be a rather good compromise</u> between its ease of use and its accuracy.

Workshop

Questions to the ports:

- Could the method help you detect the best way of doing some energy savings ?

- Is the "picture" of your port quite good ? If not, what are the ways to explore to improve the tool ?

Questions to All:

- Remarks on the report ?

- Do you agree with the current conclusions?

Data required from port

- **For lighting:**

On lighting and energy consumption		
how much energy do you use for lighting ?		kWh
if not known, how much total electricity do you used?	50000	kWh
On lighting and technologies		
What main technology do you use for outdoor lighting	Methal Halide	
What main technology do you use for indoor lighting ?	Flurorescent lamp	▾
Do you have sensors and controls for lighting ?	Some	
On lighting and spacial usage		
Is there leizure activity (marina) on your port ?	A lot	
Is there commercial activities or a container terminal on your port?	Some	
Discribe your port:		
m² of offices	200	m²
m² of warehouses	2000	m²
m² of storage area	80	m²
m² of meeting rooms	50	m²
m² of outside area	10000	m²
total	12330	

Data required from port

- **For heating and cooling**

On heating and cooling and offices		
Do you know the heating consumption of your offices ?		kWh/yr
Do you know the energy consumption of your office buildings ?		kWh/yr
(if unknown please let blank)		
m² of offices	300	m² (ente
age of the heating system (boiler or radiant electric heater)	more than 15 years old	
Date of construction of the office buildings	after 2005	
is there a cooling system ?	yes	
Is there a heat pump using sea water on site ?	no	
Is there a renewable energy for heating and cooling used on site ?	no	
Is there a recent control device for heating and cooling ?	no	
Fuel used for heating	electricity	

Data required from port

- **For heating and cooling**

On heating and cooling and warehouses		
Do you know the heating consumption of your warehouses ?		kWh/yr
Do you know the cooling consumption of your warehouses ?		kWh/yr
(if unknown please let blank)		
m² of warehouses (non-refrigerated)	5000	m² (enter 0
age of the heating system	more than 15 years old	
Is there a recent control device for heating ?	no	
Is there a renewable energy for heating used on site ?	yes	
Fuel used for heating	electricity	
m² of refrigerated warehouses	3000	m² (enter 0
age of the cooling system	more than 15 years old	
Is there a recente control device for cooling ?	no	
Is there a renewable energy for cooling used on site ?	yes	
Fuel used for cooling	electricity	

Data required from port

- **For heating and cooling**

On heating and cooling and warehouses		
Do you know the heating consumption of your warehouses ?		kWh/yr
Do you know the cooling consumption of your warehouses ?		kWh/yr
(if unknown please let blank)		
m² of warehouses (non-refrigerated)	5000	m² (enter 0
age of the heating system	more than 15 years old	
Is there a recent control device for heating ?	no	
Is there a renewable energy for heating used on site ?	yes	
Fuel used for heating	electricity	
m² of refrigerated warehouses	3000	m² (enter 0
age of the cooling system	more than 15 years old	
Is there a recente control device for cooling ?	no	
Is there a renewable energy for cooling used on site ?	yes	
Fuel used for cooling	electricity	

Data required from port

- **For Fuels**

Reducing time in port	
Does your ports have shipping operation ?	yes
Does your port have a Maritim and Port Operations System (MPOS) ?	no
Shore power supply	
Do you have on shore power supply ?	no
Eco-driving	
Does your port possess service vehicules/trucks/mobile cranes?	yes
Does your employees have been trained in eco-driving?	no

Data required from port

- **For specific equipment:**

On cranes	[Sans titre]	
Do you used mobile cranes ?	no	
How many ?	1	
What kind of spreader is used on the mobile cranes ?	Hydraulic spreaders	
Do you used STS cranes ?	no	
How many ?	1	
Does your STS crane linked to the grid ?	no	
What kind of spreader is used on the mobile cranes ?	Hydraulic spreaders	
Do you used RTG cranes ?	yes	
How many ?	2	
Does your RTG cranes is linked to the grid ?	no	
What kind of spreader is used on the mobile cranes ?	Hydraulic spreaders	
On reefer containers		
Do you have reefer containers ?	yes	
Do you have a roof shade for reefer containers ?	no	