



Work Project presented as part of the requirements for the Award of a Master Degree from  
NOVA – School of Business and Economics

Consulting project for Administração dos Portos de Sines e Algarve, SA and Aicep Global Parques:  
**The Economic, Social and Environmental Value of the Port of Sines, *Zona Industrial e Logística de Sines (ZILS)* and *Zona Industrial Ligeira (ZIL)* - an holistic approach**

**Appendix**

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## Appendix 1: Glossary (1/3)

- **Shipping agent** – Appointed representative of the ship-owner; The agents have the task of ensuring that everything runs smoothly (before, during and after ship calls) and establish the link between ship-owners and port authorities in land (captaincies, customs, immigration services or sanities). They are expected to serve well the ships, cargoes, passengers, researchers, and any other individual on board.
- **Ship-owner** –The company which, by its own risk, handles the equipment and operation of a commercial vessel, regardless of whether or not it is the owner of the vessel. Their income usually results from the charging a fee for the transportation of cargo between two ports or for the rental of the vessel at a daily / hourly rate.
- **Grantor**– The port administration which holds the right to operate the port docks and terminals and which, through a public tender, will grant it to a private economic agent.
- **Lessee** – The private agent who in the public tender has presented the best business model for the development of the quay or concessionary terminal and that will hold the right to provide the services to its users, by charging a tariff approved by the grantor, during the term of the Granted.
- **Dredging** – Is defined as the service of enlargement, clearing, removal, overturning or excavation of material from the bottom of rivers, lagoons, seas, bays and access channels to ports. The main objective is to maintain or increase depth to facilitate ships' movement.

## Appendix 2: Glossary (2/3)

- **Feederling** – Feeders are vessels of different sizes that collect containers from different ports and transport them to central port terminals where they are then transported to other vessels or directly drained to the hinterland.
- **GNL (*Gás Natural Liquefeito*)** – Natural gas which, after being purified, is condensed to the liquid phase by reducing its temperature.
- **Hinterland** – Geographical area served by a port and connected by an integrated transport network. The Port of Sines has as a direct hinterland which covers all the Southern and Center regions of Portugal. If we consider the whole extended hinterland, the Port of Sines occupies a strategic position close to the Spanish Extremadura and especially the corridor to Madrid.
- **Hub** – Multimodal transportation center normally dedicated to transshipment.
- **Intermediate Hub**– Most intermediate hubs are located along major world sea routes. Its function is to redistribute cargo among feeders or short-sea shipping.
- **Intermodality** – Combination of two or more means of transport.
- **Landlord Port** – The port infrastructure is the only asset in the possession and control of the public agent. The superstructures, including equipment, and port work are under the control and management of the private sector (operator). The public agent, by means of the concession of public service of the infrastructures, places the exploration of the port terminals in the hands of the privates for a certain period of time.



## Appendix 2: Glossary (2/3)

- **Oil pipeline** – Closed pipe that is used to transport oil and its by-products.
- **Pipeline** – Tubular structures that are responsible for transporting liquids (oil and its by-products) or gases (natural gas, carbon dioxide, liquefied natural gas) from a port to adjacent industrial areas
- **Ro-ro (Roll on Roll off)** – Name given to giant freighters used to transport cars and other vehicles.
- **Port superstructure**– Set of fixed or mobile installations (crane trucks, cranes, gantry cranes, warehouses, etc.) usually granted to or by private operators
- **TEU (twenty-foot equivalent unit)** – Unit capacity measure of a container, its value expressed in terms of equivalent units of 20 feet (1 TEU is equivalent to a 20-foot container and approximately 12 tonnes).
- **Transshipment** – The operation of cargo transfer, be it in port or at sea, in which cargo is switched to another ship towards a final destination other than the initial destination. Usually, from sizeable vessels in jube ports to feeders that take to smaller ports.
- **ZILS** – Industrial and Logistics area of Sines.

## Appendix 4: Project's calendar

Activities	Sep.	Oct.					Nov.				Dec.			
	26-Sep	3-Oct	10-Oct	17-Oct	24-Oct	31-Oct	7-Nov	14-Nov	21-Nov	28-Nov	5-Dec	12-Dec	19-Dec	26-Dec
<b>Diagnostic</b>														
Literature Review														
Understanding the activities involved at Port of Sines, ZILS and ZIL														
Defining methodology														
Gathering data on performance indicators														
Collecting information on the companies representing 80% of total turnover														
Collecting environmental data														
Collecting social data														
<b>Analysis</b>														
Designing the model for economic, social and environmental values determination														
Estimating direct economic impact and indirect economic impact														
Determining environmental impact														
Determining social impact														
Identifying trends and performance improvement gaps														
<b>Recommendations</b>														
Presenting the model														
Determining limitations and future adjustments														
Identifying opportunities to improve the model														

## Appendix 5: Port of Sines' terminals

THE PORT OF SINES IS MADE UP OF FIVE DEDICATED TERMINALS, UNDER THE MANAGEMENT OF CONCESSIONARIES.

### Liquid Bulk Terminal

- Is the largest liquid bulk terminal in the country.
- The main Products Handled are:** Crudes, Refined products, LPG, Methanol and Chemical Naphtha.
- The terminal is operated by **CLT (Galp Energia Group)**, who was awarded the concession of the Public Service and the handling of cargo.

### Petrochemical Terminal

- It has two jetties, with depths of -12m/ZH, which can receive vessels up to 20.000 m3.
- The Main Products Handled:** Propylene, Ethylene, Butadiene, ETBE, Ethanol, MTBE, Aromatic Compounds, Methanol.
- This terminal allows the handling of goods **via a dedicated pipeline** between vessels and the petrochemical complex located in the ZILS.
- It is run on a private use regime by **Repsol Polímeros**.

### Container Terminal (Terminal XXI)

- The terminal has the capacity to receive the last generation container carriers performing intercontinental routes, as well as the concerning feeder, since it offers natural depths down to 17.5 metres ZH.
- In 2004, it started its operations under a public service concession by **the company PSA Sines** (PSA – Port Singapore Authority)

### Multipurpose Terminal

- This terminal has 4 berths, with depths up to -18m/ZH;
- The main Products Handled are:** Dry Bulk, General Cargo and Ro-Ro.
- The terminal is operated by PortSines**, under a public service concession granted.

