Portugal
APQuimica - Associação Portuguesa da Química, Petroquímica e Refinação

<table>
<thead>
<tr>
<th>Number of companies</th>
<th>Turnover</th>
<th>National contact</th>
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<tbody>
<tr>
<td>867</td>
<td>€4.879 billion</td>
<td>Luis Araujo</td>
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<td></td>
<td></td>
<td>Director General</td>
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<td></td>
<td></td>
<td><a href="mailto:luis.araujo@apquimica.pt">luis.araujo@apquimica.pt</a></td>
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</tbody>
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Direct employees

14,604

CHEMICAL INDUSTRY SNAPSHOT

The activities classified as NACE 20 + NACE 211, represent about 5.4% of the total GDP of the Portuguese industry.

In comparison to others sectors, the chemical industry has an important role as exporter.

During the last years this sector has kept a good position in the ranking of the exporters, with a stable value of about 12% of the Portuguese export sales.

In 2018 exports of chemical, plastics and rubber products reached the value of €7.1 billions.

This is an increase of 2.6% since 2017.
Chemical Imports

Imports by Product Group
Annual rates of change in value, volume and price
(January to December 2018/2017)
Chemical Exports
Exports by Product Groups and Subgroups
Year-on-year growth rates in value, volume and price
(January to December 2018/2017)
Chemical Exports

- Exports (€ billions)
- Weight of chemicals in export (%)
Chemical imports - main origins (2018)

- Rest of the world: 20%
- Spain: 30%
- Ireland: 2%
- China: 2%
- United Kingdom: 4%
- Belgium: 5%
- Italy: 6%
- France: 6%
- The Netherlands: 8%

Chemical exports - main destinations (2018)

- Rest of the world: 29%
- Spain: 27%
- Italy: 3%
- Belgium: 4%
- Angola: 4%
- The Netherlands: 5%
- United Kingdom: 6%
- France: 10%
- Germany: 12%
Struture of the chemical industry in Portugal

In 2018 there were about 847 companies included in NACE (20+211). Most of the companies classified as chemical industries were small and micro companies, mostly operating in the area of consumer products. Larger operators are involved in activities such as basic chemicals, fertilisers, petrochemicals, polymers and, with less importance, fibers and specialties. There is also a small but dynamic group of companies in the fine chemicals area with its own know-how and a significant contribution to exports.

Number and size of chemical companies

NACE 20 – Manufacture of chemicals, chemical products and man-made fibres, except pharmaceutical products and NACE 211 – Manufacture of basic pharmaceutical products.

| Key facts 2018 | NACE 20 + Nace 211 | % in Section C
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<tbody>
<tr>
<td>Number of companies</td>
<td>867</td>
<td>1.2%</td>
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<tr>
<td>Personnel employed</td>
<td>14,604</td>
<td>2.0%</td>
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<tr>
<td>Turnover (€ million)</td>
<td>4,879</td>
<td>5.4%</td>
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<tr>
<td>Gross fixed capital formation (€ million)</td>
<td>333</td>
<td>7.1%</td>
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<td>Gross added value (€ million)</td>
<td>989</td>
<td>4.6%</td>
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Location of the main chemical industry hubs

Geographically, the chemical industry in Portugal is mostly located in two defined chemical industry hubs in Estarreja and Sines, and in the industrialised areas of Lisbon and Oporto.
Landscape of the European Chemical Industry 2020

1. Porto Area
   - Aromatic production in Matosinhos Refinery (Benzene)
   - Chemicals Specialities
   - Industrial Gases

2. Hub of Estarreja/Aveiro
   - Nitric Acid, nitrobenzene, aniline, hydrogen, carbon monoxide, chlor/alkalis and methylene disocyanate (MDI)
   - Urea-formaldehyde resins
   - PVC

3. Lisbon Area
   - Fertilizers
   - Fibers and Reinforcement technical fibers
   - Chemical Specialities and Pharmaceuticals
   - Industrial Gases

4. Pole of Sines
   - Refinery and petrochemical complex - Ethylene
   - Polyethylene, Butadiene and ETBE plants
   - Terephthalic acid plant (PTA)
   - Urea-formaldehyde resins
   - Industrial Gases
Porto Area

A refinery is located close to the harbour in Porto. This refinery includes an aromatics plant with a capacity of 400 kt/y, where raw materials for the chemical industry, such as benzene, toluene and ortho xylene, are produced. Benzene is used as a raw material at Estarreja, the other products are exported. Several small industries, supplying chemicals for other industries, can be found in the Oporto Area.

Hub of Estarreja/Aveiro

This hub has a significant supply chain integration, accounting for 10% of the total Portuguese chemical industry. Methylene Diphenyl Diisocyanate, or MDI, is the most important output and is produced mainly for export.

Nitric Acid, nitrobenzene, aniline, hydrogen, carbon monoxide and chlor/alkalis, are also produced in this hub by different companies. Large quantities of these products are used in the production chain of MDI, but external sales are also significant. The output of this hub includes other less important products associated with the above main products.

Also located in the same area are other chemicals plants such as PVC and urea-formaldehyde resins.

One of the main raw materials, benzene, comes from a refinery located in Matosinhos (Oporto), about 45 kilometers (km) away. Other raw material, ammonia, is brought by rail from the Lisbon area (300 km), while vinyl chloride monomer (VMC) comes by pipeline (25 km) from the port of Aveiro.

