

PEER REVIEW OF THE TURKISH SHIPBUILDING INDUSTRY



Foreword

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1. Executive summary

During the 2000s, the Turkish shipbuilding industry witnessed substantial growth, driven by its exports and dynamic financing by local banks and economic stability. Turkish shipyards focused on building relatively small oil and chemical tankers during this period.

In 2008, the Global Financial Crisis (GFC) led Turkish shipbuilding groups to look for new areas of specialisation. Thus, Turkish shipbuilding groups began to reorient their main activities into ship repair, ship scrapping, and the building of niche ships such as alternative fuelled-vessels. With the significant decline in new construction demands worldwide, they focused on tailor-made ships, notably for European buyers.

Turkish smaller yards tend now to be multipurpose, offering conversion, repair and maintenance services as well as the building of new ships. In 2019, Turkey was the 11th largest global shipbuilding economy in terms of seagoing vessel completions. Turkish shipyards have been producing a variety of vessel types over the last ten years, including fishing vessels, trawlers, tankers, tugs, cruise/passenger ferries, dry cargo ships, offshore service vessels, bulk carriers, fully cellular containers (FCC), gas carriers and roll-on/roll-off (Ro-Ro) vessels. The Turkish shipbuilding industry also produces LNG-powered, hybrid-powered and electric-powered vessels. Turkey is also a significant global actor in ship repair, ship maintenance and ship recycling.

The number of workers employed by Turkish shipbuilders has gradually recovered after the GFC, rising from 19 719 workers in 2009 to 30 910 in 2018.

As is the case for all shipyards worldwide, the recent sharp decline in shipbuilding orders in 2020 linked to the COVID-19 pandemic poses a threat to the Turkish shipbuilding industry. On the other hand, there are also opportunities for Turkish shipbuilders and marine equipment suppliers as demand for eco-friendly ships and the retrofitting of ships with green technologies increases, notably driven by the reinforcement of environmental regulations.

In general, the Turkish government takes a relatively non-interventionist approach to shipbuilding. Nevertheless, Turkey produces regular economic “Development Plans”. The 11th Development Plan (2019-2023) equally includes the shipbuilding industry. More specifically, the Plan mentions the desire to improve the competitiveness of the Turkish shipbuilding industry and marine technologies. This objective concurs with the goal to sustain a shift towards greener forms of shipping.

As an illustration, the Plan outlines the goal to convert short-distance passenger and vehicle transportation vessels into environmentally friendly and energy-efficient electrical vessels. Accordingly, the Plan pledges to increase support for projects that pursue similar practices.

2. Introduction

In 2012, the OECD's Council Working Party on Shipbuilding (WP6) introduced a peer review process focused on support measures provided by governments to their shipbuilding sectors. Under this process, each economy participating in the WP6 undergoes an in-depth study of its shipbuilding industry and related government measures. Non-WP6 economies may also join the process and be the subject of a WP6 review.

The main goal of the peer review process is to strengthen the identification of government policies, practices and measures affecting the shipbuilding sector and to support the discussion of these measures within the WP6. The analysis of the support measures is accompanied by contextual details of the industry in order to provide a rich discussion of shipbuilding policies and their impact. A key element of the process is the active debate and discussion of peer review drafts by WP6 participants, with a view to promoting transparency and sharing experiences.

Turkey is the eight country to be subject to a WP6 peer review, following the reviews of Japan (2012), Portugal (2013), Korea (2014), Germany (2015), Norway (2016), Finland (2017) and the Netherlands (2019). In 2018, the WP6 decided to conduct an ad hoc review of the shipbuilding sectors in selected non-WP6 members, including the People's Republic of China (hereafter China), Indonesia, Malaysia, the Philippines, Singapore, Chinese Taipei and Viet Nam. In 2020, the Secretariat also prepared a report on China's shipbuilding industry and policies affecting it.

The information in this report is based on publicly available information, statistical series available to the Secretariat, Turkey's response to the peer review questionnaire, and discussions with government officials and stakeholders. The Secretariat expresses its gratitude to the government and industry stakeholders who participated in the review.

The analysis focuses on the shipbuilding industry (including repair and conversion facilities), but also provides information on the marine supply industry, which manufactures the different components that are used in ships. The report includes three substantive parts: global perspectives, the structure and characteristics of the Turkish shipbuilding industry and finally government policies affecting the shipbuilding industry. At the end of the report it also includes issues for discussions and two annexes including selected information on the largest Turkish yards and on the institutional characteristics of the shipbuilding sector.

3. Global perspective

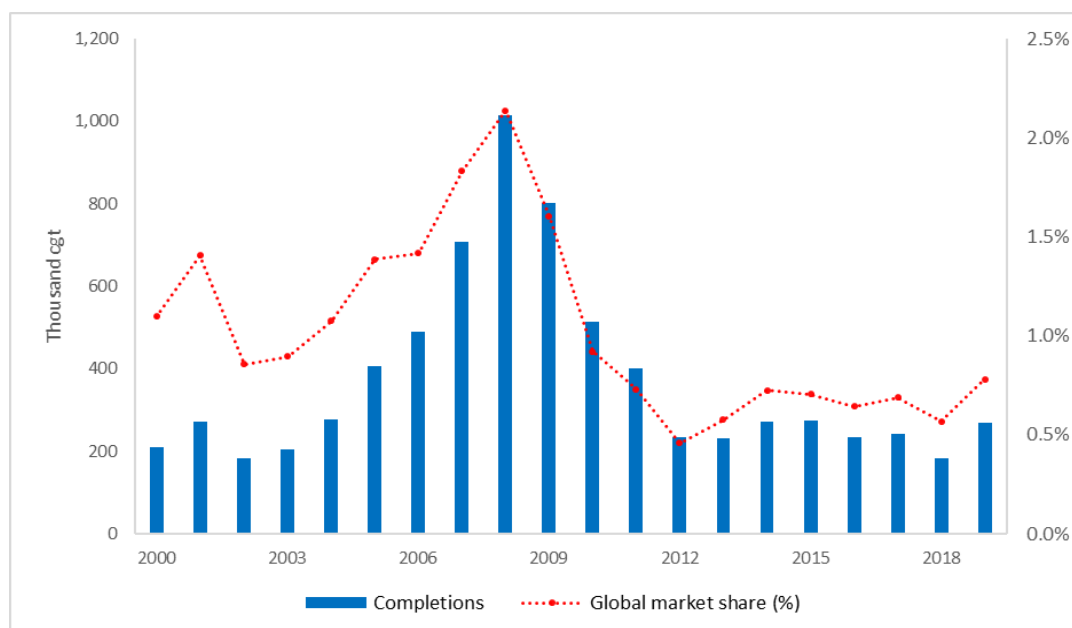
Turkey has been a fast growing economy during recent decades with an average GDP growth rate of nearly 7% over 2010-2017. This performance has been driven by policy stimulus and a dynamic, well-diversified, yet fragmented business sector (OECD 2018). The Turkish economy has however slowed down since 2018 with GDP growth reaching 2.8 % in 2018 and 0.9% in 2019. In the context of the COVID-19 crisis, according to the OECD Economic Outlook released in September 2020, Turkey's real GDP is expected to decrease by 2.9% in 2020, depending on the developments of the pandemic.

Turkey is among the world's leading producers of agricultural products and holds a strong position in a variety of manufacturing sectors, including textiles and clothing, motor vehicles, steel, consumer electronics and shipbuilding. In 2019, the shipbuilding sector's exports amounted to USD 1.02 billion, accounting for 0.6% of total Turkish exports (TMTI Questionnaire, 2020).

During the 2000s, the Turkish shipbuilding industry witnessed substantial growth, driven by dynamic financing by local banks and economic stability. Turkish shipyards focused notably on building relatively small oil and chemical tankers during this period.

In 2008, the Global Financial Crisis (GFC), which led to a global recession and a drop in the oil price, weighed on the traditional ship markets for Turkish shipyards. The GFC combined with price competition from Asian shipbuilding giants led Turkish shipbuilding groups seek for new areas of specialisation. Thus, Turkish shipbuilding groups began to re-orient their main activities into ship repair, ship scrapping, and the building of ships for niche markets. In 2012, the managing director of Besiktas Group told Lloyd's List that "*We see the future of Turkey in specialized ships such as offshore vessels and small sophisticated ships*"¹.

In 2019, Turkey was the 11th largest global shipbuilding economy in terms of seagoing vessel completions which amounted to 268 578 compensated gross tonnes (CGT). Turkey's global market share in terms of seagoing vessel completions peaked at 2.1% in 2008. As many other European shipbuilding economies, Turkey's global market share decreased sharply after the global financial crisis to 0.5 % in 2012 because of the fast development of the shipbuilding industries in several Asian countries, but rebounded to 0.8% in 2019.

Figure 1. Completions in CGT and global market shares by Turkey, 2000-2019

Note: This Figure includes all seagoing vessels from 100 GT.

Source: OECD calculations based on Clarkson Research Services Limited (March 2020), World Fleet Register, <https://www.clarksons.net/wfr>.

Turkish shipyards have been producing a variety of vessel types over the last ten years, including trawlers, fishing vessels, tankers, tugs, cruise/passenger ferries, dry cargo ships, offshore service vessels, bulk carriers, fully cellular containers (FCC), gas carriers and roll-on/roll-off (Ro-Ro) vessels. Between 2010 and 2019, Turkey accounted for 1.4% of the global production of tankers in CGT terms, 5.5% of the global production of tugs and 2.1% of the global production of cruises/passenger ferries.

Table 1. Completions of seagoing vessels by builder country and by ship type in the world and in Turkey, 2010-2019

Ship type	World	Turkey	
	CGT('000)	CGT('000)	Percentage (%) of Total
Tanker	86 828	1 204	1.4
Tug	9 351	513	5.5
Cruise/passenger ferries	18 302	391	2.1
Other dry cargo	15 574	214	1.4
Offshore Service	20 899	189	0.9
Bulk carrier	133 964	157	0.1
FCC (Fully Cellular Container)	66 930	80	0.1
Gas carrier	33 577	54	0.2
Ro-ro (roll-on/roll-off)	3 580	13	0.4

Note: This Table includes all seagoing vessels from 100 GT and is based on builder country.

Source: OECD calculations based on Clarkson Research Services Limited (March 2020), World Fleet Register, <https://www.clarksons.net/wfr>.

4. Structure and characteristics of the Turkish shipbuilding industry

4.1. The Turkish shipbuilding industry

Turkey has a shipbuilding tradition of over 600 years. Indeed, the first shipyard was established in 1390 during the Ottoman reign. Following the foundation of the Republic of Turkey in 1923, shipyards were given a special interest and underwent a process of modernisation.

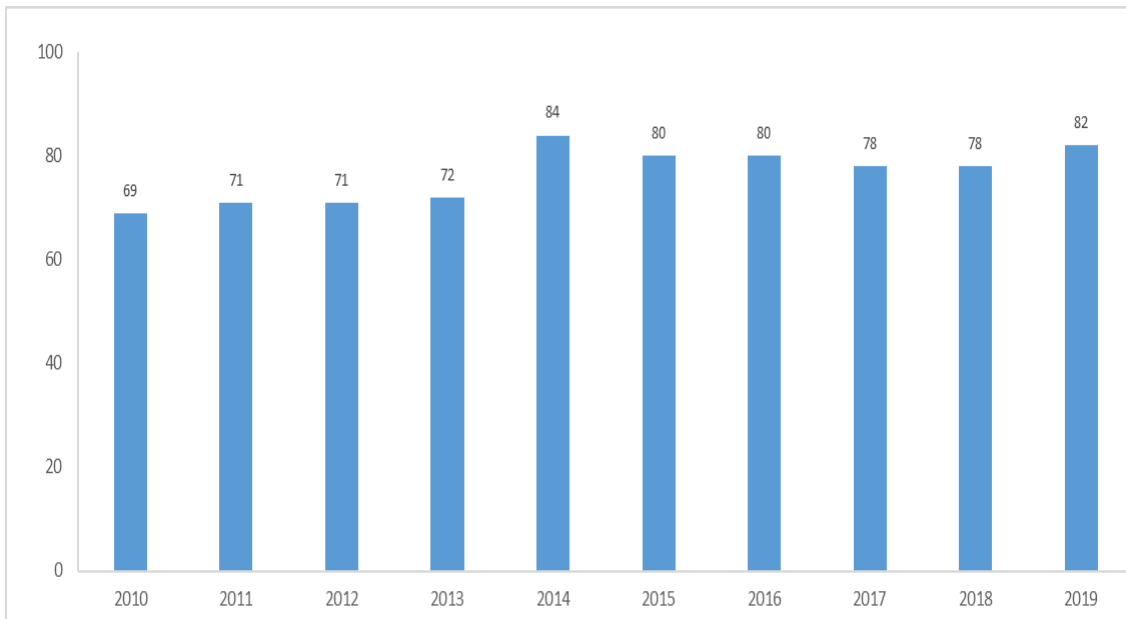
More recently, the weaker demand in the global shipbuilding market after the global financial crisis has significantly affected the Turkish shipbuilding industry. For example, the direct employment in Turkish shipyards decreased by 44% in 2009 compared to 2008. While Turkish shipbuilding focused on the market of small to mid-sized commercial vessels, the sharp decline in new orders since 2009 called for a change in the organisation of Turkish shipyards. In the decade starting in 2010, the Turkish shipyards showed their flexibility in response to the changing market conditions. They diversified their activities into ship repair and maintenance as well as naval projects. Some shipbuilding facilities have built steel decks for the 3rd Bosphorus Bridge.

In addition, yacht building is another important production area of Turkish shipyards. In recent years, Turkey has shown big progress in building boats and yachts and Turkey has become one of the world's leading mega-yacht building countries.

4.1.1. Structure of the industry

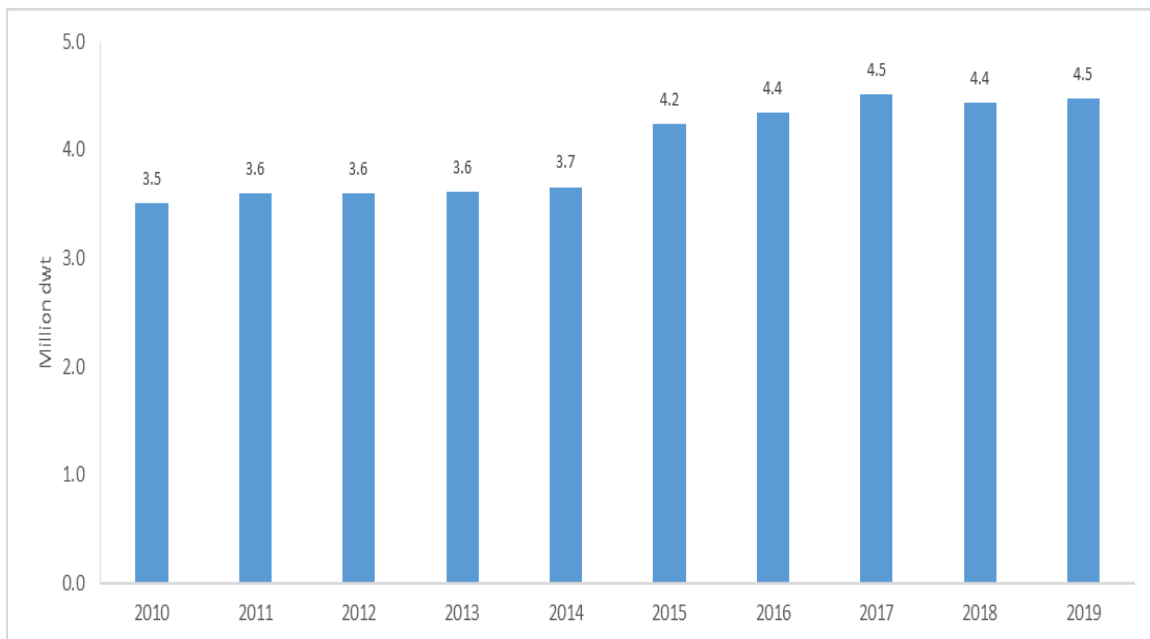
Despite the downturn of the global shipbuilding market since 2009, the number of operating shipyards in Turkey has slightly increased from 69 in 2010 to 82 in 2019 (Figure 2). Turkey's shipbuilding capacity has also been steadily increasing since 2010, reaching 4.5 million Deadweight Tonnage (DWT) in 2019 (Figure 3). Turkish shipyards encompass a total of 10 dry docks and 32 floating docks as of 2019 (Table 2).

