



REPUBLIC OF TÜRKİYE
MINISTRY OF INDUSTRY
AND TECHNOLOGY



İZMİR
DEVELOPMENT
AGENCY

CURRENT SITUATION AND ANALYSIS ON THE DEVELOPMENT OF THE PORTS OF İZMİR

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**CURRENT SITUATION AND ANALYSIS
ON THE DEVELOPMENT OF THE PORTS OF İZMİR**

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Thanks

We would like to thank the project team who participated in this project, which we are confident will contribute to the development of the ports of İzmir.

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İSKENDERUN TECHNICAL
UNIVERSITY



PRESENTATION

This study aims to complement the Current Situation Analysis and the Development Perspective of the Ports of İzmir by the İzmir Development Agency to increase the share of İzmir in the Mediterranean and global maritime commerce, and to strengthen the region in terms of maritime transport and ports in particular. Within this scope, a current status analysis of the ports in the region, a logistics analysis focused on the ports in the region and a regional strategic cargo analysis were conducted and, consequently, interpreted into suggestions to improve the maritime transport and ports in İzmir.

The study concluded that the ports of İzmir are currently capable of responding to cargo development in the short and medium terms. The export cargo character of the region, on the other hand, is a particularly critical aspect in preventing potential bottlenecks in ports in terms of their container handling capacity. Long-term capacity and efficiency are

are also possible in the region through the current development plans of specialized container terminals in the region by upgrading the TCDD (General Directorate of Turkish State Railways) Port of İzmir in line with the advancements, as well as through the holistic development of the port ecosystem.

As for the sectoral development of the region, joint schedules with the North Aegean Port in Çandarlı will present significant opportunities. The study advises prioritizing the developments in the chemical and energy industries as the leading sectors in Northern İzmir. The Port of Çandarlı has great potential for sectoral development in addition to being a container transfer location with its logistics structured around the port.

We hope that this study benefits beautiful İzmir and all concerned authorities.

Secretary General of
İzmir Development Agency

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ABBREVIATIONS

ABPRS	Address-Based Population Registration System
CART	Classification and Regression Tree
CORINE	Coordination of Information on the Environment
EC	European Commission
et al.	et alia (and others)
EU	European Union
EUROSTAT	Statistical Office of the European Commission
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GIS	Geographic Information System
IMF	International Monetary Fund
MoEU	Ministry of Environment and Urbanization
MoIT	Ministry of Industry and Technology
NAD	National Address Database
OECD	Organisation for Economic Co-Operation and Development
OIZ	Organized Industrial Zone
SARS	Spatial Address Registration System
SDG	Sustainable Development Goals
SEDI	Social Economic Development Index
SPO	State Planning Organization
TÜBİTAK	The Scientific and Technological Research Council of Türkiye
TUIK	Turkish Statistical Institute
TURKSTAT	Turkish Statistical Institute (Formerly State Statistical Institute)
UN	United Nations
UN Habitat	United Nations Human Settlement Programme
UNSC	United Nations Statistical Commission
UNSD	United Nations Statistics Division



EXECUTIVE SUMMARY

The Aegean is a dynamic region that combines a range of sectors from industry to agriculture, mining and tourism. This wide range of sectors influenced the development of the port sector. Eventually, the port infrastructure was developed to address all ship and cargo types. As of 2020, the 28 ports in the Aegean handled a total of 85.9 million metric tons of cargo.

Nineteen of these ports in the Aegean are located in the TR31 İzmir Region (İzmir and Aliağa). Ten of them handle general cargo and dry bulk, eight handle liquid bulk, and four handle container cargo and ships.

As of 2020, 15.7 percent of the total cargo handled in Türkiye was handled in the ports of İzmir. As for container load, a total of 1.7 million TEUs, which equals 14.7 percent of the total 11.6 million TEUs handled in Turkish ports, were handled in the ports of the İzmir region. The largest port in the İzmir region in terms of pier length, port area, and handling capacity is the TCDD Port of İzmir.

The theoretical general cargo ship capacity of the nine ports under the authority of Port Authorities of İzmir, Aliağa and Dikili in the İzmir region is calculated as: 2,469 ships/year and a theoretical handling capacity of 9,341,131 metric tons/year. Again for the same ports, the theoretical dry bulk cargo ship capacity is 3,120 ships/year and the theoretical cargo handling capacity is 17,450,883 metric tons/year. The ports in the İzmir region constitute approximately 9 percent (26,792,015 metric tons/year) of the total 293,311,909 metric tons/year general cargo (+dry bulk) handling capacity of Turkish ports. For the four container ports under the authority of the İzmir and Aliağa port authorities in the İzmir region, the theoretical ship capacity has been estimated to be 3,561 ships/year while the theoretical handling capacity is 2,618,969 TEUs/year. The ports in the İzmir region constitute approximately 16 percent (3,179,070 TEUs/year) of the total 19,629,665 TEUs/year container handling capacity of Turkish ports.

The hinterland of the ports in İzmir corresponds to the geographic layout of the Aegean. From north to south, the ports in İzmir are Dikili, Aliağa, Nemrut Bay, İzmir TCDD and Çeşme. The cargo handled in these ports originates from the eight provinces within the hinterland. These include İzmir, Manisa, Aydın, Denizli, Muğla, Afyon, Uşak and Kütahya. A province-based breakdown of main export items indicates mining in Afyon and Aydın, ready-to-wear in Denizli, chemical materials and products in İzmir, cement in Kütahya, electric and electronics in Manisa, aquaculture and fisheries in Muğla, and carpets in Uşak.

The free zone and the organized industrial zones (OIZ) within the area are major production and cargo locations for the regional export and ports. In 2020, the total trade volume of the 18 free zones in Türkiye reached \$21.8 billion. The Aegean Free Zone takes the leading position with \$3.8 billion, closely followed by the Istanbul Specialized Free Zone with \$3.6 billion and the Mersin Free Zone with \$2.5 billion. Of the two other free zones in the Aegean, the İzmir Free Zone achieved \$675 million in trade volume and the Denizli Free Zone achieved \$58 million. The total trade volume of the three free zones in the Aegean reached \$4.5 billion in 2020.

Free zones also present significant employment opportunities. In 2020, the free zones across Türkiye employed a total of 79,000 people. Of these, 25,000 were employed in the Aegean.

There are 14 OIZs within the İzmir province, while the entire Aegean Region includes 55 OIZs. The İzmir Atatürk Organized Industrial Zone (IAOIZ) is a crucial heart of production, export and employment in İzmir and in Türkiye with \$8 billion of annual turnover, \$4 billion in exports, \$1.5 billion in imports, a total of 600 companies and 45,000 employees.

The highly developed port infrastructure as well as the road and rail infrastructures in the Aegean render

the region highly efficient compared to other parts of Türkiye. The combination of the current transfer and cargo centers in the railway and the logistics center projects in the region create significant potential in terms of regional logistics infrastructure.

The eight provinces comprising the hinterland of İzmir ports achieved \$19 billion in export in 2020, which corresponds to 12.2 percent of Türkiye's total exports. With \$9.5 billion, the exports of İzmir correspond to 6 percent of Türkiye's and 50 percent of the region's export amount.

Manisa follows by \$4.2 billion, Denizli by \$3.2 billion, Aydın by \$660 million and Muğla by \$592 million. The total export volume of the three other provinces in the region is \$850 million. İzmir undertakes 52 percent of the total export value in the region. The top-three export items in İzmir are chemical materials and products; ready-to-wear clothing; and furniture, paper and forest products. The Aegean's greatest advantage is that it is both efficient in industry and possesses major potential in agriculture and mining.

There are two important aspects to consider when formulating a development perspective for ports in İzmir. The first is the development area's capacity to contribute to employment. From an economic added-value point of view, it is observed that, while there are exceptions, many sectors offer a limited employment capacity or opt for highly qualified employees. The second important aspect is the multiplier effect that contributes in foreign trade and the development of other sectors. From that point of view, chemical and energy industries stand out in terms of their potential.

Particularly for the development scenarios concerning the Çandarlı region, these two industries enable a holistic approach towards port and sectoral development. Within that perspective, establishing an organized industrial zone specialized in chemicals and a chemical logistics center will help begin a new

chapter in the Aegean. Energy policies also indicate a great capacity development. Renewable energy is expected to comprise approximately 95 percent of total power capacity increases by 2025. Total installed solar and wind power is expected to exceed natural gas by 2023 and coal by 2024. By 2025, solar energy will constitute 60 percent of total renewable energy sources and wind power 30 percent.

The Port of Çandarlı already features a sufficient hinterland for chemicals and renewable energy sources. If these two sectors are incorporated within the hinterland of the Port of Çandarlı, the currently container-based functions and planning of the port will expand to also include liquid bulk cargo and project loads. It could be argued that such a structuring will positively impact the economic feasibility of the port. Furthermore, it will encourage local and foreign investors interested in investing in these sectors. Having chemical and energy industries on site at the port will also further attract port investors to the Port of Çandarlı.

The study presents these scenarios based on the detailed background information on İzmir and Türkiye, and includes suggestions. Within that aspect, a current situation analysis has been conducted on the ports in the region. The second chapter, on the other hand, includes a more comprehensive study including a Port-Centric logistics analysis. The third chapter analyzes the region in terms of strategic cargo to determine from a holistic perspective the development trends in the ports and the regional needs. The fourth chapter presents a synthesis of the analysis results and puts forth suggestions for port developments.

CHAPTER 1.

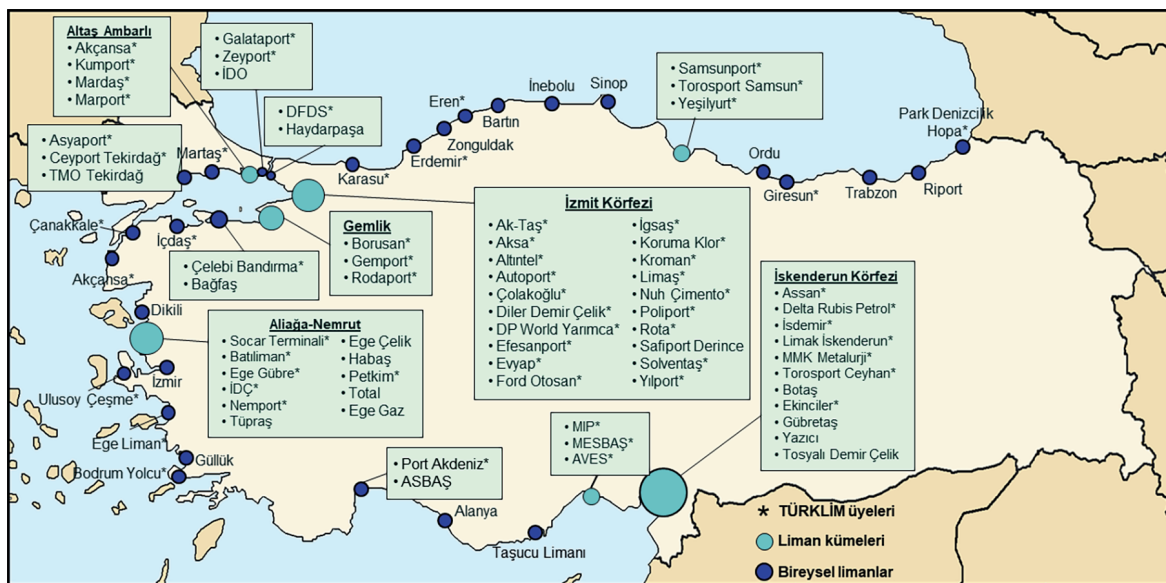
Current Situation Analysis of the Ports of İzmir

1.1. Macro Data on Türkiye

There are 197 shore facilities in Türkiye in different forms and qualities (including piers, buoys, dolphins, platforms, etc.) (Figure 1). Eighty-nine of these shore facilities, corresponding to 45 percent, are located in the Marmara Region while 45, corresponding

to 23 percent, are in the Mediterranean Region; 35, corresponding to 18 percent, are in the Black Sea Region; and 28, corresponding to 14 percent, are in the Aegean (TÜRLİM, 2020).

FIGURE 1. Major Active Ports on the Shores of Türkiye¹



According to the General Directorate of Maritime Affairs statistics, the Turkish ports handled a total of 496 million metric tons of cargo in 2020, of which 229 million metric tons are in loading and 267 million metric tons are in unloading. For all cargo types

(liquid bulk, container, etc.) and regimes (transit, cabotage etc.), unloading comprises 54 percent and loading comprises 46 percent of the total handled load in metric tons (Table 1).

TABLE 1. Distribution of Cargo Handled at Türkiye Ports According to Regimes²

Cargo Regime	2016	2017	2018	2019	2020
Import	215,132,519	233,656,024	218,544,820	221,404,812	226,539,473
Export	94,805,120	113,692,068	110,424,635	131,676,578	138,902,823
Transit	66,963,307	63,429,725	71,628,260	74,974,298	72,402,972
Cabotage	53,300,216	60,396,079	59,555,845	56,112,724	58,797,384
Total	430,201,162	471,173,896	460,153,560	484,168,412	496,642,652

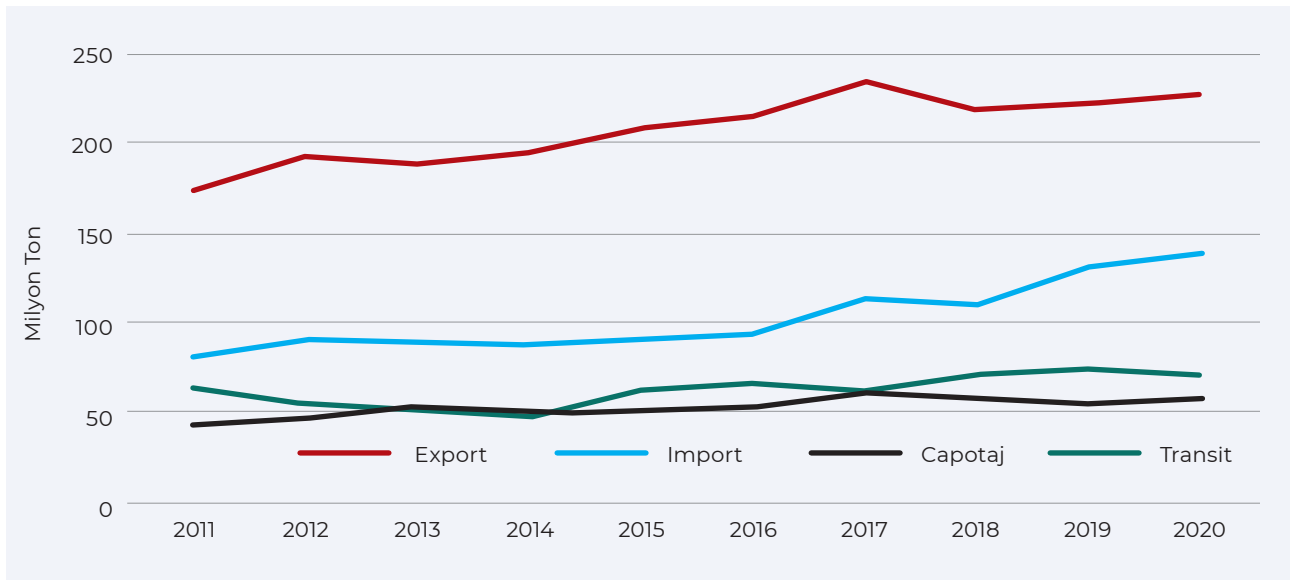
¹ Sectoral Report on Turkish Ports (2020), TÜRLİM

² Statistics courtesy of the Ministry of Transport and Infrastructure, General Directorate of Maritime Affairs (<https://denizcilikistatistikleri.uab.gov.tr/yuk-istatistikleri>)

Export cargo (138.9 million metric tons) constitutes 28 percent of the total cargo handled at Türkiye ports while export cargo (226.5 million metric tons) constitutes

46 percent, cabotage cargo (58.8 million metric tons) constitutes 12 percent, and transit cargo (72.4 million metric tons) constitutes 15 percent (Figure 2).

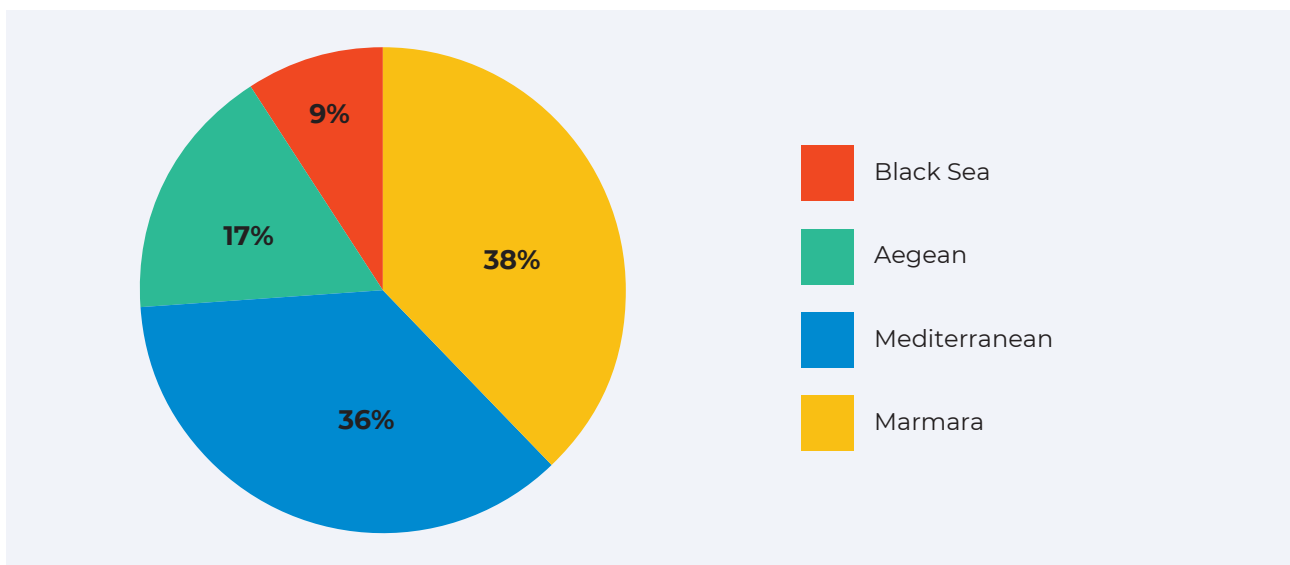
FIGURE 2. The Cargo Load Handled at Türkiye Ports During a 10-Year Period³



Based on the regional break-down of cargo handled at Türkiye ports, 38 percent of total cargo (189.8 million metric tons) was handled in in Marmara Region. The Mediterranean follows closely with 36 percent

(175.5 million metric tons) and the Aegean in the third row with 17 percent (85.9 million metric tons). And, finally, the Black Sea has 9 percent (45.3 million metric tons) (Figure 3).

FIGURE 3. Cargo-Handling Ratios Per Region⁴



³ Statistics courtesy of the Ministry of Transport and Infrastructure, General Directorate of Maritime Affairs

⁴ Statistics courtesy of the Ministry of Transport and Infrastructure, General Directorate of Maritime Affairs

1.2. Regional Dynamics

As an important agriculture, tourism, mining and industry destination in Türkiye, the Aegean holds a substantial foreign trade potential. Significantly undermining its full potential, the Aegean undertakes an important role in national development with its rapidly growing industry thanks to its productive agricultural lands, wide agricultural pattern and rich underground resources.

As always, developing and sustaining local and foreign trade is only possible through a solid transport infrastructure. In that respect, the Aegean already features a complete logistics infrastructure with the Adnan Menderes Airport, which is suitable for international flights; with a wide railway network connecting İzmir, Manisa, Denizli, Uşak, Aliağa, Balıkesir, Bandırma, Aydın and Denizli; and with an efficient road network connecting to the İzmir and Istanbul highways and motorways.

The largest city of the Aegean, İzmir is also home to several major ports in Türkiye. One of the most ancient settlements in Anatolia, İzmir's character as a port city dates back over 8,500 years. This might explain why İzmir is the only surviving port city despite being surrounded by notable ancient cities including the UNESCO World Heritage Sites Ephesus, Bergama, Teos, Miletus and Aspendos. Currently, the foreign trade of the Aegean region is undertaken at the Ports of TCDD İzmir and Aliağa. The Aegean ports have recently achieved the competitive power to rival the Marmara ports thanks to the wide product range of the Aegean in addition to infrastructural advantages and modern equipment.

With a population of over 4.2 million, the İzmir province is Türkiye's third-largest city. Currently, İzmir's population increase rate (1.32 percent) exceeds that of Türkiye's. The population is expected to reach 4,432,909 by 2020 and 4,580,076 by 2023. The tax income from İzmir towards the central budget was 84.4 billion Turkish lira as of 2019. Of the total tax

worth 99.3 billion Turkish lira accrued in the city, 84.4 billion Turkish lira has been collected. Tax collected in İzmir corresponds to 12.5 percent of total tax collected in the country and is only second to Istanbul.

According to export data from customs, İzmir realized an export volume of \$25.96 billion in 2019. Compared to the total \$180.87 billion of collective Turkish export in 2019, İzmir contributed 14.3 percent of the national export amount, according to customs data.

According to TURKSTAT data based on provinces where headquarters of companies are located, İzmir follows Istanbul in second place in the list of top exporting cities.

A significant cargo center in the Aegean, the Aliağa region currently stands out with its population of over 80,000, its qualified labor force and its industrial organizations, which operate in heavy industry including iron, steel, petrochemical and ship-breaking. Furthermore, it is a leading location in Türkiye for petrol and its derivatives. The ports in the Aliağa region that boost the regional industry contain significant high-quality logistics centers, as they are located at the intersection of the İzmir-Çanakkale and İzmir-Istanbul highways, motorways and the İzmir-Bandırma railway line.

1.2.1. Ports of the Aegean Region

There are currently 22 ports operating in the Aegean, some of which are located in the Aliağa district of the İzmir province. The only state operated port among them is the TCDD Port of İzmir. The construction of the port began in 1954 and the first stage was commissioned in 1959. The TCDD Port of İzmir is currently the largest in the Aegean in terms of dock length and hinterland area. The TCDD Port of İzmir is also the only port in the Aegean with the capacity to handle all sorts of ships and cargo. This quality makes the TCDD Port of İzmir a significant component in the logistics infrastructure of the region.

Nineteen of the ports in the Aegean are located in the İzmir Region (İzmir and Aliğa) (Table 2). Ten of the operating ports handle general cargo and dry bulk,

eight handle liquid bulk, and four handle container cargo and ships.

TABLE 2. Ports of the Aegean Region

Ports/Terminals	Location	Container	General Cargo	Liquid Bulk	LNG+PPG	Ro-Ro	Passenger
TCDD Port of İzmir	İzmir	X	X	X		X	X
Ege Fertilizer Port	İzmir	X	X	X			
Port of Habaş	İzmir		X	X			
Petkim Port	İzmir		X	X			
Nemport Port	İzmir	X	X				
SOCAR Terminal	İzmir	X					
Port of Batılman	İzmir		X				
IDC Port	İzmir		X				
Ege Steel Port	İzmir		X				
Ulusoy Çeşme Port	İzmir					X	X
Port of Dikili	İzmir		X				X
Petrol Ofisi Port	İzmir			X			
Total Port	İzmir			X			
Alpet Port	İzmir			X			
TÜPRAŞ Port	İzmir			X			
Egeport Port	Kuşadası						X
Milangaz Port	İzmir				X		
ETKİ Port	İzmir				X		
Ege Gaz Port	İzmir				X		
Güllük Port	Milas		X				
Bodrum Cruise Port	Bodrum						X
Marmaris Cruise Port	Marmaris						X
Total in the Aegean		4	10	8	3	2	6
Total in Türkiye		28	87	109	6	29	27

The Aegean plays a significant role in the national and international maritime transport with its port infrastructure. The Ports of İzmir, Aliğa and Nemrut Bay share the same hinterland thanks to their geographic proximity. According to 2020 data, 16.1 percent of the

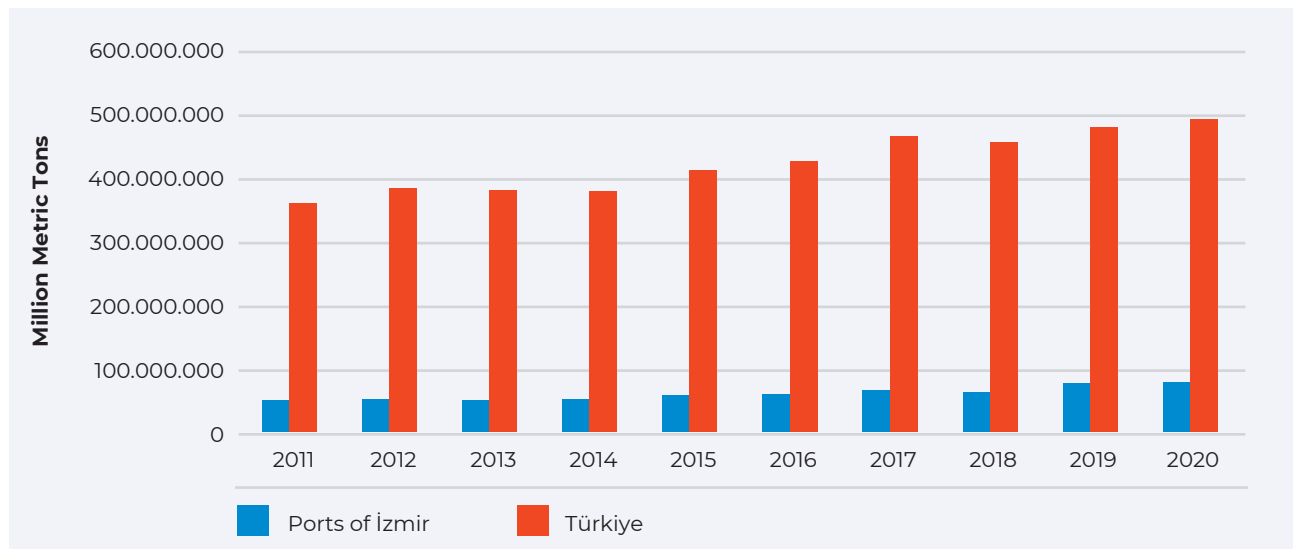
total cargo handled in Türkiye, in terms of metric tons, goes through the ports of İzmir (İzmir, Aliğa, Çeşme and Dikili). As for the total cargo volume, petrol and derivatives of the liquid bulk cargo group have a significant share in the Aliğa region (Table 3).