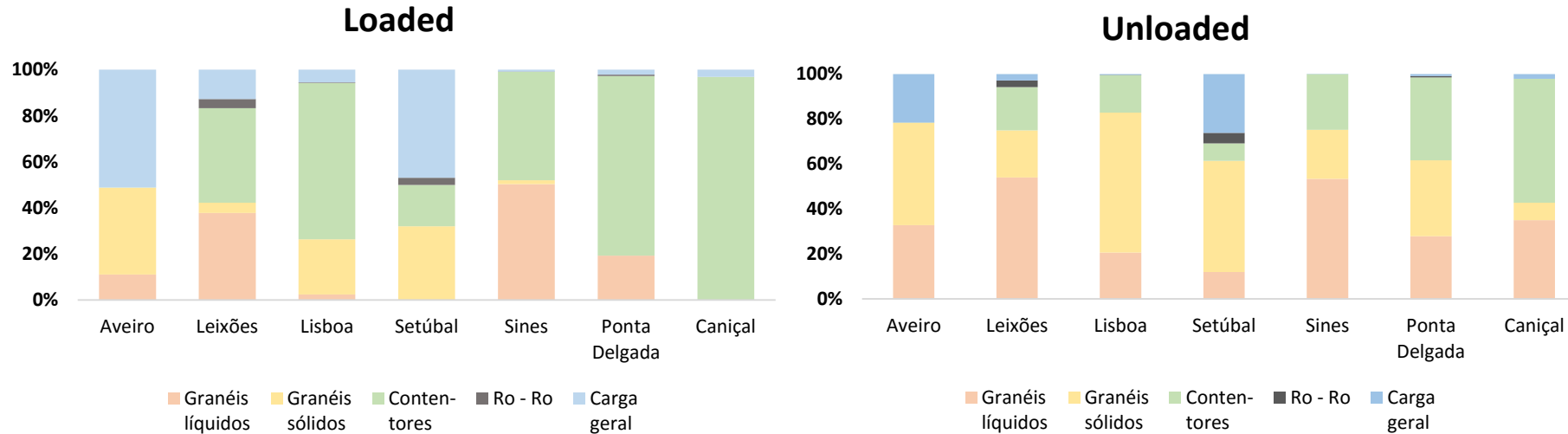
### Natural Gas Terminal

- Endowed with one jetty with depths of 15 metres ZH.
- In 2003, this terminal started its activity** and is run under a private use concession by the company REN Atlantico. These days, it is responsible for the handling of over 50% of the Natural Gas that is consumed in Portugal.



## Appendix 6: Type of movements

THE MOVEMENT OF THE PORT OF SINES IS MARKED BY LIQUID BULKS AND CONTAINERIZED CARGO



**52%**

The activity of the Port of Sines is generated by the movement of Bulk Liquids, in 2015.

**33%**

Corresponds to the handling of container cargo, within the Port of Sines, in 2015.

The **liquid bulk movement** continued to have the **largest share of port activity**, accounting for 38.5% of the total, with 33.5 million tons.

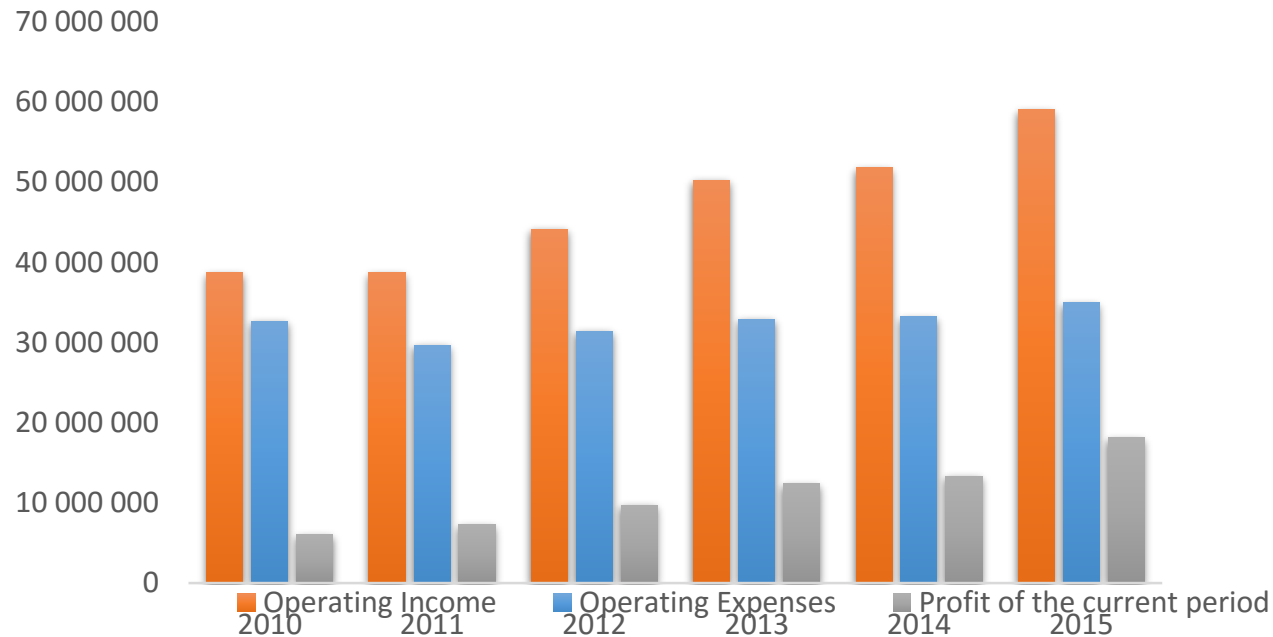
The **movement of containers** corresponded to **29% of the total merchandise movement**, with 25.2 million tons.

The **solid bulk** represented **22.5% of the total of the goods handled** corresponding to 19.5 million tons.

## Appendix 7: Financial indicators for Portuguese ports

THE PORT OF SINES SHOWS A POSITIVE GROWTH IN THE LAST 5 YEARS, AS REPORTED IN THE ANNUAL RESULTS OF APS, S.A.