Figure 2. Number of operating shipyards in Turkey, 2010-2019



Source: GISBIR (Turkish Shipbuilders' Association).

Figure 3. Total capacity of operating shipyards in Turkey, 2010-2019



Source: TMTI Questionnaire, 2020.

Table 2. Building docks in Turkish shipyards

Year	Floating dock	Dry dock
2003	11	4
2008	15	7
2019	32	10

Source: GISBIR (Turkish Shipbuilders' Association).

All commercial shipyards in Turkey are privately-owned. The Turkish shipbuilding industry is open to foreign participation and investment. However, the Secretariat did not find evidence of substantial foreign investments in Turkish shipyards, except for Damen Shipyards Anatalya.

Turkish shipyards were mostly located around the Bosphorus and Golden Horn area until 1969, i.e. when they began to move to Tuzla Shipyard Region. The epicentre of shipbuilding activities in Turkey was indeed Tuzla Bay, situated 50 kilometres east of Istanbul. However, as the dense Tuzla area could no longer offer suitable places to set up new yards, some entrepreneurs settled on nearby inland locations, such as Yalova-Altinova and Izmit. In particular, some enterprises in these nearby facilities specialise in the manufacturing of individual hull blocks that are then transported to other shipyards, where they are assembled. In addition, the industry has recently been expanding beyond its traditional locations throughout Turkey including the Black Sea and the Mediterranean Regions and diversifying into new market segments (OECD, 2011).

The shipyards are supported by a marine equipment industry and research facilities that are centred around the shipyard locations, mainly in Istanbul.

The main shipyards in Turkey are listed in Table 3. The largest shipyards are located in the Tuzla area, with a maximum annual shipbuilding capacity of 650 000 DWT. The construction capacities of all operating yards in Turkey are shown in Annex A.

Table 3. Turkish shipyards with annual capacity of over 100 000 DWT

Shipyard Name	Location	Main field of operation	Annual Capacity (Thousand dwt)
SEDEF Shipyard	İstanbul	construction	650
GEMAK Shipyard	Yalova	construction	250
HAT-SAN Shipyard	Yalova	construction	250
ALTINTAS Shipyard	Yalova	construction	210
ALTINOVA Yacht Builders*	Yalova	construction & repair	200
ICDAS Shipyard	Çanakkale	construction	165
NUR Shipyard	Trabzon	construction	150
TGE Shipyard	Istanbul	repair	110
GELIBOLU Shipyard	Çanakkale	construction & repair	108
TERSAN Shipyard	Yalova	construction & repair	100

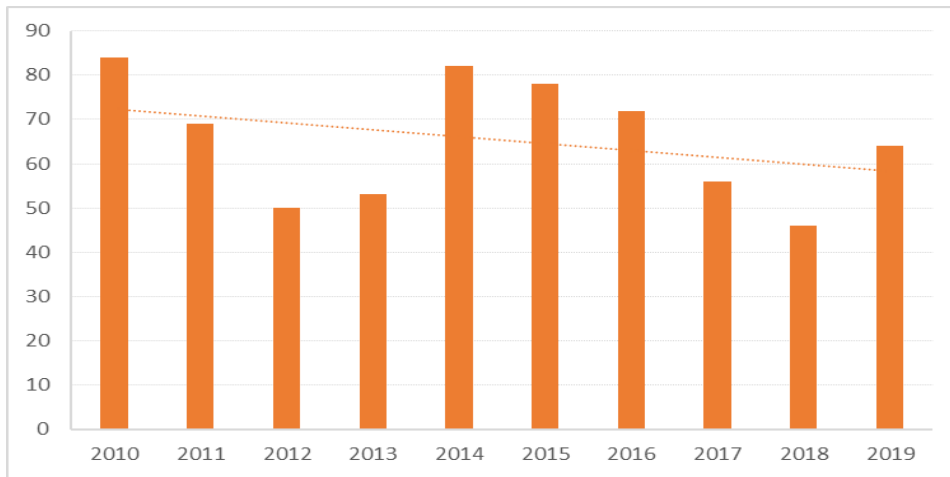
Note: * Industrial site for yacht builders

Source: TMTI Questionnaire, 2020.

4.1.2. Production and orders

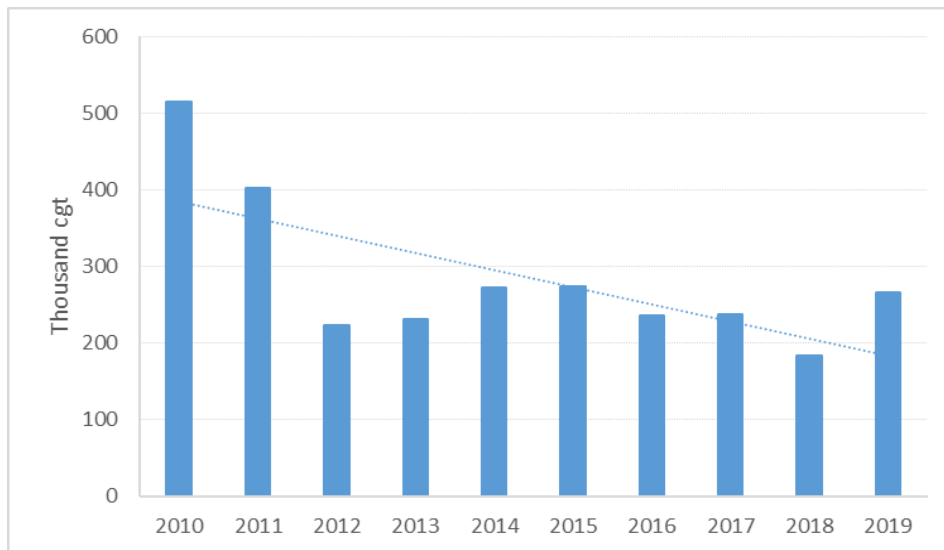
Over the past decade, an average per year of 65 seagoing vessels above 100 GT have been built by Turkish shipyards. The number of seagoing vessels built at Turkish shipyards has been oriented slightly downwards since 2014 (Figure 4). In terms of ship completions in CGT, the production of new seagoing vessels decreased by more than half from 514 743 in 2010 to 222 870 in 2012 and has fluctuated between about 180 000 and 270 000 since 2013 (Figure 5). The number of ships built dropped less quickly than the tonnage completed, showing that Turkish yards gradually focused on smaller vessels.

Figure 4. Number of seagoing vessels built in Turkey, 2010-2019



Note: This Figure includes all seagoing vessels from 100 GT.
 Source: OECD calculations based on Clarkson Research Services Limited (March 2020), World Fleet Register, <https://www.clarksons.net/wfr>.

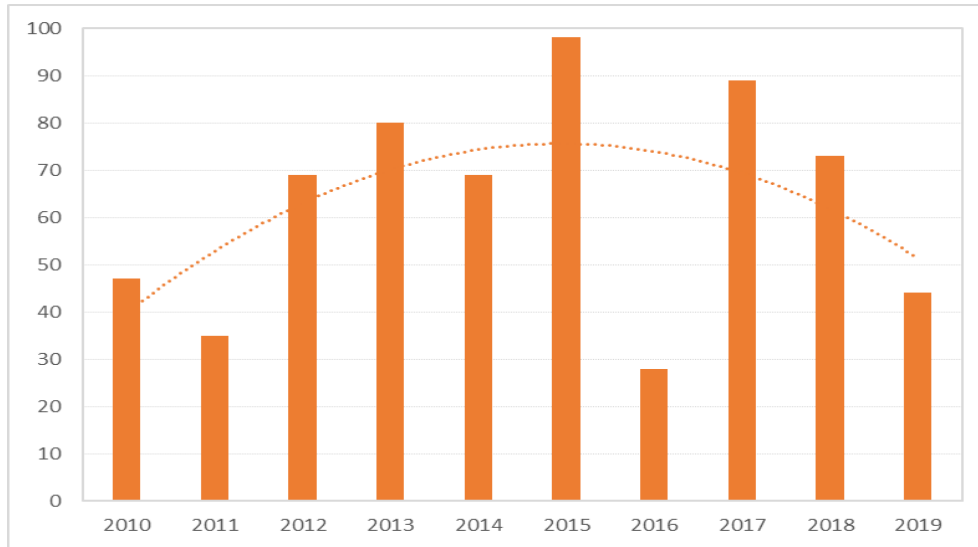
Figure 5. Completions of seagoing vessels by Turkish yards in terms of CGT, 2010-2019



Note: This Figure includes all seagoing vessels from 100 GT.
 Source: OECD calculations based on Clarkson Research Services Limited (March 2020), World Fleet Register, <https://www.clarksons.net/wfr>.

Over the last decade, new orders for Turkish shipyards have been volatile in response to the developments in the global shipbuilding market (Figure 6 and Figure 7). Between 2010 and 2015, the number and the size of new contracts have showed an upward trend, reaching a peak at 98 new orders (311 430 CGT) in 2015 and then plunged to 20 (119 355 CGT) in 2016, reflecting a drop of global new orders in 2016. New orders received by Turkish shipyards rebounded in 2017 but have been oriented downwards since 2017 in terms of number of ships.

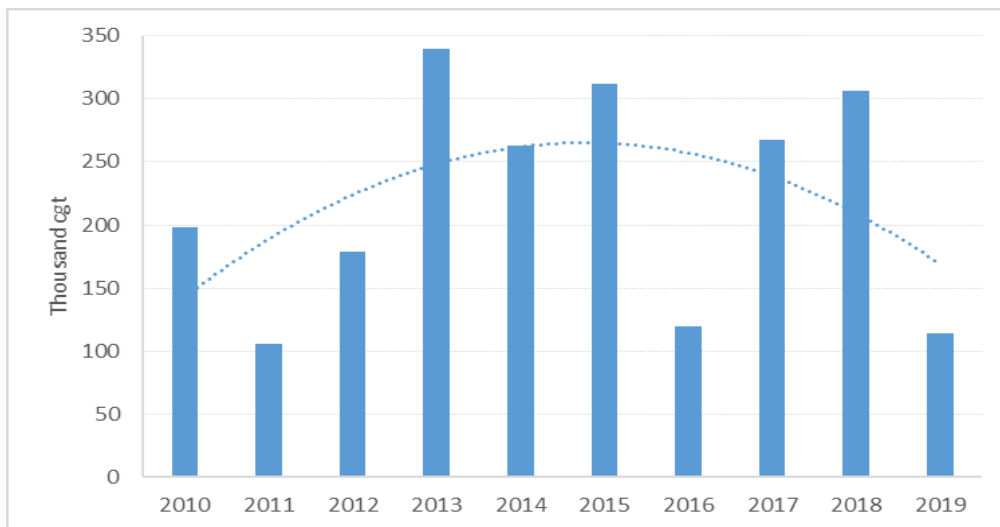
Figure 6. Number of new contracts in Turkish shipyards, 2010-2019



Note: This Figure includes all seagoing vessels from 100 GT.

Source: OECD calculations based on Clarkson Research Services Limited (March 2020), World Fleet Register, <https://www.clarksons.net/wfr>.

Figure 7. New contracts in terms of CGT, 2010-2019



Note: This Figure includes all seagoing vessels from 100 GT.

Source: OECD calculations based on Clarkson Research Services Limited (March 2020), World Fleet Register, <https://www.clarksons.net/wfr>.

In the latest order book, Turkish shipyards have 151 vessels on order. Tugboats dominate the order book, accounting for 70% of the total number of vessels in the order book and 37% of total CGT. In addition to tugboats, passenger ferries, chemical tankers and power ships make up the order book of Turkish shipyards.

Table 4. Order book at Turkish shipyards as of July 2020

Ship type	Number of vessels	CGT
Tugs	107	185 089
Passenger ferries	20	168 474
Chemical & oil tankers	5	41 704
Power ships	4	35 224
Others	15	62 127
Total	151	492 618

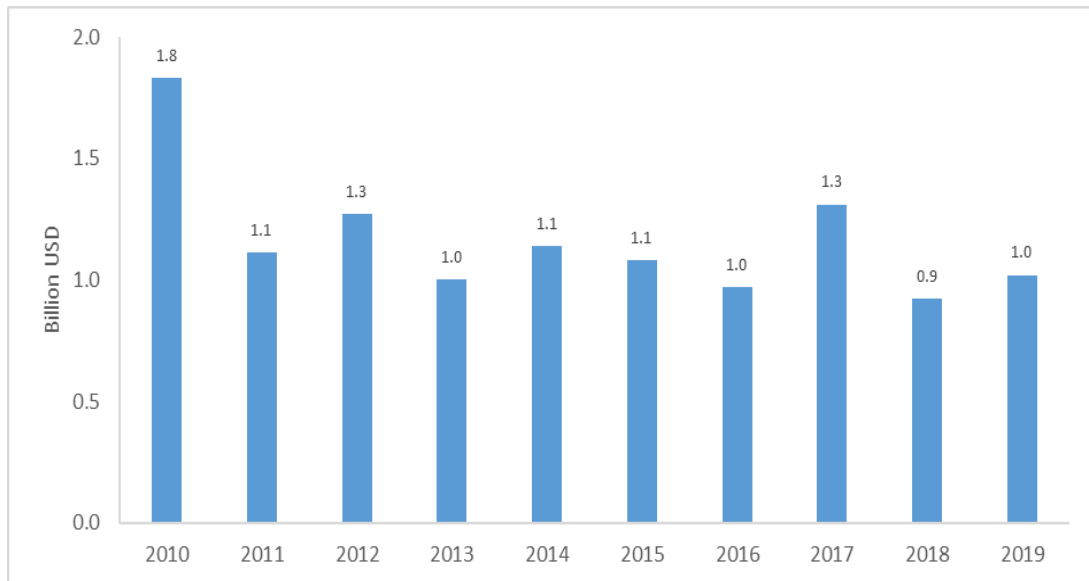
Note: This Figure includes all seagoing vessels from 100 GT.

Source: OECD calculations based on Clarkson Research Services Limited (July 2020), World Fleet Register, <https://www.clarksons.net/wfr>.

For instance, Tersan shipyard shifted its production from chemical tankers to high-tech LNG-propelled fishing vessels and battery-powered passenger ships.² Ares Shipyard focused on the production of military vessels and crafts. In 2020, the Turkish government ordered 122 new ships for its coast guards at Ares shipyard, which previously also exported similar ships to Qatar.

Sanmar Shipyard shifted to the production of innovative tugboats and was successful in attracting numerous orders for export markets. Sefine Shipyard also moved to niche ship markets including ferries (some being LNG fuelled) and live-fish carriers –sectors, which are less volatile. Sefine yard’s general manager stated that “*We are not a mass-production brand. We are a boutique brand. [...] We realized that there are some niche markets in the world that never stop, like ferries, and we spent all out efforts to enter them*”.³

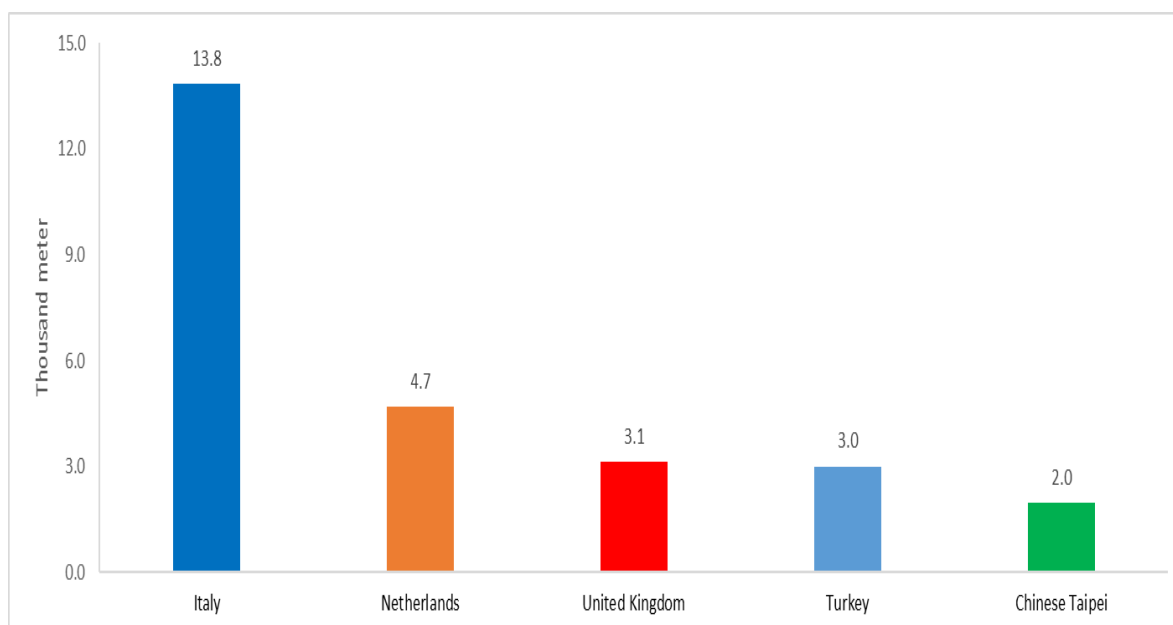
In recent years, Turkish shipyards’ revenue has reached approximately USD 2.5 billion per year thanks to large investments over the last 15 to 20 years.⁴ After a sharp decline from USD 1.93 billion in 2010 to USD 1.11 billion in 2011, exports of Turkish shipyards amounted to around USD 1 billion per year in the following years (Figure 8). In 2019, Turkish yards exported USD 1.02 billion, accounting for 0.6% of total Turkish exports.

