

# The port cost factor

Spanish state-owned company Puertos del Estado, which heads 28 port authorities and 46 commercial ports in the country, published a study in July 2019 comparing port costs in Spain and other Mediterranean countries for six dry bulk industrial commodities, including cement and clinker. With European cement producers looking to increase competitiveness, could there be room for improvement in terms of cost savings in port operations?

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The Mediterranean Sea has always played a vital role in the global economy and international trade. However, in recent years bordering countries have been impacted by downturns in construction activity. As a result, the region faces a structural cement surplus which has increased competition among regional cement exporters to an unprecedented level.

Moreover, EU environmental policies, especially the EU Emissions Trading Scheme (EU-ETS), are expected to change in 2020 and as a result, the price of CO<sub>2</sub> emissions permits will increase. For European cement exporters, these rising CO<sub>2</sub> costs and global energy prices are likely to exert further pressure on local producers compared to non-EU-based producers (eg, those from Turkey, Algeria and Morocco), where environmental and labour legislation is less strict.

Therefore, taking these recent developments into account, the European cement industry is adapting its production technology and the types of fuels used to maintain competitiveness. Part of this drive also includes improving logistics to provide export operations with a sharper competitive edge. But could there be further room for improvement in terms of cost savings in port operations?

## Benchmark study

Within this context, Puertos del Estado's benchmark study was undertaken by its Observatory for Port Services Competitiveness with the help of two consulting firms: Estrada Port Consulting and DSG Consultants. The study considers the cost chain of bulk commodities at Spanish ports, analysing competitiveness between ports within the country and also comparing the average port cost in Spain to a number of other countries in the Mediterranean region. It also provided

## Can port operations improve a cement producer's competitive edge?



recommended actions to improve competitiveness through port costs.

Port costs were examined for six dry industrial bulk commodities: coal, petcoke, fly ash, minerals, scrap steel as well as cement and clinker – which are the focus of this article.

## Methodology

To carry out the study, all Spanish ports and port operators in charge of loading or unloading the six bulk commodities were audited to collect data on port dues or fees for vessels, goods, land occupation and nautical services, as well as handling and storage services to estimate their costs in 2017.

To gather the required information from ports in other countries, local shipping agencies completed pro-forma questionnaires.

To evaluate the data and their impact, the consultants built a model which was able to calculate and compare the total port costs, including all port dues and operation costs for different vessel types and operation models.

In Spain, the analysis considered 16 different terminals or port operators for

cement and 17 for clinker. Internationally, the study focussed on eight ports and nine terminals in Turkey (Mersin, Yesilovacik, Antalya and Iskenderun), Italy (Augusta and Pozzallo) and Portugal (Lisbon and Setúbal).

The study differentiated between loading operations (ie, for exports) and unloading operations (for imports) as costs are clearly different.

## Vessels

For cement exports and imports (loading and unloading), the study addressed two types of vessels based on the most frequent types loaded with cement calling in Spain in 2017:

- Type 1: small cement carriers (3375GT) carrying an average 5000t
- Type 2: small general cargoes (3500-4500GT) transporting an average 5300t.

For clinker loading, three different types of vessels were considered:

- Type 1: small coasters (4940GT) carrying 7500t of cargo
- Type 2: Handysize bulk carriers (14,110GT) with cargoes of 20,000t
- Type 3: Supramax bulkers (31,160GT) loaded with 29,000t.



For clinker imports, which were less frequent in 2017, the study only considered Handysize bulk carriers (vessel Type 2).

## Findings

### Port costs for loading largely depend upon terminal type

The port costs for cement and clinker (and generally all kinds of industrial dry bulk commodities) depend on multiple factors, most of which are common to any type of operation and product. These include:

- dimensions of the vessel
- type of operation: ie, a private terminal (in concession) or public quay
- investments in handling and storage facilities
- labour and organisational structure at the port/terminal.

As Table 1 and 2 show, operator-related costs represent more than 50 per cent of total cement port costs. Here capital expenditure (capex) accounts for between 26-45 per cent of total costs while port worker costs range between 4-26 per cent, depending on the type of terminal and movement. It should be noted that more port workers are required to handle clinker compared to cement. On the other hand, investment in cement handling

and storage are more important than for clinker.

