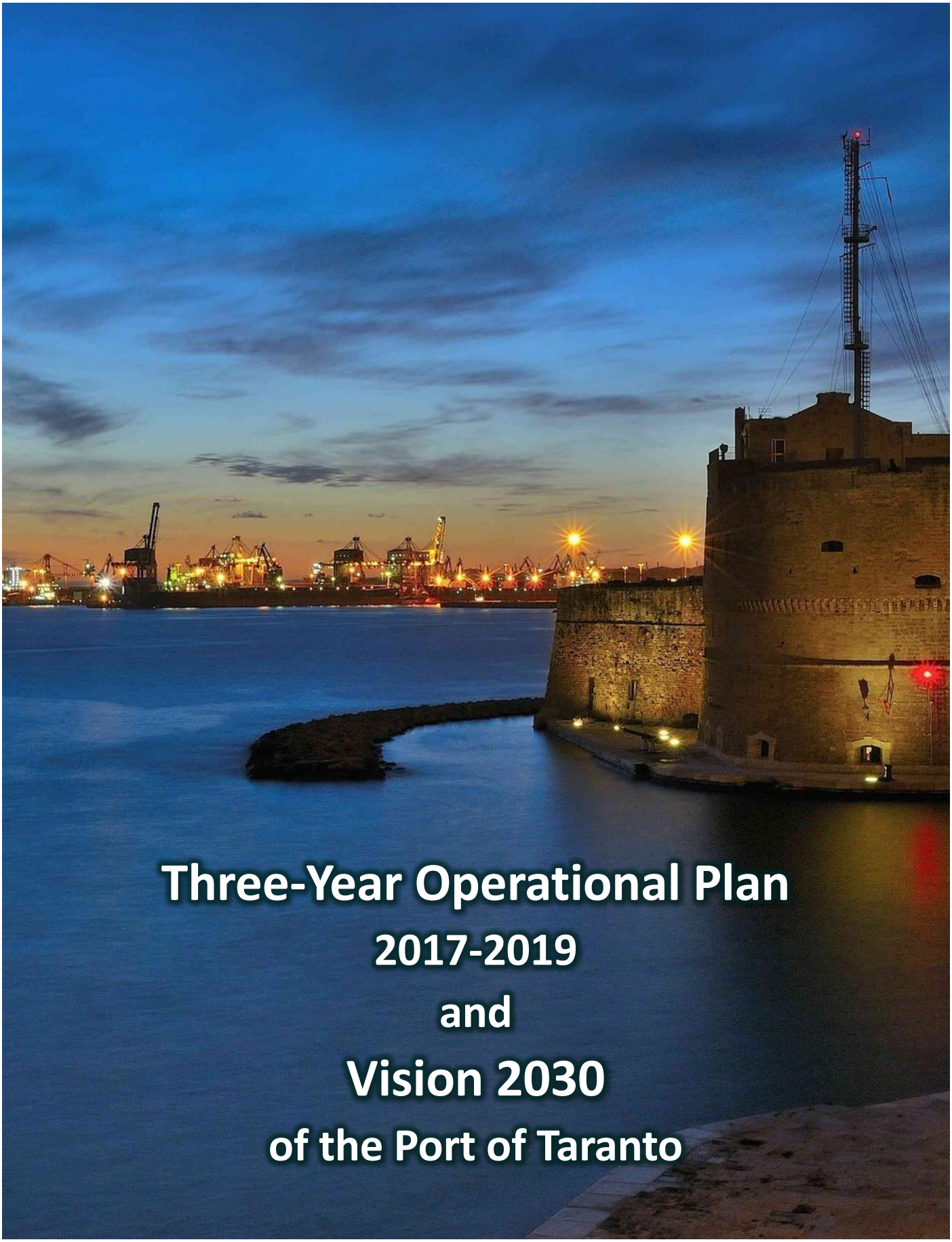

Three-Year Operational Plan
2017-2019
and
Vision 2030
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AUTORITÀ DI SISTEMA PORTUALE
DEL MAR IONIO
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This Three-Year Operational Plan 2017-2019 and Port Vision 2030 of the Port of Taranto has been prepared by the Port System Authority of the Ionian Sea with the support of Ernst & Young - Financial Business Advisors S.p.A (EY).

EY work team:

- *Donato FERRI*
- *Antonella SCARDINO*
- *Giulia AMATI*
- *Martina PRIMAVERA*
- *Matteo PEDRALLI*
- *Vincenzo DI ROCCO*
- *Vittorio TORBIANELLI*
- *Vittorio MARZANO*
- *Dario APONTE*
- *Daniela TOCCHI*

A generous collaboration was provided also by:
Federico PIRRO (University of Bari), Remo PASQUALI (Eni), Giancarlo QUARANTE (Ilva), Roberto LAGHEZZA (RFI), Roberto ALBORÈ (Vestas).

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AUTORITÀ DI SISTEMA PORTUALE DEL MAR IONIO
PORTO DI TARANTO

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PART I. THE CONTEXT OF REFERENCE

1. THE GLOBAL ECONOMIC AND GEOPOLITICAL CONTEXT

Global geopolitical equilibrium is experiencing a notable instability which seems destined to last and which compromises the safety of people, places and goods. High tension is animating global political scenarios: against a widespread reduction in the ability to control the territory by state authorities, advanced economies and Europe in particular, are once again faced with tackling numerous emergencies in terms of safety. Alongside the intensification and upsurge in episodes of international Islamic terrorism, apparently acquiring less and less weight, in fact - in terms of unforeseeability and impact - are social-economic threats (healthcare, employment, political consent, etc.) deriving from mass phenomena such as migration, environmental phenomena, cyber-attacks, each one of which requiring specific measures for the prevention and mitigation of risks.

The outcome of political movements which shook North Africa during 2009 has led, on the one hand, to an increase in the number of people fleeing from war zones, feeding a **segment of human beings in the waters of the Mediterranean**; on the high hand, the instability of local governments has represented and represents a factor of net **worsening in the business environment**, with very evident negative impacts on tourist flows (in 2016 -1.1% of cruise traffic was recorded compared to 2015), on trade and on the investments. A Survey conducted by EY on the Euro-Mediterranean area showed that investors confirmed their interest in investing in the area, mainly in infrastructures (22%), real estate and hospitality (19%) and the manufacturing sector (18%), under the condition that governments intervene to improve the political stability of the region, increase the safety of persons and goods and increase the quality of educational systems.

If the Euro-Mediterranean area directly suffers the impact of regional tensions, the geopolitical climate is also uncertain at global level. The increase in consent by populist political movements, also in more advanced economies, threatens the hold of macro-regional stability, with potential impacts on the entire global economy. In recent months the intensification of mutual pressure between Russia and the United States; the British referendum approving the United Kingdom's exit from the European Union; Donald Trump's victory in the American elections, the participation of the USA in the Paris Agreement on the environment; the coup de stat in Turkey and closely related anti-democracy: all these factors contribute to generating a climate of uncertainty which has **a strong impact on policies and strategic choices,** requiring great flexibility from the policy makers and market operators in order to tackle the challenges of the near future.

Transport infrastructures – in particular ports and airports - are particularly subject to such risks inasmuch as on the one hand they represent a **strategic target for terrorist attacks** (also the cybernetic type) and on the other a **port of access** becoming constantly less controllable in the heart of countries and economies. In a highly competitive global context in which the instabilities described above comprehensively threaten even **the reliability of long term forecasts**, the awareness of global economic and geopolitical trends constitute a fundamental element for defining strategies which are on the one hand of a sufficiently long term to guarantee **efficient planning** and on the other equipped with a certain degree of flexibility to be adapted to particularly volatile circumstances.

The main economic and geopolitical trends having an impact on the mobility of goods and people are summarised below.

1.1. General economic trends and the mobility of goods and people

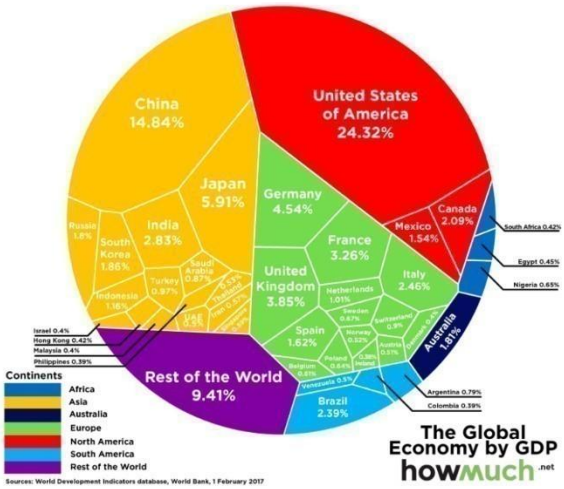
After almost ten years since the beginning of the great global economic and financial crisis, the world economy is showing signs of recovery. Albeit at slower rhythms respect to the pre-crisis period, a comprehensive growth in the world GDP is recorded, having diversified trends between less developed countries and advanced economies: although the former continue to record high growth rates, these have decreased compared to the past (China changed from +10.6% in 2010 to +6.9% in 2015), while growth in advanced economies experienced an acceleration in the years immediately after the crisis.

With 24.3% of the world GDP, the United States continue to be the most important economy, followed by China (14.8%) and Japan (5.9%). Considered as a whole, Europe would be in second place, with 21.37% of the global GDP[1].

Double the world GDP will be recorded in the long term against a strong demographic increase, such expansion driven by non OECD countries (regarding which a growth of 175% is estimated for 2040, against 60% of the economies of OECD countries). The GDP for China shall reach 20% of the global GDP.

In a similar manner to the general economic trends, **international trade** began to slow down from 2012 as well, showing an inverted trend compared the pre-crisis period in which the increase in global trade was progressing twice as fast respect to the growth in the GDP. The slowdown in the growth of trade also corresponds to a fall in global trade in value, caused, in particular, by strong reduction in prices of raw materials - including energy sources.

Figure 1: Global Economy by GDP



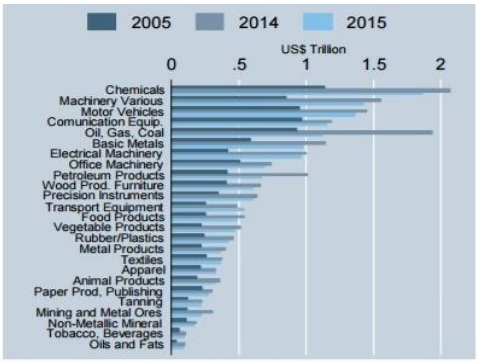
Source: World Bank, World Development Indicators Database (2017)

Trade by sea, which had recorded a constantly increasing performance and higher growth rates than those of the GDP and global industrial production in the last decade, was affected by the weak recovery following the crisis: against an increase in the global GDP of 2.5%, in 2015 trade by sea only grew by 2.1%.

If one were to identify the three regions which mostly contribute to global trade in North America, Europe and East Asia, one realises that trade flows underwent a slowdown in all three regions in 2015, albeit with a few differences: for example where traffic directed towards economies undergoing a phase of transition have decreased the most, traffic from/to North America have been relatively more constant. Despite the fall in 2015, intermediate products continue to represent an important part of global trade (approximately 7,000 billion dollars in 20150. Trade in consumables and capital proved to be more resistant, having suffered a slight reduction in 2015. Such flows are estimated at around 4,000 and 2,500 billion dollars respectively.

A large part of the global trade, given in value of goods, concerns energy productions (petroleum, gas, carbon), chemical products, plants, machinery and engines. To the contrary, light manufacturing occupies the lower part of the classification, also under the agro-food sector.

Figure 2: Trade of goods by sector

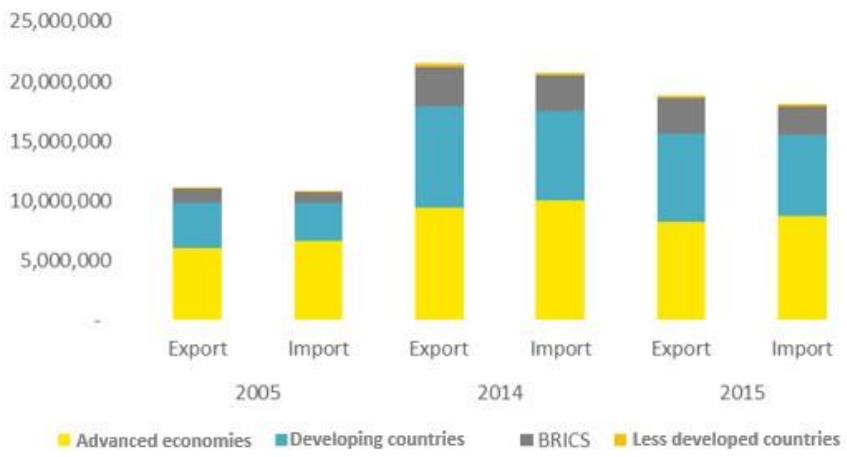


Source: UNCTAD, Key Statistics And Trends in International Trade 2016 (2016)

[1] World Economic Forum, The world's 10 biggest economies in 2017, 2017 (https://www.weforum.org/agenda/2017/03/worlds-biggest-economies-in-2017)

As the following graph highlights, the participation of developed countries and those under development (including the BRICs) is almost equivalent both in terms of import and in terms of export. Trade associated to less developed countries, although minority, in any case represents an important part of international trade, above all regarding importation.

Figure 3: Exported and imported goods (Mln $ at current prices)

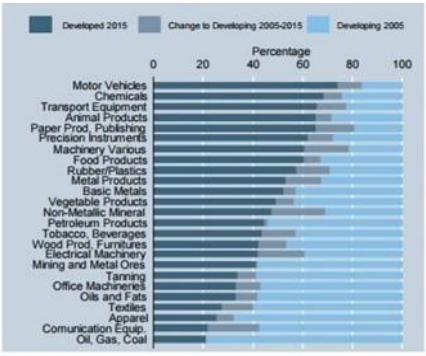


Source: EY elaboration on UNCTAD source, Key Statistics And Trends in International Trade 2016 (2016)

Among the regions under development, nonetheless, participation in international trade varies significantly, with a predominant role carried out by the BRICs, above all in the trade of intermediate products and export of consumables.[2] In particular, whereas **volumes of export** from less developed countries have grown at annual rates of 10% between 2003 and 2008, the growth rate in 2015 was about 1%. Despite the fact that for many countries, including China, traffic has plunged both in terms of import and export, the presence of countries under development has increased substantially, both in absolute terms and respect to the most developed economies: the market share of such countries in export has grown in all sectors, particularly those related to machinery, non metallic minerals and equipment for communications.

In advanced economies, volumes of trade have continued to grow, albeit at lower rates.

Figure 4: Portion of the market of exportation

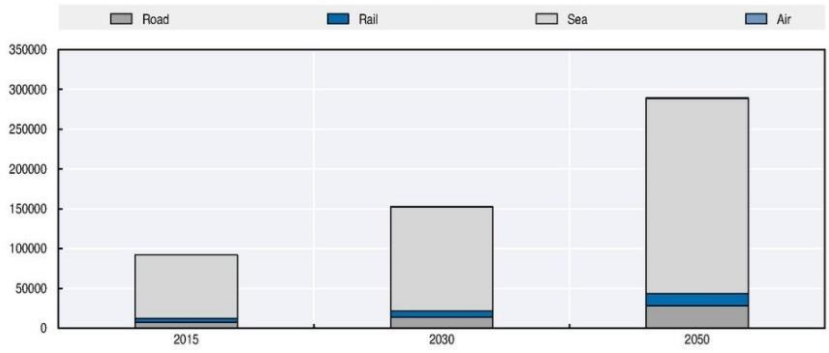


Source: UNCTAD, Key Statistics And Trends in International Trade 2016 (2016)

[2] UNCTAD, Key Statistics And Trends in International Trade 2016, 2016 (http://unctad.org/en/PublicationsLibrary/ditctab2016d3_eno.pdf)

Considered as a whole, the decreasing trend in demand of international trade, together with a growing recourse to protectionist policies, means that long term forecasts are cautious. Failed international negotiations for stipulating trade agreements with the TTP (Trans-Pacific Partnership) and the TTIP (Transatlantic Trade and Investment Partnership) denote a climate of widespread uncertainty concerning developments in global trade trends. The Transport Outlook 2017 of the OECD predicts that the growth rate in international trade could surpass the growth rate of the GDP once again in 2050, however with lower values compared to the pre-crisis decades (+3.5% per annum, against +6.9% per annum for the period 1990-2007). In the provisional scenario of reference of the OECD, China and India shall dominate world trade, with a portion of 27% of global exportation; outgoing flows of goods in the European Economic Area and from Turkey shall be reduced by 33% of the total in 2015 and 20% in 2050. Predictions also suggest substantial changes in the **merceological mix**, with a growth in manufactured goods (31% of the total) and a fall in fuel and material such as plastic and rubber mainly due to the progress along the value chain of economies of less developed countries which shall experience changes in their production and consumption models. Largely unchanged, instead, is **the modal composition of freight transp**ort, with a strong prevalence - in terms of tonnes-km - of sea transport. Nonetheless, an increase in road traffic may come about due to the growth of interregional interchange volumes, above all in developing countries, the railway network of which may prove to be inadequate for supporting such increases.

Figure 5: Volumes of international freight transport by mode



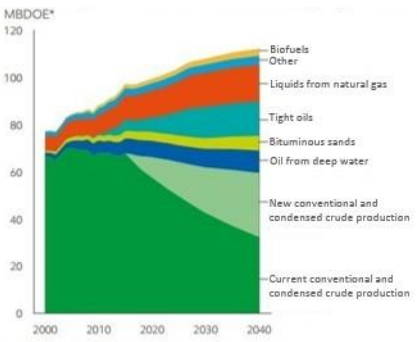
Source: OECD/ITF, Transport Outlook (2017)

1.2. The energy market

The energy market is showing very accentuated growth trends. As a whole, **global energy demand** shall increase by around 30%, with a generalised increase in demand for all sources of energy. The percentage would be even higher in the absence of technologies and investments for energy efficiency. Despite this, hundreds of millions of people shall still be without access to basic energy services: according to data from the World Economic Outlook, five hundred million people, concentrated into the rural areas of Sub-Saharan Africa, shall be wholly devoid of modern energy supply systems, whereas 1.8 billion people (a fall compared to the current 2.7 billion) shall still rely on solid biomasses for cooking food, with consequent damage to their health.

The increase in demand is accompanied by an evolution in the **energy mix**, functional to meeting the demands of a global economy which is changing: Exxon Mobil predicts that 55% of the global energy demand in 2040 shall derive from new requirements generated by the digital market and connectivity. Particularly favoured - in terms of demand - shall be low carbon intensity energy sources; natural gas is the absolute energy source which shall record the most positive trend (+50% of consumption). In any case petroleum shall continue to be the main source of procurement for the transport industry and production in strategic sectors, such as the chemical sector.

Figure 6: Liquid sources highlight technological progress

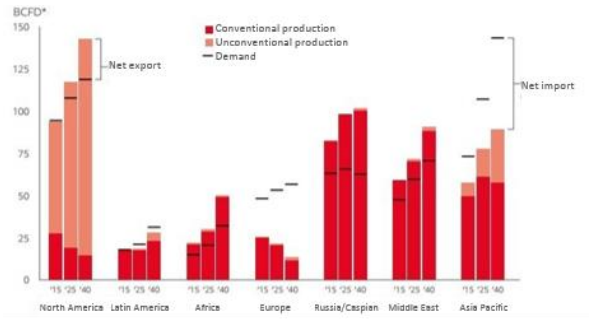


Source: Exxon Mobil, Energy Scenarios to 2040 (2017)

The increase in energy demand, albeit constituting a widespread

phenomenon on global scale, is expressed with notable differences in the different geographical areas. If energy demand in non OECD countries in 2015 is equal to 60% of the global total, such portion is destined to rise further in 2040. The medium term energy scenarios show a developing geography. Indeed, if, as a whole, world economic growth shall represent a driving force of the increase in energy requirements, this shall not take place to the same extent in all the geographic areas. Energy demands in India shall continue, for example, to grow at high rates, whereas China shall experience an acceleration in the transition to an economy based on less intensive use of energy. In OECD countries it has already been verified that economic growth has caused a fall in energy demand, both by effect of saturation and due to savings deriving from energy efficiency: when one observes the data for the period 2000-2014, both in Japan and the European Union, after a peak in demand which took place in 2004 and 2006 respectively, there was a fall of more than 10%. For non OECD countries, instead, every percentage point of growth in the GDP has a corresponding increase in energy demand of 0.7%.

Figure 7: The gas offer highlights the diversity in the geographical areas



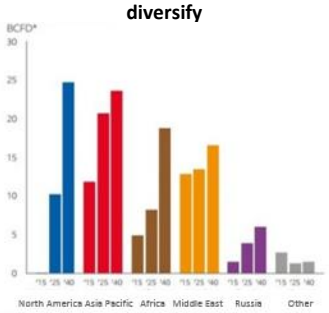
Source: Exxon Mobil, Energy Scenarios to 2040 (2017)

As demand changes, the energy offer also evolves. Liquid sources, which continue to represent an important portion of the energy mix, shall experience an increase in production, which shall require considerable investments in order to diversify the risk deriving from exhausted existing deposits.

The offer of gas shall reveal a strong geographic differentiation, according to Exxon Mobil forecasts, both in terms of quantity of gas produced and in terms of diversified production. Where the region of North America is that which shall experience the greatest increase in production in absolute terms, the area of Russia/Caspian Sea continues to be the first region for net exportation. Europe, instead, shall increase its dependence on importation as far as the use of gas is concerned.

The offer of LNG shall increase as a whole, of which North America becomes the first exporter. With a strong excess of offer over demand, the gas market shows imbalances in terms of price. The World Energy Outlook predicts, nonetheless, that there may be a transformation in the gas market in the next 25 years, triggered from factors such as new exporters entering the market, a diversification in the global offer permitted by the diffusion of non conventional gas, investments in floating storage and regasification units allowing an increase in the trade portion of gas over long distances (from 42% in 2014 to 53% in 2040). Such perspective is called into question from the competiveness of renewable energies, the prices of which are bound to become lower and lower.

Figure 8: Exports of LNG expand and diversify



Source: Exxon Mobil, Energy Scenarios to 2040 (2017)

1.3. The new Customs Code for the European Union (UCC)

Important innovations on the matter of trade were introduced with the adoption of the new **Union Customs Code** which came into force on 1st May 2016[3]. This text, which constitutes a collection of all the customs provisions already in force in the European Union, to which new computerised operational norms are added, represents the outcome of a wide scale coding operation of community law, carried out in order to provide a framework of reference which is clear and easily accessible for all entities interested in customs activities.

The new provisions cover all environments linked to customs checks: customs, representation, decisions concerning the application of the customs normative, the regulation of the authorised economic Operator, sanctions, appeals, conservation of documents, remission of duties upon importation or exportation, extinction of the customs obligation), guarantee, regulation regarding goods entering the customs territory of the Union, general norms on the

[3] The regulatory framework of reference includes: (i) Reg. (EU) no. 952/2013 of 9 October 2013; (ii) Delegate reg. (EU) no. 2446 of 28 July 2015; (iii) Implementation reg. (EU) no. 2447 of 24 November 2015; (iv) Transitory delegate reg. (EU) no. 341/2016 of 17 December 2015; (v) Implementation reg. (EU) no. 481/2016 of 1 April 2016; (vi) Decision of execution (EU) no. 578 of 11 April 2016.

matter of customs declarations and other simplifications, release into free circulation and exemption from import duties, special regimes and output of goods from the customs territory of the Union.
In order to guarantee the validity of the adopted decisions and authorisations issued by effect of the previous normative, a transitory period is foreseen until 1st May 2019 to allow adaptation to the new legal provisions. The Code solely applies between the European Union and third party countries, as there are no customs checks among the Member States of the EU. Customs law and regulations shall, instead, be the subject matter of negotiation regarding the United Kingdom's exist from the EU following last year's referendum.
Among the main objectives of the new Union Customs Code are those **to facilitate legal sea traffic and reduce obstructions to trade** between the countries of the European Union and third party countries. In this sense, the adoption of **simple, rapid and standard customs procedures as well as the use of technologies and online systems for communication** are essential elements in order to pursue such objectives. As deduced from the New Customs Code, the member States collaborate with the Commission in the development, constant updating and use of electronic systems to exchange information between customs authorities and the Commission, as well as archiving such information[4]. All exchanges in information, such as declarations, requests or decisions, between customs authorities as well as economic operators and customs authorities and storing such information, as required by the customs normative, are carried out by means of **computerised procedures**[5]. Another element of impact on sea traffic is represented by obtaining **AEO certification (Authorised Economic Operator),** provided under the New Customs Code.[6] By means of such provision not only those operating in the logistics chain, as has taken place until now in Italy, but all companies which buy or sell, from or to foreign countries, are called to adapt to customs compliance, which, indeed, requires that prior assessment of reliability is obtained when managing customs activities and assessment of financial solidity. For this reason all the facilitations and simplifications provided under the Code are subject to obtaining such certification which favours, amongst others, **less incidence of customs activities on the checks** and consequently on delays in delivering the goods. Furthermore, the New Customs Code repeals processes of incomplete declaration and domiciled procedure, exclusively providing that of the **simplified declaration**. The latter allows a declaration to be presented with reduced data or absent of accompanying documents. This change is not devoid of consequences, inasmuch as imports by means of domiciled proceedings represent the most relevant part of customs operations. In fact in 2015, 85% of customs declarations took place by means of the domiciled procedure, equal to about 4.5 million import declarations and 11 million export declarations[7]. In order to remedy the possible decrease in fluidity of sea traffic, the Customs Agency has, however, envisaged a solution requiring that declarations carried out by domiciliation procedure are considered as "normal customs declarations", in conformity with art. 139 of the New Customs Code. Therefore the spaces authorised previously for fulfilling the domiciled procedure shall be automatically recognised as "other locations approved by the customs Authorities" for the presentation of goods.

1.4. The mobility of people

Global scale mobility of people is constantly growing. 2016, for example, was the seventh consecutive year of growth for tourism at global level. Data from the World Tourism Organization (UNWTO), in fact, show that in the last three years the increase in international arrivals reached 3.6% in 2014, 4.4% in 2015 and 3.9% in 2016, an increase that is in line with recorded data over recent decades. Indeed, 435 million international arrivals were counted in 1990 whereas the data recorded at global level in 2016 is 1.23 billion arrivals.
Growth trends differentiate by geographical area. In 2016 UNWTO data show that Europe is the most visited area in the world with 620 million international arrivals, with an increase of around 12 million tourists (+2%) compared to 2015. In particular, northern Europe (+6.4%) and mid and Eastern Europe (+4.0%) had the greatest increase in tourists

[4] Source: Article 16 Regulation (EU) no. 952/2013

[5] Source: Article 6 Regulation (EU) no. 952/2013

[6] Source: Article 38 Regulation (EU) no. 952/2013

[7] Source: Ecnews. From 1st May 2016 , the new Union customs code 2016 is in force (http://www.ecnews.it/wp-content/uploads/pdf/2016-06-06_dal-1-maggio-2016-in-vigore-il-nuovo-codice-doganale-dellunione.pdf)

in 2016, while arrivals in the Mediterranean Area (+1.4%) and Western Europe (-0.3%) were affected by terrorist events hitting countries like France and Turkey.

Growth forecasts for 2017 are based on a scenario of moderate global economic recovery, with more positive values in advanced economies and constant growth in a large part of countries under development. Increased spending power of middle classes in many emerging markets, an increase in air connections and fall in comprehensive travelling costs are considered the driving force behind the growth in tourism in 2017, above all in Asia and the Pacific. China shall continue to constitute the main market for outbound tourism, whereas the United States - also due to the stronger dollar, shall feed the growing flows in the Americas. In many regions, conflict and geopolitical tensions shall continue to establish a risk for tourism.

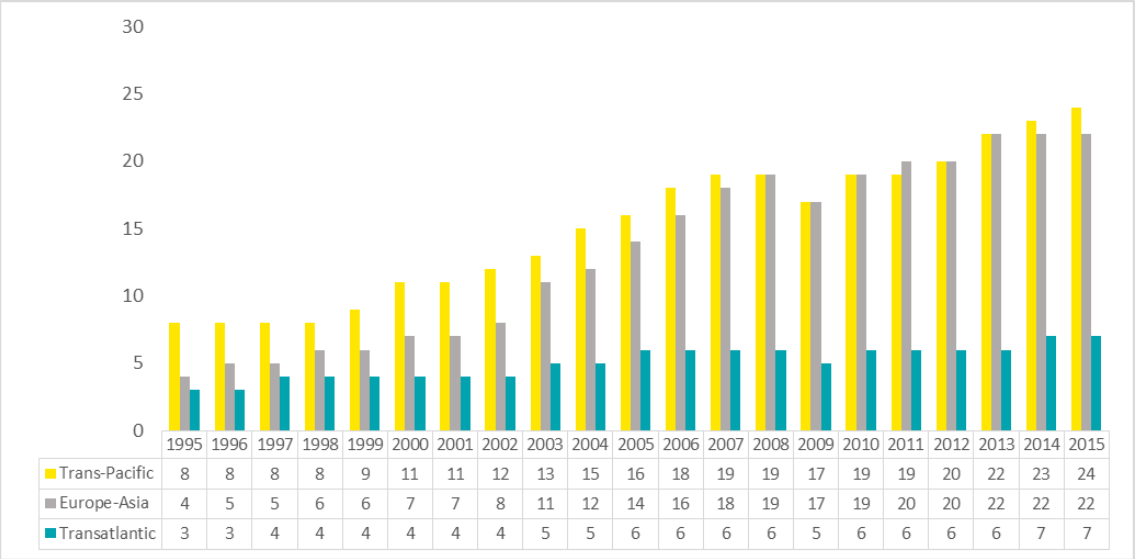
Estimates to 2030 also show a positive trend: at current growth rates, international arrivals shall amount to about 1.8 billion in the next 13 years.

2. THE CHALLENGES OF PORTS AND SHIPPING TO 2030

2.1. International dynamics, policies and trends

As shown in Chapter 1, the growth in trade by sea proves to have slowed down, both in absolute terms and in relation to the growth in GDP and world industrial production: for the first time in decades, against a growth of 2.5% of the global GDP, trade by sea recorded a lower increase in 2015 (+2.1%). At global level, observing the comprehensive movement of goods in 2015 by geographic area, a strong prevalence of trade from and to Asia is recorded: indeed, 41% of the world's loadings and 60% of unloadings take place in this continent. As regards container flows, a mapping of the main routes highlights the decline of the Europe-Asia route, which had surpassed the transpacific route from 2009 to 2011. Data for 2015 indicate that not only has this been exceeded again, but a trend in decline is also recorded, the opposite of that for the transpacific route[8].

Figure 9: Container freight flows for the major container East-West trade routes from 1995 to 2015 (Mln TEU)



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Trans-Pacific	8	8	8	8	9	11	11	12	13	15	16	18	19	19	17	19	19	20	22	23	24
Europe-Asia	4	5	5	6	6	7	7	8	11	12	14	16	18	19	17	19	20	20	22	22	22
Transatlantic	3	3	4	4	4	4	4	4	5	5	6	6	6	6	5	6	6	6	6	7	7

Source: UNCTAD, Review of Maritime Transport (2016)

Among the main global routes, the Europe-Asia route is the one with the most negative data in 2015, with a decline of 1.35%, whereas the transpacific and transatlantic routes grew by 3.15% and 3.03% respectively compared to the

[8] UNCTAD, Review of Maritime Transport (2016)

previous year[9]. Important infrastructural investments and economic circumstances contribute to redesigning the routes and dynamics of global shipping, with potentially disruptive consequences on the Italian ports system.

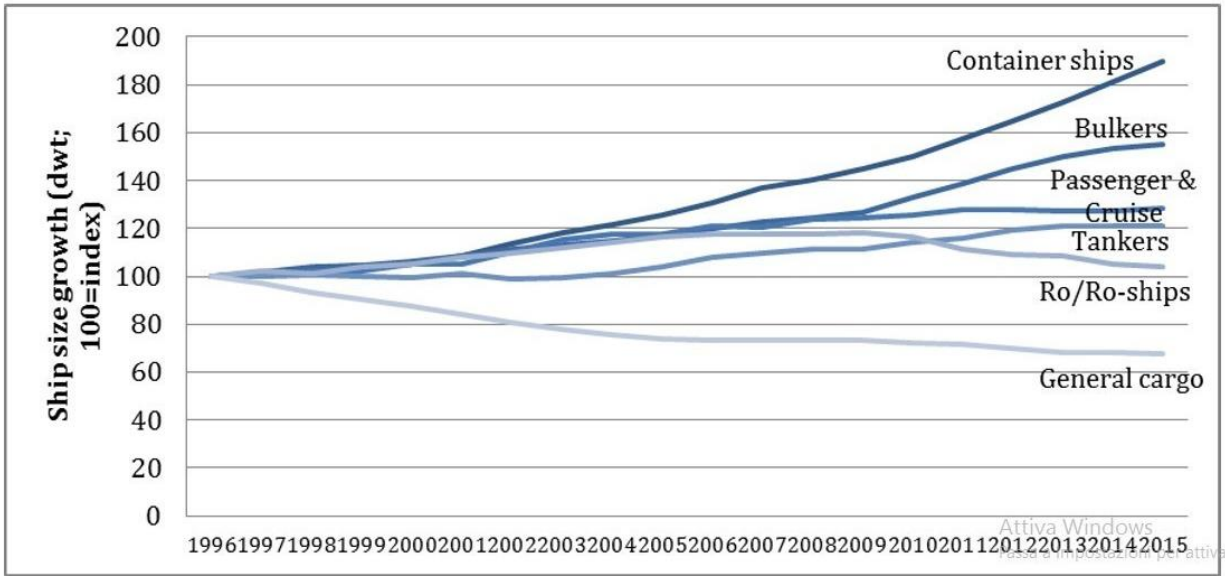
2.1.1. Dynamics and developing trends in the shipping markets

International observatories identify compatibility with the increasing size of vessels among the main challenges for the "ports of the future". The phenomenon of **naval gigantism** is nothing new in the current panorama of development in world shipping, nonetheless in recent years it has assumed a new central role within the extremely fast development that particularly concerns the container and cruiser sectors, with relevant implications in terms of both port infrastructure requirements and the actual dynamics of the geography of the flows.

As deduced from the following figure, which explains the development dynamics for recent decades in terms of the average size of the vessels used in various sectors of shipping, container ships have undergone the greatest increase in size – +90% in dead weight tonnage from 1996 to 2015 – also with an exponential curve, however other vessel segments have also experienced considerable growths. Shown in table 1, instead, are data related to the current top class ships in the various sectors.

That said, it seems important at this time to ponder on the possible evolutionary trajectory of naval gigantism, the repercussions this shall have in terms of developments in the services network and how this shall affect the port system.

Figure 10: Dimensional development of vessels 1996-2015



Source: OECD/ITF, the impact of Mega-Ship (2015)

Table 1: Dimensions of the largest ships

SHIP TYPE	NAME	LOA	BEAM	DWT	GT	DRAFT	SINCE
Container	MSC Oscar	394	59	197,362	193,000	16	2015
Container	CSCL Globe	400	59	184,320	187,541	16	2014
Oil tanker	TI Class	380	68	441,893	234,006	24.5	2002
Bulk carrier	Valemax	362	65	400,000	200,000	23	2011
Cruise ship	Oasis class	360	60.5	15,000	225,282	9,3	2009
Container	OOCL Hong Kong	400	59	197,500	210,000	16	2017

Source: OECD/ITF, The impact of Mega-Ship (2015)

[9] Shanghai International Shipping Institute, *International Shipping Market Analysis Express* (2016)

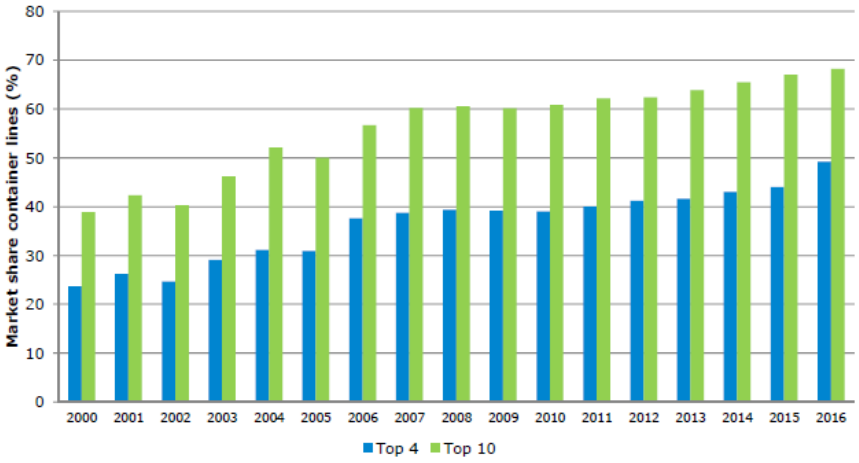
As regards container traffic, according to the most recent findings[10], the order book for the main world operators of container ships recorded - in January 2017 - that more than 290 new ships have been ordered, having a total capacity of more than 2.7 million TEU, against a comprehensive capacity of existing ships of about 20 million TEU. The average size of the new vessel is almost 9,000 TEU, which is more than double the 4,000 TEU of the current fleet. Limiting the analysis to solely the first 10 companies by controlled capacity, the average size of the ordered ships is around 12,500 TEU against 5,500 of the current fleet. Furthermore, the number of top class ships, meaning ships having a capacity exceeding 18,000 TEU, shall grow from 47 units in early 2017 to 105 units in late 2019.

On the other hand, there is no lack of signs of reversed trend or at least a stop in progress. As recent studies have revealed, obtainable scale economies, albeit still relevant in unitary terms, are rapidly declining with the growing size of the ship and depend, above all, at over 60% on technological improvements to engines (which could therefore be transferred to ships of a smaller size) and are easily limited or annulled in the case of filling coefficients (or use of capacity) that are slightly lower. Not to be neglected, moreover, are issues concerning the safety of navigation, difficulties in rescue and recovery in the event of an incident, the value of transported merchandise and consequent cost of the related insurance policies. Last but not least in importance, new orders have fallen as a whole: between January 2016 and May 2017 new orders were completed for a total capacity of solely 341,000 TEU, for an average size of just 3,216 TEU/ship and no new order for ships exceeding 18,000 TEUs. This may be partially linked to a contingent strategy linked to managing the excess offer on the part of shipping companies.

On the other hand, gigantism appears to be related to another two phenomena which are excess capacity (and consequent decrease in freight) and consolidation of the sector. Thus far, in fact, precisely regarding the relations in which the presence of mega ships is mainly concentrated, the pressure on freight markets was at its strongest, even up to concerning levels, leading to the suspicious that the bigger players continue this mad race to gigantism in order to increase their portion of the market, even at the cost of making business hardly or not at all profitable. In actual fact the beginning of 2017 recorded negative financial performances for the sector, as also 2016, which was a year of crisis for the container ship sector. Apart from the matter of the Korean Hanjin Shipping company, whose bankruptcy caused the coastal block of more than 80 container ships, forcing the Korean government to carry out an imposing financial intervention in order to solve the crisis, this is the sector which, as a whole is under pressure. It is estimated (source: National Strategic Plan for Ports and Italian Logistics) that, at global level, the container sector loses between 5 and 10 billion dollars per year. The Maersk Line, having realised profits of 32 million dollars in the first quarter of 2016 (compared to 736 in the same period of 2015), recorded a loss in the following four. On the other hand, a strong correlation was found between consolidation of the offer and gigantism. Contemporarily to the huge emission of capacity and dimensional growth, in actual fact a notable concentration of the offer was recorded: whereas the first 20 companies controlled less than 50% of the available hold capacity in 2000, in 2008 such percentage had risen to almost 70%, while in early 2017 it arrived at exceeding 88%. Looking at the first 10, the percentage is 73%.

[10] Alphaliner (2017)

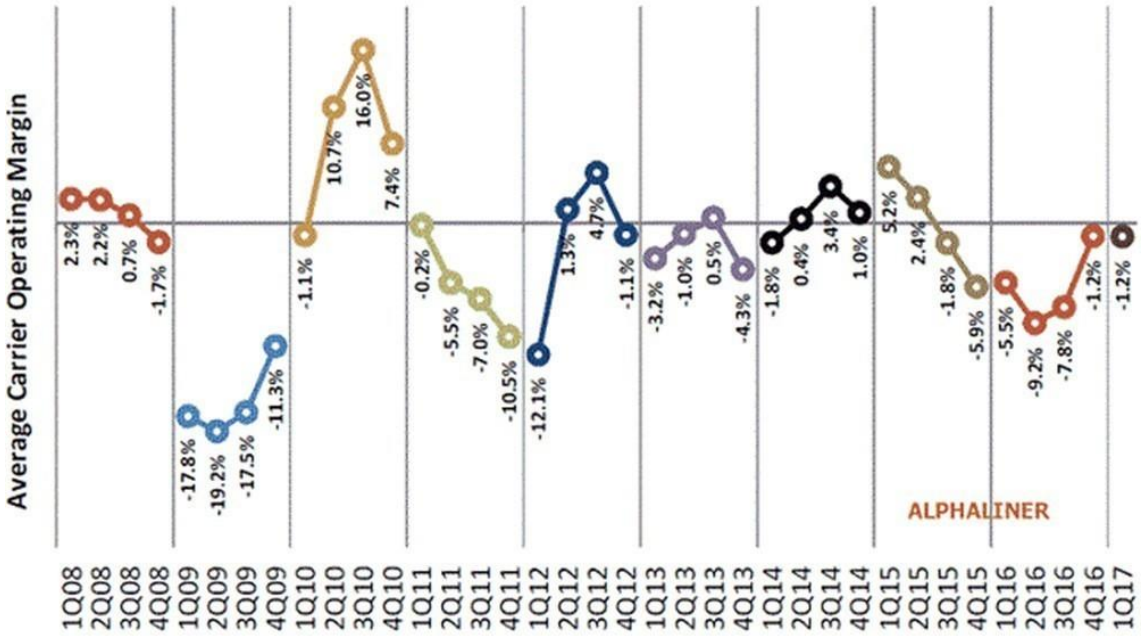
Figure 11: Concentration of the offer



Source: Alphaliner (2017)

It can be hypothesised that the progressive concentration of the offer, especially on the main relations, accentuated by the alliances, progressively mitigates the race to gigantism. Such hypothesis is also confirmed by the growth strategy defined by the foremost player on the market (AP Moeller Maersk) which, by means of its Chairman, during 2016 declared "*If Maersk Line needs to grow, it doesn't make sense to order new ships as there are already too many ships in the market. So if we want to grow, we need to do it through acquisitions so that we don't flood the market with more ships.*"[11]

Figure 12: Average operating margin in four-month periods for the main container shipping companies



Source: Alphaliner (2017)

Therefore the next dimensional leap, expected to lead to ships of 24,000 TEU, measuring at least 430 metres long, 62 metres wide with 16 metres draught, does not appear to be imminent and in any case the sole orders portfolio leads one to presume that, at least in the near future, there shall be no inversions in trend so that, by means of the so-called

[11] Source: Bloomberg Politics, Maersk Ends Mega-Ship Building Era With New Acquisition Plans, 2016 (www.bloomberg.com/news/articles/2016-09-22/maersk-ends-mega-ship-building-era-with-new-acquisition-plans)

cascade effect, the average and maximum size of the ships used in relations with the Mediterranean shall presumably continue to grow and one cannot exclude that the current top classes may also be used in such relations in the future.
Such trends give rise to the necessity for infrastructural adaptations in ports intending to attract large sized ships. These choices cannot be taken without due consideration, on the one hand of the demand expressed by the territory of reference and on the other, the capacity of absorption by the entire port and logistics system, which includes infrastructures on the sea side and terminals within the port, but also the transport networks from/to the internal territory, not only local but also national, at the least. In other words, large ships mean big volumes and this is obtainable either by acting as a transhipment hub or an important gateway and this indirectly implies the availability of efficient intermodal connections or, better still, jointly developing the two market segments. These principles are, moreover, recalled in the national sector planning documents, from the National Strategic Plan for Ports and Logistics of 2015 to the strategic document Connect Italy of 2016, arriving, lastly, at the infrastructures attachment to the Economy and Finance Document of 2017.
Another aspect to be dwelled upon in the container segment concerns **relations between shipping companies and ports**: where objectives and plans for development and planning are defined at the level of individual port and in a context of competition with neighbouring ports, it is likely that it is the shipping companies which dictate the line of development and requirements (and probably stimulate port overcapacity), above all within a context of progressive integration among companies, while if the strategic line of development is established in a supra-port, national or, depending on the case, even supranational environment, it shall be the shipping companies to "suffer" the limits laid down by the port system.
As regards the other vessel segments, the development trajectory of cruise ships proved to be similar to that of the container ships, albeit with more reduced growth values. In any case, in the period 2006-2016 demand for cruise ships grew by 53%, changing from 15.8 million passengers to an estimated 24.2 million[12]; this consistently motivates recent investments in new units, with 89 constructions to be delivered between 2017 and 2026[13]. Examining these orders in detail, ships having a tonnage between 55,000 and 96,000 tonnes of gross tonnage disappear, which is a clear sign of strong polarisation in the market between the luxury segment (small sized ships) and the contemporary segment (large sized ships), with evident repercussions on both excursions and the choice of ports of call.
Whereas Ro-Ro and general cargo segments appear to be much more stable.

2.1.2. Large infrastructures: the new sea routes

In response to the global trends described above in the container ship segment, the world's main ports are investing in large infrastructural works that are potentially able to redesign sea routes. Where, in August 2015, there was the opening of the **doubled Suez Canal,** which now allows 97 ships to cross it per day compared to 48 ships passing on a daily basis before the intervention, without dimensional limits to the watercraft, the **Panama Canal was widened** in the summer of 2016. Such works, taking place on a canal which already intercepted about 4% of the global sea traffic and 3.7% of container freight traffic, has the treble effect of allowing container ships up to 13,000 TEU to pass, allowing the contemporary transit of several ships and thus increasing daily traffic up to a maximum of 50 crossings per day, as well as expanding, lastly, Panama's offer to the LNG (Liquefied Natural Gas) and LPG (Liquefied Petroleum Gas) market segments[14]. The expansion has in any case allowed the Panama Canal to portions of the market despite the doubling of the Suez Canal. In particular, some estimates disclose that the Panama crossing would be competitive, in terms of cost, regarding both the Hong Kong – New York route and the Shanghai – New York route. In response to the new risks represented by the change in the global infrastructural context and in order to deal with the fall in crossings recorded by the Suez Canal, the Suez Canal Authority recently announced that rates for certain container routes have been lowered. This initiative may have positive impacts on the ports of the Mediterranean, with the return to this basin of ships that, in the last two years, have preferred to circumnavigate the Cape of Good Hope following the drastic lowering in the price of oil.

[12] Clia, Cruise Industry Outlook (2017)

[13] Cruise Industry News, orderbook 2017 – 2026

[14] Sr-m, *Gli effetti economici dell'allargamento del Canale di Panama sui traffici marittimi*, 2016

In relation thereto, one should also consider, though, the different configuration that the routes are assuming. As regards **container services**, until 10 years ago the Far East – Europe route included certain services dedicated to the Mediterranean area and several others which, travelling towards Northern Europe (or North America for the so-called pendulum services), made one, two or even more stops at the Mediterranean ports, mainly in the large transhipment hubs localised along the Suez-Gibraltar route. Today, apart from a consolidation of services, the Far East-Med relation is almost exclusively served by dedicated services, whereas crossing lines tend to bypass the Mediterranean, making one stop at the very most, preferably in the Gibraltar area in order to carry out a relay with the lines in the North-South routes. By way of example, examining (table 2) the services network of the two main operators (Maersk and MSC), now united in the 2M Alliance, one observes, above all, that, while they represented about 18% of the hold capacity in 2006, today they exceed 31%. Against such datum, however, one finds a reduction in the number of comprehensive services on the Far East Europe route from 15 to 10. Furthermore, although there are 4 lines dedicated to the Mediterranean (now as then), the crossing lines which make at least one stop in the Mediterranean have decreased from 10 to just 4 and none of these stops at any port in the Central Mediterranean, whereas they are all recorded at Algeciras or Tangiers. De facto, therefore, any greater traffic purely crossing from Suez could translate into a minimum or even no impact on the Italian port system which may and shall have to count solely on traffic travelling to its own catchment area or, in any case, in the Mediterranean basin. Furthermore, the tendency to serve the Mediterranean area with dedicated services has also allowed the placement of transhipment hubs to be further detached from the traditional Suez Gibraltar route, allowing so-called Regional Hubs serving a specific area to be identified. This is the case of Trieste, for example, which, with its transhipment impact exceeding 40%, has clearly assumed this role for the Adriatic; however there are now many gateways or regional ports having a transhipment share of at least 30% (Livorno, Barcelona, Valencia and so on). Therefore, where the rationalisation of services tends to increase recourse to transhipment, conversely the consolidation of operators reduces the number of hubs required for each area which, moreover, can be chosen with fewer limitations, among a greater number of options and, capacity permitting, in correspondence to ports already characterised by large inland volumes.

Table 2: Services network of MSC and Maersk in 2006 and 2017

	2006	2017	CHANGE	RATIO 2017/2006
Hold capacity of Maersk and MSC on the global fleet (%)	18	31	13	1.7
Total traffic Far East-Europe* (M TEU)	16	22	6	1.4
Average traffic 2M ships on the Far East -Europe route (TEU)	6,508	16,025	9,517	2.5
No. 2M lines Far East – Europe	15	10	-5	0.7
of which				
Exclusively serving the MED	4	4	0	1.0
stop in the MED during travel	10	4	-6	0.4
bypass the MED	1	2	1	2.0

* for the 2017 estimate

Source: Elaboration Ey based on sources Alphaliner, UNCTAD, Drewry, Clarksons Research, MSC, Maersk

An element of attractiveness of the Mediterranean area for sea traffic is potentially given by **China's strategy named One belt, One road**. This strategy, aimed at the penetration of the European internal market, envisages a terrestrial component along the routes of the "*silk road economic belt"* and a maritime component along the "*21st century maritime silk road".* The former entails crossing Asia and Europe by rail, the latter envisages a sea route skirting the Indian peninsular and penetrating the Mediterranean via Suez.