TABLE 3. Total Cargo Volume Handled by Year (Million Metric Tons)⁵

Years	2011	2012	2013	2014	2015
Ports of İzmir	49,740,219	54,103,994	52,630,143	54,568,020	59,815,737
Percentage Share	13.7%	14%	13.7%	14.2%	14.4%
Türkiye	363,346,723	387,426,232	384,930,758	383,120,619	416,036,695
Years	2016	2017	2018	2019	2020
Ports of İzmir	61,813,049	67,157,805	64,800,719	77,098,663	80,070,434
Percentage Share	14.4%	14.3%	14.1%	15.9%	16.1%
Türkiye	430,201,162	471,173,896	460,153,560	484,168,412	496,642,652

Analysis of the total cargo volume handled by Turkish ports over the course of the past 10 years does not indicate a significant increase in the share of İzmir ports. The cargo volume handled in the ports of İzmir

fluctuated during this period but has only exceeded 15 percent in the last two years (2019 and 2020) (Table 3 and Figure 4).

FIGURE 4. Development of Cargo Volume in Türkiye and in the Ports of İzmir⁶

The TCDD Port of İzmir was the only container-handling port in the Aegean before it lost that unique aspect in late 2009. By then, the Ege Fertilizer and Nempont container terminals were commissioned at the Aliağa Nemrut Bay Port. Furthermore, the port serving the container ships, which was first launched

under the name of Petlim in 2015, was renamed the SOCAR Terminal in 2018. Once the SOCAR Terminal was commissioned, the ports of Aliağa became the main location for container cargo. After that, all container lines headed to the TCDD Port of İzmir redirected their larger ships to Nemrut Bay.

⁵ Statistics courtesy of the Ministry of Transport and Infrastructure, General Directorate of Maritime Affairs

⁶ Statistics courtesy of the Ministry of Transport and Infrastructure, General Directorate of Maritime Affairs

Over the past 10 years in the Marmara region, several large-scale port investments have been made to handle container cargo (Asyaport, Belde Port, DP Yarımca Port, Safi Port, etc.). Port investment is the backbone of foreign trade and, as investments were delayed in the Aegean, new industrial investments shifted towards the Marmara. The share of İzmir ports significantly declined, particularly for container cargo carrying high-quality industrial products.

While 30 percent of container cargo handled at the ports of Türkiye in 1999 was handled at the TCDD Port of İzmir, the total share of all ports in İzmir dropped below 15 percent in 2020.

Of the total 11.6 million TEUs of container cargo handled in Turkish ports, 1.7 million TEUs, which totals 14.7 percent, are handled in the ports of İzmir region (Table 4).

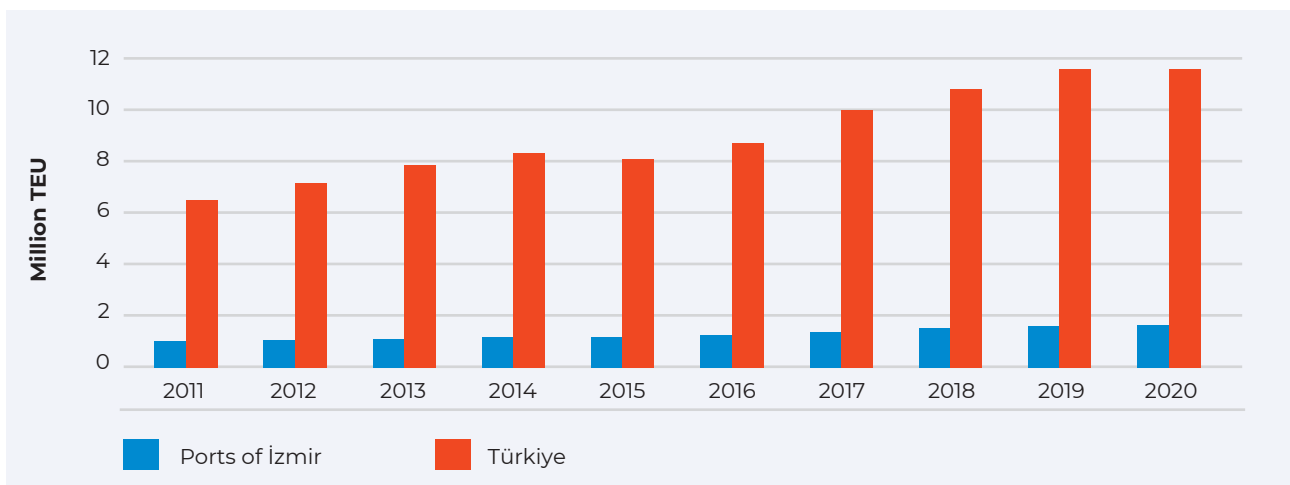
TABLE 4. Total Container Volume Handled by Year (TEU)⁷

Years	2011	2012	2013	2014	2015
Ports of İzmir	1,049,633	1,109,372	1,149,617	1,215,274	1,229,816
Percentage Share	16.09%	15.42%	14.55%	14.55%	15.1%
Türkiye	6,523,506	7,192,396	7,899,933	8,351,122	8,146,398
Years	2016	2017	2018	2019	2020
Ports of İzmir	1,321,749	1,432,245	1,555,613	1,674,159	1,711,609
Percentage Share	15.09%	14.31%	14.35%	14.44%	14.72%
Türkiye	8,761,974	10,010,536	10,843,998	11,591,838	11,626,650

A review of container cargo handled in Türkiye over the last 10 years indicates that there has been no significant increase in the ratio of cargo handled in the İzmir region. On a positive note, the share of İzmir

region ports in container cargo handling has been in a steady, though slow, increasing trend for the last three years (Figure 5).

FIGURE 5. Development of Container Volume in Türkiye and in the Ports of İzmir⁸



⁷ Statistics courtesy of the Ministry of Transport and Infrastructure, General Directorate of Maritime Affairs

⁸ Statistics courtesy of the Ministry of Transport and Infrastructure, General Directorate of Maritime Affairs

1.3. Ports of İzmir

There are seven ports in the Aegean, all located in the Nemrut Bay in the Aliağa district of the İzmir province, that share the same hinterland as the TCDD Port of İzmir. These ports are, from the south to the north shore in counter-clockwise order: the Habaş, Ege Steel, Batılıman, İzmir Iron and Steel and Ege Fertilizer (TCEEGE), with Nempont and Petkim/SOCAR Terminals in the north. Four of these ports (TCDD Port of İzmir, Ege Fertilizer Port, Nempont and SOCAR Terminal) handle container ships and cargo (Figure 6).

FIGURE 6. Ports in the Nemrut Bay



All ports in İzmir are located within the gulf. They are all natural harbors and, therefore, are not protected against the weather or the sea by a breakwater. These ports in İzmir handle a wide hinterland through a developed transport infrastructure. The railway reaches all the way through the TCDD Port of İzmir. The ports in Aliağa, on the other hand, primarily utilize the Biçerova Railway Terminal located behind Nemrut Bay. The terminal has a 40,000-square-meter open storage site.

Efficient and effective operation in ports depends on physical qualities and equipment as well as integration with world maritime trade. Pier length and depth are indicative of the maximum length of docking ships, while port equipment and warehouse storage indicate whether the port is suitable for cargo. In that respect, recent investments have leveraged the ports in the İzmir region to compete with other ports in Türkiye.

1.3.1. TCDD Port of İzmir

The TCDD Port of İzmir is located at the 38°26'39" Northern latitude and 27°09'17" Eastern longitude. It handles all cargo types but specializes in containers. The primary hinterland of the Port of İzmir includes the provinces İzmir, Manisa, Aydın, Denizli, Uşak and Afyon while the secondary hinterland includes Çanakkale, Balıkesir, Bursa, Bilecik, Eskişehir, Kütahya, Ankara, Muğla, Burdur and Isparta. The TCDD Port of İzmir has the largest port area in the region with a total hinterland of 680,000 square meters. Approximately 266,000 square meters of the port area is assigned for storage use. Of that area, 221,000 square meters is allocated to container cargo, 9,900 square meters to general cargo and 17,100 square meters to cargo on wheels. The Port Contains a Railway Connection (Figure 7).

FIGURE 7. TCDD Port of İzmir



The port extends for 3,550 meters with 25 berths, where quay depths vary between seven and 12 meters. The TCDD Port of İzmir also includes a 331-meter-long quay that handles cruise ships. Before the

onset of the COVID-19 global pandemic, the TCDD Port of İzmir, along with the Çeşme Ulusoy Port, contributed significantly in the development of regional tourism (Table 5).

TABLE 5. TCDD Port of İzmir Berth Qualities (Passenger and General Cargo)

#	Purpose	Length (m)	Width (m)	Depth (m)*
1	Passenger	140	16	-7
2	Passenger	191	16	-8.5
3	General Cargo and Dry Bulk	139	20	-10.5
4	General Cargo and Dry Bulk	125	20	-10.5
5	General Cargo and Dry Bulk	153	20	-10.5
6	General Cargo and Dry Bulk	75	31	-10
7	General Cargo and Dry Bulk	125	20	-9.5
8	General Cargo and Dry Bulk	120	20	-9.5
9	General Cargo and Dry Bulk	127	20	-9.5
10	General Cargo and Dry Bulk	127	13	-6
11	General Cargo and Dry Bulk	97	13	-7
12	General Cargo and Dry Bulk	125	13	-8
23	Bulk	212	20	-10
24	Bulk	216	20	-10
26	General Cargo and Dry Bulk	90	20	-12
	Total	2,062		

The berths numbered 13–22 extending through 1,414 meters are allocated to container ships. While these quays assigned to container ships were built -12 to -13 meters in depth, they are currently situated below the quay levels due to the shallowing nature of the

area. Thanks to the recent sea bottom dredging activities, the approach canal has once again reached -12 meters in depth.

TABLE 6. TCDD Port of İzmir Berth Qualities (Container)

#	Purpose	Length (m)	Width (m)	Depth (m)*
13	Container	143	26	-9.5
14	Container	143	26	-10
15	Container	144	26	-10
16	Container	170	26	-10
17	Container	153	30	-10
18	Container	144	30	-10
19	Container	153	30	-10
20	Container	117	30	-10.20
21	Container	126	30	-10.20
22	Container	121	30	-10.20
	Total	1,414		

There are five STSs and seven MHCs at the TCDD Port of İzmir. However, as STS cranes are older on average, they are often out of service for extended periods. Therefore, these cranes are often backed with MHCs during quay operations (Table 7).

TABLE 7. TCDD Port of İzmir Equipment

Equipment	Amount	Capacity
STS (Kocks & Fantuzzi & MSM)	5	40 metric tons
Transtainer (Noell & Sany)	14	35–40 metric tons
MHC (Italguru)	3	100 metric tons
MHC (Third Party)	4	100 metric tons
EHC (Fantuzzi)	14	8 metric tons
Reach Stacker (Kalmar)	17	40 metric tons
Tow-Truck	40	25–50 metric tons
Truck Bed	37	40–50 metric tons

1.3.2. Ege Fertilizer Port

The Ege Fertilizer Port is located in the Nemrut Bay, 58.5 kilometers from the İzmir city center, 7.5 kilometers from the Aliağa District, and approximately 600 meters from the Biçerova Railway Station. The port is situated at the 38°04'25" North latitude and 26°05'44" East longitude. The Ege Fertilizer Port handles bulk and container ships (Figure 8).

The port includes two docks extending for 1,488 meters at different depths from -7 meters to -27 meters. The dock number 1 on the west is allocated to container ships. It includes a 705-meter-long berth. The second dock (East Dock) allocated to general cargo and bulk ships includes a 773-meter berth (Table 8).

FIGURE 8. Ege Fertilizer Port⁹



TABLE 8. Lengths of container piers at the Ege Fertilizer Port

Ferry Port	Length	Width	Depth
Dock 1	Phosphoric acid, sulfuric acid, ammonia, solvent, liquid fuel, bulk		
West	356 m	30 m	11-23 m
East	417 m		7-23 m
Dock 2	Container		
West	367 m	40 m	10-27 m
East	338 m		11-27 m

The Ege Fertilizer Port is constructed on a site totaling 474,000 square meters. Within that area, the closed warehouse sits on 60,000 square meters and the open customs warehouse extends on 284,000 square meters.

The port has two 100-metric-ton STS cranes, one 100-metric-ton and two 40-metric-ton MHCs and one 10-metric-ton RMC allocated to container operations (Table 9). These equipment allow for an annual container handling capacity of 450,000 TEUs/year. The port intends to increase capacity in the following years.

TABLE 9. Ege Fertilizer Port Equipment

Brand	Amount	Capacity
SSG (Liebherr)	2	70 metric tons
MHC (Liebherr LHM500S)	2	100 metric tons
RTG (Kone Crane)	6	50 metric tons 6 + 1 level 6 side
LRS (Linde)	4	45 metric tons
ECH (Terex)	3	8 metric tons

1.3.3. Nempport Port

Nempport, the first private container port in the Aegean, was commissioned in 2010. The Nempport Port provided a new opportunity to larger ships, which could not approach the TCDD Port of İzmir due to its insufficient depth.

The Nempport Port located in the Nemrut Bay at 38°46'3" North latitude and 26°56'19" East longitude handles container and general cargo ships (Figure 9).

Nempport Port consists of three sections at different elevations due to the topographic structure of the hinterland. The main terminal is approximately 750 meters from the docks. The Nempport Port includes a total of 130,000-square-meter port site, on which lies a 3,300-square-meter closed warehouse and a 85,000-square-meter open customs warehouse.

FIGURE 9. Nempport Port



The port is located 60 kilometers from the İzmir city center by road and is 5.5 kilometers from the Aliğa District. The Nempport Port, which consists of docks, includes a 410-meter-long berth allocated to container ships (Table 10).

TABLE 10. Lengths of Container Piers at the Nempport Port

Pier	Length	Width	Depth
Southern Pier (2 & 3)	410 m	40 m	15 - 21.5 m
Northern Pier (4 & 5)	410 m	40 m	15 - 21.5 m

The port has two STS, five MHC and five RTG cranes allocated to container operations (Table 11). The equipment investment increased the annual container handling capacity to 505,000 TEUs/year. The Nempport is the only port in the Aliğa region that has a railroad connection. Commissioned in 2020, the Nempport Port operates on a wider hinterland with network reaching until the port site.

TABLE 11. Nempport Port Equipment

Brand	Amount	Capacity
STS (Liebherr)	2	2x60 metric tons
MHC (Gottwald)	5	4x100 metric tons + 1x140 metric tons
RTG (KoneCranes)	5	50 metric tons 6 + 1 level 7 side
CRS (Kalmar)	4	45 metric tons, 5 levels
CRS (Kalmar)	4	10 metric tons, 6 levels
EHC (Kalmar)	5	16 metric tons 8 + 1 level
YTT (Terberg)	30	45 metric tons

The Nempport port aims to boost its capacity to respond to the increasing cargo load and has scheduled an investment to this end. The investment is still at the approval stage. Development plans on 1:5000 and 1:1000 scales for the Category III protected area as well as the Category III Archaeological Site Protected Area Structural Plan were approved by the Ministry of Environment and Urbanization on December 31, 2020. The Nemrut Port investment plan envisions a 276-meter extension towards the south on the dock and a 320-meter extension towards the east on the shore side to create a 88,000-square-meter area. A new dock extending 55 meters in width and 342 meters in length will be constructed on the south end of the filling area. At the intersection of the 18,000-square-meter new dock and the filling area will be a 30 meter x 40 meter Ro-Ro ramp¹⁰.

10 <https://www.7deniz.net/haber-kyme-limani-imar-plani-onaylandi-34692.html>

1.3.4. Socar Terminal

Located in the Aliağa District of the İzmir province, SOCAR Terminal is 59 kilometers from İzmir and 6 kilometers from Aliağa. It is also 5 kilometers from the Biçerova Railway Station, the main railroad loading location in the area. SOCAR Terminal is geographically located at 36°04'29" North latitude and 34°04'47" East longitude (Figure 10). The eastern piers of the Petkim Port, which had long handled general cargo, were demolished and rebuilt into a modern container terminal.

The SOCAR Terminal currently handles general cargo, dry bulk, and container ships and cargo. The general cargo and dry bulk pier is 150 meters long and -10 meters deep. The recently commissioned container pier, on the other hand, extends for 700 meters in length and is -16 meters deep (Table 12).

TABLE 12. SOCAR Terminal Pier Qualities

Pier	Length	Width	Depth
Container	700 m	30	16 m
General Cargo	150 m	20	10 m

The SOCAR Terminal is one of the Aegean's largest ports with a total of 1.3-million-TEU container handling capacity on a 420,000-square-meter terminal site (Figure 10). The SOCAR Terminal is designed to handle next-generation ships in terms of pier length and depth.

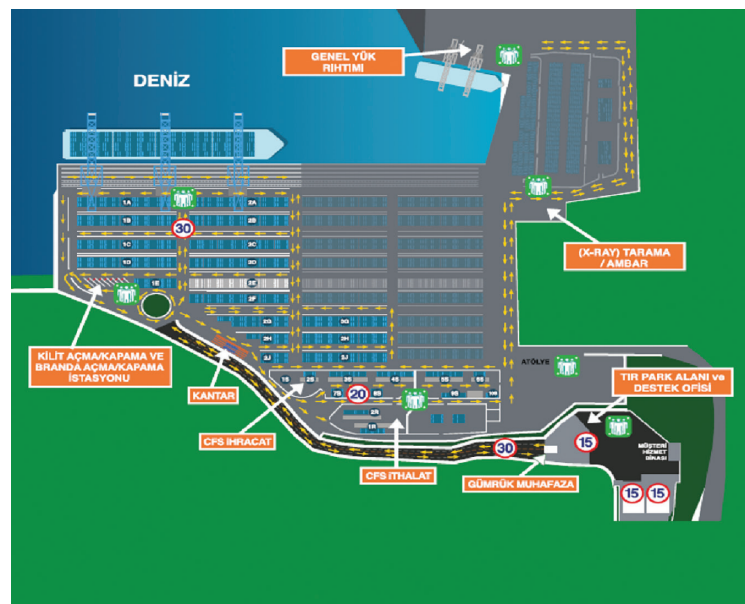
One of the port's greatest advantages over others is the pregate area. This section of the port minimizes the traffic within the port, thus promoting efficiency in port operations. Another advantage of the port is the proximity of the warehouses to the piers. Such close proximity boosts speed and efficiency in ship-warehouse-ship transports.

The container pier at the SOCAR Terminal has three ZPMC-brand SSGs and 10 RTG cranes employed in the empty and full container site. Furthermore, a third-party Liebherr LHM 180 mobile crane with a 64-metric-ton handling capacity operates on general cargo (Table 13).

TABLE 13. SOCAR Terminal Pier Equipment

Equipment	Amount	Capacity
SSG (ZPMC)	3	70 metric tons
MHC (Liebherr LHM180)	1	64 metric tons
RTG (ZPMC)	10	50 metric tons 7 + 1 level 6 sides
Reach Stacker	6	40 metric tons

FIGURE 10. SOCAR Terminal Layout Plan



1.3.5. Port of Habaş

The private enterprise Port of Habaş is owned by the Habaş Iron and Steel Plant. The port primarily operates on the loading and unloading of the exported scrap steel and the imported manufactured steel. Additionally, it is open to any other companies desiring to use the port facilities. The Port of Habaş is one of the region's most important ports as it's single-handedly responsible for 37 percent of the cargo metric tons handled in the Nemrut area.

The port is located on the 38°55'10" North latitude and 26°55'05" East longitude. It is located 55 kilometers from the İzmir city center, 90 kilometers from Adnan Menderes Airport and 2.6 kilometers from the Biçerova Railway Station (Figure 11).

FIGURE 11. Port of Habaş



Total port area is 63,000 square meters. Total pier length is 1,550 meters. The general cargo/bulk-handling capacity is reported as 5.5 million metric tons/year. The maximum draft (depth) within the region is also incorporated within this port at -40 meters (Table 14).

TABLE 14. Main Qualities of the Port of Habaş

Quality	Value
Total berth length	1,550 m
Berth No. 1 (general cargo)	100 m / - 8
Berth No. 2 (general cargo)	200 m / - 18
Berth No. 3 (general cargo)	400 m / - 40
Berth No. 4 (general cargo)	200 m / - 18
Berth No. 5 (general cargo)	100 m / - 8
Berth No. 6 (general cargo)	100 m / - 9
Berth No. 7 (general cargo)	300 m / - 3
Berth No. 8 (general cargo)	150 m / - 8
Total hinterland area	63,000 m ²

There is one 35-metric-ton Kone brand overhead crane and two 16-metric-ton German Sennebogen mobile cranes operating at the Port of Habaş. Additional cranes are outsourced if necessitated by the cargo type.

1.3.6. Port of Batiliman

Port of Batiliman lies at 8045''27' North latitude and 26055''17' East longitude. Port of Batiliman is located at Nemrut Bay in the Aliağa district of İzmir. It is situated 59 kilometers from the İzmir city center,

59 kilometers from Manisa and 196 kilometers from Balıkesir. Port of Batiliman handles general cargo and dry bulk. The quay extends for 1,273 meters and includes six berths (Table 15).

TABLE 15. Port of Batiliman Berth Qualities¹¹

Pier Dock Qualities	Dock 1	Dock 2	Dock 3	Dock 4	Pier 1	Pier 2
Length (m)	182	290	281	164	178	178
Minimum Depth (m)	12	17	12	9	3	7
Maximum Depth (m)	17	32	32	12	10	9

The port has an annual handling capacity of 1.4 million metric tons. The area is equipped to handle bulk, general cargo, project cargo, dangerous goods and non-hazardous liquid cargo as well as various warehouses and logistics options. Additional services

include accommodation, waste receipt and water supply. Port of Batiliman operates five mobile cranes, two container cranes, four loaders, three forklifts and five bunkers from 7 to 64 metric tons (Table 16).

TABLE 16. Batiliman Equipment¹²

Equipment	Amount	Capacity (metric ton)
Liebherr LHM 250 Mobile Crane	1	64
Liebherr LHM 180 Mobile Crane	1	64
Liebherr LHM 150 Mobile Crane	2	40
Sennebogen 850 Mobile Crane	1	15
Kocks Container Crane	2	10
Loader	4	–
Forklift	3	7
Bunker	5	–

¹¹ batiliman.com.tr

¹² batiliman.com.tr

1.3.7. IDC Port

The IDC Port is located at 38°04'00" North latitude and 26°05'00" East longitude. Located at the Nemrut Bay shores in the northwest of İzmir, the IDC Port is 60 kilometers from İzmir, 7 kilometers from the D550 highway and at the southern shore of the Nemrut Bay. It is a natural port. It is situated 63 kilometers from the İzmir city center, 9 kilometers from Aliağa, and 70 kilometers from Manisa.

The IDC Port handles general cargo and dry bulk. Stationed on a 196,700-square-meter hinterland, the IDC port storage areas include a 27,875-square-meter customs open warehouse and a 4,000-square-meter closed customs warehouse.

Including a 465-meter berth, the port is suitable to accommodate approaching 120,000 DWT ships. The

IDC Port operates 10 Sennebogen cranes, two container cranes and three electronic scales ranging from 5 metric tons to 300 metric tons of capacity.