Financial Indicators, 2010-2015

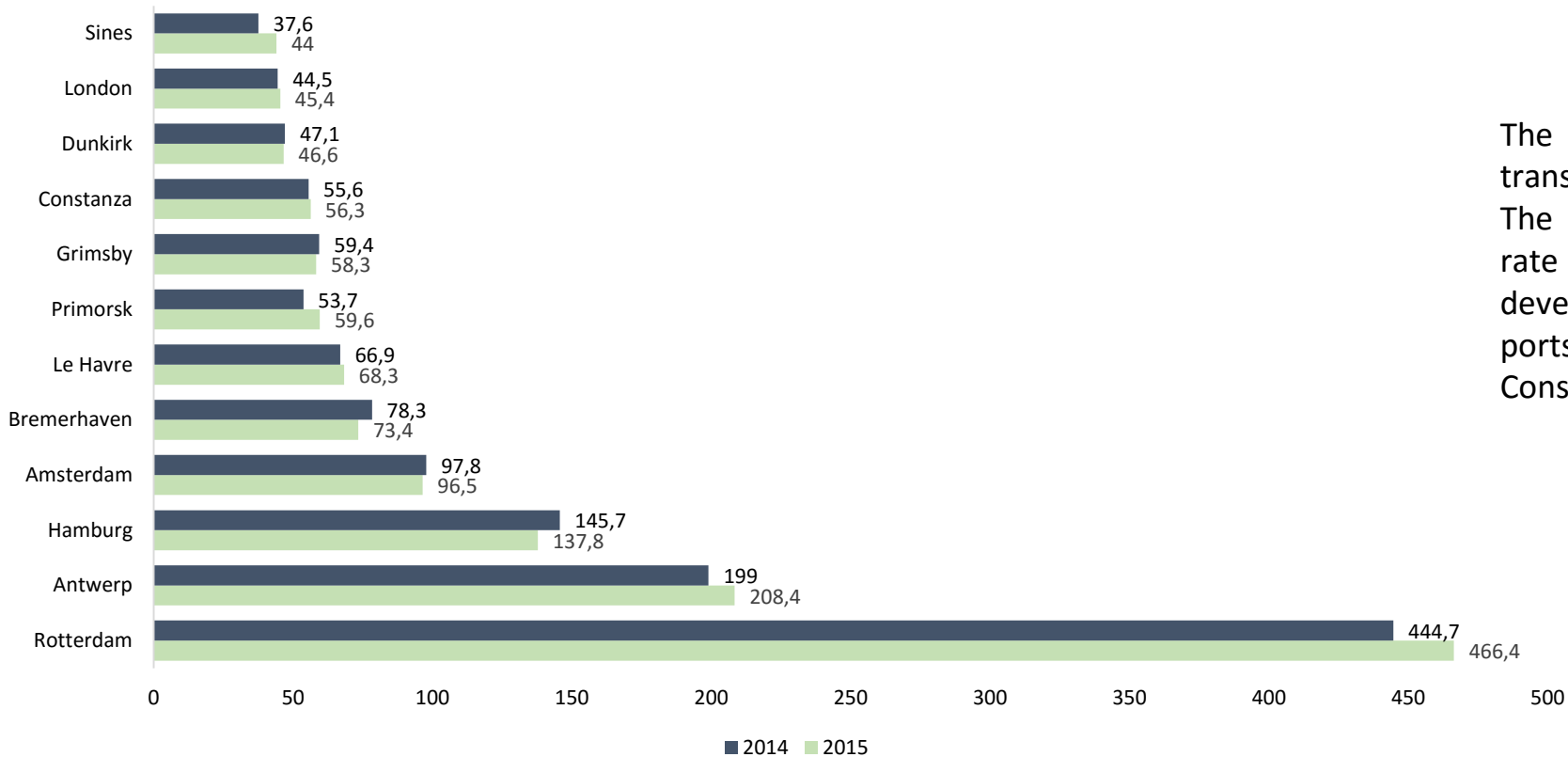


- APS, S.A. reached its maximum value of activity in 2015, maintaining the continuous growth trajectory of the previous years, and closed the year with a **Net Result of 18.1 million euros**.
- **Operating Income showed a solid growth**, amounting to 58.4 million euros, an 8.8% increase over the same period of the previous year
- **Operating Expenses** increased by 5.5%, accounting for 35 million euros.

## Appendix 8: Cargo moved in European ports

PORT OF SINES STANDS OUT AS THE ONE WITH THE HIGHEST GROWTH RATE OF THE EUROPEAN PORTS COMPARED TO 2014.

### Cargo moved in European Ports



The Port of Rotterdam is the European leader in transported goods.

The Port of Sines has shown the highest growth rate of the main European ports. In addition, it developed performances comparable to notable ports, namely, London, Dunkirk, Primorsk and Constanza.