Figure 8. Exports of new built ships by Turkish shipyards, 2010-2019

Source: GISBIR (Turkish shipbuilders' association).

4.1.3. Yacht building

Since 2000, the yacht building industry has been expanding in Turkey. A long coastline with world-class tourism resources along with a long track record, trained workforce and an affordable cost structure offer Turkish yacht builders a competitive advantage. Turkish yacht builders are concentrated in Istanbul and in the Southern Mediterranean coast, notably in the Antalya Free Trade Zone⁵, and perform the construction, repair and refit of motor yachts as well as sailing yachts. Recently, Turkish order book ranks the 4th in the world, measured in meters of length (Figure 9). Table 5 provides examples of yacht builders in Turkey.

Figure 9. Global order book of yacht as of February 2019

Source: Maritime sector report 2019, Turkish Chamber of Shipping.

Table 5. Examples of yacht builders in Turkey

Company	Overview
Mengi Yay Yachts (https://www.mengiyay.com)	Located in Tuzla Shipyard Zone, Mengi Yay Yachts is one of the leading yacht manufacturers in the sector. The shipyard is known for the wooden, steel & aluminium luxury motor and sailing yachts production. Established 56 years ago, this yard has built 200 yachts with 4290 m of total length so far.
Ursa Shipyards (https://www.ursashipyard.com)	Founded in 1983, it is located in Istanbul. Over the last ten years, it has built more than 25 yachts up to 72 m in length. The onsite facilities with total shipyard area of 30 000 m ² cater to all areas of yacht construction and refitting needs for yachts up to 100 m LOA.
Turquoise Yachts (http://www.turquoiseyachts.com)	Headquartered in Istanbul, Turquoise Yachts has two shipyards one in Pendik (25 000 m ²) capable of accommodating 8 yachts of up to 85m simultaneously and the other in Kocaeli (50 000 m ²) has a 120 m dock. Starting from its establishment in 1997, it has delivered 20 mega yachts ranging from 40 to 77 m in length to clients from USA, UK, Europe and Russia. It provides repair-maintenance and refit services as well as rebuilds.
Ege Yat (https://www.egeyat.com)	Ege Yat, formerly name as "Üstündağ Marin", was established in 1994. It produces sail yachts and motor yachts of 16 different sizes ranging between 5m and 16m.
Sarp Yachts (https://www.sarpyachts.com)	Founded in 2009, Sarp Yachts has a 10 000 m ² facility in the free zone of Antalya. It can accommodate new construction and refit of luxury motor and sailing yachts up to 80 m in length.

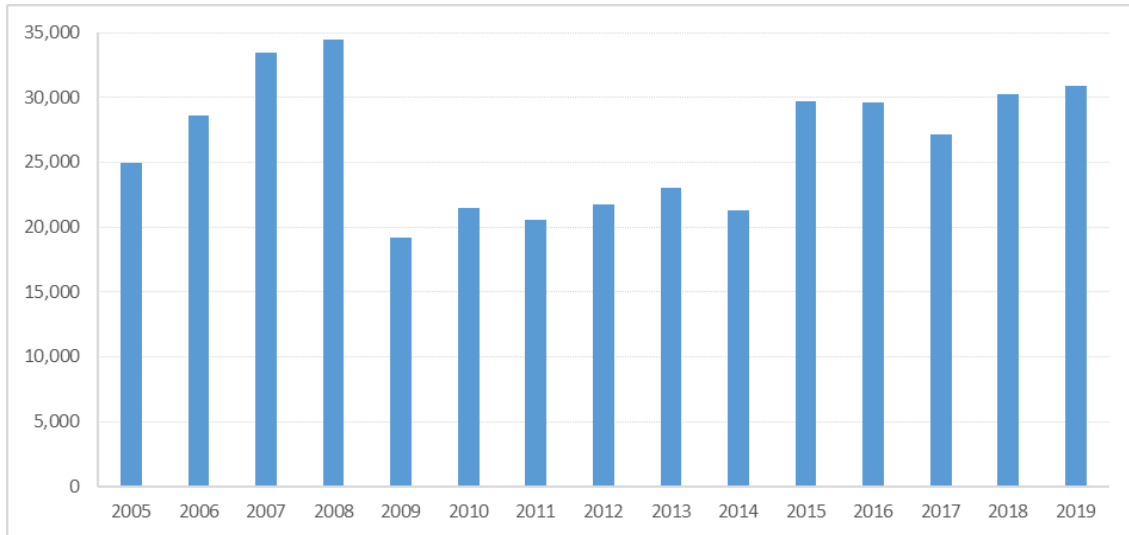
Source: TMTI Questionnaire, 2020 and websites of companies.

4.1.4. Employment and Skills

The number of workers employed by Turkish shipbuilders peaked at 34 500 in 2008. However, due to the impact of the global financial crisis, it dropped to 19 719 in 2009.

Since then, employment in Turkish shipyards has gradually recovered and the number of employees reached 30 910 in 2019 (Figure 10).

Figure 10. Direct employment in Turkish shipyards, 2005-2019



Source: TMTI Questionnaire, 2020.

In Turkey, professional education in the field of shipbuilding began with the establishment of the Ottoman Imperial Naval Engineering Faculty in Istanbul. There are currently four universities with shipbuilding departments: Istanbul Technical University (Istanbul), Yildiz Technical University (Istanbul), Piri Reis University (Istanbul) and Karadeniz Technical University (Trabzon). Approximately 400 students graduate annually with a bachelor's degree in shipbuilding from those four universities. Besides, there are six vocational schools with two-year associate programmes and over seventy vocational high schools. According to the Turkish shipbuilders' association, those schools provide sufficient numbers of skilled personnel for Turkish shipyards. More broadly, the young workforce in Turkey is quite large. Turkish shipyards employ a significant number of graduates yearly and no open positions are reported. Shipbuilding related vocational high school graduates are also employed in other sectors, in addition to the shipbuilding industry.

4.2. Maritime equipment industry

Marine equipment suppliers do not only supply inputs to shipyards but also conduct maintenance works. In parallel with the growth of the shipbuilding industry, the Turkish marine equipment industry moved up the value chain in recent years. Turkish manufacturers are active on mid-level tech segments of shipbuilding, such as deck equipment, electrical equipment and cables, hydraulic units, ship chains and anchors. Turkish shipyards are still dependent on foreign suppliers for some sophisticated and high technology items such as main engines and telecommunication systems.

Table 6. Main items produced in Turkey and imported from abroad

Production in Turkey	Imported from abroad
· Steel cast material	· Steel sheets and profiles
· Welding and cutting equipment	· Navigation devices
· Diesel generator	· Communication devices
· Deck machinery	· Propellers
· Boilers and compressors	· Bow and stern thrusters
· Valves, piping, and pumps	
· Ventilation systems	
· Electrical equipment and cabling	
· Hatch doors	
· Doors, windows, scuttles and woodwork	

Source: TMTI Questionnaire, 2020.

In Turkey, the marine equipment industry is one of the sectors with the highest potential in terms of employment. The workforce employed by this industry considerably exceeds that of the shipbuilding industry itself. The number of employees in the marine equipment industry reached 103,500 in 2008, increasing sharply from 30 000 in 2002. However, after the global financial crisis the employment has declined sharply, reaching 62 256 at the end of 2011. By the end of 2018, it was estimated that about 60 000 people worked in the Turkish marine equipment industry.

According to Mr. Cahit Turhan, Turkey's previous Minister of Transportation and Infrastructure, the turnover of the Turkish maritime sector which includes notably shipbuilding, marine equipment, shipping and ports, amounted to USD 17.5 billion in 2019 and the maritime cluster employed one million people.⁶

4.3. Repair and recycling activities

4.3.1. Repair and Maintenance

Turkish smaller yards tend to be multipurpose, offering conversion, repair and maintenance services as well as being engaged in the building of new ships. This multipurpose approach facilitates the provision of repair and maintenance services for international and domestic ship owners, and can assist the yards themselves, as conversion, repair and maintenance activities can keep facilities in use even if there is a fall in the number of orders received for new vessels (OECD, 2011).

The repair and maintenance activities in Turkish shipyards has been increasing from 10.7 million DWT in 2010 to 21.5 million DWT in 2019 (Figure 11). Turkish shipyards have the capability to carry out a variety of ship conversion projects. For example, more than ten

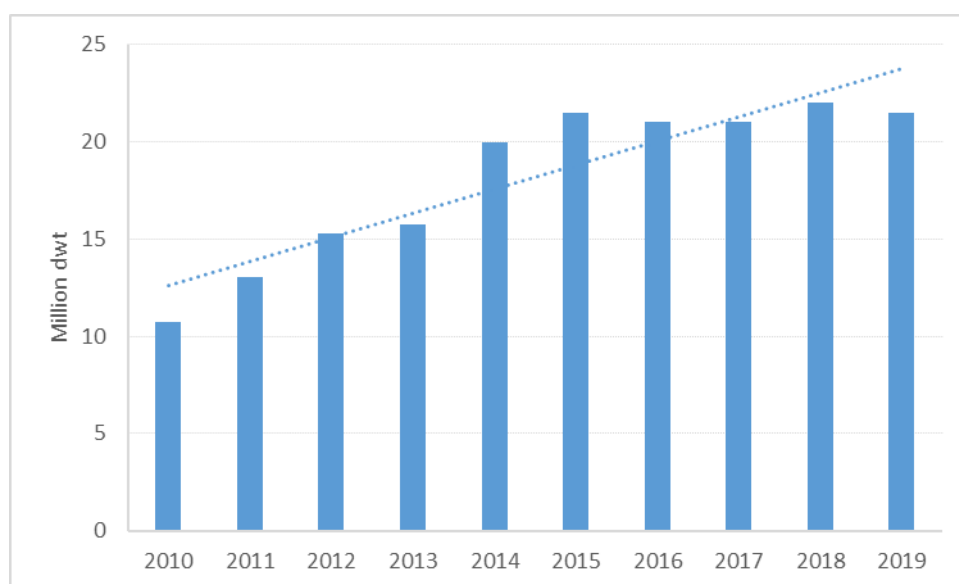
vessels have been converted from dry cargos to power ships in Turkish shipyards since 2015.

In 2019, Turkish president Recep Tayyip Erdogan stated that around 2000 vessels were being repaired and renovated at Turkish shipyards in Tuzla Bay, the biggest Turkish shipbuilding cluster⁷.

Besiktas Shipyard is an example of a Turkish shipyard that has gained expertise in ship repair and maintenance. The Besiktas Shipyard was the busiest yard for ship repair in 2018, according to Clarkson. This was particularly driven by international maritime environmental regulations, as ship owners started to install scrubbers or fit their ballast water treatment to the newest international regulations. Currently, Besiktas repairs about 200 ships per year at three docks⁸.

Sefine Shipyard also developed its ship-conversion and ship repair activities. Sefine shipyard's general manager underlined that *"there's huge demand [for ship repair], not just for us, for all the area and Turkish business"*. Sefine yard even installed a floating dock for vessels up to Aframax size, increasing its ship repair capacity⁹.

Figure 11. Repair and Maintenance activities of Turkish shipyards, 2010-2019



Source: GISBR (Turkish Shipbuilder's Association).

4.3.2. Ship Recycling

Turkish ship scrapping yards enjoy an advantageous geographical location with its proximity to Europe: ship owners can send their ship for scrap in Turkish yards as they discharge their last cargoes in European ports. Turkish yards also enjoy an advantageous location for oil rigs-scrapping compared to yards on the Indian subcontinent: they are closer to the North Sea, the Gulf of Mexico, and to Brazil¹⁰.

Turkish yards have gained experience in scrapping all types of ships, from typical bulkers to larger floating storage and offloading units, drill rigs, and aircraft carriers. Oil majors such as Shell or Chevron, shipping giants such as CMA CGM or AP Moller-Maersk, naval forces such as the British Navy have all scrapped their obsolete ships at Turkish yards¹¹.

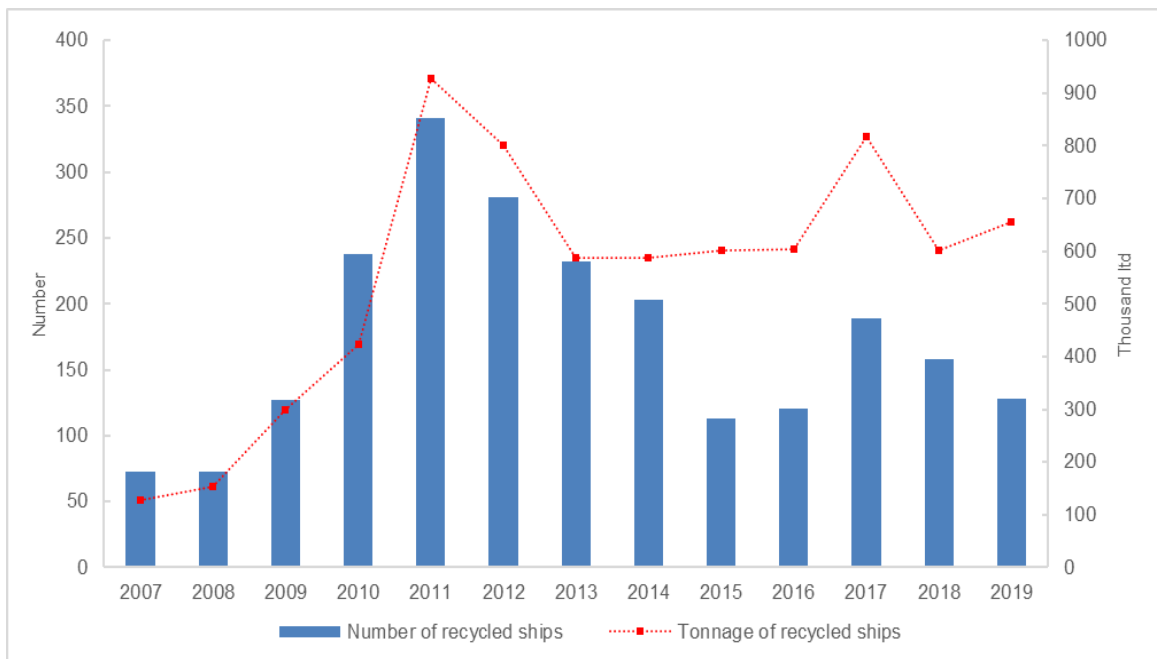
Increased pressure on the tourism industry during to the COVID-19 pandemic led shipowners to downsize fleets and to dispose older vessels. Five hulking cruise ships from Britain, Italy and the United States are currently being dismantled at Turkish yards, increasing the scope of Turkish ship recycling activities.¹²

Moreover, some ships that are considered too small by scrap shipyards on the Indian sub-continent have been allocated to Turkish shipyards for scrapping. Thus, Turkish recyclers have received a great number of ships between 4 000 to 10 000 lightweight, something unusual in previous years¹³.