TABLE 17. IDC Port Berth Qualities¹³

Dock Qualities	Quality
Depth of the Dock	Safe approaching up to 15.5 m draft (8 m–28 m)
Width and Length of the Dock	465 m length - 32 m depth

TABLE 18. IDC Port Equipment¹⁴

Equipment	Amount	Capacity (metric ton)
9300-E Sennebogen High-Up Crane	1	300
6180-R Sennebogen Crawler Crane	1	180
880 Sennebogen Crawler Crane	4	25
870 Sennebogen Crawler Crane	1	15
850 Sennebogen High-Up Crane	1	8
835 Sennebogen High-Up Crane	1	5
630 M Sennebogen Telescopic Crane	1	30
Container Crane (Hoist) ASMAŞ	2	12.5

¹³ idcliman.com.tr

¹⁴ idcliman.com.tr

1.3.8. Ege Steel Port

The Ege Steel Port is located at 38° 46'00" North latitude and 26° 55'30" East longitude. It is situated 63 kilometers from the İzmir city center, 21 kilometers from Aliağa, and 69 kilometers from Manisa. The Ege Steel Port handles general cargo and dry bulk.

The Ege Steel Port has seven berths reaching a total

of 1,115 meters and the water depth at the port varies between 7.5 meters and -35 meters (Table 19).

The Ege Steel Port operates wheel and crawl loaders and excavators, forklifts, two harbor cranes and five Mantsinen excavators with capacities ranging from 7 to 150 metric tons (Table 20).

TABLE 19. Ege Steel Port Berth Qualities¹⁵

Dock No	Length	Draft Min.-Max.	Berthing Capacity (DWT)
1	110 m	7.5 m - 7.5 m	6,000
2	186 m	9 m - 25 m	25,000
3	200 m	25 m - 35 m	70,000
4	185 m	25 m - 35 m	70,000
5	214 m	11.5 m - 25 m	40,000
6	120 m	5.5 m - 13 m	3,000
7	100 m	4.5 m - 6 m	3,000

1.3.9. Port of Dikili

The Port of Dikili lies at 39°04'13" North latitude and 26°05'31" East longitude. It is equipped to handle ships up to 70,000 metric tons DWT. The port is situated 122 kilometers from the İzmir city center, 55 kilometers from Aliağa and 102 kilometers from Manisa.

The 300-meter berth handles general cargo and passenger ships.

TABLE 20. Ege Steel Port Equipment¹⁶

Equipment	Amount	Capacity (metric ton)
Liebherr LHM – Harbor Crane	2	150
Mantsinen Excavator – diesel	3	40
Mantsinen Excavator – electric	2	60
Forklift	-	7 – 10
Wheel and Crawler Loader	-	-
Wheel and Crawler Excavator for Piling	-	-

TABLE 21. Port of Dikili Berth Qualities¹⁷

Quality	Value
Total Port Area	12,500 m ²
Total Number of Piers	3
Pier No. 1	48 m in length - 6 m draft
Pier No. 2	132 m in length - 9.5 m draft
Pier No. 3	120 m in length - 8.5 m draft

¹⁵ egecelik.com.tr

¹⁶ egecelik.com.tr

¹⁷ portofdikili.com

1.3.10. Ulusoy Çeşme Port

Ulusoy Çeşme Port is located at 38°19'21" North latitude and 26°17'47" East longitude. It is situated 123 kilometers from the İzmir city center, 60 kilometers from Aliağa, and 140 kilometers from Manisa. The Ulusoy Çeşme Port handles Ro-Ro ships and

passenger ships. The site includes a 330-meter cruise and Ro-Ro dock, a 215-meter Ferry and Ro-Ro dock, and a 50-meter ferryboat dock, reaching a total berth area of 595 meters¹⁸.

1.3.11. Liquid Bulk Cargo Ports in İzmir

There are 11 different shore facilities (dock, pier, dolphin or buoy) handling liquid bulk cargo at the North Aegean area, which includes the İzmir and Aliağa ports. However, only one port within that area (TCDD Port of İzmir) can accommodate liquid bulk cargo.

The main cargo load in the region consists of petroleum and its derivatives. The crude oil and derivatives handling capacity of shore facilities within the North Aegean (including ports in İzmir and Aliağa) reaches 27.8 million metric tons (Tables 22 and 23).

TABLE 22. Liquid bulk Cargo Capacity in the Aegea¹⁹

Crude Oil and Derivatives		Liquid Chemicals		LNG and LPG		Liquid Vegetable Oils	
Ship (Amount)	Handling Capacity (metric ton)	Ship (Amount)	Handling Capacity (metric ton)	Ship (Amount)	Handling Capacity (metric ton)	Ship (Amount)	Handling Capacity (metric ton)
459	27,815,307	575	4,361,942	800	7,998,750	141	369,547

TABLE 23. Shore Facilities Handling Liquid Bulk Cargo

	North Aegean	Petroleum and Derivatives	Liquid Chemicals	Liquid Vegetable Oils
1	Alpet Port	X		
2	Ege Gaz Port	X		
3	Ege Fertilizer Port		X	
4	ETKİ Port	X		
5	Port of Habaş	X	X	
6	Milangaz Port	X		
7	Petkim Port	X		
8	Petrol Ofisi Port	X		
9	TCDD Port of İzmir			X
10	Total Port	X		
11	Tüpraş Port	X		

18 www.ulusoyselanes.com

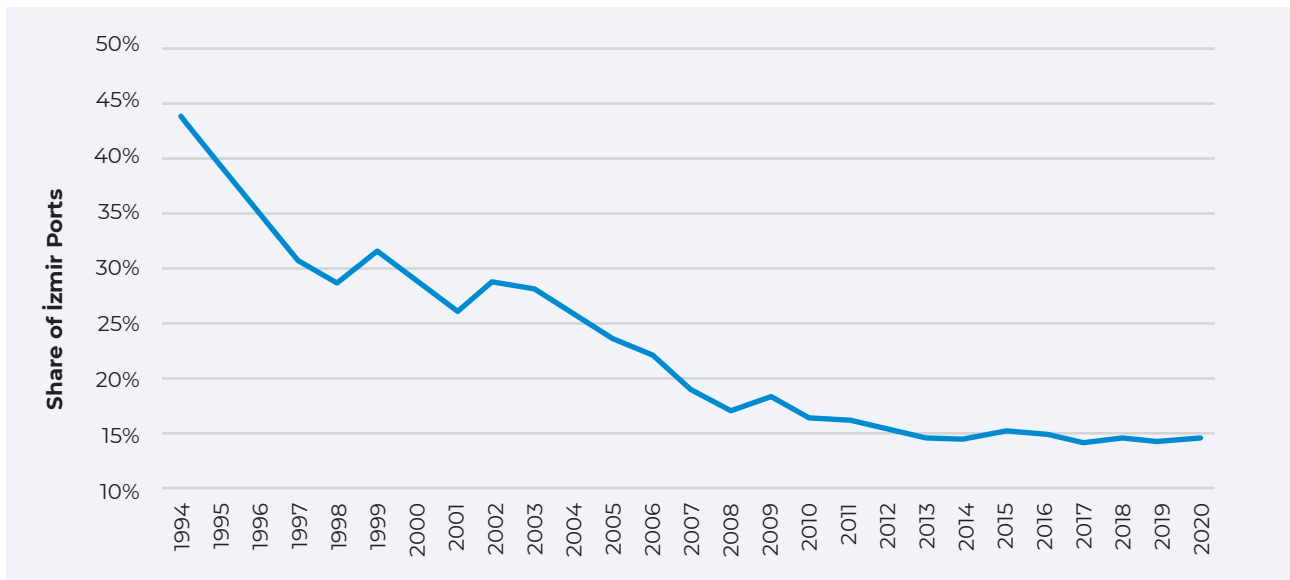
19 TÜRKLİM Türkiye's Ports Capacity Report, 2019, TÜRKLİM

1.4. Analysis of Cargo Traffic in the Ports of İzmir

A majority of the ports in the Aegean Region are located in the İzmir area. Throughout history, İzmir has been Anatolia's gate to the world through maritime trade. In the passing years, its status as a major port city with a vast hinterland has not diminished.

Within the last 20 years, however, the cargo from Central Anatolia and Southern Marmara shifted towards the ports in the Marmara Region. While the Aegean was responsible for 44 percent of total containers handled in Türkiye in 1994, this figure had dropped to 15 percent by 2020 (Figure 12).

FIGURE 12. The Distribution of Container Loads Handled in the Ports of the Aegean



As of 2020, a total of 85,890,473 metric tons of cargo were handled at the ports in the Aegean Region, including buoys, dolphins and liquid bulk Aegean of the

total cargo handled in the Aegean, 93.2 percent was handled in the ports of İzmir area (Table 24).

TABLE 24. Port Authorities and Handled Cargo Volume by Sub-Divisions

Northern Aegean	Ton
Aliağa	68,946,001
İzmir	9,390,012
Çeşme	1,236,404
Dikili	498,017

Southern Aegean	Ton
Güllük	5,762,484
Marmaris	48,285
Göcek	7,950

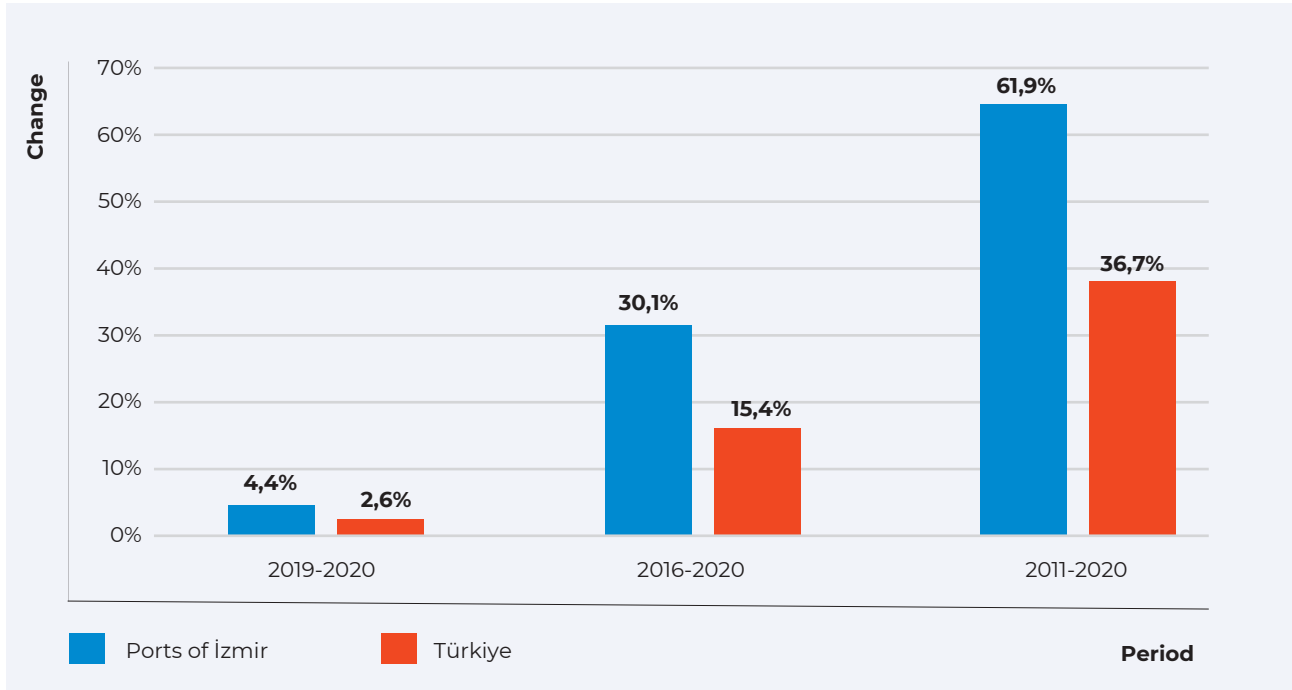
A comparison of the total cargo handled in the ports of İzmir with the total cargo handled in the ports of Türkiye on a periodic basis concludes that the

increase in cargo, including liquid bulk, is significantly higher in the İzmir area than the total amount in the ports of Türkiye.

During the 10-year period between 2011–2020, the cargo amount handled in the ports of Türkiye increased by 37 percent, and by 61.9 percent in the ports of İzmir. The increase rates in the ports of İzmir throughout

the last five years is almost double the increase rate in the ports of Türkiye (Figure 13). This difference is primarily due to the private port investments made in the Aliğa region over the last 10 years.

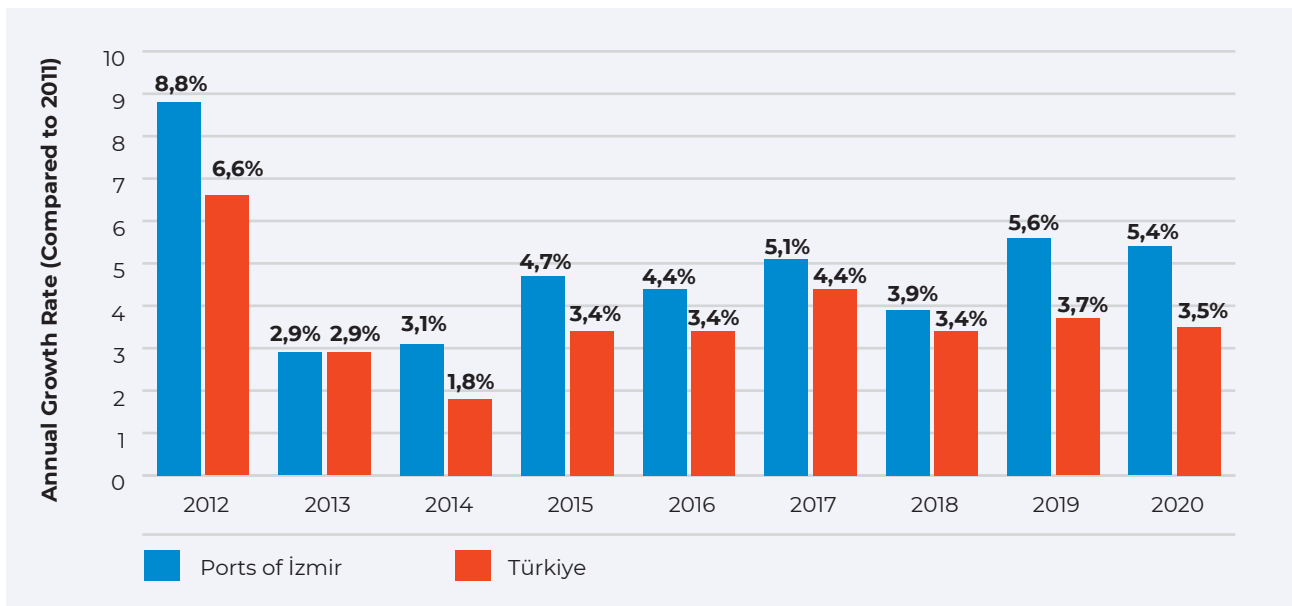
FIGURE 13. The Changing Profile of the Total Cargo Handled at Türkiye and İzmir Ports



The annual increase rate of the total cargo handled in 2011 in the ports of İzmir reached an annual rate of 5.4 percent.

Meanwhile, the annual increase rate for that same year in the ports of Türkiye remained at 3.5 percent (Figure 14).

FIGURE 14. The Total Annual Growth Rate of the Total Cargo Handled at Türkiye and İzmir Ports



According to the TÜRKLİM data of 2020, a total of 9.8 million TEUs foreign trade and cabotage cargo and 1.7 million TEUs transit cargo was handled at Türkiye ports. Consequently, the total container volume for 2020 exceeded 11 million TEUs. Foreign trade and cabotage cargo comprise 84 percent of the total container cargo handled at Türkiye ports in 2020 and the

transit cargo comprises 16 percent (Figure 15). In 2020, the transit cargo volume decreased. The Marmara Region takes the lead in terms of its container-handling capacity. The MIP Mersin Port is another port that has significantly developed in recent years (Table 25).

FIGURE 15. The development of container handling in Turkish ports (TEU)²⁰

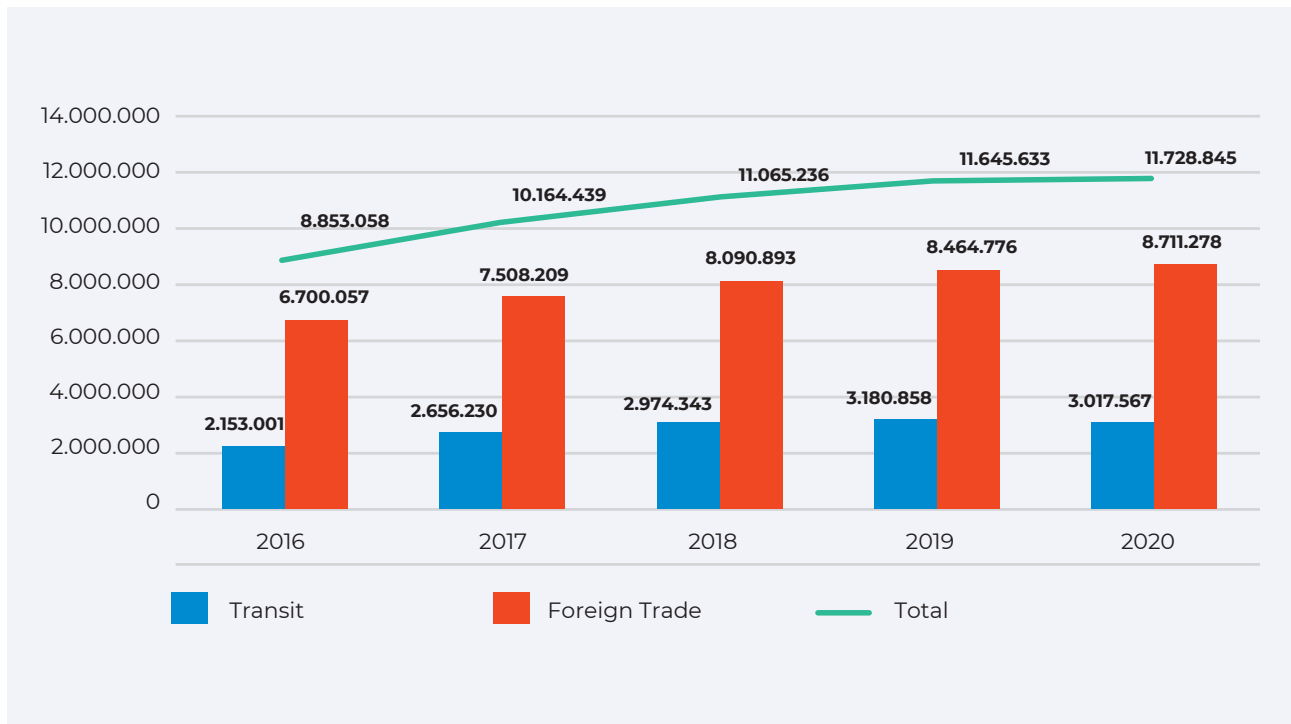


TABLE 25. Cargo Development in Container Ports in Türkiye (TEU)²¹

	Ports	2018	2019	2020
1	MIP	1,722,711	1,939,029	2,009,724
2	Marport	1,573,600	1,679,340	1,557,391
3	Asya Port	1,117,749	1,353,409	1,437,921
4	Kumport	1,258,294	1,281,850	1,210,780
5	DP World Yarımca	575,869	616,749	676,731
	Total (TEU)	6,248,223	6,870,377	6,892,547

20 Sectoral Report on Turkish Ports, 2021, TÜRKLİM, (In Print)

21 Sectoral Report on Turkish Ports, 2021, TÜRKLİM, (In Print)

The TCDD Port of İzmir has the highest container-handling capacity of all ports in the Aegean. It is responsible for 29.8 percent (531,000 TEUs) of total container traffic. Cargo has shifted from the TCDD Port of İzmir towards the ports in the Aliağa region

over the last five years. The Nemport Port comes second in terms of container volume with 27 percent (484,000 TEUs) (Table 26). The total number of containers handled in the ports of İzmir exceeded 1.7 million TEUs in 2020.

TABLE 26. Cargo Development in Container Ports in the Aegean (TEU)²²

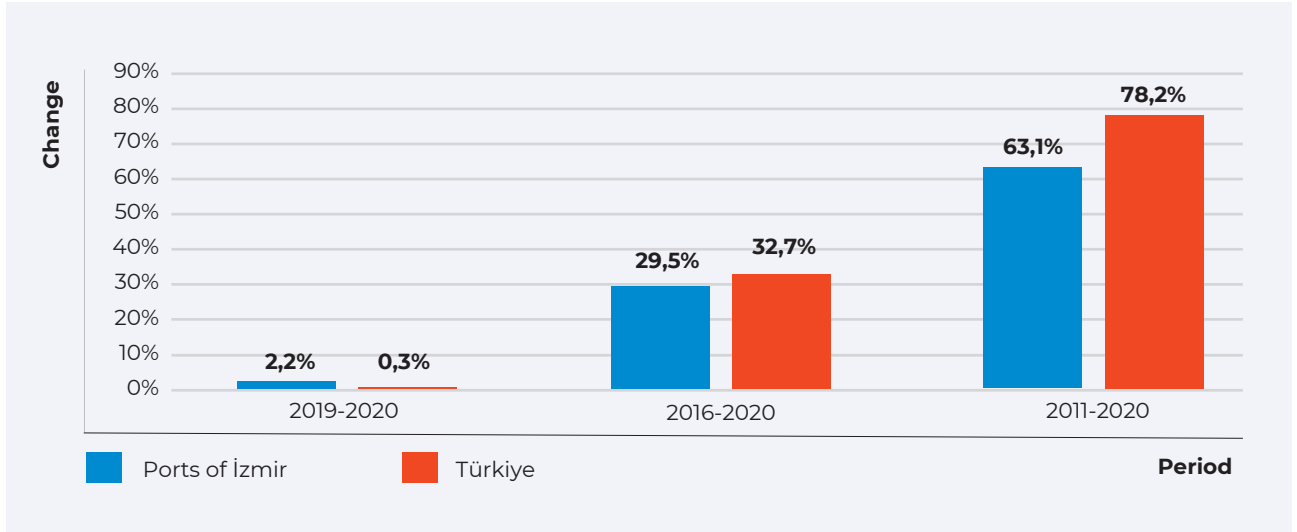
	Ports	2018	2019	2020
1	TCDD Port of İzmir	647,715	605,727	531,687
2	Nemport	390,071	430,014	484,371
3	Ege Fertilizer	298,045	380,790	460,297
4	SOCAR Terminal	277,000	311,162	307,250
	Total in the Aegean	1,612,831	1,727,693	1,783,605

The physical qualities (dock length, hinterland area, etc.) of the TCDD Port of İzmir play a determinant role in national foreign trade. It can provide continuous service throughout the year as it is a natural port in a suitable geographic location. It is the only port in the Aegean with such diversity in services. There are currently no other ports of this scale within the region. As it is located within the city, the suggestion is often made to include passenger services within its range. The TCDD Port of İzmir is a vital port infrastructure in İzmir in terms of its economic value and contributions in the development of İzmir. It is important for the port, which is currently worth over \$1 billion, to fulfill its complete potential, physical qualities and service capacity and to continuously contribute in regional export. This approach in the development of the TCDD Port of İzmir implies a policy decision rather than a focus on upgrading the port infrastructure to meet the current requirements.

While the ports in İzmir outpace the other ports in Türkiye in terms of total handled cargo, both in volume and in annual growth rate, the container-handling performance has fallen behind. A breakdown of the periodic fluctuations in the cargo handled at Türkiye ports indicates that the annual growth rate had fallen below the Turkish average until the global COVID-19 pandemic in 2020. While the number of containers handled in the ports of Türkiye in the long term (from 2011 to 2020, nine years total) increased by 78 percent, the increase in the ports of İzmir remained at 63.1 percent.