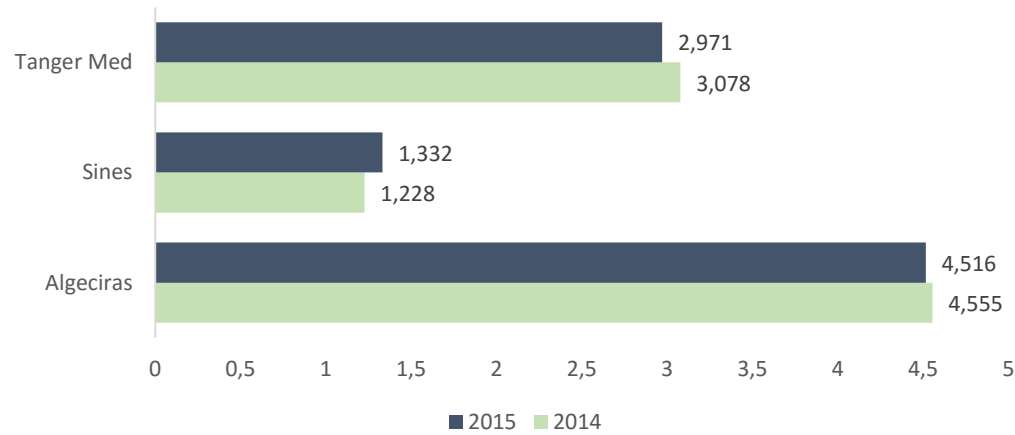
Source: Port of Rotterdam Report 2015

## Appendix 9: Containers cargo for international ports

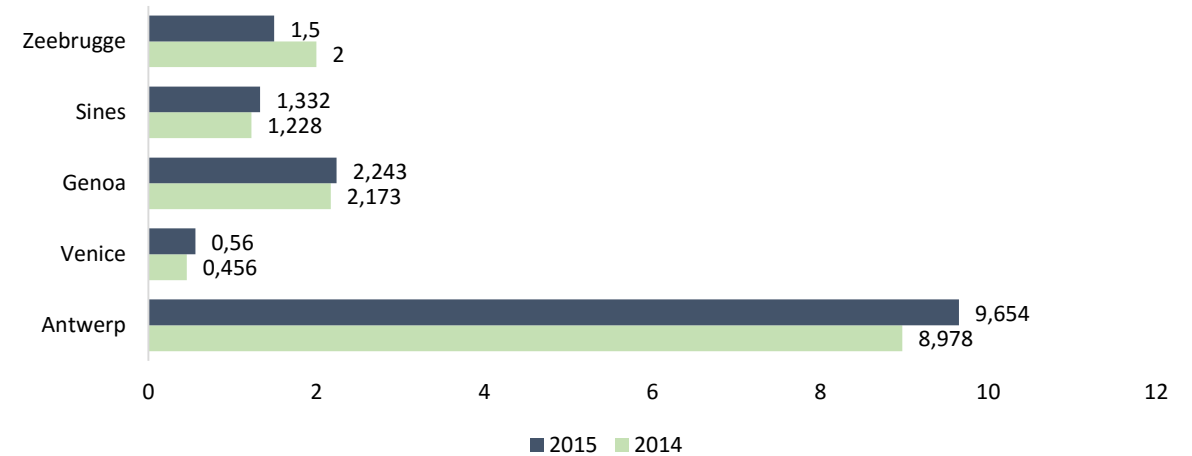
PORT OF SINES IS IN A DISTINCTIVE POSITION WHEN COMPARED TO ITS COMPETITORS.

### Containers Cargo (Thousand TEU)

Main competitors in transshipment (K TEUS)



Ports Operated by PSA in Europe ( K TEUS)



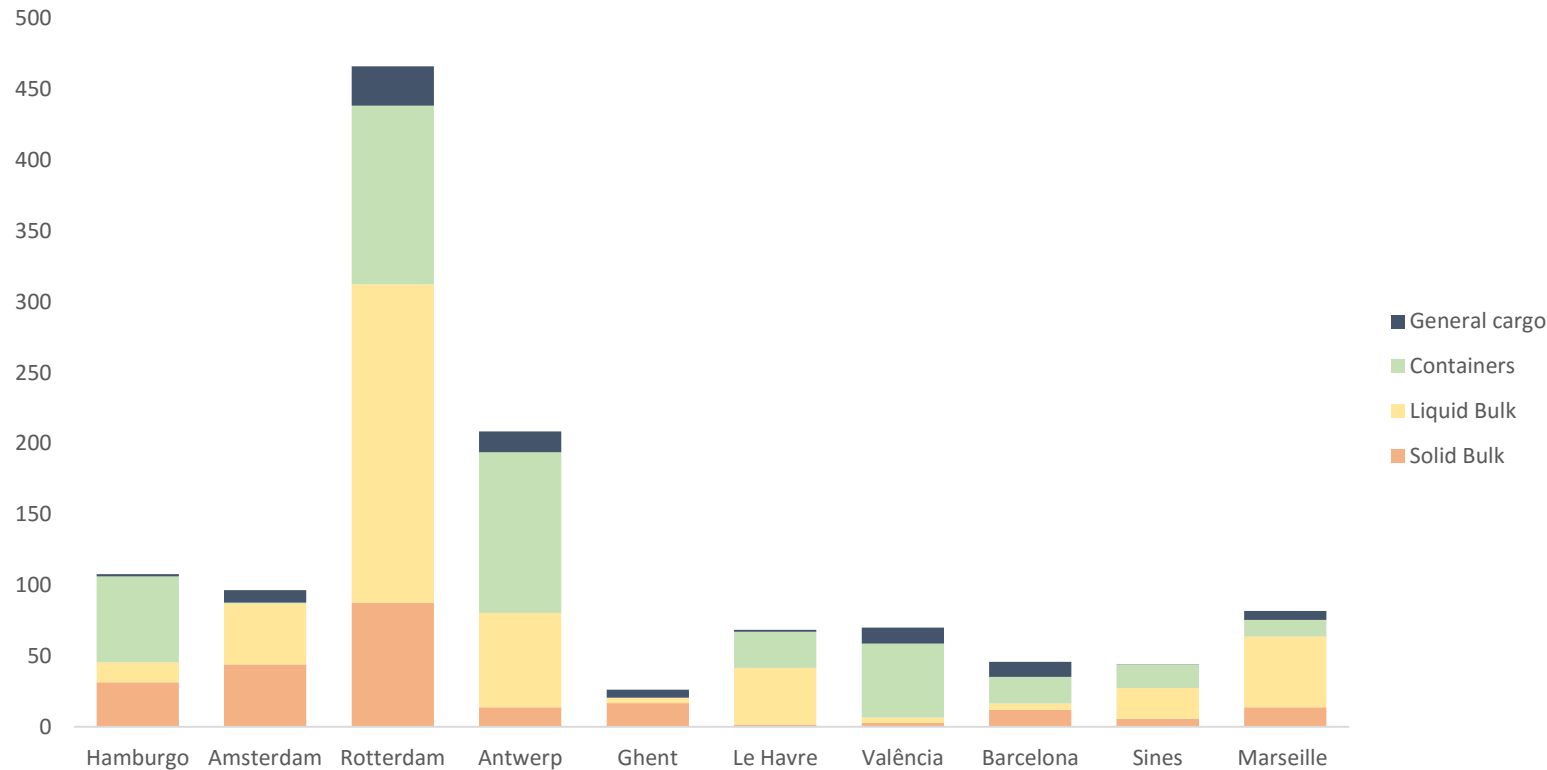
The Port of Tanger Med and Algeciras are the entry ports in the Mediterranean Sea, very close to each other, directly competing with Sines in container transshipment. The Portuguese port shows a positive annual growth, contrasting with the decrease of 1% in the performance of the Port of Algeciras.