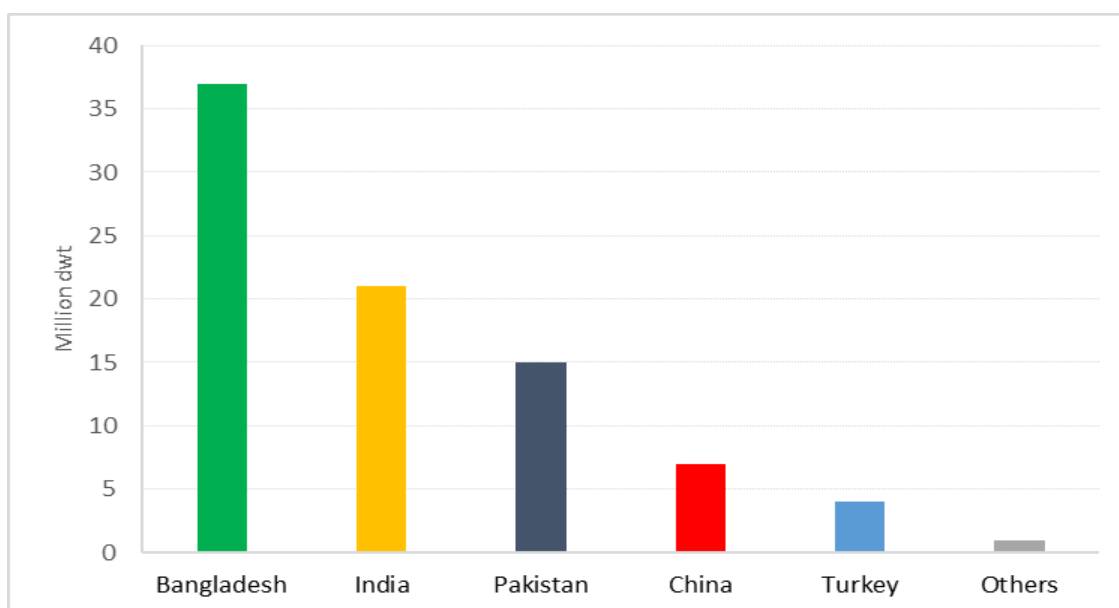
Turkish main ship recycling area is Aliaga, which is located at about 50 km north of Izmir. Twenty-three Ship recycling facilities with an aggregated annual capacity of 1 million Light Displacement Tonnes (LDT) are located there. Aliaga is part of an Organized Industrial Zone, where companies operate in a designed investor-friendly environment with ready-to-use infrastructure.¹⁴

The recycling facilities in Turkey benefited from the 2008 GFC. Ship owners around the world, including those in Turkey, opted to recycle some of their older vessels rather than laying them up when demand for shipping services fell dramatically in 2008 and 2009 (OECD 2011). In the period from 2008 to 2011, Turkish ship recycle activities have increased six fold on LTD basis (Figure 12). Turkey is one of the five main ship recycling countries including Bangladesh, India, Pakistan and China. Based on the seagoing vessels over 100 GT for the last three years (2017-2019), a total of 392 vessels (3.6 million DWT) were dismantled in Turkey (Figure 13). It accounts for 4.3% of the DWT recycled globally.

Figure 12. Ship recycling activities in Turkey, 2007-2019



Source: TMTI Questionnaire, 2020.

Figure 13. Ship scrapping by countries of demolition, 2017-2019

Note: This Figure includes all seagoing vessels from 100 GT.

Source: OECD calculations based on Clarksons Research Services Limited 2020, *World Fleet Register*, <https://www.clarksons.net/wfr>.

These recycling activities also fit in well with the Turkish steel industry, which is a comparatively heavy user of scrap steel. This scrap steel is re-melted in electric arc furnaces and is re-used for construction and other purposes, including new shipbuilding projects (OECD, 2011). In 2015, Turkey consumed 24.1 million tons of scrap steel, of which 16.25 million tons were imported from the European Union (EU), the United States (USA) and the Commonwealth of Independent States (CIS)¹⁵.

Turkish ship-scraping yards also strive to respect strict international safety and environmental regulations about ship-scraping and ship-recycling. Most yards adhere to standards from the International Maritime Organisation (IMO), the International Labour Organisation (ILO) and the Basel Convention on the Control of Transboundary Movements of Hazardous Waste and Their Disposal.¹⁶ In 2019, Turkey became the first of the world's five major ship recycling countries to ratify the International Maritime Organization's Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships¹⁷.

Turkish shipyards have developed an expertise in safer and greener ship recycling and scrapping¹⁸. In December 2018, the European Union introduced a stricter EU Ship Recycling Regulation¹⁹, imposing European-flagged vessels to be recycled at approved facilities²⁰. Several Turkish shipyards have received approval from the European Union for respecting the EU Ship Recycling Regulation²¹, enhancing their competitiveness vis-à-vis their Southeast Asian counterparts.²² In order to be included in the EU list, shipyards are subject to on-site assessments regarding their environmental and social performance.²³ Several Turkish shipyards received approval from the European Union for respecting the EU Ship Recycling Regulation²⁴, enhancing their competitiveness vis-à-vis their Southeast Asian counterparts.

Compliance with international environmental and social standards in ship recycling could become a decisive competitive factor in the future. A number of ship owning companies make efforts to increase their environmental responsiveness, including greater transparency in the final disposal of ships.²⁵ According to a large cruise ship owner, adherence to global standards and international conventions are an important prerequisite for the company to choose its ship recycling destination. Two retired cruise ships of the company are to be dismantled in Turkey.²⁶

In 2019, Turkey became the first of the world's five major ship recycling countries to ratify the International Maritime Organization's Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships²⁷.

Optimising industry practices, such as the improvement of the landing method to continually minimize the environmental impact is an important challenge for the Turkish ship scrapping industry. In this vein, the Turkish Ship Recyclers Association engages with Non-Governmental Organisations (NGOs) and local labour rights organisations to increase adherence to health and safety standards across the industry.²⁸

4.4. Competitiveness of the Turkish shipbuilding industry

Table 7 describes selected key strengths, opportunities, weaknesses, and threats (SWOT) of the Turkish shipbuilding industry on the basis of data and analyses mentioned in the previous sections of this report.

After the GFC, Turkish shipyards have showed flexibility to adjust to new market conditions. With the significant decline in new construction demands worldwide, they focused on tailor-made ships, notably for European buyers. They have established a strong position in some niche markets such as small chemical tankers, tugboats and superyachts. In addition to the production of vessels, the Turkish shipbuilding industry is also active in the fields of repair and maintenance, conversion and recycling.

A number of major shipbuilding countries struggles with access to skilled labour. Korean, Japanese and most European shipbuilders for example are facing the problem of an ageing workforce. This appears not to be an issue for Turkish shipyards because of its high skilled labour force, including well-trained naval architects.

The relatively small size of Turkish shipyards can be seen as a weakness, as compared to Asian competitors. Several Turkish shipbuilders benefit less from economies of scale than companies with larger capacities. On the contrary, a smaller size can be an advantage for building specialised vessels because these company can quickly adapt to innovations and customers' needs.

Localisation of high technology components in shipbuilding through R&D capability enhancement remains a challenge for the Turkish shipbuilding industry.

As it is the case for all shipyards worldwide, the recent sharp decline in shipbuilding orders in 2020 linked to the COVID-19 pandemic poses a threat to the Turkish shipbuilding industry. According to Clarksons research, global ship orders and deliveries decreased by around 50% and 20%, respectively, in the first half of 2020 compared to the same period in 2019.

On the other hand, there are opportunities for Turkish shipbuilders and marine equipment suppliers, as demand for eco-friendly ships and retrofitting ships with green technologies increases, notably driven by the reinforcement of environmental regulations. In the 11th Development Plan (2019-2023), the Turkish government focused on green and innovative ships to improve the competitiveness of Turkish shipbuilding industry. With the guidance

of the Turkish government, intense cooperation between marine equipment suppliers and shipbuilders could be a key factor to obtain a significant market share in the green shipbuilding market. Increasing demand for luxury yachts, especially in China²⁹, is another opportunity for Turkish yacht builders.

Table 7. SWOT analysis of Turkish shipbuilding industry

Strengths	Weaknesses
<ul style="list-style-type: none"> · Geographical location between Europe and Asia · Enough high skilled labour force including well trained naval architects · World-wide recognition in small tonnage ships (small chemical tankers, tugs, mega yachts) · Shipyards flexibly responding to market conditions (shift to other ship types and reorientation to ship repair & conversion) 	<ul style="list-style-type: none"> · Relatively smaller shipyards, compared to selected competitors · Maritime equipment industry focused on low- and mid-end technology
Opportunities	Threats
<ul style="list-style-type: none"> · Increasing demand for greener ships · Increasing demand for luxury yachts worldwide 	<ul style="list-style-type: none"> · Risk of market downturn and of rising protectionism, notably in the context of the COVID-19 crisis

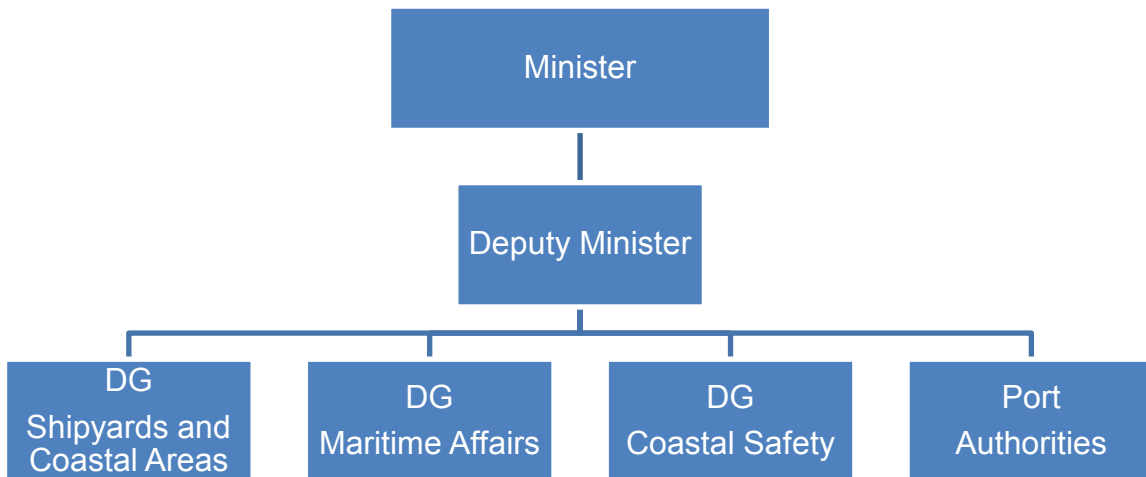
5. Government policies affecting the shipbuilding industry

5.1. Government policy

5.1.1. Government structure

From 2020, the Turkish commercial shipbuilding industry falls under the responsibility of the Directorate General of Shipyards and Coastal Areas, which is part of the Ministry of Transportation and Infrastructure³⁰. This division is in charge of coordinating the Turkish policies regarding the shipbuilding industry. It is involved in the licensing of shipyard operations, marine industry related matters, and newbuild vessels.

Figure 14. Ministry of Transportation and Infrastructure



Source: OECD, based on the website of the Turkish Ministry of Transport and other public sources

In addition, the Ministry of Industry and Technology³¹ deals with policies related to R&D and the promotion of innovation. Under its umbrella, DENİZ-TEK (i.e. the Marine Technologies and Industry Technical Committee) was established in December 2019. It is composed of maritime industry representatives from the public and private sector.

The Committee plays an advisory role to identify sectoral problems regarding marine technologies in order to improve the added value and the productivity of the shipbuilding and ship supply industries³², and to realise high value added export targets. More concretely, DENİZ-TEK covers the following list of tasks:

- advising on international cooperation for the development of the maritime sector,
- identifying bottlenecks and proposing solutions to solve them,
- drafting opinions about the issuing of strategies for the future of marine technologies and the ship supply industry,
- drafting suggestions for university-industry collaboration in the fields of ship and marine technologies and the marine equipment industry.

While fulfilling its tasks, DENİZ-TEK endeavours to create a culture of innovation among the different actors of the Turkish shipbuilding industry.

5.1.2. Shipbuilding strategy

In general, the Turkish government takes a relatively non-interventionist approach to shipbuilding, although it produces regular economic “Development Plans”. These Plans encompass a certain degree of support to R&D and innovation activities for high technology and environmental protection.

The Turkish government deploys these development plans to guide the country’s longer-term direction. The current Development Plan is the 11th of its kind and runs from 2019 until 2023³³. This plan is designed as the first part of a broader fifteen-year perspective.

The Development Plan refers to a changing international order (e.g. trade tensions and rising protectionism) and envisions the political, economic and financial risks that this entails. The Plan acknowledges that within this challenging context Turkey needs to engage in development process planning. Overall, the Development Plan aims to transform the Turkish economy by funnelling social and economic resources into more productive sectors for the medium and longer-term.

The Plan states that this is required to maintain Turkey’s competitiveness, stability and sustainability in the longer-term and to realise the ultimate vision of becoming a *‘stronger and more prosperous Turkey that produces more value and shares more fairly.’* An essential feature of the plan’s objectives relates to a boost in human capital and productivity by leveraging breakthroughs in the fields of technology and innovation. The Plan also mentions target employment ratios of R&D personnel in the private sector by 2023.

To achieve the Development Plan’s broader set of goals, the importance of boosting domestic production and accelerating industrialisation (notably in priority sectors) is highlighted. The Turkish government has taken several initiatives to contribute to Turkey’s industrial development. A first example related to the establishment of a Credit Guarantee Fund. According to the Development Plan, 50% of the Fund’s resources will be allocated for investment and export loans in the manufacturing industry sectors. Secondly, the blueprint mentions that the Development and Investment Bank of Turkey will upscale the support for industrial investments, notably in priority sectors. To be able to do this, the Bank will receive an equity injection of TRY 10 billion (ca. EUR 1.30 billion). The same vision is articulated for the Turkish Eximbank (see chapter below).

Furthermore, the Development and Investment Bank of Turkey plans to create a Turkey Development Fund, which intends to promote investments and sustainable growth projects. The Fund is complemented by the Turkish Wealth Fund, which aims to encourage large-scale investments, notably in priority sectors. The Development Plan announces to expand the support (e.g. tax subsidies) for investment loans issued by banks targeting priority sectors. Finally, Turkey has declared to raise the share of the budget allocation from the subsidies of the Small and Medium Enterprises Development Organisation (KOSGEB). The 11th Development Plan aims to improve the competitiveness of the Turkish shipbuilding industry and marine technologies while shifting towards greener forms of shipping. More specifically, the blueprint outlines a goal to convert short-distance passenger and vehicle transportation vessels into environmentally friendly and energy-efficient electrical vessels. Accordingly, the Plan pledges to increase support for projects that corroborate similar practices. At the time of drafting this report, the Turkish government also pledged to conduct an evaluation of the effectiveness of its policies to promote green and innovative ships. These evaluations are still ongoing and are scheduled to be released by 2023.

Sefine Shipyard is an example of a Turkish shipbuilder that has targeted niche sectors and the construction of more environmentally-friendly ships. It has completed several (battery-powered) ferries, fish carriers and naval vessels using smart technologies. Also, the yard constructed the first LNG powered vessel in the world.³⁴ Another example of environmentally-sustainable niche sectors is the construction of service operation vessels for offshore wind farms by Cemre Shipyard.³⁵

In addition to the objective of supporting green and innovative ships, the maritime transport sector is part of the Development Plan's sectoral aim to improve multimodal transport. This objective envisions an increasing share of maritime transport in intermodal transport, the reduction of logistic costs, the facilitation of international trade, and the establishment of an integrated transport system.

In addition to the horizontal development policies, the Turkish government continues to redesign old regulations to include the most recent developments in the shipbuilding sector in its legislative frameworks. In late 2015, the out-dated Shipbuilding Regulation was replaced by the Regulation of Vessel and Ship Building, Maintenance and Repair. This regulation is wider in scope than its predecessor. The Regulation of Vessel and Ship Building, Maintenance and Repair is part of a broader governmental strategy to increase sustainable shipbuilding activities in Turkey and to attract more maintenance and repair work for Turkish shipyards.

5.1.3. Safeguarding the level-playing field in the shipbuilding sector

The Turkish Ministry of Trade is in charge to safeguard the level-playing field in the shipbuilding industry. Its work includes the monitoring of unfair competitive practices and trading practices.