The generalised increase in traffic in the area is bound to have an impact on Italian ports, which, constituting the first European outpost for ships crossing the Suez Canal coming from Asia, may be encouraged to act as terminals for freight direct towards Central Northern Europe. Against strong competition between the ports of the Euro-Mediterranean basin, there are only three Italian ports that are capable, by their infrastructural characteristics and/or

linked to the orography or strategic choices of the country, to currently receive large sized ships: Gioia Tauro and Trieste (having respective depths exceeding 16m as represented in the infrastructural offer shown in paragraph 4.1) and Genoa also by virtue of the strategic choices declared in the DEF 2017 to increase maritime accessibility of the seabeds and candidature valid for the EU-China platform.
There are no Italian ports among the rankings for the first 7 container ports in the Mediterranean and the Black Sea. The following table shows data related to the movement of containers in some of the main ports of the Mediterranean and the Black Sea compared with the 3 top performing Italian ports:

Table 3: Container traffic in the main ports of the Md and in the TOP3 Italian container ports (2006-2015, TEU)

Year	Main container ports MED					TOP 3 Container ports ITA		
	Algeciras (ES)	Piraeus (GR)	Port Said (ET)	Tanger-Med (MA)	Valencia (ES)	Gioia Tauro	Genoa	La Spezia
2006	3,256,776	1,403,408	2,660,449	-	2,612,049	2,938,176	1,657,113	1,136,664
2007	3,420,533	1,373,138	2,755,805	600,000	3,042,665	3,445,337	1,855,026	1,187,040
2008	3,327,616	433,582	3,186,589	920,708	3,602,112	3,467,824	1,766,605	1,246,139
2009	3,042,782	666,327	3,300,951	1,222,000	3,653,890	2,857,440	1,533,627	1,046,063
2010	2,806,884	885,155	3,627,813	2,058,430	4,206,937	2,852,264	1,758,858	1,285,155
2011	3,602,631	1,679,052	4,306,468	2,072,948	4,327,371	2,304,987	1,847,102	1,307,274
2012	4.111.840	2.734.014	3.622.821	1.826.313	4.469.874	2.721.108	2.064.806	1.247.218
2013	4,337,816	3,163,755	3,671,870	2,558,426	4,327,838	3,094,254	1,988,013	1,300,432
2014	4,556,492	3,585,000	4,060,500	3,077,750	4,441,949	2,969,802	2,172,944	1,303,017
2015	4,511,322	3,330,000	3,600,000	3,000,000	4,615,196	2,546,805	2,242,902	1,300,442

Source: Assoporti, 2016

2.1.3. The TEN-T networks. Towards the single transport market

With its *Roadmap to a single European transport area* of 2011, the European Commission initiated a long term process for the realisation of an integrated multimodal transport networks at European level. The institution of the ***Connecting Europe Facility*** has substantiated the Commission's guidelines into targets for the completion of the trans-European transport network (TEN-T), for the purpose of realising a complete and integrated, competitive and efficient network that encompasses and connects all the member States of the EU in an intermodal and interoperable manner. Regulation (EU) 1315/2013 defines a dual level structure based on the principle of priority. The first level, the **core network**, includes the whole of linear and punctual infrastructures considered of strategic importance for the purposes of developing the entire European transport space with the completion of the core network envisaged by 2030. The second level, the **comprehensive network**, includes linear and punctual infrastructures aimed at guaranteeing accessibility to the central network and all the territories of the EU, with their completion envisaged by 2050. Maritime transport has a key role in European transport strategies. Identified among the priorities for TEN-T networks, in fact, are: (i) the promotion of Seaways, including navigation on short routes, the development of connections with the hinterland and, in particular, measures which improve the environmental performance of maritime transport; (ii) the interconnection of maritime ports with inland waterways; (iii) the implementation of electronic maritime services; (iv) the introduction of new technologies and innovations to promote alternative fuels and energy efficient sea transport.
In order to sustain the realisation of infrastructures on the core network and favour coordination between states and between network operators, the European Commission has identified nine multimodal corridors. The priority at European level is to ensure the continuity of such corridors, building the missing connections, eliminating bottlenecks and improving the level of interoperability with transborder networks. In order to guarantee modal integration along the corridors, specific requirements have also been defined for the various methods of transport from the viewpoint of the infrastructure, ITS systems, equipment and services.

In particular, Regulation (EU) 1315/2013 on the Union's guidelines for development the trans-European transport network establishes that Member States must take appropriate measures for the central network to conform to the provisions of such Regulation by **31 December 2030**.

By 31 December 2023 the European Commission shall examine the realisation of the core network, assessing the advancements completed under implementation of the Regulation, the changes in transport flows of goods and passengers, developments in investments concerning national transport infrastructures and the need to bring changes to the Regulation. Considering the economic situation and budget of the Member States, the Commission shall also **evaluate whether the core network should be modified.**

With reference to sea transport, the 83 ports included in the core network shall observe all the criteria of the comprehensive nodes by 2030, as well as comply with further requirements established for the core network nodes. Such criteria do not only concern **aspects related to traffic and port infrastructures**, but also **energy efficiency, pollutant emissions and electronic maritime services**.

In detail, in conformity with the basic requirements of the comprehensive network:

a) Maritime ports must satisfy **at least one of the following four criteria**:

1. **The total annual volume of passenger traffic exceeds 0.1%** of the total annual volume of passenger traffic of all the Union's sea ports;
2. The **total annual cargo volume**, either for bulk or non-bulk cargo handling , **exceeds 0.1 %** of the corresponding total annual volume of the total annual cargo volume handled in all the maritime ports of the Union;
3. The port is located on an island and constitutes the s**ole point of access to a NUTS 3 region** in the comprehensive network;
4. The port is located in an **outermost region or a peripheral area**, outside a radius of 200 km from the nearest other port in the comprehensive network.

b) Member States shall ensure that:

- maritime ports are **connected with railway lines or roads** and, where possible, inland waterways of the comprehensive network, except where physical constraints prevent such connection;
- any maritime port that serves freight traffic offers **at least one terminal which is open to users** in a non-discriminatory way and which applies transparent charges;
- sea canals, port fairways and estuaries connect two seas, or provide access from the sea to maritime ports and correspond at least to **class VI inland waterways**.

c) ports include equipment necessary to assist the **environmental performance of ships** in ports, in particular reception facilities for ship-generated waste and cargo residues in accordance with **Directive 2000/59/EC** of the European Parliament and of the Council. Lastly, Member States shall implement **VTMIS and SafeSeaNet** as provided for **in Directive 2002/59/EC** and shall deploy **e-Maritime services**, including in particular maritime **single-window** services, as provided for in Directive **2010/65/EU.**

In addition to the requirements provided for the comprehensive network, the core ports must guarantee, lastly, the **availability of alternative clean fuels**.

Apart from the European guidelines specifically regarding transport, the Sea Resource is also valorised, in the policies of the European Union, in relation to the **Blue Economy**. The document of 2012 by the European Union, *Blue Growth: an opportunity for sustainable growth in the marine and maritime sectors,* which outlines an ample strategy based on three founding elements (i) specific measures of integrated maritime policy; (ii) strategies related to maritime basins, in order to guarantee the best possible combination of measures aimed at promoting sustainable growth, in consideration of climatic, oceanographic, economic, cultural and social factors; (iii) approach aimed at specific activities, such as aquaculture, coastal tourism, marine biotechnologies, energy of the oceans and mineral extraction in seabeds.

2.1.4. Infrastructures for alternative fuels

The overview of alternative clean fuels, as recalled in EU Regulation no. 1315/2013, was governed in terms of the further requirements under **Directive 2014/94/EU** related to the "Realisation of an infrastructure for alternative fuels". This Directive meets the requirement of releasing the European sector of transport from its excessive dependence on oil by means of using alternative fuels and ensuring the realisation of refuelling points of alternative fuels with common standards. It establishes that Member States must adopt a **national strategic Framework** for the development of the market of alternative fuels and realisation of the related infrastructure. In particular, the Directive introduces a regulatory framework for the following fuels: electricity, hydrogen, biofuels, synthetic fuels and paraffin (liquefied natural gas - LNH and compressed natural gas - CNG) and liquefied petroleum gas (LPG).
By means of the national strategic Frameworks, Member States ensure that **an adequate number of refuelling points for LNG are realised by 31 December 2025**, in order to allow LNG powered seagoing ships to circulate in the TEN-T core network. LNG refuelling points include, in particular, terminals, tanks and mobile containers of LNG as well as ship and barge tanks. Within the national strategic Frameworks, the Member States designate the maritime ports guaranteeing access to LNG refuelling points, also considering actual market requirements.
Member States also ensure that the respective strategic Frameworks **assess t**he need for electricity supply along the coasts for seagoing ships in the maritime ports. Such supply of electricity along the coasts is installed, **by 31 December 2025**, as a priority **in the ports of the TEN-T core network and in the other ports**, unless there is no demand and costs are disproportionate respect to the benefits, including environmental benefits.

Italy acknowledged Directive 2014/94 by means of **Legislative Decree 257/2016**, which came into force in January 2017, which adopts the **national strategic Framework**.
As regards the supply of electricity in maritime ports, the strategic Framework refers to "in-depth local considerations of an environmental nature, regarding maritime traffic, generations and availability of electrical energy from the national grid" a "case by case, port by port" appraisal concerning the opportunity to realise and electrical power plant for ships.
With regard, instead, to the refuelling points for LNG in maritime ports, the strategic Framework tends to attenuate the distinction between the ports of the core network and ports of the comprehensive network, suggesting a widespread model.
The Document affirms, in fact, that "The LNG supply network in ports must necessarily include both ports belonging to the core network of the TEN-T and external ports".
The appraisal concerning the opportunity to insert a port in the LNG supply network, regardless of its pertinence to the TEN-T core network, shall be carried out according to the following elements:

- Presence in the port of storage and supply services for traditional fuels;
- Sustainability of the development of infrastructures needed for LNG, in terms of economic investment, predicted and perspective demand, accessibility for the means of transport which would use the infrastructure and availability of spaces for bunkering operations.

In relation to setting up an LNG supply network in the maritime and port sector, the Framework adds a distinction between a first short term phase (up to 2020) and a second medium-long term phase (from 2020 onward):

- In the first, the Document hypothesises that the demand for LNG shall be rather limited, both from the quantitative viewpoint and the geographic viewpoint, being linked to typologies of traffic and circumscribed shipowning initiatives. With regard to factors influencing the choice of fuel, such demand could interest national coastal passenger line services, national and international short services and port services. It is therefore hypothesised in this phase that a large part of the demand shall be placed in areas of high passenger short distance traffic with defined routes and stops (as the quantity of fuel required is reduced and the refuelling point easily identified). In this first phase, therefore, there is an optimisation of the placement of LNG refuelling points with criteria making them suitable to serving heavy road traffic crossing the maritime port as well.

- In the second, medium-long term (from 2020 onward) phase, it is envisaged that passenger ships and container ships regularly operating on defined routes may have an interest in LNG.

From the financial viewpoint, the national strategic Framework, citing the "North European LNG Infrastructure Project" of the Danish Maritime Authority, co-financed by the European Union, affirms that in relation to the costs of the logistic-infrastructural system supplying LNG to ships, the average cost of the supply chain can be estimated as 170 €/tonne LNG.

The strategic Framework also affirms that "in 2030 if conditions concerning the regulatory and fiscal framework are favourable, the realisation on national territory of an infrastructure to receive and use LNG is desirable, with the installation of equipment sufficient to cover a global market volume of 3.2 Mton (4 Mtep). Such an hypothesis would envisage: 5 coastal depots of LNG of 30,000 – 50,000 m^3; 3 cabotage ships of 25,000 - 30,000 m^3; 4 cargo barges; about 800 LNG service stations, also with L-CNG."

The choice to be equipped with an LNG refuelling point, in any case, would not only give rise to fulfilling the explained normative developments for the Port of Taranto, but would also increase its attractiveness, also in the light of the expected renovation of the circulating naval fleets. The possibility to refuel would represent and element of attraction for LNG powered ships, which may thus prefer Taranto over other ports.

2.1.5. Innovation and digitalisation in European ports

Within the environment of port systems and national and European logistics, the implementation of information systems supporting logistics, port operations and communications among the various operators has played a key role for the development and competitiveness of the single ports. During recent years, developments in IT in ports have led to the creation of information systems both of a national nature and local nature, able to fully meet the various port related requirements which can be mainly identified in three categories of **systems**:

- **Supporting administrative requirements**; systems typically of a national nature, capable of simplifying administrative formalities for port operators, reducing bureaucratic times for the ships to enter and leave ports. An example of this system is represented by the National Maritime Single Windows, a system introduced by European Directive 2010/65/EU for the electronic transmission of information concerning the formalities of arrival and departure to and from European ports in order to "simplify and standardise administrative procedures applied to maritime transport"[15].
- **For safety** in ports and at sea; systems of both a national and local nature, aimed, for example, at guaranteeing the safety of ship entry and exit operations (such as VTS systems, supporting homologous VTS services), monitoring hazardous cargo in a port, entry and exit operations to and from port crossings;
- **For customs clearance in ports and at sea; customs systems also integrated with maritime traffic systems aimed at speeding up the management of customs checks;**
- **For managing operations** in ports, for the optimisation of logistics and port operations in order to guarantee standards for improving the efficiency of entry and exist times both of the vessels and cargo from ports and the quality of services offered in the port, heightened and complete compared to competitor ports.

The digital transformation which is involving several European and global industrial sectors is opening the possibility for a change in mentality in the development of innovative solutions to support logistics and port systems, no longer aimed at creating circumscribed information systems but to the introduction of new technological platforms and new technologies, such as for example:

- **Digitalisation of administrative processes,** by means of computerising process workflow, aimed at guaranteeing shorter execution times for administrative and physical checks in Italian ports.
- **Automation of port processes**, such as processes concerning checks for means entering and leaving Italian ports.

[15] Article 1 - paragraph 1 - European Directive 2010/65/EU

- **Geographic Information System (GIS),** a system used to acquire, store, analyse and manage spacial or geographic data. These instruments allow interactive queries to be submitted with presentation of the obtained results, analyse geographic information and display data by means of maps.
- **Big Data**, or new data analysis architectures able to manage non-structured data and their entry in real time. Big Data allow other technologies to facilitate the comprehension of the volume of information originating from all possible sources of an analog and digital network.

a) E – MANIFEST AND SHIP PROCESS - Italy

During recent years in Italy, the General Command of the Harbour Authorities - Coast Guard and the Customs and Monopolies Agency, considering the regulatory changes which took place, deriving from European Directives and Regulations, have implemented computer systems supporting the administrative process and control procedures related to vessels entering and leaving Italian ports and developed flows of interoperability aimed at the cooperation between the Italian Administrations, amongst which, recognised as a European ***best practice*** by the European Maritime Safety Agency - **EMSA** is the **procedure of applicative cooperation provided under the Code of Digital Administration between Administrations and maritime users with particular reference to the solution in progress with the Customs Agency in Italy.** To be specific:

- Within the **AIDA** system, the Customs Agency has implemented a **computer workflow** allowing telematic **management and execution of customs requirements associated** to the import/export procedures regarding cargo, all aimed at reducing comprehensive process times linked to such procedures. Indeed, within the system is the **computerised management of all Incoming Freight Manifests (MMA) and Departing Freight Manifests (MMP)**. The AIDA system has also integrated various functional areas in order to improve the digitalisation of relations with users and administrations, amongst which of fundamental relevance is the **Sole Customs Counter** allowing a "telematic dialogue" between administrations, allowing the declaration associated to the cargo to be resented before issuing certificates/authorisations and carry out the controls of competence of the other administrations contextually to any customs checks, thus also reducing the costs for moving containers. The counter has been active since 2008 with the Ministry of Economic Development (for AGRIM and AGREX titles), since 2011 with the Ministry of Foreign Affairs (licences for importation/exportation of armament materials) and since 2013 with the Ministry of health (competent for about 80% of the certificates/authorisations needed for customs clearance) covering, to date, around 425 of the procedures under Prime Ministerial Decree 242/2010 (48 out of 114).
- The **PMIS** system developed by the General Command of the Harbour Authorities - Coast Guard for the purpose of computerising **the performance of administrative practices upon the arrival and departure of ships, both for supervising traffic within port waters** and **managing authorisations upon entry and exit of the ships to and from the port**. For the realisation of such system, at the basis of which is a process workflow, the Command developed a study of the process concerning arrival and departure related formalities of ships in Italy, which is also recognised as **a European best practice by the EMSA**. According to the provisions of legislative decree 16 February 2011, no. 18, which amended legislative decree 19 August 2005, no. 196, acknowledging European directive 2002/59/EC and law decree 18 October 2012, no. 179, converted, with amendments, by law 17 December 2012, no. 221, **the central role of the PMIS was sanctioned, as a system by means of which to carry out the administrative activities related to the formalities which ships must complete upon arrival and departure to and from national ports.**

b) PORTMAPS – Port of Rotterdam

The port of Rotterdam, in light of the growth in volume and business of the port, strictly associated to the optimisation of port spaces, decided to invest in a new framework to support the management of port assets and information, also implementing **PortMaps** (an **ArcGIS platform**) which has replaced the existing, technically obsolete

systems which are expensive to maintain and are not able to interoperate with the current systems in use as well as mobile devices. The GIS allowed the display of port assets and maps to be standardised into a single system, as well as collecting information then made available in an efficient manner. The GIS has also permitted the management and use of hydrographic information for the development of bathymetric models for seabed analysis, the knowledge of which is essential in order to conduct the port's daily activities; the inspection and monitoring of the port quays used for docking cargo carrier ships and which represent a key asset for port management.
The platform developed for the port of Rotterdam presents three fundamental characteristics: **smart, quality and simplicity. Smart**, meant as the ability to manage a single data model for which all port business can be managed by the various port players involved. **Quality**: meant as the ability to make information originating from the various information system accessible in a consistent manner in one single point of access. **Simplicity**: meant as the ability to allow each user to access any information by means of just a few clicks.
From the architectural viewpoint, integrated within PortMaps are the components of the SAP systems (used for managing administrative and financial information) and SharePoint (used for storing documents and technical drawings) placed at the centre of which is ArcGIS which connects and integrates the whole with geographic information.
The implementation of such platform has brought numerous benefits to the port of Rotterdam, amongst which an improvement in traffic control, planning of spaces, environmental management, incident response and the development of the port itself.

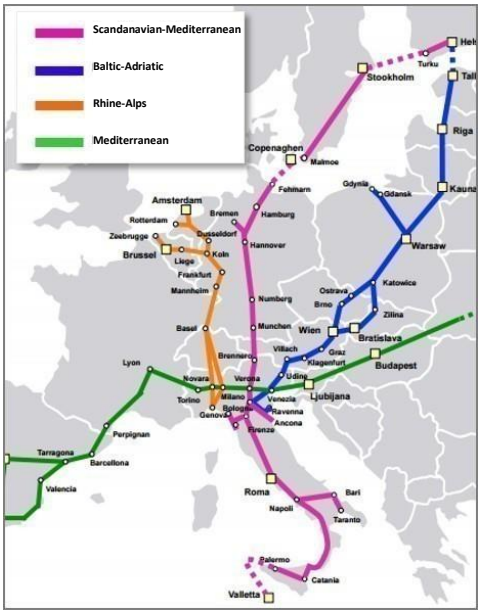
c) <u>BIG DATA – Dutch Ports</u>

The indicators which measure the performance of the maritime sector by means of multidimensional metric measurements are constantly more recognised as critical for maritime companies, their users and for the governments. These key indicators of development strongly depend on the availability and quality of data, as well as statistics; emerging in this sense is the necessity to invest in the acquisition, compilation and availability of data management systems to close gaps currently existing with regard to data on maritime transport. Ports, in Holland, represent the backbone of the Dutch economy. In the past the ports were exclusively associated to the traffic of ships and cargo, now, instead it is data traffic that is playing an increasingly more critical role. Indeed, only by sharing and exchanging data throughout the chain of transport is it possible to keep up with international competition. Port Base, a company coordinating and controlling data traffic on behalf of the Dutch ports, has initiated an information exchange project with the ports of Rotterdam and Amsterdam, also involving Statistics Netherlands. In the past Statistics Netherlands mainly used information provided by the customs offices for data about the distribution of goods throughout the hinterland. By using the relevant data of thousands of companies active in ports instead, Statistics Netherlands shall have a much wider quantity of data so that it can rapidly produce more detailed statistics concerning: the number and type of container ships in the ports, weight for each typology of cargo, country or origin and country of destination of the cargo. The management of this volume of data makes the coordination of the various processes involving the ports possible. The benefits associated to the use of Big Data can also be found in the mapping of logistic processes of the ports and planning the flow of cargo. By means of using real-time recordings via Smartphone, Radar and GPS position indicators, it is possible to predict the movements of cargo in the port and in the country. In this way haulage firms are able to find out the situation regarding traffic in the vicinity of the port beforehand and be able to best coordinate the flow of goods and plan the best moment to transport their load.

2.1.6. The impact on Italy and on the port of Taranto

Out of the nine TEN-T Corridors identified by the European Commission, four cross through Italy: (i) the **Baltic-Adriatic Corridor**, which extends from the Polish ports of Gdansk and Gdynia and from Szczecin and Swinoujscie and, passing through the Czech Republic or Slovakia and western Austria, reaches the Slovenian port of Capodistria and the Italian ports of Trieste, Venice and Ravenna; (ii) the **Mediterranean Corridor**, which connects the ports of the Spanish peninsular with Hungary and the Ukrainian border, passing through the south of France, Lyon, northern Italy and Slovenia, with a section in Croatia, and includes the inland waterway formed by the river Po; (iii) the **Rhine-Alpi Corridor**, which connects the ports of the North Sea of Antwerp, Rotterdam and Amsterdam and the Italian port of Genoa, crossing the Rhine Valley, Basilea and Milan; (iv) the **Scandinavian-Mediterranean Corridor**, which extends from the Russian-Finnish border to Stockholm and crosses southern Sweden, Denmark, Germany, western Austria, Italy (connections with the ports of La Spezia, Livorno, Ancona, Bari, Taranto, Naples and Palermo) and reaches Malta.

Figure 13: TEN-T corridors crossing Italy



Source: European Commission

Forty-two Italian ports are included in the TEN-T networks, 14 of which identified as core ports (Ancona, Augusta, Bari, Cagliari, Genoa, Gioia Tauro, La Spezia, Livorno, Naples, Palermo, Ravenna, Taranto, Trieste, Venice). Such ports, with the addition of the port of Civitavecchia in its capacity as the sea outlet of the city of Rome, have been identified by the Italian government during the reform of port governance, as the sites of the new Port System Authorities[16].

The Scan-Med corridor, which is absolutely the longest of the TEN-T corridors, is that of greatest importance for Italy, both due to the fact that it crosses the national territory in its entire extension and because it connects the Italian peninsula with the heart of the European economy and market. The port of Taranto, constituting the port of access of the Scandinavian-Mediterranean Corridor, represents the first community landing of international relevance for ships coming from the Indian Ocean having crossed the Suez canal. In light of the excellent road and rail connections with the regions of the Mid-North, the Ionian port of call is easily included in the networks of connection with Central and Northern Europe, lending itself to the completion of the north-south axis of the European Territory. It therefore plays a strategic role of great importance for the Union's entire transport policy, as recognised both by the Corridor Workplan and - for example - by Chinese strategies summarised in the initiative of the Maritime Silk Road. In this context the port of Taranto, appropriately supported by a solid long term strategy, has the opportunity of redesigning its role in the Mediterranean.

Apart from the mere design of the corridor, the fact of having defined both the **performance standards** at European level, to be guaranteed for each type of infrastructure and clear realisation targets - completion of the core network by 2030 and the comprehensive network by 2050 – has and an unquestionable immediate concrete implication, inasmuch as the single national plans have received a clear guideline to follow. For example, in the case of Italy, given the performance of the railway network, the so-called *Cura del Ferro* [care of iron] with massive investments in the railway network, mainly aimed at an upgrade in performance, seems to be the natural consequence of the guideline identified at community level. By virtue of the latter, the temporal horizon to 2030 entails the effective realisation of a large part of a significant recovery in competitiveness of the railway mode and therefore intermodality. Indeed, this scenario envisages the possibility to travel using trains 750 metres long (rather than the 450, 500 or, at most 600 metres currently used on many routes) having a total weight of up to 2,000 tonnes (rather than the 1,300/1,600 realisable today), and with an admissible form able to realise the travelling motorway or intermodal transport of

[16] With the exception of the port of Augusta, due to the decision taken by the MIT, in temporary derogation of the provisions under Legislative Decree 169/2016 and by grounded request of the Region of Sicily, to allocate the site of the Port System Authority of the Western Sea of Sicily at the port of Catania.

"megatrailers" which, de facto, has been impossible until now unless limited to some relations among the large intermodal terminals of North Italy and the border crossings. Apart from this diffused upgrade, also envisaged is the realisation of large base Transalpine tunnels (Turin Lyon; Gotthard and Ceneri; Brenner) and the so-called Third Crossing towards Genoa on the Rhine Alps Corridor, which shall decidedly improve railway services along the international routes, virtually transforming them into plain railways. This shall have a significant impact on the Italian port system, translating into an expansion in contestable areas, both at national level and on international relations. In general terms this argument also applies to Taranto.

Referring to the subsequent chapters for a detailed analysis, it seems, in any case, appropriate to point out that one cannot legitimately expect radical changes such as to allow Taranto to become competitive respect to the ports of Northern Europe or the Northern Adriatic or Northern Tyrrhenian to serve areas of central Europe. Naturally the availability of efficient connections shall, in any case, make rail transfer possible on international sections for the specific requirements of particular niches in the market, but it does not seem likely to hypothesise Taranto as a gateway of reference for serving the large markets of Northern Italy or even Central Europe. One could, rather, reasonably expect that Taranto could benefit from such improvements in widespread railway accessibility by carving itself niches of market which, although marginal from a comprehensive viewpoint of Euro-Mediterranean scale, could instead be regarded as absolutely useful to relaunch port traffic.

2.2. Production and trade dynamics

2.2.1. The hinterland markets and productive sectors

As already mentioned the "closer" hinterland of Taranto is represented, apart from the specific area of Taranto, by some areas of the Region of Puglia and the Region of Basilicata.

It is therefore useful to start with an analysis of the region of Puglia, observed in the complex of its import-export structure.

By way of preamble, also to interpret the recent dynamics of data, reminder is given that the region of Puglia, like other Italian regions, has been involved in a period of not particularly positive circumstances, although there are some signs and perspectives for recovery. Table 4 shoes the recent trend in GDP and outlook for growth (as at December 2016) elaborated by "Prometeia" and taken up by VIMEZ on the temporal scenario for 2018, which shall probably need adjustment upwards following the recent positive reports at national level.

Table 4: Rate of growth of the GDP in some Italian regions and territorial portions and related growth expectations

TERRITORIAL REGIONS AND DIVISIONS	2014	2015	2016	2017	2018
Lombardy	-0.9	1.2	1.0	1.1	1.3
Piedmont	-0.6	0.7	0.7	1.0	1.1
Veneto	0.4	0.7	0.9	1.0	1.2
Liguria	-0.1	0.4	0.5	0.7	0.8
Emilia Romagna	-0.4	0.8	1.1	1.1	1.2
Tuscany	-0.9	0.3	0.8	0.8	0.9
Lazio	1.4	0.2	0.9	0.8	0.9
Campania	-1.8	-0.8	0.5	0.6	0.7
Puglia	**-0.8**	**1.0**	**0.6**	**0.7**	**0.7**
Sicily	-0.9	1.1	0.5	0.7	0.7
North West	-0.8	1.0	0.8	1.1	1.2
North East	-0.2	0.8	0.9	1.0	1.2
Central	0.4	0.2	0.8	0.8	0.9
South	**-1.1**	**1.0**	**0.5**	**0.6**	**0.6**
Italy	-0.3	0.8	0.8	0.9	1.0

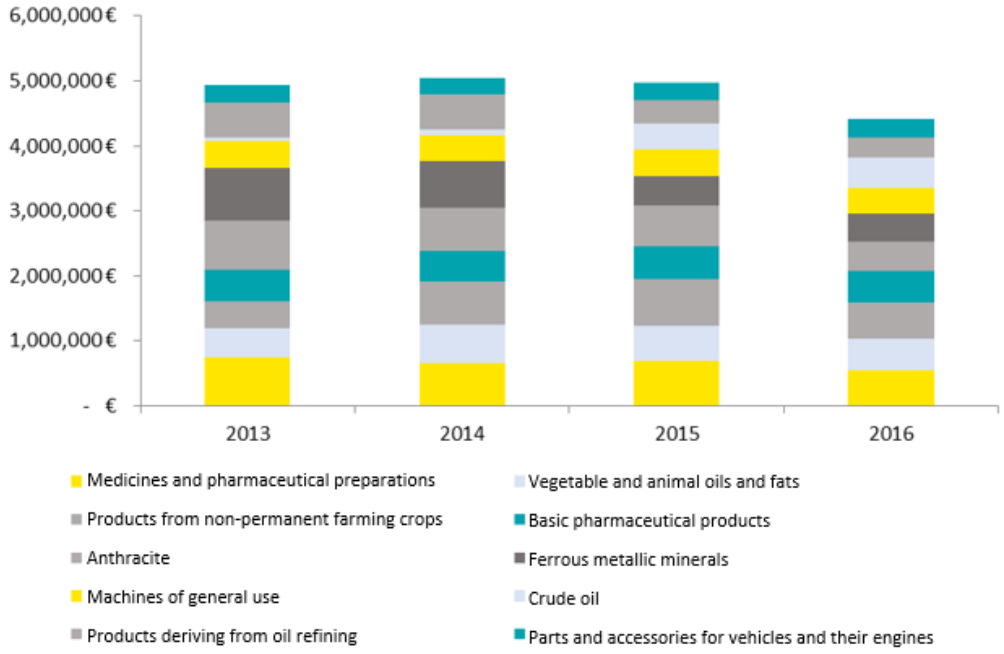
Source: Prometeia, Scenarios for local economies (2016)

Considered as a whole, the Region of Puglia presents a productive economy and therefore import and export system for goods which, at the level of economic values, is distributed among a rather ample number of sectors.

On the premise that only one part of these markets is acquired or acquirable by maritime transport (and more markedly by the polarity of Taranto), it is in any case useful to provide quantitative evidence of the sectors which may, in some way, represent possible environments of interest for a strategy of development in port flows. As in this section, this concerns analysing economic sections, the data given are expressed in value.

In the goods **importation** system, some sectors are identified which represent the traditional **core business** of the Tarantino port system; that of "large quantities", retraced to the steelmaking (**anthracite, ferrous minerals**) and energy (**oil**) sectors.
For the remainder, it concerns goods which highlight either sections of **very high value goods** (e.g. pharmaceutical and preparation*s)* **however effectively wholly absent of interest as "base traffic" for the environment of transport by sea**, or goods tending to circulate both as "**general cargo**" and as "**minor bulk**", associated to the "agro-foodstuff" industry, part of which also traded in the "Intra-Med" sector, such as fats and part of the farming products (amongst which grain arriving in bulk as a productive factor of pasta making factories).

Figure 14: Puglia Region (2013-15). Value of importation of goods of interest for transport by product sector

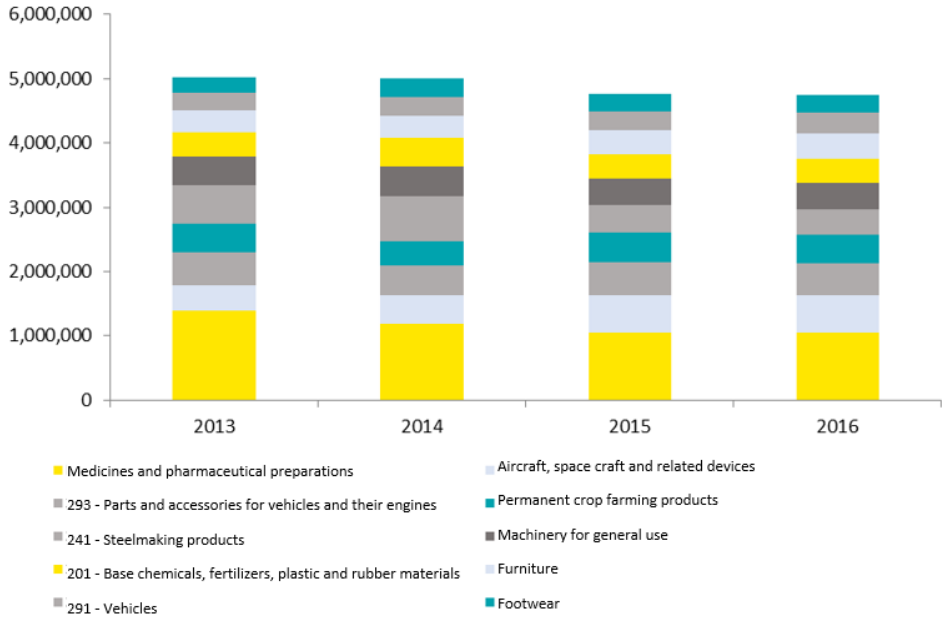


Source: Ey elaboration on ISTAT source

There is also an articulate division into sectors in **exportations**, amongst which some high value and reduced volume sectors are highlighted (the pharmaceutical component in this case too). For the remainder, apart from sectors of an historical district matrix (furniture, footwear, etc.) and products of the agro-foodstuff sector (the majority of the production of which is not, however, exported) a range of important components of exportation is formed by the extremely varied world of productions of a "mechanical" nature, ranging from vehicles and related components (an important industrial component of the "automotive supply chain" is, moreover, located in Basilicata), to productions for the aeronautic industry, up to machines for general use. Comprehensively, a role emerges, not to be disregarded, carried out in the environment of the economy of Puglia (but also Basilicata), by the sector of mechanics. Closing the report are chemicals, rubber and plastic, as well as the steelmaking component, the latter evidently connected to the context of Taranto.
As a recent study on the economic system in Puglia shows, the most significant specialisations of regional manufacturing, also in exportation, can be identified by six As forming the initials of:

Agroalimentare, Acciaio, Automotive, Aerospazio, Arredamento, Abbigliamento [Agro-foodstuff, Steel, Automotive, Aerospace, Furnishing, Clothing].[17]

Figure 15: Region of Puglia – value of exports of goods of interest for the purposes of transport



Source: Ey elaboration on ISTAT source

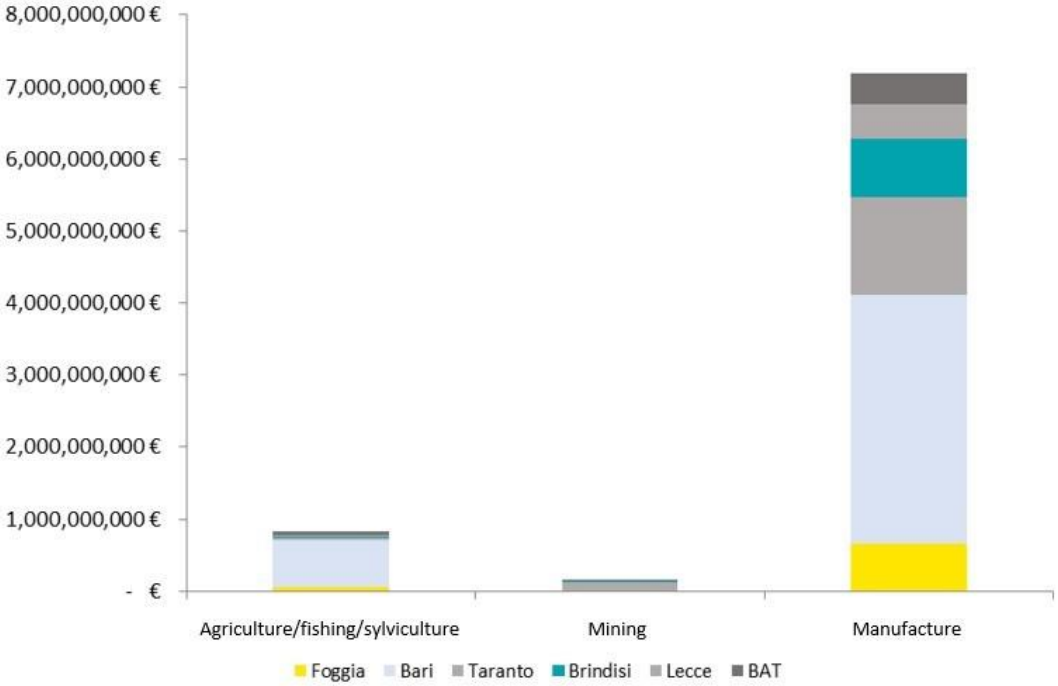
The data shown refer, as said, to the entire region of Puglia.

In order to understand how the production of the value of exportation is distributed at a level of finer geographic grain, within the key territory of the close range hinterland of Tarantino, meaning Puglia and Basilicata (BAT), the graphs in Fig. 16 and Fig. 17 can be analysed.

The former refers to 2015 and gives, in terms of value, the territorial concentration of exports of manufactured goods which is clearly concentrated into the areas of the province of Bari.

[17] Ref. SRM (2017) Puglia and Economic Development, The possible role of Agromed in the growth of the Territory

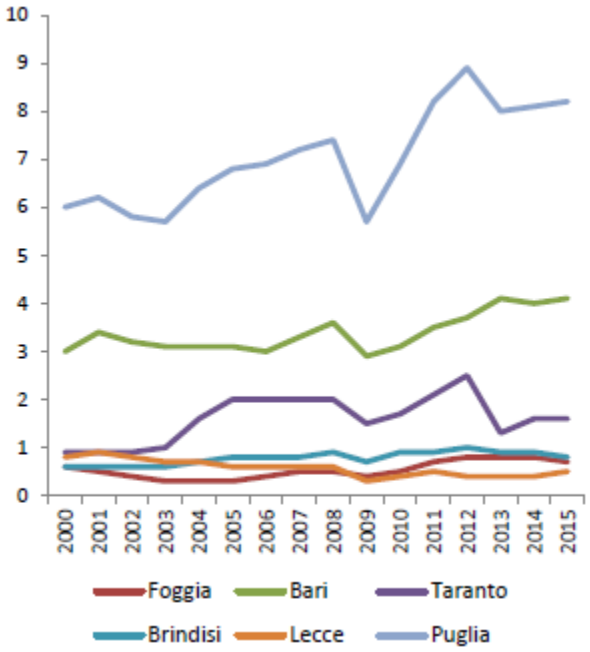
Figure 16: Year 2015 – Puglia/Basilicata(BAT). Exportations. Portions in value



Source: Region of Puglia, ISTAT data

The graph in Fig. 17 illustrates the trend in exportations by single province in the period 2000-2015.

Figure 17: Puglia and Basilicata: trend in exportations in value by single territorial area



Source: Region of Puglia, ISTAT data

Recalling once again that a datum in value and not in weight is an indicator, inasmuch as imperfect, of the presence of high added value manufacturing (tendency towards the production of unitisable "general load"), it is comprehensible that due to the specific nature of exports of "unitisable" loads, the area surrounding Bari is the greatest catalyser of

container traffic or road-sea container or lorry traffic, as it shall be possible to examine in the chapters dedicated to the port's traffic potential.

Taranto proves, in any case, to be the second province in terms of value of exportation, but in this specific case, the export market in Taranto is associated to manufacturing whose "output" tends to circulate in a non-unitised manner (steelmaking productions, etc.).

2.2.2. Some in-depth examinations in the perspective of sectorial focus

The presentation of the general overview, by sector, of the regional hinterland in terms of the import-export structure is the starting point for a further and more precise sectorial focus of analysis. Such focus is based on a double criterion:

a) The economic importance that the sector, inasmuch as at least concerning import-export, assumes in the comprehensive production context of the core region, in which the port of Taranto is located (Puglia/Basilicata)
b) The current (and potential) link with the specific territory of Taranto, for reasons associated to the presence in the site of specific and important activities of the sector, or, in any case, due to the relative geographic "vicinity" in a perspective of "collection area".

Apart from highlighting the section of the relation between a sector and the territory of Taranto, the sectorial focus in some cases includes an analysis of the wider performance of the sector at national level too, where, due to the importance of the sector with a view to the polarity of Taranto, a wider analysis would appear to be worthy.
From this viewpoint we chose to further analyse the following sectors:

a) Steelmaking sector
b) "Agrifood" sector
c) Vehicle production sector
d) Oil supply sector
e) Other sectors of local interest (cement, mechanics)

a) The steelmaking sector

This historically represents the fundamental sector of the economy (and traffic) of the area of Taranto and is still at the centre of the area's development processes.

ILVA and the local context

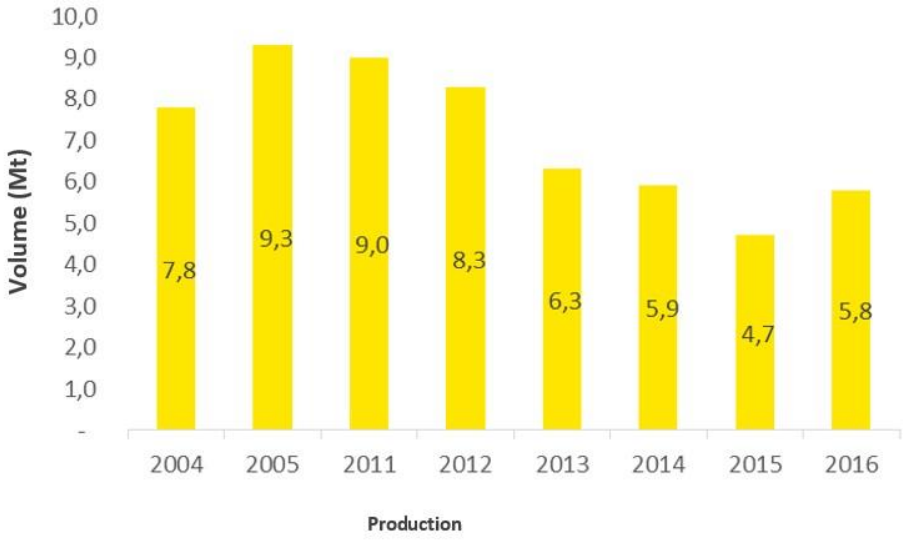
The Gruppo ILVA group is active in the production and transformation of steel, it is one of the most important players in the Italian and European steelmaking sector. Founded in 1905, the Group is formed of ILVA S.p.A. and by other operational companies functional to the productive process. The Group has numerous factories, the most important of which is located in Taranto and represents the first steelmaking facility in Europe. The other facilities are in Genoa, Novi Ligure, Racconigi, Marghera, Legnaro, Salerno and Paderno Dugnano. In more recent years, growing sensitivity in the public opinion on the matter of the environment has fed the debate on the harmful nature of the emissions from the factories in Taranto and Genoa; a debate which culminated in the closure of the hot works area in Genoa in 2005 and with the seizure of that of Taranto in 2012. After the Ministerial Decree of 21 January 2015, ILVA S.p.A. was placed under Extraordinary Administration. In the following months the subsidiaries of ILVA S.p.A. were placed under Extraordinary Administration with the purpose of safeguarding the industrial assets of the Group and rebuild awareness of the strategic role covered by the Group for the territories in which it works, as well as the whole country. In early 2016 an international procedure began for the transfer and sale of the company's assets. The best proposals received by the commissioners were those of the AcciaItalia consortium (formed of Jindal South West, the Arvedi group, Cdp and Delfin) and that of Am Investco Italy (joint venture formed of the Marcegaglia group, ArcelorMittal and Intesa Sanpaolo). On 5 June 2017, the Minister of Economic Development, Carlo Calenda, signed the decree authorising extraordinary commissioners to proceed with awarding the corporate complexes of the ILVA S.p.A

group to Am Investco Italy, for an amount equal to 1.8 billion Euros. In conformity with the provisions of the tender regulations, another negotiatory phase was envisaged on an exclusive basis between the commissioners and the winning enterprise, aimed at bringing further improvements to the offer. Among such improvements are a review of employment levels, finalisation of the commitment to pursue more sustainable technological solutions, a reduction in the times for realising environmental investments and strengthening the initiatives envisaged for the territory.

Gruppo ILVA currently consists in 14,200 employees and 15 production units producing about 5.8 million tonnes of steel per annum. ILVA offers a catalogue of products aimed at different markets; in particular in the facility of Taranto, the production cycle, called the integral cycle, begins with raw materials, mainly iron minerals and hard coal and ends with finished steel products, amongst which hot laminated black and pickled coils, cold laminated coils, hot galvanised coils, quarto plates and welded pipes.

The production values of the Group, against the crisis and events which have interested the company, have undergone a decrease during the last few years, as implied by the following graph.

Figure 18: ILVA Production Volumes 2004-2005 and 2011-2016



Source: EY elaboration on source[18]

[18] Sources: Corriere del Mezzogiorno [newspaper], Senza Ilva la Puglia perderebbe [Puglia would lose without Ilva], 2012 (http://corrieredelmezzogiorno.corriere.it/lecce/notizie/cronaca/2012/15-ottobre-2012/senza-ilva-puglia-perderebbei-traffici-si-ridurrebbero-un-terzo-2112259170682.shtml);

Il Post [newspaper], Che cos'è l'Ilva di Taranto [What is Ilva of Taranto], 2012 (http://www.ilpost.it/2012/07/28/che-cose-lilva-di-taranto/);

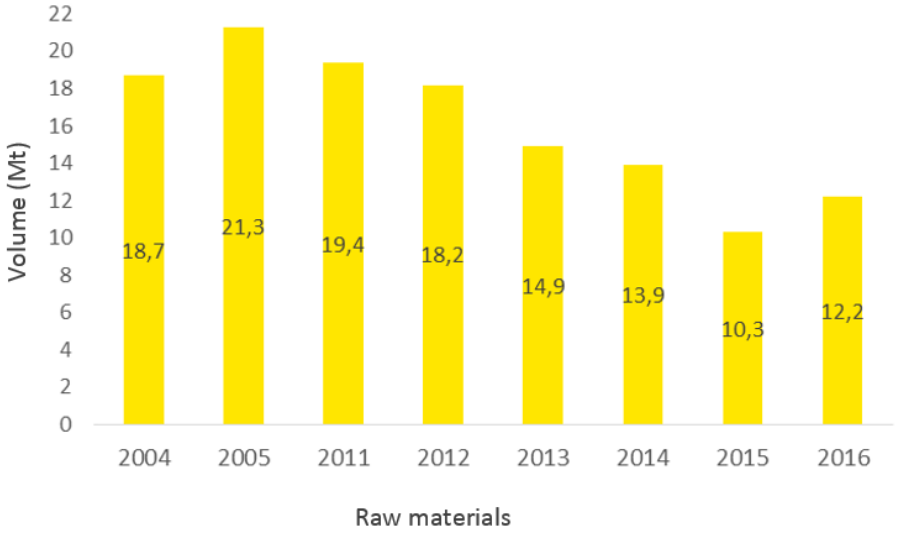
Tempi [magazine], Il romanzone del caso Ilva, una catastrofe italiana, [the great Ilva romance, an Italian catastrophe] 2014 (http://www.tempi.it/il-romanzone-del-caso-ilva-una-catastrofe-italiana-ecco-come-abbiamo-distrutto-la-piu-grande-acciaieria-d-europa#.WTb4IuvyiCh);

Quotidiano di Puglia [newpaper] Ilva: produzione ai minimi, dati in negativo,[Ilva, production at the minimum, data go negativee] 2016 (http://www.quotidianodipuglia.it/taranto/ilva_produzione_ai_minimi_dati_negativo-1579053.html);

Askanews, Ilva, Laghi: in 2016 production +23% with 5.8 mln tonnes, 2017 (http://www.askanews.it/economia/2017/01/19/ilva-laghi-in-2016-produzione-23-con-58-mln-tonnellate-pn_20170119_00091/);

Gruppo Ilva, http://www.gruppoilva.com/it/gruppo-ilva/gruppo-ilva/breve

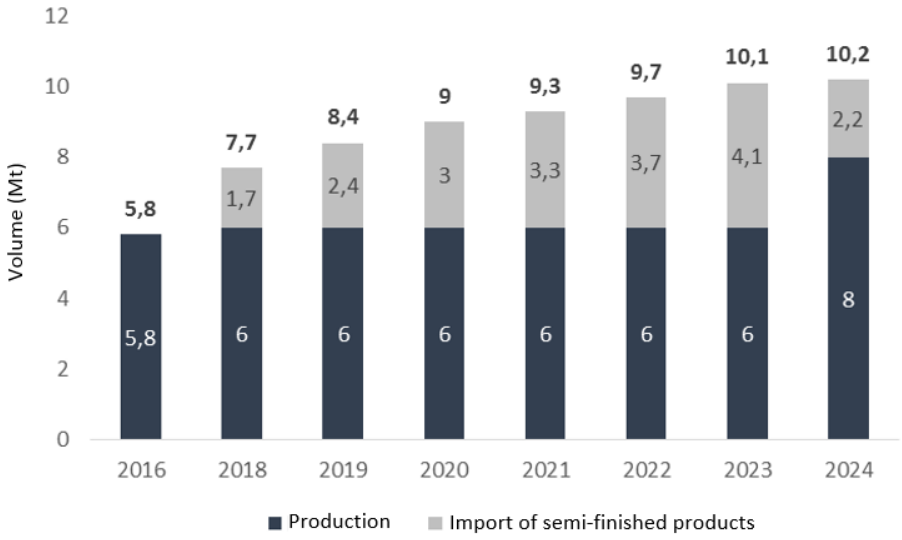
Figure 19: ILVA Raw Materials 2004-2005 e 2011-2016



Source: EY elaboration on source Port System Authority of the Ionian Sea

The **new industrial plan** proposed by Am Investco Italy envisages bringing the current production to 6 million tonnes per annum by 2018 and 8 million tonnes per annum under full working order, starting from 2024. Between 2018 and 2023 the productive ceiling of 6 million tonnes imposed by the Ministry for the Environment shall have a significant impact. Decree 98/2016, converted into law since August last year, provides, in fact, that the environmental part is preventively assessed by the other components of the offer and is considered as preparatory to approving the latter.

Figure 20: ILVA Production Volumes 2016-2024



Source: AM Investco, ILVA management Industrial Plan (2017)

The consortium foresees the maximisation of the productive capacity to 10.2 million tonnes with the contribution of semi-finished products (metal sheets and hot laminated coils) imported from the other plants owned by ArcelorMittal in Europe, in increasing quantities ranging from 1.7 million tonnes in 2018 and 4.1 million tonnes in 2023. The productive limits imposed by the Ministry of the Environment (equal to 6 million tonnes) also have a significant impact on the staffing structure. Indeed, considering that the employment parameter corresponds to about 1000 people for each million of produced liquid steel, Am Investco Italy expects cuts to fluctuate between 4813 and 5740 employees between 2018 and 2024, which shall bring the staffing structure from the current 14,200 employees to 9407 in 2018,

to then settle under regime at 8,480 in 2021. Following the award of the tender, Am Investco has, however, foreseen further commitments regarding employment, with a view to bringing the total employment level to about 10,000 employees. Another fundamental point of the industrial plan of Am Investco concerns the recovery of investments. In fact the offer entails investments for about 2.4 billion Euros, of which 1.25 in technological investments (technologies for the reduction of the environmental impact such as magnetic separation of fine steel slag, electrostatic conveyor belts for dust containment, technologies for the reduction of gases and water treatment technologies) and 1.15 in environmental investments (amongst which 301 million destined to cover mineral parks, 196 million to coking plants and 179 million to the water plan). ArcelorMittal also intends to reactivate blast furnace 5 in 2023 (cost 225 million Euros for repairs) and increase continuous casting plant 4 (cost of 80 million Euros to replace the plant).
It is in any case in the interest of the context of Taranto to appraise all the opportunities to launch a support policy for the development of possible initiatives for the growth of a more ample local steelmaking cluster, with expansion into the field of “downstream” activities, respect to that currently associated to the presence of steelmaking polarity.

The Italian steel market

The specialisation of the Taranto area in the steel industry requires the focus on the entire national production context due to the various current and future relationships that could develop between Taranto and the general context of the market also in relation to the port of Taranto as a "port for the steel industry" intended not exclusively for the mere local market.
In general, the national steel sector should be looked at, despite its difficulties, not in totally pessimistic perspective, but indeed, with some positive hope, due to the fact that Italy is the twelfth country in the world for steel production with 23.4 million tonnes of "crude steel" produced in 2016 (the cruel steel accounted for 94.8% of total Italian steel production by weight).
Italy is also the second "consumer" of steel at the EU level, with 24.2 million tonnes of apparent consumption (production-exports+imports) in 2016. The trend after the critical period 2012-2014 has returned to above 24 million tons between 2015 and 2016 as it may be observed in Table.
The crude steel data includes cast iron (6.0 million tonnes produced in 2016 and 1.6 million imported tons), iron ore (8.1 million tonnes imported in 2016) and ferrous metal scrap (4.4 million tons imported in 2016 and 0.4 million tons exported).