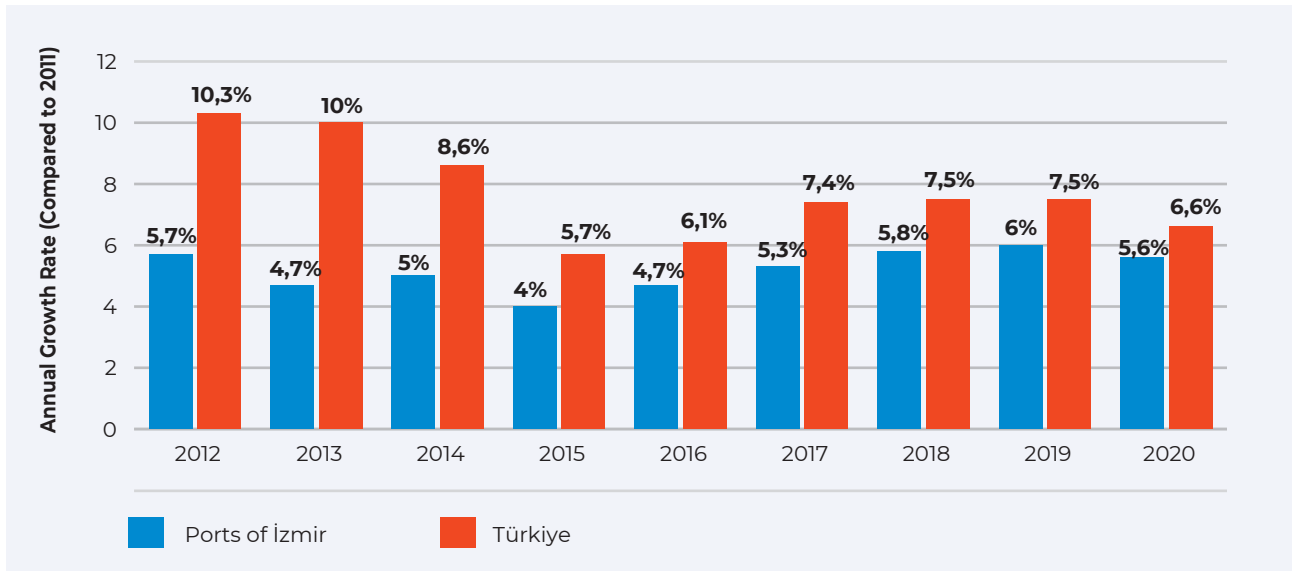
The number of containers handled in the ports of Türkiye in the medium term (five years) increased by 32 percent while, in the ports of İzmir, the percentage remained at 29.5 (Figure 16). While the container cargo often includes industrial products such as minerals, iron and steel, petroleum and petroleum derivatives, the cargo volume in the Aegean Region includes general cargo, dry and liquid bulk cargo.

22 Sectoral Report on Turkish Ports, 2021, TÜRKLiM, (In Print)

FIGURE 16. The Changing Profile of the Container Volume Handled at Türkiye and İzmir Ports

2011 yılına göre limanlarda elleçlenen toplam konteyner yükün yıllık artış hızına bakıldığında İzmir limanlarında elleçlenen toplam konteyner yükün yıllık artış hızı yıllık bazda %5,6 iken Türkiye limanlarında elleçlenen toplam konteyner yükün yıllık bazda artış

hızı %6,6 olarak gerçekleşmiştir (Şekil 17). Aradaki fark İzmir limanlarının Türkiye limanları toplam konteyner elleçlemesindeki oranının sürekli olarak düşmesine neden olmaktadır.

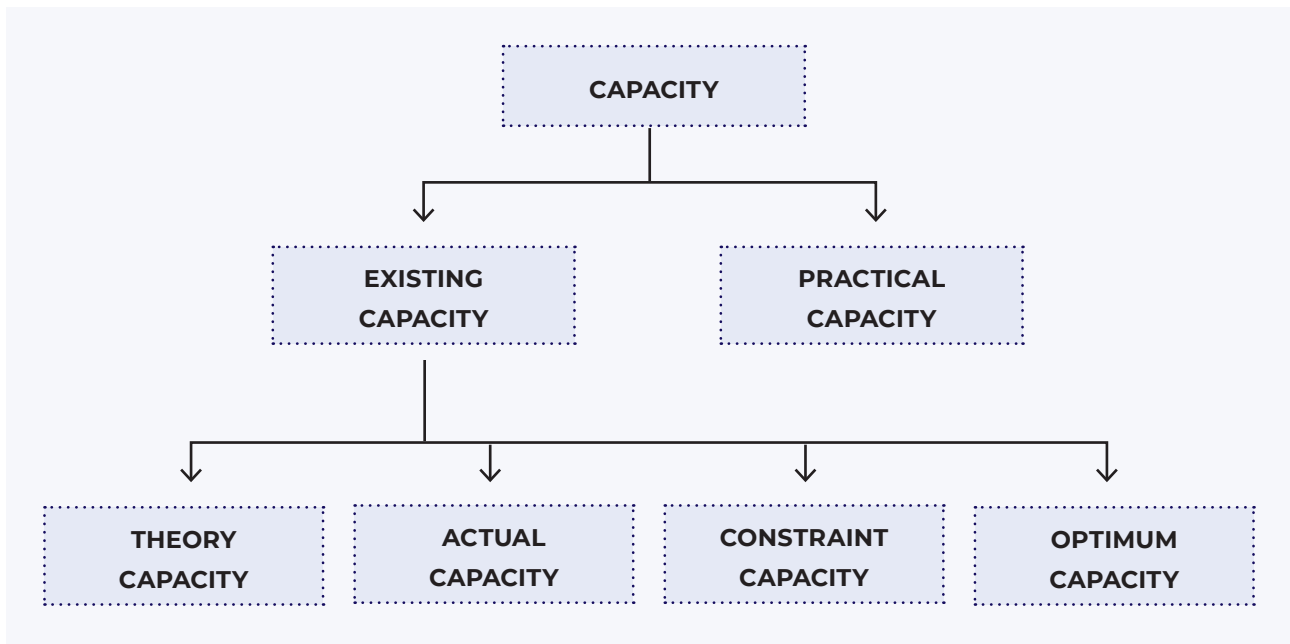
FIGURE 17. The Annual Growth Rate of the Container Volume in Türkiye and İzmir Ports

1.5. Capacity of the Ports of İzmir

Capacity is a shared concept in many different sectors. While the data, basic norms, coefficients and calculation methods may differ, capacity carries the same connotation across sectors. Capacity is a measure of the ability to provide a service and expresses a potential.

Different types of capacities are currently available based on calculation methods (Figure 18). However, the results offer differ for different capacity types. The calculation method depends on the intended purpose. Each type of capacity calculation is a different approach that depends on the number of ships and cargo handled at a port.

FIGURE 18. Capacity Calculation Methods²³



Theoretical capacity is an algebraic calculation based on assertions and it indicates the amount of cargo that can be handled within a year based on these pre-determined assertions. The more realistic the assertions, the more realistic the calculated capacity will be. The changes in the realized cargo volume depend on the periodic changes in the assertions. Theoretical capacity can therefore be exceeded from time to time.

Actual capacity is calculated based on the past cargo volume and ship traffic in the ports using the existing and outsourced equipment. A statistical calculation, actual capacity typically considers the highest cargo volume achieved in all years. As the actual capacity builds on the cargo and ships arriving at a port, it is susceptible to the distribution of cargo amount and type between different ports. Likewise, periods of crisis and equipment investment also inconvenience the use of past port statistics.

Optimum capacity is the ideal, most efficient and effective functioning capacity of a port. Optimum capacity is often below the theoretical and current capacity. The theoretical capacity includes the limit values of each piece of equipment in terms of cargo volume. Optimum capacity, unlike the other two capacity calculations (theoretical and actual), considers the port economy (revenue, expenses, profit, etc.) in addition to the cargo volume (Chang et al., 2012). Optimum port capacity is defined as the most efficient and effective service level for the highest cost efficiency. Calculating the optimum capacity, including financial optimization, that will yield the highest efficiency, rather than a capacity calculated by exhausting all port resources will provide a more realistic outcome. Each port is also a commercial establishment at which the highest cargo volume is not preferred but the most profitable business model.

Constraint capacity refers to exceeding of the existing capacity under certain conditions, unlike the optimum capacity (often prioritizing cost and efficiency). Such a case often occurs to meet increasing customer demand by:

- ▶ Extending the pre-determined work period,
- ▶ Postponing the maintenance of equipment,
- ▶ Procuring additional equipment in the market,

and similar methods to exceed the normal capacity. However, constraint capacity may cause issues as it is not a sustainable model. Operating the machines or establishments on “Constraint Capacity” for extended periods may:

- ▶ Injure workers’ health,
- ▶ Cause machines to prematurely deteriorate,
- ▶ Prompt a higher cost or reduced standards for urgently procured equipment,
- ▶ Increase safety and security risks (Gülerman, adapted from 1976).

Practical capacity refers to the ideal capacity that can be achieved through superstructure, infrastructure and equipment investment in the port as well as the allocation of technically and quantitatively sufficient equipment to each ship. It is significant as it indicates the maximum potential cargo volume and ship traffic for the port. The highest possible capacity that can be achieved by upgrading the existing physical facilities and equipment can also be considered as the practical capacity when projecting on the future of a port.

The practical capacity is the potential capacity through equipment investment such as the commissioning of new berths, the allocating of new storage sites, reassigning the gates, and conducting bottom dredging to accommodate larger draft ships. While the practical capacity may imply an unlimited growth potential in the port, the physical development potential of a port is limited to the number of cranes operable on the pier.

There has been no developments over the last two years to change the port capacity in the ports of İzmir. Therefore, the report includes the 2019 values excerpted from the Port Operators Association of Türkiye’s (TÜRKLİM) “Türkiye’s Ports Capacity Report,” published in book format the same year, based on a wide sectoral participation and the agreement of participating ports.

The theoretical general cargo ship capacity of the nine ports under the authority of Port Authorities of İzmir, Aliağa and Dikili in the İzmir region is calculated as: 2,469 ships/year and a theoretical handling capacity of 9,341,131 metric tons/year. Again for the same ports, the theoretical dry bulk cargo ship capacity is 3,120 ships/year and the theoretical cargo handling capacity is 17,450,883 metric tons/year.

The ports in the İzmir region constitute approximately 9 percent (26,792,015 metric tons/year) of total general cargo (+dry bulk) handling capacity (293,311,909 metric tons/year) of Turkish ports (Table 27).

TABLE 27. General Cargo Ship and Handling Capacity²⁴

Port Authority	General Cargo		Bulk		Total	
	Ship	Metric Tons	Ship	Metric Tons	Ship	Metric Tons
North Aegean						
Aliağa	1,695	8,136,499	2,171	14,542,795	3,866	22,679,294
İzmir	702	1,116,720	870	2,770,794	1,572	3,887,513
Dikili	72	87,912	79	137,295	151	225,207
Total	2,469	9,341,131	3,120	17,450,883	5,589	26,792,015
South Aegean						
Güllük	494	558,735	938	8,375,019	1,432	8,933,754
Total	494	558,735	938	8,375,019	1,432	8,933,754
Total in Türkiye						
TOTAL	25,968	73,103,147	40,766	220,208,762	66,734	293,311,909

The theoretical container ship accommodation capacity for the four ports under the İzmir and Aliağa Port Authorities in the İzmir region is estimated to be 3,561 ships/year and the theoretical handling capacity is estimated to be 2,618,969 TEUs/year.

The ports in the İzmir region comprise approximately 16 percent (3,179,070 TEUs/year) of total container handling capacity of ports in Türkiye (19,629,665 TEUs/year) (Table 28).

TABLE 28. Container Ship and Handling Capacity²⁵

Port Authority	Capacity (TEU)		
	Ship	Handling	Storage
Total of Ports of İzmir and Aliağa			
Aliağa	1,984	1,535,565	2,079,855
İzmir	1,577	1,083,404	1,099,214
Total	3,561	2,618,969	3,179,070
Total in Türkiye			
TOTAL	24,620	18,015,131	19,629,665

As of 2020, the ports of İzmir have handled 1,783,605 TEUs of container cargo (TCDD Port of İzmir and ports of Aliağa). The total capacity utilization rate of the ports of İzmir reached 56 percent in 2020. The feasible optimum capacity of the ports equal 75 percent of the theoretical capacity.

There are currently no bottlenecks in terms of container capacity for local cargo in the region. However, there is no port in the Aegean Region for serving transshipment cargoes such as the Port of Çandarlı. It is, therefore, advised not to limit projections with local cargo.

24 TÜRKLİM Türkiye's Ports Capacity Report, 2019, TÜRKLİM

25 TÜRKLİM Türkiye's Ports Capacity Report, 2019, TÜRKLİM

1.6. Development Potential of the Ports of İzmir

Accelerating over the last 20 years, globalization deeply impacted the communication and transportation sectors. The ports, as the most important infrastructure element in the transportation sector and the global trade, developed accordingly. Increasing competition in all areas is one of the most crucial consequences of globalization. Maritime trade has always been an integral part of global trade and has accelerated globalization. It is currently one of the biggest actors in the competition in global trade.

The maritime trade consists of two important components. The first is the ships that carry the cargo. The second is the ports that handle the cargo. The globalization-induced competition challenged both components (ship and the port) to exceed their limits. The defining strengths during this period are the creation of innovative solutions to establish a more efficient and wide interaction network, further employing technology, further incorporating automation and information systems, and ensuring constant improvements are made to adjust to the scale economy.

This is particularly true of the container shipping market, which specializes on quality products and has a dynamic structure in both its ship and port aspects. The most visible consequences of the globalization-induced competition include changing ship sizes, alliances of container-line cooperations assuming definitive roles in the market, and the operations of the small–medium scale lines limited to their own region

. As the small–medium scale lines removed themselves from the container market, the large scale lines overtook the market, forcing the ports to invest higher amounts to accommodate ships and cargo. Today, the IT systems at the ports are no longer simple tools to regulate business and document flow; they now directly control and manage port equipment and, therefore, the port operations. Almost all the container ports in Türkiye use the IT system. The ports in İzmir, including the TCDD Port of İzmir, have also

upgraded to catch up. The ports of İzmir process all data digitally and operate all communication between companies through a single network with the single window system.

The most striking of the technological development, however, is the development of the port-handling and transshipment equipment. Currently, all container-handling ports in the Aliğa region use modern port equipment. This equipment is new on average and has both high capacity and efficiency. The hourly handling capacity of the harbor cranes is sufficient to operate the lines.

The “smart ports” practice is another trending approach. The main purpose of the “smart ports” is to upscale the IT-supported automation systems to eliminate human error in operations, boost efficiency, and save on workforce and cost. Minimizing the negative impacts of ports in their surroundings is another goal of these systems. However, the smart port practice can only be possible if the entire supply chain is included in the automation. While the warehouses and port authorities worldwide are quick to integrate the automation systems, the rest of the supply chain tends to fall behind. The smart port practices are therefore limited. The automated gate passes, storage monitoring in warehouses, and the efficiency, maintenance and repair operations of cranes are now in place in Türkiye ports. The unmanned port concept, which, active in only a few terminals, is still a relatively new global development, has yet to be implemented in Türkiye’s ports.

The greatest consequences of the increasing population and industrialization are, without a doubt, the exhaustion of natural resources and the creation of environmental pollution. The high carbon emissions not only reduce the air quality, but continuously exacerbate the impacts of climate change. The sea pollution has come to threaten not only the aquatic life, but human life as well. All these consequences

make a sustainable environment imperative for a sustainable growth. Therefore, the transportation sector, as well as the industry, have taken precautions to reduce their carbon emissions. The ship designs have been altered following the large-scale tanker accidents resulting in oil spills, and laws and regulations have been implemented to prevent accidents and to compensate the results thereof. The ports adopted the sustainable environment policies with the “Green Port” practice.

The green port practice in Türkiye is a volunteer-based environmentally friendly initiative that aims to preserve the quality of the environment and prevent or minimize port-induced pollution. The green port activities include eliminating, removing or minimizing the negative impacts on the environment by the port authorities in cooperation with the shareholders interacting with the ports.

The main purpose of the green port policy is to preserve the wildlife and the ecosystem, to minimize the ship and port-induced exhaust emissions to protect the air quality, to prevent ship- and port-induced marine pollution, and to create sustainable environmental policies by establishing cooperative efforts and training programs to raise environmental awareness.

The Ministry of Transport and Infrastructure, the General Directorate of Maritime Trade and the Turkish Standards Institution launched the “Green Port/Eco-Port” project within the scope of the protocol dated December 16, 2014.

To apply for the green port certificate, port authorities must have obtained the TS EN ISO 9001 “Quality Management System,” TS EN ISO 14001 “Environment Management System” and the TS 18001 “Occupational Health and Safety Management System” quality systems, and must have established and ensured the sustainability of the integrated management system.

The Green Port project is led by the Ministry of Transport and Infrastructure. A total of 16 ports obtained the “Green Port” certificate from the Port of Hopa to the Limak Port of İskenderun, and the Marmara Region achieved the highest participation rate. The Kuşadası Ege Port and Bodrum Cruise Port in the Aegean Region and Petkim Port in the İzmir area met the criteria and obtained the green port certificate.

While it is not legally required, a majority of the ports are expected to prioritize the eco-friendly port concept and apply for the “Green Port Certificate” in the following three years in compliance with global trends, and the national policies and efforts.

CHAPTER 2.

Port-Centric Logistics Analysis of the İzmir Region

2.1. The Concept of Port-Centric Logistics

The role of the ports evolve constantly. They become transfer, distribution or logistics centers as part of the supply chain strategies. Following recent global developments, Port-Centric Logistics (PCL) has become a leader in container ports and is particularly endorsed and developed in the United Kingdom and the United States of America²⁶. The Teesport, London Gateway and the PD ports in the UK^{27,28,29}, Hutchison Ports³⁰, Port of Rotterdam in the Netherlands³¹ and the Port of Antwerp.

Mangan, et al.³² describe PCL as: “concluding distribution and other value-added logistics services within the port site” and highlight in their work that PCL applies to imported cargo. In the study conducted by Acciaro and McKinnon³³ PCL is described as “importing stored cargo, handling it then distributing to customers within the hinterland by lorries or railway cars.” Baker and Sleeman³⁴ on the other hand, describe the concept as “increasing supply chain efficiency

by providing storage facilities and logistics at or near the port site.”

Nam and Song³⁵ describe PCL as follows: “in transport and transshipment, it is a hub that enables door-to-door cargo delivery, a major distribution center with a temporary storage and classification, and a center to create and facilitate value-added services on an international scale.”

In light of these descriptions and statements, PCL practice facilitates the adjustment of the supply chain through storage and value-added services. Moving the services at cargo delivery points closer to the ports to minimize the rounds and costs of cargo transportation and handling as well as maximizing storage space and cost advantages for exporters and importers. Furthermore, unloading containers closer to the ports minimizes the return costs of empty containers to the ports.

26 Acciaro, M. ve McKinnon, A. (2013). Efficient Hinterland Transport Infrastructure and Services for Large Container Ports. International Transpot Forum. Discussion Paper No. 2013-19.

27 Baker, P. ve Sleeman, J. (2011). The Impact of Economic and Supply Chain Trends on British Warehousing. Logistics Research Network 2011 Conference. Southampton. 7-9 Eylül 2011.

28 Wall, G. (2007) Heading For The Coast Is Port-Centric Logistics The Way Forward?, Logistics & Transport Focus. 9: 42-44.

29 Monios, J. ve Wilmsmeier, G. (2012) Port-Centric Logistics, Dry Ports and Offshore Logistics Hubs: Strategies To Overcome Double Peripherality?, Maritime Policy & Management, 39(2): 207-226.

30 Hutchison Port (UK) (2009). Port-Centric Logistics – Integrated Supply Chain Solutions, Logistics & Transport Focus. 11: 52-53.

31 Nam, H.S., Song D.W. (2011) Defining Maritime Logistics Hub and Its Implication for Container Port. Maritime Policy and Management. 38(3): 269-292.

32 Mangan, J., Lalwani, C. ve Fynes, B. (2008). Port Centric Logistics. The international Journal of Logistics Management. 19(1): 29-41.

33 Acciaro, M. ve McKinnon, A. (2013). Efficient Hinterland Transport Infrastructure and Services for Large Container Ports. International Transpot Forum. Discussion Paper No. 2013-19.

34 Baker, P. ve Sleeman, J. (2011). The Impact of Economic and Supply Chain Trends on British Warehousing. Logistics Research Network 2011 Conference. Southampton. 7-9 Eylül 2011.

35 Nam, H.S., Song D.W. (2011) Defining Maritime Logistics Hub and Its Implication for Container Port. Maritime Policy and Management. 38(3): 269-292.

The advantages of the PCL practice are provided in Table 29. These advantages vary for port authorities, ship lines, port customers and the society in which the port exists.

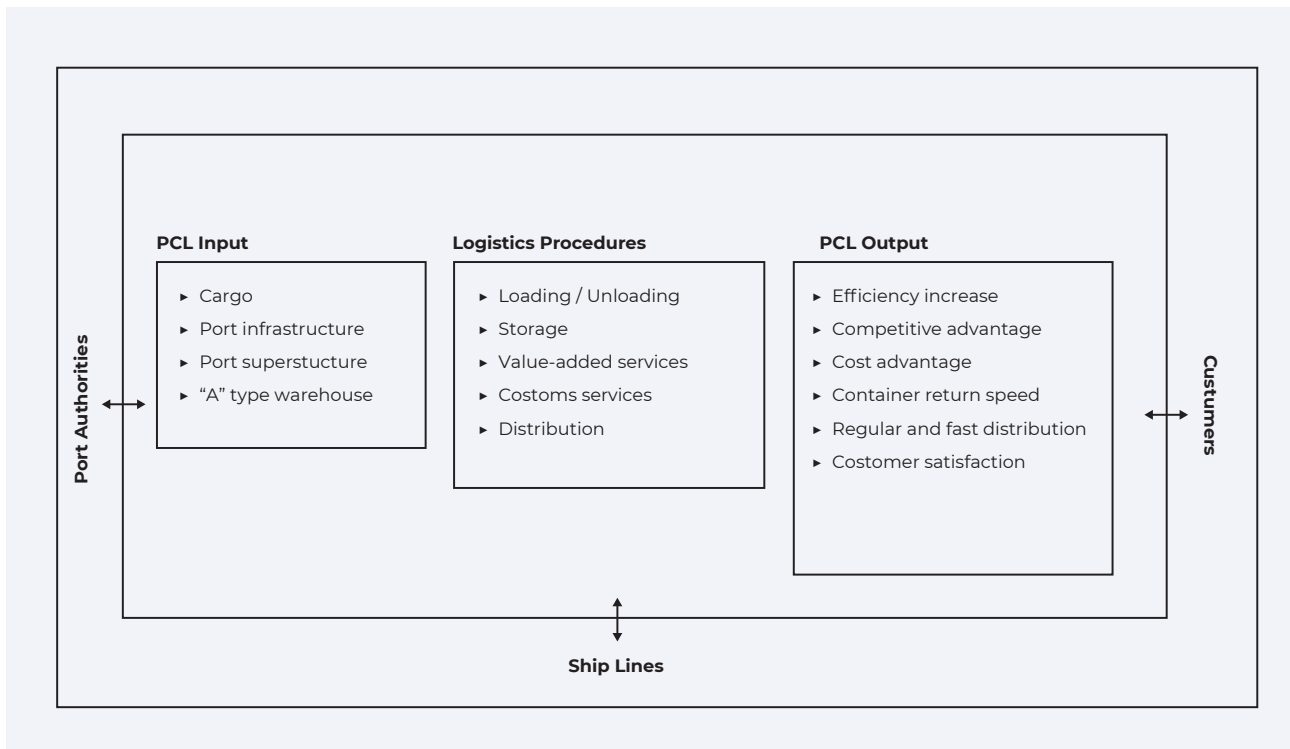
Figure 19 demonstrates the input, process and output of PCL. As port authorities, ship lines and port customers are all affected by the PCL practice. These components are also included in the table.

Logistics centers of our days offer comprehensive and improved value-added services³⁶. A logistics center refers to a facility. A PCL, however, is not limited to a facility in that it comprises the entire system. Services at Port-Centric logistics and traditional logistics centers are similar. Table 30 compares the services included in both structures.

TABLE 29. The Advantages of Port-Centric Logistics³⁷

Parties	Advantages
Port authorities	<ul style="list-style-type: none"> ▶ Utilizing idle lands ▶ Establishing long-term relations with customer ▶ Competitive advantage
Ship lines	<ul style="list-style-type: none"> ▶ Accelerating container returns
Customers	<ul style="list-style-type: none"> ▶ Stronger supply chain ▶ Cost advantage ▶ Organized and fast distribution
Society	<ul style="list-style-type: none"> ▶ Reduced CO₂ emissions ▶ Decreased urban traffic congestion

FIGURE 19. Inputs, Processes and Outcomes of Port-Centric Logistics³⁸



36 Nam, H.S., Song D.W. (2011) Defining Maritime Logistics Hub and Its Implication for Container Port. *Maritime Policy and Management*. 38(3): 269-292.

37 Gunes, H. ve Esmer, S. (2016) *Liman Merkezli Lojistik: Ege Bölgesi İçin Bir Değerlendirme (Port Centric Logistics: An Evaluation for Aegean Region)*. *Journal of ETA Maritime Science*. 2016; 4(4): 303-316. <http://dx.doi.org/10.5505/jems.2016.92400>

38 Gunes, H. ve Esmer, S. (2016) *Liman Merkezli Lojistik: Ege Bölgesi İçin Bir Değerlendirme (Port Centric Logistics: An Evaluation for Aegean Region)*. *Journal of ETA Maritime Science*. 2016; 4(4): 303-316. <http://dx.doi.org/10.5505/jems.2016.92400>

TABLE 30. Services at Port-Centric Logistics and Traditional Logistics Centers³⁹

Logistics Services	Traditional Logistics Center	PCL Practice
Storage and Warehouse	X	X
Distribution	X	X
Customs	X	X
Cargo Collection	X	X
Stock Management	X	X
Assembly	X	X
Examination	X	X
Packaging	X	X
Labeling	X	X
Barcoding	X	X
Supply	X	-
Order Management	X	-
Handling	X	X

System-based benefits of PCL practice include the following: PCL ensures the following in a supply chain⁴⁰:

- ▶ Reduced total logistics costs,
- ▶ Reduced stock costs,
- ▶ Efficiency in additional equipment and workforce in handling,
- ▶ Advantageous deals in stock warehouses,
- ▶ Reduced damage and insurance costs,
- ▶ Discounts in customs tax.