Protection of competition in Turkey is covered by the Turkish Commercial Code (2012) and the Competition Law (1994). These are the primary legal sources dealing with the protection of competition in the Turkish markets. The Turkish Commercial Code deals with unfair competition arising out of deceptive and misleading practices, whereas the Competition Law regulates prohibited actions and exemptions thereto, abuse of dominant position, clearances for certain mergers and acquisitions and administrative measures to protect the markets. So far, there has not been any investigation in the shipbuilding sector regarding unfair competitive practices.

The General Directorate of Imports under the Turkish Ministry of Trade is in charge of trade defence policies. This means that this Ministry is responsible for regulating and monitoring unfair trading practices associated with imports to Turkey. One of the essential duties of the General Directorate of Imports is to defend Turkish producers' interests against imports that cause (serious) injury to the Turkish industry. In this respect, the General Directorate of Imports applies trade defence instruments (anti-dumping, anti-subsidy, anti-circumvention and safeguard), and follows up on the enforcement of those measures.

In the context of shipbuilding and the maritime industry, there have only been two examples of trade defence investigations. The first one concerned an anti-dumping investigation in 2011 regarding the imports of welding electrodes originating in China. In 2017, the anti-dumping investigations were extended to Viet Nam. The approximate additional customs duty applied as the result of this investigation is 28%. A second procedure in 2018 touched upon the import of steel products (including pipes and hollow profiles, stainless steel, rods and wires) from third nations. The measure taken under this investigation is an anti-dumping preventive action with 25% additional custom duties to be

applied in general with exception of EU Countries and countries having a Free Trade Agreement with Turkey.

5.1.4. COVID-19 measures and effects on shipbuilding industry in Turkey

The Turkish government published a business guide detailing the working conditions under pandemic threat for every sector. Shipyards apply these pandemic measures and managed to report a minimal number of cases compared to similar industries. Turkish shipyards were able to avoid cross-infections between vessel and shipyard personnel, according to the shipyards. A special identification system supported by the government is used at the entrance of shipyards. This system called “HES Code Application” keeps the history in terms of COVID-19 infection of every citizen.

On the new building and repair sides, activity remains high despite reduced personnel. No order cancellations are reported.

5.2. Support measures

The role of the government in the shipbuilding industry is one the central themes³⁶ of the WP6 Peer Reviews. This part provides an overview of government policies that affect the shipbuilding industry, and the policy intent and expected outcomes of those policies. All of the policy measures mentioned below are horizontal in nature. The Secretariat could not find any support measures that were directed to the shipbuilding sector specifically.

5.2.1. Financing and guarantee schemes

The Treasury Support Scheme serves as a credit guarantee programme for ship construction credits. The programme is implemented by the Credit Guarantee Fund (CGF)³⁷ and is monitored by the Turkish Treasury. The purpose of the guarantee is to support the shipbuilding industry in Turkey by increasing shipbuilding firms’ access to financing.

A first type of guarantee was established in 2010 and was terminated as of February 2015. In order to benefit from this guarantee mechanism, the loan had to be used for the construction of a ship that was incomplete (i.e. at least 15% of the ship construction should have been completed or payment amount for the construction should be equal to the 15% of construction cost of the ship). Under this scheme, a guarantee of up to 75% of the credit could be provided.

In February 2015, a new type of guarantee replaced the previous version. Following this new initiative, the buyer has to provide the finance for the new ships that will be constructed. The Credit Guarantee Fund subsequently guarantees a non-cash loan (warranty letter), which is issued in favour of the buyer. The guarantee can cover up to 70% of the credit cost. The total amount of the guarantee is limited to USD 70 million per company or facility, with a maximum duration up to 3 years.

5.2.2. Export and home credits

The OECD Arrangement on Officially Supported Export Credits (“OECD Arrangement”) provides a framework for the orderly use of officially supported export credits and seeks to foster a level playing field for official support that encourages competition amongst exporters based on quality and price of goods and services rather than financial terms and conditions. Ship financing transactions are also subject to the Sector Understanding on Export Credits for Ships (SSU), which is an annex to the OECD Arrangement.

In addition, the OECD Arrangement is recognised under item “k” of Annex I of the WTO’s Agreement on Subsidies and Countervailing Measures (ASCM) as an international

undertaking on officially supported export credits. This article indicates that an export credit practice that is in conformity with the provisions of that international undertaking shall not be considered as an export subsidy, which is prohibited by the ASCM. Also, item “k” states that any WTO member, even if not a party to that undertaking, can benefit from the ASCM ‘safe haven’ clause if it applies the interest rates provisions of the undertaking.³⁸

Turkey had been an Invited Participant to the OECD Arrangement since 2006 and became a Participant to the OECD Arrangement in 2018. Turkey has also been participating as an observer to the sessions of the WP6, which deals with the Sector Understanding on Export Credits for Ships (SSU).

The Export Credit Bank of Turkey or *Türkiye İhracat Kredi Bankası A.S.* (hereafter *Türk Eximbank*)³⁹ was established in 1987 and is fully owned by the Turkish Ministry of Treasury and Finance. It is also affiliated to the Turkish Ministry of Trade. *Türk Eximbank*’s main objectives are: promoting Turkey’s exports through diversification of exported goods and services, increasing the share of Turkish exporters in international trade by finding new markets for traditional and non-traditional export goods and providing support to exporters and overseas contractors to increase their competitiveness by mitigating risks in international markets. To reach these objectives, it provides short, medium and long-term export credit, insurance and guarantees.⁴⁰ The 11th Development Plan foresees that the ratio of cross-sectoral exports supported by the Turkish Eximbank will gradually rise from 26% in 2018 to 29% in 2023.

The current programmes of *Türk Eximbank* can broadly be classified into 3 categories, namely credits to exporters to meet their working capital needs, export credit insurance to guarantee the receivables of exporters and buyer’s credits to enable the penetration of contractors/exporters into new markets by financing foreign institutions. These programmes are general in nature. On the shipbuilding front, Turkey indicates that the total amount of export financing is limited. Most of the provided support is short term and falls out of the scope of the OECD Arrangement. And most of the financing to the shipbuilding sector is to address shipbuilders’ working capital needs.

The Bank draws its resources from multiple sources. These include syndicated loans, bond issuances, loans that come from or that are guaranteed by supranational institutions (e.g. IBRD, EIB, IDB, CEB and MIGA)⁴¹, trade loans and bilateral loans from international financial institutions, rediscount facility of the Central Bank of Turkey as well as possible capital injections from the Ministry of Treasury and Finance. As the sole owner of *Türk Eximbank*, the Ministry of Treasury and Finance of Turkey compensates the Bank for losses arising from political risks. The nominal capital of the *Türk Eximbank* amounted to TRY 6.4 billion in 2018, and TRY 7.1 billion in 2019 and 2020 half year.⁴² The Turkish government pledged in its 11th Development Plan to increase the Eximbank’s equity between 2018 and 2023 with TRY 10 billion (ca. EUR 1.30 billion).

The *Türk Eximbank* has provided a total amount of direct lending support to the shipbuilding sector of approximately USD 1 billion between 1990 and 2019. This amount intends to finance the working and investment financing needs of companies and is split up in USD 820 million for short-term support and USD 150 million for medium to long-term transactions. *Türk Eximbank* has for instance financed a tugboat transaction to Gabon with a valuation of USD 4.8 million under the Export Receivables Discounting Program. This Program discounts the deferred export receivables arising from the export of capital goods, including ships from Turkey.

Türk Eximbank began supporting the shipbuilding sector with direct loans in 1990, following a study that explored the structure of the Turkish shipbuilding industry, the effects of the government policies on the sector and the relationship between national and

international shipbuilding industries. Under the Shipbuilding Finance and Guarantee Program, which is dedicated to the shipbuilding sector, the Bank can provide direct loans and/or letters of guarantee to Turkish shipbuilders or exporters so they may obtain pre-financing, either in advance or in instalments from the buyer, or they can buy supplies and materials with payments deploying a fixed term. The amount of direct loan/ letter of guarantee may not exceed 85% of the total contract price. Türk Eximbank is entitled to issue letters of guarantees in favour of Turkish firms involved in the shipbuilding sector and/or in the exporting of ships, which can be provided to the:

- i) Buyer's bank (as a Refund Guarantee for advance payments),
- ii) Buyer (as a Refund Guarantee for advance payments),
- iii) Supplier's bank (for Letters of Credit),
- iv) The supplier.

In addition to the programs directly financing exporters, Türk Eximbank also provides International Project Loans, which is a buyers' credit scheme. These loans provide financial support to foreign buyers of Turkish goods and services, including ships that are constructed at Turkish shipyards. While there is no official ceiling of the project loans regarding the size of the project or the company involved, country limits are determined in line with the OECD country risk classification of the buyer's country. Up to 85% of the Turkish content within the contract can be subject to financing, while exports from third countries are not covered by the scheme. The repayment period of the loan is longer than two years.⁴³

In the scope of the Fourth Export Finance Intermediary Loan (EFIL-IV) signed between Türk Eximbank and the International Bank for Reconstruction and Development (IBRD), it was aimed to provide medium and long term investment and working capital support to entities, including to companies operating in the Turkish shipbuilding industry. The programme urges companies willing to apply for a loan to comply with financial ratio requirements, environmental and safety procedures and the IBRD public procurement rules. The loans have been provided to firms in Turkey, including shipbuilders, and deploy a floating interest rate. The EFIL-IV programme falls out of the scope of the OECD Sector Understanding on Ships of the Arrangement on Officially Supported Export Credits.

Türk Eximbank also provides export credit insurance under the Specific Export Credit Insurance Post - Shipment Program. Pursuant to this programme, exports are insured against commercial and political risks. All sectors can benefit from this program. In the shipbuilding sector only one transaction from 2017 has been covered by the program, corresponding to a total cost around USD 6.3 million.

5.2.3. R&D and innovation

The Turkish government promotes research and development (R&D) in order to encourage innovation. The policy initiatives are horizontal in scope and consequently cover the shipbuilding sector as well. The 11th Development Plan mentions the need to establish an innovation culture across the Turkish shipbuilders and marine technology providers in order to boost their competitiveness.⁴⁴ Most of the funding for R&D in the shipbuilding sector relates to the creation of innovative techniques to build green and high-tech vessels. However, there are no government support R&D schemes in place that specifically target green shipbuilding projects.

R&D and innovation policies are generally conducted by TÜBİTAK (Turkish Scientific and Technologic Research Institution)⁴⁵ and KOSGEB (Small and Medium Enterprises Development and Support Administration)⁴⁶. TÜBİTAK was founded as an autonomous public agency and coordinates Turkey's policies and research on science, technology and

innovation. In the field of maritime affairs, TÜBİTAK for instance conducts research about the polar region and is engaged in a maritime research project in the Black Sea. KOSGEB resorts under the Ministry of Industry and Technology and aims to stimulate innovative entrepreneurship of Small and Medium-Sized companies (SMEs) in Turkey.

TÜBİTAK's support scheme is covered by the 1501-TÜBİTAK Industrial R&D Projects Support Programme⁴⁷. The programme aims to support R&D projects, which identify the production of a new product, develop or improve an existing product, or examine new production techniques that reduce costs. Regardless of the sector and scale of the applicants, the basic support rate corresponds to 40% of the total R&D cost. This basic support rate may be supplemented by other forms of support, but the total level of support is capped at 60% of the total R&D cost.

Within the context of Turkey's R&D programmes, the development of the shipbuilding industry and the establishment of offshore technology in Turkey necessitated the parallel development of scientific and technical research to support the industry. The Ata Nutku Ship Model Testing Laboratory (ANSMTL) and the ITU Large Cavitation Tunnel, falling under the Faculty of Naval Architecture and Ocean Engineering at Istanbul Technical University, are two examples of laboratories that play an important role in the development of marine technologies in Turkey. They are able to function by virtue of support by various public and private institutions. The ANSMTL is the largest and most active facility of the faculty. In addition to providing education, research, and development activities for the faculty, it also offers consultancy services for the marine industry. The activities of the laboratory are concentrated on ship resistance and propulsion, offshore technology, ship design and transportation. The ANSMTL is a member of the International Towing Tank Conference (ITTC).⁴⁸ This voluntary association conducts work on the hydrodynamic performance of ships and marine installations. The ITTC takes the form of an NGO with observer status at the International Maritime Organisation (IMO).

Turkey has set up various internal collaborations between the government, the private sector (SMEs and large firms) and research institutions. One illustration of such an initiative is the TÜBİTAK 1505 University – Industry Cooperation Support Programme. This programme applies to projects across various industrial sectors, as identified by the Turkish Ministry of Industry and Technology, and includes shipbuilding. The underlying motive of the programme is to connect institutions with different backgrounds to share their knowledge so new conceptualisations can be identified that have the potential to be applied commercially.

SMEs and large-scale enterprises that commit to implement the project results in Turkey, as well as universities and public research institutions can apply jointly for the TÜBİTAK 1505 University – Industry Cooperation Support Programme. The funding for each project is limited to TRY 1.000.000. In addition to the project's budget, a project incentive bonus and a project institution share may be granted. A project incentive bonus is a bonus paid to staff employed by a research institution, university, or public institution that is involved in one of the projects. It is limited to 75% of the employee's monthly payment and is determined by a scientific committee. The amount of the project institution share corresponds to 5% of the project's budget and is granted as a counterpart for benefiting from the services provided by the executive institution during the execution and finalization of the project. Finally, TÜBİTAK may contribute to the costs of a feasibility study. This amount is limited to TRY 10.000 and has a maximum term of 3 months.

Also, the 11th Development Plan mentions that product-oriented initiatives falling under the scope of the Technology-Oriented Industry Action Plan may benefit from project-based support. The targeted products encompass strategic product priorities, the future potential of a product, and the impact of the product on technological developments and on domestic

production. In addition, companies can apply for exceptional R&D support if they operate in Technology Development Zones. These Technology Development Zones aim to bring together universities, research institutions, public agencies and private institutions to identify innovations that may be commercialised. So far, these policies seem to have had a limited impact on the shipbuilding sector. However, indirectly the shipbuilding sector may benefit from these policies through the development of cross-sectoral technologies or machinery and equipment that may equally be installed on ships.

Finally, Turkish universities are engaged in several European projects covering the shipbuilding and shipping industry. Some examples relate to research about the global efficiency of shipping transport, projects about low emission ships, or to sustainable hull designs.

5.2.4. Other forms of support

In 2012, the Ministry of Trade introduced a customs duty exemption for certain types of machinery and equipment. The customs duty exemption is included in the Turkish Decree Concerning State Encouragements to Investments (Decree No. 2012/3305 from 15 June 2012) and aims to encourage the duty-free imports of machinery and equipment that are needed for investment projects. The support measure is limited to investments that qualify for an ‘Investment Encouragement Certificate’. Once the investment is certified, the imported machinery and equipment needs to be added to the ‘Machinery and Equipment List’. Only the imports covered by this list can be exempted from customs duties.

As Turkey forms a Customs Union together with the EU, all customs duties and charges having equivalent effect have been nullified between the EU and Turkey, and tariffs are determined on rates defined as common customs tariffs for third countries. Therefore the above mentioned exemption is implemented only for imports from third countries.

The Turkish Decree Concerning State Encouragements to Investments also includes an exemption from value-added tax (VAT) for the imports of machinery and equipment that is included in the ‘Machinery and Equipment List’. The net support of this measure hinges on the applicable VAT rate, the purchasing time of the machinery and equipment, the market interest rates, and whether the company is operational at the time of purchase. The support measure is administered by the Ministry of Treasury and Finance.

Finally, the Decree Concerning State Encouragements to Investments provides for a social security premium support by the Turkish Ministry of Trade. The implementation of the premium is monitored by the Ministry of Labour and Social Security. The social security premium applies to the employer’s social security contributions and corresponds to the amount that needs to be paid on the minimum salary. The premium is limited to a period of eighteen months during a ship’s construction time.

5.3. Policy assessment

5.3.1. Assessment of maritime strategy

Turkey has announced several initiatives to uplift its state of development. Some of these plans are applied horizontally, while others are tailored towards the shipbuilding industry. Some important elements of Turkey’s medium term and longer-term strategies are included in the 11th Development Plan. This Plan offers a wide overview of the main elements for Turkey’s development and refers to certain priority sectors⁴⁹.