Table 5: World production of crude steel: the top 12 producing countries (millions of tons)

COUNTRY	2016		2015	
	RANK	TONNAGE	RANK	TONNAGE
China	1	808.4	1	803.8
Japan	2	104.8	2	105.1
India	3	95.6	3	89.0
United States	4	78.5	4	78.8
Russia	5	70.8	5	70.9
South Korea	6	68.6	6	69.7
Germany	7	42.1	7	42.7
Turkey	8	33.2	8	31.5
Brazil	9	31.3	9	33.3
Ukraine	10	24.2	10	23.0
Italy	11	23.4	11	22.0
Taiwan, China	12	21.8	12	21.4

Source: Worldsteel Association (2017)

Table 6: Apparent consumption of steel in the EU (millions of tons)

	2010	2011	2012	2013	2014	2015	2016
Austria	3.6	3.9	3.6	3.5	3.6	3.9	4.0
Belgium - Luxembourg	4.6	5.0	4.2	4.2	4.3	4.3	4.4
Czech Republic	5.5	6.1	5.9	5.9	6.2	6.6	6.7
France	13.1	14.0	12.6	12.6	12.5	12.7	13.0
Germany	36.2	40.7	37.5	38.0	39.6	39.3	40.3

Italy	25.7	26.6	21.5	22.0	22.0	24.6	24.2
Netherlands	3.5	4.1	4.0	3.7	3.5	3.5	3.8
Poland	10.0	11.0	10,4	10.4	12.3	12.6	13.1
Romania	3.3	3.8	3.3	3.3	3.8	4.0	3.7
Spain	13.1	13.1	10.4	10.9	11.6	12.6	12.6
Sweden	3.6	3.9	3.5	3.6	3.4	3.4	3.9
United Kingdom	9.9	10.2	9.6	9.6	10.7	10.5	10.7
Other EU (28)	14.7	14.6	14.0	14.7	15.6	16.0	17.1

Source: Worldsteel Association (2017)

The Italian role in steel import-exports is overall significant and, above all, quantitatively balanced as to its inputs and outputs. Naturally, these quantities also affect the maritime trade.
In 2016, Italy, as noted in Tab. 7, exported 17.9 million tonnes and imported 19.6 million tonnes.

Table 7: Import export of leading world importers and importers of steel

RANK	TOTAL EXPORTS	Mt
1	China	108.1
2	Japan	40.5
3	Russia	31.2
4	South Korea	30.6
5	European Union (28)	29.9
6	Germany	25.1
7	Ukraine	18.2
8	Italy	17.9
9	Belgium	16.7
10	Turkey	15.3
11	France	13.7
12	Brazil	13.4
13	Taiwan, China	12.2
14	India	10.3
15	Netherlands	10.2
16	Spain	9.3
17	United States	9.2
18	Austria	7.3
19	Canada	5.8
20	Iran	5.7

RANK	TOTAL IMPORTS	Mt
1	European Union (28)	40.4
2	United States	30.9
3	Germany	25.5
4	South Korea	23.3
5	Italy	19.6
6	Vietnam	19.5
7	Thailand	17.6
8	Turkey	17.0
9	France	14.6
10	China	13.6
11	Belgium	13.0
12	Indonesia	12.6
13	Mexico	12.5
14	Poland	10.1
15	India	9.9
16	Spain	9.4
17	Egypt	9.2
18	Netherlands	8.4
19	Taiwan, China	7.9
20	Canada	7.7

Source: Worldsteel Association (2017)

The export table highlights that, at a global level, the Far East countries have the dominant role as exporters, among which China stands out.
The issue of import duties applied to the steel sector, a still uncertain element, will certainly be a key factor that will also lead to an increase in steel imports, for Italy as well, for example from the Far East.
Although steel is a commodity whose excessive moving is not economically convenient and there are "controlling" policies of imports, there are reasonable expectations for a possible proportional increase in import-export.
From the point of view of import, the possible (as much as it may be dependent on political factors) increase in oriental imports, linked to the highly dynamic and diversified framework of the world-wide industry and export and the high competitive quality potential of the Italian steel, however, make the "Eastern" maritime way (both to the Far East and other destinations, such as the "Middle East") an opportunity for interchange aimed at acquiring a growing potential role.

It should be recalled, in general, that between 2016 and 2017, the Italian iron and steel industry proved, as a whole, considerable dynamism in terms of acquisitions/disposals for concentration and rationalisation of production purposes indicating the emergence of a phase that is new in certain respects and potentially very lively in the sector, also in the field of logistics innovation.
In Italy, the territorial concentration of steel productions and processes in relatively well-defined areas (in addition to Taranto in the South and the Northern Tyrrhenian region, the production is currently concentrated in the territorial centres of the Po Valley, with the largest agglomerations in the Brescia area but also in the Verona area) puts the port of Taranto, in principle, in an unfavourable position in its intent to become a logistic point of land/sea interchange for the Italian steel industry.
However, as it will be discussed in the parts dedicated to the traffic prospects in the port, it should be noted that in perspective, **the critical mass potential a priori localised in the Taranto area is still an interesting attraction for specialised logistic operators who want to activate distribution networks based on the optimisation of the maritime transport** (avoiding the "climbing" costs in the Adriatic or Tyrrhenian Seas) and capable of exploiting the increased performance of rail logistics along the "Adriatic" line. If the rail option allowed good efficiency levels along the logistics chain, Taranto could really become a context of great interest for the localisation of large deposits, which could serve as platforms for connecting with the steel sector of the northern areas, both in and out of the country, also in conjunction with other break-bulk trades. The iron and steel industry, which sees the presence of several establishments connected between themselves, is one of the most suitable to develop, as it will be said, the railway logistics.

b) The "Agrifood" sector

The Agrifood sector (which includes both the agricultural and food sectors) is not an area that can be counted among the most significant components of the Taranto area. It, however, represents, as noted above, a **key sector for the Puglia economy** and which, above all, is characterised by a **considerable propensity for further development of the import-export potential**. For this reason, besides the general data, some specific features should be underlined. As also highlighted in the latest field study[19], the production system is still heavily oriented towards the cross-regional sales and purchases.
The industry **of foodstuffs** (with drinks and tobacco) is the sector that adds most value and has, however, shown between 2013 and 2015 import-export values ranging between 2.9 billion in 2013 and 3.5 billion in 2014 and 2015, increasing its market share in the regional import-export complex, up to exceeding 20% in 2015.
The "exports" related to agriculture are mainly directed to other Italian regions: the 2.3 billion euro of agricultural products sold outside Puglia are in fact of an inter-regional nature and are 3.4 times above the exports to foreign countries. Much of the output going outside the regional borders is therefore sold "in proximity", namely to a large extent in Campania (about 27% of the total), in the Emilia-Romagna market which absorbs about 15% of the primary Puglia agricultural exports followed by Lazio. Less than 10% is routed to Lombardy.
According to the SRM study, "the regional food industry favours, even more than the agriculture does, the destinations of proximity. The amount of inter-regional exports of the Puglia food industry is, however, 13 times the value of inter-regional agricultural exports, indicating that, despite a market position that is not very good among the Italian regions, the regional processing industry can add much value to the local product as compared to the primary sector".
Proportional to the production, Puglia's foreign exports are still weak as compared to its potential, but they show a significant maritime propensity, considering that, as pointed out by the SRM study, "in 2015, Puglia's exports to the 28 EU countries decreased by 5.1%, resulting in less than 50% of the regional total. More specifically, the exports decreased by 7.7% towards the Euro Zone Countries, while they increased by 35.5% to North America, by 61.8% to South-Central America and by 29.5% to Asia (..) The exports towards North America, Central and South America and Asia amounted to over 2 billion in 2015, namely 25 percent of the total".

[19] SRM (2017), Puglia and the Economic Development - Agromed's potential role for the Territory's growth

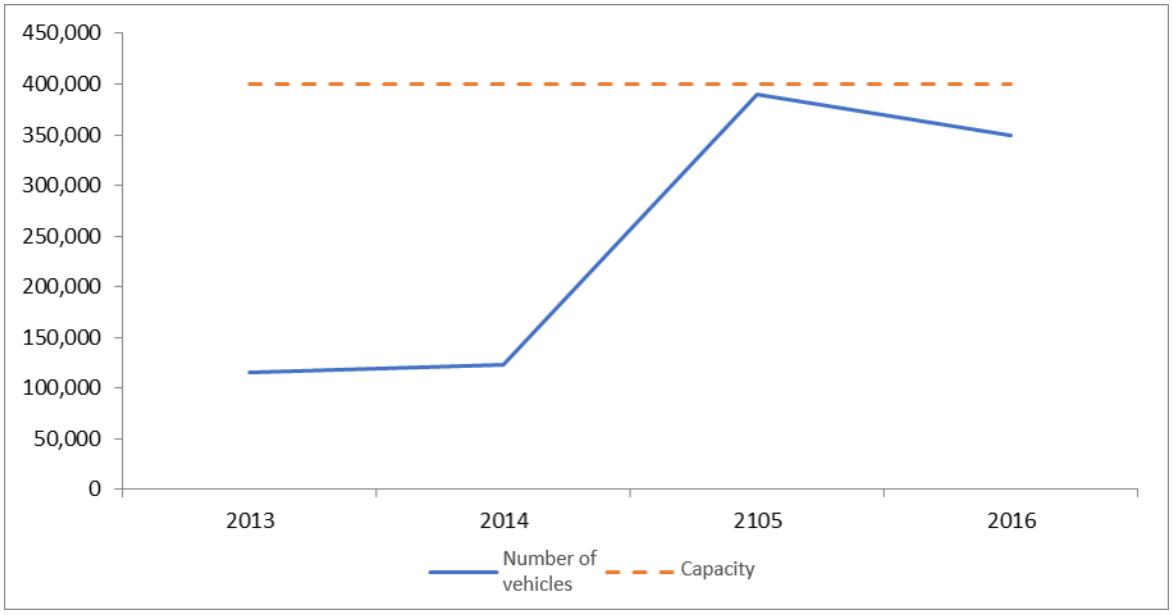
The same study notes that Puglia also has a strong propensity to import agri-food, in particular, livestock products, dairy products, fresh fruit, exotic and dry fruit, coffee, spirits, and more recently, oils and "biodiesel" vegetable oils from other Mediterranean countries, as well as cereals from the United States, Australia and Ukraine. The conclusion reached by the SRM study is that "the food processing industry is a precious asset of the Puglia economy, which is capable of generating extra-wealth production effects, also serving other sectors and other areas of the country" but it requires support on the logistics level as regards the international import-export by sea.

c) The automotive industry ("automotive")

The automotive industry does not currently find any specific references to the Taranto area either on the production or on the logistics side. However, as far as the hinterland is concerned, the port of Taranto, though not in the position of an undeniable natural primary port, is located in a gravitational area of interest for the car industry located in the central and southern part of the country, considering the factories in Melfi (Basilicata). In addition to these, though further North, there are the ones of Atessa, Chietino village along the Adriatica coast.
However, the sector deserves to be considered as a sector of interest also with respect to its potential logistics, although it should be immediately noted that the compatibility between the car logistics and dust emissions in the port area (such as those which are possible in areas where bulk is processed or blast furnace processes exist) is generally considered low.

The production plants of Melfi, declared by the owner company (FCA - Fiat Chrysler Automibies) to have a potential of 400,000 vehicles a year, have recently been concerned with a developmental dynamics based on the production of some successful models intended also for export, which has recently decelerated due to turbulence on the "diesel" segment, on the one hand, and the exit of old models from the production range, on the other hand. The trend, as compared to the current maximum potential of the plant, is described in the graphics of Figure 18. In any case, a recovery is envisaged, also considering the optimistic signals that come from the car production market in Italy. As it may be seen from the data below concerning the total production of vehicles in Italy, the absolute incidence of Melfi in the national panorama of passenger car production may be observed.
For Melfi, it should be noted that, recently, there have been signs of interest for the launch of a maritime logistics focused on the port of Gioia Tauro.

Figure 21: Melfi Plant - Production performance (vehicles) 2013-2016



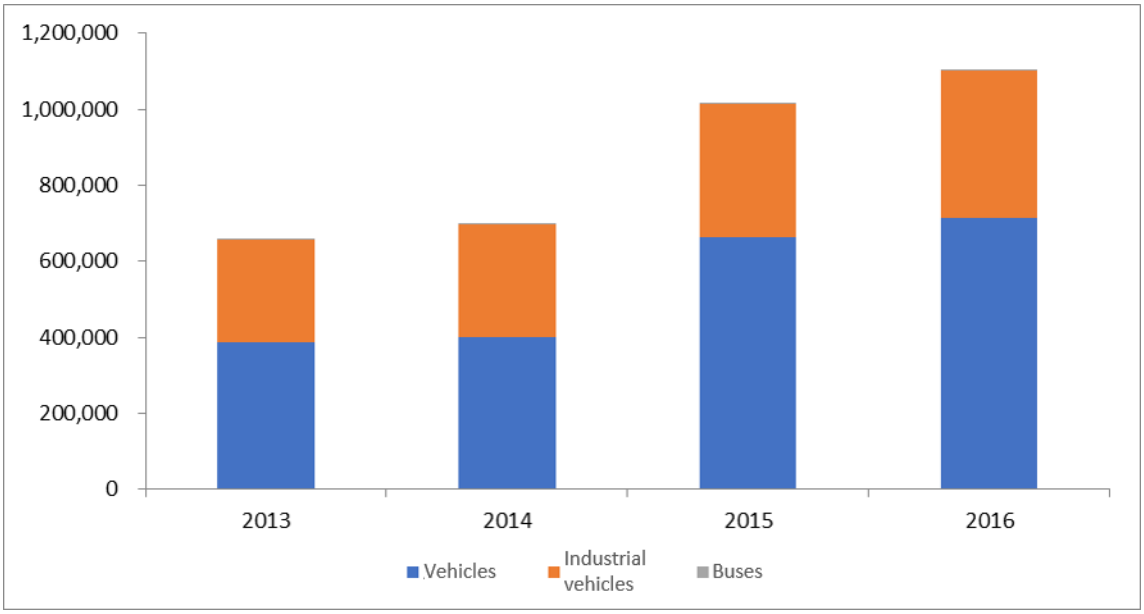
Source: EC elaboration of various sources

Atessa (Province of Chieti) along the Adriatic coast, near Ortona, hosts both the production of motorcycles (about 80,000 scooters per year in 2016) and vans (29,0000 units in 2016, with further development prospects). Currently, export automotive logistics from the Atessa plant uses differentiated solutions, including the use of ports (such as the natural port of Ortona, despite its infrastructure weaknesses).

The production and import-export of motor vehicles in Italy

A reading of the automotive production market and its export potentials still deserves to be achieved by referring to the entire national landscape in order to highlight the absolute importance of this industrial chain in the country and its recent expansive trend after some years of difficulty, as shown in the graphic of Figure 19.

Figure 22: Italy - Italian production of new vehicles



Source: EY elaboration of ANFIA source

As to the import-export of the automotive industry in Italy, it is highlighted that, in 2016, the exports of motor vehicles (excluding components) amounted to € 21.21 billion (+6.3% as compared to 2015), accounting for 5.1% of all national exports, while imports reached € 30.18 billion (+23.3% as compared to 2015), accounting for 8.3% of all exports imports. The automotive exports to EU countries reached € 12.14 billion in 2016, increasing by 12%, while it was worth € 9.07 billion in non-EU countries, decreasing by 0.6%.

Among the non-EU European countries, the most important area for the role of maritime transport were the exports to Turkey which accounted for 0.62 billion (-0.1%). As far as non-EU countries are concerned, exports in 2016 amounted to about 4 billion to the US (-5.3%), to 0.81 billion to China (+67.5%) and to 0.70 billion to Japan (+27.6%). The exports to these countries accounted for 61% of non-EU exports of the sector and 26% of total automotive exports.

The vehicle imports reached € 24.63 billion in 2016 from EU countries (+20.1%) and € 5.55 billion from non-EU countries (+39.8%).

Among the European non-EU countries, the value of imports from Turkey was € 2.45 billion (+70%). As to the non-EU countries, the imports from Japan reached € 0.80 billion (+95.5%) and € 0.21 billion (+121%) from the ASEAN countries

According to ANFIA, the association bringing together automotive manufacturers, in 2016, the total automotive industry exports, including components, exceeded € 39 billion (+3.5% as compared to 2015), while the imports accounted for over € 43 billion (+17%).

d) The oil sector

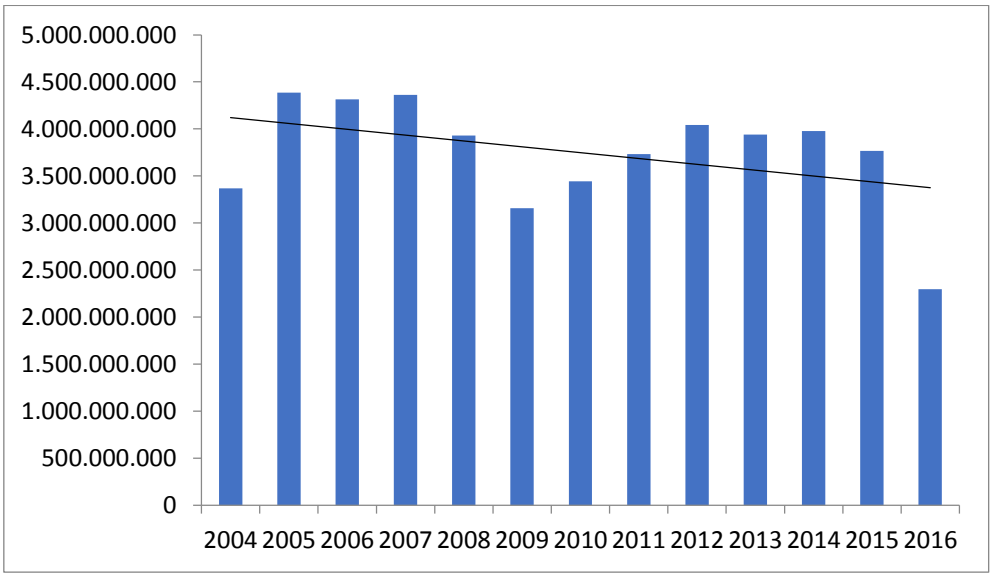
The choice to focus on the oil sector, even though in a regional dimension, is that the Taranto area hosts an important refinery owned by Eni's Refining&Marketing, with a potential of 6 million tonnes per year, currently being exploited for about 4.2 of production destined partly abroad and partly to supplying the Eastern regions of Southern Italy.

The Eni refinery processes the crude oil coming by sea from the Middle East and North Africa as well as the crude oil coming by land from the fields located in the Basilicata area. The Taranto plant imports crude oil and provides for shipments of both crude oil (coming from Basilicata) and products, as further explained in chapter 8.

As to the production environment of Basilicata, this envisages a considerable development potential with regard to the oilfields reserves. However, there are some major uncertainties due to the high level of disagreement from the population (and, to some extent, by the local governments themselves) in relation to the investments intended for a sector considered to be damaging to the local environment, a factor which, in any case, determines a certain degree of uncertainty about the expectations of product development.

The graphic below shows the progress of crude oil extraction from the various sites of the Basilicata Region between 2004 and 2016, underlining the oscillating trend and the significant decrease of 2016 (with a trend confirmed in 2017).

Figure 23: Crude oil production at the Basilicata plants (Kg)



Source: EY processing of data from the Ministry of Economic Development

e) Other sectors: cement and mechanics/plants

The attention paid to the cement sector is due to the fact that the industrial area of Taranto hosts a company belonging to Gruppo **"Cementir ",** an Italian multinational company, which has a cement plant that uses steel mills for blast furnace cement in Taranto. Cementir Italia is one of the leading cement and concrete producers in Italy. The company is controlled by Cementir Holding SpA, active internationally in the building materials sector.

The mechanical industry, in the case of large-scale plants that intensively use exports by sea, is of interest to the Taranto area since it hosts a leading company in the field of wind turbines, namely "**Vestas**".

Another reality connected to the plants is represented by **Arsenale della Marina Militare di Taranto (Mar Piccolo)**, which has about 1,453 employees. It is the largest in Italy together with La Spezia. The Arsenale occupies an area of over 90 hectares, has a seafront area of about 3 km with an area of 4.5 km of docks. In order to ensure the availability and operational readiness of the Marina Militare Ships, it intervenes in the maintenance and repair of highly technological equipment and installations and provides the necessary support to a ship for work such as compressed air, water, electricity, availability of means of transport and lifting and dry-dock facilities. Therefore, considering the

particular tasks entrusted to it, Arsenale, apart from representing a real workplace establishment, represents a major technical-logistical structure. Recently, the Ministry of Defence also assigned the maintenance of two new units to this industrial plant.

The analysis of the regional economic environment of the Puglia and Basilicata areas has favoured an overview of the economic structure of the import-export area, thus revealing an environment offering a broad range of products. Among such products, some fields provide current or potential connections with the port of Taranto.
In order to better identify which sectors and chains are most interesting, also for the future, for the port of Taranto (both in terms of "organic" growth and "innovation" in the commodity framework) it is necessary to **address some accessibility features of the Taranto neighbouring area related to transport**.
Paragraph 8 will show precisely the size of the port market area by following an accessibility analysis.
As it will be observed, for the road transport, within the productive regions, the area of influence corresponds to some areas of Puglia and important portions of Basilicata.
Potentially wider is the area that can be reached by railway, which allows reaching the various destinations on the Adriatic coast in a sufficiently competitive time, up to reaching the Northern part in the Po Valley, with the centre of reference of the railway junction of Bologna. Additionally, the railway makes some of the Western areas of Central Italy and Southern Italy (Campania and Lazio) economically accessible.
Based on the analyses carried out above, the following observations may be made while attempting to make a first identification of any interests for the port of Taranto, in a traffic-oriented perspective.

a) For the **general cargo markets of non-specialised chains** (also of high value and absolute low volumes such as footwear, clothing, small mechanics, a part of the agro-food) that are carried together towards destinations served by container lines, there is no specific interest in the port of Taranto. This traffic tends to be distributed among several ports that are located close to each other and are served by line services. The Bari area is that part of the territory which hosts much of these productions, also offering opportunities to access closer ports served by line services even if feeder (e.g. Bari itself - both with containers and with Ro-Ro lines for some countries, such as Greece) or more distant locations (e.g. Campania, for ocean shipping), but which traditionally attract multiple line services due to their closeness to large markets. These chains show no priority interest in the Port of Taranto.
b) As to **some industrial markets** located in the Taranto area, such as the **cement** and **oil** markets, there is moderate interest perspective in the sense that there are no noticeable structural changes in flows and patterns of traffic, although, in the hydrocarbons sector, the supply problems of Basilicata could reduce the competitiveness of the plants. In relation to the **mechanics** of large plants, it is possible to envision the localisation of some other producers in case of a greater industrial plant dynamics in the area.
c) The **Agrifood chain,** for absolute quantities, tendencies and, above all, unexpressed potentials, has considerable interest potential and relevance in the import-export development component for markets to be supplied by Ro-Ro that could be interested in connecting to some production chains based on some cold-related and specialised logistics platforms. Taranto's not particularly central position in the production and consumption market poses some questions, but the presence of logistical infrastructure already built for the cold chain offers traffic innovation perspectives.
d) The **Automotive** chain, located not too far from Taranto and accessible by railway, has a considerable potential relevance from a theoretical point of view and could be affected by innovative port facilities characterised by availability of space, excellent maritime accessibility and good railway logistics. Still subject to the dust risk, this is an industry that, also for the foreseeable dynamics of import-export, can still be considered as a focus for a new growth in traffic.
e) The **steel chain is of** great interest not only due to the volume growth prospective related to the ongoing redevelopment of the steel sector and the possible rise of a further allied industries, but also due to the opportunity that the specialisation of the area and the high presence of flows (including products and semi-

finished products) stimulating the localisation of operators interested, also as terminal operators, in a "break-bulk" logistics with the opportunity to use the large areas available and railway accessibility in any further improvement, also to serve more areas in the Northern part of the country. The steel traffic base could also favour the complementarity with further traffic, even lighter, such as, typical forestry products.

PART II. THE COMPETITIVENESS OF THE COUNTRY-SYSTEM AND THE ITALIAN PORTS

3. THE NATIONAL STRATEGIES FOR THE SEA SYSTEM

3.1. Connecting Italy and the new Integrated National System of Transport and Logistics

By the "Connecting Italy - Strategies for the Transport and Logistics Infrastructures" (2016) document, the Ministry of Infrastructure and Transport has started a strategic planning process for infrastructure policies that, after fifteen years of dissipating the financial resources for a large number of major works, is now planning to reorganise the public investment within a coherent and unified framework, as requested by the European Commission. Therefore, "Connecting Italy" together with its update, "Requirements and Infrastructure Projects" (annexed to the Economic and Financial Document of 2017) is the document whereby the various industry strategies find consistence, which proposes an organic planning of all the nationally significant infrastructural works for transport and logistics.

"Connecting Italy" aims at re-launching the country's competitiveness through the construction of appropriate transport and logistics connections and services with Europe and the Mediterranean area, enabling people and goods to be fully mobile and serving some specific "strategic markets", represented by workplaces, manufacturing poles and tourist destinations. In order to achieve this goal, the document defines four medium-long term strategic objectives:

- To increase the accessibility to the territories, Europe and the Mediterranean area;
- To improve the quality of life and the competitiveness of urban areas;
- To support the industrial chain policies;
- To pursue a sustainable and secure mobility.

Consistently with the strategies defined by the European Union, "Connecting Italy" identifies one of the drivers in pursuit of the objectives of the maritime transport and logistics chain. In fact, among the set strategies, the "Water Care" plays a central role and together with the Iron Care are the two pillar of the government action intended to achieve transport decarbonisation targets. Among the lines of action related to the "Water Cure":

- The promotion of intermodal railway transport;
- The improvement of the intermodal chain in ports;
- The full inter-functioning between information and technology systems in ports and along the logistic chain;
- The use of ITS for multimodal transport and logistics management, the creation of a suitable framework for the real-time tracking of goods.

Additionally, the 2017 update of "Connecting Italy" identifies the infrastructural needs of the national port system, defining intervention cross-programmes related to the following topic areas:

- **Maintenance of state-owned public assets:** the programme aims at ensuring the maintenance of the state-owned public assets in port areas, and includes works on quays, squares, docks and inland port traffic.
- **Digitalisation of logistics and ICT:** the programme aims at continuing the logistics chain efficiency progress through digitalisation and promotion of ICT applications and aims at extending the integrated PMIS-PCS-AIDA-PLN /*preclearing+fast corridors to* all core and *comprehensive* Italian ports.
- **Last/penultimate railway mile and port network connections:** The programme envisages the identification of infrastructure initiatives useful to optimise the accessibility of Italian ports, while complying with the vocation and catchment area of each port, in order to create competitive, effective and efficient conditions for the land transport of iron containers.
- **Last road mile:** the programme provides for the resolution of structural weaknesses in road accessibility of some Italian ports in order to optimise their market penetration in the *catchment area* of reference.
- **Maritime accessibility:** the programme includes useful measures to improve maritime accessibility in order to accommodate ships that are consistent with the types of traffic to attract.

- **Energy and environmental efficiency:** the programme aims at significantly increasing the environmental sustainability of Italian ports, in line with the Strategic Goals of the National Strategic Plan for Ports and Logistics.
- ***Waterfront* and cruise and passenger services:** the programme includes measures for adapting ground-based reception services, the development of cruise terminals, where necessary, and the enhancement of urban *waterfronts* in order to improve the port-city relationship.
- **Industrial activities in ports:** the programme envisages interventions on the shipbuilding chain and on value-added industrial activities in ports.
- **Selective increase in port capacity**: the programme provides, where necessary, in line with the strategic perspective outlined above, a selective increase in port capacity in the Ro-Ro and container segments.

3.2. The National Strategic Plan for Ports and Logistics

If "Connettere l'Italia" works in terms of infrastructure policies – including those for the maritime and port sector, the National Strategic Plan for Ports and Logistics (Piano Strategico Nazionale della Portualità e della Logistica – PSNPL) is the programmatic document that identifies a development model for the maritime system and lays down in detail a catalogue of strategic actions for Ports and logistics.

Drawn up in full continuity with European Union's strategies and with the specific EU recommendations for Italy, the Plan revolves around the concept of *Maritime System*, construed as the group of *stakeholders* – institutional actors, traders, users and infrastructures – that need a shared *vision* and a joint *governance*. Therefore, the logic of the Plan expects to enable the Maritime System to work effectively and also do it in an always more competitive international context by hinging on the starting of internal synergies and on the overcoming of silos tied to the autonomous choices of the single ports.

PSNPL's strategic goals are ten:

1. **Simplification and reduction:** reduction of times and costs of transit of goods, optimisation of the approval of the project and their realisation times.
2. **Competition, transparency and *upgrading* of the services:** improvement of the effectiveness and efficacy of Technical-Nautical services; uniformity of the access conditions for state concessions; uniformity of port work conditions; increase in competition and transparency as far as Italian ports are concerned.
3. **Improvement of the accessibility and of sea and land connections:** improvement of the port accessibility via land and sea, through the enhancement of the rail services for inland goods movement from the ports and the promotion of new maritime services and connections in support of markets and logistics chains, with the utmost potential of growth and value added creation.
4. **Integration of the Logistic System:** improvement of the quality and competitiveness of logistic services provided inside and outside of the port through the functional and management integration of port systems with freight terminals and logistics platforms.
5. **Improvement of infrastructure performances:** removal of infrastructure limits by working on the collection and modernisation of the existing infrastructure capital and on the railroad and street bottlenecks for short- and long-range port accessibility, also through public-private financing arrangements.
6. **Innovation:** diffusion of *Intelligent Transport Systems* for port operations management, by connecting universities and research centres with the country and the industrial framework linked to ports and logistics.
7. **Sustainability:** reduction of ports' impact on environment at a global (greenhouse gases) and local level through the adoption of measures for energy conservation and efficiency, integrated with technologies of renewable sources production and use.

8. **Certainty and programmability of financial resources:** centralised and multi-year planning of financial resources for infrastructures, to be also ensured by drawing up the Multi-Year Planning Document (Documento Pluriennale di Pianificazione – DPP).
9. **National coordination, sharing and partnership comparison:** strengthening of the national coordination and its structures; comprehensive stakeholders' involvement.
10. **Updating of Maritime System's governance:** port *governance* reform, to enhance the action of the System as a sole structured actor and overcome the "port individualism" through a unification of Port Authorities, according to Law 84/1994.

3.2.1. PSNPL implementation status

After the adoption of PSNPL, several implementation measures have been introduced, mainly referring to two scopes of applications defined by the Plan: the simplification of procedures and the port governance.
As far as the **simplification** goes, a clear regulatory framework with safe and simple procedures has been defined to control the excavation and dredging operations; the one-stop customs Facility has been established to coordinate the goods receipt and dispatch through a single body (Customs and Monopolies Agency); moreover, areas have been outlined for the customs clearance by sea that goes by the name "Pre-clearing", which is the advanced customs clearance procedure that takes place while the ship is sailing to the final destination port, through telematic delivery of the custom manifest; the customs clearance at destination "Fast corridor", which is the creation of simplified customs corridors controlled by the National Logistics Platform; the digitalisation of the Logistics Chain has started. On the other hand, as far as **port *governance***, the **Legislative Decree 169/2016**, which considerably amends the Law 84/1994 that used to regulate Port Authorities, has been approved. This provision institutionalises the Marine Resource as an integrated system: in fact, it redesigns the whole national ports profile through the reorganisation of the pre-existing 24 Port Authorities and their unification into 15 Port System Authorities, entrusted with new functions and strictly connected to a specific control booth located at the Ministry of Infrastructure and Transport. Among those functions, the most relevant refers to the strategic planning of large investments and marketing promotions, to be operated in accordance with national and European strategies, but also in synergy with the other Port System Authorities. The goal is to direct strategic choices and investments, enhancing the peculiarities of territories and ports that fall within each PSA's jurisdiction and encouraging a constructive competition within the country-System. The appointment cycle of the new PSA Presidents has been recently completed. In this perspective, the Legislative Decree 169/2016 gives the new PSA's Three-Year Operational Plans a higher-level planning role that defines the port's vision and the short-range actions just as a beginning of the realization of the identified vision. In line with these requirements, PSA Taranto is becoming a pioneer thanks to the drafting of this Three-Year Operational Plan.

3.2.2. Revitalisation of rail transport (Iron cure)

In terms of national strategies, the Iron cure is complementary to the water cure. In order to achieve the national and European targets as far as the modal shift towards rail transport goes, the Government is driving the plan of *Actions for the Revitalisation for Rail Goods Transport*, which has faced an early confrontation between the Ministry of Infrastructure and Transport and the field stakeholders. As a result of this partnership, MIT's Technical Structure of Mission has laid down a package of actions or interventions related to the following themes:

1. High speed/High capacity line for goods
2. Facilitations for Combined Transport
3. Rail Fast Corridor
4. Incentives
5. Freight terminals
6. Engine drivers (temporary, Sole, training)
7. Railway maintenance
8. Dangerous goods

9. Planning
10. Safety
11. Traffic spread
12. Waste transport

The package of actions has been accomplished thanks to a legislative measure which is currently being voted in Chamber and Senate and includes:

- Collection of resources 2016 Ferrobonus and extension until 2019;
- Collection of resources 2016 Marebonus and extension until 2019;
- Collection of resources 2016 toll discount;
- Fund for engine drivers' training;
- Contribution of 45 M euro for the re-fitting of the carriages (noise reduction);
- Chances for PSAs to anticipate discounts on the fees of the terminal operators that enhance the railroad system.

Then, there are two regulatory issues that do not need provisions and for which the MIT will issue a circular: the document dematerialisation (Review of the MIT Circular no. 30048/2010) and the simplification and harmonisation of the procedures for tank and packaging homologation.
The revitalisation activities for the rail transport include also the Launch of Mercitalia, new national player within the rail goods transport field, and the enhancement of RFI Program Contract, interventions for the last-mile rails and the connection ports – freight terminals – TEN T Network Corridors.

3.3. PON Infrastructures and Networks 2014-2020 and the Integrated Logistic Areas

As for the European Union Cohesion Policy, the infrastructure and transport planning finds an important decision-making moment and a financial source in the National Operational Program (Piano Operativo Nazionale – PON) Infrastructures and Networks 2014-2020. This NOP is the programmatic document for the realisation of Thematic Objective 7 – "Promoting sustainable transport and improving key network infrastructures", which represents for Italy a vehicle to overcome several critical situations, such as the modal composition unbalanced towards road traffic, the inadequate infrastructure endowment, the weakness of the logistics system, the insufficient involvement of the private capital in financing transportation infrastructures, the regulatory complexity and the inefficiency of planning instruments. In order to overcome these critical issues that damage the Country's overall competitiveness, the NOP Infrastructures and Networks focuses the interventions on regions lagging in development (Campania, Calabria, Apulia, Basilicata and Sicily). The Plan's strategy is based on the following Priority Axes (in addition to the technical support for the Plan implementation):

- Axis I – "Promoting the creation of a unique European multimodal transportation space with investments in TEN-T"
- Axis II – "Developing and improving environmentally sustainable transportation systems".

The role of ports is a decisive factor in the pursuit of PON's Objectives: out of a total amount of 1,8 billions of Euro (75% of which are financed by EU), over 600 millions of Euro destined to the improvement of port and freight terminal systems' competitiveness with regard to Axis II and, specifically, to port projects (€ 328.912.174,67), last-mile ports and freight terminals (up to € 235.331.649,33) and Single Window's implementation (up to € 120.000.000,00).
Besides defining the scopes of application, the NOP borrows from the Partnership Agreement a specific access mode for port-logistics financing. In fact, the Program defines the Integrated Logistics Areas (Aree Logistiche Integrate – ALI) as "focal points of a wider strategic-relational fabric that works as a site for decision- and policy-making, aiming at avoiding gaps and overlaps and simplifying the interventions' programmatic and implementing procedures". There are 5 ALIs (Sicily's south-east quadrant; Gioia Tauro's logistics Hub; Apulian System; Campanian logistics; Sicily's western quadrant), each of them includes a port system, inner harbours, freight terminals or logistics platforms related to it and the multimodal corridor connections of the European transportation network. In summary, ALIs constitute the smallest logistics units within which integrated planning takes place. This setting, used also by PSNPL, reflects Port

Systems' logic and enhances the possible synergies between ports and territories, in order to make port infrastructures available to the mobility needs of passengers and goods.
The Port of Taranto is included in the Integrated Logistic Area named Apulian-Lucanian System. With regard to the ALI Table coordinated by the MIT and the Agency for Territorial Cohesion, which includes the regions Apulia and Basilicata, the Port System Authority is strengthening the territorial and institutional relationship with the region Basilicata and especially with the towns of Matera and Metaponto. This relationship shall become a key feature for the development of both territories, with particularly positive impacts on the Port of Taranto, as we will be able to display in the following chapters related to the analysis of the Port of Taranto's trade potentiality.

3.4. Complementary planning (POC)

In order to support the completion of the relevant interventions which could not be financed within the planning period 2007-2013, the Ministry of Infrastructure and Transport designed a Complementary Operational Plan (POC – Programma Operativo Complementare) for the period 2014-2020, which contributes to the pursuit of the overall strategy defined by the NOP "Infrastructures and Networks".
The reinforcement Plan insists on PON's geographical area of intervention (regions lagging in development) and answers to the Partnership Agreement 2014-2020 in terms of strategic framework and expected results. The Plan's overall value amounts to around 490 millions of Euro, distributed into four theme fields:

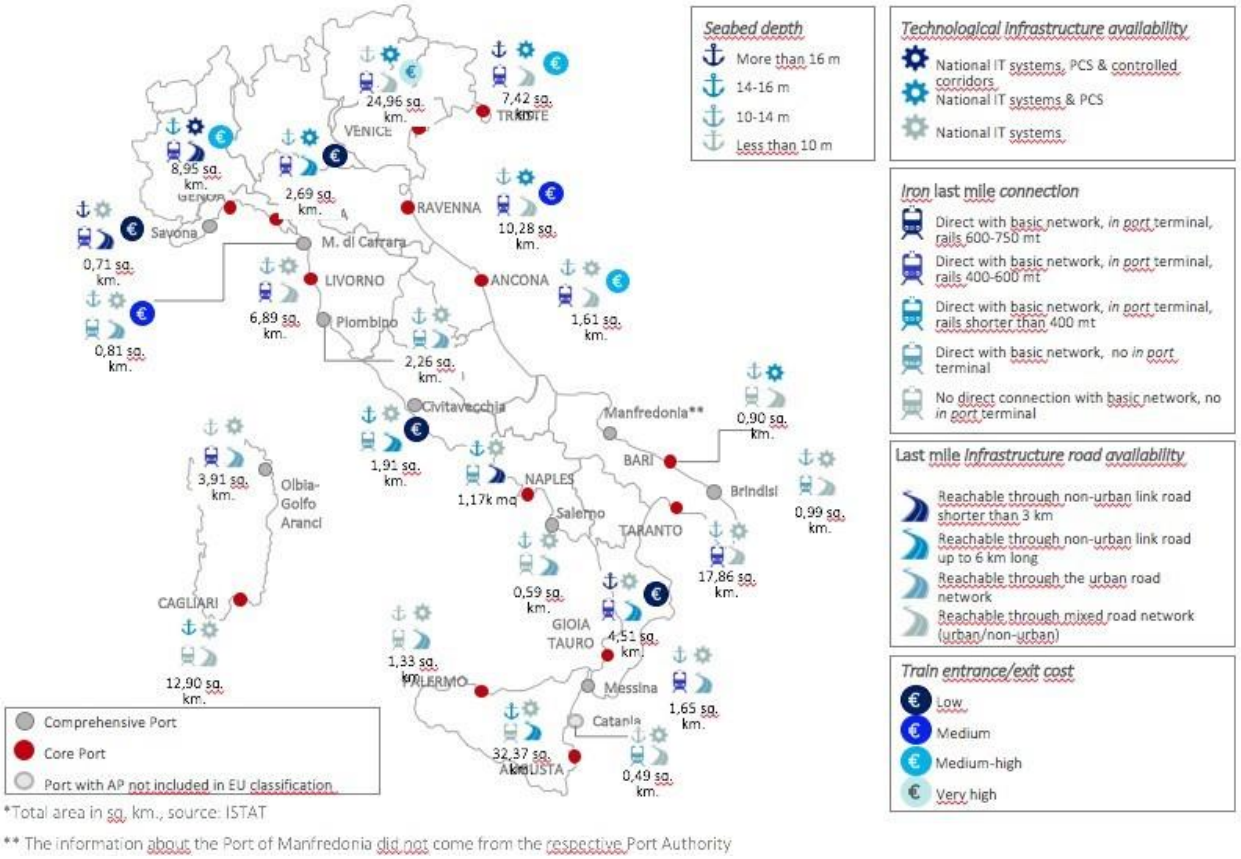
A. **Digitalisation of logistics**, which includes action for the strengthening of Fast Corridors, Port Community Systems, customs clearance by sea, one-stop customs facility;
B. **Waterfront redevelopment**, which includes urban regeneration actions for port waterfronts;
C. **Tourism accessibility**, which includes the improvement of links between stations and cultural attractions and bike paths interventions;
D. **Green Ports**, which includes actions that promote the national creation of a methodological and operational framework for the development of investment platforms to gather the single project to be funded;
E. **Institutional capacity**, which includes the support in the Program's implementation, monitoring, accounting, certification and management.

4. THE SCENARIO OF ITALIAN LOGISTICS

4.1. Accessibility by land and by sea

One of the main evaluation elements to comprehend Italian logistics is the analysis of the infrastructure offer of ports, examined in detail in the National Plan for Ports and Logistics on the basis of three axes: maritime axis (seabed depth), road axis (availability and last mile connections) and rail axis (availability and last mile connections).

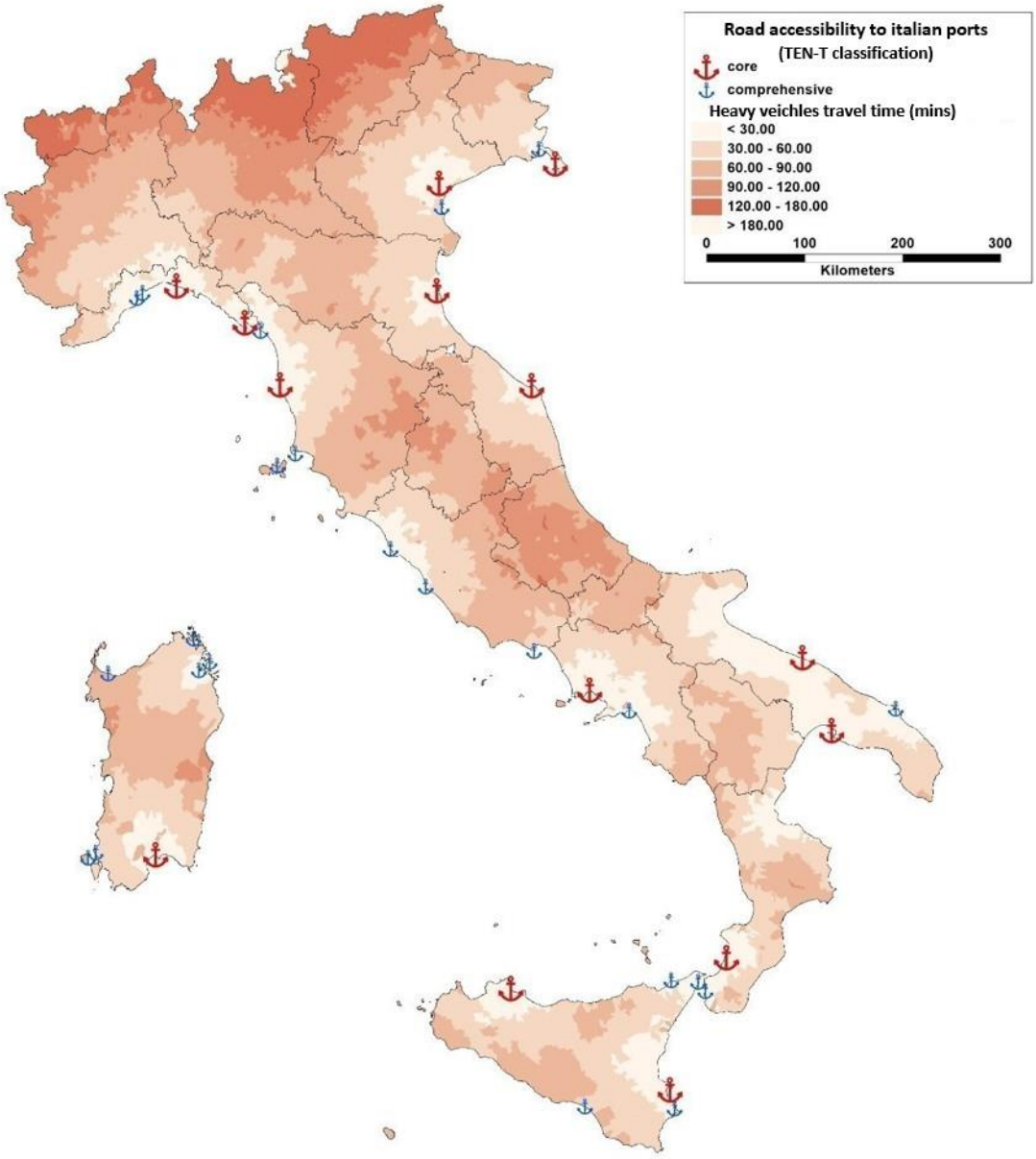
Figure 24: Infrastructure offer of Italian ports



Source: National Strategic Plan for Ports and Logistics

The particular structure of the national territory considerably affected the Italian port system. The alleged system fragmentation in several ports, which has been often described as a limit to growth and to an effective and modern logistics system, based on flow concentrations and economies of scale, is instead the logical (and locally effective) answer to the territory's request for access to global markets. In fact, throughout the history, the access to the sea has guaranteed the opportunity to cheaply transport goods from and to that territory, therefore encouraging trade exchanges and becoming an important competition factor for local productions. With the advent of containerisation, this characteristic amplified, allowing also peripheral areas to effectively integrate themselves into globally spread service networks. It is therefore clear that in a country with a large coastal development, in which also internal areas often feature a challenging orography and are very close to the sea, the widespread development of ports is the main instrument with which the national territory secured a good accessibility (next figure).

Figure 25: Road accessibility to Italian ports, TEN-T classification



Source: EY processing

This peculiarity, albeit revisited in light of modern *supply chains* requirements, must not be ignored, especially in a time in which the cost element of land forwarding services highly affects intercontinental transport operations as well. To make it all clear, **Italy's high port density and the elongated structure of the territory that often parallelises the sea mode and the land modes (road and rail) make it easier to directly reach the ports nearest the final destinations or to proceed with at-sea transhipments and feeder services which, in terms of unit transportation costs, are more competitive than land modes.** The same goes for ro-ros and the other bulk carriers, for which the land forwarding element is even more demanding than intermodal traffic.

In this regard, it is therefore comprehensible that **each port performs a function (or more functions) for the immediately adjacent socio-economic and productive fabric and just in certain cases, or on specific routes, the ports become relevant as focal points for wider territories or corridors**. For example, that is the case of the ports of the north Tyrrhenian Sea and north Adriatic Sea, which are well located to both serve Northern Italy's market and compete as gateway ports at the service of Middle-Eastern Europe's (and north Adriatic's) continental areas. Naturally, in order for the geographical position to turn into accessibility, infrastructure endowments are required to

host effective maritime and land forwarding services. In particular, the **accessibility by sea** is characterized by the amount, the type and the size of the hosting canal and, therefore, by the availability of docks and service areas, the depth of the seabed, the width of the turning basins and the annual usability. As far as the **accessibility by land** is concerned, road and rail connections prove to be decisive, since they become more and more relevant in locations where the served area grows, that is locations with particularly relevant logistical or productive units. Other important elements in complex supply chains are ***redundancy and resilience***, that is the network ability to offer alternatives and therefore resist malfunctions or suspension without damaging any link. In this regard, a good rail accessibility represents an important asset for the ports of other peninsular and, to a lesser extent, insular clusters.

It is therefore clear that the downside of this fragmentation and this lack of functional specialisation is the **actual difficulty to achieve economies of scale and scope** and the **historical inability to create a critical mass and compete with the shipping companies'** (containers, ro-ros and cruises) **leading market role**. An answer to this issue must derive from a more significant and effective coordination of all port infrastructures, and this is why the National Strategic Plan for Ports and Logistics has introduced substantial changes to the national port *governance* and to the selection of the Italian port system's projects and strategic priorities.

So, returning to the Italian port system's characterisation, the **North Tyrrhenian cluster** presents a maritime accessibility which, albeit not in line with the standards of north European *competitors*, is enough to host the largest container ships currently used for the route Far East – Mediterranean in at least two of its ports and with some limitations. Thanks to the already implemented interventions, aimed at the enlargement and creation of new marine terminals and at the deepening of the seabed, this situation will shortly present further improvements. In terms of land accessibility, the clusters' potential to become international gateway are partially frustrated by rail connections that do not consent excellent performances, most of all because of the hard crossings of Apennines and Alps. This turns into a rail traffic limited to national relationships, especially with Lombardy and, to a lesser extent, with the freight terminals of Padua and Bologna. The already made and current investments, both abroad and in Italy, are changing things up: the recently launched Gotthard Base Tunnel, the realisation of the Ceneri Base Tunnel, the so-called Terzo Valico dei Giovi and the network's functional *upgrading* along with the last-mile and second-to-last-mile interventions in Ligurian ports, will allow to increment the rail mode competitiveness, both from north Tyrrhenian ports to the Po Valley and the Central Europe and on the axis Northern Europe – Northern Italy, surely increasing the size of the contestable area and finally enabling the north Tyrrhenian port cluster to exploit its potential as international gateway.

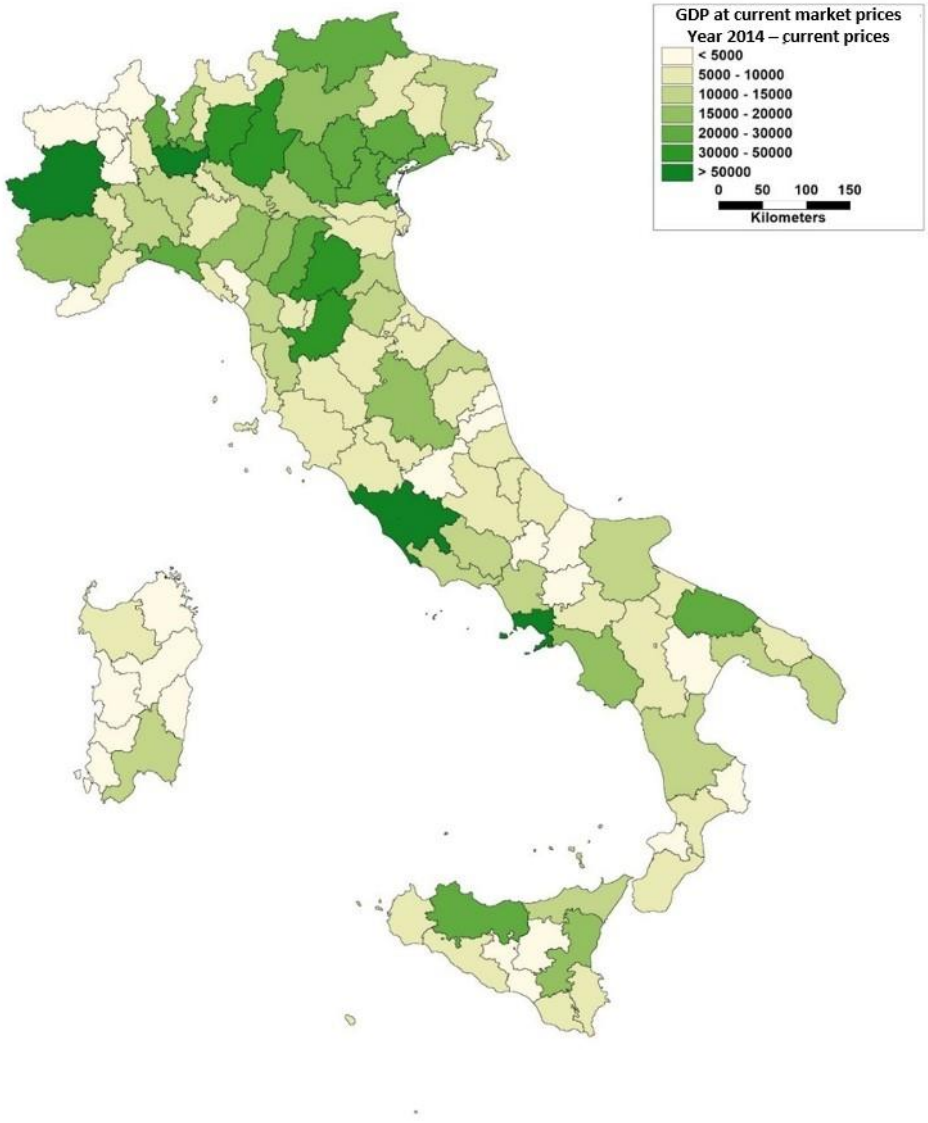
The north Adriatic port cluster is characterized by the excellent maritime accessibility of Trieste and more binding conditions related to western ports, that is Venice and Ravenna. Road and rail connections already guarantee a good accessibility to the rich North-Eastern area and to the international markets that can be reached via the Brenner pass and, most of all, the Central and Eastern Europe markets well served by Trieste, which currently is the only Italian port that develops relevant international rail traffic. Also in this case, the investments made in rail and port networks and hubs will further increase the rail mode's potential and the competitiveness, anticipating a widening of *catchment area*.