Port dues on the vessel call mainly vary according to the size of the vessel, and possible reductions and bonuses granted by different port authorities (mainly due to frequent calls or environmental concerns). The cost of nautical services fluctuates in line with the commercial policy developed by the service providers and port rules about towage or pilotage obligations.

### Cement loading

In the case of cement loading, the best option was observed when a cement carrier is loaded from a public quay (average port cost of €1.94/t). As the vessel is loaded directly from trucks without any specific equipment, this operation does not require any capex and a limited number of port workers.

Loading cement at a dedicated (private) terminal increases the total port cost (up to €4.82/t) because of higher capex supported by the terminal operator, which will push the operation cost up to 72 per cent of the total cost. The land occupation cost (linked to the concession fees) will also increase and account for 9-10 per cent of the total port cost (see Table 1).

### Cement unloading

The average port cost for cement unloading is around €4.90/t. Specific equipment for unloading (eg, ship unloaders, dust-free hopper) and temporary storage at the port (silos, dedicated terminal) are required and the receiver often needs a long-term concession. Most of these terminals are now designed for annual throughputs higher than the current ones. All these factors affect the total cost.

### Clinker loading

In terms of clinker loading, the optimal port cost was observed at dedicated terminals (see Table 2). Under this category, total costs ranked between €3.54-3.72/t, depending on the size of the vessel (compared to €4.20/t on average).

The best vessel size-terminal combination is Handysize bulk carriers loaded with about 20,000t of clinker at a dedicated terminal. Handysize carriers are loaded to full capacity. This is not the case with most Supramax carriers calling at Spain (in 2017 the average amount of clinker loaded on a Supramax was 29,000t). Therefore, Handysize carriers achieve a better economy of scale in terms

**Table 1: port costs for cement in Spain**

Cost type	Average loading cost (€/t)*	Share of total cost (%)	Average unloading cost (€/t)*	Share of total cost (%)
Port dues on vessel call (including port dues on goods in Spain)	0.73	20.4	0.66	13.5
Land occupation and activity port fees	0.35	9.8	1.04	21.3
Nautical services	0.37	10.4	0.26	5.3
MARPOL dues	0.03	0.8	0.03	0.7
Operation and stevedoring	2.06	57.7	2.90	59.2
Other commercial services	-	-	-	-
<b>Total port cost</b>	<b>3.57</b>	<b>100.0</b>	<b>4.90</b>	<b>100.0</b>

\* Cost calculated by authors with average costs given in the study for vessel Type 1 (small cement carrier) and Type 2 (small general cargo)

**Table 2: port costs for clinker in Spain**

Cost type	Average loading cost (€/t)*	Share of total cost (%)	Average unloading cost (€/t)*	Share of total cost (%)
Port dues on vessel call (including port dues on goods in Spain)	0.76	18.2	0.86	21.7
Land occupation and activity port fees	0.43	10.1	0.07	1.9
Nautical services	0.34	8.0	0.27	6.7
MARPOL dues	0.03	0.8	0.03	0.7
Operation and stevedoring	2.58	61.5	2.71	68.4
Other commercial services	0.05	1.3	0.02	0.4
<b>Total port cost</b>	<b>4.20</b>	<b>100.0</b>	<b>3.96</b>	<b>100.0</b>

\* Cost calculated by authors with average costs given in the study for vessel Type 1 (small bulk carrier), Type 2 (Handysize) and Type 3 (Supramax)



of port dues. In addition, the high level of automation at dedicated terminals allows for efficient loading rates of up to 10,000-15,000tpd). These terminals operate 24/7 and their annual throughput is significant (ie, more than 0.5Mta).

However, clinker loading at a public quay or multipurpose terminal is more expensive. Average port costs rank between €4.05-4.94/t for both categories according to the vessel size. At a public quay, nearly half of the port cost is composed of the cost of port workers and investment in cranes and maintenance. The cost of land occupation for multipurpose terminals is higher than average when the volumes of clinker to be handled are low. For both categories, loading rates are lower than at dedicated terminals (~5000tpd) and, thus port dues are higher for the same vessel sizes.