Before assessing the hinterland of İzmir ports within the scope of PCL, it would be more informative to first provide further information on the cargo centers, namely the free zones and the OIZs in the region.

39 Gunes, H. ve Esmes, S. (2016) *Liman Merkezli Lojistik: Ege Bölgesi İçin Bir Değerlendirme (Port Centric Logistics: An Evaluation for Aegean Region)*. Journal of ETA Maritime Science. 2016; 4(4): 303-316. <http://dx.doi.org/10.5505/jems.2016.92400>

40 Gunes, H. ve Esmes, S. (2016) *Liman Merkezli Lojistik: Ege Bölgesi İçin Bir Değerlendirme (Port Centric Logistics: An Evaluation for Aegean Region)*. Journal of ETA Maritime Science. 2016; 4(4): 303-316. <http://dx.doi.org/10.5505/jems.2016.92400>

2.2. Hinterland and Cargo Facilities in the Aegean Region

The hinterland of the ports in İzmir corresponds to the geographic layout of the Aegean. From north to south, the ports in İzmir are Dikili, Aliağa, Nemrut Bay, TCDD İzmir and Çeşme. The cargo handled in these ports originates from the eight provinces within the hinterland. These include İzmir, Manisa, Aydın, Denizli, Muğla, Afyon, Uşak and Kütahya (Figure 20)

This chapter starts with the export data to explore the trade volume of İzmir ports and its hinterland (the Aegean Region). In 2020, the Aegean Region registered a total of \$19 billion, and İzmir single-handedly accounts for half of that sum with \$9.5 billion. Manisa followed İzmir with \$4 billion and Denizli with \$3 billion within the same year. The share of the Aegean Region within the total export of Türkiye was 12.2 percent (Table 31).

FIGURE 20. Ports and Hinterland of İzmir



TABLE 31. Export Values and Regional Shares of Provinces in the Aegean⁴¹

Province/Region	2019	2020	2019–2020 Changing Profile (%)
İzmir	9,770,278	9,534,712	-2.4
Manisa	4,450,434	4,180,359	-6.1
Denizli	3,185,780	3,191,333	0.2
Aydın	653,931	660,163	1
Muğla	554,106	592,258	6.9
Afyon	363,665	323,437	-11.1
Kütahya	277,597	285,309	2.8
Uşak	248,678	239,873	-3.5
Aegean Region	19,504,469	19,007,443	-2.5
Türkiye	165,959,755	156,286,764	-5.8
Share of the Aegean Region (%)	11.8%	12.2%	–

41 <https://tim.org.tr/en/export-export-figures>

A province-based breakdown of the main export items indicates mining in Afyon and Aydın, ready-made garments in Denizli, chemical materials and

products in İzmir, cement in Kütahya, electronics in Manisa, aquaculture in Muğla, and carpets in Uşak (Table 32).

TABLE 32. The Top-Five Export Products in the Aegean by Provinces⁴²

	SECTOR	2019	2020	Change
AFYON	Mining Products	205,631.05	200,482.01	-2.5%
	Aquatic and Animal Products	55,609.74	32,650.22	-41.29%
	Cement, Glass, Ceramic and Earthenware	17,482.50	25,418.42	45.39%
	Ferrous and Non-Ferrous Metals	13,522.25	14,892.10	10.13%
	Chemical Substances and Products	10,380.39	10,916.28	5.16%
AYDIN	Mining Products	163,352.3	152,635.12	-6.56%
	Dried Fruits and Dried Fruit Products	127,602.75	141,136.45	10.61%
	Automotive Industry	78,743.71	86,999.76	10.48%
	Machinery and Equipment	63,608.3	64,313.29	1.11%
	Chemical Substances and Products	43,226.02	39,346.85	-8.97%
DENİZLİ	Ready-to-Wear and Garment	1,090,030.09	1,100,906.11	1.00%
	Electrical and Electronic Products	486,222.2	494,627.85	1.73%
	Ferrous and Non-Ferrous Metals	397,402.94	429,058.93	7.97%
	Steel	379,958.77	350,048.81	-7.87%
	Textile and Raw Materials	275,024.11	269,043.2	-2.17%
İZMİR	Chemical Substances and Products	1,549,056.96	1,358,257.08	-12.32%
	Ready-to-Wear and Garment	1,297,680.49	1,351,558.76	4.15%
	Furniture, Paper and Forest Products	594,884.61	590,417.18	-0.75%
	Tobacco	560,035.56	586,880.28	4.79%
	Automotive Industry	647,241.02	549,946.59	-15.03%
KÜTAHYA	Cement, Glass, Ceramic and Earthenware	170,719.36	165,559.6	-3.02%
	Ferrous and Non-Ferrous Metals	35,925.93	37,320.49	3.88%
	Electrical and Electronic Products	20,991.65	19,986.31	-4.79%
	Ready-to-Wear and Garment	978.54	17,215.73	1659.33%
	Mining Products	11,943.73	10,936.28	-8.43%

42 <https://tim.org.tr/en/export-export-figures>

	SECTOR	2019	2020	Change
MANİSA	Electrical and Electronic Products	2,222,564.18	2,056,877.91	-7.45%
	HVAC Industry	601,032.03	617,670.54	2.77%
	Automotive Industry	539,941.72	454,854.77	-15.76%
	Dried Fruits and Dried Fruit Products	309,988.00	257,287.43	-17%
	Machinery and Equipment	107,752.28	137,850.89	27.93%
MUĞLA	Aquatic and Animal Products	359,469.85	405,894.53	12.91%
	Mining Products	66,264.99	77,065.28	16.3%
	Fresh Fruits and Vegetables	30,602.86	41,367.19	35.17%
	Cement, Glass, Ceramic and Earthenware	26,867.70	20,312.17	-24.4%
	Ready-to-Wear and Garment	3,333.70	11,744.10	252.28%
UŞAK	Carpet	81,518.69	57,921.23	-28.95%
	Textile and Raw Materials	49,925.69	52,465.07	5.09%
	Ready-to-Wear and Garment	34,586.19	41,991.67	21.41%
	Aquatic and Animal Products	10,857.68	21,947.88	102.14%
	Cement, Glass, Ceramic and Earthenware	20,246.22	18,183.66	-10.19%

2.2.1. Free Zones in the Hinterland

In the simplest terms, free zones are located within a country's political borders, yet are independent of the customs borders in terms of foreign trade, tax and customs regulations. The legal status of free zones in Türkiye is set forth under the Law No. 3218 on Free Zones. According to the law, free zones are exempt from legal and administrative regulations governing commercial, financial and economic matters; include further subsidies in industrial and commercial activities; and are physically separated from the rest of the country.

The Article 1 of the Law No. 3218 on Free Zones includes the following as to the establishment and operation purposes of free zones:

- ▶ Encouraging export-oriented investment and production,
- ▶ Accelerating direct foreign investments and technology input,
- ▶ Guiding enterprises towards export,
- ▶ Boosting international trade.

Other regulations concerning the free zones include the Law No. 3218 on Free Zones, Free Zones Governing Regulation, Amendment to the Law No. 6772, and the Decree No. 32 on the Protection of the Value of Turkish Lira.

The primary advantages of free zones are listed below⁴³:

- ▶ **Tax Exemption:** Free zone users with operating licenses in the production branch are exempt from the income and corporate tax on the sales revenue of their products until the end of the taxing period of the year when Türkiye's membership to the European Union is finalized.
- ▶ **Income Tax:** Manufacturers in the Free Zone will be exempt from income tax on the payment to their personnel on the condition that they export at least 85 percent of the FOB of their productions
- ▶ **VAT, Customs Tax:** As the import regime does not apply to goods imported from abroad, they are

exempt from import costs such as the Customs Tax, VAT and RUSF.

- ▶ **Foreign Trade Regime:** Goods sold by Türkiye to the free zone are subject to the export regime, while the goods sold by the free zone to Türkiye are subject to the import regime. Companies operating in the area can purchase goods from Türkiye at export prices and are exempt from VAT.
- ▶ **Unlimited Storage:** Goods delivered in the free zone can be stored without any time limitations.
- ▶ **Equal Advantages:** Domestic and foreign companies will equally benefit from the advantages in the free zone
- ▶ **Facility Transfer:** Investors in the area can transfer the facilities they established to other persons upon receiving permission from the General Directorate of the Free Zones.
- ▶ **Stamp Tax:** Free zone users are exempt from stamp tax and fees for processes and documents concerning their operations in the free zones.
- ▶ **Less Bureaucracy:** All bureaucracy from application to operation is minimized.
- ▶ **Free Movement:** All goods manufactured in a free zone are entitled to free movement within the EU countries
- ▶ **Profit Transfer:** All foreign or local free zone users can transfer the profits obtained in the zone to Türkiye or abroad with no permissions required.

All natural and legal persons willing to operate in the free zone should obtain an operating license from the General Directorate of Free Zones, Overseas Investment and Services of the Ministry of Trade.

Activity areas include the following:

- ▶ **Manufacturing:** Procuring raw materials and intermediate goods used in manufacturing, selling, branding, packaging, labeling and displaying the manufactured goods.
- ▶ **General Trading:** Trading, storing, labeling, packaging and displaying commercial goods.
- ▶ **Storing:** Products owned by users or non-user persons or organizations can be stores.
- ▶ **Maintenance and Service:** Maintenance and repair services provided for goods.
- ▶ **Assembly and Disassembly:** Goods can be assembled or disassembled.
- ▶ **Workplace Renting:** Ready-to-use workplaces can be rented to users.

A list of the free zones in Türkiye as well as their transaction volumes for 2020, is provided in Table 33. Figure 21 demonstrates the zones on a map. The total trade volume of the 18 free zones in Türkiye realized as \$21.8 billion in 2020⁴⁴. The Aegean Free Zone (ESBAŞ), Istanbul Specialized Free Zone (ISBI) and the Mersin Free Zone (MESBAŞ) stand out with \$3.8 billion, \$3.6 billion and \$2.3 billion, respectively, in trade volume. In addition to ESBAŞ, the İzmir Free Zone (IZBAŞ) and the Denizli Free Zone in the Aegean Region are situated within the borders of the İzmir province. The total trade volumes of the İzmir and Denizli Free Zones were \$675 million and \$58 million, respectively, in 2020. All three of these free zones are located within the hinterlands of the İzmir ports and their total trade volume in 2020 reached \$4.6 billion.

44 <http://tayseb.com/en>

TABLE 33. Trade Volumes and Change Ratios of Free Zones⁴⁵

Free Zone	2019	2020	2019–2020 Change (%)
Aegean Free Zone (İzmir)	4,151,220	3,849,145	-7.3
Istanbul Specialized Free Zone	602,503	3,639,047	504
Mersin Free Zone	2,801,862	2,520,963	-10
Istanbul Industrial and Trade Free Zone	2,077,808	2,019,422	-2.8
European Free Zone (Tekirdağ)	2,124,837	2,016,312	-5.1
Bursa Free Zone	1,901,484	1,709,448	-10.1
Istanbul Trakya Free Zone	1,292,615	1,343,521	3.9
Adana Yumurtalık Free Zone	1,166,498	1,279,498	9.7
Kayseri Free Zone	968,692	1,063,568	9.8
Antalya Free Zone	777,655	840,024	8
Kocaeli Free Zone	755,039	739,066	-2.1
İzmir Free Zone	719,350	675,711	-6.1
Samsun Free Zone	108,245	159,316	47.2
TUBITAK MAM Free Zone (Kocaeli)	67,803	82,220	21.3
Gaziantep Free Zone	84,749	61,617	-27.3
Denizli Free Zone	37,823	58,126	53.7
Trabzon Free Zone	17,677	1,233	-93
Rize Free Zone	0	8	-
Total	19,655,860	22,058,245	12.2%

45 <https://www.trade.gov.tr/free-zones/general-outlook>

FIGURE 21. Free Zones in Türkiye⁴⁶

A recent development is the establishment of the West Anatolian Free Zone (BASBAŞ), established in Aşağıkırklar, Bergama, North of İzmir, as İzmir's third free zone with the Presidential Decree published in the Official Gazette dated September 8, 2021. With the BASBAŞ in operation, the free zone potential in the region will improve faster.

Free zones also present outstanding employment opportunities. According to the Ministry of Trade data, the Aegean, İzmir and Denizli Free Zones employed, respectively, 20,428, 4,771 and 80 persons in 2020. The total number of employment in these three free zones is 25,279. The 2019 and 2020 employment figures in the free zones in Türkiye are listed in Table 34.

TABLE 34. Employment Data of Free Zones⁴⁷

	2019				2020				2019/2020
	Worker	Office P.	Other	Total	Worker	Office P.	Other	Total	
Aegean Free Zone (İzmir)	15,772	3,589	1,046	20,407	5,583	3,609	1,236	20,428	0.1%
Bursa Free Zone	8,405	1,218	284	9,907	9,971	1,246	267	11,484	15.9%

46 <https://www.disticaretajansi.com/turkiyedeki-serbest-bolgeler/>

47 <https://ticaret.gov.tr/serbest-bolgeler>

	2019				2020				2019/2020
	Worker	Office P.	Other	Total	Worker	Office P.	Other	Total	
Mersin Free Zone	7,918	976	2,107	11,001	8,186	959	1,603	10,748	-2.3%
Antalya Free Zone	3,646	733	712	5,091	3,808	779	765	5,352	5.1%
Istanbul Industrial and Trade Free Zone	4,718	641	0	5,359	4,526	641	0	5,167	-3.6%
Kocaeli Free Zone	461	284	1,018	1,763	812	327	2,237	3,376	91.5%
TÜBİTAK MAM Free Zone (Kocaeli)	1,203	377	28	1,608	1,245	381	30	1,656	3.0%
European Free Zone (Tekirdağ)	3,772	828	0	4,6	3,772	828	0	4,6	0.0%
Kayseri Free Zone	4,07	539	157	4,766	4,945	572	169	5,686	19.3%
İzmir Free Zone	2,948	699	197	3,844	3,898	580	293	4,771	24.1%
Istanbul Trakya Free Zone	2,268	692	34	2,994	2,427	781	43	3,251	8.6%
Istanbul Specialized Free Zone	500	462	173	1,135	635	738	100	1,473	29.8%
Adana Yumurtalık Free Zone	907	104	121	1,132	861	105	83	1,049	-7.3%
Samsun Free Zone	280	30	0	310	143	26	0	169	-45.5%
Gaziantep Free Zone	152	50	4	206	178	55	8	241	17%
Trabzon Free Zone	0	0	54	54	0	0	20	20	-63%
Denizli Free Zone	23	9	1	33	55	17	8	80	142.4%
Rize Free Zone	0	4	0	4	0	2	0	2	-50%
Total	57,043	11,235	5,936	74,214	61,045	11,646	6,862	79,553	7.2%

2.2.2. Organized Industrial Zones in the Hinterland

While Free Zones are operated under the Ministry of Trade, the OIZs report to the Ministry of Industry and Technology. Data⁴⁸ obtained from relevant Ministerial sources concluded the following statements concerning the OIZs.

- ▶ Industry was named the “flagship” industry during the planned development era in the 1960s, and long-term goals including the establishment of an economic balance, the parallel realization of economic and social development, a steady growth and the prioritization of industrialization were set forth.
- ▶ The Organized Industrial Zones were part of the precautions implemented to promote industry. The first OIZ was established in 1962 in Bursa. By 2021, there were a total of 201 OIZs on 34,272 hectares. Seventy OIZ projects were concluded from 1962 to late 2002 and another 131 were finalized from 2003 to 2020.
- ▶ The Law No. 4562 on Organized Industrial Zones entered into force upon publication in the Official Gazette No. 24021 dated April 15, 2000. The Law affirmed that the OIZs were established to structure the industry in the acknowledged areas, to prevent unplanned industrialization and environmental problems, to guide urbanization, to ensure the rational use of resources, to facilitate the use of

information and information technologies, and to categorize and develop industry types

- ▶ The OIZs are goods and services manufacturing sites that are established and operated in accordance with the Law and allocated to industrial activities based on a system, within set boundaries and equipped with necessary common use areas, service and support areas as well as technology development zones.
- ▶ The goals and targets of OIZs in manufacturing include the disciplining of industry, enforcing productivity and profitability by gathering complementary and auxiliary industries together and by promoting manufacturing within a schedule, and spreading industry in less developed areas⁴⁹.

As of March 2021, there are a total of 349 OIZs in the 81 provinces of Türkiye. The OIZs are established on 56,000 industrial plots, covering a total area of 104,000 hectares. Of these industrial plots, 42,000 are allocated and 32,000 are used in manufacturing⁵⁰. Approximately 50,000 manufacturing plants are in production in the OIZs, employing approximately 750,000 persons. Today, the OIZs are the backbones of planned industrial production, employment and export in Türkiye⁵¹. Table 35 includes the OIZs and a range of technical infrastructure data pertaining to İzmir.

TABLE 35. OIZs in İzmir

No	Manufacturing Type	Operational Status	OIZ Title	Area (ha)	Total Industrial Plot	Allocated Plot	Manufacturing Plot
1	Specialization	Operation	Aliağa Chemicals Specialized and Mixed	922	338	186	77
2	Mixed	Operation	Atatürk	624	638	615	604
3	Mixed	Operation	BAYOSB	146.80	67	28	12
4	Mixed	Operation	Bergama	179	75	28	2

48 <https://www.sanayi.gov.tr/sanayi-bolgeleri/organize-sanayi-bolgeleri-hizmetleri>

49 <https://www.sanayi.gov.tr/sanayi-bolgeleri/organize-sanayi-bolgeleri-hizmetleri>

50 <https://osbuk.org/wp-content/uploads/2021/03/12MART2021.pdf>

51 <https://avrsyaosb.com.tr/>

No	Manufacturing Type	Operational Status	OIZ Title	Area (ha)	Total Industrial Plot	Allocated Plot	Manufacturing Plot
5	Specialization	Planning	Dikili Sera TDİOSB	302.98	83	0	0
6	Mixed	Operation	Buca Ege	57.67	141	131	107
7	Mixed	Operation	İTOB	248.8	351	322	296
8	Mixed	Operation	Kemalpaşa	1,317	1,078	1,048	235
9	Mixed	Operation	Kınık	74.3	38	38	7
10	Specialization	Operation	Menemen Plastic Specialized	85.52	41	40	17
11	Mixed	Infrastructure	Ödemiş	97.4	45	41	0
12	Mixed	Operation	Pancar	128.9	94	94	50
13	Mixed	Operation	Tire	410	204	107	74
14	Mixed	Operation	Torbalı	66.59	42	42	10
Total				4,660.96	3,235	2,72	1,491

The OIZs in the other provinces within the Aegean hinterland are as follows:

- ▶ **Afyonkarahisar (Nine Locations):** Bolvadin, Dazkırı Dokuma, Dinar, Emirdağ, İscehisar Marble, Merkez II, Sandıklı, Şuhut, Afyonkarahisar
- ▶ **Aydın (Eight Locations):** Aydın, Buharkent, As-tim, Çine, Efeler Kadıköy TDİ (Sera), Nazilli, Ortaklar, Söke.
- ▶ **Denizli (Five Locations):** Çardak Özdemir Sabancı, Leather Specialized and Mixed, Sarayköy Sera TDİ-OSB, Denizli Machinery Specialized, Denizli
- ▶ **Kütahya (Six Locations):** Altıntaş (Zafer), Gediz, 30 Ağustos, Kütahya Ceramic (1), Kütahya Seramik (2), Kütahya
- ▶ **Manisa (Eight Locations):** Akhisar, Kula Leather Specialized and Mixed, Turgutlu I., Muradiye, Salihli, Soma, Akhisar Olive and Olive Oil, Manisa
- ▶ **Muğla (One Location):** Milas
- ▶ **Uşak (Four Locations):** Banaz, Leather Specialized, Karahallı, Uşak

As listed here, there are 14 OIZs within the İzmir

provincial borders and a total of 55 OIZs in the Aegean Region.

The İzmir Atatürk Organized Industrial Zone (IAOIZ) is a crucial heart of production, export and employment in İzmir and in Türkiye with \$8 billion of annual turnover, \$4 billion in exports, \$1.5 billion in imports, a total of 600 companies and 45,000 employees⁵². imports The IAOIZ consumes an annual 120 million cubic meters of natural gas, 600 million kWh in electricity, and 4 million cubic meters of water⁵³. From an overall point of view in the Aegean, Manisa OIZ ranks highest in transaction volume.

Extending on 10 million square meters, a total of 227 establishments operate in the Manisa OIZ with a 99-percent occupancy rate. Providing employment to 58,500 people, the foreign trade volume of the OIZ reached \$7.5 billion. The manufacturing consumption of the OIZ in 2019 reached 1.3 billion kWh in electricity, 13.5 million cubic meters in water, 95.1 cubic meters in natural gas, 650,000 in steam, and 36.2 million kCal in hot water⁵⁴.

52 <https://www.kobi-efor.com.tr/haber/oncu-calismalarin-adresi-iaosb-h10695.html#:~:text=Y%C4%B1ll%C4%B1k%20cirosu%20%20milyar%2C%20ihracat%C4%B1,ve%20%20C3%B6nc%C3%BC%20%20C3%A7al%C4%B1%C5%9Fmalar%C4%B1yla%20g%C3%B6z%20dolduruyor.>

53 <http://www.osbder.org/uye-detay/12/izmir-ataturk-organize-sanayi-bolgesi>

54 <https://www.mosb.org.tr/tr/kurumsal/rakamlarla-mosb/>

2.3. Port-Centric Logistics Infrastructure in the Aegean Region

The following chapter reviews the logistics centers, warehouses, and bonded warehouses in the Aegean Region as well as the regional transportation infrastructure to lay out the port-centric logistics infrastructure in the region.

2.3.1. Transportation Infrastructure

This header examines the road, rail, air and maritime lines reaching the ports of İzmir. As detailed information on the ports in İzmir has been previously

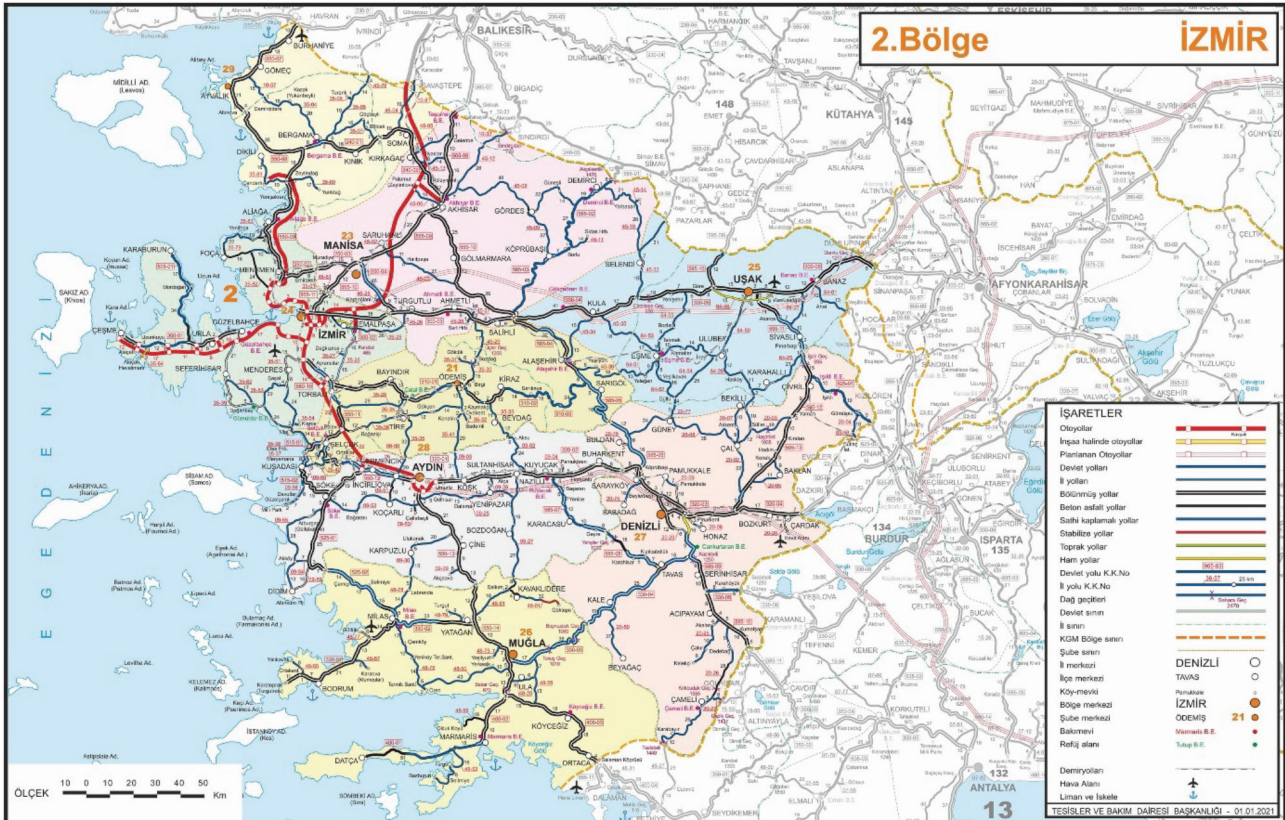
provided, maritime transport has not been further reviewed in this chapter.