With the exception of the Port of Ancona, which works as a gateway on the Balkan route not just for central-northern Italy, but also for Switzerland and other international relationships via the Gotthard Tunnel, the **remaining ports and peninsular clusters** benefit from a favourable location to serve national areas, since they are dominated by north Adriatic and/or north Tyrrhenian as far as transalpine relationships are concerned. In terms of infrastructure endowments, be it by sea or by land, the situation is quite uneven, given the involvement of the Port of Gioia Tauro that benefits from a high maritime accessibility and the involvement of ports with stricter restrictions. With the completion of the already planned works, the maritime accessibility of the Ports of Naples and Taranto will considerably improve, but there is a large scarcity in terms of road connections, in respect of which Taranto's endowment is definitely significant. However, generally speaking, it is right to note that rail connections with good performances are getting started (or about to get started) only along the Adriatic coast, whereas the transverse east-west axis and the south Tyrrhenian one are heavily penalised: the wait for a significant performance *upgrade* could last until 2030.

4.2. Italy's market position

In order to correctly interpret Italy's market position in the international logistics scene, there are some point that must be carefully considered. First of all, **the position of the country's economic-productive centre of gravity is further north than the geographical centre of gravity**, as shown in the GDP distribution on the territory (next figure), just like the European centre of gravity is further north than Italy. This simple remark already explains why, apart from national productions, **Italy can hardly host Trade Distribution Centres and Regional Distribution Centres, which serve Italy, tend to locate north of the country**.

Figure 26: GDP at current market prices, year 2014 – current prices



Source: EY processing

This affects considerably the concentration of port and rail traffic related to the national territory: for example, in 2016, net of the *transhipment* traffic, the north Tyrrhenian and north Adriatic cluster together have moved 77% of the containers (Table 1) and 80% of rail freight services start and end in a northern Italy region or beyond the respective borders.

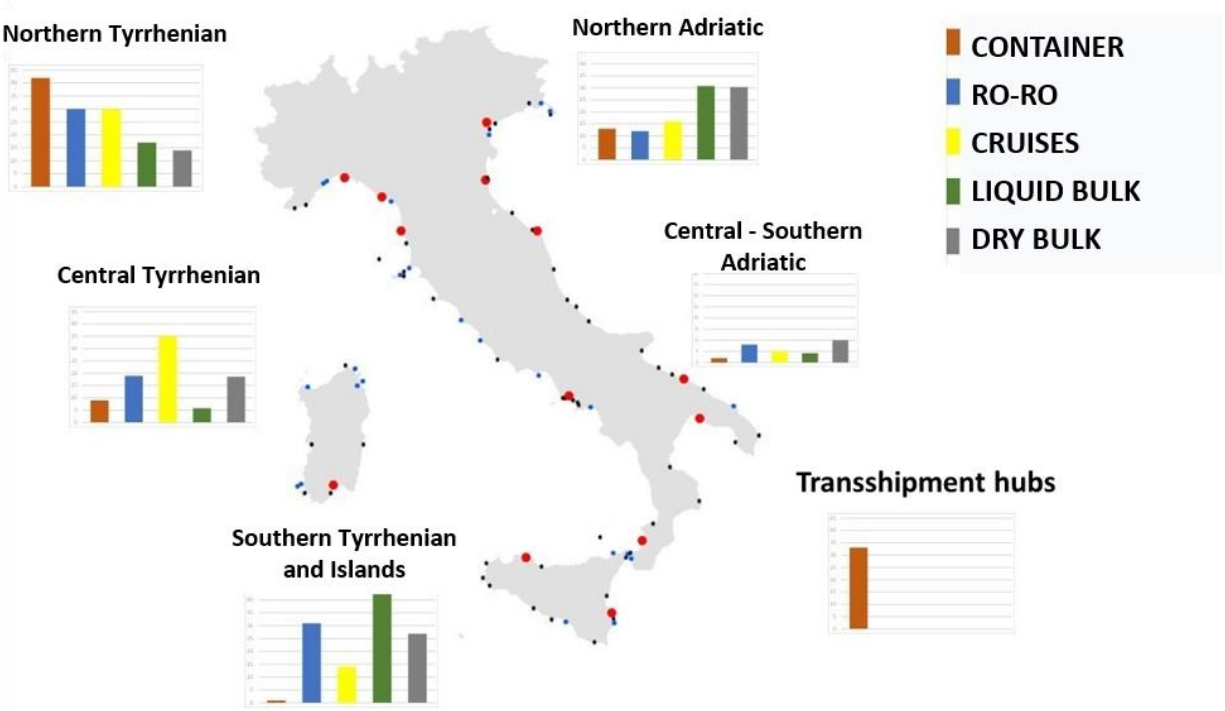
Table 8: Total amount of 2016 container movs. per cluster, in terms of transhipment and towards the hinterland

CLUSTERS	TOTAL MOVEMENTS (TEU)	%	TRANSHIPMENT (TEU)	%	HINTERLAND (TEU)	%
Hubs	3,520,412	33%	3,282,455	82%	237,957	4%
Other clusters	1,266,915	12%	-	0%	1,266,915	19%
North Adriatic	1,327,865	13%	215,047	5%	1,112,818	17%
North Tyrrhenian	4,458,551	42%	506,666	13%	3,951,885	60%
	10,573,743	**100%**	**4,004,168**	**100%**	**6,569,575**	**100%**

Source: EY processing on sources from Assoporti, Dynamar, Port Authorities

Naturally, on the basis of what mentioned in the paragraph 4.1, there is a substantial traffic for each port cluster, as shown in the following figure.

Figure 27: Traffic heterogeneity for each port cluster



EY processing on data by the Ministry of Infrastructure and Transport

However, the remoteness of a large portion of territory and the orographic roughness connected to the barriers represented by Alps and Apennines only partly explain the logistical gap that Italy suffers in comparison with the European average. According to the most precautionary estimates, the extra-cost amounts to an increase of around 11% that becomes a bit lower than 7% if you consider only operational and system inefficiencies[20], which must not be identified with lacks of infrastructure but rather with administrative, control and management procedures.

It should be noted that many efforts have been conducted to close the gap: from investment plans for the rail network in order to achieve the abovementioned performance upgrade, to the computerisation, simplification and improvement in efficiency of customs procedures. Speaking of the latter, it is right to highlight the incredible steps forward made in the last few years that led Italy from behind the other European countries to an excellent position,

[20] MIT, Connettere l'Italia (2016)

also thanks to experimental planning initiatives that introduced innovations such as the *Fast Corridors*, which made Italy jump from the 37th to the 1st place in terms of customs service efficiency in just three years.
The first challenge for each Port System Authority will be the identification of an at least national reference benchmark for each service, from rail shunting to technical-nautical services, from customs practices to control management, verify that the service level offered is comparable or, otherwise, make an effort to implement it.
However, at an overall level, the Italian port system is recovering, as shown by the overall traffic information reported in the following table.

Table 9: Overall traffic information of the Italian port system

	2014	2015	2016	Var% 2016-2014	CAGR 2016-2014
Liquid carriers [Mt/year]	169.91	182.92	182.48	7.4%	3.6%
Solid carriers [Mt/year]	72.90	69.27	69.11	-5.2%	-2.6%
Goods in containers [Mt/year]	108.33	106.68	11099	2.5%	1.2%
Goods in Ro-Ros [Mt/year]	85.54	90.44	93.65	9.5%	4.6%
Other goods [Mt/year]	24.19	22.18	21.92	-9.4%	-4.8%
Total goods traffic [Mt/year]	**460.87**	**471.49**	**478.34**	**3.8%**	**1.9%**
Containers [MTEU/anno]	10.22	10.18	10.58	3.5%	1.7%
Total passengers [Mpax/year]	**43.30**	**44.66**	**47.00**	**8.6%**	**4.2%**
Of which cruise passengers [*Mpax/year*]	10.41	11.09	11.10	6.6%	3.3%

Source: DEF (2017)

In terms of an international comparison, it should be considered that container traffic has grown at a national level by 3.9% between 2015 and 2016, while in the same period in the Northern Range the Port of Antwerp has reported a +4% and Rotterdam and Hamburg a +1.1%, and in the Mediterranean Valencia a +2.3%, Piraeus a +10.5%, all after a 3.9% transit reduction via the Suez Canal. Moreover, looking at the 2014 PSNPL forecasts that remain as a reference, the 2016 hinterland traffic of around 6.56 MTEU (Table 1) suggests a growth by 2020 between 7.2 and 8 MTEU, whereas, as far as cruises are concerned, a slowdown is expected (-7% in 2017 predicted by Risposte Turismo). The trend of ro-ro services is very positive: it has already reached in 2017 a traffic rate that was expected for 2020.
As far as rail traffic goes, there has been an upturn from 2015 (overall +9% between 2010 and 2016, +5.3% in 2015-2016 and around +3% in 2016), with a +27% raise in average distances covered from 2010 to 2016, that is from 173 to 220 km, and a greater dynamism of international traffic (+18% between 2010 and 2016). The quality of the iron cure stands out also in the recovery of national traffic thanks to the so-called toll discount, with a +3.9 from 2014 to 2015 and a growth of services from/to the South of 23% in 2015 and 15% in 2016.

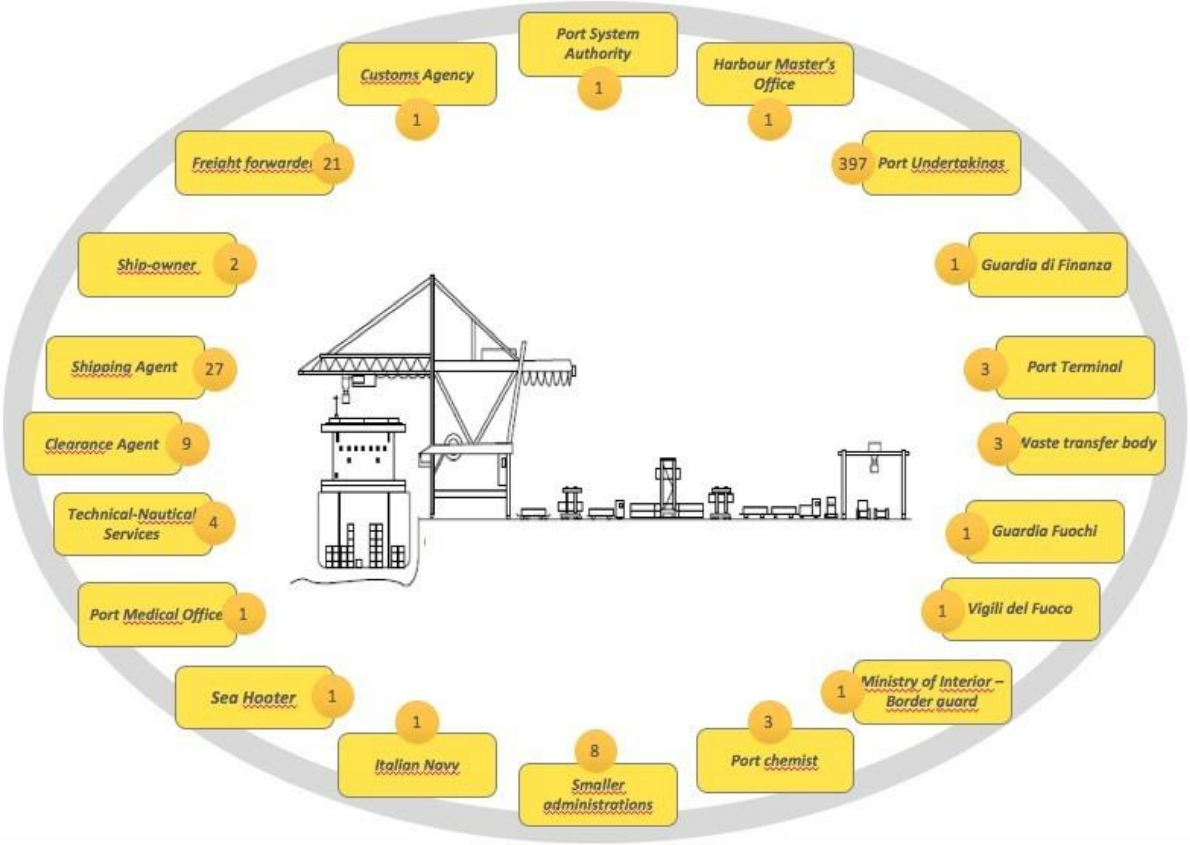
PART III. THE PORT OF TARANTO TODAY

5. THE PORT ECOSYSTEM: ACTORS MAPPING

The Italian port context is characterised by a diversified Port Community, different from port to port, which is composed of many public and private actors, such as Maritime Operators, Institutional Subjects, Authorities, Subjects connected to the local productive context and other stakeholders; for the complete list, see Attachment 1 – Port Community.

Taranto's port community features a port ecosystem characterised by a subset of all the figures of Italy's port entities. The following figure identifies for each class of actors those which are present in Taranto's ecosystem and the respective numbers. For the detailed list of the ecosystem's subjects, see Attachment 1 – Port Community.

Figure 28: Taranto's port ecosystem



Source: EY processing

6. THE PORT INFRASTRUCTURE

6.1. The existing port infrastructure

Located on the northern coast of the Gulf of the same name, 172 nautical miles away from the route Suez-Gibraltar, the Port of Taranto articulate itself in a roadstead called Mar Grand and an inlet called Mar Piccolo. Along the north-western side of Mar Grande, there is the Trading Port and the Industrial Port, and west of the Mar Grande, there is the Container Terminal and the 5th dock.

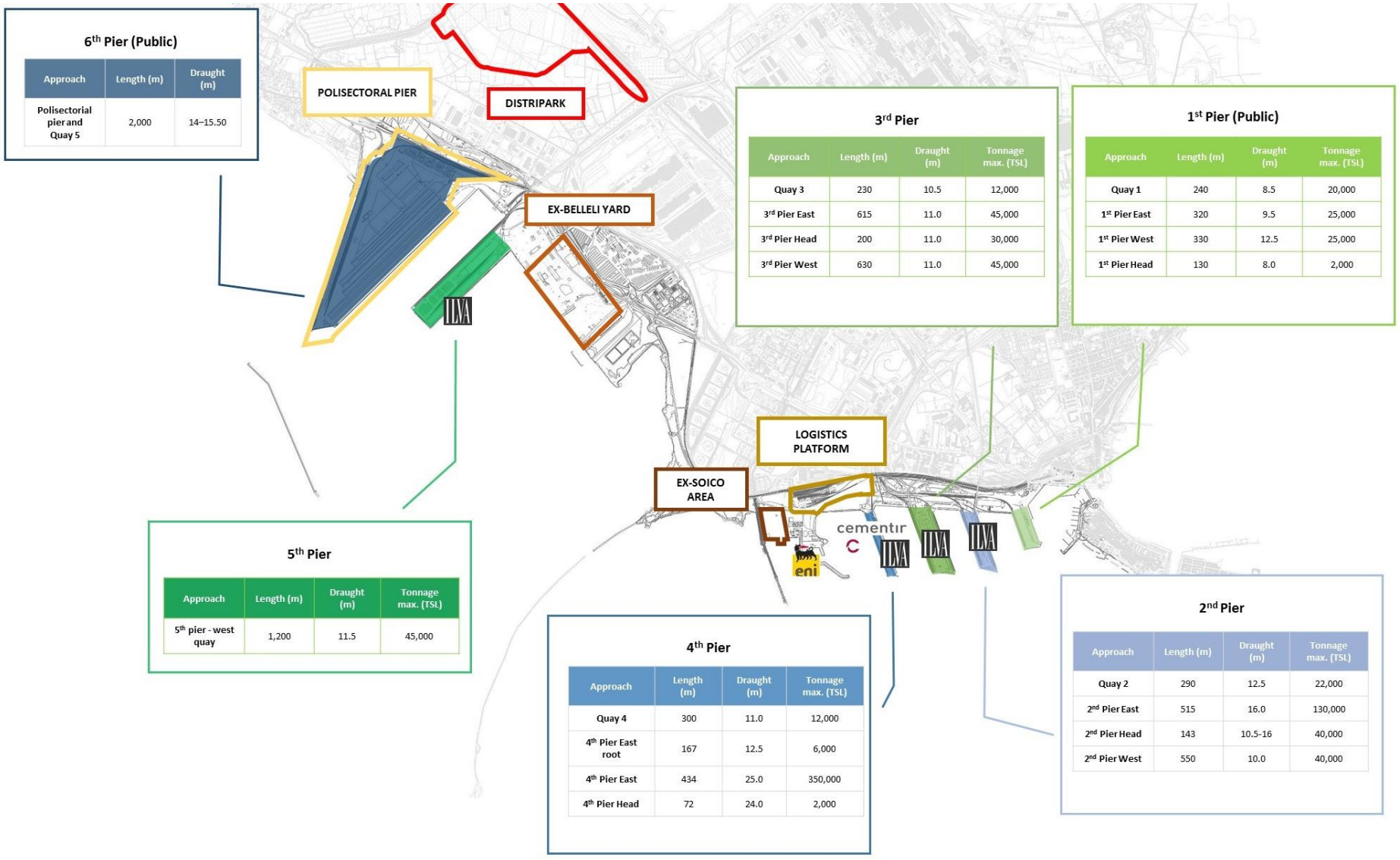
The overall size of the port amounts to 3,250,000 sq.m., divided in 1,600,000 sq.m. of operational areas and 1,150,000 sq.m. of areas subject to concession. The overall docks length amounts to 9,995 m, of which 3,410 m for public use and 6,585 m subject to concession.
The following table offers the complete framework of the Port's docks:

Table 10: Docks of the Port of Taranto

BERTH NAME	AUTHORITY	LENGTH (M)	DRAFT (M)	MAX. TONNAGE (TSL)	OPERATIONAL AREAS (MQ)	MOVED GOODS
Wharf 1		240	8.5	20,000	1,800	Various
1st Dock Levante		320	9.5	25,000	1,600	Various
1st Dock Ponente		330	12.5	25,000	13,000	Various
1st Dock Testata		130	8.0	2,000		Various
Wharf 2		290	12.5	22,000	30,000	Various
2nd Dock Levante	ILVA SpA	515	16.0	130,000	9,000	Iron ore discharge
2nd Dock Testata	ILVA SpA	143	10.5-16	40,000		Ship stopover
2nd Dock Ponente	ILVA SpA	550	10.0	40,000	10,600	Steel pre-fabrication
Wharf 3	ILVA SpA	230	10.5	12,000	4,000	Ferroalloys – slag
3rd Dock Levante	ILVA SpA	615	11.0	45,000	10,800	Steel pre-fabrication
3rd Dock Testata	ILVA SpA	200	11.0	30,000	13,400	Fuel-tar
3rd Dock Ponente	ILVA SpA	630	11.0	45,000	12,200	Steel pre-fabrication
Wharf 4		300	11.0	12,000		Various
4th Dock Levante landward end	Cementir Italia S.r.l.	167	12.5	6,000		Cement load
4th Dock Levante	ILVA SpA	434	25.0	350,000		Iron and coal discharge
4th Dock Testata	ILVA SpA	72	24.0	2,000		Bitumen loading
Petroli Pier	ENI SpA	560 +560	11.0	20,000		Refined petroleum products
Campo Boe	ENI SpA		22.0	300,000		Crude oil discharge
5th Dock/Western Pier	ILVA SpA	1,200	11.5	45,000	631,300	Steel products
Container Terminal and Wharf 5		2,000	14 – 15.50		1,000,000	Movement of various goods containers/ro-ros

Source: Port System Authority of the Ionian Sea

Figure 29: Logistic areas and approaches in the Port of Taranto



Source: EY processing

The total number of berths is 20. Seven of these handle miscellaneous cargo, and thirteen are used for specific goods such as steel, iron, coal, and petroleum products.

The **multipurpose pier** is one million square metres in area, with wharfs 2,000 metres long. Its container terminal is currently being redeveloped, and dredging is also being carried out. The pier has a total capacity of 2 million TEU, ten gantry cranes for ship-to-shore operations, a plaza with 22 rail-mounted gantries, and 900 electrical outlets for refrigerated containers. There is also a mobile crane with a 50-metre reach and a capacity of 100 tonnes. The five 1.2-kilometre railway tracks provide a direct link to the national network.

The port has four terminals, one each for containers, steel, petroleum, and cement. There are also independent commercial wharfs used for aluminium, frozen fish, cement, metal assemblies, machinery, wind turbines, clinker, fertilizer, and other cargo. The container terminal on the multipurpose pier has an operating area of 110 hectares, with a 25-hectare plaza, 7,062 ground positions for containers, and a total capacity of 35,310 TEU. Its empty container storage capacity is 45,000 TEU.

The steel terminal has historically been used by the Ilva steel group, whose fortunes will have a key impact on its future development. The terminal has six portainers with capacities of 42 to 63 tonnes for unloading raw materials, a continuous unloader with a maximum capacity of 7,200 tonnes per hour for mineral and 3,600 tonnes per hour for fossil products, four 30-tonne portainers for unloading ferroalloy and scrap, twelve loaders of between 32 and 63 tonnes for loading and unloading products, a continuous 1,100-tonne-per-hour slag loader, and four conveyor belts linking the port to the mineral areas.

The main concessionary at the **petroleum terminal** is the oil and gas company ENI, which has a 560-metre jetty and 1,120 metres of berths. A buoyed area in the Mar Grande is used by tankers of up to 300,000 GRT carrying petroleum for the refinery, with crude being transferred from ship to refinery via underwater pipes.

In the **cement terminal**, Cementir has a concession to the 300-metre quay and 167 metres of one pier. Cement is transferred from the berth to the plant by a mobile bridge with a capacity of 2,400 bags per hour or 400 tonnes of clinker per hour, and a conveyor belt.

There are also **logistical areas** in and around the port. Those in the port include the former Soico area (55,000 square metres) and the former Belleli yard (360,000 square metres), and a 200,000-square metre logistics platform behind the fourth pier. This is a model integrated platform combining multiple modes of transportation and a freight services hub. Its infrastructure, which was completed in December 2015, is not currently usable for three reasons: the limited logistical connections with the railway system; equipment problems resulting from a dispute with Gruppo Gavio, which helped to build it; and a rail link which is unusable because of the platform's layout. One important development outside the port is the 75,000-square-metre Distriport, which will mainly be used for agricultural produce.

Many construction projects are under way in the port. One is the **new breakwater** protecting the area outside the harbour, which will provide improved shelter from the swell for the berths in the multipurpose dock. A **dredged mud dump** is being built as part of the expansion of pier 5. The redevelopment of the San Cataldo pier (no. 1) includes the creation of a new waterfront with pedestrian and cycle routes, and a multipurpose service centre that is intended to become a major focus for the city as a whole.

User service areas such as ticketing, checking, customs, lounges, tourist information and restaurants will be built in the wing of the centre adjacent to the eastern wharfs. The upper level will house a viewing area for cruise passengers, facing towards the historic city centre and the statue of St Cataldo.

6.1.1 Intermodal access to the port

The port has road, rail and air links.

The most important roads are the A14 Taranto-Bari-Bologna autostrada and, more locally, state road SS7 linking Taranto with Brindisi and Lecce, and state road SS106 from Taronto to Reggio Calabria.

The Taranto-Bari, Taranto-Brindisi and Taranto-Metaponto railway lines offer connections to the Bari-Bologna line, and the Potenza-Naples, Brindisi-Lecce and Reggio Calabria routes.

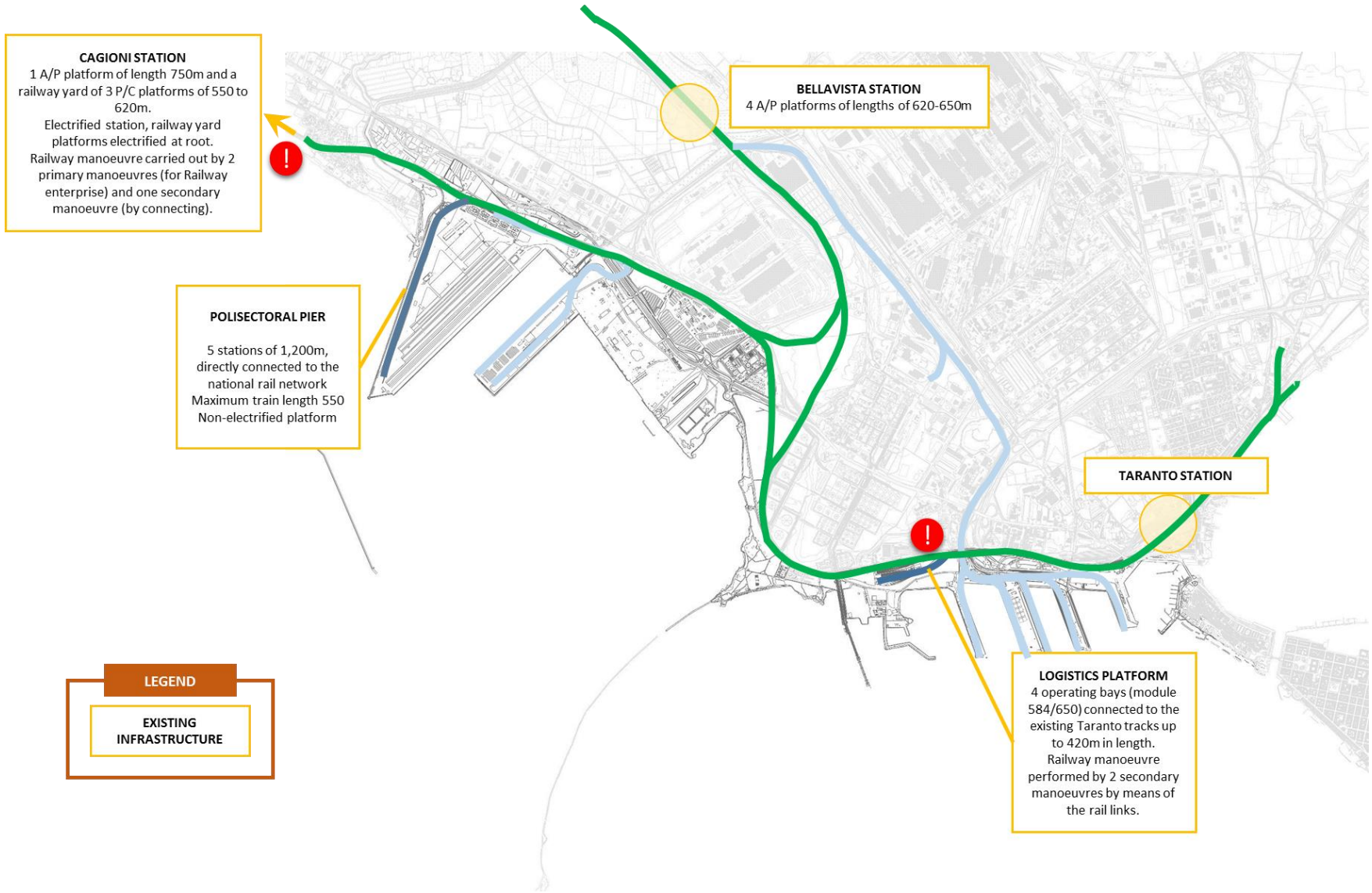
Figure 30: Road and rail links from the port

Source: EY processing

The port has **internal rail links** between the logistics platform and the multipurpose pier, and two stations, Cagioni and Bellavista, to the north and north-east of the pier. **Cagioni** has one 750-metre arrivals and departures track and a set of three collection and delivery tracks 550 to 620 metres long. **Bellavista** has four arrivals and departures tracks ranging in length from 620 to 650 metres. The **multipurpose pier** has five 1.2-kilometre tracks linked directly to the national rail network. The rail terminal is equipped with 22 rail-mounted gantries and three tracks for train loading and unloading. Piers 1, 3 (both east and east sides), 4 and 5 are on concession to ILVA S.p.A, and have sets of tracks connected to the company's site.

In terms of passenger traffic, the port is located close to Taranto railway station, one of Italy's 100 busiest stations. This is 1.4 kilometres or five minutes away by road, or 1.4 to 1.6 kilometres on foot, taking about 18 to 20 minutes.

Figure 31: Rail infrastructure



Source: EY

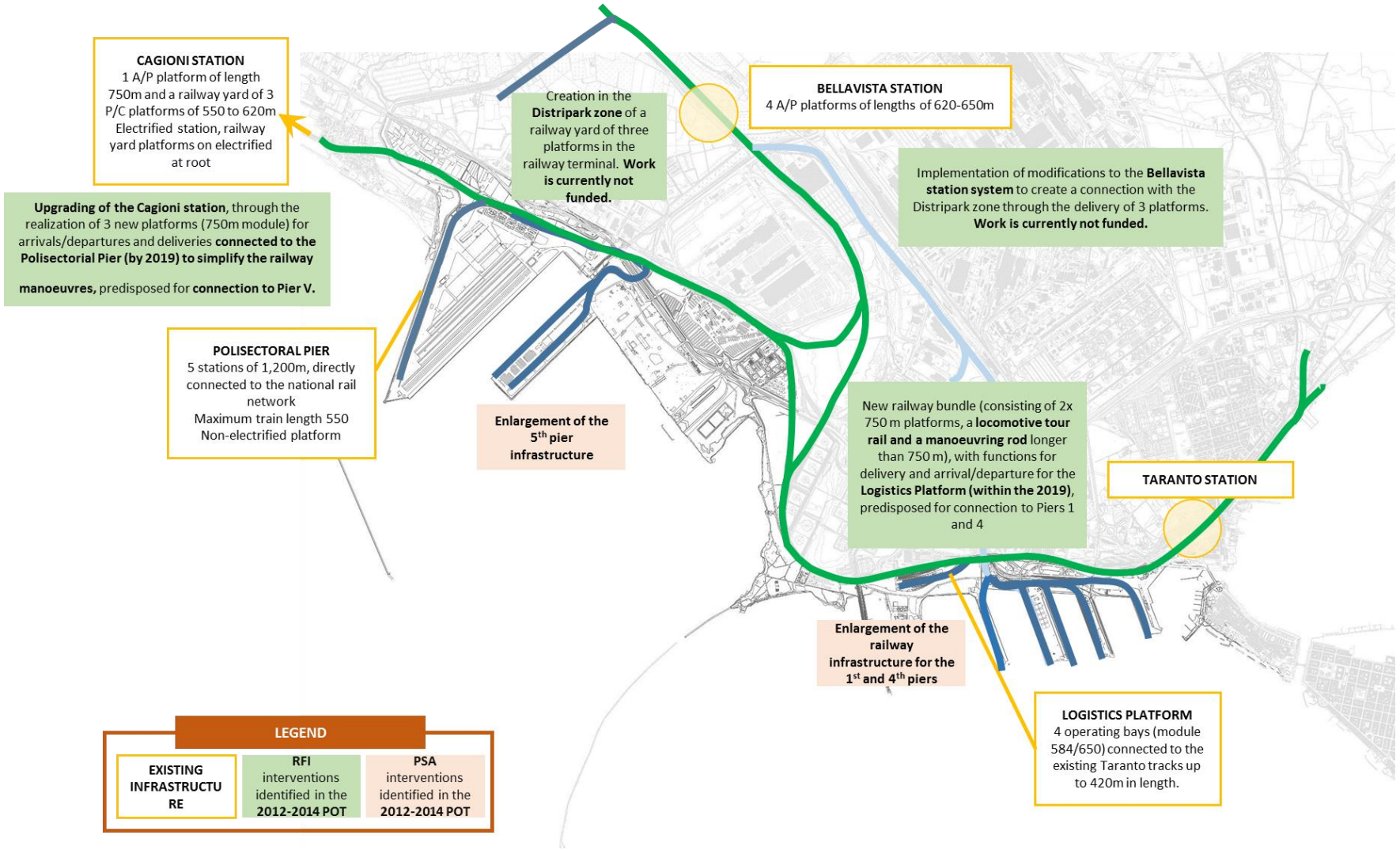
The main **issues affecting the port's rail infrastructure** are as follows:

- Only one pier is connected to the RFI national rail network: the others are connected to ILVA's private lines.
- The physical characteristics of the stations and other port infrastructure do not allow access to trains of the maximum length of 750 metres. Changing this would make rail transportation more efficient. Also, two shunts are required.
- The logistics platform tracks are connected to the national rail network not directly but via a temporary link adjoining Taranto station.

The 2012-2014 operating plan stated that the following infrastructure work needed to be carried out:

- **Improve Cagioni station** by building a new set of arrival/departure and collection/delivery tracks connected to the multipurpose pier, and by building a link to pier V, which will be completed after 2025. This involves the construction of a new set of three electrified collection/delivery and arrival/departure tracks: IV (750 m), V (734 m) and VI (727 m).
- Build a new rail system consisting of two 750-metre tracks, one locomotive turning track, and a shunt branch of at least 750 metres. This will serve as a collection/delivery and arrival/departure system for the logistics platform and piers 1 and 4.
- Modify the Bellavista station infrastructure to create a link with the Distripark area via a set of three collection and delivery tracks
- Build a set of three tracks in the Distripark rail terminal.

Figure 32: Rail infrastructure



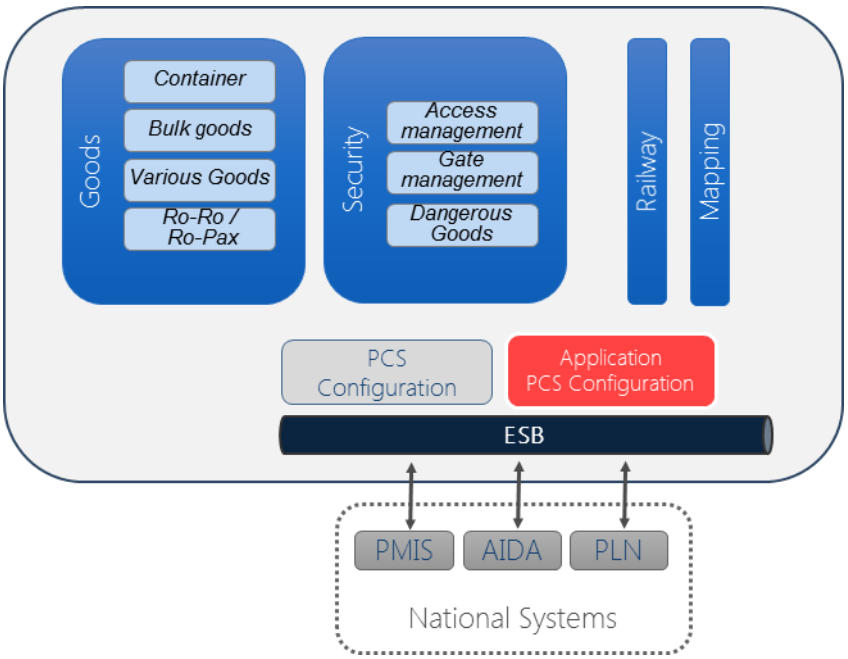
Source: EY

There are three airports nearby: Bari, Brindisi, and Grottaglie, 90, 75 and 20 km away respectively. Grottaglie airport is connected to the port by the Grottaglie-Brindisi road, which passes the north entrance to the port. Bari and Brindisi airports have daily domestic and European flights, but Grottaglie is particularly important because it serves local businesses and has a 3.2-kilometre runway for freight aircraft.

6.1.2 The port community system

The former Port Authority and Port System Authority began modernising and digitising the port some time ago. The 2012-2014 three-year operating plan set the objectives of transforming Taranto into a third-generation port, covering the entire logistics chain and connecting the city, the region, and the international markets.
This objective has been pursued thanks to the Taranto Port Authority's involvement in the creation of the Modulo Port Community System (MPCS) within the national logistics platform implemented by UIRNet. The Taranto Port Community System was created as part of the MPCS framework for the port, partly through integration with the surrounding area, for example by specialising in local companies, and configuring modules and functionalities of the framework, such as profiles and users.
The PCS module of the PLN as implemented in the Taranto PCS has been used as a reference in defining the single PCS model promoted by Assoporti as the national PCS framework for Port System Authorities.

Figure 33: Progress in implementation of Taranto PCS



As the PCS system diagram shows, the prototype has the following modules:

- Operations management (general information management, freight collection/delivery bookings etc), authorisation of goods loaded and/or unloaded and thus entering and/or leaving the port, broken down by mode of transportation, namely containers, bulk, miscellaneous goods, ro-ro/ro-pax
- Port security management, divided into:
    - Access management: issuing security permits and badges for people, vehicles, goods, passengers and crew entering and leaving the port
    - Entry checks
    - Managing, authorizing and monitoring hazardous
    - goods and waste stored in the port
    - Managing rail operations in the port

- Mapping the port and related geographical information, such as infrastructure, equipment, and buildings
- PCS configuration and application management
- ESB layer to achieve interoperability between the PCS, PMIS, AIDA and PLN systems

The pilot PCS project was carried out jointly with UIRNet until late 2015, and included a system upgrade phase lasting until November 2016. PCS is not currently used at Taranto for procedural reasons, but discussions are taking place with UIRNet with a view to implementing it. There has been a delay in agreeing this due to uncertainty concerning the terms of what was initially a tripartite agreement involving the ministry of infrastructure and transport. Now, it simply requires the agreement to be signed by the Port System Authority of the Ionian Sea and UIRNet. Once this has been done, the final phase of user testing can take place.

The priority modules for final testing are those relating to access management and entrance checks.

6.2. Progress of infrastructure projects included in 2012-2014 operating plan

The 2012-2014 plan listed the infrastructure projects whose completion was regarded as important to the port's development. The table below summarises the physical and financial progress of these projects, broken down into those that have been completed, are currently in progress, and have yet to be started, and a map showing their locations.

Table 11: Projects included in 2012-2014 operating plan

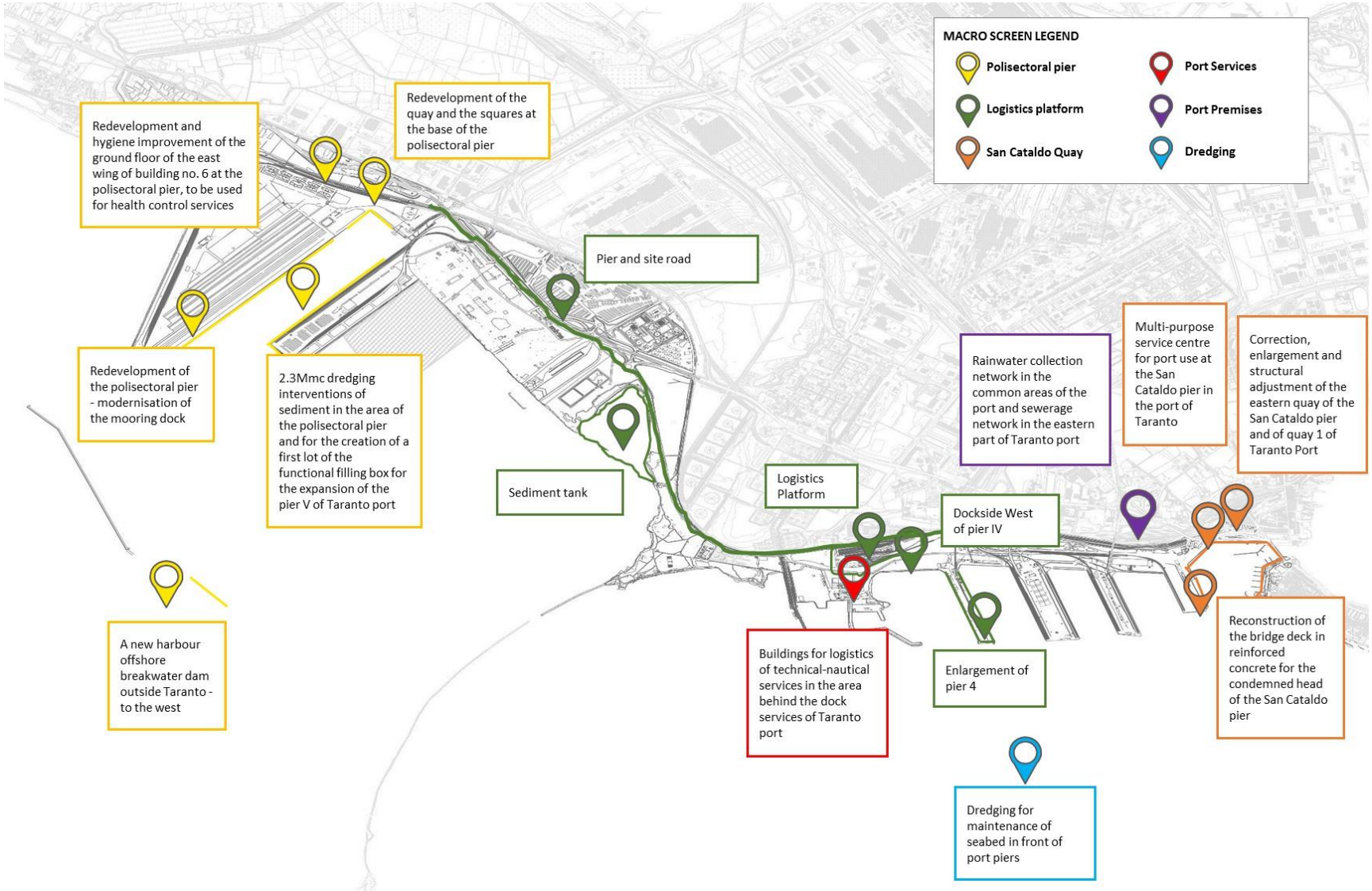
AREA	PROJECT	STATUS	PHASES	COST €M	BEGUN	PROCEDURAL PROGRESS	PHYSICAL PROGRESS	FINANCIAL PROGRESS
MULTIPURPOSE PIER	Redevelopment and cleanup of ground floor of east wing of building no. 6 to be adapted to health inspection services	Completed	☐ Planning/ Design ☐ Tender ☐ Implementation ✓ Acceptance	0.49	2013	Completed and accepted.	100%	100%
MULTIPURPOSE PIER	Redevelopment – modernisation of mooring wharf	In progress	☐ Planning/ Design ☐ Tender ✓ Implementation ☐ Acceptance	75.00	2013	1. In progress 2. Section accepted (0 – 600) m.	100%	95%
MULTIPURPOSE PIER	Redevelopment of wharf and buildings at end of pier	In progress	☐ Planning/ Design ☐ Tender ✓ Implementation ☐ Acceptance	15.00	2012	Being implemented	2%	2%
MULTIPURPOSE PIER	Dredging of 2.3 million cubic metres of sediment, and first phase of mud dump to expand pier V	In progress	☐ Planning/ Design ☐ Tender ✓ Implementation ☐ Acceptance	83.00	2014	Being implemented	0%	10%
MULTIPURPOSE PIER	New breakwater to protect area outside harbour – western section	Not yet begun	✓ Planning/ Design ☐ Tender ☐ Implementation ☐ Acceptance	14.00	2012	1. Final design verification out to tender. 2. Tender documents being prepared for final design, security coordination and project management.	0%	0%

AREA	PROJECT	STATUS	PHASES	COST €M	BEGUN	PROCEDURAL PROGRESS	PHYSICAL PROGRESS	FINANCIAL PROGRESS
LOGISTICS PLATFORM	Logistics platform	In progress	☐ Planning/ Design ☐ Tender ✓ Implementation ☐ Acceptance	219.00	2003	Being implemented. In particular: 1. <u>Pier road:</u> Should be complete by the end of June 2017. 2. <u>Expansion of pier IV:</u> Dredging, and prefabrication of cellular caissons for foundations, in progress. 3. <u>Dock to west of pier IV:</u> Dredging, and prefabrication of cellular caissons for foundations, in progress. 4. <u>Logistics platform:</u> Completed in 11/2015, now in acceptance phase. 5. <u>Mud tank west of Punta Rondinella:</u> Phase 1 complete, ready for dredged material from pier IV and dock.	54%	54%
SAN CATALDO PIER	Multipurpose port service centre	In progress	☐ Planning/ Design ☐ Tender ✓ Implementation ☐ Acceptance	12.755	2008	Being implemented	8%	0%
SAN CATALDO PIER	Structural redevelopment and expansion of east wharf of San Cataldo pier and jetty 1	In progress	☐ Planning/ Design ✓ Tender ☐ Implementation ☐ Acceptance	28.00	2009	Tender in progress	0%	2%
SAN CATALDO PIER	Rebuilding of framework of closed San Cataldo pierhead	Not yet begun	✓ Planning/ Design ☐ Tender ☐ Implementation ☐ Acceptance	16.90	2011	1. Project approved, verified and validated. 2. Tender documents being drawn up.	0%	0%

AREA	PROJECT	STATUS	PHASES	COST €M	BEGUN	PROCEDURAL PROGRESS	PHYSICAL PROGRESS	FINANCIAL PROGRESS
RFI WORKS	Improving rail connection between port and national network	In progress	☐ Planning/ Design ✓ Tender ☐ Implementation ☐ Acceptance	25.50	2010	1. The final design for lot I, the caissons of the multipurpose pier, has been reviewed and is in the c.m. RFI will begin the tender procedure. 2. Lot II, the logistics hub, has been awarded and the implementation plan is being drawn up by the contractor.	n/a	n/a
PORT SERVICES	Construction of logistics services buildings behind the services dock.	Not yet begun	☐ Planning/ Design ✓ Tender ☐ Implementation ☐ Acceptance	7.80	2010	The tender is in progress.	0%	0%
SEDIMENT	Rainwater collection system in the common areas, and water and sewerage system on the eastern side of the port	Not yet begun	✓ Planning/ Design ☐ Tender ☐ Implementation ☐ Acceptance	17.65	2009	Implementation plan has been verified, and is now being validated and approved.	0%	0%
DREDGING	Dredging of sea bed outside the breakwaters	Not yet begun	✓ Planning/ Design ☐ Tender ☐ Implementation ☐ Acceptance	To be defined	-	Morphobathymetry of sea bed completed.	0%	0%

Source: Port System Authority Of the Ionian Sea

Figure 34: Map of port, with locations of projects



Source: EY

6.3. Existing planning tools

The port is the subject of important local, national and European development plans. The government's involvement was reflected in the signing of the Taranto area institutional development contract, one of 16 agreements forming part of a wider plan known as the Masterplan for the South. This was designed to exploit the region's assets as part of an industrial, infrastructure and services policy that would encourage entrepreneurialism and transform the region's economy. The masterplan consists of 16 development programs, of which eight concern the regions, six are for major cities, and one relates to the Taranto area. This involves a total investment of some €98 billion between now and 2023, consisting primarily of resources already allocated in other plans and programmes such as structural funds, national joint financing, additional programmes, and the 2014-2020 development and cohesion fund. This, together with the investment clause negotiated at European level, has allowed the government to allocate the national share of these resources more flexibly than it would under budget constraints, and provides significant leverage in the form of private investment.

The Taranto area institutional development contract has gathered and reallocated existing resources[21] totalling over €882 million to accelerate spending on public projects relating to the port, infrastructure, urban rezoning, and environmental incentives. It is currently the main planning tool for the whole Taranto region. €416.4 million, or 47% of the entire CIS, has been allocated to port infrastructure and transport. Based on the progress of the CIS in the first quarter of 2017, €182.4 million, or around 20% of the total, has been spent.

The CIS includes eight projects affecting the port, in the areas of infrastructure, transport, health and the environment. The table below shows the finance available for each, the sources of funding that have been identified, any residual requirement, and the total spend at the end of the first quarter of 2017.

Table 12: Projects included in the Institutional Development Contract that affect the port

PROJECT TITLE	FINANCE AVAILABLE	SOURCES OF FINANCE	ADDITIONAL FUNDING REQUIREMENT (unallocated resources)	AMOUNT SPENT (MARCH 2017)
Project area: port infrastructure and transport				
Redevelopment of the multipurpose pier: modernisation of mooring wharf	€75,000,000	- €35,000.000 (Regione Puglia FSC Decision CIPE 62/11) - €40,000,000 (Port System Authority's own funds)	n/a	€50,211,128.86
Dredging of 2.3 million cubic metres of sediment, and first phase of mud dump to expand pier V	€83,000,0000	- €7.674.000 (MATTM – ministerial decree 468/01) - €17,167,143 (Regione Puglia FSC Decision CIPE n. 87/2012) - €38,158,587 (APT own funds) - €20,000,000 (PON networks and mobility) 2007/2013)	n/a	€2,147,369.39
Logistics platform integrated with the port's infrastructure hub	€219.144,000	- Fondi MIT – Decision CIPE n. 74/03; Decision CIPE n. 104/10 - APT's and concessionary's own funds	n/a	€101,620,423.73
Rail link between the port and the national network	€25,500,000	- MIT – NOP Infrastrutture e Reti 2014-2020	n/a	€1,244,144.38

[21] The resources for the projects included in the CIS come from the following sources: Regione Puglia FSC 2007-2013 (Decision CIPE 62/2011, 87/2012); MATTM funds (ministerial decree 468/01, decree by the secretary general dated 10/10/2012, decree by the director general of MATTM, ref. 3984/TRI/DI/G/SP); FESR funds (PON networks and mobility 2007/2013, POR Puglia 2007-2013, NOP Infrastrutture and Networks 2014-2020); MIT funds (Decision CIPE n. 74/03; Decision CIPE n. 104/10, PAC – city plan); MIBACT funds (POIn cultural, natural and tourism attractions 2007-2013; PAC 2007-2013); FAS Regione Puglia funds 2007-2013 (Decision CIPE 92/2012); Legisltive decree 1/15 as law 20/2015 art.3, comma 5bis; residual resources decisions CIPE 17/2003, 83/2003 and 179/2006; AQP CITTÀ (decisions CIPE 36/2002, 20/2004); decree c.d. water emergency no. 16 of 22.06.2004 - OPCM 3536/06; D.P.C.M. 23 March 2013: state funds under D.G.R. 1524 of 24/07/2014; Decision CIPE 92/2012 FSC 2007-2013 D.G.R. 169/2014; Decision CIPE of 23 December 2015; regional resources; Port System Authority's own resources, concessionaries' resources.