### Clinker unloading

Clinker unloading costs reach €3.96/t on average for operations only run at public quays. Port operator-related costs represent 68 per cent of the total, of which port workers costs account for 32 per cent.

### Regional comparison

For clinker loading, costs at Spanish ports were compared to costs at ports in Turkey and Portugal. For example, the costs given in the study for a Supramax (vessel Type 3) loaded with 29,000t are shown in Table 2. Meanwhile, Table 3 shows that the average total port costs in Turkey were higher than in Spain and Portugal (the latter achieving the lowest port costs). The study leads to the same conclusion with a more detailed analysis.

Looking specifically at port operator-related costs, which represented the major share of port costs across all the terminals monitored, Spain is more competitive than the other two countries. However, Portugal and Turkey have lower port dues on a vessel's call.

The difference between the total port costs in these three countries is small and mainly reflects port operator-related costs and port authority dues. Therefore, to improve export competitiveness through port costs, producers should focus on these two factors.

### Impact of environmental protection costs

The study did not outline separately the impact of environmental considerations for cement and clinker on port costs. The cost of dedusting systems to prevent dust emissions during handling or storage was included in the total equipment or terminal facilities costs. However, some port authorities are applying commercial fees for wheel-cleaners use.

Since 2017, amid growing pressure from local citizens and environmental groups, port authorities in Spain have started to invest in wind screens, walls, sprays and dust control measures. Port operators are increasingly being required to build covered storage or develop dedicated terminals for clinker (like Eiffage's solid bulk cargo terminal being built at the port of Alicante or Cementos Tudela Veguin terminal at Gijón port for the reception, storage and loading of cement) or find new solutions to avoid dust contamination (eg, FYM-HeidelbergCement's enclosed clinker

conveyor at the port of Malaga).

All these improvements are necessary, but will increase capex for operators and, consequently, total port costs. A way to compensate for this could be through the bonus on port dues. Port authorities already apply bonuses on port dues for environmentally-friendly vessels but rarely on goods or land dues for environmentally-friendly clinker operations.

However, the cost of service for a vessels' waste collection (MARPOL Annex I-IV-V and VI), which currently represents about one per cent of total port costs in Spain, is expected to increase in 2020 due to the full application of the International Maritime Organization's directive regarding cutting sulphur emissions. Sulphur cleaned through scrubbers and unloaded in ports will be subject to the MARPOL VI service fee, which at present is almost non-existent in Spain and other Mediterranean countries. The impact of this new regulation could increase freight costs by 10 per cent in Mediterranean-northern Europe routes.

### Future factors for consideration

Analysis of new Mediterranean exporting countries such as Algeria, Morocco or Tunisia was not included in the Puertos del Estado study as clinker and cement exports from these countries was limited in 2017. It would therefore be interesting to update the study in 2020-21, factoring in both environmental-related costs within total port costs as well as these new exporting countries within the Mediterranean region. ■

**Table 3: average port costs in Spain, Turkey and Portugal**

Cost type	Spain		Turkey		Portugal	
	Average port cost (€/t)*	Share in total cost (%)	Average port cost (€/t)**	Share of total cost (%)	Average port cost (€/t)***	Share of total cost (%)
Port dues on vessel call (including port dues on goods in Spain)	0.90	21.4	0.36	6.3	0.25	6.1
Land occupation, operation and stevedoring fees	2.80	66.6	4.86	85.3	3.35	81.5
Nautical services	0.40	9.5	0.50	8.8	0.50	12.2
MARPOL dues	0.04	1.0	0.01	0.2	0.01	0.2
Other commercial services	0.10	2.4	-	-	-	-
<b>Total port cost</b>	<b>4.22</b>	<b>100.0</b>	<b>5.70</b>	<b>100.0</b>	<b>4.11</b>	<b>100.0</b>

\* Cost calculated by authors with average costs given in the study for vessel Type 3 (Supramax) loaded with clinker in Spain

\*\* Average port cost calculated by authors on the basis of port costs given in the study for Antalya, Iskenderum and Yesilovacik terminals

\*\*\* Average port cost calculated by author on the basis of port costs given in the study for Lisbon and Setubal