2.3.1.1. Road

According to data from the General Directorate of Highways of the Ministry of Transport and Infrastructure, there are a total of 68,633 kilometers of highways, state roads and provincial roads as of January 2021. Of these, 3,523 kilometers are highways,

30,974 kilometers are state roads and 34,136 kilometers are provincial roads. The Aegean Region is included within the Directorate of the Second Region of the General Directorate of Highways (Figure 22).

FIGURE 22. General Directorate of Highways Road Network in the 2nd Region



Within the İzmir provincial borders, the 5,403-total-kilometer road network includes 274 kilometers of⁵⁵ highways, 2,481 kilometers of state roads, and 2,648 kilometers of provincial roads. As for the highways connected to İzmir, the İzmir–Istanbul highway, commissioned in 2019, extends for 426 kilometers and reduces the travel time between the two provinces to three and a half hours. The İzmir orbital road that extends for 60 kilometers and encircles İzmir is crucial for the İzmir urban traffic. The 77-kilometer İzmir–Çeşme highway, launched in 1992,

was an influence in the direction of urbanization. Then came the 95-kilometer 1996 İzmir–Aydın stage of the İzmir–Aydın–Denizli–Burdur highway, of which the 163-kilometer Aydın–Denizli stage is still under construction. The most recent highway connected to İzmir is the Menemen–Aliağa–Çandarlı highway, tender made in the build-operate-transfer model, and it extends for a total of 95.9 kilometers, of which 55.7 kilometers are highways and 40.2 kilometers are connection roads. The entirety of this highway was opened to traffic on February 22, 2020⁵⁶ (Figure 23).

FIGURE 23. Highways in Türkiye⁵⁷



The data and information indicate that the ports of İzmir have an efficient highway connection. These highways connect directly to Manisa and Aydın and partially to Denizli, all of which are important cargo centers. Once the Aydın–Denizli highway is completed, the road connections to the hinterland will be mostly complete. The recently launched Aliağa highway, in particular, provided major relief to the highly congested İzmir–Aliağa route.

However, while roads are crucial in the final delivery of goods and the initial transportation between the manufacturing plant and the port, a well-established railway infrastructure is also essential, particularly in the hinterland, within the scope of the port-centric logistics. In that vein, the following chapter includes information on the railway infrastructure in the region.

55 The highway length includes the main line as well as the connection roads and excludes side roads and intersection lines.

56 <https://www.kgm.gov.tr/Sayfalar/KGM/SiteTr/Projeler/OtoyolProjeleri/MenemenAliaga.aspx>

57 General Directorate of Highways website

2.3.1.2. Rail

Considered one of the world’s safest transportation mediums, railway is actively used in both freight and passenger transport in Türkiye. Developing the railways in complete integration with other transportation mediums is a state policy in Türkiye and the weight of railways are increasing within the scope of the 2023 targets. The ‘Transformation Program from Transportation to Logistics’ aims to include Türkiye within the top 15 countries in the World Logistics Performance Index.⁵⁸

With a view to liberalize the railway transportation for a more efficient and effective railway transport, the TCDD Transportation Inc. launched into business on January 1, 2017. Subsequently, the TCDD was reassigned as the infrastructure operator while the TCDD Transportation Inc. became the train operator company. Railway investments are continuously increasing. Within the scope of the 2023 targets, a 12,803-kilometer railway network (including both conventional and HST) has been developed.

TABLE 36. Information on the National Railway Network⁵⁹

Railway Category	Railway Line Length (km)
Conventional	11,590
Electrification	4,540
Signaling	5,169
High Speed	1,213
Signaling	1,213
TOTAL	12,803
Electrification	5,753
Signaling	6,382

The TCDD infrastructure is continuously improved, maintained and repaired, and new lines are regularly constructed to expand the railway network. The railway network of Türkiye is provided in Figure 24. The figure clearly shows that the primary ports of Türkiye in the Mediterranean, Aegean, Marmara and Black Sea are well connected to the railway network.

FIGURE 24. The National Rail Infrastructure Network in Türkiye⁶⁰



58 TCDD Transportation Inc. General Directorate 2019 Annual Report

59 TCDD Transportation Inc. General Directorate 2019 Annual Report

60 Ministry of Transport and Infrastructure, Railway Annual Report 2018

The General Directorate of TCDD is located in Ankara while directorates are located in Istanbul, Ankara, İzmir, Malatya, Sivas, Adana and Afyon. This structure aims to achieve a more efficient organization through regional directorates.

İzmir is under the authority and responsibility of the 3rd Regional Directorate. Table 37 shows the regional organization of TCDD.

TABLE 37. TCDD Regions⁶¹

Regions	Centers	Lines	Railway Line Length
Area 1	Haydarpaşa- İstanbul	Haydarpaşa- Adapazarı and Trakya Regional Trains	1,389 km
Area 2	Ankara-Ankara	Ankara-Kırıkkale-Ankara, Zonguldak- Karabük-Zonguldak, Ankara-Sincan- Polatlı Regional Trains and Karabük-Çankırı-Karabük Karaelmas Express	1,721 km
Area 3	Alsancak-İzmir	Basmane-Torbalı-Çatal-Tire-Ödemiş-Basmane, Basmane-Söke-Aydın-Denizli-Basmane, Alsancak-Manisa-Alaşehir-Uşak-Alsancak, Alsancak-Balıkesir-Bandırma Regional Trains	1,388 km
Area 4	Sivas-Sivas	Amasya-Havza-Amasya, Amasya-Samsun-Amasya, Erzincan-Divriği-Erzincan, Sivas-Divriği-Sivas, Sivas-Samsun-Sivas and regional trains to and from Kars-Akyaka-Kars	1,919 km
Area 5	Malatya-Malatya	Tatvan-Elazığ-Tatvan Regional Trains, Batman-Diyarbakır-Batman Regional Trains	1,480 km
Area 6	Adana-Adana	Mersin-Adana-Mersin, Karaman-Konya-Karaman, İslahiye-Mersin-İslahiye, İskenderun-Mersin-İskenderun, Nusaybin-Gaziantep-Nusaybin Regional Trains	1,727 km
Area 7	Afyon-Afyon	Afyon-Eskişehir-Afyon, Kütahya-Eskişehir-Kütahya Regional Trains	1,428 km
TOTAL			11,052 km

Freight transportation plays a significant role in the overall transportation policy of Türkiye. Extending the existing lines and constructing junction lines that will carry the cargo from door to door are highly prioritized to encourage the shifting of freight towards

the railways.

In addition to the 229 358-kilometer-long junction lines connecting to facilities and OIZs, nine additional junction lines extending for 19 kilometers are still under construction (Figure 25).⁶²

61 Marmara Coğrafya Dergisi (Marmara Geography Journal) No: 28, July- 2013, S. 466-486 İstanbul – ISSN:1303-2429 E-ISSN 2147-7825 Türkiye’de Demiryolu Güzergâhları Jeomorfoloji İlişkisi (The Correlation Between Railway Routes and Geomorphology in Türkiye) Asst. Prof. Ayşe Çağlıyan- Aysel Bozkurt Yıldız

62 Ministry of Transport and Infrastructure, Railway Annual Report 2018

FIGURE 25. TCDD Junction Lines⁶³

There are three rural loading and unloading stations, namely: Alsancak Logistics Directorate, Biçerova Logistics Directorate and Halkapınar Logistics Division in the İzmir Region (Area 3), all reporting to TCDD Transportation Inc.

İzmir Alsancak Logistics Directorate

There are seven railway lines within the Alsancak region of the TCDD Transportation Inc. Notable qualities of these lines include:

- ▶ One unloading line,
- ▶ One loading line,
- ▶ Five subsidiary car lines,
- ▶ Distance from the road is 0.02 km,
- ▶ Line section: Alsancak,
- ▶ Distance of lines within the port to roads: 50 m
- ▶ Elevation: 2
- ▶ Distances from stations to other roads: Road 1 – 336 m, Road 2 – 336 m, Road 3 – 376 m, Road 4 – 308 m, Road 5 – 226 m,
- ▶ Road 6 – 226 m, Road 7 – 520 m
- ▶ Turnouts on the existing railway lines: 18 Single Turnouts
- ▶ Existing railway lines: Seven lines and Gate C, then customs loading and unloading site

İzmir has a historical significance in that it is home to the first railway lines in Anadolu: the İzmir–Aydın and İzmir–Turgutlu lines. Detailed information on units in service in İzmir are provided in the following chapters.

FIGURE 26. TCDD Port of İzmir Gate D

63 Ministry of Transport and Infrastructure, Railway Annual Report 2018

As of March 2021, two lines are under construction. This station handles 100–120 cars directed from the port line and Halkapınar line. The handled cars travel to and from many stations, including Muradiye, Kemalpaşa, Biçerova, Sarayköy and İmamköy. The Alsancak Directorate includes loading and unloading sites for empty and full containers. Lines in these sites allow for the handling of containers (Figure 27, 28).

FIGURE 27. Alsancak Unloading Line



FIGURE 28. Alsancak loading line



The Alsancak region experiences a high level of container traffic. Lines in and out of the port enable loading and unloading containers in cars (Figure 29, 30). Various goods; liquid fuel – tar, iron and steel products; food products; animal and vegetable products; coal; empty containers; wood and wood products; and various ore products are loaded and unloaded. In addition to the container transportation, the region accommodates railway car freight transport. This cargo includes marble, plastic materials, cotton, furniture, raisin, and sesame oil.

FIGURE 29. TCDD Port of İzmir line



FIGURE 30. TCDD Port of İzmir Empty Container Site



Biçerova Logistics Directorate

This TCDD railway station is located in the Aliğa district of İzmir. The station was constructed and commissioned in 1996 to be employed in the Basmane–Aliğa regional trains of TCDD. In 2006, train lines were canceled and the station was shut down within the scope of the İZBAN project. It was renovated and reentered service in 2010. The station is currently used by the İZBAN northern lines operating from Menemen to Aliğa. The industrial facilities in the region admit and transfer the TCDD Transportation Inc. regional freight trains and freight trains headed to the ports in Nemrut Bay.

Due to its close proximity to the ports, Biçerova Railway Station is a busy cargo center for the Aliğa Chemical Specialized and Mixed OIZ and large manufacturing plants such as Petkim and SOCAR. The junction line reaching into the Station area as well as the Nempport Port enables loading and unloading at the Çakmaklı Railway Station.

FIGURE 31. Biçerova Railway Station



There are 22 railway lines in this station. Notable qualities of these lines include:

- ▶ Railway line section: Basmane–Aliğa Line
- ▶ Distances from stations to other roads: Road 1 – 1,001 m, Road 2 – Suburbs, Road 3 – Suburbs, Road 4 – 1,009 m, Road 5 – 1,009, Road 6 – 940, Road 7 – 832 m, Road 8 – 725 m, Road 9 – 613 m, Road 10 – 613 m, Road 11 – 293 m, Silo 1 – 245 m, Silo 2 – 195 m, Silo 3 – 220 m, Pool road 335 m,
- ▶ Warehouse Road 1 – 329 m, Warehouse Road 2 – 276 m, Warehouse Road 3 – 191 m, Warehouse Road 4 – 190 m, Orbital road 460 m, Ballast Road 580 m, Canal Road 293 m.
- ▶ Existing railway lines: Six lines connected to the TSI and five lines not connected to the TSI
- ▶ 11 dead-end tracks; a total of 22 lines.
- ▶ Number of lines with overhead lines: Six
- ▶ Turnouts on the existing railway lines: 26 Remote Turnouts, Eight Single Turnouts
- ▶ Platform: 1 Railway Station – 1 İZBAN,
- ▶ Three unloading and loading lines
- ▶ One junction line headed to the Nempport Port
- ▶ One junction line to Çakmaklı
- ▶ Four subsidiary car lines,
- ▶ Open Warehouse Area 40,000 m²
- ▶ Distance from the road is 0.02 km,
- ▶ Elevation: 13

FIGURE 32. Unloading-Loading Zone



Cargo is similar to that loaded and unloaded in the Alsancak Station.

FIGURE 33. Aliğa Line, Lines 2–3–4**FIGURE 34.** Railroad Cars Loaded with Containers in Biçerova

This station features an area to load and unload Manisa OIZ cargo. An average of 80 to 90 railroad cars a day are handled and transfer cargo to other parts of Anatolia are redirected to Halkapınar Railway Station. Export cargo is also loaded in the railroad cars to be delivered to the port area.

The mainline of the station serves İZBAN on the second and third lines. Both are closed to passenger boarding and disembarking. Freight loading and unloading operations are also handled.

Nemport Port line entered into service on January 1, 2017 and is supervised by the Biçerova Railway Station Directorate. It consists of a terminal, including a six-kilometer double-track railway out of the Biçerova Railway Station and a five-line concrete loading site.

The main qualities of these lines include:

- ▶ Existing railway lines: Five lines not connected to the TSI
- ▶ Turnouts on the existing railway lines: Eight Single Turnouts
- ▶ Number of lines with overhead lines: Zero
- ▶ Distance from the Road: 200 m
- ▶ Platform: None
- ▶ Distances from stations to other roads: Road 1 – 577 m, Road 2 – 531 m, Road 3 – 491 m, Road 4 – 450 m, Road 5 – 350 m

Halkapınar Logistics Division

It is located within the Konak district of İzmir and is the second-oldest railway line in Anatolia. It was constructed as Mersinli by the SCR&SCP company for the İzmir (Basmane) – Kasaba (Turgutlu) line and entered into service in 1866. The SCR&SCP company was purchased and annulled by TCDD in 1934, and the railway it operated was renovated and renamed “Halkapınar.” It was shut down in 2006 within the scope of the İZBAN project and was renovated and reentered into force in 2010. The four platforms in the station are positioned as two island platforms. Lines 5 and 6 on the east platform are currently used by İZBAN and the central train lines. Lines 1, 2, 3, 4 and 7 on the west platform are used for the handling and organization of the TCDD Transportation Inc. freight trains headed to the Port of İzmir.

Halkapınar Railway Station organizes and dispatches railroad cars loaded at the port as well as other regional cars. The station also handles freight trains to be unloaded at the port (Figure 35, 36, 37).

FIGURE 35. Halkapınar Railway Station

FIGURE 36. Halkapınar Railway Station Direction A**FIGURE 37.** Halkapınar Railway Station Direction B

This station is where the railroad cars from Biçerova, Alsancak and all across the Anatolia are gathered and sorted. The station only deals with the organization and storage of railroad cars and not with the loading and unloading processes. There are eight lines within the division. All of those lines incorporate maneuvering railroad cars. The main qualities of these lines include:

- ▶ Railway line section: Basmane–Bandırma Line
- ▶ Elevation: 2
- ▶ Existing railway lines: Eight lines connected to the TSI and three dead-end tracks;
- ▶ Turnouts on the existing railway lines: 29 Remote Turnouts, Seven Remote Crossovers, One Remote UK, Seven Single Turnouts;
- ▶ Number of lines with overhead lines: Seven
- ▶ Platform: 1 Railway Station – 1 İZBAN,
- ▶ Distances from stations to other roads: Road 1 – 360 m, Road 2 – 500 m, Road 3 – 550 m, Road 4 – 580 m, Road 5 – Suburbs
- ▶ Road 6 – Suburbs, Road 7 – 220 m, Road 8 – 120 m, Dead-End Military Ramp 105 m, Dead-End Barrack 100 m, Dead-End Fuel Station 50 m.
- ▶ Distance from the road is 0.05 km,
- ▶ Open Warehouse Area 12,950 m²

Adjacent to the division area is another site belonging to the Öznak company at which loading and unloading operations are carried out through the junction line that leads to the area.

The division site includes a railroad car maintenance workshop, a liquid fuel station, and two lines pertaining to the İZBAN. These lines make it difficult to maneuver and, as İZBAN is used in intercity passenger transport, it can delay the cargo loading and unloading operations. With a view to boost the efficiency of divisional operations, it would be beneficial in the future to redesign the İZBAN lines without hindering current operations.

2.3.1.3. Air

According to data from the General Directorate of State Airports Authority, there are currently six airports operating in the Aegean Region. Of these airports, İzmir Adnan Menderes Airport lost 38 percent of the cargo volume due to COVID-19 in 2020 compared to the previous year.

However, it maintained its position as the most important airport in the region having handled a total of

82,000 metric tons of cargo. The others in the region are the Muğla Dalaman, Muğla Milas-Bodrum, Denizli Çardak, Uşak and Zafer (Kütahya) airports. In 2020, a total of 121,000 metric tons of cargo is handled in all airports in the region. Of this total, 78,000 metric tons is handled in domestic lines. There has been a 41-percent drop in total cargo volume compared to the previous year (Table 38).

TABLE 38. Air Cargo Traffic in the Region (Baggage+Cargo+Mail, Metric Tons)⁶⁴

Airports	End-of-Year 2019			End-of-Year 2020 (Not Certain)		
	Domestic	International	Total	Domestic	International	Total
İzmir Adnan Menderes	73,173	60,279	133,452	57,912	24,267	82,179
Muğla Dalaman	13,528	43,927	57,455	7,649	12,058	19,707
Muğla Milas-Bodrum	20,358	24,757	45,116	9,765	6,335	16,100
Denizli Çardak	4,063	2,280	6,343	2,198	215	2,413
Uşak	197	12	209	1,175	5	1,180
Zafer (Kütahya)	486	534	1,020	83	158	241
Aegean Region	111,806	131,788	243,594	78,782	43,038	121,820
Rest of Türkiye	721,963	3,124,611	3,846,574	423,483	1,858,656	2,282,139
Overall Türkiye	833,768	3,256,399	4,090,168	502,265	1,901,694	2,403,959

The pandemic prompted a substantial decrease in passenger traffic due to the travel limitations enforced in Türkiye and around the world. During this period, İzmir Adnan Menderes Airport's annual passenger count dropped from 12 million in 2019 to 5.5

million in 2020, by a range of 56 percent. (Table 39). Similarly, the total passenger count of the Aegean Region dropped from 22 million in 2019 to 8.8 million in 2020, by a margin of 61 percent.

TABLE 39. Airline Passenger Traffic in the Region⁶⁵

Airports	End-of-Year 2019			End-of-Year 2020 (Not Certain)		
	Domestic	International	Total	Domestic	International	Total
İzmir Adnan Menderes	9,031,924	3,333,332	12,365,256	4,459,734	999,624	5,459,358
Muğla Dalaman	1,583,089	3,321,930	4,905,019	1,626,702	833,822	1,626,702

64 <https://www.dhmi.gov.tr/Sayfalar/Istatistikler.aspx>

65 <https://www.dhmi.gov.tr/Sayfalar/Istatistikler.aspx>

Airports	End-of-Year 2019			End-of-Year 2020 (Not Certain)		
	Domestic	International	Total	Domestic	International	Total
Muğla Milas-Bodrum	2,464,398	1,873,335	4,337,733	1,015,194	478,261	1,493,455
Denizli Çardak	529,091	120,691	649,782	224,113	8,234	232,347
Uşak	27,475	508	27,983	6,804	714	7,518
Zafer	57,741	24,285	82,026	9,512	6,938	16,450
Total in the Region	13,693,718	8,674,081	22,367,799	6,508,237	2,327,593	8,835,830
Rest of Türkiye	86,252,854	99,753,043	186,005,897	43,112,937	29,658,432	72,771,369
Overall Türkiye	99,946,572	108,427,124	208,373,696	49,621,174	31,986,025	81,607,199

2.3.2. Logistics Centers

Logistics centers are all-in-one locations that combine all domestic and international transport, logistics and cargo distribution activities by many different operators. The Türkiye Logistics Master Plan, formulated to set forth the location and operation conditions for logistics centers, includes the following purposes.

- ▶ Identifying the “logistics villages, centers or hubs of Türkiye” to prevent idle investments, and enabling optimum connection to all transportation models to encourage combined transportation;
- ▶ Setting the rules and procedures concerning the minimum geographic, physical and operating conditions to ensure the efficient and effective operation of these logistics villages, centers and hubs.⁶⁶

The Logistics Center Establishment Project aims to create dedicated areas outside of cities with accessible road connections that would be preferred by customers. It also projects to restructure areas closer to the organized industrial zones with high cargo potential in accordance with the technological and economic developments.⁶⁷

A logistics center comprises;⁶⁸

- ▶ Container loading, unloading and stock areas;
- ▶ Customs area;
- ▶ Customer offices, parking lot, TIR parking;
- ▶ Banks, restaurants, hotels, maintenance-repair and wash facilities, fuel stations, warehouses;
- ▶ Train organization, admittance and dispatch lines.

Initially, logistics centers were proposed in a total of 21 provinces with high cargo potential due to their proximity to organized industrial zones⁶⁹ (Figure 38). These provinces were Istanbul (Halkalı), Kocaeli (Köseköy), Eskişehir (Hasanbey), Balıkesir (Gökköy), Kayseri (Boğazköprü), Samsun (Gelemen), Denizli (Kaklık), Mersin (Yenice), Erzurum (Palandöken), Uşak, Konya (Kayacık), Istanbul (European Side), Bilecik (Bozüyük), Kahramanmaraş (Türkoğlu), Mardin, Sivas, Kars, İzmir (Kemalpaşa), Şırnak (Habur), Bitlis (Tatvan) and Karaman.

In the Aegean Region, the Uşak and Kaklık/Denizli logistics centers are currently in operation while the Kemalpaşa Logistics Center in İzmir remains under construction. The logistics centers in the Aegean are examined in further detail in the following chapters.

66 Ministry of Transport and Infrastructure, Railway Annual Report 2018

67 Ministry of Transport and Infrastructure, Railway Annual Report 2018

68 Ministry of Transport and Infrastructure, Railway Annual Report 2018

69 Ministry of Transport and Infrastructure, Railway Annual Report 2018

FIGURE 38. Logistics Centers in Türkiye⁷⁰

2.3.2.1. Kemalpaşa Logistics Center

Logistics centers combine various functions of transportation, integrate different transportation models such as railway and road, and carry out transshipment operations rapidly and efficiently as necessitated by today's competitive world. In that aspect, they are becoming increasingly important for maritime transport and ports. The Kemalpaşa Logistics Center is still under construction and will be the largest logistics infrastructure investment in İzmir.

Located near the Kemalpaşa Organized Industrial Zone in İzmir, the initial operation site for the Kemalpaşa Logistics Center is planned to be 1.3 million square meters. The facility will then be expanded up to 3 million square meters. The logistics center is constructed in stages and is currently in the infrastructure stage (Figure 39).⁷¹

FIGURE 39. Kemalpaşa Logistics Center⁷²

70 <https://www.tcdd.gov.tr/kurumsal/lojistik-merkezler>

71 İzmir Chamber of Commerce – İzmir (Kemalpaşa) logistics center “İzmir Kemalpaşa logistics specialized organized industrial zone”

72 Elron İnşaat Website

The Kemalpaşa Logistics Village is adjacent to the Kemalpaşa Organized Industrial Zone by the İzmir–Istanbul Highway. It will be linked to the Port of Çandarlı by railway in addition to the road connection. The region will also be linked to the Torbalı–Kemalpaşa railway. Once the project is completed, railway cargo from Denizli or Aydın will be able to use this route to access the Port of Çandarlı⁷³ (Şekil 40).

The Kemalpaşa Logistics Center is located at the intersection of various logistics routes and is estimated to play a crucial role in the development of İzmir. Supported by the port and railway connections, the logistics center will have easy access to the organized industrial zones (Figure 41).