PROJECT TITLE	FINANCE AVAILABLE	SOURCES OF FINANCE	ADDITIONAL FUNDING REQUIREMENT (unallocated resources)	AMOUNT SPENT (MARCH 2017)
Redevelopment of multipurpose pier: new breakwater to protect area outside harbour – western section	€14,000,000	- Port System Authority's resources	n/a	€24,289.47
Subtotal 1	*€416,644,000*		*n/a*	*€155,247,355.* New breakwater to protect area outside harbour – western section *83*
Project area: Health and environment				
Cleanup, environmental enhancement and redevelopment of MAR Piccolo-I Seno di Taranto basin and neighbouring areas	€21,000,000	- Decision Cipe 87/12 (Regione Puglia FAS 2007-2013)	€93,500,000	€6,796,428.74
Platform for an integrated development system of the wider environmental crisis area, including monitoring and innovative experimental technology – I functional removal	€20,800,000	- Residual resources decisions CIPE 17/2003, 83/2003 and 79/2006	€0	
Completion of ILVA industrial usage project for waste water from Taranto for drinking and irrigation	€14,000,000	- Decree c.d. water emergency no. 16 of 22.06.2004 - OPCM 3536/06	€0	
Subtotal 2	*€55,800,000*	-	*€93,500,000*	*€6,796,428.74*
TOTAL	*€472,444,000*		*€107,500,000*	*€162,043,784.57*

Source: Taranto Area Institutional Development Contract, appendices 1 and 2; note on progress in implementing the CIS as at the first quarter of 2017

The region of Taranto included in the CSI is also part of the industrial recession area for which the economic development ministry has drawn up an industrial conversion and redevelopment plan (PRRI). Its content, defined in an agreement protocol signed on 26 July 2012 between central and local government, included projects affecting the port and its hinterland. €30 million is available for redeveloping the area under the NOP business and competition 2014-2020. Italian and foreign companies were invited to invest in the recession-hit area, and were required to express their interest by February 2017. The call for tenders involves investment consistent with the PRRI's objectives, in the following areas:

- Production investment (new businesses, new units of existing ones, expansion/diversification of existing businesses)
- Environmental protection
- Process and organisational innovation
- Industrial research and development

As well as the strategies laid down by the Taranto regional government and the national government, Taranto receives funding from European Union programmes. In order to access European Social Fund finance, the port is covered by the Pugliese and Lucano integrated logistics area plan. As part of the preliminary application for projects under the infrastructure and network PON, Taranto has submitted nine projects, of which eight are covered by action line II.1.1 (port development) and one by action line II.1.3 (single window). These are currently being discussed by the Tavolo ALI.

The following table summarises the projects submitted for funding under the infrastructure and networks NOP for 2014-2020.

Table 13: Projects submitted for finance under the Port System Authority of the Ionina Sea infrastructure and networks NOP 2014-2020

PROJECT	ACTION LINE	TOTAL COST (€)	PON FINANCE (€)	% FROM PON	OTHER FUNDING SOURCES	INCLUDED IN CIS
Dredging of 2.3 million cubic metres of sediment, and first phase of mud dump to expand pier V	II.1.1	83,000,000	56,264,837.43	67%	- DM 408/01 MATTM (9%) - Del, CIPE 87/12 (21%) - PON 2007-2013 (3%)	Yes
Redevelopment of multipurpose pier: modernisation of mooring wharf	II.1.1	75,000,000	40,000,000	53%	- Delib, CIPE 92/2012	Yes
Redevelopment of multipurpose pier, jetty, and plazas at end of multipurpose pier. Upgrade of the port's waste terminal area.	II.1.1	15,000,000	15,000,000	100%		No
Multipurpose port service centre on San Cataldo pier	II.1.1	12,755,000	12,755,000	100%		No
Redevelopment, widening and structural upgrade of east wharf of San Cataldo pier, and consolidation of dock 1	II.1.1	25,500,000	13,798,271	54%	- Art, 36 L, 166/02 (DM 18/13) (0.05%) - MIT letter of intent no. 7 21/10/2002 (45.5%)	No
Reconstruction of the C.A.P. framework of the closed San Cataldo pier	II.1.1	18,800,000	18,800,000	100%		No
Completion of permanent securing of surface layer in former Belleli yard – lot II	II.1.1	40,843,988.66	40,843,988.66	100%		No
Taranto Port Community System to support interoperability with regional, national and global logistics systems	II.1.3	5,000,000	5,000,000	100%		No
Redevelopment of multipurpose pier: new breakwater to protect area outside harbour – western section	II.1.1	14,000,000	14,000,000	100%		Yes

Source: EY, based on Port System Authority Of the Ionian Sea data

The Infrastructure and Network 2014-2020 NOP also includes the completion of an RFI project begun during the 2007-2013 planning period and affecting the port. The total value of this project, entitled "Rail link from the port of Taranto to the national network (operational phase 1, lot 2, Cagioni and Taranto logistics platform", is €25.5 million, of which €24.6 million relates to the 2014-2020 planning period.

The total infrastructure investment in the port includes work in progress of €404,755,000, programmed projects amounting to €84,850, 000, and planned projects totalling €351 million.

The table below summarises the projects and their costs. They are divided as follows:

- Planned: finance is not yet available
- Programmed: the sources of funding have been identified
- In progress – work has already started

The table also summarises the projects in progress as described in the previous paragraph.

Table 14: Summary of infrastructure projcts relating to the port

DESCRIPTION	COST (€)
PLANNED PROJECTS	
Lot II of the mud dump at pier V	€81,000,000
Distripark Taranto	€170,000,000
Seabed dredging outside harbour	€20,000,000
Lot II, securing and improving layer in former Belleli yard	€45.500,000
Semi-underground carpark at end of San Cataldo pier	€7,000,000
New breakwater protecting area outside harbour – eastern section	€20,000,000
Construction of new eastern entrance and redevelopment of Taranto dock waterfront	€2.500,000
Taranto Port Community System to support interoperability with regional, national and global logistics systems	€5,000,000
TOTAL PLANNED PROJECTS	*€351,000,000*
PROGRAMMED PROJECTS	
Logistical service buildings in the area behind the port's service dock: functional lots I and II	€7.800,000
Rainwater collection system in the port's common areas, and water and sewerage on the east side	€18.050,000
Redevelopment, expansion and structural upgrading of the east wharf of San Cataldo pier and dock 1 of the port	€25.500,000
New breakwater protecting the area outside the harbour – western section	€14,000,000
Environmental improvement of outdoor areas of the harbour: remove hot spot at north entrance	€700,000
Rebuild CAP framework of closed San Cataldo pierhead	€18.800,000
TOTAL PLANNED PROJECTS	*€84.850,000*
PROJECTS IN PROGRESS	
Redevelopment of pier and plazas at end of multipurpose pier – upgrade of waste terminal	€15,000,000
Port platform (five projects)	€219,000,000
Redevelopment of multipurpose pier – modernisation of mooring wharf	€75,000,000,00
Dredging of 2.3 million cubic metres of sediment in multipurpose pier area, and lot 1 of the mud dump used for the expansion of pier 5	€83,000,000,00
Multipurpose port services centre on the San Cataldo pier	€12,755,000
Improved rail links between the port and the national network	€25,500,000
TOTAL PROJECTS IN PROGRESS	*€430,255,000*

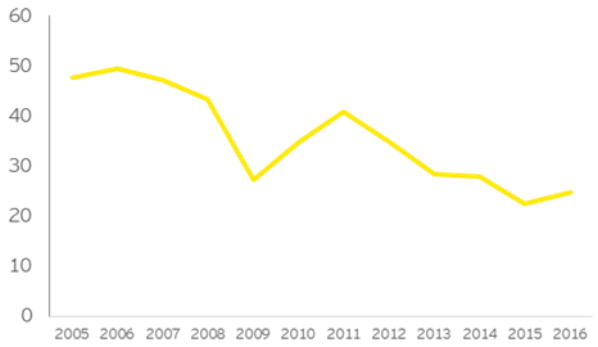
Source: Port System Authority Of the Ionian Sea

7. THE PORT'S PERFORMANCE

7.1. Traffic trends

Taranto has been one of the slowest ports in Italy to recover from the recession in the sector between 2007 and 2013. Two major factors have affected its performance in recent years: the crisis at ILVA, and the fact that Evergreen moved its operations from the container terminal to Piraeus. Despite the slight recovery over the past year, the port is a long way from achieving its pre-recession performance, and has been affected both by local events and by international recession.

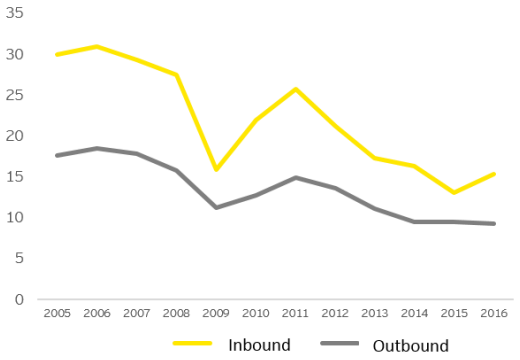
Figure 35: Freight movements in the port (2005-2016, million tonnes)



Source: EY, based on Assoporti data

As the graph below shows, there are significantly more unloaded than loaded goods.

Figure 36: Freight movements in the port (2005-2016, million tonnes)

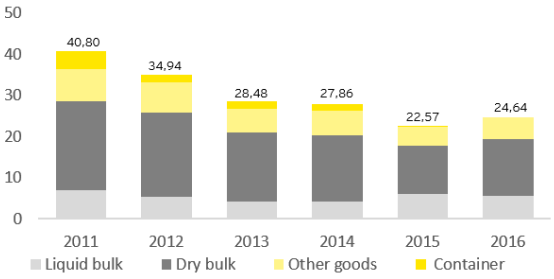


Source: EY, based on Assoporti data

The graph also shows that the slight recovery in 2016 was due solely to an increase in unloadings, which were up by 17.4% on 2015, whereas loadings were down by 1.8%.

The breakdown of traffic by freight category also shows that while petroleum product movements remain stable and miscellaneous goods are falling slightly, in line with the port's overall fortunes, solid waste traffic has declined more significantly.

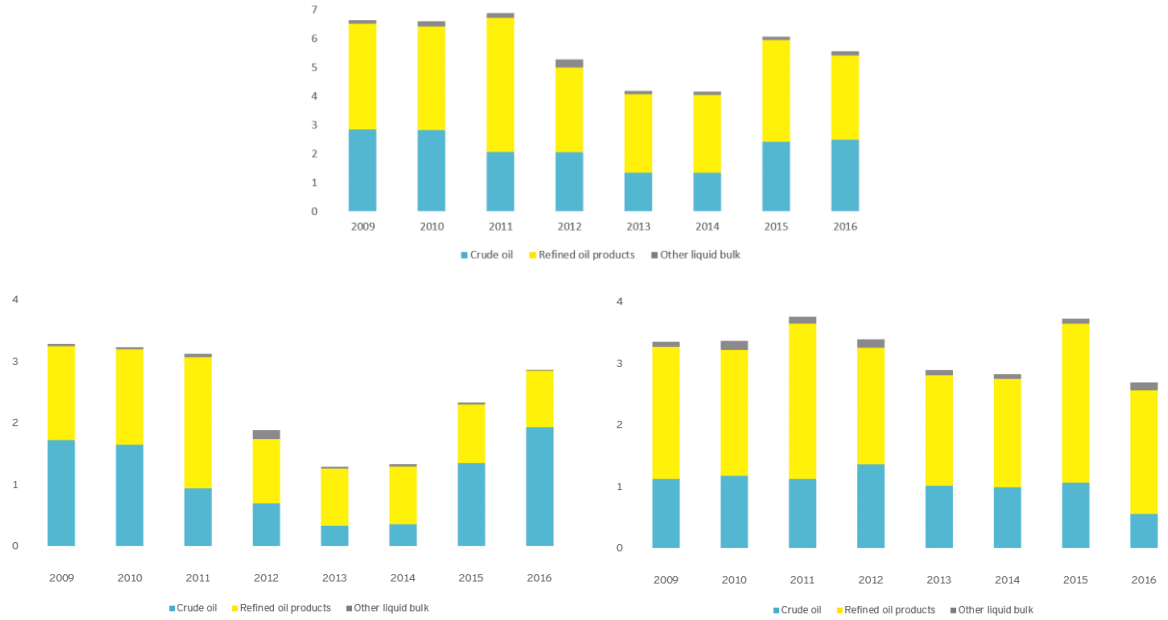
Figure 37: Movements by freight category (2011-2016, million tonnes)



Source: EY, based on Assoporti data

The liquid waste consists mainly of refined petroleum products and crude, and a small quantity of other waste. Petroleum movements increased by 3.1% in 2015, to 2.5 million tonnes, while other liquid waste grew by 24.6%, or more than 142,000 tonnes. Refined products fell by 17.2%, and remain the majority component, at 2.9 million tonnes.

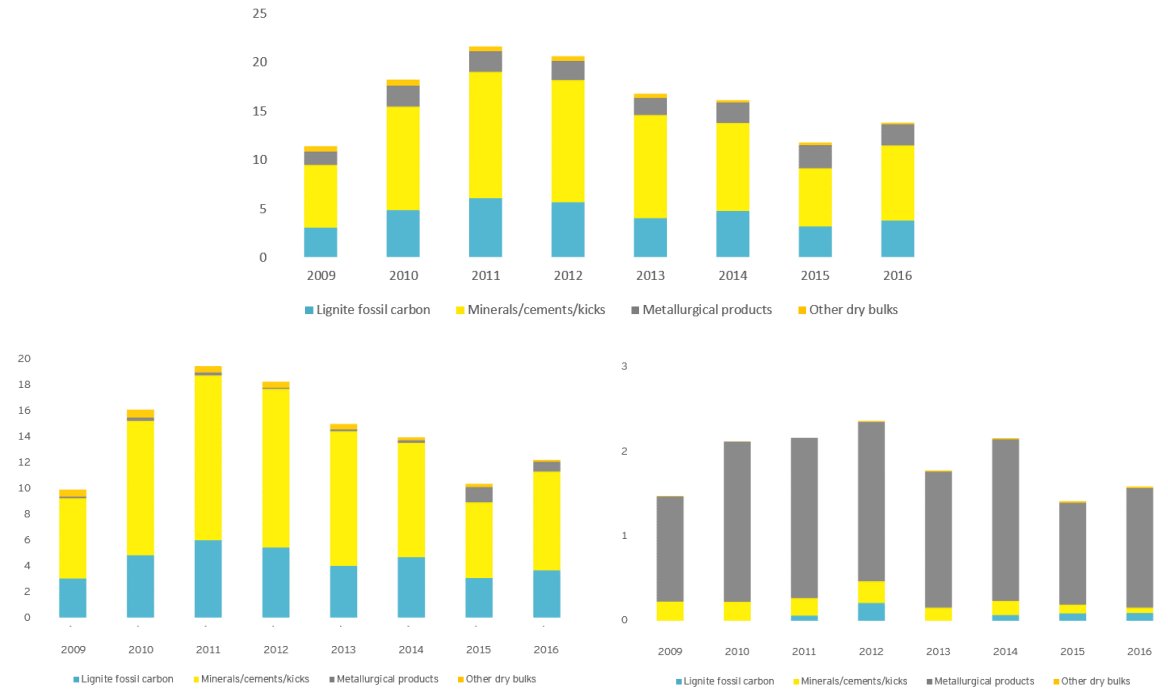
Figure 38: Total liquid waste movements, liquid waste in, and liquid waste out (million tonnes)



Source: EY, based on Assoporti data

Solid waste movements consisted primarily of minerals, cement and limestone (7.7 million tonnes in 2016, up 29.2%), followed by fossil coal and lignite (3.7 million tonnes, up 19%), metals (2.2 million tonnes, down 8.5%), and other solid waste (over 167,000 tonnes, down 39.8%). Unlike liquid waste, there were many more unloadings than loadings.

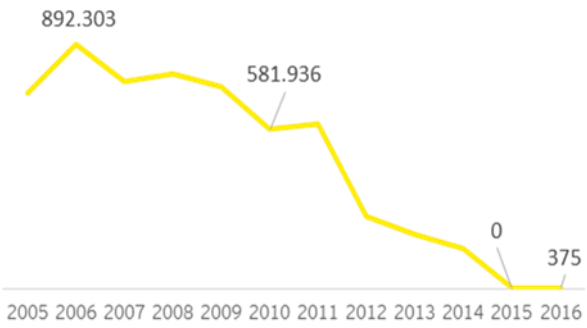
Figure 39: Total solid waste movements, solid waste in, and solid waste out (million tonnes)



Source: EY, based on Assoporti data

In terms of total traffic, the most significant fact is that containerised freight traffic has collapsed, falling to zero in 2015, and then recovering slightly in 2016.

Figure 40: Containerised freight traffic (2005-2016, TEU)

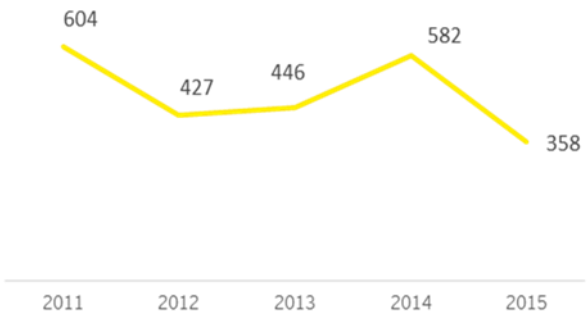


Source: EY, based on Assoporti data

As stated in the 2012-2014 operating plan, there has been an increase in ro-ro traffic. According to the Ionian Sea Port Systems Authority, 24,147 tonnes of freight were moved in this way in 2016, of which 22,700 tonnes were loaded and 1,447 tonnes unloaded. However, this figure is still low compared to total miscellaneous goods handled, at 5,398,043 tonnes in 2016. This is undoubtedly a positive trend.

Cruises have traditionally represented only a minority of traffic. According to Assoport, volumes increased by 30.5% in 2014 but fell by 38.5% in 2015. Three hundred and fifty-eight passengers transited the port, compared to 582 in 2014. However, these figures are not comparable with those of other ports in Apulia: in 2015, 360,000 passengers passed through Bari and 150,000 through Brindisi.

Figure 41: Cruise traffic (2011-2015, number of passengers)



Source: EY, based on Assoporti data

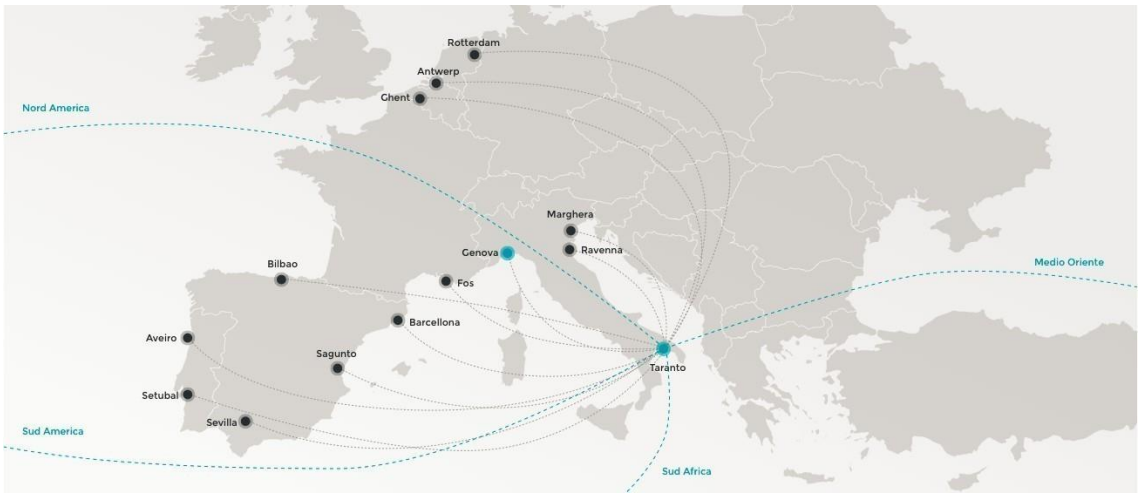
In 2017 the 1,400 berth Thomson Spirit, owned by the British company Thomson Cruises, will pay seven visits and bring a new dimension to Taranto as a tourist port.

7.2. Traffic relating to local manufacturing

The port also plays a fundamental role in the businesses of local manufacturers. The most important of these in terms of production, traffic movements and social and economic impact on the region, is the steel company ILVA S.p.A.

ILVA and the Port of Taranto. As noted in section 2, ILVA has been the main driver of Taranto's economy since the early 1960s. It is the biggest client of the port, which serves as a strategic terminal for traffic to the east and the Black Sea.

Figure 42: Main routes from Taranto

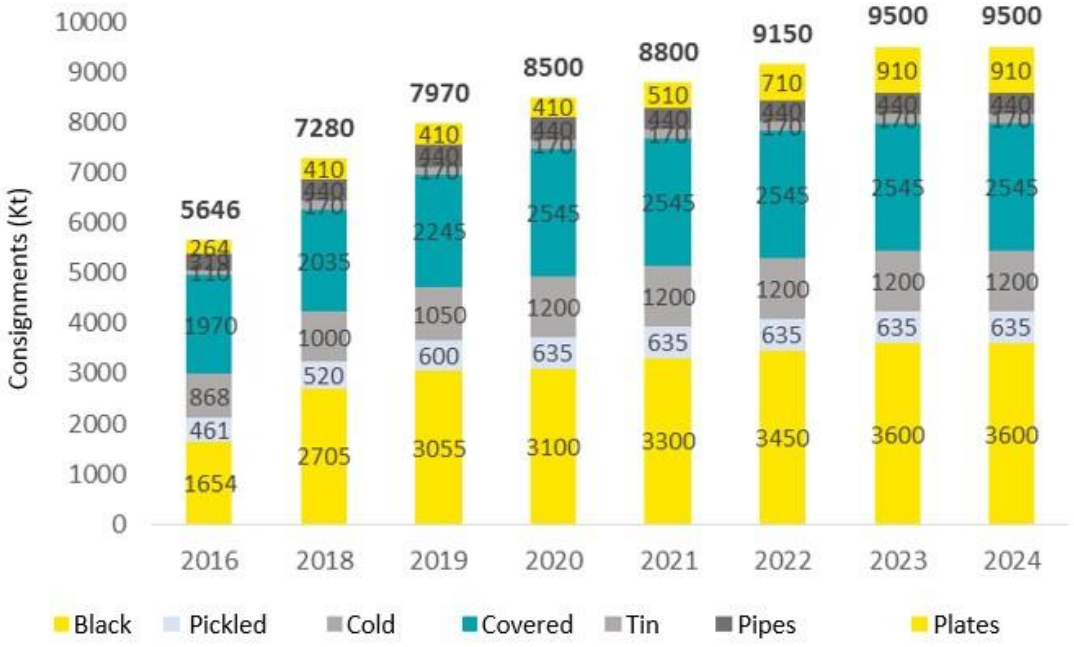


Source: Gruppo Ilva (http://www.gruppoilva.com/it/gruppo-ilva/gruppo-ilva/logistica)

The company has concessions to piers 2, 3, 4 and 5, and to dock 3, with 5,300 metres of berths and an operating area of 691,300 square metres. Ships arrive in Taranto and unload raw materials such as iron ore, fossil coal, ground granulated blast-furnace slag, fuel, tar, and semifinished steel products such as pig iron and briquettes, which are sent to the storage areas by a system of conveyor belts. Finished steel products are loaded for national and international destinations in the same way. Clearly, a manufacturing group like ILVA is dependent on efficient logistics and a huge infrastructure of ports, ships, and trains.

The group's fleet management subsidiary is ILVA Servizi Marittimi. The fleet comprises one cargo vessel, the very large ore carrier Gemma, with a capacity of some 315,000 tonnes, four pusher tugs, and eight barges used to transport finished and semifinished products, two with a capacity of 31,000 tonnes and two of 16,000 tonnes. One of the key objectives of the manufacturing plan proposed by ArcelorMittal and Marcegaglia is a commercial relaunch that will increase consignments of finished goods to 9.5 million tonnes from 2023 onwards.

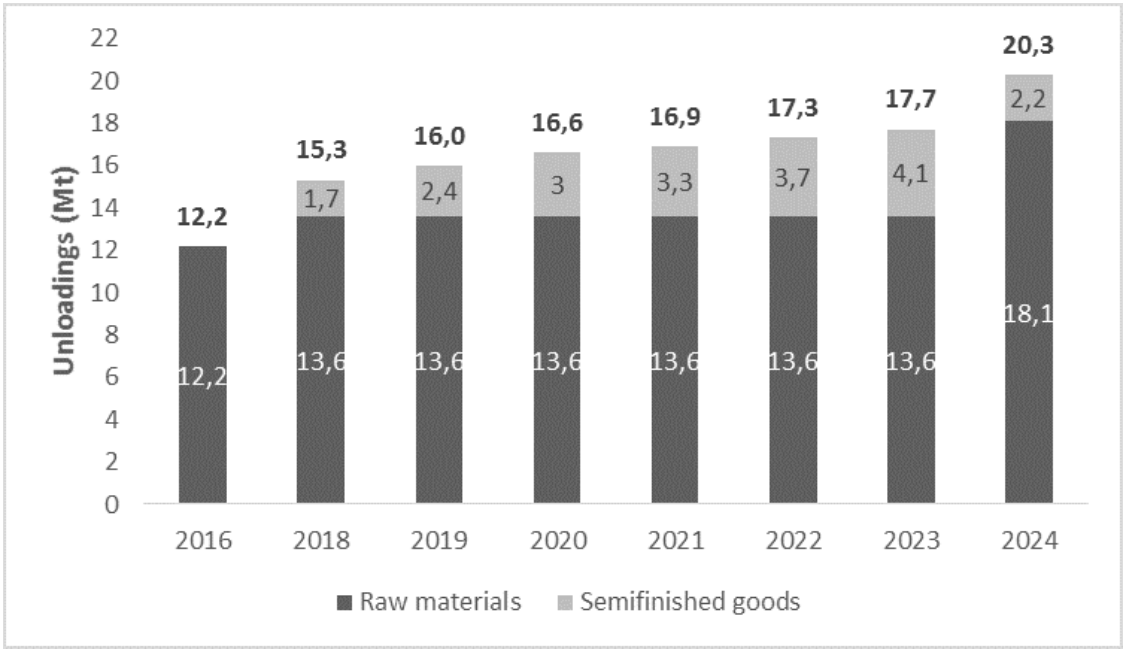
Figure 43: ILVA consignments 2016-2024



Source: AM Investco, ILVA manufacturing plan (2017)

It is possible to estimate the volumes of raw materials that ILVA will unload in Taranto during this period, based on the forecast output for 2018-2024 and the ratio of raw materials to finished goods leaving the plant, which averages 2.26 to one based on the data in section 2.

Figure 44: ILVA raw materials and semifinished goods unloaded 2016-2024



Source: EY, based on AM Investco, ILVA manufacturing plan (2017)

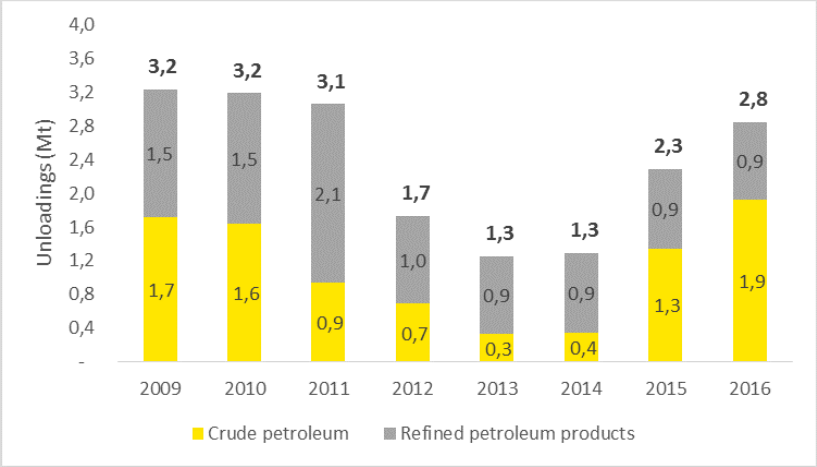
7.2.1. Other manufacturing plants

The following is a summary of goods flows from other manufacturers using Taranto, as described in section 2.

Oil and petroleum products

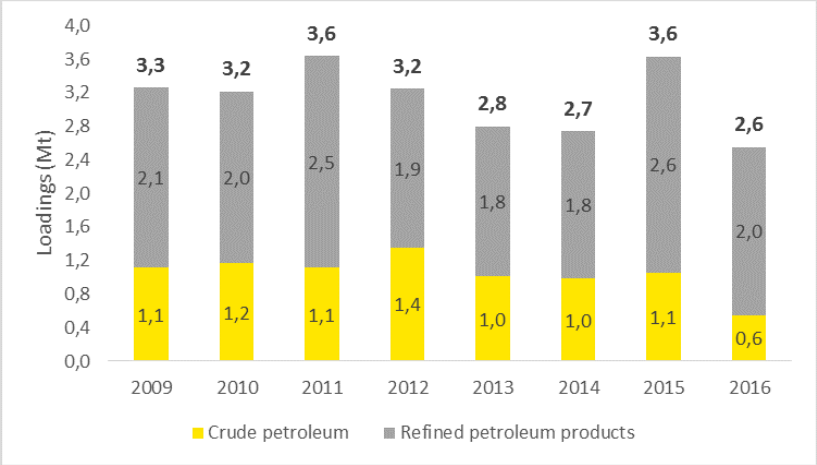
As stated above, ENI's refining and marketing division owns a refinery with a current output of 4.2 million tonnes a year and a capacity of 6 million tonnes. It processes oil from wells in the Basilicata region, and in the Middle East and North Africa. The company is the port's second biggest user, with a 560-metre wharf offering 1,120 m of berths used to load and unload crude, refined petroleum products, and derivatives. The Taranto refinery supplies southeast Italy, with its proximity to the Basiilicata fields enabling it to receive, store, process and ship domestic crude. Transshipment takes place using a system of conduits between the dock and the refinery. The port's inflows and outflows consist primarily of crude and refined petroleum products, as shown below.

Figure 45: ENI crude and refined petroleum unloaded, 2009-2016



Source: EY, based on Assoporti data

Figure 46: ENI crude and refined petroleum loaded, 2009-2016



Source: EY, based on Assoporti data

As described in section 2, the local cement manufacturer Cementir Italia has a concession on dock 4, 300 metres long with a draught of 4.5 metres, and a 167-metre section of east pier 4. This is used to load and unload between 400,000 and 500,000 tonnes of cement a year. The factory is directly connected to the dock by a high-capacity conveyor belt handling 2,400 bags or 400 tonnes of clinker an hour, with a floating loading plant to ship cement.

7.3. Support services

Support services in Italy are provided by government bodies, port companies, co-operatives, associations, and private entities. The range of services available in Italian ports is as follows:

- **Pilotage:** This is provided for commercial and safety purposes, using pilots to help ships manoeuvre in and out of the port. It is governed by the National Pilotage Regulations and local regulations issued by harbormasters (decree no. 51 of 22/12/1989 – Bari Maritime Directorate; local regulations for pilot services in the Port of Taranto – additional decree by the Bari maritime directorate, no. 47 of 12 July 1974 concerning compulsory pilot services in Taranto), which lay down guidelines for the service and specify that it is compulsory.
- **Mooring:** This service is provided to help vessels tie up and untie, and to assist with movements at the wharf and in the harbour. It is governed by the National Mooring Regulations, and local ordinances issued by harbourmasters (ordinance no. 200/2016 – Amendment to the mooring service regulations; ordinance no. 225/2007 – mooring and unmooring regulations for the port of Taranto), which lay down guidelines and specify that this service is compulsory.
- **Towing:** This service is intended to assist vessels entering and exiting the port by pulling, or pushing in the case of non-powered vessels. It is governed by local ordinances issued by harbourmasters (ordinance numbers 420/2016 – Waiver of the obligation to use towing services; 61/2015 – Towing tariff for ships in the port of Taranto; 364/2014 – Regulations for marine towing services in the Mar Grande and Mar Piccolo di Taranto and the extension to the west of Punta Rondinella; and 295/2013 – Towing in the port of Taranto) which lay down guidelines for the service and specify that it is compulsory.
- **Shuttle service:** This is provided by boatowners to transport individuals and equipment from land to seagoing vessels and vice versa. It is governed by local harbourmasters' ordinances (no. 137/2013 – Adoption of regulations for the shuttle service in the port and harbour of Taranto).
- **Solid waste management:** This service is provided by port concession holders who remove and dispose of solid waste stored on vessels while at sea or in port.
- **Liquid waste measurement**: This service collects, transport, treats, recycles and/or disposes of bilgewater, slops, oil sludge with a flashpoint exceeding 60°C, and ballast water from merchant vessels in port, in accordance with anti-pollution laws.
- **Water surface cleaning:** This maintains the cleanliness of water alongside wharves and removes pollution.
- **Pollution control and emergency assistance**: This service prevents pollution in port and provides assistance in the event of emergency
- **Fire service:** Provided in ports by co-operatives and private companies authorised by the local maritime authority in accordance with law no. 690 of 13 May 1940, as amended by law no. 850 of 27 December 1973, to prevent and control fires in tankers, vessels transporting hazardous goods, work sites where naked flames are present, and naval shipyards.
- **Bunkering:** The refuelling of vessels anchored in the port. It may be provided by road or sea tankers, or fixed equipment in port terminals.
- **Specialist chemicals advice** from registered chemists.
- **Water supplies:** Providing vessels with water from tankers while they are moored.
- **Rail services:** Shunting.

The following table summarises the services available in the port of Taranto, giving details of how they are provided and the body or bodies (where there is a free market) providing them.

Table 15: Services available in the port

SERVICE	AVAILABLE IN TARANTO	GENERAL DETAILS	SERVICE PROVIDER
Pilotage	Yes	Provided by entities authorised by the harbourmaster	Pilot corps of the port of Taranto
Mooring	Yes	Provided by entities authorised by the harbourmaster	Port of Taranto moorers' group
Towing	Yes	Provided by entities authorised by the harbourmaster	Rimorchiatori Napoletani S.r.l
Shuttle	Yes	Provided by entities authorised by the harbourmaster	Gruppo Barcaioli del Porto di Taranto
Solid waste management	Yes	Concession awarded by Port System Authority	Nigromare S.r.l.
Liquid waste management and water collection	Yes	Concession awarded by Port System Authority	ATI Morfini Hidrochemical S.r.l.
Water surface cleaning	No	n.a.	n.a.
Pollution control and emergencies	Yes	Provided by entities authorised by the harbourmaster	Ecotras S.p.A.
Fire service	Yes	Authorised entities	Ecoservizi S.r.l.
Bunkering (road or floating tanker, or fixed equipment)	Yes	Multiple authorised entities operating in a free market: - Floating: authorised by harbourmaster - Road tanker: single authorised entity - Fixed equipment: private company	Consorzio Autocisterne Tarantine; B.T. Trasporti; Consorzio Trasporti Carburanti Taranto; T.C.L.
Rail	No	n.a.	n.a.
Port chemist	Yes	Register kept of port chemists	3 authorised professionals
Water supply	Yes	Private entities on the free market	Ecotras S.p.A.

Source: EY

It is important to note the following:

- A water surface cleaning service was formerly provided in the port. The concession holders signed an agreement with a private company to clean the water at their terminals. Most of the cost was paid by ILVA.
- The rail service is no longer available due to lack of demand from the terminal operators involved.

7.4. Costs

Shipping companies choose ports for many reasons. One of the most important is the cost of mooring in the port from arrival to departure, including all the various commercial services involved. These may include the following:

- **Mooring charges** for tying up to a wharf;
- **Administration costs and taxes,** such as mooring taxes and maritime duties (law number 82/1963 and presidential decree number 107 of 28 May 2009), special duties (law 130/2011), and stamp duty for administrative transactions;
- **Port service costs:** payable to authorised concession holders for the services specified in paragraph 7.3;
- The ship's **operating costs;**
- **Customs duties** on goods arriving in or departing from the port, payable to the Customs and Monopolies Agency.

Taxes, duties and other government charges will affect a shipping company's choice of port, but are based on national laws and apply nationwide, so they do not make the port any more or less competitive with others in the country.

Mooring and other service charges, and the ship's operating costs, relate specifically to the terminal where it is moored. These are typically commercial decisions that depend on the private entity that manages the terminal or a wharf concession holder.

As a general rule, as instead regards the costs connected with port services, one element of great impact as concerns this cost item is the whether or not the service is compulsory and the instructions laid down for the carrying out of certain operations defined by the competent authorities on a local level. The costs generated by these provisions for this category of services, above all in those connected with the nautical technical services or waste management, are

therefore an essential element in the choice of the port. As regards the port of Taranto, the costs relating to the port services present in reality have been analysed; the table below shows, for each service, the orders or provisions regulating and defining tariffs.

Table 16: Costs relative to the services supplied at the Port of Taranto

SERVICE	AVAILABLE IN TARANTO	SOURCES FOR COST IDENTIFICATION
Pilotage	Yes	Decree Direzione Marittima Bari 04/2017 – Fares for pilotage in the Port of Taranto, valid since 01/01/2017
Mooring	Yes	Ordinance CP Taranto 496/2015 – Review of mooring fares for 2016 – 2018 period
Towing	Yes	Ordinance CP Taranto n. 61/2015 – Fares for towing of ships in the Port of Taranto and relative roadsted
Shuttle	Yes	Ordinance CP Taranto n. 497/2015 – Review of shuttle fares for 2016 – 2018 period
Solid waste management	Yes	Ordinance PSA 08_14
Liquid waste management and water collection	Yes	Ordinance PSA 15_15_Fares bilgewater
Pollution control and emergencies	Yes	Ordinance CP 198/2014 – Fares for services provided by ECOTARAS company within the Concession for antipollution services and cleaning services of water surface and port areas under the control of the Capitaneria di porto of Taranto
Fire service	Yes	Free market
Bunkering (road or floating tanker, or fixed equipment)	Yes	Free market
Port chemist	Yes	Price list by National Association of Port Chemists
Water supply	Yes	Free market

Source: EY

8. POTENTIAL

8.1. Analysis of logistical relations: catchment area of the port of Taranto

As highlighted by the previous chapter, the port of Taranto has historically been characterised by the **presence of industrial traffic**, mainly at the service of the major production plants (e.g. ILVA, ENI, Cementir, Vestas) and more marginally, of traffic generated/attracted on a local level. Only more recently has a transitional development been seen of container traffic, with the experience of Evergreen, which, however, applied to the transshipment port and, therefore, effectively with no stable, significant relationship with solid ground (apart form some gateway services towards the north).

The history of the analyses of the port's logistics relations is, therefore, first and foremost the history of relations with a few, major industrial groups and this without doubt constitutes an essential starting point from which to also outline the port's future development route. In this sense, in addition to clearly interpreting the changes in progress for the groups to which the port has historically referred, it would appear to be very relevant indeed to try to assess possible interactions with other market opportunities and first and foremost with the **automotive segment** (plants in San Nicola di Melfi and Atessa). More generally, in order to construct a more resilient, open traffic model, it would appear to be useful to try to **assess the catchment area** of the port of Taranto, thereby to better characterise the logistic and production fabric of reference.

A first analysis is represented by the **assessment of road access to the port of Taranto** with respect to the other Italian ports, measured on the network with reference to heavy vehicles, and graphically shown in the figure below, in the form of isochrones with 30 minute steps. Clearly, the portion of land that can be reached within two hours - the cut-off time if imagining a daily two-way trip with a heavy vehicle - skims Campania and extends north throughout the whole of Apulia and south reaches the plane of Cosentino. Naturally, we also need to consider the presence of other ports in the area: to this end, the travel time with heavy vehicles has been calculated for each Italian municipality from the significant ports for the analysis of Taranto[22], and this was compared with travel time using heavy vehicles to the same municipality from the port of Taranto. The difference between these two times defines an easily-understood

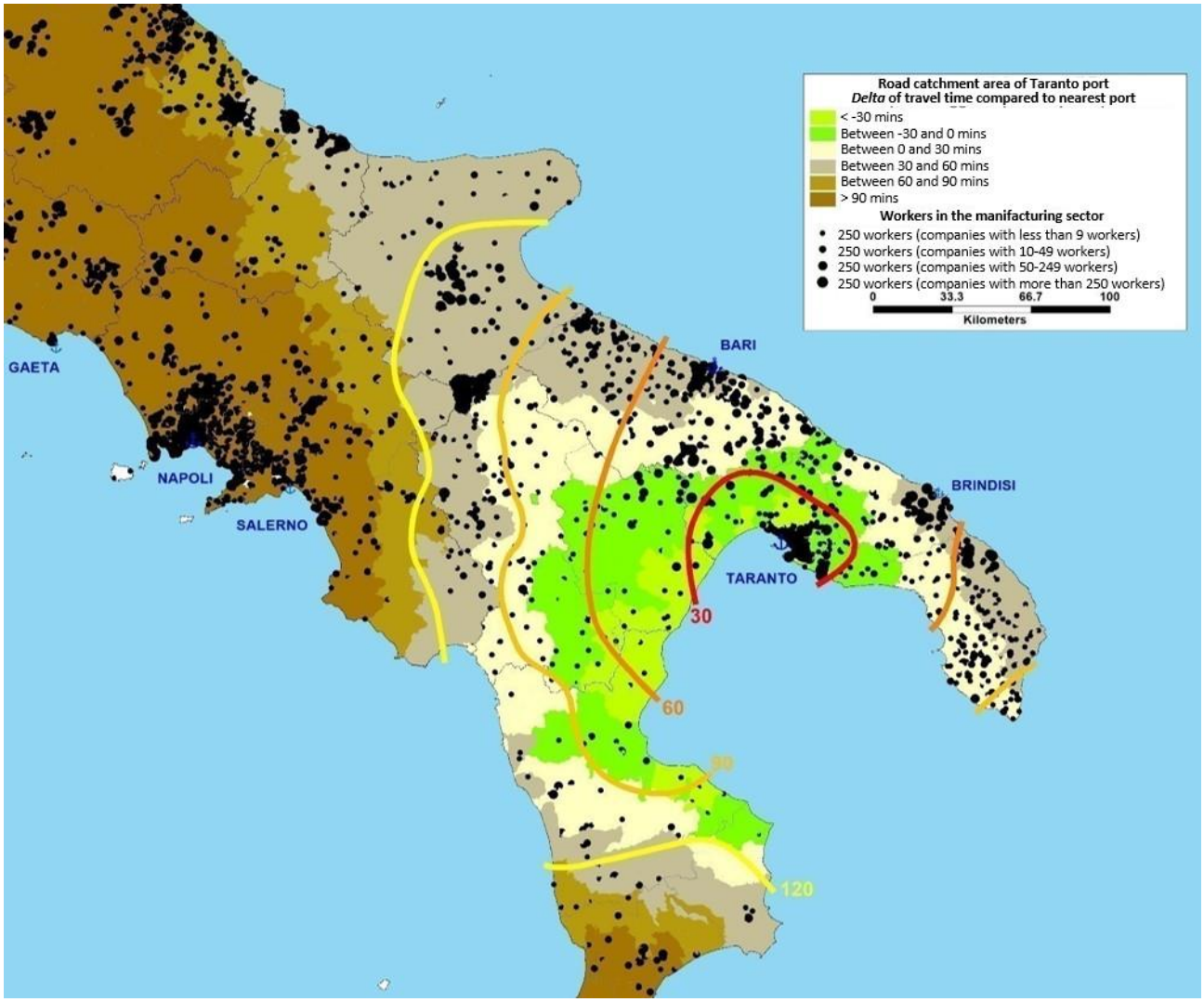
[22] Naples, Salerno, Civitavecchia, Ancona, Bari, Brindisi, Gioia Tauro.

index of the competitiveness of the port of Taranto, shown graphically in the figure below in colour scale. More specifically, the **green area** is that which includes all municipalities for which the port of Taranto is without doubt closer (the "captive catchment area"); the **light yellow strip** includes all municipalities that have a port that is closer than Taranto, but for which the additional travel time required to reach Taranto is less than 30 minutes, and which could therefore certainly be included in the port's catchment area. Finally, the **dark colour bands** are where the competitive advantage of the other ports with respect to Taranto is considerable. The analysis clearly confirms that the port of Taranto is without doubt the reference port for Basilicata, and there are non-negligible areas of the territory with respect to which it can play an important role.

The road catchment area can then be cross-matched with the **production and social-economic data**: the figure below shows for each municipality the number of operators on the local units of the manufacturing sector, broken down according to business dimension, thereby also showing the structure of the production fabric. In this sense, we also note a significant heterogeneity of the reference production fabric of the port of Taranto, with an alternation of large enterprises and small and medium enterprises.

It is important to stress that this analysis applies in the hypothesis that the ports are equivalent with respect to the shipping routes, which certainly applies to intercontinental traffic; for intra-Mediterranean Ro-Ro traffic, on the other hand, the analysis should be reconsidered considering, for example, that the Adriatic ports of Apulia have an extremely vast catchment area with respect to the traffic towards Greece and Turkey, whilst the Tyrrhenian ports are to be absolutely preferred in traffic towards the western Mediterranean.

Figure 47: Road catchment area - Port of Taranto

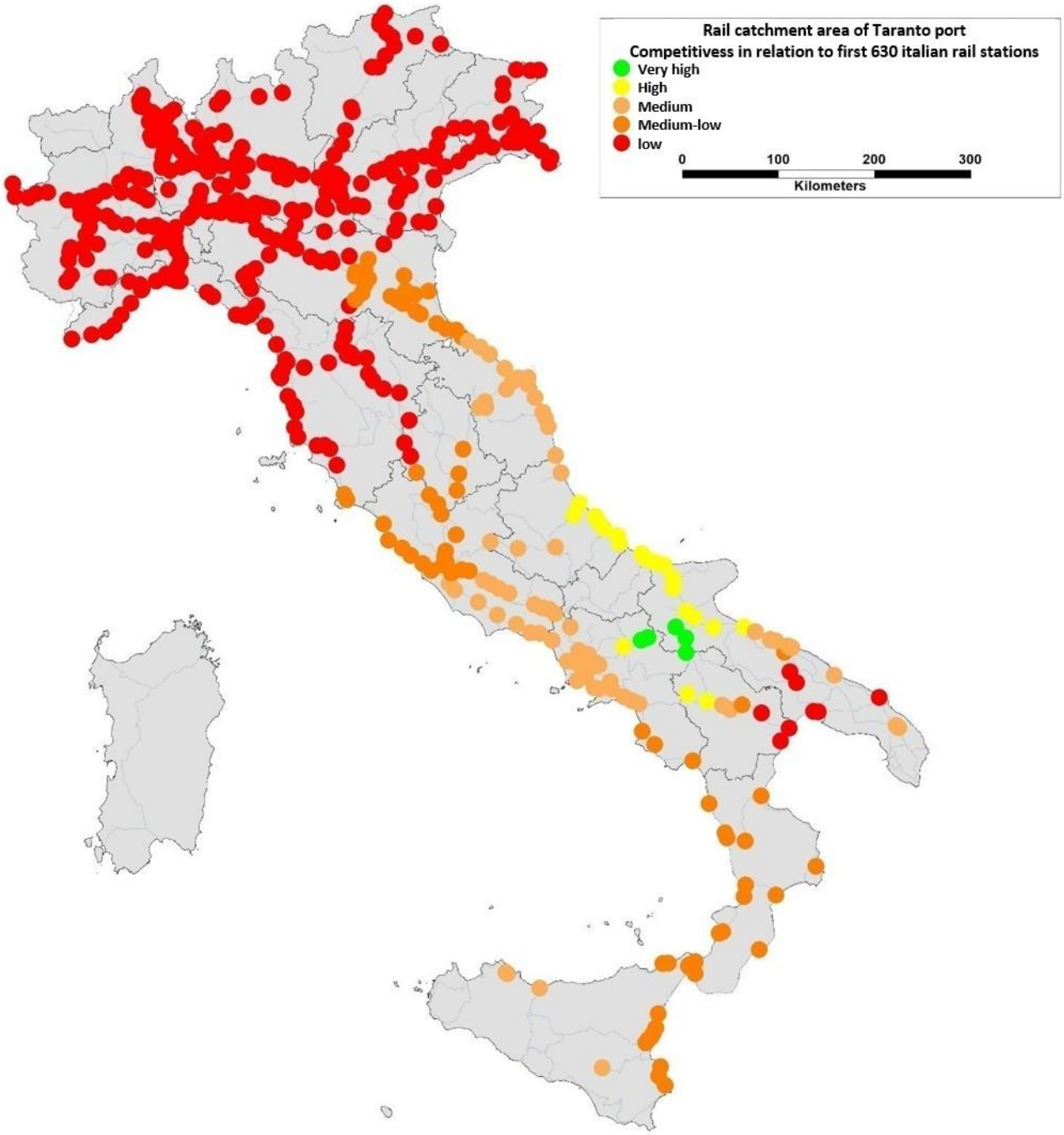


Source: EY processing

A similar reasoning applies to the **rail access to the port of Taranto**. To this end, an Italian railway network analysis model was used that specifically considers all the relevant performance of the infrastructure (weight, shape, slope, maximum length admissible) and, for each Italian port, the total cost and cost per unit transported was calculated of the best train that can be developed towards each of the top 630 stations of the national rail network for total goods traffic as at 2015[23]. As for road access, therefore, it has been possible to calculate for each railway station the **difference in cost between the rail connection with the nearest Italian port (in terms of cost) and the port of Taranto**; this difference therefore constitutes once again a measurement of the competitiveness of the port of Taranto and, therefore, of its catchment area with respect to rail transport. The analysis is shown in graphic form in the figure below, which shows, for each station, on a colour scale, the relative competitiveness of the port of Taranto.
Clearly the destinations that are immediately closest suffer the incidence of fixed costs (which do not depend on demand), whilst those further away, the strong competition offered by the ports of the central-north of the country. At the same time, there are opportunities to compete along the Adriatic backbone and, subordinately, towards Emilia and the Campania/Lazio cluster. Moreover, in line with that reported in the part on the infrastructural works of the POT, the infrastructure manager RFI is currently in the process of carrying out important rationalisation works on the stations of Cagioni and Taranto (respectively serving the multiple-sector dock and the logistic plate), which will enable significant interventions on the reduction of the costs of the railway manoeuvre.

[23] Details of the method are given in Marzano et al. (2017).

Figure 48: Rail catchment area - Port of Taranto



Source: EY processing

It must then be stressed that the previous analysis regards, in absolute terms, railway alone, and should therefore be cross-matched with any competition with shipping. On this latter point, in particular, it is considered appropriate to stress that the greater capacity per individual dispatch offered normally by the sea with respect to rail (above all for bulk goods that reason logistically in terms of order volumes of thousands of tonnes per load) and the volatility of the shipping charter market, which, for contingencies, can be extremely low, can, as a whole, mean that shipping is often preferred over a potential rail delivery, more or less parallel to the maritime part.

8.2. Rail: increased competitiveness and rail manoeuvre

Performance upgrade interventions envisaged on the whole of the national network will extend the areas that can be contended by each port and, therefore, will tend to drive the Taranto catchment area further north. As already mentioned, however, unless there should be any real upheaval (which today looks unlikely) in the structure of relations between the shipping hubs and the cost of sending overland, this will not lead to any substantial changes in the definition of the reference ports of each territory. It will, however, allow the ports that are best able to optimise the intermodal alternative:

- to increase traffic beyond the market's structural growth;
- to extend the set of goods, market niches and related supply chains, for which it may be worth using that port as a hub, or even only including it in the network of services;
- to make the logistics offer more resilient and more easily adjusted to the different needs in terms of speed, capacity and cost, which may characterise the different functions or components of the supply chain.

As concerns Taranto, another key element concerns the **final mile interventions** (already in progress), which will shortly considerably simplify the manoeuvres necessary to make-up and break-down the trains, moving them between the arrival/departure tracks and the loading/unloading tracks. These interventions, in affecting the time/cost of crossing the node, have no connection with the length of the route serviced and, therefore, would more greatly increase the competitiveness on the short- and medium-distance relations, thereby strengthening the position with respect to the current catchment area and, more generally, to central-southern peninsular Italy.