The 11th Development Plan rightfully refers to important topics such as education, productivity, access to finance and digitisation to raise the Turkish economy's competitiveness.

The Turkish economy is largely based on services (61.5% of GDP in 2018).⁵⁰ For this reason, current peer-review suggests to further stimulate the creation of jobs in the maritime services area. Investing in innovation and new technologies may play an important role in the creation of these jobs. The 11th Development Plan acknowledges the significance of investing in R&D since the share of R&D spending as percentage of GDP remains relatively low. According to cross-sectoral data, the gross domestic spending on R&D in Turkey only accounts for 1%, while the OECD average amounts to 2.4%.⁵¹ The intent to establish R&D networks between the private sector, public sector and research institutions may result into important cross-sectoral spill-over effects within all different segments of the maritime sector or across different export sectors. To ensure the effectiveness of these policies, care must be taken to establish efficient and holistic policies across different government agencies such as the Ministry of Transport, Ministry of Trade and the Ministry of Industry and Technology, and to reduce red tape.

The 11th Development Plan could further benefit from increased attention to detailed and measurable indicators to assess how certain policy areas have evolved. Some of the objectives of the Development Plan remain rather opaque and do not always indicate how the projected goals could be achieved. Particularly related to shipbuilding, the Development Plan for instance indicates that "[i]n order to improve the competitiveness of the marine technologies and shipbuilding, (...), R&D and an innovation culture will be disseminated among the companies operating in the sector (...)". It is hard to discern the criteria to measure if this objective has been reached. An important tool to assess the effectiveness of policies is impact assessment and evaluation. This type of assessment can take place before a new governmental policy is issued or thereafter. While the 11th Development Plan refers to an evaluation and impact analysis to analyse the effectiveness of government programs, such assessment has not yet taking place for the shipbuilding sector. Concrete output indicators could, however, ease the evaluation of government policies afterwards.

Provided that the Development Plan mentions that the private sector plays an important role in the future development of Turkey, more guidance to the private sector would be welcomed as regards the eligibility criteria for government support, the competent government agency to process these applications, the total amount of government support and its duration.

Finally, there does not appear to be a sectoral government plan that covers shipbuilding. This may seem at odds with the priority status of the sector. Turkey may want to consider drafting a shipbuilding strategy that couples with other maritime sectors such as fishing, aquaculture or shipping. A cluster-based approach could in fact identify positive spill-over effects and may induce a more holistic approach to encourage a sustainable development of the shipbuilding sector. The shipbuilding sector could for instance share important technologies with other manufacturing sectors or could serve as a pilot project for the Turkish government to transform towards a more sustainable economy.

5.3.2. Assessment of selected support measures

The subsequent subsections assess the impact of the selected Turkish support measures. These measures are all generic in nature, but are narrowed down to the shipbuilding sector. Particular attention is given to the effect of the support measures in light of the overall objective of the WP6 to assist governments in designing and implementing policies that foster normal competitive conditions.

Financing and guarantee schemes: Treasury Support Scheme

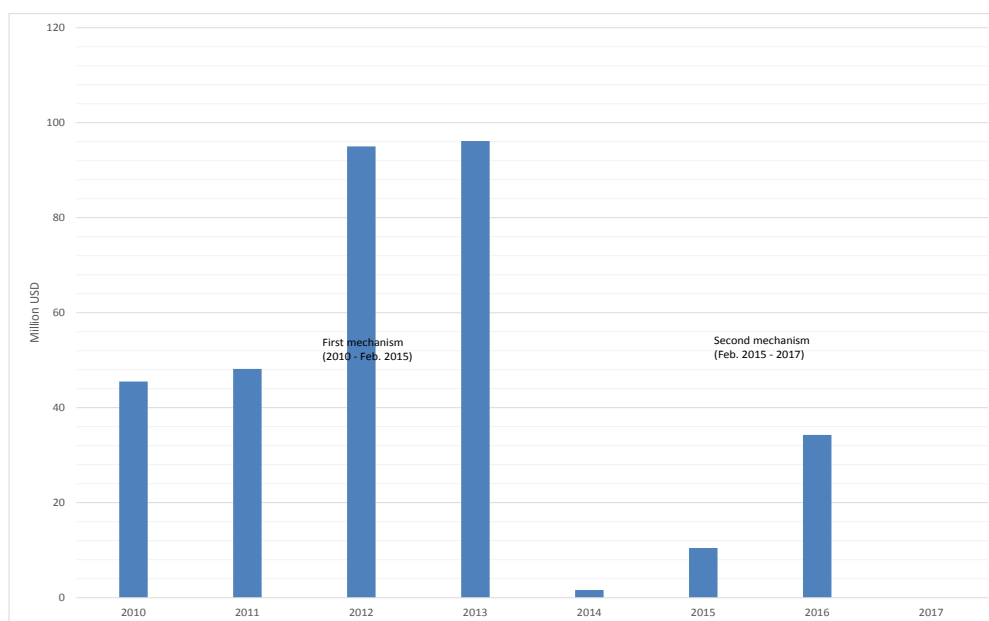
The Turkish financing and guarantee schemes (Treasury Support Scheme) are indicated to be applied in line with market conditions. The Secretariat lacks the information to evaluate this statement against any concrete projects but – at first glance - has no reasons that could give rise to opposing presumptions.

The Treasury Support Scheme was a credit guarantee programme, supported and monitored by the Turkish Treasury. This programme was implemented by the Credit Guarantee Fund (CGF) between 2010 and 2017. There were two types of guarantee mechanisms for ship construction credits. The purpose of these mechanisms was to support the shipbuilding industry in Turkey by increasing shipbuilding firms' access to financing. A first mechanism was launched in 2010 and terminated in February 2015. There were two types of loans for the construction of a ship that could be guaranteed, namely “working capital loan” and “investment loan”. A second mechanism was introduced in February 2015 and terminated in 2017. Under this mechanism, a buyer provided finance for the ship to be constructed and the CGF guaranteed a non-cash loan (warranty letter) issued in favour of the buyer.

Under the first mechanism, a guarantee of up to 75% of the credit could be provided. The maximum amount of working capital loan for a company was TRY 7 million (for the same group of companies, TRY 10 million) with a four year grace period and up to six years maturity. The maximum amount of the investment loan for a company was TRY 20 million (for the same group of companies, TRY 30 million) with six years grace period and up to ten years maturity. Under the second mechanism, a guarantee of up to 70% of the credit could be provided. The maximum guarantee amount was USD 70 million per company, with a maximum maturity up to 3 years. Under this scheme, the amount of guarantee fee collected by the CGF was 1% of the outstanding guarantee each year.

The amount of support provided by this scheme peaked in 2012 and 2013 (Figure 15). This period coincided with a time during which the world's completion and Turkey's completion share in shipbuilding had dropped significantly, as illustrated by Figure 1. In addition, during the lifetime of the support scheme, Turkey's capacity of operating shipyards increased by about 1.3 times between 2010 and 2017, as shown in Figure 15.

In light of the above, it is possible that the support provided by this scheme, especially the support provided by the first mechanism, limited the effect of the market downturn and contributed to maintain shipbuilding capacity in Turkey. However, there is no evidence that the Turkish support measures had an impact on the normal competitive conditions in the shipbuilding industry. In addition, the support scheme applied a cap on the total amount of money provided to a company (group) as well as a maximum time limit. These specificities should limit its overall impact. In any case, the scheme was terminated in 2017 and as such will have no additional impact in the future.

Figure 15. Amount of the support in the Treasury Support Scheme to shipyards in Turkey

Source: WP6 Inventory of Subsidies and Other Support Measures.

Export and home credits

Most of Turkey's export credits support is short-term support to cover the working capital needs of specific companies. This type of export credit falls outside the scope of the OECD Arrangement. For export credits that are covered by the OECD Arrangement, Turkey has indicated that all of its export credits are applied in line with the terms and conditions of the OECD Arrangement. Indeed, the Secretariat could not find any counterexample, although the terms and conditions of specific projects that benefit from export credit financing are not publicly available. In addition, Turkey has declared to provide limited export credit financing to its shipbuilding industry. Consequently, the impact of the Türk Eximbank export financing on the global shipbuilding industry appears to be limited.

The Secretariat underscores the importance for the global level-playing field to act in accordance with the terms and conditions of the OECD Arrangement on Officially Supported Export Credits and the SSU. In light of this observation, the Secretariat makes reference to a paper by K. Dawar. In this paper, the author concludes that there is a growing tendency to finance exports outside the terms and conditions of the OECD Arrangement, either by providing export financing tools that are not covered by the OECD Arrangement or by the rise of new export credit agencies that are not a participant to the OECD Arrangement.⁵²

Türk Eximbank has indicated that the largest share of its export credit to the shipbuilding industry is provided in the form of short-term insurance and loan support and that it does not offer any form of untied financing or untied aid.

The Secretariat encourages Turkey to continue providing export credits in accordance with the terms and conditions of the OECD Arrangement and the SSU. Additional transparency would be welcomed on the total amount of export credit that is issued outside the scope of the OECD Arrangement and the SSU.

R&D and innovation

As the instruments addressing overall measures in the global shipbuilding industry, the WP6 has approved the “Revised General Arrangement for the Progressive Removal of Obstacles to Normal Competitive Conditions in the Shipbuilding Industry” (C(82)194/FINAL), the “Revised General Guidelines for Government Policies in the Shipbuilding Industry and Shipbuilding Agreement” (C(83)27) and the “Agreement Respecting Normal Competitive Conditions in the Commercial Shipbuilding and Repair Industry” (the Agreement)⁵³, even though the Agreement has never entered into force. Yet, it should be noted that the Agreement stipulates some concrete criteria in its Annex I, including a list of prohibited measures. Therefore, reference to these instruments could help the WP6 for the discussion on policy measures. The support measures for R&D and innovation are not specific to the shipbuilding industry.

Box 1. Preliminary analysis of support measures with the provisions of the 1994 “Agreement”

Prohibited measures in the Agreement include export credits inconsistent with the SSU, export subsidies, direct and indirect domestic support, R&D assistance, and regulations and practices such as local content requirements. Therefore, by referring to the Agreement, “the support for R&D” can be discussed here.

The relevant paragraphs of the Agreement read as follows:

(1) Assistance provided by public authorities in the form of grants, preferential loans, preferential tax treatment or other means for research and development to the shipbuilding and ship repair industry, except for:

- a. Fundamental research⁵⁴;
- b. Basic industrial research⁵⁵, where the aid intensity is limited to 50 per cent of the eligible costs⁵⁶;
- c. Applied research⁵⁷, where the aid intensity is limited to 35% of the eligible costs; or
- d. Development⁵⁸, where the aid intensity is limited to 25% of the eligible costs.

(2) The maximum allowable aid intensity for research and development related to safety and the environment may be 25 percentage points higher than those percentages mentioned under (1) b., c. and d. above, under the condition that the Parties Group has approved the project by consensus minus one, or more than 25 percentage points higher if the Parties Group has approved the project by consensus.

(3) The maximum allowable aid intensity for research and development carried out by small and medium sized shipbuilding enterprises shall be 20 percentage points higher than those percentages mentioned at (1) b., c. and d. above. Small and medium sized enterprises are those with less than 300 employees whose yearly sales figure does not exceed 20 million ECU and which are not more than twenty five per cent owned by a large company

(Annex I, B 3. OECD 1994 Agreement)

The R&D support schemes of Turkey seem to favour projects with commercial potential. As illustrated above, the 1501-TÜBİTAK Industrial R&D Projects Support Programme provides support between 40% and 60% of the total R&D cost. The projects falling under this programme will – depending on the concrete circumstances and objectives – probably be classified as “applied research” or “development” research. It will depend on factors such as the specificities of the project support (e.g. environmental project, SME), the total

eligibility costs and a possible cap on the total R&D support whether this form of support is deemed to comply with the terms and conditions of the Agreement.

Taking the example of the TÜBİTAK 1505 University – Industry Cooperation Support Programme, these projects will – depending on the concrete circumstances and objectives – probably be classified as ‘‘applied research’’ or ‘‘development’’ research. In light of the (non-binding) Agreement it is therefore recommended to limit the support to respectively 35% and 25% of the eligible costs. Given that most of the Turkish R&D support to the shipbuilding industry also has an environmental or safety angle, these thresholds may – in such case - be increased by 25%.

The total amount of R&D support reported in the WP6 Inventory is relatively low. However, to ensure that the 1501-TÜBİTAK Industrial R&D Projects Support Programme and the TÜBİTAK 1505 University – Industry Cooperation Support Programme are used within the scope allowed in the 1994 Agreement and that these support programmes do not appear to have an adverse effect on normal competitive conditions, it is recommended that the Turkish government continues its efforts to evaluate the relationship between commercial products and the innovative aspect of the applied projects before deciding to provide the support allowance and to continuously and regularly monitor the end-use of the support measures.

Government revenue that is foregone or not collected

From a practical point of view, the specific customs duty and social security exceptions seem to couple with the development of Free Trade Zones. These zones are regulated by specific regulations and benefit from preferential investment and trade incentives to attract foreign investments, notably in industrial sectors. Three of the most important Free Trade Zones in Turkey focusing on shipbuilding and ship repair activities are Adana-Yumurtalik, Antalya Free Trade Zone, and Kocaeli.

The ‘‘Recommendation of the Council on Countering Illicit Trade: Enhancing Transparency in Free Trade Zones’’ [[OECD-LEGAL-0454](#)] was adopted on 21 October 2019, and it recommends that Members and non-Members having adhered to the Recommendation should ensure that competent authorities have access to aggregated statistical data on goods entering and leaving an FTZ on the basis of their tariff classification, and information that identifies the owner(s) of the goods.

The Secretariat is not aware of available statistics on the number and amount of imported machinery and equipment that benefited from the customs duty exemption. Consequently, the Secretariat recommends Turkey to adhere to the Recommendation above and ensure access to relevant statistical data.