FIGURE 40. Kemalpaşa Logistics Center Satellite Image⁷⁴



FIGURE 41. Kemalpaşa Railway Line Intersecting the OIZ and the Logistics⁷⁵



73 Rahmi Baki, Avrupa Birliği Ülkeleri ile Türkiye'deki Lojistik Köy Uygulamaları ve Uygun Kuruluş Yeri Seçimi (Logistics Village Establishment and Location Selection in European Union Countries and Türkiye) – Adnan Menderes University, Social Sciences Institute Magazine, Volume: 5, No: 2 (p 148–162)

74 İzmir Chamber of Commerce – İzmir (Kemalpaşa) logistics center “İzmir Kemalpaşa logistics specialized organized industrial zone”

75 Ministry of Transport and Infrastructure, Railway Annual Report 2018

2.3.2.2. Uşak Logistics Center

The Uşak Logistics Center was launched in 2013. It has been in operation since 2014 on a 140,000-square-meter logistics area with a capacity of 246,000 metric tons. The logistics village project launched with the installation of an 18-kilometer-long rail track between the city center and the 74-acre area across the Uşak OIZ. A logistics support station will subsequently be established and will receive cargo units from the current station.⁷⁶

This will facilitate the transportation of products such as ceramics, containers, blankets, thread, marble and marble dust, plastic raw materials, machine equipment and food that are produced in the industries of Uşak.⁷⁷

The Uşak Logistics Center's main physical qualities are as follows:

- ▶ Closed Warehouse Area: 1,000 m²
- ▶ Open Warehouse Area: 84,216 m²
- ▶ Distance from the road: 2 km
- ▶ Number of lines: 13

2.3.2.3. Kaklık / Denizli Logistics Center

The Kaklık Logistics Center is located 40 kilometers northeast from Denizli at the 283rd kilometer of the İzmir–Isparta railway. The Kaklık Logistics Center is one of 19 centers constructed by TCDD around Türkiye.⁷⁸

The logistics center is designed to transport cargo from Denizli and its neighboring regions to the

ports in Alsancak and Aliağa as well as further in the country. The site aims to eliminate bottlenecks and to increase the cargo transportation capacity. An additional 30,000-square-meter site was expropriated and combined with the existing 90,000-square-meter area at the Kaklık Railway Station to locate the center on a total of on 120,000 square meters. The Kaklık Logistics Center is located 289 kilometers from the TCDD Port of İzmir, and 335 kilometers from the Biçerova Railway Station, the closest station to the ports of Aliağa.

The Kaklık Logistics Center is designed to increase the annual loading and unloading capacity from 250,000 metric tons to 1 million metric tons. The logistics site employs three portal crane routes for loading and unloading operations, whereas the service building includes offices for customs operations and to rent out to logistics companies. There is also a station building and a three-story boarding consisting of six apartments for employees.⁷⁹ Notable features of the logistics center include the following:⁸⁰

- ▶ There are 13 lines at the terminal.
- ▶ There are specific loading and unloading lines for containers, bulk cargo and hazardous goods.
- ▶ The site incorporates a 84,216-square-meter open warehouse and a 1,000-square-meter closed warehouse.

The logistics center carries out the transportation of textile products and marble, as well as containers, coal, and copper raw materials in line with the regional priorities.

76 RAÇLI, Selin. (2010). "Lojistik Köyler ve Dünyadaki Durumu," (Logistics Villages and Their Situation Around The World) Uludağ University, Vocational School of Social Sciences, Foreign Trade Program, Professional Practice, p.1–61

77 <https://zafer.gov.tr/bolgemiz/tr33-bolgesi/bolgemize-genel-bakis/246-tr33-bolgesi-ulastirma-ve-lojistik.html>

78 <https://tr.railturkey.org/2017/10/06/turkiyenin-lojistik-merkezleri-hangileri-acildi/2/>

79 DENİZLİ-KAKLIK LOJİSTİK KÖYÜNÜN SWOT ANALİZİ İLE DEĞERLENDİRMESİ, (SWOT Analysis of Denizli-Kaklık Logistics Village) Mustafa BAYHAN- Mevhibe TÜRKMEN-Duygu KEPE, Mehmet Akif Ersoy University Social Sciences Magazine

80 <https://tr.railturkey.org/2017/10/06/turkiyenin-lojistik-merkezleri-hangileri-acildi/2/>

2.3.3. Temporary Storage Facilities and Warehouses

Any goods that are not in free movement, once brought into the Customs Territory of the Republic of Türkiye, must be submitted to customs officers and are considered temporary storage goods until they are subject to any uses or transactions upon customs approval. The warehouses, storage facilities, repositories or hangars where these goods are kept are located where the transportation vehicle stop, pull along or unload and protected against all sorts of exterior conditions and interventions.⁸¹

Temporary storage facilities are the backbones of the supply chain. In today's fiercely competitive world, companies must eliminate any non-value-adding processes and instead efficiently manage value-adding processes to achieve competitive power. Moving from that point, storage facilities and their management became increasingly important. The facility layout is key to efficient storage management. Facility layout refers to the positioning of units and business centers with a view to reduce costs and to improve operations' performances.⁸²

- ▶ vEkol Lojistik firmasına ait olan iki adet deponun bir tanesi Kemalpaşa'da, diğeri İzmir Limanı yakınında bulunmaktadır.
- ▶ Mars Lojistik firmasına ait olan 5050 m²'lik bir depolama alanı Kemalpaşa'da kurulmuştur.
- ▶ Medlog firmasına ait olan üç adet depo Kemalpaşa Tren İstasyonu'nda, İzmir konteyner terminalinde ve Biçerova'da bulunmaktadır.
- ▶ MOS Lojistik firmasına ait olan 60.770 m² kapalı depolama alanı Manisa'da bulunmaktadır.

Warehouses, on the other hand, are customs storage areas where goods that have been confiscated by customs and are awaiting processing are stored. These facilities are often used for import operations. According to customs regulations, these warehouses are considered exempt from the customs borders

of Türkiye.

These facilities are often used for import operations. According to customs regulations, these warehouses are considered exempt from the customs borders of Türkiye.

The main differences between temporary storage facilities and warehouses include the following:⁸³

- ▶ Goods are admitted into the temporary storage facilities upon summary declaration and with no requirement of a regime declaration. A warehouse, however, requires a regime declaration (registering a warehouse declaration) before any goods can be admitted.
- ▶ Goods can be stored for an unlimited time in a temporary storage facility while a warehouse operates on a limited schedule. The storage duration at the temporary storage facilities commences as of the summary declaration submission and, as set forth in the Article 46 of the Customs Regulation, is 45 days for goods arriving by maritime transportation and 20 days for goods arriving by any other means. In contrast, goods can remain at a warehouse for an unlimited time until a procedure or a use is approved.
- ▶ Customs controlled handling and processing are facilitated at warehouses while such opportunities are limited at temporary storage facilities.
- ▶ Customs supervision and audit at the temporary storage facilities are carried out by customs officers while at the warehouses (except liquid fuel warehouses), the duty lies with the authorized customs brokers.
- ▶ The transfer of goods can be carried out both at the warehouse and at the temporary storage facility. However, warehouses better facilitate partial and systematic transfer.

81 T.C. Ticaret Bakanlığı Gümrük Mevzuatı

82 İTÜY, 2011, Sempozyum, Kongre ve Konferans Bildiri Koleksiyonu Depo Süreçlerinde Performans Ölçümü Ve Değerlendirmesi İçin Bir Model Önerisi Bayraktar, Demet Bolat, Hür Bersam Fakı, Betül Merve Steelkol, Sedef Gizem

83 <https://www.gumruktv.com.tr/>

The A-type Warehouses in İzmir are as below::

- ▶ Solmaz Customs Brokerage Inc.
- ▶ Opet Petroleum Inc.
- ▶ Ege Fertilizer Industry Inc.
- ▶ Bumerang Logistics Transport Distb. Wareh. Service and Trade LLC
- ▶ İzmir Iron and Steel Industry Inc. 1
- ▶ Turkish State Railways İzmir Regional Directorate
- ▶ İzmir Iron and Steel Industry Inc. 2
- ▶ Umat Public Warehouses Trade Inc.
- ▶ Ardep Customs Clearance Warehousing and Trade Inc.
- ▶ Elmas Transport and Brokerage Insurance Agency Inc.
- ▶ Schenker Arkas Transport and Trade Inc.
- ▶ Çobantur Transp. Tourism and Trade LLC
- ▶ Yudum Food Industry and Trade Inc.
- ▶ Elmas Transport and Brokerage Insurance Agency Inc.
- ▶ Agro Service Foreign Trade LLC
- ▶ Sakaoğlu Logistics Service Transport Trade LLC
- ▶ Directorate General of State Railways
- ▶ İnci Logistics Distb. Wareh. Shipping Intl. Transp. Trade Inc.
- ▶ Total Oil Türkiye Inc.
- ▶ Ege Fertilizer Industry Inc.
- ▶ Schenker Arkas Transport and Trade Inc. 2
- ▶ Akdeniz Chemical Industry and Trade Inc.
- ▶ Elmas Group Logistics Transp. Wareh. Distb. ve Trade Co.
- ▶ Ege Fertilizer Industry Inc.
- ▶ Küçükbay Vegetable Oil and Detergent Industry Inc.
- ▶ Ege Gas Inc.
- ▶ Altınbaş Petroleum and Trade Inc.
- ▶ Barsan Global Logistics Inc.
- ▶ TCDD İzmir Port Authority
- ▶ Ekol Logistics Inc.
- ▶ Aktif Bonded Warehouse Logistics Textile and Food Industry Trade LLC

Some of the A-type warehouses in the list are operated by professional logistics service providers and port authorities. They provide professional services to the other commercial establishments in the area. Others are used directly by manufacturing and service companies towards their own requirements. The balanced development of the cargo and the warehouses that serve them in the region, as well as a sustainable and competitive commercial development, are critical. Warehouse capacities maintain their development over the years in line with the regional requirements and market conditions.



CHAPTER 3.

Strategic Cargo Analysis for the İzmir Region⁸⁴

Foreign trade-oriented ports exist because of the cargo in the hinterland. It is, therefore, important to assess the manufacturing dynamics in the hinterlands of İzmir ports from an exporting point of view and to develop a port strategy in line with the exporting trends to ensure correspondence between port development and regional needs. This chapter includes retroactive analysis as well as product-specific trends and developments for provinces within the İzmir ports' hinterlands to gather sufficient cargo data to formulate development scenarios for the ports in the region.

⁸⁴ Data used in this chapter is obtained from the Turkish Exporters' Assembly and the General Directorate of Maritime Affairs.

3.1. The Region in Turkish Exportation

The eight provinces comprising the hinterland of İzmir ports achieved \$19 billion in export in 2020, which corresponds to 12.2 percent of Türkiye's total exports. With \$9.5 billion, the exports of İzmir correspond to 6 percent of Türkiye's and 50 percent of the region's export amount.

Manisa follows by \$4.2 billion, Denizli by \$3.2 billion, Aydın by \$660 million and Muğla by \$592 million. The total export volume of the three other provinces in the region is \$850 million.

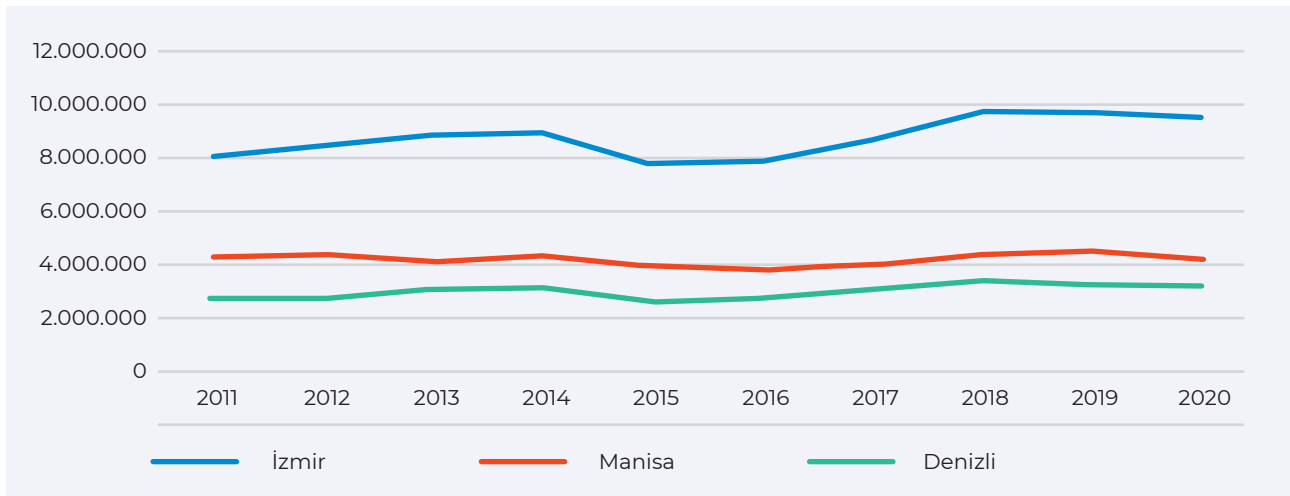
TABLE 40. Development of Export in the Region (*000 USD)

	İzmir	Manisa	Denizli	Aydın	Muğla	Afyon	Kütahya	Uşak	Total in Aegean	Total in Türkiye	Share İzmir	Share Aegean
2011	8,061,954	4,263,530	2,754,797	539,608	244.28	288,207	148,969	155,665	16,457,010	133,172,548	6.1%	12.4%
2012	8,484,259	4,314,899	2,739,106	558,742	236,215	308,648	154.05	181,038	16,976,957	137,709,929	6.2%	12.3%
2013	8,908,624	4,028,783	3,079,173	573,869	255,075	364.32	180,022	258,799	17,648,665	145,392,974	6.1%	12.1%
2014	8,942,893	4,311,381	3,199,067	596.71	306.54	358,347	194,067	268,352	18,177,357	151,292,662	5.9%	12%
2015	7,828,230	3,897,200	2,679,901	497,474	341,023	304.26	191.28	220,494	15,959,863	133,541,552	5.9%	12%
2016	7,931,457	3,772,155	2,766,607	487,298	386,989	291,568	198,528	248,293	16,082,897	131,676,179	6%	12.2%
2017	8,726,558	3,993,349	3,050,331	599,295	428,594	313,442	246,385	247,675	17,605,629	147,184,613	5.9%	12%
2018	9,757,833	4,429,647	3,370,191	657,845	482,201	341,714	284,668	243,519	19,567,620	163,532,569	6%	12%
2019	9,767,008	4,448,239	3,183,427	655.64	545,194	363,665	277,094	248,605	19,488,870	165,873,447	5.9%	11.7%
2020	9,534,712	4,180,359	3,191,333	660,163	592,258	323,437	285,309	239,873	19,007,443	156,286,764	6.1%	12.2%
Improvement	1.9%	-0.2%	1.6%	2.3%	10.3%	1.3%	7.5%	4.9%	1.6%	1.8%	0.1%	-0.2%

Between 2011 and 2020, Muğla achieved the highest percentage increase by an average of 10.3 percent per year. Kütahya followed by 7.5 percent and Uşak by 4.9 percent. Manisa was the only province where export decreased (though minimal), though the overall share of the Aegean Region in total Turkish export also reduced.

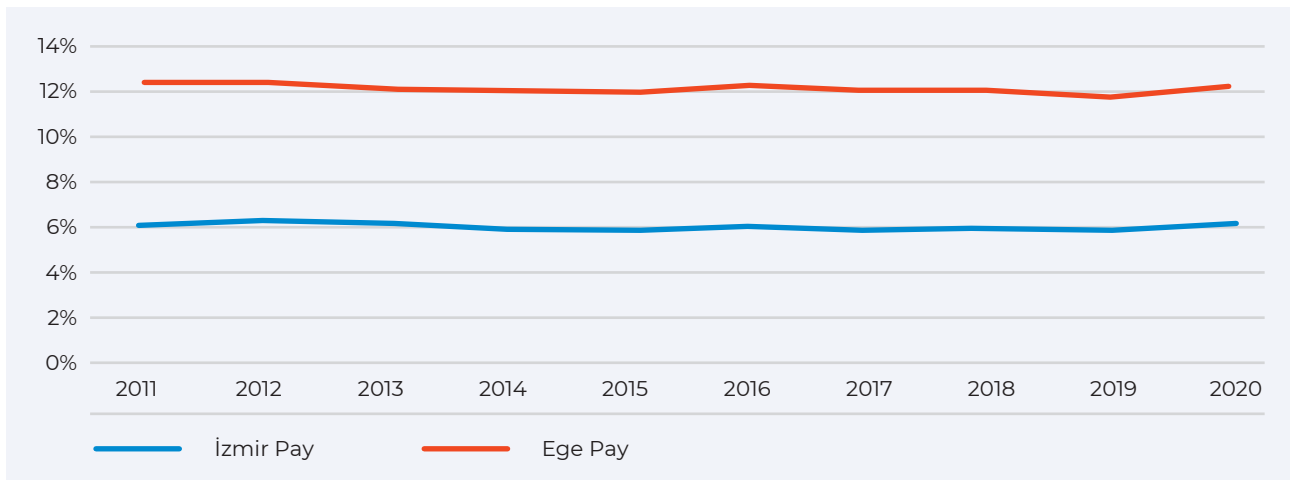
İzmir, Manisa and Denizli provinces, all realizing over \$3 billion in annual exports, achieved, respectively, 1.9, -0.2 and 1.6 percent improvements during the same period.

The total share of these three provinces combined in the total regional export equals 89 percent. When oil prices and, subsequently, commodity prices in the global market reduced between 2015 and 2017, export statistics in Türkiye did not follow the trend and decreased below the expected levels. This decrease also manifested in the İzmir, Manisa and Denizli provinces. İzmir, for instance, plummeted below \$8 billion between 2015 and 2016 while Manisa dropped below \$4 billion between 2015 and 2017. However, as of 2018, both provinces entered a recovery period.

FIGURE 42. Export Development in İzmir, Manisa and Denizli (*000 USD)

The shares of İzmir and the Aegean in the total export of Türkiye were stable between 2011 and 2020. İzmir maintained its 6-percent share while the region

remained at 12 percent. These percentages indicate a lack of recent investment to boost the Aegean's share in export.

FIGURE 43. Graphic Representation of Export Shares of İzmir and the Aegean

Before moving on to comprehensive information regarding the export products per province in the region, it would be best to recount the average export price per kilogram in Turkish export. These figures are significant as they will provide an insight concerning the quality of the cargo detailed in the following chapters. In the simplest terms: a higher added value reflects a higher unit price. Put in a more tangible perspective, the 2020 unit prices per kilogram of various export produces are provided in Table 41. The table also includes the kilogram prices of traditional Aegean export produces such

as seedless grapes, olive oil and figs, and it facilitates comparison with other products.

While metric tonnage is indeed a significant pricing tool for ports, the table demonstrates that it alone is not sufficient and requires reasonable export prices for regional prosperity and future. At this point, it would be wiser to assess regional products based on export prices. This assessment is included in the following chapters as well as further evaluation of the cargo handled in the İzmir ports in terms of unit and metric tonnage.

TABLE 41. Average Weight in Kilograms of All Export Product Groups in Türkiye (2020)

	Product Groups	Kg Price(\$)
1	Unprocessed or Semi-Finished Gold	37,214.97
2	Leather and Fur Clothing	119.35
3	Unprocessed or Semi-Finished Silver	91.35
4	Defense and Aerospace Industry	47.94
5	Yachts, Boats, Inflatable Boats	25.65
6	Ready-Made Outerwear	17.88
7	Electronic Devices and Parts	17.21
8	Primary Automotive Industry	10.18
9	Cigarettes, Cigars	8.42
10	Ready-Made Home Textile (Bedding, Blanket, etc.)	7.35
11	Leather Shoes	7.13
12	Machinery and Equipment Sector Other Machinery, Equipment and Parts	6.17
13	Cooling Systems and Components	5.77
14	Leaf Tobacco and Tobacco Scraps	5.55
15	Plumbing Systems and Components	5.32
16	Games and Sports Equipment	5.31
17	Fish and Aquatic Products	5.30
18	Textile and Ready-Made Clothing Machinery Equipment and Parts	5.17
19	Textile Fabrics	5.04
20	Automotive Ancillary Industry	4.65
21	Dried Figs	3.47
22	Textile Threads	3.16
23	Carpet Machine-Made Carpets	2.95
24	Ornamental Plants Cut Flowers	2.92
25	Olive Oil	2.47
26	Furniture (Wood, Forest Products)	2.19
27	Seedless Raisins	1.99
28	Chemicals Plastics and Products Thereof	1.90
29	Temporarily Preserved Fruits and Vegetables	1.89
30	Milk and Dairy Products	1.82
31	Olives	1.74
32	Fruit and Vegetable Juices	1.49
33	Ornamental Plants Live Plants	1.49
34	Wood and Forest Products Paper and Cardboard	1.19
35	Fruit and Vegetable Preserves	1.19
36	Chemical Soap and Cleaning Products	1.02
37	Vegetable Oils	0.96
38	Fresh Fruits	0.88
39	Pastries	0.87
40	Iron & Steel	0.62
41	Fresh Vegetables	0.53
42	Citrus	0.52
43	Wood and Wood Products	0.47
44	Soft Drinks and Spirit Drinks	0.43
45	Chemical Mineral Fuels. Mineral Oils and Products Thereof	0.34
46	Marble, Travertine, Onyx, Granite and Other Natural Stones	0.27
47	Chemistry Inorganic Chemicals	0.23
48	Chemical Fertilizers	0.23
49	Mining Products Metal Ores	0.16
50	Cement	0.04

3.2. Evaluation of Export by Provinces

Following the headers list and examine the eight provinces in the Aegean Region by their 2020 export volume from the highest to the lowest. The sorting begins with İzmir and ends with Uşak.

3.2.1. İzmir

İzmir is the most important province in the region in many respects. Having increased the export volume by 1.9 percent between 2011 and 2020, İzmir increased its export figures from \$8 billion in 2011 to \$9.5 billion in 2020. Chemical products and ready-made

garments were the highest exported product groups of 2020 by \$1.4 billion each. The chemical industry, which requires comprehensive know-how, a qualified workforce and technological infrastructure, is evidently well-established in İzmir (Table 42).

TABLE 42. Development of Export Products in İzmir by Years (*000 USD)

İZMİR	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Improvement
Chemical Substances and Products	1,409,527	1,747,726	1,543,048	1,311,895	1,193,824	1,179,250	1,481,211	1,542,378	1,549,057	1,358,257	-0.4%
Ready-to-Wear and Garment	1,055,978	1,112,877	1,253,018	1,311,917	1,137,451	1,132,453	1,197,892	1,359,957	1,297,680	1,351,559	2.8%
Furniture, Paper and Forest Products	299,421	363,935	422,141	493,926	495,334	523,765	509,878	537,316	594,885	590,417	7.8%
Tobacco	426,777	511,965	531,237	659,686	502,146	630,005	604,314	650,599	560,036	586,88	3.6%
Automotive Industry	704,57	624,314	610,202	673,069	619,917	539,128	559,96	672,899	647,241	549,947	-2.7%
Steel	998,072	955,179	873,228	803,459	492,268	464,817	499,599	660,758	608,569	542,518	-6.5%
Machinery and Equipment	365,553	384,144	458,926	473,629	381,011	365,942	463,282	566,405	574,502	533,762	4.3%
Dried Fruits and Dried Fruit Products	478,94	459,51	475,28	509,87	471,555	440,059	427,375	431,417	443,886	447,44	-0.8%
Electrical and Electronic Products	157,702	166,696	206,656	241,552	249,298	261,779	275,277	372,683	460,926	444,895	12.2%
Fruit and Vegetable Products	231,21	238,596	262,834	279,935	279,085	301,38	337,06	354,283	358,869	399,046	6.3%

İZMİR	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Improvement
Aquatic and Animal Products	173,916	191,841	224,142	262,14	279,703	292,718	336,38	362,899	354,024	386,524	9.3%
HVAC Industry	330,882	308,794	367,065	377,095	306,23	299,837	339,542	412,653	438,204	373,906	1.4%
Cement, Glass, Ceramic and Earthenware	160,208	149,374	164,434	181,951	214,83	210,265	205,601	237,607	280,326	369,741	9.7%
Grains, Pulses, Oily Seeds and Their Products	262,572	247,303	271,385	265,297	215,663	290,258	229,056	267,978	307,818	346,651	3.1%
Ferrous and Non-Ferrous Metals	190,689	191,818	216,127	204,693	180,794	198,007	219,656	280,512	306,418	290,189	4.8%
Mining Products	246,629	269,705	309,536	290,525	233,658	208,537	229,617	225,405	220,402	205,369	-2.0%
Fresh Fruits and Vegetables	90,961	122,117	138,706	84,783	110,148	113,887	149,014	150,532	161,264	193,919	8.8%
Textile and Raw Materials	209,742	170,375	153,942	168,467	149,566	151,268	183,227	195,467	165,649	178,74	-1.8%
Leather and Leather Products	110,542	102,42	107,011	116,586	101,446	111,102	127,863	140,494	134,533	115,371	0.5%
Defense and Aerospace Industry	24,269	38,814	51,849	79,41	61,556	54,216	53,505	55,838	48,071	74,911	13.3%
Olive and Olive Oil	39,173	53,923	193,929	45,454	38,368	50,16	157,656	162,663	76,572	63,67	5.5%
Hazelnut and Its Products	13,51	16,962	20,822	31,518	31,568	38,598	33,289	37,571	39,626	60,481	18.1%
Ship and Yacht	27,201	18,526	17,205	30,31	41,896	48,17	50,964	33,154	111,635	41,121	4.7%
Ornamental Plants and Their Products	6,796	7,074	7,733	8,127	5,263	6,906	10,12	12,442	11,889	12,901	7.4%
Other Industrial Products	5,215	4,644	5,074	7,896	9,217	9,812	6,993	8,269	8,928	11,477	9.2%
Jewelry	16,435	5,196	5,425	2,829	1,875	6,24	14,064	5,361	3,952	2,873	-17.6%
Carpet	25,464	20,431	17,669	26,874	24,56	2,898	24,161	20,29	2,044	2,145	-24.0%
Total	8,061,954	8,484,259	8,908,624	8,942,893	7,828,230	7,931,457	8,726,558	9,757,833	9,767,008	9,534,712	1.9%

As the profile changes in less-handled products will yield higher percentages, it would yield more coherent results to only include products that exceed a certain threshold per province in export volume (for instance, \$200 million for İzmir). Of the products exceeding \$200 million in export, electrical and electronic appliances, cement and aquatic products prove to be the highest improved export products with 12.2, 9.7 and 9.3 percent, respectively. By contrast,

the products that saw the smallest improvement were steel, the automotive industry and the mining industry with -6.5, -2.7 and 2 percent, respectively.