On this same element, we also have the infrastructural interventions aimed, for example, at lengthening and standardising the A/P, P/C, C/S tracks, at extending the electrification through to the intermodal terminal, to developing connections for the direct release on the line and avoiding the need for stops at the station to reverse direction, which can have a considerable impact on the **organisation and operative management of rail manoeuvres**. More specifically, what would appear to be important, and which has emerged both under the scope of the "Actions for the Re-launch of Rail Goods Transport" coordinated in the last year by the MIT, and in the regulatory activities of the ART, is that it should be possible to avoid splitting competences between various subjects designated to operate between the different stations, connections and terminals relating to the port of Taranto. In other words, it would appear best to **identify a single manager**, which can operate impartially, fostering access to the service by all rail companies and guaranteeing a reasonably-priced, efficient rail manoeuvring service. This solution would appear to be suitable also in consideration of the specific moment in time currently being experienced by Taranto, where rather than making traffic management more efficient, it actually needs re-launching. In this situation, and without even considering the hypothesis of several subjects competent on different portions of the area, even the **use of self-production as a structural solution**, would considerably reduce the set of rail companies able to offer to provide services to and from Taranto. Again in line with the contingent situation in Taranto, a direct intervention by the Port System Authority on the model of what has already been successfully achieved elsewhere in Italy (Trieste) may prove to be key in giving the initial boost and help structure the service, even without a solid operative traffic base. Notwithstanding the need to verify coherence with the restrictions set by current legislation, the public participation in the service manager may also provide a further guarantee of impartiality and neutrality of management and accessibility and continuity of service, in favour of the rail companies. Additionally, the public participation may make it possible to adopt structural and organisational measures with a view to promoting the development of rail transport at the service of shipping traffic, for example through the reorganisation and extension of the service or by means of investments to modernise the infrastructures.

In addition to this, a further operative leverage comes in the form of an article of law that has been partially approved by parliament as at the date on which this POT is prepared, which envisaged, under Art. 47, paragraph 11ter of the "corrective manoeuvre decree", which "*In order to promote rail traffic of goods in a port environment, each Port System Authority, relative to concessions in place for state areas on which terminal business takes place, may recognise, in respect of the minimum limits to the charges pursuant to Article 18 of Italian Law no. 84 of 28 January 1994, a progressive reduction of concession charges according to the achievement of specific port rail traffic objectives generated by each area, or in any case related to it. Specific rail traffic objectives, the entity and method of*

determination of the discount will be established by each Port System Authority according to the resources available on their budgets."

8.3. Analysis of the tax regime: Customs free zone and Special economic zone

As at the date on which the POT is drafted, there is a Customs free zone in the Port of Taranto. In 2013, the Port System Authority of Taranto had submitted a request to the Taranto Customs Office for the establishment of **a Type II non-landlocked customs free zone** in the state maritime areas, for the carrying out of activities such as: storage, usual handling, transformation under customs control, completion of assets and marketing of third party goods. The initiative had received the support of Taranto City Council (Resolution no. 90 dated 11/09/2013), which had undertaken to intercede with the government for the institution of a free zone or Special Economic Zone (SEZ).
The Customs Free Zone was **launched in 2016**, by the issue of the Port Committee document regulating the operating methods, which governed the activities permitted to users and connected obligations, use of the areas, the activities of competence of the Port System Authority and the possibility of new production establishments. At present, **in the CFZ, it is possible** not only **to deposit goods on suspension of duties and VAT**, but also to carry out other operations, such as **packaging**, **labelling**, **inward processing** and other works and **miscellaneous processes**. The Port Authority had already ruled in favour of the opportunity of establishing the SEZ, hypothesising that this would have enabled the introduction of tax benefits, such as the reduction of income tax (IRES), the reduction of contributions on salaries from employment, the reduction of regional production tax (IRAP) and the reduction of property tax (IMU). In addition to the detaxation, the SEZ would also have offered up a **logistic opportunity**, fostering a greater simplification of the administrative side and more certain times in terms of bureaucratic procedures. In this sense, a bill of law setting out "Provisions on the institution of Special Economic Zones in logistical-industrial areas connected with internationally-important ports", aiming to institute SEZs for the areas of Cagliari, Gioia Tauro and Taranto, was deposited in Parliament in 2013, but it has remained there, untouched, since then. In light of the approval of the Decree Law setting out "Urgent measures for the economic growth of southern Italy"[24], which, amongst others, regulates the institution of SEZs, the route started by the **institution of a Special Economic Zone in the Port of Taranto** with more extensive prerogatives with respect to the Free zone, will probably take on a new level of importance.
This Decree, in continuity with Decree Law no. 243/16, which had increased the incentives for industrial investments, continues the aim of activating aids for southern Italy and, in particular, institutes and regulates Special Economic Zones. they will be focussed on the port areas and areas economically-connected to them. If, after the immediate phase of effectiveness, the process for the conversion into law should be completed successfully, the SEZs will be characterised by **new forms of economic governance**, as the administrative procedures and procedures for gaining access to infrastructures for companies operating or establishing within these areas, will be coordinated by a **single manager**, in representation of the Central administration, the Region concerned and the Port System Authority. This has been established in order to allow for an **integrated development project** and the re-launch of the competitiveness of the ports of the southern regions. To the same end, the SEZs will be assigned additional tax benefits, with respect to the ordinary south tax credit regime. More specifically, in addition to the investments of the SMEs, they will be eligible for an investment tax credit of up to 50 million euros, sufficiently large to attract major international players and of strategic importance to shipping and goods movement in the ports of southern Italy. The SEZs will be activated at the request of the southern regions concerned, upon submission of a suitable development project.
By virtue of the favourable tax regime that would characterise them, the Taranto SEZ may represent an important factor of competitiveness in terms of

- incentives for making initial investments in industrial establishment;
- interventions to improve the infrastructures on the territory and improve connections;

[24] Decree Law approved in the Council of Ministers on 09 June 2017, on the proposal of the Chairman of the Council and the Minister for Territorial Cohesion and Southern Italy

- customs benefits, by means of suspension of payment of value added tax and duties, with simplification of customs procedures;
- tax exemptions;
- exemptions or derogations from regulations on employment contracts;
- exemptions or reduction of social charges on salaries.

As a general rule, the institution of an SEZ is not, in itself, any guarantee of increased competitiveness: this potential is, in fact, mitigated if areas are activated characterised by similar conditions at the ports in direct competition with the port of Taranto. However, **the combination of the specific morphological and infrastructural characteristics of the port of Taranto and, in particular, the offer of a bed that can welcome large ships, unique to Taranto in the Mediterranean, would make the Special Economic Zone of Taranto particularly appealing to new production plants**.

8.4. Analysis of traffic in the reference basin

8.4.1. International traffic in the reference regions

This paragraph analyses commercial trade of southern Italy with foreign countries: firstly, the evolution was analysed, in the last four years, of the flow of imports and exports that have involved the regions of southern Italy, so as to identify the positioning of these regions on the global markets, with a view to particularly assessing the development potential of the market of the Region of Apulia.
The level of detail used for the representation of the Italian territory in the processing shown below, is the regional level (level 2 of the Nomenclature of Statistical Territorial Units - NUTS2), in line with the purpose of the analysis as described above. The processing shown below was carried out with the support of data from official ISTAT sources, identifying the four-year period 2013 - 2016 as the period of reference.
In detail, the tables below show the volumes of international trade, in terms of imports and exports, between the regions of southern Italy and the rest of the world, divided up into 10 areas of commercial interest.

Table 17: 2016 import - export flows

CAMPANIA	APULIA	BASILICATA	CALABRIA	SICILY	SARDINIA	OTHER OR UNSPECIFIED REGIONS	SOUTH ITALY	2016	
3,327	2,027	323	293	2,012	1,306	5,325	14,614	import	European Union 28
2,241	3,107	836	139	5,570	4,728	5	16,626	export	
863	2,553	84	48	6,231	2,107	20,085	31,971	import	Non-EU European countries
178	497	20	29	2,497	1,624	131	4,977	export	
593	667	2	8	2,533	1,676	17,101	22,580	import	North Africa
469	778	63	12	2,511	2,304	8	6,145	export	
121	3,724	0	7	1,279	3,552	14	8,696	import	Other African countries
201	32	3	2	408	117	1	765	export	
897	2,302	28	9	372	275	1	3,884	import	North America
330	136	195	10	906	67	2	1,646	export	
403	7,411	20	12	413	216	6	8,482	import	Central-South America
135	262	5	2	227	25	1	657	export	
97	603	0	6	14,770	7,199	7	22,682	import	Middle East
171	328	8	5	1,330	1,750	7	3,599	export	
173	1,036	11	7	2,866	1,164	3	5,260	import	Central Asia
54	19	1	1	44	82	2	203	export	
870	1,138	71	31	131	72	11	2,324	import	East Asia
433	159	12	9	855	80	7	1,555	export	
6	853	0	2	1	0	0	863	import	Oceania and

CAMPANIA	APULIA	BASILICATA	CALABRIA	SICILY	SARDINIA	OTHER OR UNSPECIFIED REGIONS	SOUTH ITALY	2016	
155	54	2	2	15	3	2	232	export	other territories
7,350	22,316	538	422	30,608	17,569	42,553	121,356	import	World
4,368	5,372	1,146	211	14,364	10,780	165	36,406	export	

Source: EY processing of Coeweb Istat source

Table 18: 2015 import - export flows, figures in thousands of tonnes

CAMPANIA	APULIA	BASILICATA	CALABRIA	SICILY	SARDINIA	OTHER OR UNSPECIFIED REGIONS	SOUTH ITALY	2015	
3,045	1,823	299	341	1,689	1,636	7,426	16,260	import	European Union 28
2,119	2,761	637	121	4,703	3,803	34	14,178	export	
1,009	2,627	16	47	6,581	2,145	22,156	34,580	import	Non-EU European countries
208	923	327	44	3,220	2,116	139	6,976	export	
529	762	4	15	3,155	2,428	10,402	17,294	import	North Africa
396	1,056	73	53	2,817	2,420	18	6,832	export	
118	3,294	0	5	1,153	4,843	22	9,436	import	Other African countries
229	52	5	3	436	88	1	815	export	
685	3,561	32	10	83	273	1	4,644	import	North America
317	83	46	7	987	21	2	1,465	export	
350	6,104	12	10	723	837	1	8,036	import	Central-South America
88	24	5	2	215	70	1	406	export	
114	222	0	3	13,556	6,064	3	19,961	import	Middle East
174	309	5	11	1,641	1,657	21	3,817	export	
180	715	0	5	2,884	1,245	1	5,030	import	Central Asia
45	25	1	1	58	94	2	226	export	
866	3,148	89	28	272	84	10	4,497	import	East Asia
398	282	7	9	1,164	81	16	1,957	export	
13	370	0	2	1	1	0	388	import	Oceania and other territories
141	52	1	2	12	4	1	213	export	
6,910	22,627	452	467	30,095	19,555	40,021	120,128	import	World
4,115	5,568	1,108	253	15,253	10,355	234	36,886	export	

Source: EY processing of Coeweb Istat source

Table 19: 2014 import - export flows, figures in thousands of tonnes

CAMPANIA	APULIA	BASILICATA	CALABRIA	SICILY	SARDINIA	OTHER OR UNSPECIFIED REGIONS	SOUTH ITALY	2014	
2,776	2,095	214	377	1,557	1,842	7,945	16,808	import	European Union 28
2,090	3,435	170	93	5,053	2,596	51	13,488	export	
986	2,359	18	64	7,889	2,914	19,542	33,771	import	Non-EU European countries
188	855	199	38	2,112	1,762	133	5,287	export	

CAMPANIA	APULIA	BASILICATA	CALABRIA	SICILY	SARDINIA	OTHER OR UNSPECIFIED REGIONS	SOUTH ITALY	2014	
430	795	3	14	2,852	3,047	9,652	16,794	import	North Africa
294	877	7	10	2,942	1,508	62	5,700	export	
74	2,724	0	4	381	2,719	0	5,901	import	Other African countries
231	34	2	2	514	190	2	975	export	
783	5,551	8	38	933	386	0	7,699	import	North America
292	130	18	8	718	140	2	1,308	export	
311	6,943	1	8	920	1,074	36	9,294	import	Central-South America
92	35	6	1	174	115	1	423	export	
61	209	0	23	11,127	4,179	6	15,606	import	Middle East
149	178	5	5	1,243	1,285	12	2,878	export	
156	104	1	4	2,822	906	0	3,994	import	Central Asia
42	30	1	2	40	108	1	223	export	
682	2,532	40	52	157	75	10	3,548	import	East Asia
430	210	7	7	1,037	91	4	1,786	export	
8	877	0	2	1	1	0	888	import	Oceania and other territories
135	50	1	1	38	8	1	234	export	
6,268	24,190	285	587	28,639	17,142	37,193	114,304	import	World
3,943	5,833	416	168	13,869	7,804	269	32,302	export	

Source: EY processing of Coeweb Istat source

Table 20: 2013 import - export flows, figures in thousands of tonnes

CAMPANIA	APULIA	BASILICATA	CALABRIA	SICILY	SARDINIA	OTHER OR UNSPECIFIED REGIONS	SOUTH ITALY	2013	
2,641	1,875	235	354	1,708	1,346	8,774	16,931	import	European Union 28
2,152	3,067	175	86	5,302	2,938	49	13,769	export	
819	1,996	16	99	9,517	3,629	18,870	34,946	import	Non-EU European countries
174	656	300	10	3,242	1,447	179	6,007	export	
621	777	2	14	2,641	3,976	13,233	21,265	import	North Africa
418	805	13	11	3,326	1,687	22	6,282	export	
68	2,676	0	35	392	1,462	0	4,633	import	Other African countries
272	29	3	2	365	28	1	702	export	
681	4,280	1	11	183	155	0	5,311	import	North America
327	98	19	7	893	29	1	1,374	export	
306	7,763	0	39	91	586	2	8,788	import	Central-South America
169	39	3	1	231	216	1	661	export	
90	142	5	7	11,001	5,342	21	16,609	import	Middle East
140	204	59	4	1,242	1,515	17	3,183	export	
146	134	0	7	4,482	652	1	5,422	import	Central Asia
33	11	1	1	44	104	2	195	export	
602	2,537	48	69	106	206	10	3,579	import	East Asia
422	239	4	12	585	97	7	1,366	export	
4	1,084	0	2	1	6	0	1,097	import	Oceania and other territories
165	37	1	2	14	12	1	231	export	
5,979	23,264	308	638	30,121	17,361	40,911	118,582	import	World

CAMPANIA	APULIA	BASILICATA	CALABRIA	SICILY	SARDINIA	OTHER OR UNSPECIFIED REGIONS	SOUTH ITALY	2013	
4,274	5,184	578	135	15,245	8,074	279	33,769	export	

Source: EY processing of Coeweb Istat source

The analysis of the data shown reveals that most of the traffic recorded is concentrated in 4 areas of prevalent commercial interest. More specifically, the **main commercial partners of southern Italy are the European countries** with a volume of movements (intended as the total imports and exports) of **36 mln tonnes** for non-EC European countries, and **31mln** tonnes for the EU 28 countries. These are followed by the **countries of North Africa, with 29 mln tonnes** and those of the **Middle East with 27 mln tonnes** of goods moved, showing a clear increase, in particular in the imports sector, to the detriment of European countries (see figure).

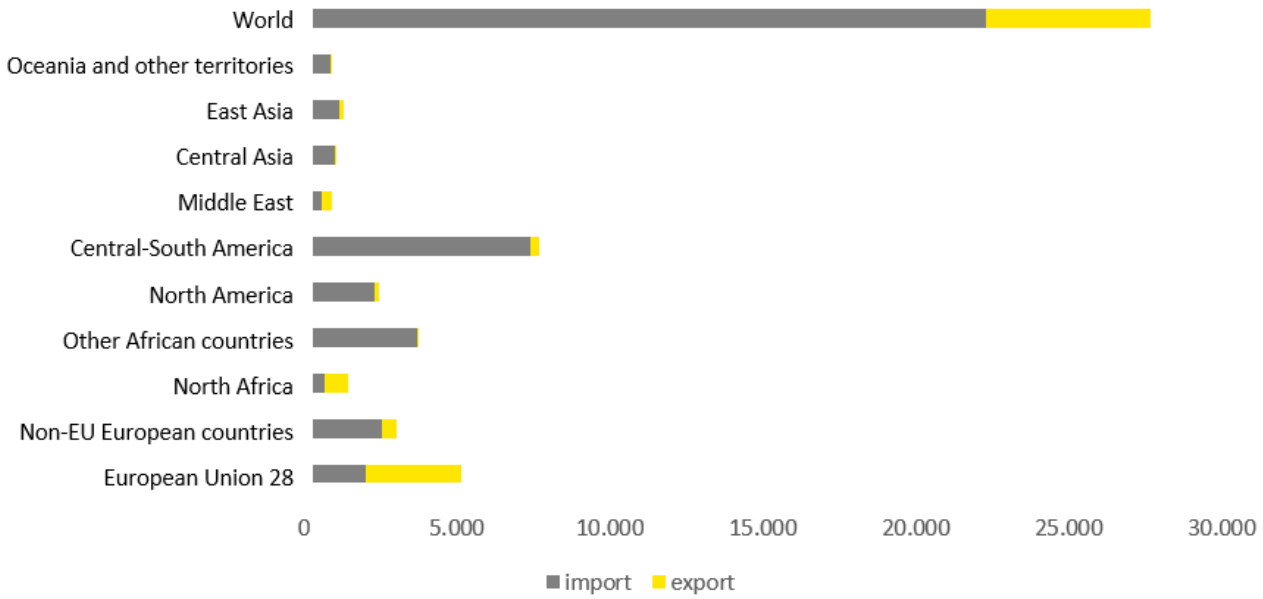
In this context, last year Apulia moved a volume of goods of 28 million tonnes, with a clear prevalence of imports, which accounted fro around 80%. Although confirming the trend expressed by the other regions of southern Italy, identify **America as the main commercial partner for the Region of Apulia with 10.1 mln tonnes**, followed by European countries with 8.2 mln tonnes (see figure).

Table 21: Import - export percentages for southern Italy, figures in thousands of tonnes

Southern Italy									
2016		2015		2014		2013			
Amount	%	Amount	%	Amount	%	Amount	%		
14.614	40%	16.260	44%	16.808	52%	16.931	14%	import	European Union 28
16.626	46%	14.178	38%	13.488	42%	13.769	12%	export	
31.971	26%	34.580	29%	33.771	30%	34.946	29%	import	Non-EU European countries
4.977	14%	6.976	19%	5.287	16%	6.007	5%	export	
22.580	62%	17.294	47%	16.794	52%	21.265	18%	import	North Africa
6.145	17%	6.832	19%	5.700	18%	6.282	5%	export	
8.696	24%	9.436	26%	5.901	18%	4.633	4%	import	Other African countries
765	2%	815	2%	975	3%	702	1%	export	
3.884	11%	4.644	13%	7.699	24%	5.311	4%	import	North America
1.646	5%	1.465	4%	1.308	4%	1.374	1%	export	
8.482	23%	8.036	22%	9.294	29%	8.788	7%	import	Central-South America
657	2%	406	1%	423	1%	661	1%	export	
22.682	62%	19.961	54%	15.606	48%	16.609	14%	import	Middle East
3.599	10%	3.817	10%	2.878	9%	3.183	3%	export	
5.260	14%	5.030	14%	3.994	12%	5.422	5%	import	Central Asia
203	1%	226	1%	223	1%	195	0%	export	
2.324	6%	4.497	12%	3.548	11%	3.579	3%	import	East Asia
1.555	4%	1.957	5%	1.786	6%	1.366	1%	export	
863	2%	388	1%	888	3%	1.097	1%	import	Oceania and other territories
232	1%	213	1%	234	1%	231	0%	export	
121.356		120.128		114.304		118.582		import	World
36.406		36.886		32.302		33.769		export	

Source: EY processing of Coeweb Istat source

Figure 49: Details of exchanges of the region of Apulia for 2016, figures in thousands of tonnes



Source: EY processing of Coeweb Istat source

8.4.2. The Port of Taranto and the countries of the MENA Area

The market in which Italy's main commercial partners fall is very heterogeneous, both in terms of the reference geographic context and the related economic trends.

More specifically, the countries of eastern Europe, and Poland first and foremost, are classed as the countries of greatest economic importance, characterised by a growth trend, despite the recession that has struck the whole of Europe. In the same way, the countries of the MENA Area are also becoming a point of reference for the European economy and the Italian economy in particular, with an economy that shows constant growth, despite the critical issues generated by the persistent climate of social and religious instability. More specifically, a recent analysis of trade between Italy and the MENA Area confirms and increase in traffic to date of 64% as compared with 2001, for a value that comes in at 66.5 billion euros and estimates a further increase for 2018, up to 68.2 billion euros.

Other countries that are growing strongly and which play an important role in the European economy are those of Sub-Saharan Africa and the Indian subcontinent (Bangladesh, India and Pakistan); India, in particular, in the last few years, has also exceeded China’s growth rate. However, trade between these countries and Italy at present accounts for a small portion of our international carriage. (A detailed analysis of the commercial trade between Italy, in particular southern Italy and foreign countries, is given below).

The progressive slowing recorded to the growth of the economy of continental Europe, may be faced by exploiting the optimal position of boundary with the regions of the south-eastern Mediterranean, eastern Europe and the Balkans. These regions are, in fact, characterised by both a numerous, young population with good schooling and professional training, and by a highly dynamic employment market, with relatively low costs; these two aspects represent the ideal mix for strong, long-term economic growth. Hence, therefore, the major interest in this type of market, which, by providing a valid opportunity for consumption growth, an attract important foreign investments, both as regards industries and services. More specifically:

- In terms of the Mediterranean, economic growth is very much hindered by political and military tensions involving the Middle East; however, in recent years, the market has shown signs of recovery, particularly for some countries of North Africa, such as Algeria, Egypt, Morocco and Tunisia, with consequent positive repercussions on trade with Europe. Moreover, the countries facing out onto the Mediterranean enjoy an extremely favourable position thanks to the presence of the Suez canal, which, with the transit of

approximately 10% of the world's maritime traffic, offers the ports of the Mediterranean the possibility of naturally intercepting trade with the east. Moreover, the recent expansion of the canal, with the consequent reduction of ship transit time, has facilitated the growth of commercial traffic, giving the Egyptian government the chance to promote new production and logistic settlements along the canal, from Port Said to Alexandria.

- Another market of major interest is that of Turkey, which has managed to ensure continuous growth of the GDP, with far higher rates than those of western Europe, despite the political and religious tensions; a factor that has enabled it to put itself forward as a major logistic-port hub along the Silk Route. Egypt too, thanks to the strategic geographic position for the control of the Suez canal transits, flaunts a growing economy, particularly in the transport and logistics sector, offering interesting investment possibilities.
- Central-eastern Europe and the Balkans too, from the 1990s onwards, have shown a growing economy, doubling the rates recorded in western Europe. In this case too, key factors included low labour costs and skilled labour, which, during the decade that spanned the end of the last century, have resulted in a transfer of the main manufacturing activities in Europe, to the east.
- Differently to that recorded for the above countries, in the last few decades, Italy has suffered an increasing decline in the growth of its GDP, with major transversal consequences affecting almost all sectors of the economy. The only exception, which has partly allowed the negative trend of the Italian market to be cope with, is the exports sector, which, having shown continuous growth in recent years, now accounts for more than 30% of the GDP.

Italy's commercial partners are extremely diversified, thanks to the geographic context, which allows it to face onto various different export markets. We need merely consider that a considerable portion of exports, around 20% of the national total, head towards non-European destinations, and this figure is currently growing. It is estimated that in the next decade, the portion of these exports will exceed that intended for European markets. This opportunity will clearly require an important challenge to be faced: achieving long-distance connections that are increasingly higher-performing, involving different transport methods (rail and shipping first and foremost) by which to easily connect Italy with the Middle East and African continent.

The market analysis given here shows that the Adriatic backbone is a zone of major strategic interest to the Italian exports sector. More specifically, south-east Italy, thanks to its geographic location, represents a "natural" access route to the European continent for traffic involving the east Mediterranean and Far East and central-eastern Europe. This potential should be optimised through the promotion of territorial cohesion policies, giving a positive boost to the formation of port clusters with shared objectives. All this should clearly be flanked by a production system that is very much focussed on exports, able to generate and manage an important flow of goods, through the inclusion in very extensive logistics chains.

In a context where non-European trade is presented as a driving sector of the Italian economy, the ports, neuralgic centres for the transit of goods on the reference markets, and interports, above all in the areas of overlay of national and international flows, take on a key role. In Italy, some of these contexts, like the interports of Bologna, Padua, Parma and Verona and the ports of Ravenna, Trieste and Venice, together with those of Capodistria and Rijeka, have formed a system, in the wake of the virtuous examples of the Northern Range, precisely in order to face up to the strong competition between industry players. In order to create this type of collaborative structure, one very important factor is the belonging to a single macro economic region, because the cluster is seen as a real gateway to the export markets.

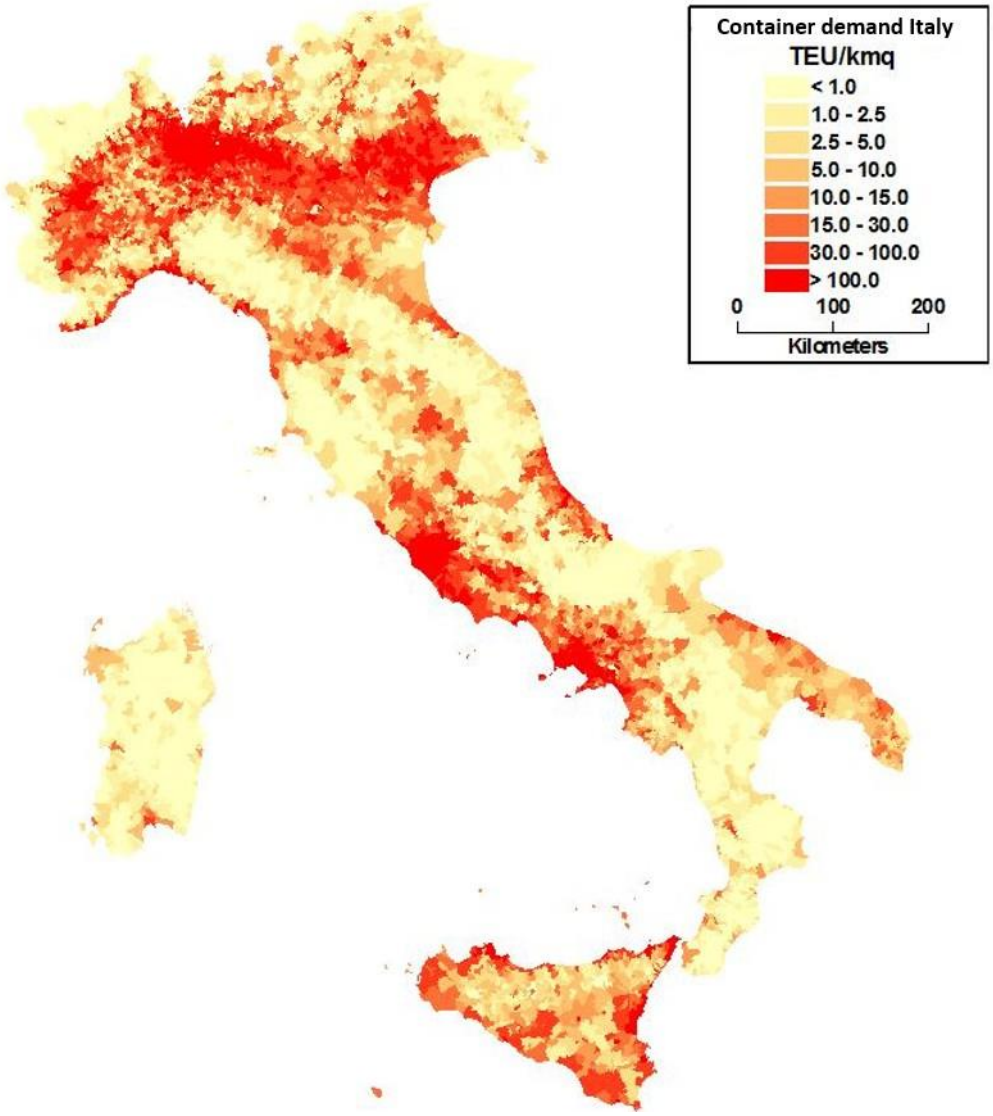
In this case too, it must be considered that geographic proximity is, however, just one of the advantages that can be exploited on which, potentially, to establish a primary role for Taranto, at least on a national level, in commercial relations with North Africa and the Middle East. Another important factor, which, however, does not this time go in Taranto's favour is, instead, the centrality with respect to the most important commercial flows. Although, in fact, for the southern Regions, the importance of trade with North Africa averages out as being greater than that recorded nationally, it must in any case be considered that the four southern regions (Campania, Apulia, Basilicata and Calabria) are in any case worth less than 6% of national imports-exports towards North Africa. In logistics terms, therefore,

despite the positioning along the route, the flows will tend to bypass the south, coming in close to their barycentre. And this is why, in the network of shipping services, connections with the northern regions are greater than those with the south, despite the geographic proximity. In this case too, therefore, the key factor on which to base the implementation of a leadership (or in any case important) role in relations with the Middle East and North Africa regards the possibility of offering added value to goods, both consolidating them with local productions and (potentially) through assembly, handling, packaging or other activities supplied at advantageous conditions. From this point of view, both the development of the SEZs and the identification of local productions to be consolidated with the flows to and from the southern and eastern shores of the Mediterranean, are essential. Merely by way of example, we can mention the agricultural food productions of Metaponto, which may be able to use the Port of Taranto as a node for transformation and consolidation with the (or some of the) Israeli, Egyptian and Tunisian productions towards the markets of the north (e.g. those of Emilia Romagna).
For lack of any specific projects, simple transport connections will experience difficulty in developing: the potential formation of hubs may allow, in the case of container flows, feeding connections, particularly towards the ports of the central Mediterranean, in any case needing to suffer both the competition offered up by other hubs, including those of Africa, and an evolution of services that is increasingly dedicated to sub-Mediterranean regions, rather than aiming to serve the through Mediterranean. In the case of rolling stock transport, on the other hand, there may be room for manoeuvre to the extent to which it can become included on routes heading back up the peninsular or on the Adriatic or Tyrrhenian shores, in any case considering that the ports of Bari and Brindisi are positioned far better than the Adriatic routes and that only on the route of the Tyrrhenian towards the eastern Measurements, is the deviation for Taranto not particularly burdensome.

8.4.3. Details on container traffic

It may be useful to take a detailed look at the final container demand within the reference territories for the port of Taranto, as outlined in the paragraphs above, in a bid to quantify flows within the port of Taranto catchment area. To this end, a forecasting model has been used of flows of container traffic in the Euro-Mediterranean area, developed by the working party, which correlates the TEUs generated/attracted by each zone (in the case in point, Italian municipalities), according to social-economic, production and territorial characteristics. The result is shown by themes, expressed in TEUs/km^2, in order to standardise the graphic output, in the figure below.

Figure 50: Italy container demand, TEUs/km2



Source: EY processing

According to this analysis, the catchment area of the ports of Apulia total approximately 390,000 TEUs/year, whilst the catchment area of the Campania port system accounts for approximately 613,000 TEUs/year. These figures are useful in attempting to measure a reasonable traffic gateway of the port of Taranto, should container traffic be re-activated.

8.5. Logistics chains and prospective port traffic

In prospective terms, reference can, in particular, be made for the container segment to the analyses prepared by the Ministry for Infrastructures and Transport Mission Technical Structure, which has provided indications in line with the PSNPL, separately for gateway traffic - relative to three geographic macro areas: *North Adriatic* (from Ravenna to Trieste), *North Tyrrhenian* (from Livorno to Savona), *Other* (all other gateway ports) - and transshipment. In detail, **demand forecasts** are, **for 2020**, **those reported in the PSNPL**, **whilst as at 2030**, **for the areas of the North Adriatic and North Tyrrhenian, reference was made to the MDS Transmodal study** carried out in 2013 for the North Adriatic Port Association (NAPA) and updated in 2015, which assumes a highly ambitious objective scenario (international extension of the catchment area of the Italian port clusters, based on a high level of access from the sea and, above all, efficient, high-performance rail connections). For the other gateway ports, although at the service of local areas of

central-south Italy, for which lower growth rates are forecast, **a traffic growth coefficient was assumed between 2020 and 2030, as equal to that of the North Tyrrhenian**, thereby, here too, constituting an ambitious demand scenario. The above estimates are given below, updated according to the 2016 data (*Table 8: 2016 total container movements by cluster, transshipment and towards the hinterland*), aggregating the gateway demand (i.e. movements towards the hinterland) of the "Other clusters" and "Hubs" (in any case located in southern or insular Italy) and maintaining the same growth rates.
In short, the gateway traffic demand scenarios are given in **Errore. L'origine riferimento non è stata trovata.** below.

Table 22 – Gateway traffic movements (M TEUs)

CLUSTER	2016	2020	2030
North Tyrrhenian	3.95	4.45	5.97
North Adriatic	1.11	1.45	2.82
Other	1.5	1.69	2.27
Total	**6.56**	**7.59**	**11.06**

Source: Processing of STM data, PSLN data, MDS Transmodal

** The estimate is based on a hypothesis of a complete penetration of the Italian port clusters in the respective international catchment areas, through suitable rail interventions on the final mile and network.*

These demand values are to be assessed according to **current and prospective capacity** of the macro port areas of Italy. To this end, in continuity with the analyses carried out by the MIT Mission Technical Structure, the capacity has been calculated, parametrising it to usable linear metres of quay and total terminal surface area, considering, in future scenarios, the infrastructural projects in progress and/or at an advanced stage of proceedings and/or declared as strategic by the Port System Authority, also considering the results of the project review currently underway.

Thus the estimation was achieved of the movement capacity of the port gateways alone (therefore net of the approximately 7 million TEUs capacity of the transshipment hubs of Cagliari, Gioia Tauro and Taranto) given in the Table and, therefore, the assessment of the degree of saturation given in the Table. In general, in the current scenario, we do not, overall, see a lack of capacity and, albeit with different levels of saturation in the various macro areas, **current capacity should suffice** at least through to 2020, in both the North Tyrrhenian cluster and that of the North Adriatic, whilst **for the remaining port gateways, even through to 2030 and beyond**. More specifically, it is the North Tyrrhenian that today is the area where the need for new capacity appears to be most impelling and, moreover, where, in the short-term, more additional capacity will be released, thanks to the new terminal of Vado and the Genoa works on Calata Bettolo and the Ronco and Canepa jetties. It should also be noted that the data on the degree of saturation of the "other clusters" tends to be considerably overestimated, insofar as no consideration is taken of the contribution of the capacity offered by the hubs of Cagliari, Gioia Tauro and Taranto. By contrast, the data of the clusters of the North Tyrrhenian and North Adriatic tend to be underestimated, insofar as the evolution of routes towards networks based on the regional hubs, tends to concentrate a significant number of transshipment operations in these clusters (such as, for example, is the case of Trieste for the Adriatic, or Livorno on the Tyrrhenian, ports with transshipment percentages that exceed 30%). On the other hand, the choice to ignore the transshipment component in the gateway ports, to measure the necessary capacity, stems from the observation that, in the event of saturation, transshipment operations are rapidly transferred to other ports. It is therefore extremely clear that maximum caution must be adopted for any operation involving an increase to capacity that therefore risks resulting in further overcapacity.

Table 23– Movement capacity of the Italian gateway ports alone 2016-2030 (M TEUs)

CLUSTER	2016	2020	2030
North Tyrrhenian	5.2	7.45	8.25
North Adriatic	2.04	2.74	4.27
Other	2.55	2.55	3.21
Total	**9.79**	**12.74**	**15.73**

Source: Processing of STM data, Ministry for Infrastructures and Transport

Table 24 – Current and future degree of saturation of the Italian port container terminals 2016-2030

CLUSTER	2016	2020	2030
North Tyrrhenian	76%	60%	72%
North Adriatic	54%	53%	66%
Other	59%	66%	71%
Total	**67%**	**60%**	**70%**

Source: Processing of STM data, Ministry for Infrastructures and Transport

In this sense, the comprehensive size of the market, even in the most optimistic growth hypotheses, suggest that for the gateway ports not on the North Tyrrhenian and the North Adriatic, conditions are not met to allow for the arrival of mega ships, apart from any infrastructural restrictions. All projects to increase capacity and nautical accessibility of said ports must, therefore, be explained on the basis of extremely detailed analyses, also considering the contribution that can/must be made by the major transshipment hubs of Gioia Tauro and Taranto to at least the southern basin. More specifically, the port clusters of Campania and Apulia are called to consolidate their role with respect to the reference regional economy. The matter of land access to these ports is, instead, relevant, with critical issues that must be solved on a case-by-case basis. Also with regards to the role of the pure transshipment hubs, it would appear evident that the crisis of the Italian transshipment ports is now structural, linked to both the intrinsic characteristics of the market - determined by the choices of just a few shipping companies and with the availability of numerous infrastructures - and the intrinsic nature of Gioia Tauro, Cagliari and Taranto, which do not express a level of gateway traffic such as to make the business profitability of these ports, more resilient. By way of comparison, it should be considered that the percentage transshipment of total traffic averages out at 30% less for the ports of the Northern Range, with only Bremerhaven at 44%, whilst in the Mediterranean, the port of Valencia accounts for 50%. As there are no restrictions in terms of maritime access and capacity, and as the problems of rail access are now being solved - with the Ionic-Adriatic route creating a north-south connection for the Italian hub ports, there is a substantial problem of market positioning and economic sustainability in the medium/long-term. **In general, with effective railway connections, the transshipment ports of southern Italy will be able to make a greater contribution towards ensuring the efficient management of national import-export traffic and, in this case, the internal competition with other gateway port clusters, and the Campania and Apulia systems first and foremost, must be rationalised.**

8.5.1. Liquid bulk

The main generator/appeal of liquid bulk for the port of Taranto is the ENI refinery, which has seen a substantial change to its role in the last ten years, by virtue of the presence of deposits in Basilicata, notably Val D'Agri and Tempa Rossa, Europe's largest onshore deposits. The reduction in the number of ships/year, from approximately 700 in 2006 to approximately 350 in 2016, is explained, in fact, with the role of storage and dispatch that the refinery, and therefore the port of Taranto, have taken on in synergy with these deposits. These flows are all export and essentially regard the following areas:

- semi-finished products: approximately 100 ships/year towards Brindisi, considering that the project of a land oil pipe is currently blocked, and direct relations with the refinery of Priolo/Augusta;

- finished products: mainly national distribution on the market, with significant traffic to the Ortona deposit.

At present, the refinery processes approximately 4.2 million tonnes/year and has a production capacity of approximately 6 million tonnes/year. A prudent estimate of the increase in port traffic deriving from the full activation of the Tempa Rossa plant is appraisal 90 additional ships/year, for maximum forecast traffic of approximately 450 ships/year. This traffic would substantially increase the flow routes described previously. In the past, there was traffic of the derivative finished product (bitumen) abroad, which may resume in the event of a favourable economic outlook for some countries of the non-EU Mediterranean. Alongside this, another important aspect to stress in conjunction with the analyses given in paragraph 8.1, is that despite the traffic flows of liquid bulk being located in the area of greatest competitiveness of the railway mode, the latter is considered as rather unappealing insofar as the capacity is too limited with respect to that offered by shipping. On the other hand, if rail were to play a role in dispatch, it would remove traffic from the port, taking the place of shipping instead of operating in synergy with it.

8.5.2. Solid bulk

The solid bulk traffic of the port of Taranto is mainly due to two large producers: the ILVA plant, which in turn, by synergy (derivative of the production of basic blast furnace slag) generates the cement traffic of Cementir.
As regards ILVA, there is no doubt that historically this is the main industrial player of reference of the port of Taranto and that forecast port traffic flows deriving from it must depend on the business model and strategic industrial choices to be made by the group awarded it.
In recalling, therefore, the information given in chapter 7 and merely making some general technical-objective remarks, in its current configuration, the ILVA plant has a nominal production capacity of 10 million tonnes/year, currently reduced to 6 million for environmental rulings. The conversion of these volumes into port traffic can be initially achieved by considering that 1 tonne of steel produced requires the import of approximately 2.26 tonnes of materials (minerals and fuel) of which approximately 90% has always come in via sea. In all, therefore, 1 million tonnes/year in steel production (to a large extent embarked as general cargo from Taranto) generate approximately 2.26 million tonnes/year of bulk imported and disembarked, and 1 million tonnes/year of exports of finished product, hence a reasonable approximation is possible if we assume a **ratio of 1:3.26 of production and corresponding port traffic**. A product deriving from steel production is basic blast furnace slag, an essential element in cement production, for approximately 0.3 tonnes produced for every tonne of steel, hence **a production of 10 million tonnes/year generates a further 3 million tonnes/year in the export of solid bulk**. As mentioned previously, this assessment naturally depends on the strategic production model to be adopted by the successful consortium, insofar as the use of imports of semi-finished products naturally reduces overall movements, whilst production using an integrated cycle will probably continue to involve the use of valemax type ships, certified on the IV pier with a depth of 25 metres. The data supplied in any case makes it possible to parametrise a forecast of future traffic according to the production plans of the future new ILVA. In general, it will be important to verify to what extent the new owners manage to increase production, with what level of employment and how much they will focus on Taranto.
The **IV pier**, which must be connected to the extremely high maritime access that has already enabled the hosting of valemax with 400,000 DWT, is worthy of separate mention, giving both the ILVA plant of Taranto - insofar as it considerably reduces the unit costs of procurement of the raw materials - and the port of Taranto itself, as it is one of a few able to boast this characteristic, a considerable competitive advantage, making it the natural candidate for the **role of Mediterranean hub for this type of bulk too**.
An apparently marginal aspect, but one which is extremely important in understanding the future logistical placement of the port of Taranto, lies in the **strategy that the Riva Group adopted, partly for finished products and semi finished products of the plant**. On the one hand, in fact, rail was used above all for destinations towards central Italy, as further evidence of the reasonable nature of the hypotheses relating to the rail catchment area shown in paragraph 8.1. On the other, as from 1997, the Riva Group equipped itself with ships that were able to effectively supply a “sea motorway” type service to serve from Taranto both Genoa in the Tyrrhenian and Marghera in the Adriatic, and from the latter to then serve the plants of Novi Ligure and Central Europe, respectively by rail. This is symptomatic of the optimal synergic composition of the road, rail and maritime composition for developing gateway traffic from the port

of Taranto: if, in fact, on the one hand the port suffers its position within the Ionian, outside the direct routes penetrating the Tyrrhenian and the Adriatic, on the other, it can, however, capitalise on this same position, offering itself as **transshipment hub not only for container services, but for bulk or general non-container cargo traffic too, made using multi-purpose or ro-ro-ships that stop over at Tyrrhenian and Adriatic ports**, making the most of the capillary nature of the Italian port offer and certainly proving to be competitive in terms of capacity and charter than road and rail methods. The latter, however, also proves to be a natural way by which to serve destinations in central Italy.

8.5.3. General cargo

In addition to the productions of the ILVA, as mentioned in previous paragraphs, the main player of the port of Taranto in terms of general cargo traffic is **Vestas**, hence the competitive advantage of the port of Taranto derives first and foremost from the nearness of the production plant with respect to the port itself, which successfully minimises the burden deriving from the exceptional road transport necessary to move the wind blades, the dimension of which varies between 25 and 62 metres in length. Considering that typical maritime transport involves approximately 45 blades per ship and that the plant production is around 1,200 blades per year, almost all transported by sea (approximately 95%), we reach a contribution of approximately **25 ships/year**. Destinations are across the globe and logistics takes place "by project", thereby seeking to consolidate all orders intended for a single site. It is very difficult to forecast future traffic insofar as, although the group production plant is important and its forecasts on the world markets solid, there are various production plants in various parts of Europe and worldwide and production and logistics decisions are centralised at the Hamburg headquarters. It should in any case be mentioned that **market trends are currently stable** and the sector level of production specialisation is significant, with a fundamental component of know-how with respect to the quality of the final product, which makes a relocation of production to more competitive labour markets, less appealing. In terms of port traffic, it is interesting to note that the **procurement** of Vestas also takes place using the maritime mode, but not through the port of Taranto. More specifically, the prevalent import flows for the plant are **dry fibre from China**, with traffic that can be quantified as approximately **25 containers/year**, mainly disembarked in Naples, Salerno and Bari and taken to terminal via road, and approximately 6 lorries/day from various areas of Europe for the supply of semi-finished products; some of these come from Spain, using the ro-ro-services to/from Spain offered by Grimaldi. Another important element of interaction with the port is the **storage of blades in the port area** for the composition of the ship load, with respect to which, clearly, there is an advantage in the spaces available in the port of Taranto.

8.5.4. Container

Demand forecasts and logistics chains relative to the container market have been well characterised in the previous chapters. More specifically, considering the overall dimension of the central-south market and the high competition offered by other national ports (such as, for example, that with the ports of Campania or other ports of Apulia), **it would not appear to be reasonable to hypothesise a future for Taranto whereby the gateway traffic exceeds a few hundred thousand TEUs**. On the other hand, the traffic forecasts connected with the implementation of logistics activities within the port, must consider various aspects. Generally, this traffic, although extremely relevant in terms of added value, is only a far more minor portion in terms of total volumes, hence activating significant traffic of this type, without major volumes, would be an anomaly on the international scene. Developing infrastructures for logistics activities of added value alone, does not, therefore, suffice. For these activities to effectively take place, as a general rule, for preference the location should be as close as possible to the destination markets (or at least a considerable portion of them) or at a strategic point of flow concentration. Now, **given that for Taranto, as seen, the most important markets are not very close, medium/large volumes can only be achieved when the port is (re)-identified as a reference hub for the Mediterranean basin** or, at least, the Central Mediterranean, well aware that the container sector is finding it increasingly difficult to play this role and that, in any case, the related traffic is extremely volatile. In any case, even once the dimension of hub has been recovered, in order to attract logistics activities, the market will need to be offered considerable, concrete advantages in order to beat the competition or other locations that are perhaps closer to the end markets or identified at other Mediterranean hubs.

8.5.5. Ro-Ro

As already noted in the previous paragraphs, **the position within the Ionian Sea is not optimal with respect to the inclusion in the traditional national and international commercial routes**, which, in mainly concentrating on either the Adriatic or Tyrrhenian sector, do not easily find sufficient volumes as to justify such a deviation, or can more effectively be serviced by the ports of Apulia on the Adriatic side. Therefore, **the development of these services will be possible by mainly being characterised as a strategic node for the logistics chains of industrial production within the catchment area**. In this context, natural attention must be paid to the needs of the automotive sector, which well also lends itself to the establishment and implementation of additional logistics activities of added value.

8.5.6. Cruises

If it is true that for this sector too, the considerations relating to the difficulty of being included on the classic routes of the western Mediterranean or the Adriatic-Greece corridor, apply and that, therefore, **no development of the cruising sector can be forecast such as to reach the major numbers recorded by other Italian ports, there is, in any case, the possibility of seeking to develop the sector, focussing on some strengths** and, in particular: the availability, in the near future, of suitable infrastructures to welcome passengers with the Multi-Purpose Service Centre on the San Cataldo quay; the ideal positioning as disembarkation port for the major sites of tourist interest in Basilicata (the Matera Sassi, first and foremost) and also well positioned with respect to the great many sites of Apulia (Alberobello, etc.); and the possibility of effectively being included along alternative transversal routes, but which are in any case attractive in view of the numerous hubs near items of historical, archaeological or natural beauty. On the other hand, the development of this sector, even without seeking to aspire to the huge numbers, is, however, strategic and functional to the re-launch of the image of Taranto also in terms of tourism.

8.6. Wind farm

The construction of the new wind farm envisaged in Taranto's Mar Grande, may represent a success factor for the Port of Taranto. The Luxembourgian company Beleolico Srl, in fact, has submitted the project to develop a wind farm, announcing that construction will start in 2017 and commissioning shall apply early 2018. In detail, the project envisages the installation of ten off-shore turbines with a nominal power of 3MW each and an annual production forecast at 80GWh. More specifically, four turbines will be located along the quays of the port of Taranto and the other six at the end of the jetty. According to the project data, the wind farm will be able to **supply clean energy to the port itself as well as to more than nine thousand homes, thereby eliminating forty thousand tonnes a year of CO_2**. The electricity generated by the wind farm may also be used as an **alternative source of fuel for the ships**. The IDTechEx "Electric Boats and Ships 2017-2027" report reveals, in fact, that the market for hybrid and electric ships and boats will rapidly rise to more than 20 billion dollars worldwide in 2027. Also in view of the depth of its bed,the Port of Taranto may see an increase to its traffic, both in terms of large ships and cruise ships. There are, in fact, already more than one hundred manufacturers of electric ships and boats across the globe. More specifically, in Norway, in 2018, the world's first all-electric propulsion cargo ship will be launched, after a year of tests with the crew, set to start remote-controlled voyages and in 2020, it will be using a fully automatic driving system. The zero-emissions vessel will have an autonomy of 65 nautical miles and will be able to carry from 3,000 to 3,500 tonnes of material per voyage at a speed of approximately 15 knots. The ship's batteries will be recharged within the port of Porsgrunn by means of hydroelectric energy. It will not, in fact, be the world's only electric propulsion ship, Msc is also working on the construction of zero-emissions cruise ships. The ships will be driven by two helix units powered electrically and by transversal helix electric units at the bow.

PART IV. PORT VISION 2030

9. A VISION FOR THE PORT OF TARANTO IN 2030

Between now and 2030, the Port of Taranto will become the logistic and territorial keystone for a process of productive renewal of a leading Italian and international industrial pole lying at the centre of the Mediterranean.

Thanks to the effective strategies put in place for the correct market positioning of the port of Taranto, **the infrastructures built during the last 15 years have been promoted, and** the port of Taranto has witnessed an **upturn in traffic**, allowing it to comply with the European standards for the ports of the core network, and making Taranto become, in all respects, the southern point of access to the Scan-Med corridor.

As a primary local player, the port has contributed to the consolidation of the whole process of transformation and redevelopment of the Taranto area (activated by a strong intervention of the government), and in particular to a more cohesive and coordinated action of the local players and of the *port-community*, gathered in the **industrial maritime cluster**.

The creation of a **Special Economic Zone** to support industrial investments has encouraged not only the stay of historic companies (in industries like steel, cement, mechanics, hydrocarbons) which have improved their efficiency and their market role, but also the development of a network of other companies, in similar sectors (steel, mechanics) or in complementary sectors, as well as of services providers, including those of the logistic sector. The SEZ has gained a competitive advantage over other SEZs developed in the South of Italy, thanks to its infrastructures and to the easy land and sea access to the port of Taranto.

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It will be right in the nearby "revived" industrial district that the port, in 2030, will continue to find its fundamental, although not unique, traffic feeding base.

Thanks to the modernization and rationalization of production processes, as well as to their environmental improvement, **in the "historic" steel sector**, which **has remained a point of reference in national productions**, the port has **further strengthened its vocation to be the access point for inputs**: bulk goods, but also a growing quantity of semi-finished products.

In the steel sector, thanks also to the flourishing of additional local productions of semi-finished and steel products for export, the port has simultaneously witnessed an overall improvement in its role as "logistic platform", going well beyond the flows feeding the production of raw steel or its export. Attracted by investment and tax conditions, by the specialization of the area as well as by the traffic base already existing, and in order to exploit its favourable sea position and its conditions of access by sea allowing a reduction of ship costs, some logistic operators specialized in the break-bulk sector, in partnership with railway operators and in their capacity as terminal operators, have activated special platforms for those industries in the port of Taranto, which has become a reference port for this kind of traffics at a Mediterranean level.