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ANNEX I: SELECTED INFORMATION ON THE TURKISH SHIPYARDS

1) Location and size of the shipyards

NO	Location	Shipyards Name	Field of Operation	Annual Capacity (DWT/Year)
1	İstanbul	ERKAL Uluslararası Nakliyat ve Ticaret A.Ş.	repair	25 000
2	İstanbul	GEMSAN Gemi ve Gemi İşlet. San. Ve Tic. Ltd. Şti.	repair	6 000
3	İstanbul	HİDRODİNAMİK Gemi San. ve Tic. A.Ş.	construction & repair	8 100
4	İstanbul	GEMAK Gemi İnşaat Sanayi ve Tic.A.Ş.	repair	12 000
5	İstanbul	DESAN Deniz İnşaat Sanayi A.Ş.	construction & repair	14 400
6	İstanbul	DESAN Shipyards A.Ş.	construction & repair	6 000
7	İstanbul	KPT Tersane İşletmeciliği A.Ş.	repair	30 000
8	İstanbul	SNR Gemi İnşaat Sanayi A.Ş.	construction & repair	12 500
9	İstanbul	İSTANBUL Denizcilik Gemi İnşaat San. ve Tic. A.Ş.	construction & repair	15 000
10	İstanbul	ANADOLU Deniz İnşaat Kızakları San. ve Tic. A.Ş.	construction	45 000
11	İstanbul	DENİZ ENDÜSTRİSİ A.Ş.	construction	75 000
12	İstanbul	TÜRKTER Tersane ve Deniz İşlet. A.Ş.	repair	50 000
13	İstanbul	YILDIZ Gemi ve Makine San. Tic. A.Ş.	construction & repair	10 000
14	İstanbul	KUZEYSTAR Shipyards Denizcilik San. Ve Tic. A.Ş.	construction & repair	60 000
15	İstanbul	RMK Marine Gemi Yapım San.	construction & repair	40 000
16	İstanbul	SEDEF Gemi İnşaatı A.Ş.	construction	650 000
17	İstanbul	TUZLA GEMİ Endüstrisi A.Ş.	repair	110 000
18	İstanbul	SELAH Makine ve Gemicilik End. A.Ş.	construction	42 000
19	İstanbul	DEARSAN Gemi İnşaat Sanayi A.Ş.	repair	32 000
20	İstanbul	ADA Denizcilik ve Tersane İşlet. A.Ş.	construction & repair	40 000
21	İstanbul	TORLAK Denizcilik Sanayi ve Tic. A.Ş.	construction & repair	32 000
22	İstanbul	YARDIMCI Gemi İnşaat A.Ş.	repair	30 000
23	İstanbul	ÇEKSAN Gemi İnşaat San. Ve Tic. A.Ş.	construction & repair	16 000
24	İstanbul	GİSAN Gemi İnşaat San. ve Tic. Ltd. Şti.	construction & repair	30 000
25	İstanbul	TORGEM Gemi İnşaat Sanayi ve Tic. A.Ş.	construction & repair	28 000
26	İstanbul	DENTAŞ İnşaat ve Onarım San. A.Ş.	repair	22 000
27	İstanbul	ÇİNDEMİR Mak. Gemi Onarım ve Tersanecilik A.Ş.	repair	8 410
28	İstanbul	İSTANBUL ŞEHİR HATLARI TURİZM SAN. TİC. A.Ş.	construction & repair	15 000
29	İzmit	SELAH Körfez Gemi İnşaat San. ve Tic. A.Ş.	construction	45 000
30	İzmit	ÇİMTAŞ Çelik İmalat Montaj ve Tesisat A.Ş.	construction	75 000
31	İzmit	ATLAS Tersanecilik San. Ve Tic. A.Ş.	construction	40 000
32	İzmit	UM Deniz Sanayi A.Ş.	construction	116 000
33	İzmit	UZMAR Gemi Yapım Sanayi A.Ş.	construction	40 000
34	Yalova	KUZEYSTAR Shipyards Denizcilik San. ve Tic. A.Ş.	construction	30 000
35	Yalova	SELTAŞ Denizcilik San. ve Tic. A.Ş.	construction & repair	40 000

36	Yalova	YAŞARSAN Gemi İnşa San. ve Tic. Ltd.Şti.	construction & repair	12 500
37	Yalova	ALTINTAŞ Mermer ve Tersanecilik San. ve Tic. A.Ş.	construction	210 000
38	Yalova	CEMRE Mühendislik Gemi İnşa San. ve Tic. Ltd.Şti.	construction	60 000
39	Yalova	AYKIN Tersanecilik ve Taş. İnş. San.ve Tic.Ltd. Şti.	repair	27 000
40	Yalova	TÜRKOĞLU Gemi İnşa San. ve Tic. Ltd.Şti.	construction & repair	27 000
41	Yalova	BEŞİKTAŞ Tersane A.Ş.	construction & repair	30 000
42	Yalova	ARIF KALKAVANOĞULLARI Gemicilik A.Ş.	repair	70 000
43	Yalova	DÜZGİT Yalova Gemi İnşa San. A.Ş.	construction	60 000
44	Yalova	DEN-TA Denizcilik Tic. ve San. Ltd.Şti.	construction	25 000
45	Yalova	KARMARİNE Karadeniz Denizcilik ve Tic. A.Ş.	construction	30 000
46	Yalova	SANMAR Denizcilik Makine ve Tic. A.Ş.	construction	20 Tugboats
47	Yalova	HERÇELİK Tersanecilik San. Ürünleri Pazarlama ve Dış Tic. A.Ş.	construction	70 000
48	Yalova	GEMAK Gemi İnşaat Sanayi ve Tic.A.Ş.	construction	250 000
49	Yalova	CEMRE Tersanesi Gemi İnşaa San. A.Ş.	construction	28 390
50	Yalova	Grup ICT Yatçılık Turizm San. ve Tic. A.Ş.	construction	20 000
51	Yalova	HİCRİ ERCİLİ Tersanecilik San. Ve Tic. A.Ş.	construction & repair	70 000
52	Yalova	SEFİNE Denizcilik Tersanecilik tur. San. ve Tic. Ltd. Şti.	construction & repair	75 000
53	Yalova	TERSAN Tersanecilik San. Ve Tic. A.S.	construction & repair	100 000
54	Yalova	ÖZATA Tersanecilik San.Tic.Ltd.Şti.	construction	33 150
55	Yalova	GİSAN Gemi İnşaa San. ve Tic. A.Ş.	construction & repair	12 500
56	Yalova	GÜRDESAN Gemi İnşa ve San. Tic. A.Ş.	construction	5 000
57	Yalova	BAYRAKLAR Gemi İnşaat Den. San. Ve Tic. A.Ş.	construction	40 000
58	Yalova	DOĞRUYOL Tersanecilik Denizcilik San. ve Tic. A.Ş.	repair	40 000
59	Yalova	HAT-SAN Gemi İnşa Bakım Onarım Deniz Nakliyat San. Ve Tic. A.Ş.	construction	250 000
60	Yalova	YÜKSEL Tersanecilik Ticaret A.Ş.	construction	25 000
61	Yalova	ALTİNOVA Yat İnşaacılar San. Ve Tic. A.Ş.	construction & repair	200 000
62	Yalova	KARSAN Gemi İnşa. San. Ve Tic. A.Ş.	construction	25 670
63	Zonguldak	AZİM Otel Turizm Deniz. Metal San. ve Tic. Ltd. Şti.	construction	8 600
64	Zonguldak	EREĞLİ Gemi İnşa San. ve Tic. A.Ş.	construction & repair	58 000
65	Zonguldak	DEMİR GEMİ Tersanesi San. Ve Tic. Ltd. Şti.	construction	55 000
66	Zonguldak	MADENCİ Gemi San. Ltd. Şti.	construction	50 000
67	Zonguldak	MED-YILMAZ Gemi İnşa San. ve Tic. A.Ş.	construction	7 000
68	Zonguldak	UMO Gemi San. Tic. Ltd. Şti.	construction	20 000
69	Zonguldak	USMED Gemi İnşa San. ve Tic. A.Ş.	construction	20 000
70	Zonguldak	USTAMEHMETOĞLU Gemi Tersanesi	construction	3 000
71	Zonguldak	USTAOĞLU Yat ve Gemi San. Tic. A.Ş.	construction	36 500
72	Çanakkale	GELİBOLU Gemi İnş. San. ve Tic. A.Ş.	construction & repair	108 000
73	Çanakkale	İÇDAŞ Çelik Enerji Tersane ve Ulaşım San. ve A.Ş	construction	165 000
74	Trabzon	BAŞARAN Gemi San. Ve Tic. LTD ŞTİ. (1. TESİS)	construction	5 000
75	Trabzon	BAŞARAN Gemi San. Ve Tic. LTD ŞTİ. (2. TESİS)	construction	5 000
76	Trabzon	NUR Gemicilik ve Tic. A.Ş.	construction	150 000
77	Ordu	KARADENİZ Gemi İnşa Sanayi A.Ş.	repair	38 744

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78	Samsun	TERME Tersanesi A.Ş.	construction	51 000
79	Kastamonu	CİDE Gemi ve Yat San. Tic. A.Ş.	construction	30 000
80	Kastamonu	İNEBOLU Denizcilik San. Ve Tic. A.Ş.	construction	12 900
81	Hatay	LİMAK İsken. Uluslararası Liman İşlet. A.Ş.	construction	12 000
82	Adana	AKDENİZ Gemi İnşa Sanayi ve Tic. A.Ş.	construction & repair	31 250

Source: TMTI Questionnaire, 2020.

2) Employment and activities of the shipyards

LOCATION	SHIPYARD	SIZE			ACTIVITY				
		SME (less than 250 employees)	Large (+250 employees)	XL (+1.000 employees)	Ship repair, maintenance, conversion	Newbuilding	Naval	Civil	MegaYachts (+24m length)
Istanbul	Anadolu Deniz İnş. Kızaklar San. Ve Tic. Aş.		X		X	X	X	X	
Istanbul	Argem Tersanecilik Turizm İnşaat Sanayi Tic.Ltd.Şti	X			X	X		X	
Istanbul	Arkadaş Denizcilik İnşaat San.Ve Tic.Ltd.Şti	X			X	X		X	
Istanbul	Astaş Aslan Tersanecilik Denizcilik San.Ve Tic.Aş	X			X	X		X	
Istanbul	Aykın Denizcilik San.Ve Tic.Ltd.Şti	X			X	X		X	
Istanbul	Çeksan Gemi İnşaa Ve Çelik Kontrüksiyon San. Ve Tic. Aş	X			X	X		X	
Istanbul	Çeliktrans Deniz İnşaat Ltd. Şti.	X			X	X		X	
Istanbul	Çindemir Makina Gemi Onarım Ve Tersanecilik Aş	X			X			X	
Istanbul	Dearsan Gemi İnşaat San. Aş.	X			X	X	X	X	
Istanbul	Dentaş Gemi İnşaa Ve Onarım San. Aş.	X			X	X		X	
Istanbul	Desan Deniz İnşaat San. Aş.		X		X			X	
Istanbul	Erkal Uluslararası Nakliyat Ve Tic. Aş.		X		X			X	
Istanbul	Gemak Gemi İnşaat San. Ve Tic. Aş			X	X			X	
Istanbul	Gemtiş Tersanecilik Ve Tic. Ltd. Şti	X			X	X		X	
Istanbul	Ge-Ta Genel Tasarım San. Ve Tic. Aş.	X			X	X		X	
Istanbul	Gisan Gemi İnşaa San Ve Tic. Ltd.Şti	X			X	X		X	
Istanbul	Hidrokinamik Gemi San. Ve Tic. A.Ş.		X		X	X		X	
Istanbul	Istanbul Denizcilik Gemi İnşaa San. Ve Tic. Aş.		X		X	X	X	X	
Istanbul	Kpt Tersane İşletmeciliği A.Ş		X		X	X		X	
Istanbul	Kuzey Star Shipyard Denizcilik San.Ve Tic.A.Ş		X		X	X		X	
Istanbul	Nesa Gemi İnşaa San.Ltd.Şti	X			X	X		X	
Istanbul	Rmk Marine Gemi Yapım San.Deniz Taş İşl.A.Ş		X		X	X	X	X	
Istanbul	Sanmar Denizcilik Makine Ve Ticaret A.Ş		X		X	X		X	
Istanbul	Sedef Gemi İnşaatı Aş			X	X	X	X	X	
Istanbul	Selah Makina Ve Gemicilik Endüstri Tic..Aş.		X		X	X	X	X	
Istanbul	Snr Gemi İnşaa Sanayi A.Ş	X			X	X	X	X	
Istanbul	Tersan Tersanecilik Ve Taşımacılık Aş.			X	X	X		X	
Istanbul	Torgem Gemi İnş. San.Ve Tic. Aş.	X			X	X		X	
Istanbul	Torlak Denizcilik San. Ve Tic. Aş	X			X	X		X	
Istanbul	Turquoise Yat Sanayi A.Ş.	X			X	X		X	
Istanbul	Tuzla Gemi End. Aş		X		X	X		X	
Istanbul	Türkter Tersane Ve Deniz İşl.Aş	X			X	X		X	X
Istanbul	Ursa Gemicilik Bakım Onarım Tersanecilik San.Ve Tic.A.Ş		X		X	X		X	
Istanbul	Viking Mann Teknik Donatımlar Mümessillik San.Ve Tic.Ltd.Şti	X			X	X		X	
Istanbul	Yardımcı Gemi Aş	X			X	X		X	
Istanbul	Yıldız Gemi Ve Makina San. Ve Tic. Aş	X			X	X		X	
Istanbul	Yonca Teknik Yatırım Turizm Ve San.Tic.A.Ş	X			X	X	X	X	
Yalova	Hicri Ercili Tersanecilik San.Ve Tic.A.Ş.	X			X	X		X	
Yalova	Beşiktaş Tersane A.Ş			X	X	X		X	X
Yalova	Boğaziçi Denizcilik San.Ve Ticaret A.Ş	X			X	X		X	
Yalova	Cemre Mühendislik Gemi İnş.San.Ve Tic.Ltd.Şti			X	X	X		X	
Yalova	Özata Tersanecilik San.Ve Tic.Ltd.Şti	X			X	X		X	X
Yalova	Sefine Denizcilik Ters.Turizm San.Ve Tic.Aş			X	X	X		X	X
Yalova	Yaşarsan Gemi İnşaa San.Ve Tic.Ltd.Şti.		X		X	X		X	
Kocaeli	Çimtaş Gemi İnşaa Sanayi Ve Tic.A.Ş		X		X	X		X	
Kocaeli	Uzmar Gemi İnş.San.Ve Tic.A.Ş		X		X	X		X	
Ereğli	Ereğli Gemi İnşaa San. Ve Tic. Aş.	X			X	X		X	
Çanakkale	Gelibolu Gemi San. Ve Tic. Aş.	X			X	X		X	
Çanakkale	İçdaş Çelik Ene. Ters. Ve Ulaşım San. Aş.	X			X	X		X	
Antalya	Ares Tersanecilik San.Ve Tic.A.Ş.	X			X	X	X	X	
Antalya	Damen Shipyards Antalya Deniz Araçları San.Ve Tic.Ltd.Şti	X			X	X		X	
Antalya	Ege Yat Hizmetleri Tur.San.Tic.A.Ş.	X			X	X		X	
Antalya	Sarp Yat İmalat Sanayi Ve Ticaret A.Ş.	X			X	X		X	
Trabzon	Nur Gemicilik Ve Ticaret A.Ş.	X			X	X		X	
Adana	Shipyard Famagusta Ltd.	X			X	X		X	

Source: TMTI Questionnaire, 2020.

ANNEX 2: INSTITUTIONAL CHARACTERISTICS OF THE SHIPBUILDING SECTOR

1. Industry associations

GISBIR (Turkish Shipbuilders' Association)

Turkish Shipbuilders' Association (GISBIR) was established by shipyard owners on 07.07.1971 in Istanbul.

GISBIR is one of the oldest non-governmental organizations in Turkey and representative of the Turkish ship and yacht building, repair and maintenance industry.

Improving the Turkish shipbuilding industry, helping the Turkish shipyards to take place in the world market, finding solutions for everyday problems of shipyards through relevant authorities, associations, and organizations, representing the Turkish Shipbuilding Industry in national and international areas are among the missions of GISBIR.

Turkish Shipbuilders' Association (GISBIR) has almost one hundred members and represents vast majority of the industry.

GISBIR is a member of SEA Europe and Council Member of ASEF (Active Shipbuilding Experts' Federation).

IMEAK DTO (Chamber of Shipping of Istanbul and Marmara, Aegean, Mediterranean and Black Sea Region)

Istanbul and Marmara, Aegean, Mediterranean and Black Sea Regions Chamber of Shipping, briefly called the Turkish Chamber of Shipping (TCS), is an important professional organization of the Turkish maritime sector, with its headquarters in Istanbul and main branch offices in Izmir, Bodrum, Marmaris, Antalya, İskenderun, Fethiye, Karadeniz Ereğlisi (West Black Sea Region) Kocaeli and Aliğa. It has a Liaison Bureau in Ankara and also representations at all the coastal towns and cities in Turkey. Turkish Chamber of Shipping was first established as Istanbul Chamber of Shipping in 1982 by a group of Turkish shipowners led by Mr. Ziya Kalkavan, the reputed Turkish shipowner and afterwards its area of activities has been extended gradually so as to cover the region of the Sea of Marmara, the Aegean Sea coast and the Mediterranean coast of Turkey, then finally the Black Sea coast of the country.

The most important aim of the Turkish Chamber of Shipping is to try to develop shipping in accordance with the national transportation and shipping policy and the public interest. Moreover, to promote the interests and provide the common requirements of its members, to arrange the development of the profession, to guide and facilitate the professional activities, to establish common rules and to inform the authorities on shipping matters and to keep the discipline, morals and solidarity of the shipping profession are the other major concerns of the Turkish Chamber of Shipping.

Mission

To provide right and timely services and correct information to our members with an ever growing service concept in mind and to eliminate any obstacles in the international and national regulations which hinder the development of the maritime shipping, the purpose of which is to make Turkish Shipping Sector develop in a free and fair competitive atmosphere and contribute to the development of our country in cooperation with public and private sectors.

Vision

To achieve the ideal of becoming a Maritime Nation and a Maritime Country.

Mersin Chamber of Shipping

Mersin Chamber of Shipping was established in 1989 and is subject to the provisions of the Union of Chambers and Commodity Exchanges of Turkey.

Mission

To be a chamber that transforms the power of its stakeholders into synergy, strengthens its members with accurate, fast and reliable information and contributes to the permanent solution of the shipping issues in order to improve the maritime profession and increase the share of our country in maritime trade.