Source: Port of Rotterdam Report 2015; Port of Barcelona Report 2015; Port of Marseille statistics 2015; Port of Valencia Report 2015; Tanger Med Statistics 2015; Zeebrugge Statistics 2015;

## Appendix 10: Cargo throughput by commodity for international ports

PORT OF SINES IS RECOGNIZED AT AN EUROPEAN LEVEL IN THE HANDLING OF LIQUID AND SOLID BULK.

Cargo Throughput by Commodity, 2015 (millions tons)



**Containerized** and **liquid bulk** cargoes account for approximately **80% of the total cargo transported** in the largest European ports.

The Port of Sines is the leader in the handling of liquid bulk in front of references such as the port of Barcelona, Ghent or Hamburg.

Sines is better placed in what concerns the transaction of solid bulk when compared to detachable ports such as Le Havre, Barcelona or Valencia.

Source: Port of Rotterdam Report 2015; Port of Barcelona Report 2015; Port of Marseille statistics 2015; Port of Valencia Report 2015;

## Appendix 11: Algebraical and matricial representation of the input-output model (1/3)

THROUGH THE INPUT-OUTPUT MODEL IT IS POSSIBLE TO WRITE DOWN THE MODEL ALGEBRAICALLY AND MATRICIALLY, WHICH PERMITS TO VERIFY HOW EACH INDIVIDUAL EFFECT IS ESTIMATED

Algebraically, the Input-Output Model for an economy constituted by  $n$  sectors settles in a system with  $n$  equations and  $n$  unknowns  
 - For the analytical expression, only the first and the second quadrants of the input-output matrix are considered

Equation for each of  $n$  sectors

$$X_i = z_{i1} + z_{i2} + \dots + z_{in} + Y_i$$

$X_i$  - It represents sector  $i$ 's total output

$z_{ij}$  - Monetary value of the sector  $i$ 's goods consumed by sector  $j$

$Y_i$  - It represents sector  $i$ 's final demand

One of the model's assumptions says that the quantity of the sector  $i$ 's goods consumed by sector  $j$  depends exclusively on sector  $j$ 's output. Sticking to this, there is the following dependence relation:

$$a_{ij} = \frac{z_{ij}}{X_j}$$

$a_{ij}$  - It represents the technical coefficient, it means, the input's value required from sector  $i$  per each monetary unit of sector  $j$ 's output.

By rewriting the equation, integrating  $a_{ij}$ , it is verified:

$$X_i = a_{i1}X_1 + a_{i2}X_2 + \dots + a_{in}X_n + Y_i$$

## Appendix 12: Algebraical and matricial representation of the input-output model (2/3)

THROUGH THE INPUT-OUTPUT MODEL IT IS POSSIBLE TO WRITE THE MODEL ALGEBRAICALLY AND MATRICIALLY ALLOWING TO VERIFY HOW EACH EFFECT IS ESTIMATED

By passing all the terms with  $X$  (referring total output's sector) to the first member, it is verified:

$$(1 - a_{11})X_1 - a_{12}X_2 - \dots - a_{1i}X_i - \dots - a_{1n}X_n = Y_1$$

$$- a_{21}X_1 - (1 - a_{22})X_2 - \dots - a_{2i}X_i - \dots - a_{2n}X_n = Y_2$$

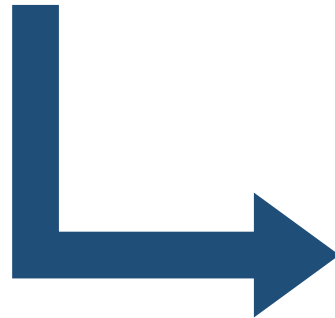
...

$$- a_{i1}X_1 - a_{i2}X_2 - \dots - (1 - a_{ii})X_i - \dots - a_{in}X_n = Y_i$$

...

$$- a_{n1}X_1 - a_{n2}X_2 - \dots - a_{ni}X_i - \dots - (1 - a_{nn})X_n = Y_n$$

In matrix terms



$$\begin{pmatrix} (1 - a_{11}) & -a_{12} & \dots & -a_{1i} & \dots & -a_{1n} \\ -a_{21} & (1 - a_{22}) & \dots & -a_{2i} & \dots & -a_{2n} \\ \dots & \dots & \dots & \dots & \dots & \dots \\ -a_{i1} & -a_{i2} & \dots & (1 - a_{ii}) & \dots & -a_{in} \\ \dots & \dots & \dots & \dots & \dots & \dots \\ -a_{n1} & -a_{n2} & \dots & -a_{ni} & \dots & (1 - a_{nn}) \end{pmatrix} \begin{pmatrix} X_1 \\ X_2 \\ \dots \\ X_i \\ \dots \\ X_n \end{pmatrix} = \begin{pmatrix} Y_1 \\ Y_2 \\ \dots \\ Y_i \\ \dots \\ Y_n \end{pmatrix}$$

## Appendix 13: Algebraical and matricial representation of the input-output model (3/3)

THROUGH THE INPUT-OUTPUT MODEL IT IS POSSIBLE TO WRITE THE MODEL ALGEBRAICALLY AND MATRICIALLY ALLOWING TO VERIFY HOW EACH EFFECT IS ESTIMATED

By writing the system of equations in matrix form, it is verified:

$$(I - A) \times X = Y$$



The Leontief model consists in the system of equations' solution in order to "output"



$$X = (I - A)^{-1} \times Y$$



Leontief Inverse Matrix

- $I$  - It represents the Identity matrix
- $A$  - It represents the technical coefficients' matrix
- $X$  - It represents the column vector which elements correspond total output for each of the  $n$  sectors
- $Y$  - It represents the column vector which elements correspond final demand for each of the  $n$  sectors

From this matrix, it is possible to obtain the multipliers. The multipliers determine the output created in the economy derived from the variation in final demand for each of the  $n$  sectors (per monetary unity)

## Appendix 14: Types of multipliers and the effects associated (1/2)

IT IS POSSIBLE TO ESTIMATE THE ECONOMIC IMPACT FOR DIFFERENT ECONOMIC INDICATORS THROUGH THE DIFFERENT MULTIPLIERS

### Output's multiplier

$$m_j = \sum_{i=1}^{i=n} b_{ij}$$

- $m_j$  - It represents the output's multiplier of type I for sector  $j$
- $b_{ij}$  - It represents the coefficient between sectors  $i$  and  $j$  taken from the Leontief inverse matrix
- $n$  - It represents the total number of sectors presented in the input-output matrix