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Thanks to the efficiency of the "distribution platform/railway" integrated system, the port in 2030 will serve not only as a "door for the local industry", but also as a "gate" for the import and export of steel products, with destination or origin in areas located outside the Taranto area, namely in Centre-North Italy (e.g. Emilia Romagna, Veneto, etc.). The potential of the railway will be exploited not only by the steel sector, but also by other break-bulk industries, even with smaller specific weights (such as that of forest products), which will integrate the flows of steel break-bulk.

The railway, made more efficient also through infrastructural interventions around Taranto, is increasingly appreciated for its low environmental impacts, measured by companies now committed to provide accurate environmental audits of their productive and logistic cycles.

An optimization of the operations of train shunting and integration with network carriers is made possible by the **presence in the port of a railway company, controlled by the Port System Authority** and also carrying out some traction activities on specific short routes.

The **presence in Taranto of other engineering companies**, fostered by the unique combination between the tax benefits of an important Special Economic Zone and the morphological and infrastructural characteristics of the depths, has further improved the **role of the port in the traffic of non-unitised general cargo** (e.g. large-size mechanical parts, assembly of systems), also with some differentiations in production compared to the past.

The railway allows the development of further traffics: given the wide yards available and the consolidation of logistic projects including the railway, the port of Taranto has achieved the goal of also becoming, with the **creation of an advanced** "**car terminal"**, the platform for the export of motor vehicles produced in the factories of Melfi and Atessa, considered more viable, for geographical and other reasons, than other ports in the south Tyrrhenian Sea. In addition to motor vehicles for export, there are motor vehicles being imported in Italy and sent to platforms located in central-northern markets. This allows a further optimization of the logistic cycles both at sea (shortening of the routes of large car-carrier ships) and onshore (savings in the terminal and on the railway side).

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In a region like Apulia, where the ability of the local agri-food system to seize the opportunities of import-export has dramatically increased, Taranto has improved the special infrastructures for fresh and frozen products managed by operators attracted by the position and the investment conditions offered by the SEZ, and has thus gained an interesting **role as storage/sorting/channelling platform in the fresh and frozen segments for those import-export routes, to/from the markets of North Africa, Middle East, Turkey, starting from Apulia or directed there**.

Most of the flows go through large ro-ro ships, in unaccompanied, temperature-controlled intermodal units (swap bodies), while a part of the flows uses temperature-controlled containers.
The same special Ro-Ro freight routes to/from North Africa, Middle-East, Turkey, now a cornerstone of the services confirmed in Taranto, **also serve several industries of interest for the port, such as those of the steel break-bulk** (in the range of semi-finished products with higher added value).

The container flow in the port of Taranto provides an interesting additional traffic, although much smaller than in other large ports where it has centred as a result of market choices.

The **container traffic** of Apulia has split among different ports. Taranto is anyway involved in some **regional direct services and in some feeder services**, but not in substantial transhipment operations, while there are some trains

organized by a company which, in order to avoid going up the Adriatic Sea, regularly connects Taranto to an **inland terminal located in the Emilia Romagna area**.

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The Port is the driving force of a new culture of sustainable development and of protection of the maritime ecosystem, as well as the promoter of the reconciliation and coexistence between heavy industry and locsl community.

The environmental achievements of steel manufacturers, with the drastic reduction of dust emissions, and the new technologies for the protection of vehicles, **have allowed an excellent compatibility of the industries,** with no contamination problems.

Besides the industrial area, the **whole port as well offers very high levels in the reduction of the environmental impact of processes**, by supporting the achievement of the stringent European standards on the reduction of polluting emissions and on energy efficiency: the possibilities to fuel ships with LNG and to receive ships electrically powered from land are now widespread.

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Through systems for the computerized tracing of cargo and means of transport, integrated in the PCS of the port, **customs pre-clearance is possible on many routes**, thanks also to the cooperation among all the components of the industrial-maritime cluster, including public administrations.

With the implementation of the **Port Community System,** the Port has computerized all the operational and management processes of the Port System Authority and has offered to the port community (workers, businesses, employees of the Port System Authority) highly digitalized services, thus increasing efficiency and smoothness in the management of daily operations in the port.

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The identity of the town of Taranto is now fully integrated with that of the port. The founding myth of the town, dating back to the ancient city of Sparta, and the cultural and archaeological legacy of the Magna Grecia, have strengthened the relationship between the community and the sea. Thanks also to the collaboration with the Superintendence for Cultural Heritage, the maritime-port identity of Taranto is well represented also by the presence of valuable archaeological finds in the port area, with an immediate return also in terms of territorial marketing.

The population of Taranto now knows its port very well, and is proud of it. People often go in there to assist, in some marine areas, to big events usually attracting a vast audience from other provinces and regions.
More and more students every year visit the port, its interactive “port-exhibition centre” and the main companies of the area, which have created technical visit packages in line with those proposed since the early years of the industrial-maritime cluster.

The industrial-maritime cluster, among other activities, has also encouraged the **development of a series of strictly technical training courses, matching the new demand for professionals**, for local young people, while some **initiatives supporting the development of research, innovation and technological transfer** in areas being of interest

for the port and the logistics have been put in place with the collaboration of local specialized agencies, regional universities and entrepreneurs.

In the port area, the landscape itself has changed: the buffer area between the port and the industrial district has been successfully re-modelled with a project of "landscape-design", so as to host a linear park serving as a supporting system surrounding a cycle path, which offers to the people of Taranto the opportunity to visit different sites of high environmental value, created as part of the processes of infrastructure development and excavation.

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Taranto has become a hospitable town, receiving regular tourist visits, and has a discrete cruise activity, having become a reference "port of call" for several routes, in which the town is included for the particular opportunity it offers to diversify the tours to Basilicata (Matera), Alberobello, to the old town with the archaeological museum, but also for the possibility of a guided tour to the industrial and port facilities of ILVA and to the museum of steel, as well as to the interactive "port-exhibition centre".

The **ongoing promotion and development of cruising- and boating-related activities** is now managed in perfect autonomy, but in full coordination with the institutions, by a group of operators of different sectors gathered in the industrial-maritime cluster, and now coordinating regularly to promote, improve and offer the whole range of services required by ships and passengers.

Taranto is a location where also **pleasure boating** has gradually developed in the spacious facilities of the docks located near the cruise port, and where it is easy to reach the town, on foot or by renting electrical means, going along the **nice "waterfront**" developed according to projects shared with the local community.

9.1. THE PORT AS DRIVER OF THE LOCAL ECONOMY

9.1.1. The specialization of the Port

An invariable element of the vision of the port for 2030 is that Taranto must serve, first of all, the development of its reference hinterland. In this sense, the multifunctional nature of the port, which is the result of the needs expressed by the territory, is undoubtedly a value to be promoted and enhanced, and this implies, for the current and/or potential market segments:

- **Industrial port:** the original vocation of the port shall continue to be supported and enhanced as much as possible – within the limits of the possibilities of the Port System Authority – to support the recovery and/or further development of the important production facilities existing there and being extremely important for the local economy;
- **Container:** the local demand is modest, and moreover, there is already a clear overcapacity in the port clusters of Centre-South Italy. Therefore, unless the port manages again to carve out for itself a role as hub – something which is now increasingly difficult to do without engaging in an undesirable, non-constructive competition with other Mediterranean, or worse, Italian ports – there is no need for a dedicated container terminal, since local traffics can also be handled in a multipurpose view. In practical terms, a small part of the docks and yards of the Multi-sector Pier could be certainly dedicated to a small container terminal, which would be anyway served most likely via feeder, and this, it is worth specifying, would not create any disadvantage to the local economic and manufacturing fabric. On the other hand, this also implies an assessment of the market positioning of the Multi-sector Pier in view of more general kinds of traffics, therefore not limited only to containers;

- **Cruises**: The development of this sector in Taranto works towards the tourist's appreciation of the historical, architectural and natural riches of an area that goes from Taranto to Matera, for which it represents the natural docking site. The works at the San Cataldo dock, including the creation of the Multifunctional Centre, with functions such as the Maritime Station, and the upgrading of the waterfront and the port-city interface, are the necessary hardware to support this development, without neglecting possible synergies with the airport system (fly and cruise from Grottaglie) which could also enable Taranto to be valued above the role of a transit port. On the one hand, the analyses show Taranto's marginality compared to traditional cruise ship routes in the Western and Eastern Mediterranean, with deviations compared to the usual routes and maximum stop times in port often not compatible with a profitable stop in the eyes of the navigation companies. On the other hand, however, Taranto has a substantially captive tourist/cruise offer in its catchment area, Matera in particular, and could be a useful point on which to build alternative cruise offers. In this sense, other synergies that could lead to an unpredictable acceleration of the current cruise sector are related to the logistics platform, with the possibility that some Cruise Companies may choose Taranto as a logistics hub for ship supplies. At the same time, the cruise software is the Puglia-Basilicata interregional system formed by local and regional institutions and administrations, tour operators, and the Port Authorities, and their ability to develop and propose to international markets an integrated package, where the supply and competitiveness of port infrastructure and services are just some of the components necessary to make the tourist experience of this geographical area attractive. It will therefore be necessary to closely monitor the evolution of the required infrastructure and service standards, for example, in relation to the current polarization of the canal on large or medium-sized vessels, any constraints that could arise and limit the development of the sector;
- **Ro-ro:** given the unfavourable position compared to traditional ro-pax routes, both national and international, the development margins are mainly related to solely roll on/roll off, i.e. to wholly-for-freight traffic. In any case, even where it is possible to attract mixed services, such as the extension of Adriatic or Tyrrhenian links with Sicily, this would probably be to serve specific commercial or industrial traffic, with a marginal contribution of passengers and private cars. The most interesting opportunities are probably related to the automotive sector, especially with respect to the factories in Melfi and Atessa that fall into the tarantine catchment area;
- **Multi-purpose and break-bulk:** in addition to the tarantine production that already feeds this sector and, more specifically, that of the project cargo - particularly with the production of wind turbines up to 60 meters in length by Vestas - new interesting scenarios could be opened up by exploiting the optimal positioning as a hub, first and foremost for Italy, but also for the whole of the Mediterranean, for raw and / or semi-processed materials. Naturally, it will be simpler, though not strictly necessary, to follow this path, focusing on the goods already handled by the port of Taranto and linked to local industry.

From now until 2030, however, once the already programmed works have been carried out, the provision of space and infrastructure will be of paramount importance and the focus will have to be shifted primarily to the continuous improvement of port services, achieving as a minimum national benchmarks; on the development of ever closer synergies with the different components of the territorial system in question; on the international promotion and marketing to try and implement the hub role, at least nationally (and not for containers, or at least not solely); on the implementation of the organizational and normative conditions necessary to attract new flows and to stimulate value-added logistics and/or new productions (ZES).

9.1.2. Target traffic by segment

Container (gateway): a demand target linked to the container traffic gateway component can be defined as starting from the growth rates of demand generated nationwide by all port clusters, excluding the North Tyrrhenian and North Adriatic. By updating the estimates produced by the Mission Technical Survey, depending on the actual traffic recorded, net of transhipment by Italian port clusters in 2016 and maintaining the same growth rates assumed here by 2030, it is estimated that overall traffic is slightly over 11 million TEU, of which about 2.27 million are attributable to "other clusters", i.e. different from the North Tyrrhenian and North Adriatic. Looking at the market share covered

by Taranto in the years 2006-2008, which corresponds to the busiest years for the Taranto hub, the minimum market share that can be targeted is 9% of the gateway traffic of the "other clusters", while considering the recovery of the competitiveness of inter-modal connections and the possibility of expanding the contestable area, a target quota of 12% can be set, i.e. over 270,000 TEUs for 2030, or 2.8 million tonnes. It should also be considered that the completion of the AV / AC Napoli-Bari corridor by 2030 will significantly increase the accessibility of the railway from the port of Taranto to the markets of Campania and Lazio, and therefore open up a competition of serviceable catchment area with the road from the port cluster and the railway from the port of Taranto. This, in optimistic terms, could increase the quota of Taranto gateway containers, thus boosting the fixed gateway target quota.

Liquid Bulk Goods: an achievable traffic target already in the medium term and due to market evolution that can be extended to 2030, an increase can be inferred from the assumptions in the number of ships operated by ENI, which is approximately 25 % compared with 2016 numbers. By projecting this increase, a target of about **7 million tonnes** will be fixed for 2030.

Solid Bulk Goods: an achievable traffic target for this segment is estimable through trade projections from the ILVA business plan, on which this traffic will predominantly depend in the future. This estimate reaches a 2030 target value of 22 million tonnes[25].

Other various goods **(excluding ro-ro and containers):** by also looking at ILVA production in this case, a target value of 10 million tonnes by 2030 can be defined.

Other traffic connected to the development of the HUB function (not necessarily containers) and ZES: for simplicity, the conducted estimate hypothesises a hub container function. In this case, setting aside the traffic related to the ZES (very significant in terms of value-added for the local economy, but presumably marginal compared to the overall handling of goods at the hub), a target can be set of at least 1 million TEU of *transhipment* handling, or, more simply, **10 million tonnes of goods.** Obviously, there is a considerable development scenario for a ZES that needs raw material supply, coupled with Taranto's excellent maritime accessibility in this sector - making it one of the few ports in the world that can also accommodate valemaxes and ships of over 350,000 dwt - which could produce a significant increase in bulk inbound traffic. On the other hand, the fact that there is already considerable traffic in the harbour, can in turn be a critical success factor for the development of ZES. Naturally, at current knowledge levels, it is not possible to quantify the extent of the contribution to port trade. However, the joint development of ZES and port hub function (not necessarily following that which is said in the container sector) is clearly synergistic, guided by the already excellent maritime accessibility of the port itself.

Ro-ro Traffic: it is not appropriate to set any specific target, since, as mentioned, the mere development of some links to the service of the local economy are unlikely to lead to significant volumes. The case is different where any ro-ro services are the result of the development of the hub function (repeat, not necessarily tied to containers) or ZES, in which case, however, it would be calculated in the previous entry.

Cruises*:* By subdividing the Italian port infrastructure according to cruise ship traffic, we find the largest scales of traffic with more than one million passengers (Civitavecchia, Venice, Naples, Genoa), an intermediate range for ports, which are still important and already included in the main routes, with at least 350,000 passengers (Livorno, Savona, Palermo, La Spezia, Bari, Messina), and a first range of secondary ports for cruises, but which still have "non-marginal" traffic, i.e. over 100,000 units (Cagliari, Olbia, Salerno, Trieste, Catania). An achievable target for Taranto would be to enter into this range, therefore exceeding **100,000 passengers.**

Table 25: Taranto Port - 2030 target traffic

CLUSTER	MOVIM TOT (MTONN)	PAX ('000)
Liquid Bulk Goods	7.0	-

[25] From 5.8 million tonnes in 2016 to 8 million tonnes of production in 2024 (assumed as a benchmark for 2030), it would go from 13.7 million tonnes of bulk in 2016 to 19.8, to which 2.2 tonnes of imported semi-finished products are to be added

Solid Bulk Goods	22.0	-
Container (gateway)	2.8	-
Other various goods	10.0	-
Hub and ZES development	10.0	-
Cruises	-	100
	52	**100**

Source: EY Processing

9.2. PORT OF THE FUTURE

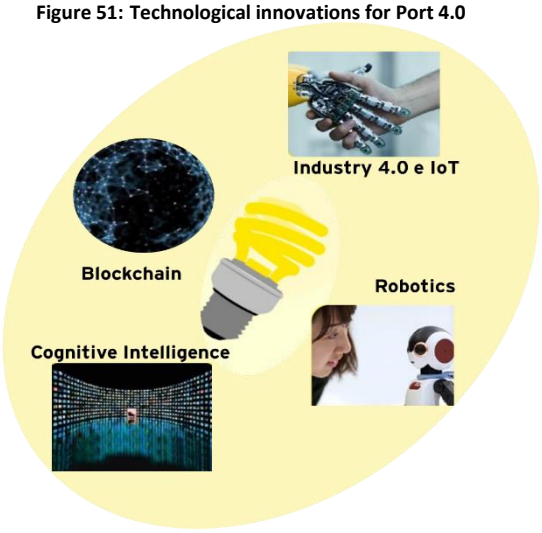
9.2.1. Towards Port 4.0

a) Technologies

In consideration of the modern day technological revolution and specifically the technological innovations that have been developed in recent years, it is necessary to think from the perspective of the Port of The Future, to a port that is capable of incorporating and developing these technologies and **transforming them into a success factor** for the port itself, thus increasing **efficiency and competitiveness** in relation to other national and external ports. Particularly important for the development of **Port 4.0** are the following technologies:

- **Blockchain;**
- **Internet of Things – IoT;**
- **Robotics;**
- **Cognitive intelligence.**

Figure 51: Technological innovations for Port 4.0



Source: EY Processing

Blockchain is a **public and distributed register** shared among the different participants of a peer-to-peer network. The name *blockchain* originates from a chain of blocks that are chronologically sorted and protected by encryption. Each block (list of transactions) is linked to the previous one so that it is not possible to modify a block without modifying the sequences and without having control of at least 50% + 1 of the network. For a transaction to be recorded in a block, it must be checked and validated by the participants. The main structural elements are: *distributed ledger*, *consensus*, encryption and flexibility. The main advantages of using Blockchain are: Immutability, Disintermediation, Security, Interoperability, Transparency, Open Source, Privacy and Automation. In the area of port infrastructure, **Blockchain** can become a key tool for facilitating the communication of institutional actors and private individuals in the port community, providing privacy, security, speed, transparency and interoperability, the latter being a key factor in port operations.

IoT is essentially the process of **automation and exchange of data** in the field of production technologies. This type of technology includes **cyber physical, cloud, and simulation** systems, horizontal and vertical integration, *cybersecurity*, **augmented reality** and **IoT**. **The IoT** is one of the most *disruptive* phenomena, not just in the industry: a set of "intelligent objects" that communicate with each other to **exchange and collect data in an autonomous manner**. The added value that IoT can give to port infrastructure lies in the full checking and monitoring of the maintenance of port areas; thanks to the IoT it is possible to optimize the maintenance work and to monitor the state of functionality / operations of the assets from remote, guaranteeing a 360°degree operation of the port.

Robotics, which is the design and development of Robots that can perform specific tasks by replicating human work (e.g. R2R processes, billing, asset and treasury management, etc.) and intervening in those repetitive processes that

cause reusable resource losses in other tasks with greater added value. Robotics in the port environment would allow for the **automation of all "manual" and standardised processes**, ensuring high levels of quality and providing predefined task execution times.

Cognitive Intelligence - the process of analysing and re-processing a large amount of **de-structured data** with the aim of **supporting decisions** through the use of operational search tools. Predictive insight and analysis. **Machine learning** and **artificial intelligence.** All tools with the potential to **enable a competitive advantage through informed decisions.** Considering the process of computerisation and the collection of data portals to which ports are being orientated, Cognitive Intelligence would be a key tool for data processing in order to exploit this information to inform the decision-making process inherent in the port's strategic lines.

b) Port Community System and computerisation of processes

In view of the role played by the Port Community System in the field of Italian port infrastructure, it is increasingly important for the Port System Authority to create an instrument capable of optimizing all port operations, therefore providing an instrument for assisting the port community.

In consideration of the state of the art PCS in the port of Taranto, and its evolution thanks to the possible agreement with the PLN promoter and aimed at achieving the goal of Porto 4.0, the evolutionary lines of the PCS that are aimed at the creation of a management and control instrument for the port, take on ever more value and relevance.

A key element for PCS evolution is the development of a mapping layer, through the implementation of a georeferenced platform, which is integrated with port management processes. Such support would enable computerisation and automation of processes related to:

- The management of the publicly owned areas, also thanks to the implementation of procedures for the management and monitoring of the public concessions in the port areas;
- The management of goods by means of the implementation of control systems for stored goods in port areas and support to port workers in relation to administrative practices and checks on goods;
- Execution of processes connected to port security;
- Management and monitoring of emergency situations at the port.

Another element of relevance in the development of port IT is the digitisation of environmental monitoring procedures related to the inclusion of areas of the Taranto port between SIN areas. The solution will be found through the use of IoT components (for the detection of sensor data installed at sea), data modelling techniques, data collection layers, workflow components for programming and management of monitoring activities and a front-end portal to the ARPA.

Regarding the internal management of the Taranto Port System Authority, it is possible to trace the evolutionary lines of the model of budget and management control, and the related systems, subject to a preliminary work to be done with Customs which provides detailed data relating to Port Levies. This information is a prerequisite for design and would also boost Port System Authority evolutions from the point of view of strategic analysis and addressing

9.2.2. Taranto Port as a hub for research and innovation

The Port of Taranto can aspire to becoming, in the medium term, a driving force for innovation linked to the blue economy, becoming a magnet and attracting talent and innovative companies in the digital field to support shipping, logistics, and tourism related to the sea, the protection of the marine ecosystem, the preservation of the environment, and the development of modern and sustainable heavy industry. The Port System Authority will be able to pursue this vision through two directives, both closely related to the territory, but also influenced by national and international best practices.

c) The promotion of research

In cooperation with training institutes and universities, the port can be promoter of research and development initiatives for the blue economy and maritime economics with the threefold purpose of:

- **Incentivizing the specialist study and research in the thematic spheres related to the development of the port** and the related logistical activities, promoting the development of professionalism with distinctive skills that can be used immediately on a local scale, with important employment returns for the tarantine territory;
- **Contributing to the creation of local social capital**, which guarantees the port and its affiliated companies an important pool of knowledgeable and up-to-date human resources in order to maintain high levels of competitiveness;
- **Establish a network with regional universities** which enhances the maritime characteristics of the territory, through degree courses and research programmes to which foreign universities and research centres and internationally-ranked researchers can participate.

To this end, it is worth noting the experience gained by the former Port Authority of Livorno thanks to the agreement with the CNIT - National Inter-University Consortium for Telecommunications with the aim of creating a "Innovation Services Centre for Port Infrastructure and Logistics (CSI-PL, Directorate of Development and Innovation)" to provide innovative services to the Port Community. The main areas of opportunity concerned open data, the computerisation of operational processes in port computer platforms, and the implementation of functions and services involving the interests of port stakeholders. In order to provide an instrument capable of measuring variables and identifying important events for the Port Community, the Monitoring and Control Application (MONI.CA) has been developed, which provides information on boarding numbers, weather data, pollution sensors, surveillance, inflexibility, etc.; the system is also capable of interfacing with the PMIS and the National Maritime Single Window.

d) The port as an accelerator of ideas

Port System Authority will also be able to become the protagonist of a new entrepreneurial development model that involves start-ups, researchers, incubators, private investors and digital sector operators in co-creating innovative solutions for port services and the Port's business model.

In order to realize this vision, the Port System Authority will be able to promote the establishment, in the port or its surroundings, of a business accelerator for entrepreneurs and industry innovators. The initiative, conducted in partnership with key members of the business world, will facilitate market access to innovative start-ups that can support the port and operators involved in the digital transformation and evolution towards the Port of the Future. Appropriately supported by investors, bank institutions and local institutions, such an initiative would contribute to the economic relaunch of the tarantine area, creating a business-friendly ecosystem that can produce value for the stakeholders and create the conditions for the development of a local business mindset connected to the maritime economy.

9.3. PORT AND TERRITORY

9.3.1. The port as an element of territorial promotion

In the case of Taranto, as in other contexts, the promotion of the territory finds in the port a two-sided element of possible support and synergy in relation to:

A) the promotion of the territory as an area of localization of industrial or logistic activities

(B) the promotion of the territory in the broader context of achieving socio-economic opportunities (through potentially diversified functions such as the contribution to the implementation of tourist flows or the improvement of urban conditions)

Both functions, also in the case of Taranto, should be included in a wider strategic, formalised framework, which can be described as a "territorial vision, development and marketing plan", which should be shared by the entire system of stakeholders.

In the case of Taranto, a city which is living through an important transformation in the sense of "innovative recovery" of development paths interrupted by damaging events (the Ilva crisis and the "transhipment" terminal crisis in the port), the moment seems opportune to contribute, on the part of the Port System Authority, to the tracking and sharing with the local community, and more specifically with the maritime-industrial cluster, of some of the essential lines of this "plan" from the opportunities offered by the port.

A. The territory as a context for the establishment of logistics and industry

As for the function of the port as a "promoter of productive activities of a logistic or industrial nature" it should be noted that Taranto is one of the few Italian ports that has its own "original" industrial port. This is a value which should not to be overlooked and which should indeed be the basis of a vision (and a process of evaluation and focus) aimed at exploring all the potentialities and opportunities that the Taranto site has, as a whole, as a site for localisation of activities productive.

The port is called to act as a driver for greater integration into the local system, as in the case of the initiative developed under Invitalia ("Restructuring and Industrial Reclamation Project of the Taranto Industrial Complex Crisis Area" - "PRRI Taranto"), in order to increase the efficiency of the process itself: the" generalist "characters of the important Invitalia initiative, due to its national dimension, could be utilized alongside and integrated at the local level[26].

The Port System Authority considers it useful to promote and further formalise a "maritime-industrial" cluster in the tarantine area, including private individuals and a limited number of public bodies, including the Taranto local council, with the mission of supporting and focusing the process of revitalising the industrial/port area of Taranto already undertaken at national and regional level.

The port of Taranto, in the period 2017-2019, is also interested in promoting, in co-operation with super-ordinated bodies, the development of a strategy document for the maritime-industrial cluster strongly geared towards the objective of attracting investment and workers based on:

a) an accurate mapping of sites of potential interest for settlements, both for industries and business services, with documentation on the condition of the areas and the legal/urban and physical statuses of the areas themselves, also in the perspective of achieving a more defined "guide tool";

b) an evaluation, carried out with the support of independent third-parties, of genuinely attractive opportunities at the site, both in terms the overall configuration (investment climate, specialised pooled resources, etc.) and in the specific elements (within and outside the narrow fence of the Port System Authority), considering which sectors would be interested in locating (logistics of various types, industrial producers interested is maritime distribution, e.g. plant engineering, etc., or proximity to existing companies, e.g. steel, wind), and identifying the various indicators for the evaluation of the "Business location", possible valuation tools (e.g. incentives, benefit tax, etc.), in relation to possible settlement costs;

(c) the definition and implementation, including the establishment of a specific 'promotion core' created, for example, within the cluster, of a strategy for adequate communication of opportunities and development plans[27], as well as the implementation of operational tools focussed on the accompaniment of potential investors or operators interested in evaluating localisation and therefore also the settlement process.

Furthermore, alongside the promotion and support, a plan for "strengthening" the context of settlement will be set up, for example, by assessing business training needs and programming appropriate training paths or similar initiatives.

Following the process, in harmony with the processes initiated at national level, it should be considered possible to initiate the formulation of a true local plan for the promotion and development of the industrial-maritime cluster.

In the context that we find at Taranto, strongly and traditionally characterised by the industrial nature of maritime activities, it seems to be appropriate that the Port System Authority is assuming, at this point in time, the role of promoter of local initiatives related to the development of settlement opportunities which, while departing from the specific opportunities placed within the port area, are broadened in a coordinated manner to the wider context of the industrial/production area.

[26] As a pure example of Invitalia's local investment activities, one can imagine the creation of a potential investor information system designed to meet the real needs of international stakeholders, alongside the extremely synthetic information on the area provided by Invitalia in the announcement of an "Invitation to Express Interest in Investing in the Serious Industrial Crisis Area of Taranto" of December 2016.

[27] Also, initiatives such as the regular organization of a conference (e.g. biennial) on the logistics of heavy iron and steel products in the Mediterranean will be possible tools for the promotion of the site

As far as development support policies are concerned, it is also important to carefully consider the risks of pathways aimed at the "artificial" creation of generic innovation projects.
The concept of the 'innovative hub' can be used as a point of reference, as long as it is effectively matched to the specific needs of the present companies, fully integrated with the sectoral innovation models and with their own financial sustainability after a short start-up period. In fact, the creation of generic centres of innovation such as "start-up accelerators" or "innovation parks", mainly through public intervention, should be avoided, given the high degree of failure, in terms of local impact and economic sustainability, on average seen by such initiatives, which are very likely to be in no way related to the real context of business innovation, especially if sectoral contexts are characterised by various motivations or by innovation processes that are scarcely sensitive to technological transfer or a modest level of "absorption capacity".

B. *The promotion of the territory in the broader context of achieving socio-economic opportunities (through potentially diversified functions such as the contribution to the implementation of tourist flows or 'training' systems).*

The Port System Authority, seizing the opportunities associated with its institutional role as a subject responsible for the development of the cruise market, aims to further integrate the offer and tourist attraction system of the Tarantine area with the bidding system for the cruise industry, which has just begun the construction of a cruise terminal. The area of Taranto must recognize the need for a special development effort for the cruise segment, considering the strong competition of other 'port of call' in Puglia. This effort requires, more than in other contexts, a strong focus on the quality of the offer, the attainment of high quality standards of service, and its innovative differentiation.
By always acting within the strategy of strengthening the functions of the industrial-maritime cluster, the Port System Authority will promote the creation of a specific cluster subsystem, specifically dedicated to the cruise/nautical/tourism sector.
The aim will be to develop, with a process of further coordination, engagement and awareness raising among stakeholders, an integrated strategy that will have to be based on:

- recognition of the actual potential and actual limits of the Tarantino site in the current cruise market
- identifying priority actions for optimal promotion of opportunities among key stakeholders (companies, regional tourism promotion agencies, etc.), also in a context of more coordinated marketing of the various sites and ports (shared differentiation strategies/integrated enhancement);
- identification of weaknesses and possible areas of improvement, on the basis of the relationship between cruises and tourism, which indicates the following themes in particular: (a) information system, pre-dated and in situ, multilingual, for the cruise ships and crews, showing the full range of possible necessary information (terminal-city routes, territorial/cultural/commercial resources, maps, taxi and public transport, timetables, discounts, "extra" services (car hire with driver, chaperones/guides, etc.) b) evaluation and optimization - also within the framework of waterfront upgrades - of the terminal/city infrastructure (pedestrian and means of transport), with a view to optimum standards of information, perceived safety of routes, physical accessibility, population, etc. c) evaluation and eventual optimization of the terminal interface/tourist bus parking;
- launching "shared standards definition" processes to optimize the relationship between the cruise tourism system and the city system in the following possible areas of work: taxi services (rates, information, electronic payment/credit cards, etc.); commercial services (e.g. co-ordination of shops, means of payment, discounts, handicrafts markets, foreign languages, other "events" etc.).
- evaluation, design and eventual test promotion, through the cruise group of the maritime-industrial cluster, of possible of innovative visitor packs (excursions) for cruise passengers in the Taranto site (e.g. guided

tours organized at the port/steel complex[28]; excursions focused on agri-food resources, such as milling, etc.).

A specific evaluation process will be developed to identify the potential of Taranto Port as a "home port", given the quality of the site (good and fast connections to the highways, the possibility of using airport sites such as Brindisi - low congestion rates for charter services, large parking spaces near the docks, etc.), although this is a strategy that requires more effort than the development of "port of call" opportunities, and therefore at this point should be seen as a second step in the development of cruise opportunities.

A specific marketing process, always within the industrial-maritime cluster (tourism/cruise subgroup), is appropriate in the field of nautical tourism.

Nautical Tourism

For some aspects, the system of services and information developed for cruise passengers can be fully integrated into the nautical tourism offer system. For other aspects, related to the mooring system (information, booking systems, supply of services, etc.) and technical services to boats (maintenance, spare parts, etc.), a systematic instrument for mapping and evaluation of the state of facts will have to be developed. Following this, it will be possible to coordinate the implementation of an optimization path, which also includes the development of the information, communication and promotional component. Also in this case, the cluster-level definition of shared bidding and service standards, promoted on the basis of benchmarking, will be helpful in coordinating and qualifying the offer.

Infrastructure for the nautical sector

On the basis of the infrastructure for the nautical sector, considering the existing plan for the dismantling of the former Torpedo Base of M.M. located in the Mar Piccolo di Taranto and its conversion into a dock for pleasure craft, maxiyachts and cruise ships, the Port System Authority believes that it is necessary to focus the model of possible development (from the point of view of demand for the different actors, economic-financial viability, management model and design-related needs) with a specific evaluation and addressing process, so that the next steps are implemented with a clear market orientation .

Other models of development of 'port-related' activities

Outside the specific context of nautical tourism and cruises, the opportunities to develop activities that can take advantage of the port 'facilities' integrated with the local knowledge system will be evaluated; just as an example, the assessment of the possibilities of developing a centre for the training and certification of personnel and technologies related to on-board safety and emergency response operations requiring, among other things, a physical context (pool for means testing, etc.) suitable for purpose.

9.3.2. The port as an element of civic identity

Taranto is a city where the port is close the city, but without significant overlaps and disturbances with respect to urban functions. Recently, the city has embarked on a complex challenge of innovation not only in the area of the quality of urban spaces (see, for example, the initiatives carried out in collaboration with "Invitalia" on the redesign of the historic centre) but also, more generally, for its urban identity.

In relation to the theme of urban identity (firstly in the economic and functional sense, which has long borne the weight of a substantial industrial monoculture), signs can be seen of a shared will to place more emphasis on the role played by the port (and more generally from the maritime nature of the site).

Events such as the "Ionian Shipping Days" have already had been able to highlight the possible greater weight of local identity related to port infrastructure, both commercial and touristic (cruises).

[28] It is considered that the (re)construction of a port city identity will also go through processes of positive "reappropriation" of its characters, including those apparently characterised by critical aspects. The Taranto steelworks and its marine logistics system, as well as the entire harbour space system, represent a unique example in Italy that, compatible with security measures and other constraints, could be made accessible and contain, if necessary, an advanced exhibition centre to showcase the steel industry and the relationship (historical and technical) between industries and territory

The bringing of port and city together is also pursued through the upgrading of the "waterfront" and the design of the multifunctional service centre at the San Cataldo pier. This project aims to enhance the commercial side of the port, with a possible visual and conceptual appeal to traffic, creating a living space for the community and promoting a maritime culture as part of citizenship.

In general, in order to support the development of the "port factor" as a local identity factor, the Port System Authority of Taranto believes that the principles to follow for this strategy are as follows:

a) Provide primary space, especially in the early stages, to "soft" action components which are focused on direct relations with categories of citizenship and interest groups (information, training, communication, research and cultural awareness events, active involvement, meetings, etc.) rather than on the realisation of mainly material investments;
b) Systematization and co-ordination of a program of timely initiatives entrusted to a specific actor, including a new constitution, possibly integrated in the industrial-maritime cluster community and more generally in the broader territorial, focusing on creative design of initiatives and bottom-up involvement from people within the territory. The concept of "port-centre" should therefore be developed more as a function system than a physical site. For example, it would be useful to launch an exploratory initiative (with cognitive and engagement aims) through tools such as interviews, questionnaires or focus groups on local population perceptions of city-port identity.
c) Identification (also in relation to the general development objectives under consideration)
d) Focus on the relationship with the youth population (children, teenagers) and with the training system, as well as with the productive categories (e.g. traders, etc.) and more generally with households. Sono possibili strumenti per lo stabilimento di tale rapporto operazioni quali ad esempio: 1. The organisation of a standard integrated pack (preparation & visit) different for each school level, to extend, if possible, not only to the visit to the port but also to the main industrial entities connected to it, with the possibility of extending it to the public (tourists, cruise passengers); 2. The regular organisation of an "open day" day of the port; 3. The organization of extemporaneous events (e.g. concerts, other popular events, sporting competitions, etc.) in some "practicable" areas of the port - with the preventive need to define clear rules, access rules and, where appropriate, "one-off" interventions for technical/administrative and security issues (etc.): the organization will be responsible for the subject mentioned in b). 5. Proposals for bottom-up initiatives in the field of city-port relations (e.g. short films, photo competitions, etc.) on topics that involve the human dimension of harbour and port work. 6. Creation of a small ‘urban park’ in the city centre, with a space for a playground, aimed at citizenship and thematically inspired by the port. 6. Opening of underused space (e.g. maritime station) to cultural and leisure activities for the tarantine population.

More generally, following the methodological indications and good practice models developed by the International Association of Port Towns[29], there is the possibility of carrying out some "hardware" interventions, such as the city/port physical interface and green or leisure areas (e.g. bike paths, etc.), landscapes and landmarks, and biodiversity resources at port areas. The Port System Authority could develop and formalise a "layer" of its development plans explicitly devoted to "urban" and "environmental resource management" interventions for the benefit of the urban community

9.3.3. The economic and cultural integration between the port and the city and the birth of a new concept of Port Community

As highlighted in the preceding paragraphs, the formation of a new dimension in the city-port identity relationship can benefit from a strong economic and cultural integration with the city, provided that it has included in its development agenda a participatory pathway for the definition of a shared identity from which the community may feel represented.

[29] Cfr. Association Internationale Villes Ports, Plan the City with the Port, Guide of Good Practices, Le Havre (2015).

It should be considered that in the case of Taranto this process can be supported (partly economically) through the reinforcement of the "industrial-maritime cluster" project, mentioned above.
In general, it is fundamental to avoid the cluster becoming a formal subject, solely as representation but without internal dynamics.
A shared and neutral leadership, but still strong and charismatic, will be important. However, the basic point is that the cluster evolves as a real operational partnership, from a private-public perspective, capable of developing within itself the various "sub-segments" specialized for different fields (e.g. industrial, touristic/nautical, etc.), although still interactive.
At the level of formulas for cluster governance, it will be required to proceed with a step-by-step process starting from with experiences guided by the European character.
An apparatus of "propulsion" and "dynamization" for the cluster, characterised by the presence of strong personnel and high knowledge levels, is an inevitable necessity.
The Port System Authority considers that at least in the early stages, the "start-up" and the vivifying of the industrial-maritime cluster of the tarantine area can be a legitimate objective of the Port System Authority, which will be called upon to follow the process of constitution of growth and organization of the working model, sharing with other subjects.
The cluster does not, of course, convey the concept of "port community", which is far larger, it does not require formalisation factors, and it mostly incorporates identity and cultural elements. At this stage, however, the cluster appears as an important actor for support, along with other tools, designed to launch and support the widest system of the tarantine "port (and producer) community".

PART V. PLAN ACTIONS

10. SHORT-TERM ACTIONS FOR THE PERIOD 2017-2019

Short-term actions represent the starting point of the roadmap towards the Port Vision 2030, since they lay the foundations for a new phase of innovation, competitiveness and relauch of local economy. Actions follow seven streams:

A. Digital Innovation
B. Physical and technological Infrastructure
C. Partnerships and agreements
D. Development and improvement of port services offering
E. Organization of the Administration
F. Port and territoriy
G. Environmental sustainability

Asse	Pillar	Action
A. Digital Innovation	Innovation	1. FuturePORT Innovation Hub
	Innovation	2. Port Community System (PCS)
	Innovation	3. Environmental Monitoring
	Innovation	4. Operational Cartography
B. Physical and technological Infrastructure	Traffic, Logistics and Competitiveness	5. Redevelopment of the quay and squares in root of the Multi-purpose pier – bulk terminal adjustment
	Traffic, Logistics and Competitiveness	6. Taranto Logistic Platform Project (5 interventions)
	Traffic, Logistics and Competitiveness	7. Remediation of the Multipurpose Pier - modernization of the mooring dock
	Traffic, Logistics and Competitiveness	8. Actions for the dredging of 2.3 bcm of sediment in the area of Multipurpose Pier and the construction of the first lot for the functional sediment tank in order to expand the V Dock
	Traffic, Logistics and Competitiveness	9. Polyvalent service centre for port purposes at S. Cataldo
	Traffic, Logistics and Competitiveness	10. Buildings for logistic accommodation of technical-nautical services in the area behind boatsheds services (I and II functional lot)
	Traffic, Logistics and Competitiveness	11. Collection of rainwater network in the common areas of the harbor and sewage and drainage network in the levante area
	Traffic, Logistics and Competitiveness	12. Rectification, enlargement and structural adjustment of the Levante dock of San Cataldo Pier and Calata 1
	Traffic, Logistics and Competitiveness	13. New external dam to protect the roadstead off the Taranto harbor – west side
	Traffic, Logistics and Competitiveness	14. Environmental redevelopment of the harbor free areas in roadstead - North hotspot removal
	Traffic, Logistics and Competitiveness	15. Reconstruction of the pre-stressed concrete scaffold of the inagible head of the San Cataldo pier
C. Partnerships and agreements	Traffic, Logistics and Competitiveness; Territory	16. Agreements and partnership for development of trade
	Traffic, Logistics	17. Agreements and partnership for developing passenger traffic

Asse	Pillar	Action
	and Competitiveness; Territory	
	Traffic, Logistics and Competitiveness; Territory	18. Agreements and partnerships for the development of logistic activities
	Innovation	19. Agreements and partnerships to promote innovation and research
	Territory	20. Agreements and partnerships for the promotion of sea culture
D. Development and improvement of port services offering	Traffic, Logistics and Competitiveness	21. Competitiveness analysis of port services
	Traffic, Logistics and Competitiveness	22. Establishment of an in-house company with the role of rail operator
E. Organization of the Administration	Traffic, Logistics and Competitiveness	23. Reorganization of offices and respective responsibilities
	Traffic, Logistics and Competitiveness; Innovation	24. Continuous learning for the personnel of Port System Authority
	Traffic, Logistics and Competitiveness; Innovation	25. Development of internal communication
	Traffic, Logistics and Competitiveness; Territory	26. Launch of the Agency for Port Jobs
	Traffici, logistica e competitività; Territorio	27. Introduction of a dedicated office for strategic analysis, promotion and marketing, in charge of the start-up of the industrial-maritime cluster
F. Port and territory	Territory	28. Activity programme (2017-2020) for the promotion of the port and of sea culture as parts of urban identity, and establishment of a facilitating body
	Territory	29. Development of the “port exhibition centre” and creation of a modular system of educational/touristic visits to the port/industrial area
	Territory	30. Regulation and measures for the organisation of events in the port area
	Territory	31. 2018-2020 workplan for “leisure/environmental” areas within the port’s and urban scope
	Territory	32. Development and support for the establishment of an observatory on equitable and sustainable well-being at both urban and port system authority level
	Territory	33. Startup of the taranto industrial maritime cluster and the “cruise-cluster”
G. Environmental Sustainability	Traffic, Logistics and Competitiveness; Territory	34. Document of energy and environmental planning in the port system
	Traffic, Logistics and Competitiveness; Innovation	35. Studies on alternative fuels

10.1. Digital Innovation

ACTION 1: "FuturePORT INNOVATION HUB"	
Objectives	Increase the attractiveness of Taranto Port as a promoter of digital innovations applied to port issues and blue economy
Stakeholders involved	Port System Authority, Taranto Future**PORT** Foundation, Puglia Region, PortXL Rotterdam, Universities, Association SRM – Studi e ricerche per il Mezzogiorno, Banks, local Credit Cooperatives, Ministry for Economic Development, Start-ups
Timing	Starting by 2017
Esteemed cost / Potential fundig sources	€300.000 Self-financing and EU funding to be evaluated for the start-up stages; Self sustaing in following fiscal years.

Description:

Launch of an Innovation Hub within the Port of Taranto, aimed at the implementation of a Start-ups accelerator Programme and of an incubator for port-related innovative solutions to be promoted and exported world wide. The project should be launched in partnership with local Administrations and entrepreneurs.

The necessary operational model includes the following steps:

- **Identification of potential partners** to be involved as promoters/sponsors of the project together with the Port System Authority, such as Universities (e.g.Politecnico di Bari), research centrers (e.g.Sr-m), Banks (e.g. Intesa – San Paolo), port operators (shipowners, forwarders, terminal operators, …), local entrepreneurs, industrial plants (e.g. Ilva, Eni);
- **Institution of an annual programme** for a number of italian and foreign start-ups interested in port and/or industrial issues;
- **Definition of a roadmap and support to selected start-ups**, aimed at sponsoring their innovative solutions and obtaining funding for their implementation;
- **Definition of a go-to-market strategy** aimed at identifying potential buyers, and support in all the phases of solution proposition;
- **Support in finalizing the negotiation** between start-ups and clients.

Expected benefits:

The implementation of an Innovation Hub will provide Taranto Port with an opportunity to go in depth in ICT and digital impctful issues, thus allowing the Port System Authority to:

- Contribute creating an ecosystem for innovative digital solutions, to be implemented within the Port itself;
- Making the port of Taranto an attractive pole for talented and innovative entrepreneurs for the whole Mediterranean area and on international scale;
- Developing a new business model starting from Taranto's port and logistic supply chain, aimed at generating and exporting digital solutions and best practices.

ACTION 2: PORT COMMUNITY SYSTEM (PCS)

Objectives	Making an informative system available to the Port Community, supporting port operations
Stakeholders involved	Port System Authority. UIRNet, National Logistic Platform Operator, Port Community
Time frame	Timing in accordance with development and deployment times of the services assumed by the Promoter and the Manager of the PCS Module of the National Logistic Platform
Estimated costs / Possible financing channels	To be evaluated NOP Infrastructures and Networks 2014-2020

Overview:

In order to have a working Port Community System which responds to the needs of the port community, the Port System Authority will have to proceed with:

- The subscription of the convention with UIRNet for the startup of services currently implemented in the Port Community System pilot developed by UIRNet itself in the Port of Taranto with the collaboration of the Port System Authority of the Ionian Sea;
- The activation of the final phase of test with the user for the components relating to the modules for access management and port gate management;
- The identification of the major information and digitalisation needs of port operations that are functional to the needs of the Port Community of Taranto;
- The identification of the terms of technical collaboration with the operator of the PCS module of the National Logistic Platform with regard to the design of evolutionary modules of the system based on workplans agreed upon with UIRNet;
- Addressing any needs not covered by the terms of technical collaboration defined with UIRNet.

Expected benefits:

The launch of the PCS in the Port of Taranto is intended to provide a comprehensive benefit to the entire Port Community and is mainly identifiable in terms of:

- Efficient exchange of information between actors in the portal community;
- Optimisation of port operations;
- Better control of port operations for port security.

ACTION 3: ENVIRONMENTAL MONITORING

Objectives	Creation of a support system for the monitoring and control of environmental impacts in the port of Taranto
Stakeholders involved	Port System Authority, Port Terminals, Capitaneria di Porto, ARPA, Ministry of the Environment
Time frame	Identification of the technical requirements and definition of the auction base to be put out to tender by the first quarter of 2018 106/5000 Start of public tender procedure and selection of technology/IT partner by 2018
Estimated costs / Possible financing channels	To be evaluated Self-financing/EU funds

Overview:

Based on the integrated monitoring plans defined in the port of Taranto and in view of the inclusion of the Taranto port area in the SIN areas, a process of digitization of environmental monitoring activities will be initiated, which will foresee, as the reference framework for environmental monitoring activities:

Sulla base dei piani di monitoraggio integrato definiti nel porto di Taranto ed in considerazione dell'inserimento della zona portuale tarantina nelle aree SIN, si procederà all'attivazione di un percorso di digitalizzazione delle attività di Monitoraggio ambientale, che prevede come framework di riferimento per le attività di monitoraggio ambientale: the characterization of the project, the definition of the project and the remediation intervention. Specifically, the following aspects shall be considered:

- the construction of the sensor component for monitoring to be installed in port areas;
- the development of algorithms for the modeling of environmental monitoring parameters based on the relative legislation;
- defining the reference workflow for programming and managing monitoring activities;
- developing a database for collecting data and front-end, for the distribution of information related to monitoring data with stakeholders.

The digitalization of monitoring activities includes:

- the preparation of a public call for tenders through the definition of the technical requirements that will be part of the Technical Specifications;
- the initiation of the public tender procedure for the selection of the technological / IT partner;
- the assignment of the service to the identified technological / IT partner.

Expected benefits:

The main aims of the Action are:

- Safeguarding and protecting the city's health;
- Timely identification of "abnormal" environmental situations;
- Simplifying monitoring activities.

ACTION 4: OPERATIONAL CARTOGRAPHY

Objectives	Creating a cartography layer for port processes management
Stakeholders involved	Port System Authority, Port Terminals, Other Port System Authorities
Time frame	Platform release and first operating modules: mid-2018
Estimated costs / Possible financing channels	€ 1.000.000 NOP Infrastructures and Networks 2014-2020, Horizon 2020 and other EU funds

Overview:

Launch of a roadmap aimed at the realization of a cartographic system for the port of Taranto, achieved through the development of a project of:

- georeferencing of the port's demarcation areas, for the representation on a mapping layer;
- Computerization of port processes (operational and non-operational) in synergy with the development of the Taranto PCS in order to optimize and automate the activities, wherever possible (e.g. programming of checks on grants concessions, monitoring and scheduling of corrective, fault and predictive maintenance of port infrastructures and facilities, monitoring of people and vehicles in the marine area, etc.).

Specifically, the Port System Authority shall proceed with:

- The identification of port areas within the project;
- The analysis and design of port processes that can be optimized and automated through the realization of the macartographic layer;
- Agreements with other Port System Authorities for the preparation of a public call for tenders through the definition of technical requirements to be part of the Technical Specifications for both the creation of the cartographic layer and the digitalization of processes;
- The initiation of the public tender procedure for the selection of the technological/IT partner;
- The assignment of the service to the identified technological/IT partner.

Expected benefits:

The intervention allows both the Port System authority and the port community to have greater support on:

- Monitoring and control, in terms of safety, of port areas and of people in port;
- The planning and monitoring of port operations;
- Port Management;
- Programming and managing the institutional activities of the Port System Authority (environmental monitoring, checks on concessions of state-owned areas, etc.)

10.2. Phisical and technological Infrastructure

ACTION 5: REMEDIATION OF THE QUAY AND SQUARES IN ROOT OF THE MULTI-PURPOSE PIER – BULK TERMINAL AREA ADJUSTMENT	
Objectives	Increasing the competitiveness of the harbor and the attractiveness of trade
Stakeholder involved	Port System Authority, Managing Authority of NOP "Infrastrutture e Reti"
Timing	Completion and testing by mid-2018
Estimated costs/ Possible financing channels	€15.000.000 NOP "Infrastrutture e Reti" 2014-2020

Description:

The work is part of the "General Agreement for the development of container traffic in Taranto harbor and overrun the socio-economic and environmental emergency situation" of 20.06.2012.

The interventions planned in the project are the following:

- civil rehabilitation works of the dock structures;
- road upgrading works of the squares;
- adaptation of service facilities and networks to regulatory requirements.

Specifically, the proposed works are:

- restoration of the filler tiles front and the superstructure of the dock;
- remodeling of the existing pavement of squares, which is currently severely damaged, with many depressions, footprints and without the use-surface;
- regularization of the area's dimensions, also through the elevation of the areas, from a height of + 2m to + 3m above sea level. Currently, in fact, the area in the root of the pier (the so-called "operational dock") is located at an elevation of +2.90 m above sea level., while the area interposed between the multipurpose pier itself and the V Dock (the so-called "quay") is located at an elevation +2.00 m above sea level.
- disassembly, revamping and restoration of bollards;
- installation of new fenders type "cell fender";
- tracking the horizontal and vertical signage for the new road;
- realization of a new fence of tariff barriers;
- adjustment of the electrical and lighting system of the area;
- construction of an IR intrusion system;
- adaptation of the fire system serving the area;
- drainage network implementation and water conveyance to the treatment plant.

Therefore, at the end of the work the area will have two docks:

- the operating dock, from a progressive 1,500m to 1,800m, at an altitude of +2,90m above sea level, served by mobile cranes, with a total area of approximately 10,150 sqm;
- the service dock, ranging from 1,800m to 2,050m. The current dimension of the quay is equal to +2.00m above sea level, that will be raised to a height of 2.90m. It also has a service square of about 20,000 sqm.

Expected benefits:

The main objectives and expected results coming from this intervention are as follows:

- restoring the functionality of the dock facilities that require extraordinary maintenance;
- requalification of land-based areas;
- electrical systems adaptation and meteoric waters drainage to the current legislation;
- Trade development through rationalization of the use of docks and the maintenance of the infrastructure, plant and services efficiency in Puglia stopover.