Vision

To be a chamber that grows by offering the best opportunities to the members and the industry, with an accredited institutional identity, which is known for its service quality, respectability and reliability both within the country and abroad.

Turkish Shipowners Association

Turkish Shipowners Association was established in 1939 with the first public committee meeting in Galata-İstanbul.

Turkish Shipowners Association contributes to increasing the competitiveness of Turkish Marine Transportation on a global scale and to be among the most effective countries in the world maritime transportation. The association contributes to the production of national and global maritime transport strategies and policies and to create a practice area with a common understanding. The association also contributes to the development of the Turkish Maritime Fleet in terms of quality and quantity. The association conducts researches, creates opinions, develops projects and organizes activities in this context. The Turkish Shipowners Association, as the top structural institution of the Turkish Maritime Transport, transmits the opinions formed on behalf of the members and the sector to the government, the relevant government institutions and organizations in the international arena, and contributes to creating solutions for sector questions.

Türk Loydu

Türk Loydu has been registered as a ‘facility’ by the Chamber of Naval Architects and Marine Engineers in 1962 after making its first General Assembly with the contributions of the Turkish Union for Insurance and Reinsurance Companies and has become a national, independent and impartial ‘foundation’ in 1967.

Türk Loydu Foundation supports:

- Training Scholarship
- Training and education aids
- Research and Development funding
- Technical personal education program aids
- Developing the knowledge level of the industry
- Sponsorships

At the beginning of 1998, Türk Loydu Foundation Economic Enterprise has been established to perform the activities connected to the Türk Loydu Foundation and organs whose only duty was to carry out lofty objectives.

Change of legal status of Organization from Türk Loydu Foundation Economic Enterprise to Türk Loydu Conformity Assessment Services Corporation (Türk Loydu Uygunluk Değerlendirme Hizmetleri Anonim Şirketi) in accordance with Turkish Commercial Code was realized and issued in Turkish Trade Registry Gazette of İstanbul number 9303, dated 11th April 2017.

Türk Loydu Foundation has also established other companies to perform its activities abroad. Türk Loydu Foundation has a company in Turkey namely TL Teknik ARGE ve Tasarım Ltd. to perform Research and Development activities.

GMO (The Chamber of Turkish Naval Architects & Marine Engineers)

Foundation

The Chamber was founded in İstanbul at the date of December 11, 1954. (Established by the Association of Turkish Maritime Engineers after the Law of Union of Chambers of Turkish Engineers and Architects was enacted in 1954, it is the first Professional Chamber of Engineers of Turkey).

Members

All of the following groups which are professionally active can become members of the Chamber:

- Naval Architects
- Marine Mechanical Engineers
- Shipbuilding and Maritime Mechanical Engineers
- Naval Architects and Maritime Engineers
- Ocean Technology Engineers
- Ship Construction Engineers

The Chamber's Vision

“To be a prestigious professional organization through its pro-labor, inventive and advanced approaches, obtaining its power from the participation of its members and the guidance of science.”

The Chamber's Mission

- From the view of marine engineers;
- To protect their professional dignity and their rights and competencies;
- To meet their common professional needs,
- To facilitate their professional activities,
- To maintain professional discipline and ethics so as to ensure the dominance of honesty and reliance with each other and in their relationship with the public.
- From the view of the Profession of Marine Engineering;
- To provide for its development in line with public weal,
- To establish relationships with national and international fields where applicable and to represent the profession,
- To engage in and undertake activities in subjects relating to their interests and professional fields in terms of education, researches, studies etc., to share the results with members, concerned persons and the society via publications, congresses, symposiums and other means and to prepare and put into force any kinds of legal regulations so as to regulate the field of profession and the practice of the profession.

GESAD (Turkish Association of Ship Industrialists)

GESAD was established in 2000 by 13 entrepreneurs serving Turkish maritime and ship industry.

Missions;

- to provide cooperation and solidarity between real and legal persons operating on various equipment, maintenance and repairs of all types of ships and marine equipments.
- to provide contribution to the development of the Turkish shipbuilding industry
- to help the members of the association and their works to be known in the sector, to obtain information from job opportunities and technological developments, and to train the personnel.

GESAD was established with the purpose to take the whole marine industry and shipping forward in the 21st century, to represent the industry in all aspects, to gain prestige by showing a strong presence in the

international market and to facilitate the coordination and solidarity among its members, to improve the training and experience of the employees.

The association's long-term goal is to keep Turkish Shipbuilding industry and Maritime at the top as a permanent brand in the world, and to work for achieving this status.

Ship and Yacht Exporters Association

Ship and Yacht Exporters Association of Turkey was founded in April 2010 under the umbrella of Istanbul Exporters Association with head office in Istanbul; but the history of ship and yacht building industry in Anatolia, dates back to ancient ages.

In terms of unit as well as tonnage, Turkish shipbuilding industry is one of the major producers in the world. Ship and yacht sector support not only the growth of employment and logistic sector; but also foreign currency input and sub-industries. The sector has adequate facilities, technology and workforce.

The docks are located mainly in Tuzla, Yalova, Izmit and other shores. In addition, there are 220 member companies specialized in petrol, chemical, oil and serving tankers, mega yachts, container and cargo ships, bulk carriers, tugboats and repair issues.

Subjects of Ship and Yacht Exporters Association;

1. Cargo vessels for the transport of both persons & goods
2. Tankers Turkish Ship & Yacht Exporters Brochure
3. Floating docks and vessels which perform special functions
4. Motorboats, other than outboard motorboats
5. Cruise ships, excursion boats principally designed for transportation of persons
6. Floating or submersible drilling or production platforms
7. Vessels, including lifeboats (excluding warships, rowing boats and other vessels)
8. Tugs and pusher craft
9. Warships of all kinds
10. Rowing boats, canoes, sculls and other pleasure boats
11. Sailboats, with or without auxiliary motor
12. Vessels and other floating structures for breaking up
13. Dredgers
14. Refrigerated vessels other than tankers
15. Fishing vessels and factory ships
16. Buoys, beacons, coffer-dams, pontoons and other floating structures
17. Inflatable pleasure craft
18. Inflatable rafts including those for carrying shipwrecked persons
19. Anchors, grapnels and parts

KOSDER (Coaster Shipowners and Operators Association)

KOSDER was established in 2014 to make contributions on development of Turkish coaster fleet and to create a solidarity platform between the Turkish shipowners and operators of all types of ships operated as a coaster. The missions of the association are;

- to focus on the common and/or individual problems of its members with a strong corporate representation
- to support its members who they believe are treated unfairly
- to inform members about the market changes and developments first hand
- to look for ways to develop managers and employees in other words intellectual capital which is the biggest capital in management of companies

- to carry out joint projects that will carry the crisis-weary ships and companies of its members to the future, in particular, it will take the studies that have started the search for financing the renewal of the coaster fleet to a higher level with this new structure.
- to become an organization that can be benefited by anyone interested in the sector for the future of our country's foreign trade and coaster transportation, which is a very essential national project to implement

2. International co-operation

GİSBİR (Turkish Shipbuilders' Association) became a council member of ASEF in 2019 and member to Sea Europe in 2018. GİSBİR is also an observer member of EU Waterborne Technology Platform that attend Waterborne TP meetings as observers.

Endnotes

- ¹ <https://loydslist.maritimeintelligence.informa.com/LL034502/Yards-wait-for-better-economic-times>
- ² For a recent example of LNG-powered coastal ships, see <https://www.cruiseandferry.net/articles/tersan-shipyard-launches-two-newbuilds-for-havila-voyages>
- ³ Source: <https://www.tradewindsnews.com/interviews/turkish-boutique-yard-sefine-focuses-on-niche-markets-to-drive-growth/2-1-525010>
- ⁴ <https://www.tradewindsnews.com/shipyards/turkish-shipyard-revenue-hits-2-5bn/2-1-109887>
- ⁵ E.g. Alia Yachts, <https://www.superyachtnews.com/business/alia-yachts-unveils-new-sheds-and-project-updates>
See also <https://www.hurriyetdailynews.com/antalya-yacht-builders-rake-in-over-1-billion-150696>
- ⁶ <https://www.hurriyetdailynews.com/turkish-maritime-industry-size-exceeds-17-5-billion-141427>
- ⁷ <https://www.tradewindsnews.com/shipyards/erdogan-turkish-shipping-blows-cobwebs-away/2-1-540225>
- ⁸ <https://www.tradewindsnews.com/tankers/besiktas-busy-with-norden-and-grimaldi-scrubber-work/2-1-542234>
- ⁹ <https://www.tradewindsnews.com/interviews/turkish-boutique-yard-sefine-focuses-on-niche-markets-to-drive-growth/2-1-525010>
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- ¹² <http://www.turkishmaritime.com.tr/cruise-ship-shipbreaking-booming-in-turkey-38694h.htm>
- ¹³ <https://loydslist.maritimeintelligence.informa.com/LL039220/Cascade-effect-boosts-Turkish-yards>
- ¹⁴ <http://www.ebso.org.tr/en/services/organized-industrial-zones>
- ¹⁵ See <http://celik.org.tr/en/english-turkish-steel-industry/>
- ¹⁶ <https://loydslist.maritimeintelligence.informa.com/LL034505/Shipbreakers-cash-in-on-prime-location>
- ¹⁷ <https://loydslist.maritimeintelligence.informa.com/LL1126092/Turkey-ratifies-ship-recycling-convention>
- ¹⁸ <https://loydslist.maritimeintelligence.informa.com/LL109091/ClassNK-certifies-Isiksan-yard-in-Turkey>
- ¹⁹ <https://www.tradewindsnews.com/shipyards/turkish-shiprecycling-yards-relish-chance-to-compete-on-a-level-playing-field/2-1-586995>
- ²⁰ <https://loydslist.maritimeintelligence.informa.com/LL044924/Turkish-ship-recycler-moves-closer-to-European-approval>
- ²¹ <https://www.tradewindsnews.com/shipyards/turkish-shiprecycling-yards-relish-chance-to-compete-on-a-level-playing-field/2-1-586995>
- ²² <https://ec.europa.eu/environment/waste/ships/list.htm>
- ²³ <https://loydslist.maritimeintelligence.informa.com/LL111985/Is-the-EU-Ship-Recycling-Regulation-a-lame-duck>
- ²⁴ <https://www.tradewindsnews.com/shipyards/turkish-shiprecycling-yards-relish-chance-to-compete-on-a-level-playing-field/2-1-586995>
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- ²⁸ NGO Shipbreaking Platform, "Annual Report 2017", <https://shipbreakingplatform.org/wp-content/uploads/2018/07/Annual-Report-2017-Final-Spreads.pdf>, 10.
- ²⁹ <https://superyachtinvestor.com/news/chinas-richest-beginning-to-show-interest-in-luxury-yachts-123/>
- ³⁰ <https://www.uab.gov.tr/>
- ³¹ <https://www.sanayi.gov.tr/kurumsal/teskilat-semasi>
- ³² <https://www.sanayi.gov.tr/medya/haber-detayi/0aac5b39-1bbc-46fc-8684-bc75761c53b3>
- ³³ For an English translation of the 11th Development Plan, see http://www.sbb.gov.tr/wp-content/uploads/2020/03/On_BirinciPlan_ingilizce_SonBaski.pdf
- ³⁴ <https://sefine.com.tr>; <https://www.seanews.com.tr/turkey-s-sefine-shipyard-to-build-4-lng-ready-ferries-for-estonia/162550/>; <https://www.lngnews.com/the-mediterranean-meets-its-first-lng-powered-ferry/>
- ³⁵ <http://www.turkishmaritime.com.tr/sov-for-hornsea-two-owf-launched-in-turkey-38633h.htm>
- ³⁶ WP6 PEER REVIEW PROCESS [C/WP6(2012)5]: "At the WP6 meeting of November 2011, delegates agreed that the objectives of the peer reviews at this stage would be two-fold: to strengthen the identification of government subsidies, policies, practices and measures that should be reported in the WP6 Inventory of Subsidies and Other Support Measures; and to enable such policies, practices and measures to be discussed within the WP6 so that their impact on the shipbuilding industry can be better understood."

³⁷ <http://www.kgf.com.tr/index.php/tr/>

³⁸ See also WTO Panel report Brazil – Export Financing Programme for Aircraft, WT/DS46/R, paras. 1.1 – 1.10. Confirmed by WTO Appellate Body Report Brazil – Export Financing Programme for Aircraft Recourse by Canada to Article 21.5 of the DSU, WT/DS46/AB/RW.

³⁹ <https://www.eximbank.gov.tr/en/homepage>

⁴⁰ Turk Exim Bank, Annual Report 2019, <https://www.eximbank.gov.tr/content/files/40dcebd3-acd1-4e43-8eef-34ecd249d038/annual-report-2019>

⁴¹ For a recent example, see the EUR 380 million loan by an international group of banks, half of which is backed-up by a guarantee by the IBRD, <https://seenews.com/news/turk-eximbank-gets-380-mln-euro-loan-from-intl-lenders-report-704583>

⁴² WTO Secretariat, G/AG/W/125/Rev.11/Add.2, ‘Export Subsidies, Export Credits, Export Credit Guarantees or Insurance Programmes, International Food Aid and Agricultural Exporting State Trading Enterprises’, 2019, 77.

⁴³ <https://www.eximbank.gov.tr/en/product-and-services/buyer-s-credits/international-project-loans>

⁴⁴ 11th Development Plan, p. 94-95.

⁴⁵ <https://www.tubitak.gov.tr/en>

⁴⁶ <https://www.kosgeb.gov.tr/>

⁴⁷ See <https://www.tubitak.gov.tr/tr/destekler/sanayi/ulusal-destek-programlari/icerik-1501-tubitak-sanayi-ar-ge-projeleri-destekleme-programi>

⁴⁸ <https://gidb.itu.edu.tr/en/faculty/history>

⁴⁹ The priority sectors mentioned in the 11th Development Plan are the chemical industry, pharmaceuticals and medical devices, electronics, machinery and electrical equipment, automotive and rail system vehicles.

⁵⁰ Turkish 11th Development Plan, p. 19, number 128.

⁵¹ Gross domestic spending on R&D is defined as the total expenditure (current and capital) on R&D carried out by all resident companies, research institutes, university and government laboratories, etc., in a country. It includes R&D funded from abroad, but excludes domestic funds for R&D performed outside the domestic economy. This indicator is measured in USD constant prices using 2010 base year and Purchasing Power Parities (PPPs) and as%age of GDP, see <https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm>

⁵² See K. Dawar, ‘Official Export Credit Support: Competition and Compliance Issues’, Journal of World Trade 2020, 373 and following.

⁵³ <https://www.oecd.org/sti/ind/shipbuildingagreement-overview.htm>

⁵⁴ Defined by the Agreement as ‘research activities independently conducted by higher education or research establishments for the enlargement of general scientific and technical knowledge, not linked to industrial or commercial objectives.’

⁵⁵ Defined by the Agreement as ‘original theoretical and experimental work whose objective is to achieve new and better understanding of the laws of science and engineering in general and as they might apply to an industrial sector or to the activities of a particular undertaking.’

⁵⁶ Defined by the Agreement as ‘ i) Costs of instruments, materials, land and buildings to the extent that they are used for the specific research and development project; ii) Costs of researchers, technicians and other supporting staff to the extent that they are engaged in the specific research and development project; iii) Consultancy and equivalent services including bought in research, technical knowledge, patents, etc; iv) Overhead costs (infrastructure and support services) to the extent that they are related to the research and development project, on condition that they do not exceed 45 per cent of the total costs of the project for basic industrial research and 20 per cent for applied research and 10 per cent for development.’

⁵⁷ Defined by the Agreement as ‘investigation or experimental work on the basis of the results of the basic research with a view to facilitating the attainment of specific practical objectives such as the creation of new products, production processes and services. It normally ends with the creation of a first prototype and does not include efforts whose principal aim is the design, development or testing of specific items of services to be considered for sale.’

⁵⁸ Defined by the Agreement as ‘work based on the systematic use of scientific and technical knowledge in a design, development, testing or evaluation of a potential new product, production processes or service or of an improvement of an existing product or service to meet specific performance requirements and objectives. This stage will normally include pre-production models such as pilot and demonstration projects but does not include industrial application and commercial exploitation.’