Parcial Effect (direct e indirect)	$m_j \times y_j$
Direct Effect	$y_j$
Indirect Effect	$(m_j - 1) \times y_j$

$y_j$  - It represents the variation in sector  $j$ 's demand

### Primary Resource's multiplier (e.g. GVA)

$$m_p = \frac{\sum_{i=1}^{i=n} b_{ij} \times a_{pi}}{a_{pj}}$$

- $m_p$  - It represents the multiplier of type I for the primary resource  $p$  resulting from the variation on sector  $j$ 's demand
- $b_{ij}$  - It represents the coefficient between sectors  $i$  and  $j$  taken from the Leontief inverse matrix
- $a_{pi}$  - It represents the quantity of the primary resource  $p$  that is necessary to produce one unit of sector  $i$ 's output
- $a_{pj}$  - It represents the quantity of the primary resource  $p$  that is necessary to produce one unit of sector  $j$ 's output
- $n$  - It represents the total number of sectors presented in the input-output matrix

## Appendix 15: Types of multipliers and the effects associated (2/2)

IT IS POSSIBLE TO ESTIMATE THE ECONOMIC IMPACT FOR DIFFERENT ECONOMIC INDICATORS THROUGH THE DIFFERENT MULTIPLIERS

### Primary Resource's multiplier (e.g. GVA)

Parcial Effect (direct e indirect)	$m_p \times a_{pj} \times y_j$
Direct Effect	$a_{pj} \times y_j$
Indirect Effect	$(m_p - 1) \times a_{pj} \times y_j$

$y_j$  - It represents the variation in sector  $j$ 's demand

### Employment's multiplier

$$m_e = \frac{\sum_{i=1}^{i=n} b_{ij} \times a_{ei}}{a_{ej}}$$

- $m_e$  - It represents the multiplier for the employment created, resulting from the variation in sector  $j$ 's demand
- $b_{ij}$  - It represents the coefficient between sectors  $i$  and  $j$  taken from the Leontief inverse matrix
- $a_{ei}$  - It represents the number of jobs that it is necessary to produce one unit of sector  $i$ 's output
- $a_{ej}$  - It represents the number of jobs that it is necessary to produce one unit of sector  $j$ 's output
- $n$  - It represents the total number of sectors presented in the input-output matrix

Parcial Effect (direct e indirect)	$m_e \times a_{ej} \times y_j$
Direct Effect	$a_{ej} \times y_j$
Indirect Effect	$(m_e - 1) \times a_{ej} \times y_j$

$y_j$  - It represents the variation in sector  $j$ 's demand

## Appendix 16: Output's multiplier

THE EFFECT PER ONE MONETARY UNIT OF OUTPUT IS HIGHER IN THE SECTORS WHICH THE PORT OF SINES AND THE POWER STATION OF SÃO TORPES ARE INTEGRATED, IN TERMS OF OUTPUT (BUSINESS REVENUES)

Output				
Sector (CAE)	Coke and refined petroleum products	Electricity, gas, steam and air-conditioning	Rubber and plastics products	Warehousing and support services for transportation
<b>Multiplier Type I</b>	1,1708	2,4260	1,4966	1,7121
<b>Multiplier Type II</b>	1,2812	2,8795	2,2601	2,9333
<b>Direct Effect <sup>1</sup></b>	1	1	1	1
<b>Indirect Effect <sup>1</sup></b>	0,1708	1,4260	0,4966	0,7121
<b>Induced Effect<sup>1</sup></b>	0,1103	0,4535	0,7634	1,2213
<b>Total Effect <sup>1</sup></b>	1,2812	2,8795	2,2601	2,9333

1 - Effect, in monetary units, on the variation of a monetary unit in the product of the sector

## Appendix 17: Employment's multiplier

Employment				
Sector (CAE)	Coke and refined petroleum products	Electricity, gas, steam and air-conditioning	Rubber and plastics products	Warehousing and support services for transportation
<b>Multiplier Type I</b>	4,0264	4,7986	1,3826	1,5839
<b>Multiplier Type II</b>	5,2378	6,1833	1,6891	1,9678
<b>Direct Effect <sup>1</sup></b>	0,3933	1,4144	10,7565	15,6118
<b>Indirect Effect <sup>1</sup></b>	1,1904	5,3728	4,1158	9,1154
<b>Induced Effect<sup>1</sup></b>	0,4765	1,9585	3,2967	5,9944
<b>Total Effect <sup>1</sup></b>	2,0602	8,7457	18,1690	30,7215

1 – Number of workers per one million of sector's output



## Appendix 18: Correction in Port of Sines' data

THE DATA FROM EXPORTS AND IMPORTS THAT IS GATHERED BY THE PORT AUTHORITY INCLUDES CARGO THAT DOES NOT CORRESPOND TO ACTUAL EXPORTS OR IMPORTS, BUT ONE THAT IS “TRANSHIPPED” TO OTHER VESSELS.

Not only the statistics from INE but also those available in the public statistical reports of APS included the cargo that corresponded to *transshipment*.

For the sake of an accurate analysis, the following adjustments have been performed:

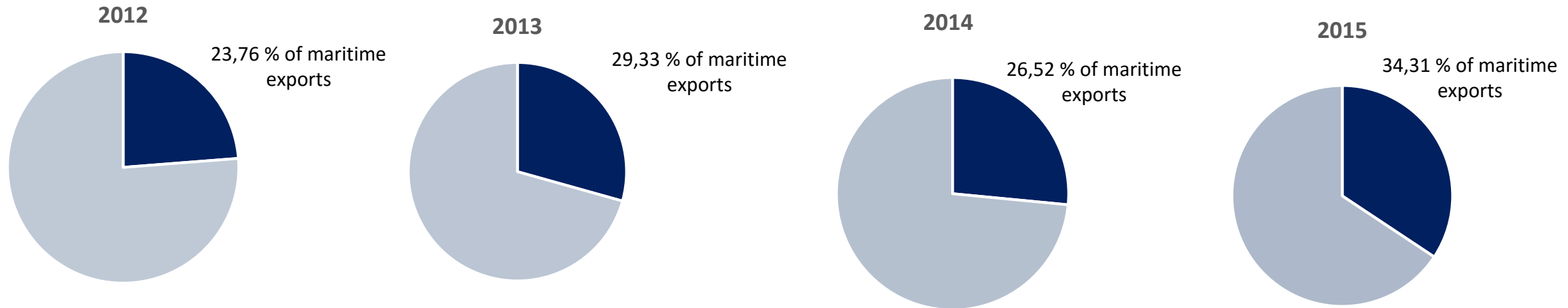
- ✓ As far as the Port of Sines is concerned, the share of “transhipped” containers (out of total containers) was computed, and that proportion was applied (meaning deducted) from both total exports and imports attributed to the Port.
- ✓ As for the national data, the volume of “transshipped” cargo for the Ports of Sines, Lisboa and Leixões was taken into account. The level of transshipment for the Ports of Lisboa and Leixões was obtained in the report of AMT<sup>1</sup> (*Associação Mobilidade e Transportes*) for 2015, and was assumed to be constant since 2012. Once the level of transshipment for the three ports is known, one can easily obtain the level of exports and imports “free” of transshipment by deducting this overall transshipment from the total level of maritime exports and imports.

1 - <http://www.cargodicoes.pt/site/Default.aspx?tabid=380&id=12792&area=Cargo>

## Appendix 19: Contribution to the Portuguese exports by sea

THE RELATIVE WEIGHT OF THE PORT OF SINES IN THE TOTAL MARITIME EXPORTS HAS BEEN INCREASING, AMOUNTING TO MORE THAN 34% AS OF 2015

Weight of the Port of Sines in the total maritime exports

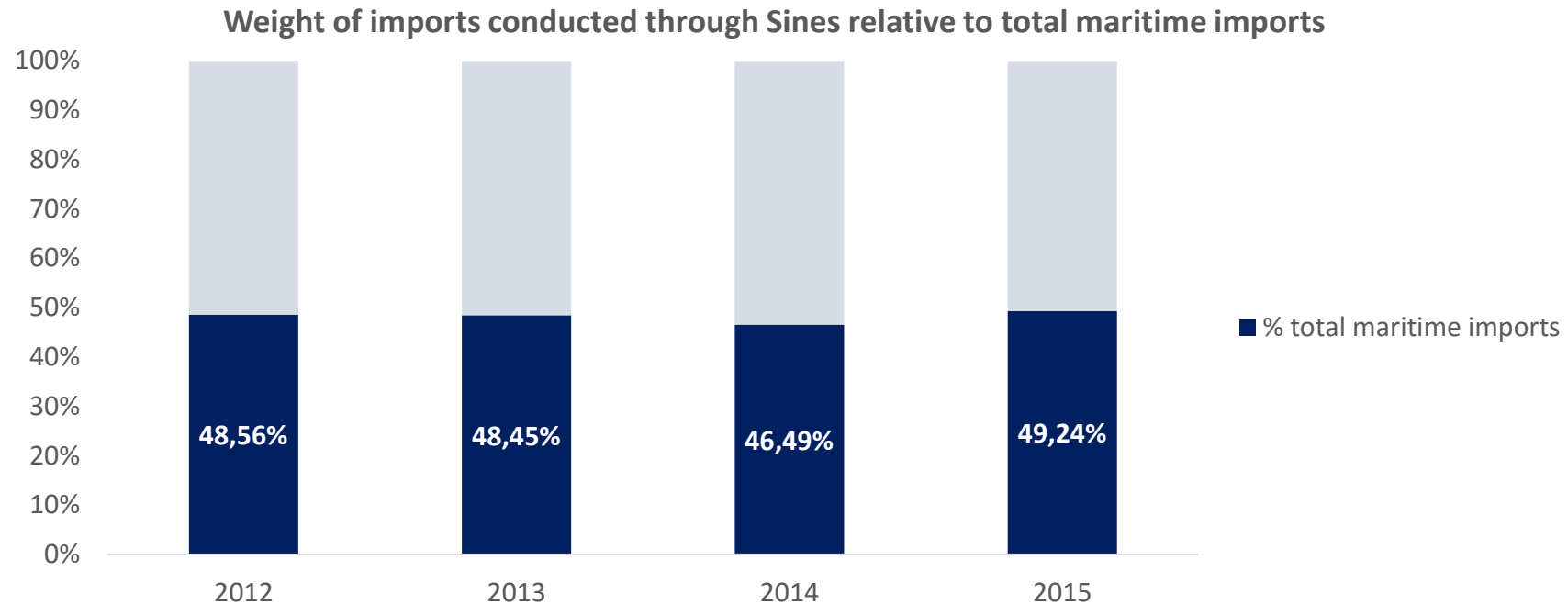


Source: Data from the Port of Sines obtained from *Estatísticas do Porto de Sines*;  
National data – ETC 2012, 2013, 2014 e 2015 (INE)

The proportion of maritime exports conducted through Sines has shown an increase of, approximately, 1000 basis points in the last four years

## Appendix 20: Contribution to the Portuguese imports by sea

WHEN IT COMES TO IMPORTS THAT HAVE ENTERED THE COUNTRY THROUGH THIS SAME PORT, SINES HAS BEEN STRNGHTENING ITS LEADING POSITION, BEING RESPONSIBLE FOR ALMOST 50% OF MARITIME IMPORTS



Source: Data from the Port of Sines obtained from *Estatísticas do Porto de Sines*;  
National data – ETC 2012, 2013, 2014 e 2015 (INE)