ACTION 6: TARANTO PORT PLATE PROJECT (5 INTERVENTIONS)

Objectives	Increasing the competitiveness of the harbor and trade
Stakeholder involved	Port System Authority
Timing	Completion and testing by mid-2020
Estimated costs/ Possible financing channels	€219.000.000

Description:

The project for the construction of the integrated Logistics Plot of Taranto harbor consists of the following interventions:

- **Logistic Platform (work completed and inaugurated in December 2015).**

This is a logistic platform model integrated into the different transport segments no longer subdivided by mode (maritime, terrestrial, aerial), but as stages of a single process constituting an exchange center between two or more mode of transport (road - Iron - sea) in an area with adequate connections run with the national railway and road net (intermodal transport).

- **Road of piers and plants**

The piers and plants route provides for the organic and efficient connection of all piers of Taranto harbor and the improvement of the connections with the national railway net. It is scheduled the construction of water and sewerage networks, rain and industrial water conveyance, public lighting network, power supply, telephone and telematics predisposition.

- **Extension of IV Dock**

The extension of the IV Dock involves the construction of a new dock for a length of m 600.

- **Boatshed in the west of the IV Dock**

The boatshed in the west of the IV Dock includes both the shore dock and the connecting docks to the existing boatshed services.

- **Sediment tank (connected work).**

The Sludge tank serves to accommodate sludge from the dredges of the IV Dock and the West boatshed.

Expected benefits:

The Logistics Dock, the new docks, and the road that will connect the piers to water / sewage / telematics networks, will substantially modify the harbor's appearance and efficiency to the benefit of trade and its differentiation. The works will also contribute to achieving the other goal: increasing the percentage of container traffic in import / export at the expense of the simple "transfer" (transhipment). In addition, the works will allow the creation / perimeter of a single customs circuit (there is no continuity at present) to the benefit of speeding up the checks, services, and cost and time-consuming practices. The Dock, in particular, being a harbor infrastructure, is designed to build an integrated logistic dock model in the different transport segments that are no longer subdivided into modes (maritime, terrestrial, aerial). However, segments are conceived as phases of a single process that will be a center of interchange between two or more modes of transport (road - iron - sea) in an area with adequate connections run with the national railway and road net (intermodal transport).

ACTION 7: REMEDIATION OF THE MULTIPURPOSE PIER - MODERNIZATION OF THE MOORING DOCK

Objectives	Increasing the competitiveness of the harbor and trade
Stakeholder involved	Port System Authority, Autorità di Gestione NOP "Infrastrutture e Reti"
Timing	Completion and testing by the end of 2017
Estimated costs/ Possible financing channels	€75.000.000 / NOP "Infrastrutture e Reti" 2014-2020, Puglia Region CF (Delibera CIPE 62/11), - Port's own resources, Delib. CIPE 92/2012

Description:

The work is part of the "General Agreement for the development of container traffic in Taranto harbor and overrun the socio-economic and environmental emergency situation" of 20.06.2012.

The intervention consists in the creation of a structure on poles, coplanar (+3.00 m above sea level) and adjacent to the existing dock caisson, although completely structurally disconnected from the caisson themselves. A 3.0m stretch from the new dock is planned the exterior way of the crane portrainers, embedded in the body of the stairway on poles with bore type burbak A120 embedded and placed with the extrados at +3.0 m.

Inside the multipurpose pier is foreseen the implementation of the new track raft beam with the 100-foot (30.48 m) burbak rail (burbak A120) from the rail axis of the external travel path embedded in the pole structure.

The intervention also involves dredging activities limited to a 20-meter band located adjacent to the existing dock. The planned dredges are complementary to the much larger ones envisaged by the 2.3mmc dredging project of sediments at the multipurpose pier, as they involve the adoption of technical precautions to ensure the stability of the existing dock caisson.

Lastly, the project involves the integration of the drainage system of the rainwater that will not only capture, but also regulate treatment units, in accordance with environmental protection standards.

Expected benefits:

- To ensure the stability of the existing caisson structures, a follow-up of the seabed from the current -14.50, -15.50 meters to the required -16.50 meters, in accordance with the forecasts of the Variation of the Harbor Regulatory Plan of Taranto harbor (2007 edition);
- Conducting racing routes able to serve the latest generation dock cranes that have the characteristics to operate up to the 24th row of next-generation of container holders; Simultaneously handling four 20-foot containers at a time, doubling the static and dynamic kits induced by the carts wheels compared to the existing portainers from about 50 tons (linear track line) to about 100 tons / (linear track line);
- Update user networks such as drainage system and power supply in Medium Voltage.

The consequence of these actions is the increase of the Taranto harbor role as International HUB.

ACTION 8: ACTIONS FOR THE DREDGING OF 2.3 BCM OF SEDIMENT IN THE AREA OF MULTIPURPOSE PIER AND THE CONSTRUCTION OF THE FIRST LOT FOR THE FUNCTIONAL SEDIMENT TANK IN ORDER TO EXPAND THE V DOCK

Objectives	Increasing the competitiveness of the harbor and trade
Stakeholder involved	Port System Authority, Managing Authority NOP "Infrastrutture e Reti"
Timing	Completion and testing by the first mid-2018
Estimated costs/ Possible financing channels	€83.000.000 / NOP "Infrastrutture e Reti" 2014/2020, MATTM – DM 408/01, Puglia Region CF Delibera CIPE n. 87/2012, Fondi propri APT, NOP 2007-2013

Description:

The work is part of the "General Agreement for the development of container traffic in Taranto harbor and overrun the socio-economic and environmental emergency situation" of 20.06.2012.

The intervention involves the dredging of the boatshed, the evolution circle and the entrance of the multipurpose pier and the construction of the connected reservoir tank, in extension to the V Dock (east side), where dredged sediments will be diverted. Dredging has both a purpose of environmental remediation, by removing contaminated sediments, and of portability, through reaching the depth of -16.50m, which will allow the container to reach up to 18,000 TEUS compared to the current 8,000 TEUS.

In particular, the quota of -16.50 m will be reached in the dock and for the first 1,200m of the dock of the multipurpose pier, with the exception of the areas close to the quayside of the two piers which, for issues related to the stability of existing harbor infrastructures, has been decided to lead to:

- depth of - 15,50 in the center of the boatshed;
- depth of -14,50 in the buffer zone of 20 m from multipurpose pier;
- depth of - 12,50 in the buffer zone of 15 m from V Dock.

Only non-hazardous sediments or transformed as a result of treatments intended solely for the removal of pollutants, excluding the only processes aimed at the immobilization of the pollutants themselves, through solidification / stabilization processes, will flow info the sediment tank. The sediments that will become dangerous after characterization will in fact be managed outside the sediment tank and given, after treatment, to a special landfill.

Expected benefits:

The main objectives and expected results from the intervention are:

- Allow mooring of last-generation container ships (up to 18,000 TEU);
- Develop the Taranto harbor role as logistics/port and European gateway International HUB.

Numerically speaking, the primary objective of the intervention (which is associated with other ongoing interventions) is to bring back the container traffic of Taranto harbor, or the multipurpose pier, to the pre-crisis situation (2005-2009), with an average of 750,000 TEUs.

ACTION 9: POLYVALENT SERVICE CENTRE FOR PORT PURPOSES AT S. CATALDO

Objectives	Improvement of the service offering
Stakeholder involved	Port System Authority, Managing Authority of NOP "Infrastrutture e Reti"
Timing	Completion and testing by the end of 2017
Estimated costs/ Possible financing channels	€12.755.000 / NOP "Infrastrutture e Reti" 2014-2020

Description:

The work involves the construction of a multifunctional building on the S. Cataldo dock with the reclamation of the external areas.

The aim of the project is to promote, along with the guidelines of the Port Regulatory Plan, a process of valorisation of the port waterfront and the integration between the city and the port.

The building is characterized by a wide flexibility of use by providing the performance of the following activities:

- Promotion of maritime culture: polyphonic auditorium meeting room and multifunctional spaces for exhibition and didactic activities;
- services to passengers and cruisers;
- service and reception (information, relaxation area, bar, toilet).

Expected benefits:

The creation of the multipurpose Port Services Center for the San Cataldo pair of Taranto harbor aims to activate a redevelopment process of the port waterfront and the integration between the city and the harbor through the generation of continuity between public spaces and pedestrian interconnections between the old town and the harbor. This aligned with the objectives of the PO aimed at enhancing port facilities and adapting them to the best operating standards. The "port facility" will therefore be understood both as a set of infrastructure as services, which are capable of triggering a virtuous cycle of regenerating the local economic and social fabric process of the local area and, with a view to an integrated logistics area , complementary to the whole set of services at Puglia level. Given that, in the Service Center service, activities will be carried out to passengers and cruise passengers with the intention of developing this type of traffic in Taranto harbor, always for the port diversification and sustainable tourism growth. The latter, increasing the region attractiveness through the sustainable development of coastal, maritime and inland tourism also aimed at promoting a common regional brand.

ACTION 10: BUILDINGS FOR LOGISTIC ACCOMMODATION OF TECHNICAL-NAUTICAL SERVICES IN THE AREA BEHIND BOATSHEDS SERVICES (I AND II FUNCTIONAL LOT)

Objectives	Improvement of the service offering
Stakeholder involved	Port System Authority
Timing	Start of work on the end of 2017
Estimated costs/ Possible financing channels	€ 7.800.000 / three-year program LL.PP. 2016-2018

Description:
The intervention is aimed at the realization of two buildings, in the areas behind the San Nicolicchio service Taranto harbor, where logistical arrangements can be found for port service operators such as pilots, tugs, boatmen, moorings, and other port operators.

Expected benefits:
The design solution identified in the current analysis responds, through modularity and flexibility, to the different needs of operators.

ACTION 11: COLLECTION OF RAINWATER NETWORK IN THE COMMON AREAS OF THE HARBOR AND SEWAGE AND DRAINAGE NETWORK IN THE LEVANTE AREA

Objectives	Compliance regulations
Stakeholder involved	Port System Authority
Timing	Start of work in the second half of 2017
Estimated costs/ Possible financing channels	€ 18.050.000 / three-year program LL.PP. 2016-2018

Description:
The project envisages the realization of:

- Underground networks for collecting, treating and discharging rainwater from rafting in the common areas of Taranto harbor;
- sewerage network in the eastern part of Taranto harbor;
- distribution of industrial water for the use of meteoric water treated and recovered as wash water network for the sewerage network, washing for yards and for the irrigation of green areas.

Expected benefits:
Adaptation of plant networks with current regulations.

ACTION 12: RECTIFICATION, ENLARGEMENT AND STRUCTURAL ADJUSTMENT OF THE LEVANTE DOCK OF SAN CATALDO PIER AND CALATA 1

Objectives	Increasing the competitiveness of the harbor and trade
Stakeholder involved	Port System Authority, Autorità di Gestione NOP "Infrastrutture e Reti"
Timing	The contract for the assignment of works is under way
Estimated costs/ Possible financing channels	€ 25.500.000 / NOP "Infrastrutture e Reti" 2014-2020, Art. 36 L. 166/02 (DM 18/13), Protocollo d'intesa MIT n. 7 21/10/2002

Description:

The project deals with:

- Rectification and enlargement of the eastern dock of San Cataldo pier;
- Refit of Calata 1 dock.

The overall area, which includes the interventions, extends, overall, for about six hectares, and is shaped by the two docks that are the subject of the interventions, and from the areas behind them, to the border with the north rail areas of the harbor. Calata 1 develops for a total of about 230 meters, while the eastern shore of San Cataldo pier has an extension of approximately 360 meters. In the southern part of the quay, there is a recess, of approximately 25 meters in depth, and length of approximately 230 meters. In the contact area between the two docks there are a number of buildings used for different port functions (Harbor Master's Office, Port System Authority, pertinence offices...).

The project includes necessary works for the consolidation of the Calata 1 and the rectification and extension of the eastern dock of the S. Cataldo pier through the elimination of the current catch, and the accommodation of the areas behind.

The intervention at the Molo S. Cataldo involves the rectification of the existing dock of the I Dock, which is aligned with that of the sections immediately preceding and following according to the indications of the current port control plan with consequent enlargement of the eastern dock. The area of the operation extends for about 230 m, with a width of about 25 m. The project envisages the construction of a dock on poles with a total thickness of 1.60 m, consisting of prefabricated beams and prefabricated slabs, which are solidified with each other by a final casting. The final part of the square is 2.80 m.

The intervention in Calata 1, on the other hand, involves the refitting of the existing dock made of overlapping boulders. Currently the boulders made of concrete have an advanced state of decay while in backwaters aprons are observed widespread failure of the plan probably due to the escape of the fine part of the filling material through the joints between the boulders. This has even led the Port System Authority to fence the area and block access while awaiting adaptation work. The project solution adopted for the structural consolidation / recovery of the dock wall consists in the realization of an encapsulation of the existing quay by the realization of a chassis constituted by seaside from piles of c.a. and metal sheet piles connected through a bridge deck slab at individual poles of c.a. behind the wall.

Expected benefits:

The intervention provides for the rectification, enlargement and structural adjustment of the eastern dock of the San Cataldo pier and consolidation of Calata 1 of Taranto harbor.

ACTION 13: NEW EXTERNAL DAM TO PROTECT THE ROADSTEAD OFF THE TARANTO HARBOR – WEST SIDE

Objectives	Improving the offer
Stakeholder involved	Port System Authority, Autorità di Gestione NOP "Infrastrutture e Reti"
Timing	Start of work in mid-2018
Estimated costs/ Possible financing channels	€ 14.000.000,00 / NOP "Infrastrutture e Reti" 2014-2020

Description:

The work is part of the "General Agreement for the development of container traffic in Taranto harbor and overrun the socio-economic and environmental emergency situation" of 20.06.2012.

The intervention consists in the realization of a pouring dam in Taranto harbor, 500 meters long, called "Tratto di Ponente", and located about 100 m from the paleo alveo of the existing Tara river. The new external dam will be made of natural and artificial boulders that type best suits the geotechnical features of the backdrops. The cliff will consist of a tout-venant quarry, a filter layer in natural boulders and a kind of mantle. The latter will be made with two layers of tetrapod, varying in size between 16 and 20 t, along the outer edge of the cliff and in the headings, in natural IV class masses along the inner rim of the dam body.

More specifically the works consist of:

- environmental dredging for the removal of yellow and red sediments, as referred to in the "Sediment Management Plan" prepared by ISPRA, in which four classes were defined according to the sediment contamination level;
- seabed dredging, at different points, at the dam marking for the complete removal of compressible sediments;
- seabed bedding, performed by means of stones bachelor 5-50kg, up to project dimensions;
- formation of the core of quarry tout-venant, having a weight of 5-100kg;
- realization of filter layer, after the installation of geotextile for protection of the core and formation of the berm at the base;
- realization of the inner mantle, by means of natural boulders of IV category (7-10t);
- creation of artificial boulders "tetrapod" type, of size equal to 16t and 20t and subsequent handling, transport and laying, according to the project sections, for the formation of the outer mantle.

Expected benefits:

The intervention aims to improve the artificial defense system of the Taranto commercial harbor. The construction of the west side of the external dam leads to an improvement in the safety of navigation, in terms of residual agitation, moorings dock of the roadstead off and the rest within the evolution circle of the harbor.

ACTION 14: ENVIRONMENTAL REDEVELOPMENT OF THE HARBOR FREE AREAS IN ROADSTEAD - NORTH HOTSPOT REMOVAL	
Objectives	Environmental sustainability
Stakeholder involved	Port System Authority
Timing	Start of work at the beginning of 2018
Estimated costs/ Possible financing channels	€ 700.000 / three-year Public Works Programme 2016-2018

Description:
It is a remediation intervention required due to the characterization of "free areas on the ground" performed by the Taranto Port System Authority and submitted to the Ministry of Environment. The Risk Analysis, conducted in April 2013, revealed that it is necessary to remove contaminated soil in the adjacent areas of the North gate.

Expected benefits:
This intervention is proposed as a tool to eliminate the environmental risk for the underground water resource.

ACTION 15: RECONSTRUCTION OF THE PRE-STRESSED CONCRETE SCAFFOLD OF THE INAGIBLE HEAD OF THE SAN CATALDO PIER	
Objectives	Increasing the competitiveness of the harbor and trade
Stakeholder involved	Port System Authority, Autorità di Gestione NOP “Infrastrutture e Reti”
Timing	Start of work in the second half of 2017
Estimated costs/ Possible financing channels	€18.800.000 / NOP “Infrastrutture e Reti” 2014-2020

Description:
The intervention involves the reconstruction of the scaffold in pre-stressed concrete, after demolition of the existing (currently inaccessible), located at the head of the "San Cataldo" pier. Surface area affected by the works about 8,100 square meters.

Expected benefits:
Redevelopment of the historical Taranto harbor, diversification and enhancement of trades. In particular, the intervention is aimed at integrating the important function of the pier in the port activities envisaged.
Along the pier, in fact, port companies are involved in the embarkation / disembarking of various goods on commercial vehicles from and on ro-ro ships and for the goods loading and unloading of various goods.
Specifically, the primary objective of the intervention is to restore the staticity of structures deeply and diffusely damaged and / or degraded, and to prevent the recurrence of the degradation phenomena of all parts exposed to the aggression of the surrounding marine environment.

It is unlikely to start work in the three-year period of the planned interventions, for which no reliable funding sources are available to date.

10.3. Partnerships and Agreements

ACTION 16. AGREEMENTS AND PARTNERSHIP FOR DEVELOPMENT OF TRADE	
Objectives	Increase trade and local industry development
Stakeholder involved	Port System Authority, compagnie armatoriali, terminalisti, stabilimenti produttivi locali
Timing	By 2018 first agreements
Estimated costs/ Possible financing channels	n.a. – Port System Authority

Overview:
Scouting of potential partners following various infrastructural improvements. Strengthening the commercial dialogue with ship owners to identify competitive conditions that make the Taranto's stopover preferable to others. Specifically, during the three-year period, the Port System Authority will be active in the definition and selection of one or more terminals for the multipurpose pier, in order to modernize the infrastructure of the mooring dock and the first stage of dredging in the area in front of the new dock.

Expected benefits:
Attract interested operators in benefiting from the infrastructure of the multipurpose pier will increase the Taranto harbor role as an International hub.

ACTION 17. AGREEMENTS AND PARTNERSHIP FOR DEVELOPING PASSENGER TRAFFIC

Objectives	Increase in passenger traffic and the development of the local tourism industry
Stakeholder involved	Port System Authority, MIT, MiBACT, ENIT, Compagnie crocieristiche, Aeroporti di Puglia, Regione Puglia, Regione Basilicata, provider di servizi turistici a terra
Timing	First agreements by 2018
Estimated costs/ Possible financing channels	n.a. – Port System Authority

Overview:

In three-year period, AdSL wants to enhance the agreements already made in terms of cruise arrivals, along four directions:

- strengthening the dialogue with cruise companies to grasp in advance innovative services and "products" needs to be realized concretely and promptly in Taranto's area that would make the harbor more attractive to those companies.
- the interlocution with the MIT and Apulian airports will facilitate the activation of tourism initiatives characterized by air-cruise intermodal trips (fly & cruise), enhancing also the Grottaglie airport as a charter flight.
- the interlocution with MiBACT, l'ENIT, Puglia region and Basilicata region in order to define and promote integrated sea-land tourism routes in both the city of Taranto and the surrounding tourist basin.
- the facilitation of agreements between cruise companies, international tour operators and local operators for the promotion of integrated tourist offers for passengers.

Expected benefits:

The pursuit of agreements and partnerships aiming to enter the port within an integrated tourist offer will make the Taranto stopover more attractive to cruise companies as a "home port" for departures of cruises to Greece or the eastern Mediterranean improving the positioning of Taranto compared to competitors, even in optical deseasonalisation of tourist flows. The increase in tourist flows transiting through Taranto harbor can have positive impacts on the entire territory, especially if joint efforts with local authorities and operators will increase the residence time and the average spending of tourists landed at Taranto.

ACTION 18. AGREEMENTS AND PARTNERSHIPS FOR THE DEVELOPMENT OF LOGISTIC ACTIVITIES

Objectives	Attracting operators and facilitating logistics operations
Stakeholder involved	Port System Authority, Logistics operator, Industrial plants
Timing	First agreements by 2018
Estimated costs/ Possible financing channels	n.a. – Port System Authority

Overview:

To develop port logistics activities Taranto's Port System Authority aims to enhance the available logistics platform by adopting a strategic approach to agreements and partnership that would simultaneously resolve the ongoing litigation with Gavio to equip the platform and the definition of its intended use activating agreements with industrial / logistic operators.

Expected benefits:

Both the resolution of the dispute over the platform's equipment and the identification of industrial and logistic operators interested in using it, will allow the effective use of an infrastructure on which important investments have come, which can be an important factor in harbor's competitiveness and attractiveness.

ACTION 19. AGREEMENTS AND PARTNERSHIPS TO PROMOTE INNOVATION AND RESEARCH

Objectives	Contribute to the promotion of innovation and research on issues related to the port
Stakeholder involved	Port System Authority, Regional and European Universities, Ministry of Education, University and Research, Research centers
Timing	The first notice of competition for the grant of a fellowship will be issued by the end of the 2017/2018
Estimated costs/ Possible financing channels	€10.000 Self-financing / EU funds

Overview:

From the point of view of promoting innovation and research related to port, logistics and *blue economy*, in order to give immediate effect to the "Promotion of Research" line identified in Vision 2030, Taranto Port System Authority promotes partnerships and operational agreements aimed at :

- Establishment of scholarships and / or graduation awards on port issues;
- Activation of curricular stages to be carried out at the Port System Authority for university students, open at European level;
- Collaboration with Apulian and European universities, as well as with European ports, for the activation of training exchanges under the Erasmus Program (Erasmus placement, Erasmus young entrepreneurs).

Expected benefits:

The Port System Authority comfrey a scientific and entrepreneurial community with specific expertise on issues relevant to their interests, thus contributing to the creation of sustainability factors related to the innovative activities envisaged by the Plan.

ACTION 20. AGREEMENTS AND PARTNERSHIPS FOR THE PROMOTION OF SEA CULTURE

Objectives	Improved harbor perception and Contribution to the definition of city identity
Stakeholder involved	Port System Authority, Municipality of Taranto, Puglia Region, museums
Timing	Proclamation of ideas contest for the Port Exhibition Center by the first half of 2018
Estimated costs/ Possible financing channels	n.a. – Port System Authority

Overview:

In order to ensure broad resonance and adequate participation in its initiatives to promote the culture of the sea and the maritime-port identity of the city, Port System Authority promotes strategic partnerships with local authorities and active people in urban and regional cultural life At all stages of the design and implementation of these.

In particular, during the three-year period 2017-2019, the Port System Authority will be able to activate this inclusive method for launching a contest of ideas among young designers, architects and designers to identify the concept of the next Port Exhibition Center.

Expected benefits:

The proclamation of joint initiatives with local and/or national partners on issues related to sea culture also ensures additional advertising initiatives and more sharing with the community, with significant returns expected in terms of territorial involvement and increased attractiveness towards other partners.

10.4. Development and improvement of port services offering

ACTION 21: COMPETITIVENESS ANALYSIS OF PORT SERVICES	
Objectives	Identification of the main competitive forces of the Port of Taranto in relation to port services
Stakeholders involved	Port System Authority of the Ionian Sea, reference panel of Port System Authorities, Capitaneria di Porto di Taranto, Comando Generale delle Capitanerie di Porto, Port services companies, Technical-nautical services companies
Time frame	Comparative benchmark within 2017
Estimated costs / Possible financing channels	€80.000 Self-financing/funds for studies on Axis 3 of NOP Infrastructures and Networks 2014-2020

Overview:

Carrying out a benchmark analysis for the assessment of the competitiveness level of the Port of Taranto in comparison with a panel of national ports, to be selected in relation to the competitiveness level and the possible competition with the Port of Taranto, with reference to port services, and particularly:

- Technical-nautical services of towing, pilotage, mooring and barging;
- Solid and liquid waste - water collection;
- Mirror cleaning and disinfection;
- Anti-pollution and prompt intervention;
- Fire guard;
- Bunkering.

The study will be aimed at identifying, for each service provided in the ports subject to analysis, following important features:

- Service compulsoriness in the port, through the analysis of national and local regulations governing the service;
- Fee charged for the service.

Expected benefits:

The intervention will lay the foundations for identifying and launching remediation actions on port services to be brought to the attention of the appropriate institutional work tables aimed at increasing the competitiveness of the Port of Taranto.

ACTION 22: ESTABLISHMENT OF AN IN-HOUSE COMPANY WITH THE ROLE OF RAIL OPERATOR

Objectives	Structuring of the rail service in the Port of Taranto
Stakeholders involved	Port System Authority, Rete Ferroviaria Italiana, National Agency for Railway Safety, Transport Regulatory Authority
Time frame	Economic feasibility and industrial plan within the beginning of 2019
Estimated costs / Possible financing channels	100.000€ Port System Authority self-financing, other sources to be evaluated

Overview:

The project envisages the implementation by the Port System Authority of the economic feasibility analysis and the definition of the industrial plan to assess the costs and benefits of the creation of an internal company owned by the Port System Authority, that shall carry out the functions of Railway Operator and Plant Operator, as defined by the Transport Regulatory Authority, for the provision of the railway maneuvering service in the Port of Taranto and the services connected with the railway terminal activities.

Expected benefits:

The establishment of the railway company under the management of the Port System Authority will allow:

- Impartiality in the provision of services towards railway companies;
- Simplification of charges for railway companies;
- Structuring of organizational measures aimed at promoting the development of rail transport supporting maritime traffic.

10.5. Organization of the Administration

ACTION 23: REORGANIZATION OF OFFICES AND RESPECTIVE RESPONSIBILITIES	
Objectives	Efficiency of Port System Authority's administrative offices
Stakeholders involved	Port System Authority
Timing	Change management plan by mid 2018
Esteemed cost / Potential fundig sources	€150.000 Own resources/NOP "Governance"

Description:

In compliance with MIT Directive "*Individuazione degli obiettivi finalizzati alla determinazione della parte variabile dell'emolumento dei Presidenti delle Autorità di Sistema Portuale per l'Anno 2017*" (31/05/2017), Port System Authorities are in charge of pursuing the following operational objectives:

a) Re-designing the offices' organization;
b) Ensuring full offices operativity so as to allow the Port System Authorities' start up;
c) Consolidating culture of transparency and prevention of corruption.

In particular, according to Objective A), Port System Authority Of the Ionian Sea has to equip itself with administrative offices functional for the purposes of the Reform of Ports Governance (Italian law "D.Lgs. 169/2016"). Such need allows the Authority to take the chance to introduce innovations in terms of internal organization.

The action is implemented throughout different stages:

- Analysis of the AS-IS administrative organization;
- Design of the organization model which better fits the Administration's objectives so as defined by D.Lgs. 169/2016, the MIT Directive 31/05/2017 and the Port Vision 2030;
- Implementation of the selected organization model through continuous dialogue with the Port System Authority's personnel;
- Indentification of transversal teams for cross-cutting activities (e.g. accounting);
- Enforcement of inter-offices coordination;
- Introduction of organization and digital innovation in support of offices' activities.

Expected benefits:

Throughout the new organization model, the Port System Authority will compy with national rules and will be able to obtain higher performances, both in terms of offices' efficiency and improvement of the quality of working environment, thus empowering the internal resources to carry out the new tasks.

ACTION 24: CONTINUOUS LEARNING FOR THE PERSONNEL OF PORT SYSTEM AUTHORITY

Objectives	Enforcement of Administration institutional capabilities
Stakeholders involved	Port System Authorities, Ministry of Infrastructure and Transport
Timing	First stage by 2018 and continuous learning during the whole Plan period
Esteemed cost / Potential fundig sources	€200.000 NOP "Governance" or other EU funds

Description:

Due to the provisions of the Italian law "D.Lgs 169/2016, the Administration needs to revise its offices' organization so as to guarantee the completion of the new tasks and responsibilities that the Reform of Port Governance attributes to Port System Authorities.

In particular, it seems necessary to enforce the Administration personnel; both through specific learning moments aimed at widen the range of tasks and through the acquisition of new people with specific expertise functional for the new purposes of the Administration.

Specifically, the Port System Authority needs to enhance its capabilities in the following areas:

- **Europlanning and project management**, in order to access EU funding programmes and to manage the respective projects;
- **Marketing and communication**, in order to promote Port's activities both within the territory and at the international scale, so as to attract invetors, operators and commercial partners, and to valorize the port as an "Access point" to the territory, in terms of both tourism and commerce;
- **Administrative simplification**, in order to implement the Single Administrative Window and the Single Custom Window;
- **Digital Innovation,** in order to support the Port System Authority in the digitalization of infrastructure and logistic processes, in the start-up of a shared path towards digital transformation of the entire maritime supply chain. Specific training opportunities can be organized for different targets.

Expected benefits:

The enforcement of internal capabilities allows the Administration to experience – together with the traditional administrative and technical tasks strictly connected to the Port System Authority's mission – new and innovative streams of actions functional for the purposes of the italian law and of the Port Vision.

ACTION 25: DEVELOPMENT OF INTERNAL COMMUNICATION

Objectives	Improve internal socialization and the personnel's involvement in ordinary administration and in strategic planning.
Stakeholders involved	Port System Authority
Timing	By 2017
Esteemed cost / Potential fundig sources	n.a. / Port System Authority's personnel

Description:

In order to promote the involvement of the different offices in the decision-making related to strategic planning and to cross-cutting issues, thePort System Authority will equip itself with specific tools aimed at facilitate collaboration and inter-office communication, in line with the best standard of sophisticated organizations.

More specifically, the Port System Authority will introduce the following tools:

- Daily news made available on the Port's intranet;
- Weekly or monthly newsletter containing in-depth focuses on port-related issues, open to personnel's contribution;
- Regular meetings with the whole personnel, aiment at providing updates Actions and Vision of the Port System Authority.

Expected benefits:

The entire Port System Authority's community is more engaged and contributes enthusiastically to the efficent functioning of the Administration. The Port System Authority strengthen its attractiveness as job place both for Taranto's citizens and foreign talents.

ACTION 26: LAUNCH OF THE AGENCY FOR PORT JOBS

Objectives	Support for employment
Stakeholders involved	Port System Authority, Ministry of Infrastructure and Transport, Unions, Agency for Territorial Cohesion
Timing	By 2017
Esteemed cost / Potential fundig sources	T.b.d.

Description:

The Italian Ministry of Infrastructure and Transport authorized the institution, within Taranto Port, of an Agency for Port Jobs, according to italian decree "D.L. 243/2016" (converted into Law 18/2017), concerning urgent measures for social and territorial cohesion, specifically related to critical situations in the South of Italy. Such Agency has been designed in order to facilitate the resolution of the employment crises happened in the transshipment ports of Taranto and Gioia Tauro when social shock-absorbers came to an end.

Taranto Port System Authority is now in charge of finalizing the path for the start-up of the Agency, which will be allowed to act in the following 36 months.

Expected benefits:

Taranto Agency for Port Jobs will allow the hiring in port-related companies of around 520 former employess of Tct, whose work activity ceased on 31 december 2016. The Agency will also provide support to those who will not be hired, both in financial terms and through professional training.

ACTION 27: INTRODUCTION OF A DEDICATED OFFICE FOR STRATEGIC ANALYSIS, PROMOTION AND MARKETING, IN CHARGE OF THE START-UP OF THE INDUSTRIAL-MARITIME CLUSTER

Objectives	Triggering the activities connected to supporting and promoting the innovations in port's role, both in relation to commercial traffic and in terms of integration with the territory.
Stakeholders involved	Port System Authority
Timing	2017
Esteemed cost / Potential fundig sources	€250.000 (personnel's costs and promotional actions) T.b.d. (EU funds and stakeholders of maritime cluster)

Description:

- The Port System Authority is in charge of realising an important activity of relaunch of the Port's role both in the market – through new logistic partnerships – and in the territory – by widening its network.
- To such aim, it is necessary to strengthen the activity related to analysis, promotion and marketing. Such activity has to become crucial to the Port top management, and an adequate leadership has to be dedicated to that. More specifically, dinamism, representativeness, ability to engage local stakeholders must be the main peculiarities of the management, so as to guarantee, for instance, the successful start-up of the industrial-maritime cluster.
- In terms of organization, the activity will consist of the enforcement of the dedicated office, even through the selection of new personnel with specific expertise.

Expected benefits:

- Strategic and executive implementation of the activity related to promotion and marketing, with resulting improving of decision-making and positive impact on market issues, on the selection and implementation of logistic projects and on the settlement of industrial plants;
- Strengthening of the territorial partnerships and of the industrial-maritime cluster.

10.6. Port and Territory

ACTION 28: ACTIVITY PROGRAMME (2017-2020) FOR THE PROMOTION OF THE PORT AND OF SEA CULTURE AS PARTS OF URBAN IDENTITY, AND ESTABLISHMENT OF A FACILITATING BODY

Objectives	Bringing citizenship and other local stakeholders, with the mediation of a facilitating body, closer to the world of maritime port activities, with an activity programme aimed at enhancing their sensibility, knowledge and attention towards maritime port economy and culture
Stakeholders involved	*Local authorities; local cultural associations; other actors of the maritime port community; local schools; local study and research centres*
Time frame	Identification/establishment of the facilitating body: by 2017; programme design and development: 2018-2020
Estimated costs / Possible financing channels	€300.000 To be evaluated (EU funding and actors of the maritime port cluster)

Overview:

The Port System Authority will take action – through a top representative – as the promotor and coordinator of an association, which can be joined by legal entities, for the promotion of Taranto's maritime port culture and identity. The association, under the coordination of the Port System Authority and in collaboration with other actors, will aim at defining the strategic orientation, the operative model and the development of an activity programme **for the promotion of the port and of sea culture as parts of urban identity**.

- The strategic definition of activities, managed by the association, with possible external funding sources (e.g. foundations, etc.), shall identify a consistent programme of goals, necessary actions, and inititatives, involving at different stages other urban organizations and interested companies;
- The action goals shall consist, in particular, in the organisation of cultural events (conferences, exhibitions, performances, etc.) or in other activities (e.g. study visits, education, school contests/scolarships, audio/video production, etc.) that will actively engage citizens, in their different segments and with different methods.

Expected benefits:

- Engagement of citizens and other actors (entrepreneurs, local authorities, etc.) in the topic of Taranto's "maritime" identity, as a precondition for more attention, knowledge and sensibility towards the challenges of port develpment and maritime port activities.

ACTION 29: DEVELOPMENT OF THE "PORT EXHIBITION CENTRE" AND CREATION OF A MODULAR SYSTEM OF EDUCATIONAL/TOURISTIC VISITS TO THE PORT/INDUSTRIAL AREA

Objectives	Definition and creation of a modular diversified system of visits to the port, targetting different possible users (citizens, tourists, school groups of different educational levels, etc.) in order to enhance Taranto's attractiveness alongside with the development of the maritime port identity. Concept, design and creation of a multifunctional location ("port exhibition centre"), as a facility for the presentation of the port environment (visit centre, exhibition and conference centre, interactive/information centre, etc.)
Stakeholders involved	Service company; industrial and port entrepreneurs; terminal operators; other administrations
Time frame	Visit system: Design in 2017; implementation from 2018; Port Exhibition Centre: by 2018
Estimated costs / Possible financing channels	Visit planning: €125.000 (three-year) Port Exhibition Centre: to be evaluated

Overview

- In collaboration with internal offices of the Port System Authority and with the support of a selected service provider, a modularized and standardized system will be set up for the organization of visits offered to different user groups, both free of charge and, prospectively, for payment;
- There will be a selection of the actor who will support the Port System Authority in the design of the system and of visit paths, identify technical and legal requirements for visits, and take action for the tentative startup of the initiative, which could include visiting some industrial partners (e.g. Ilva, etc.);
- In collaboration with the selected actor, an analysis on legal, safety, technical and other aspects will be carried out;
- Concept, design and creation of a multifunctional location ("Port Exhibition Centre"), as a facility for the presentation of the port environment (visit centre, exhibition and conference centre, interactive/information centre, etc.).

Expected benefits

- Opening of the port to the city as part of the strategy aimed at creating the maritime port identity;
- Increasing the number of visitors of Taranto (attractiveness);
- Promotion of the port with visiting actors, with consequences in terms of "brand recognition";
- Bringing younger generations closer to the port, through visits.

ACTION 30: REGULATION AND MEASURES FOR THE ORGANISATION OF EVENTS IN THE PORT AREA

Objectives	For the purpose of enriching the port maritime identity of the Taranto community, as well as the coming together of urban community and port, technical and regulatory conditions are set up allowing events to be organized in areas under the control of the Port System Authority.
Stakeholders involved	Local public authorities
Time frame	Soft measures: beginning of 2018; technical realization: mid-2018
Estimated costs / Possible financing channels	€500.000 To be evaluated

Overview:

- The Port System Authority will map the possible use of areas under its control for the purpose of events (e.g. concerts, contests, performances, visits, etc.), setting up the legal and technical conditions to this end (also with possible adapting measures and the installation of technical equipment);
- Moreover, the drafting of terms of reference is foreseen, containing the conditions for use and specifications on how to apply.

Expected benefits:

- Actual support to territorial promotion, by facilitating attractive activities, also at touristic level;
- Increasing the visibility of the port and of its relationship with the city.

ACTION 31: 2018-2020 WORKPLAN FOR "LEISURE/ENVIRONMENTAL" AREAS WITHIN THE PORT'S AND URBAN SCOPE

Objectives	Actualizing, through the perceptible aspect of space quality, the Port System Authority's commitment to contribute to the building of a renewed environment, capable of enhancing natural resources, by offering the citizenship new opportunities for using the port-city interface and, more generally, the urban spaces highlighting the relationship between city and port.
Stakeholders involved	Municipalities; other local authorities; companies located in the industrial area
Time frame	Design and first assessment of the Plan: 2018/19 First pilot projects: 2020
Estimated costs / Possible financing channels	Elaboration/design: €600.000 To be evaluated

Overview:

- For the purpose of approaching and integrating port and city, the Port System Authority will initiate - as an autonomous proposal to be further developed, evaluated and shared with other actors (Municipalities, entrepreneurs) and the participation of citizens and young professionals (e.g. through an idea contest for young architects) - an integrated plan aimed at the coordinated development of projects (e.g. linear cycling park along the port border, spaces for sporting activities, areas for the enhancement of biodiversity micro-fields, observation and information points, urban playgrounds for children, etc.) for the enjoyment of leisure time;
- The plan/project will represent the preparatory step to the actual implementation, that can also take place through different stages, starting with some pilot actions.

Expected benefits:

- Redevelopment and enhancement of marginal and environmentally degraded areas, particularly but not only in the city-port interface area; creation of leisure opportunities for the population; contribution to the enhancement of the relationship between the urban community and the port;
- Creating areas with specific environmental qualities (e.g. development or conservation of biodiversity, etc.).

ACTION 32: DEVELOPMENT AND SUPPORT FOR THE ESTABLISHMENT OF AN OBSERVATORY ON EQUITABLE AND SUSTAINABLE WELL-BEING AT BOTH URBAN AND PORT SYSTEM AUTHORITY LEVEL

Objectives	Improving the quality of processes in the field of environmental management and sustainability in the Taranto area, through the promotion and application of analytical protocols and assessments of the multi-indicator system on territorial welfare "BES" (equitable and sustainable well-being - Italian National Institute of Statistics), to be applied at both the municipal level and, as far as impacts are concerned, the Port System Authority level.
Stakeholders involved	Municipalities; Leading companies
Time frame	2018
Estimated costs / Possible financing channels	€50.000 To be evaluated

Overview:

- The BES system (Benessere Equo e Sostenibile, equitable and sustainable well-being) is a model aimed at the measurement of well-being and the quality of life based on 12 classes of indicators, that can be applied for assessing the quality of life in specific areas (e.g. citywide, provincewide, statewide). Since 2016, Italy has introduced it in its legislation as a reference system for policy assessment;
- The Port System Authority intends to promote, through a series of actions in collaboration with local institutions and providing support where useful and necessary, the adoption of this indicator system, so that Taranto becomes the subject of a BES evaluation and management process, with the aim to better assess and address policy choices and improve the quality of life of citizens;
- As far as the Port System Authority is concerned, an internal procedural model will be established in the context of the most important decision-making processes, in order for an assessment of the chosen action's impact on BES indicators to become mandatory.

Expected benefits:

- Improving knowledge and information on quality of life in Taranto and improving collective decision-making processes with regards to sustainability;
- Recognition of Taranto and the Port System Authority, even at the official level, as applying advanced models of sustainable management and development;
- Supporting, through inter-institutional cooperation, the development of an active role of the port in the city, as an important identitary institution.

ACTION 33: STARTUP OF THE TARANTO INDUSTRIAL MARITIME CLUSTER AND THE "CRUISE-CLUSTER"

Objectives	Accelerating, also through the establishment of a legal entity, the creation and development of a multi-subject context of "local industrial-maritime community", in order to develop the sense of identity, relational and collaborative opportunities and the dissemination of strategies, shared operational models and innovative business partnerships. The action will be developed both in general and, as a priority, in the specific sub-area concerned with the development of cruises and the nautical sector.
Stakeholders involved	Local authorities; companies; trade associations; other institutions (e.g. educational centres)
Time frame	2018
Estimated costs / Possible financing channels	€300.000 To be evaluated

Overview:

- In view of the current low level of interaction between the parties that should represent the maritime and industrial community, the Port System Authority takes action for a rapid acceleration of the "aggregation" process, by proposing and coordinating an aggregation path based on the formalization and promotion of an industrial-maritime network, starting from the lead actors, according to an internationally successful cluster model;
- The Port System Authority initiates the network, through the establishment of an entity (e.g. association) and promoting its leadership position, creating and enriching the network, with the direct commitment of the management and adequate resources for organisational and promotional aspects, as well as for first "cluster projects" (e.g. mapping actors and interactions; building a shared view of the context and of cooperation opportunities; shared event management);
- The Port System Authority promotes, in particular, the rapid creation of a sub-level in the network, conceived as the substratum of a business partnership, including groups and actors working in the cruise and nautical sectors, basing on existing best practices of "cruise clusters".

Expected benefits:

- Accelerating the creation of an "industrial-maritime community" context and of its identity; Dissemination and promotion of innovation in the processes of cooperation in partnerships between private and public actors; Analysis and shared design of initiatives; Creation of a group with different (also entrepreneurial) actors (service providers, etc.) for the coordinated self-organization of the cruise/nautical bidding system, inspired by good practices of urban cruise clusters.

10.7. Environmental sustainability

ACTION 34: DOCUMENT OF ENERGY AND ENVIRONMENTAL PLANNING IN THE PORT SYSTEM	
Objectives	Energy and environmental sustainability of the Port
Stakeholders involved	Port System Authority, Arpa, Coordinating Steering Committee of Port System Authorities, Italian Ministry of the Environment
Time frame	Within 2017
Estimated costs / Possible financing channels	€ 130.000 To be evaluated

Overview:

Each Port System Authority, after the port reform (Legislative Decree 169/2016), must adopt a Document of energy and environmental planning in the port system. This Document, which must give particular importance to the reduction of carbon dioxide emissions, is drafted on the basis of guidelines adopted by the Ministry of the Environment and Protection of Land and Sea, in agreement with the Ministry of Infrastructure and Transport. The Document provides orientation on the implementation of detailed measures for improving energy efficiency and the use of renewable energy in the port area.

The Document details the single actions to be undertaken and for each one it carries out a technical-economic feasibility assessment, including cost-benefit analyses. It also describes how to coordinate environmental and infrastructural interventions and indicates appropriate energy and environmental monitoring measures.

Expected benefits:

The main goals and the expected results of this Action are:

- compliance to legislation;
- the opportunity to lay down a framework for improving energy and environmental sustainability with measures that represent key competitiveness factors for every port.

ACTION 35: STUDIES ON ALTERNATIVE FUELS

Objectives	Increasing the port's attractiveness
Stakeholders involved	Port System Authority
Time frame	Call for participants within the first quarter of 2018
Estimated costs / Possible financing channels	€ 130.000 To be evaluated

Overview:

In the light of Directive 2014/94/EU on alternative fuels infrastructure and its Italian transposition through Legislative Decree 257/2016, which introduced a National Strategic Framework, studies on alternative fuels could address the following two aspects:

- the supply of **electricity** for seagoing ships;
- the possibility of providing a refuelling point for **LNG**.

The first hypothesis refers to the National Strategic Framework, which explicitly shifts the assessment on the need for electricity supply in mooring berths to an analysis of the characteristics of the individual ports. In particular, the elements on which the analysis would concentrate would be represented in the first instance by in-depth considerations on environment, maritime traffic flows, generation and availability of electricity from the national network. Although Taranto can take advantage of the priority that the Directive assigns to the ports of the core network, there is a need for a closer look at the demand for electricity and the proportion between the expected costs and benefits, also in environmental terms, as laid down in the Directive itself. The study could also provide a solid documentary basis for the effective reduction of measurable pollutant emissions and for the analysis of the benefits of an integrated energy approach to the port area. Finally, this document would contain information on the financial sustainability of an intervention in this field, which, in addition to the initial investment in machinery capable of supplying electricity with qualities that are to be adequate for the biggest possible number of ships, as set out in the National Strategic Framework, needs to take into account the plant's exploitability (with the forecast of how many ships, among those already ready to be fueled from the ground, will dock in the port in a given period) and the final cost to the user (since the cost must be competitive compared to that of naval fuels that comply with the laws on ship emissions).

The second research, instead, is based on the obligation laid down in the 2014/94/EU Directive for Member States to identify an adequate number of LNG refuelling points in seaports. Since the recent Italian Strategic Framework that transposes the Directive proposes a widespread model, not prioritizing core ports over ports of the global network, the Port of Taranto, through a thorough study of the conditions under which to invest in a LNG refuelling point would be convenient, would be provided with an indispensable tool, especially in the case of competition between Italian ports for the construction of LNG service stations. Focusing on a refuelling point for LNG could be strategically important for the Port of Taranto because, far from representing merely the compliance to legisation, it could be a factor in increasing the attractiveness of the port. Moreover, the opportunity to refuel will become an element of competition between ports for the attraction of LNG-fueled ships, whose number is expected to increase.

Expected benefits:

The main goals and the expected results of this Action are:

- the opportunity to have updated data and in-depth analyses at disposal, on crucial topics for the future port development;
- the opportunity to be provided with a Document aiming at representing a decisive tool in the competition with other ports;
- the opportunity to identify possible gaps to fill, infrastructural works on which to invest or additional actions to undertake.

11. PLAN GOVERNANCE

From a methodological point of view, this three-year Operational Plan, which includes a long-term Vision, represents a turning point for the strategic planning related to Taranto Port. Coherently with such an innovative approach, the very governance of the Plan conciles consolidated practices with distinctive innovative streams of action. More specifically:

- The Plan will be the object of regular updates to the Port System Authorities Coordination Body of the Ministry of Infrastructure and Transport and to the Port System Authority Stakeholders Body, concerning the advances related to the Actions and the critical issues to be solved;
- The annual update of the Plan, together with the internal offices and personnel, so as to valorize all the Administration capabilities;
- The draft of a new Plan every three years, containing the update of the long-term Vision and a new set of short-term actions to be implemented in a three-year time frame. Such drafting process will actively involve local, national and international, so as to ensure that Taranto Port's strategy be functional for the fulfillment of shared needs.

Table 26: 2017-2019 actions GANTT

STREAM	PILLAR	ACTION	2017		2018				2019			
			Quarter III	Quarter IV	Quarter I	Quarter II	Quarter III	Quarter IV	Quarter I	Quarter II	Quarter III	Quarter IV
A. Digital Innovation	Innovation	1. FuturePORT Innovation Hub										
	Innovation	2. Port Community System (PCS)										
	Innovation	3. Environmental Monitoring										
	Innovation	4. Operational Cartography										
B. Physical and technological Infrastructure	Traffic, Logistics and Competitiveness	5. Redevelopment of the quay and squares in root of the Multi-purpose pier – bulk terminal adjustment										
	Traffic, Logistics and Competitiveness	6. Taranto Logistic Platform Project (5 interventions)										
	Traffic, Logistics and Competitiveness	7. Remediation of the Multipurpose Pier - modernization of the mooring dock										
	Traffic, Logistics and Competitiveness	8. Actions for the dredging of 2.3 bcm of sediment in the area of Multipurpose Pier and the construction of the first lot for the functional sediment tank in order to expand the V Dock										
	Traffic, Logistics and Competitiveness	9. Polyvalent service centre for port purposes at S. Cataldo										
	Traffic, Logistics and Competitiveness	10. Buildings for logistic accommodation of technical-nautical services in the area behind boatsheds services (I and II functional lot)		Infrastructural work: starting time established								
	Traffic, Logistics and Competitiveness	11. Collection of rainwater network in the common areas of the harbor and sewage and drainage network in the levante area	Infrastructural work: starting time established									
	Traffic, Logistics and Competitiveness	12. Rectification, enlargement and structural adjustment of the Levante dock of San Cataldo Pier and Calata 1	Infrastructural work: starting time established									
	Traffic, Logistics and Competitiveness	13. New external dam to protect the roadstead off the Taranto harbor – west side					Infrastructural work: starting time established					
	Traffic, Logistics and Competitiveness	14. Environmental redevelopment of the harbor free areas in roadstead - North hotspot removal			Infrastructural work: starting time established							
	Traffic, Logistics and Competitiveness	15. Reconstruction of the pre-stressed concrete scaffold of the inagible head of the San Cataldo pier	Infrastructural work: starting time established									
C. Partnerships and agreements	Traffic, Logistics and Competitiveness;	16. Agreements and partnership for development of trade										
	Territory	17. Agreements and partnership for developing passenger traffic										
	Traffic, Logistics and Competitiveness;	18. Agreements and partnerships for the development of logistic activities										
	Territory	19. Agreements and partnerships to promote innovation and research										
	Traffic, Logistics and Competitiveness;	20. Agreements and partnerships for the promotion of sea culture										
D. Development and improvement of port services	Territory	21. Competitiveness analysis of port services										
	Innovation	22. Establishment of an in-house company with the role of rail operator										
E. Organizzazione dell'ente	Territory	23. Reorganization of offices and respective responsibilities										
	Traffic, Logistics and Competitiveness	24. Continuous learning for the personnel of Port System Authority										
	Traffic, Logistics and Competitiveness	25. Development of internal communication										
	Traffic, Logistics and Competitiveness	26. Launch of the Agency for Port Jobs										
	Traffic, Logistics and Competitiveness; Innovation	27. Introduction of a dedicated office for strategic analysis, promotion and marketing, in charge of the start-up of the industrial-maritime cluster										
F. Port and territory	Traffic, Logistics and Competitiveness; Innovation	28. Activity programme (2017-2020) for the promotion of the port and of sea culture as parts of urban identity, and establishment of a facilitating body										
	Traffic, Logistics and Competitiveness; Territory	29. Development of the "port exhibition centre" and creation of a modular system of educational/touristic visits to the port/industrial area										
	Traffici, logistica e competitività; Territorio	30. Regulation and measures for the organisation of events in the port area										
	Territory	31. 2018-2020 workplan for "leisure/environmental" areas within the port's and urban scope										
	Territory	32. Development and support for the establishment of an observatory on equitable and sustainable well-being at both urban and port system authority level										
	Territory	33. Startup of the taranto industrial maritime cluster and the "cruise-cluster"										
G. Environmental Sustainability	Territory	34. Document of energy and environmental planning in the port system										
	Territory	35. Studies on alternative fuels										

Source: EY

This document has been approved with decision n.09/17 by the Management Committee on June 19th 2017.

The President

Prof. Sergio Prete