This hub is considered an efficient site, mainly export-oriented, with good links to universities mainly Aveiro (about 20 km away), Porto (40 km) and Coimbra (80km).

Concerning logistics, the hub uses the port of Aveiro (25 km), railways and a motorway junction (enabling connections with the whole of Portugal, Spain and Europe). There are some points which can be improved, such as the transport of benzene and the railway connection with the harbour of Aveiro.

The strong dependency on one output (MDI) is the weak point of this hub, limiting the development strategy.

Lisbon Area

In the past there were two important hubs for chemicals in the Lisbon area. Since 1985, for competitiveness and environmental reasons, plants producing basic chemicals, which were the basis of these hubs, have been disabled.
The Lisbon area still has sizable chemical units in the field of middle-sized plants such as fertilisers, fibers and reinforcement technical fibers, specialties and pharmaceuticals. These industries are not interconnected, and the plants are in different locations, so they do not constitute a chemical complex. Their competitive edge comes from the central location of Lisbon, the good logistics conditions - such as the port of Lisbon, railways, motorways - and the importance of Lisbon as a consumption centre for final consumers and downstream users.

Lisbon has two highly esteemed universities with a technology curriculum.

The sales of the chemical industry in the Lisbon area are roughly estimated to represent about 35% of the national total.

**Pole of Sines**

Developed in the early 70s, Sines is a petrochemical complex at the coast and 150 km south of Lisbon. The construction started in the middle of that decade, with a 10 million tonnes refinery and an ethylene plant. The ambitious initial plan was affected by the two oil crisis, and the growth of the complex was slower than planned. At present, in addition to the refinery and the ethylene plant, there are plants for the production of polyethylene, butadiene, and ethyl tert-butyl ether (ETBE). In the same complex there are also plants for the production of terephthalic acid (PTA) and urea formaldehyde resins. Local utilities include a large coal power plant.

The sales from Sines represent about 20% of the Portuguese chemical industry. This figure can be some points higher, with the stabilisation of the 600 Kilotonnes /year PTA plant.

The main logistic strength of the complex is a deep water harbour (28 meter) capable of receiving ships up to 350 kt. This harbour, planned together with the refinery, now receives different kinds of bulk cargoes, including liquefied gases, liquids and solids. A container terminal was added some years ago. Near the harbour there is a large LNG storage facility, linked to a LNG maritime terminal connected with the natural gas transport network. The complex also has a railway connection.

The refinery recently underwent a deep revamping and its competitiveness has been improved.

In the near future, it will be possible to evaluate the production capacity of the ethylene plant.

**HOW ARE WE DOING**

**Strengths**

- Logistics

Portugal, being a peripheral country in Europe, is well placed in relation to other continents – North America, South
America and the Western and Northern coast of Africa.

The expansion of the Panama canal will allow much larger ships to pass through, and most of the traffic between Asia and Europe is expected to use it. Then Sines will be the closest European harbour. The railway connections between Sines and Europe are already being improved and the general logistic conditions of this hub will improve considerably.

Sines has good conditions for receiving LNG from the US and will be an appropriate entry to Europe, as soon as the capacity of the pipelines between Spain and France has improved.

- Know-How

The chemical industry in Portugal is supported by the availability of competences at the different levels, at reasonable costs. There are good chemical engineering schools and research in the universities has been improving considerably during the last 15 years.

Weaknesses

- The value chain in the Portuguese chemical industry has significant gaps, mainly in the field of intermediate products. Therefore production processes are not fully integrated.
- Electricity costs are higher in comparison to the average in Europe, especially since Portugal is a big consumer. The electric power connections between Iberia and the rest of Europe are poor, making it difficult to develop of a real competitive market in Portugal and Spain.
- Portugal does not have natural gas reserves. There are good facilities to import LNG, but pipeline connections are limited to just one supplier (Algeria). This means that the price of natural gas cannot be better than in other European countries, which means high figures compared to other world regions.

OUR CONTRIBUTION TO A COMPETITIVE EUROPE

The segment of chemical specialties for the manufacturing of pharmaceuticals has been quite dynamic in Portugal during the last years. The number of companies in this segment is limited, but their growth, both in terms of number of patents, production and employment, has been quite substantial. The cost of energy and the difficulties of financing are not relevant for this segment, which supports its ability to grow in the development of know-how and in the availability of qualified human resources at reasonable costs.

Production of Nano-materials is being developed in Portugal. Additionally, the Iberian Nanotechnology Lab, located in the north of Portugal, with its state of the art facilities and top researchers from all over the world, is expected to drive the widespread of nanotechnology throughout the industrial landscape.

The segments related to forest products should also be watched. Portugal has an extensive area covered by pine and eucalyptus woods which support industries of cellulose, paper and wood based panel production. These industries induce the development of several segments of chemicals. For instance, they justify the existence of plants of Urea
formaldehyde resins and they are important consumers of the chlor-alkali products. Related with the pine woods, there are some chemical companies producing derivatives of the resins, which are quite competitive in the external market.

Landscape of the European Chemical Industry Website:
http://www.chemlandscape.cefic.org/country/portugal/