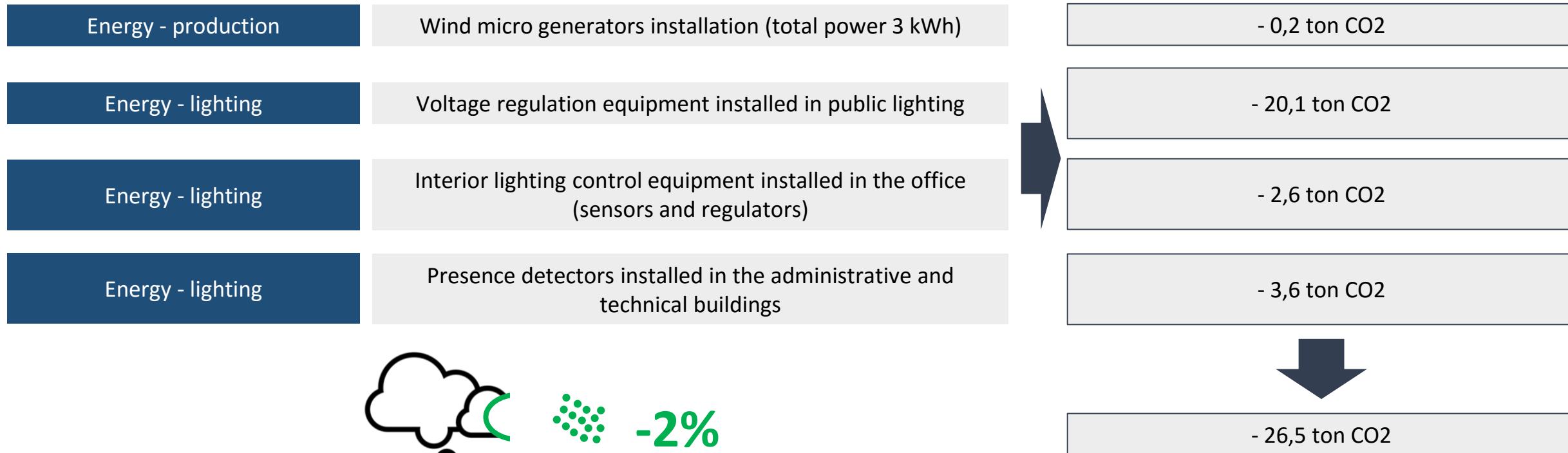
**The increase in this proportion was not as steep as that for exports, but, as of 2015, around 50% of maritime imports has conducted through Sines**

## Appendix 21: Summary table

QUADRO RESUMO		2009	2010	2011	2012	2013	2014	2015	2016E	2017E	2018E	2019E	2020E
<b>MUNICÍPIO</b>													
Poder de compra	Posição a nível nacional	11	-	4	-	7	-	Indisponível	Indisponível	Indisponível	Indisponível	Indisponível	Indisponível
	Nível	132,6	-	137	-	128	-	Indisponível	Indisponível	Indisponível	Indisponível	Indisponível	Indisponível
Taxa de desemprego	Município de Sines (%)	-	-	9,7%	-	-	-	-	Indisponível	Indisponível	Indisponível	Indisponível	Indisponível
	Média nacional (%)	-	-	13,2%	-	-	-	-	Indisponível	Indisponível	Indisponível	Indisponível	Indisponível
Ganho médio mensal	Município de Sines	-	-	-	-	2327	Indisponível	Indisponível	Indisponível	Indisponível	Indisponível	Indisponível	Indisponível
	Média nacional	1034	1075	1084	1095	1093	0	0	0	0	0	0	0
Formandos	# de formandos	-	-	-	845	823	805	2136	0	0	0	0	0
<b>PORTO DE SINES</b>													
Emprego directo	FTEs	-	-	-	-	-	-	1223	0	0	0	0	0
Emprego indirecto	# de empregados	-	-	-	-	-	-	2428	0	0	0	0	0
Emprego induzido	# de empregados	-	-	-	-	-	-	1544	0	0	0	0	0
<b>ZILS</b>													
Emprego directo	FTEs	-	-	-	-	-	-	1471	0	0	0	0	0
Emprego indirecto	# de empregados	-	-	-	-	-	-	11317	0	0	0	0	0
Emprego induzido	# de empregados	-	-	-	-	-	-	5436	0	0	0	0	0
<b>ZIL 2</b>													
Emprego directo	FTEs	-	-	-	-	-	-	707	0	0	0	0	0

## Appendix 22: Environmental initiatives from Port of Sines

EVERY YEAR SEVERAL INITIATIVES ARE IMPLEMENTED BY APS IN ORDER TO MINIMIZE ITS NEGATIVE ENVIRONMENTAL IMPACT, WHETHER IT IS AN INDIVIDUAL INITIATIVE OR PARTNERING WITH OTHER ENTITIES INVOLVED IN PORT'S ACTIVITY



**-2%**

Average annual reduction of CO2 emissions

## Appendix 23: Summary Table

QUADRO RESUMO		2012	2013	2014	2015
<b>Porto de Sines</b>	<b>Unidade</b>				
Emissões CO2	Ton	1.434.905	1.938.906	2.138.869	2.392.454
Consumo de energia	kWh	40.993.353	46.257.453	52.574.551	61.999.000
Resíduos produzidos	ton	424	566	617	692
% de emissões nacionais	%	2,055%	2,860%	3,163%	3,595%
% consumo de energia	%	0,087%	0,100%	0,114%	0,134%
% resíduos produzidos pelo sector	%	0,013%	0,018%	0,024%	0,026%
Emissões/VAB	kg CO2/€			31,577	13,977
Emissões/cargo	ton CO2/ton	0,05	0,05	0,06	0,05
Custo ambiental	€	0	0	6.117.164	7.105.587
<b>ZILS</b>					
Emissões CO2	ton	10.220.428	10.647.941	11.830.956	12.735.621
Consumo de energia	kWh	1.109.881.880	1.335.306.521	1.236.661.586	1.316.570.020
Resíduos produzidos	ton	193.026	94.128	69.361	45.225
% de emissões nacionais	%	14,64%	15,71%	17,50%	19,14%
% consumo de energia	%	2,36%	2,89%	2,68%	2,84%
% resíduos produzidos pelo sector	%	6,05%	2,95%	2,65%	1,73%
Emissões/VAB	kg CO2/€			14,74	12,31
Custo ambiental	€	0	0	33.836.534	37.824.795
<b>Total</b>					
Emissões CO2	ton	11.655.333	12.586.847	13.969.824	15.128.075
Consumo de energia	kWh	1.150.875.233	1.381.563.974	1.289.236.137	1.378.569.020
Resíduos produzidos	ton	193.450	94.694	69.978	45.917
% de emissões nacionais	%	16,69%	18,56%	20,66%	22,73%
% consumo de energia	%	2,44%	2,99%	2,80%	2,97%
% resíduos produzidos pelo sector	%	6,07%	2,97%	2,68%	1,76%
Emissões/VAB	kg CO2/€			16,05	11,33
Custo ambiental	€	0	0	39.953.698	44.930.382