Germany became the top export destination in İzmir with \$1.1 billion, followed by the USA with \$730 million and the United Kingdom with \$627 million. Top 20 export destinations of İzmir comprise 68.2 percent of the total export volume in İzmir (Table 43).

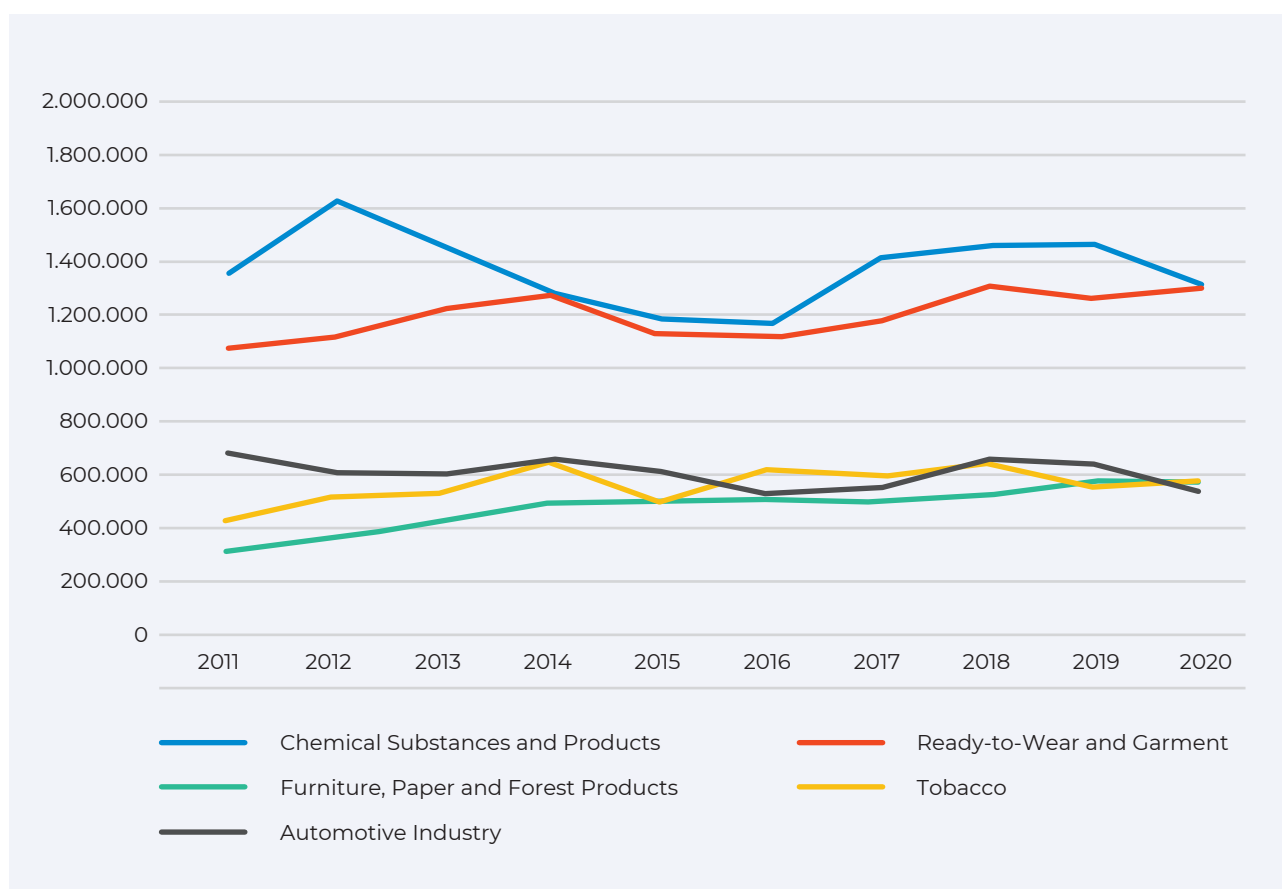
TABLE 43. Export Destinations of İzmir (*000 USD)

İzmir	2019	2020	Changing Profile 2019/2020 (%)
Germany	1,117,835	1,109,918	-0.7
USA	694,247	730,404	5.2
United Kingdom	590,587	627,140	6.2
Spain	615,932	559,238	-9.2
The Netherlands	459,603	495,647	7.8
Italy	486,870	466,624	-4.2
France	398,589	344,797	-13.5
Russian Federation	280,818	274,799	-2.1
Belgium	261,757	241,730	-7.7
Israel	194,005	227,250	17.1
Poland	158,637	178,722	12.7
Iran	191,022	176,375	-7.7
Aegean Free Zone	191,738	173,698	-9.4
Iraq	156,119	152,355	-2.4
Romania	131,627	133,386	1.3
Greece	132,141	128,100	-3.1
Egypt	139,487	126,655	-9.2
Saudi Arabia	151,825	121,495	-20
China	114,264	120,922	5.8
UAE	103,556	109,993	6.2
Total Sum of Top 20 Countries	6,570,662	6,499,247	-1.1
The Share of Top 20 Countries	67.3%	68.2%	

As these tables indicate, the export volume of various products fluctuated between 2011 and 2020 based on international demand and other dynamics. This situation can be observed in İzmir and in many other provinces of the Aegean Region. It is particularly important for this report, which aims to develop future scenarios for regional ports, to identify increasing and decreasing volumes in exports.

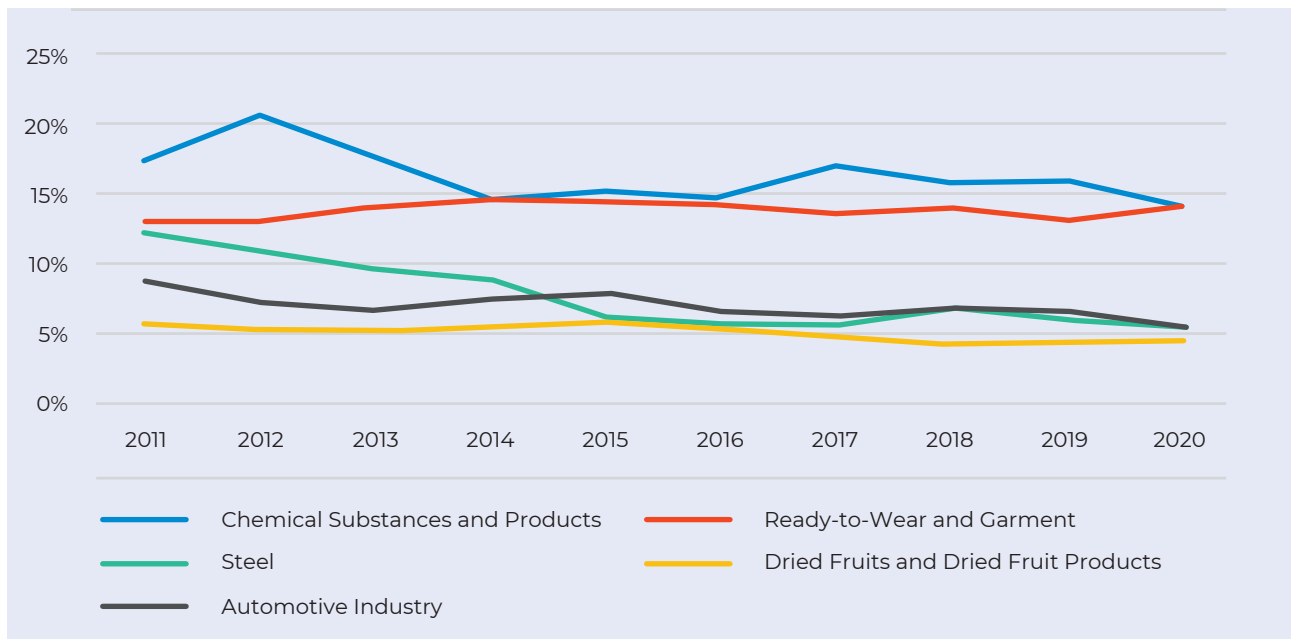
From this perspective, Figure 44 includes a retrospective analysis concerning the last 10 years of top-five export products in İzmir, while Figure 45 starts from the top-five export products of 2011 to evaluate the following 10 years of their export volume.

FIGURE 44. Development of the Top-Five Export Products in İzmir (*000 USD)



This assessment points out the lack of a coherent trend in the export volumes top products of 2011 and 2020. Steel, for instance, while listed in the top five in 2011, decreased in significance over time and was not

included in the 2020 top five. Tobacco, on the other hand, reached the sixth position in 2011 and climbed to the fourth top export position by 2020.

FIGURE 45. Development of the Top-Five Export Products in İzmir in 2011 (%)

The data suggests that while chemical and ready-made garment industries maintained their position in the export market of İzmir, furniture and paper products almost doubled in export volume as

cement, electrical and electronic appliances and aquatic products gained a significant increase between 2011–2020.

3.2.2. Manisa

Manisa is a significant manufacturing center in both the region and the world at large. Manufacturers in the Manisa OIZ are responsible for the export of electrical and electronic appliances worth \$2 billion. Electrical and electronic appliances constitute half of the entire export volume while the remaining half includes 27 product groups. Air conditioning follows

next (\$617 million) with automotive products (\$454 million) in close ranks. However, the total export shows a decreasing trend over the years. The total export of Manisa decreased by an average of -0.2 percent each year from 2011 and settled at \$4.2 billion in 2020 (Table 44). Manisa is the only province in the region where the export volume reduced over time.

TABLE 44. Development of Export Products in Manisa by Years (*000 USD)

MANİSA	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Improvement
Electrical and Electronic Products	2,834,003	2,840,099	2,355,236	2,549,907	2,266,142	2,120,603	2,227,829	2,364,910	2,222,564	2,056,878	-3.5%
HVAC Industry	318,485	314,187	362,392	371,468	365,925	382,915	405,568	507,21	601,032	617,671	7.6%
Automotive Industry	297,082	319,429	404,916	430,944	396,302	389,642	431,269	514,072	539,942	454,855	4.8%
Dried Fruits and Dried Fruit Products	265,853	280,34	265,753	258,529	240,177	247,177	234,532	296,603	309,988	257,287	-0.4%
Machinery and Equipment	23,043	20,23	30,345	27,856	35,325	35,843	48,398	68,968	107,752	137,851	22.0%

MANİSA	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Improvement
Chemical Substances and Products	101,143	99,81	111,314	145,722	138,221	139,832	138,278	147,297	131,559	135,185	3.3%
Fruit and Vegetable Products	97,104	110,176	131,008	121,052	96,391	97,434	96,368	104,954	107,004	114,111	1.8%
Grains, Pulses, Oily Seeds and Their Products	25,834	26,222	65,682	74,716	61,726	69,276	72,929	65,94	66,764	81,371	13.6%
Ferrous and Non-Ferrous Metals	66,939	65,22	69,128	81,332	80,842	72,878	67,828	73,934	71,889	63,133	-0.6%
Mining Products	23,836	29,65	33,202	36,224	36,242	37,354	48,056	48,263	48,587	47,465	8.0%
Cement, Glass, Ceramic and Earthenware	1,397	3,452	9,605	19,458	20,796	24,918	36,437	40,128	50,007	38,226	44.4%
Fresh Fruits and Vegetables	47,731	53,367	53,049	51,759	58,317	60,962	47,39	40,299	30,173	38,158	-2.5%
Olive and Olive Oil	16,406	14,84	19,04	20,428	19,398	13,17	12,332	22,051	27,418	30,444	7.1%
Furniture, Paper and Forest Products	9,28	10,798	12,814	13,533	15,988	27,971	25,093	37,922	37,605	29,951	13.9%
Steel	24,102	20,812	18,751	24,997	18,667	16,649	20,986	26,583	24,201	26,483	1.1%
Aquatic and Animal Products	83,127	81,497	61,558	62,563	30,794	20,622	64,243	49,803	45,342	24,241	-12.8%
Ready-to-Wear and Garment	2,38	2,112	3,306	3,654	2,844	3,33	1,895	2,823	3,017	7,769	14.0%
Defense and Aerospace Industry	306	208	232	415	516	335	354	1,665	7,492	6,359	40.1%
Leather and Leather Products	9,382	7,893	7,142	6,88	4,767	4,552	5,714	7,96	7,49	5,574	-5.6%
Ornamental Plants and Their Products	2,392	2,48	3,754	2,691	3,367	3,377	4,17	4,528	3,428	3,603	4.7%
Carpet	1,426	2,624	2,902	1,431	1,3	1,052	1,537	1,582	1,745	1,416	-0.1%
Textile and Raw Materials	10,662	7,141	4,544	3,195	2,382	1,47	1,418	1,414	2,314	1,27	-21.1%
Tobacco	0	0	0	0	0	0	0	0	155	461	N/A
Other Industrial Products	272	651	567	720	432	432	424	313	439	252	-0.8%
Ship and Yacht	528	675	1,726	1,133	278	295	302	356	321	233	-8.7%
Hazelnut and Its Products	817	986	817	774	59	69	2	67	12	113	-19.8%
Jewelry	0	0	0	0	1	0	0	0	0	0	N/A
Total	4,263,530	4,314,899	4,028,783	4,311,381	3,897,200	3,772,155	3,993,349	4,429,647	4,448,239	4,180,359	-0.2%

In 2020, the United Kingdom and Germany became the top export destinations for products of Manisa manufacturing with \$765 million and \$678 million, respectively. Other EU countries followed, including France, Italy and Spain. All countries listed in the top 10 are European countries, except for the USA

and Israel. Exports to EU countries is prevalent in all Aegean provinces. While the 2020 export volumes dropped due to the COVID-19 pandemic, this trend might be considered temporary. In 2020, the top-20 export destination of Manisa constitutes 81.3 percent of the total export volume in the province (Table 45).

TABLE 45. Export Destinations of Manisa (*000 USD)

Manisa	2019	2020	Changing Profile 2019/2020 (%)
United Kingdom	807,188	765,003	-5.2
Germany	688,854	678,192	-1.5
France	473,727	400,083	-15.5
Italy	298,421	277,817	-6.9
Spain	255,151	239,611	-6.1
Poland	117,945	127,093	7.8
The Netherlands	122,867	118,230	-3.8
Romania	109,849	106,872	-2.7
USA	92,153	81,210	-11.9
Israel	73,295	79,373	8.3
Russian Federation	63,178	69,121	9.4
Greece	70,419	57,509	-18.3
Sweden	61,363	56,083	-8.6
Egypt	54,650	55,267	1.1
Belgium	51,929	52,774	1.6
Iraq	64,995	52,119	-19.8
Bulgaria	52,689	51,142	-2.9
Czech Republic	57,015	47,407	-16.9
Australia	40,410	42,938	6.3
Morocco	39,310	40,462	2.9
Total Sum of Top 20 Countries	3,595,410	3,398,306	-5.5
The Share of Top 20 Countries	80.8%	81.3%	

While electrical and electronic appliances gained popularity in İzmir, they have experienced a significant downturn since 2011 in Manisa, where they are the flagship product in export (Figure 46). Triggered by the reduced demand in European countries, the export volume in the sector decreased by an average of -3.5 percent each year between 2011 and 2020. By 2020, the export volume dropped to \$2 billion from the 2011 sum of \$2.8 billion. The electrical and electronic appliances still constitute half of the total export figures.

In 2020, the air conditioning, automotive, and machinery and equipment sectors increased while the other two products within the top five, namely dried fruits and products thereof as well as the electrical

and electronic appliances, experienced a decrease. Chemical substances and products thereof, on the other hand, were included in the top exported in 2011 and they showed an overall decline despite the annual increases (Figure 47).

Manisa and İzmir are located close to each other. At 37 kilometers from İzmir, Manisa is known for its industrial products and particularly for the manufacturing of electrical and electronic appliances. Therefore, consistent improvements are expected to be made in service of the electrical and electronic appliances, despite the recent negative trend, as well as in the air conditioning, automotive, and machinery and equipment sectors.

FIGURE 46. Development of the Top-Five Export Products in Manisa (*000 USD)

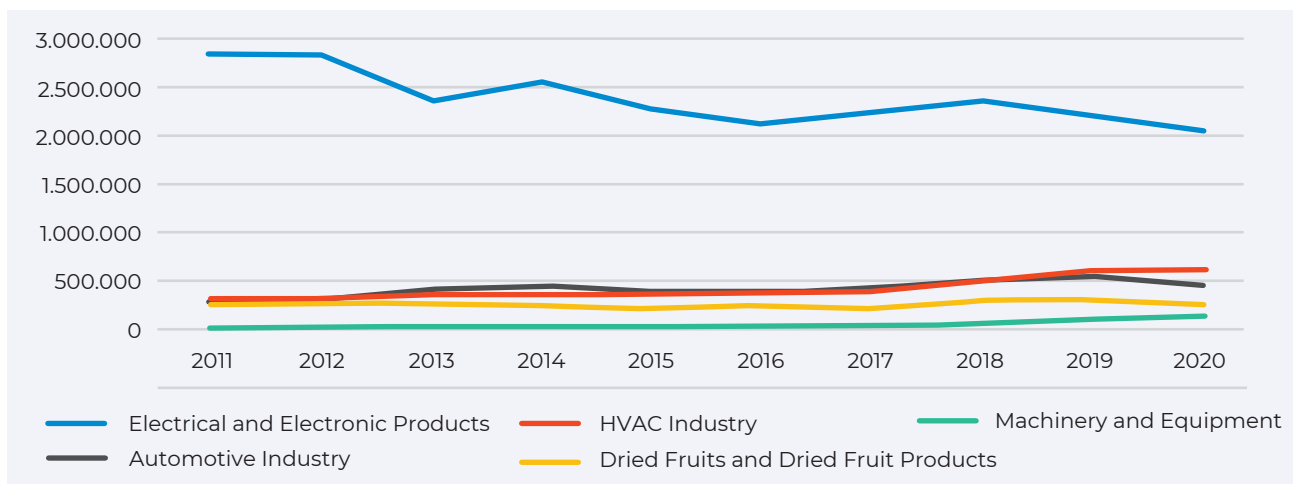
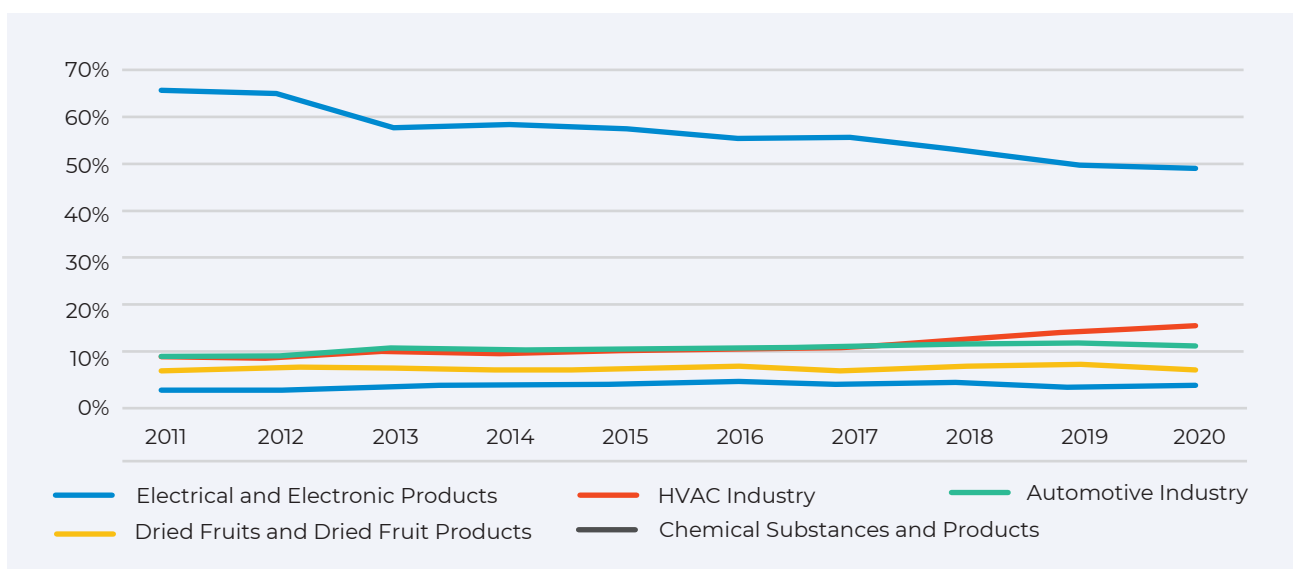


FIGURE 47. Development of the Top-Five Export Products in Manisa in 2011 (%)



3.2.3. Denizli

Denizli is the third-largest export center of the Aegean following İzmir and Manisa with over \$3 billion per year. Denizli has registered a consistent improvement in export volume by an average of 1.6 percent per year since 2011. In 2020, with an export volume of \$1.1 billion, ready-made garments constitute 34.5 percent of total exports in the province, followed by electrical and electronic appliances with

\$496 million, and ferrous and non-ferrous metals with \$429 million (Table 46).

In addition to mining products, steel, textiles and the raw materials thereof have an export volume of over \$200 million in Denizli. These six sectors are responsible for 89 percent of Denizli exports while the remaining 20 sectors achieve a total of \$345 million.

TABLE 46. Development of Export Products in Denizli by Years (*000 USD)

DENİZLİ	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Improvement
Ready-to-Wear and Garment	1,097,173	1,028,117	1,171,997	1,230,948	1,062,780	1,104,670	1,129,597	1,098,066	1,090,030	1,100,906	0.0%
Electrical and Electronic Products	301,52	352,72	405,176	453,95	379,563	390,808	460,7	523,367	486,222	494,628	5.7%
Ferrous and Non-Ferrous Metals	434,304	375,396	400,262	339,13	251,21	231,299	338,39	432,902	397,403	429,059	-0.1%
Steel	372,349	391,221	405,489	399,217	284,421	261,548	296,666	465,348	379,959	350,049	-0.7%
Textile and Raw Materials	180,205	188,894	233,503	247,143	230,255	274,431	286,478	310,195	275,024	269,043	4.6%
Mining Products	132,591	161,716	201,317	217,794	192,842	201,268	217,343	194,999	190,387	201,867	4.8%
Aquatic and Animal Products	13,378	29,436	53,778	98,326	69,969	77,281	76,893	84,822	88,714	80,675	22.1%
Machinery and Equipment	34,977	36,883	23,959	29,636	35,641	33,539	40,997	50,992	61,412	48,564	3.7%
Chemical Substances and Products	29,423	28,342	29,822	34,28	34,681	33,891	36,26	44,112	49,852	43,647	4.5%
Furniture, Paper and Forest Products	25,128	30,955	36,438	36,303	35,238	35,542	35,466	36,888	32,376	35,458	3.9%
Grains, Pulses, Oily Seeds and Their Products	3,273	4,778	15,177	13,006	13,464	25,049	24,761	21,931	31,264	31,655	28.7%

DENİZLİ	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Improvement
Cement, Glass, Ceramic and Earthenware	23,54	16,664	6,358	10,195	10,403	11,412	13,494	14,923	17,857	18,369	-2.7%
Carpet	35,647	22,599	24,17	27,837	20,426	20,703	20,681	20,411	16,583	16,274	-8.3%
Dried Fruits and Dried Fruit Products	20,107	20,175	16,051	16,111	14,042	19,724	19,624	15,178	11,886	14,09	-3.9%
Automotive Industry	7,619	8,416	10,359	13,857	13,202	9,553	9,565	9,921	12,763	13,52	6.6%
Fruit and Vegetable Products	10,468	12,022	15,216	9,983	13,274	15,361	13,901	14,349	14,313	13,218	2.6%
Hazelnut and Its Products	8,02	6,681	6,779	8,215	7,617	5,489	6,967	8,884	8,351	12,35	4.9%
Fresh Fruits and Vegetables	7,31	6,924	12,16	8,035	4,763	7,848	11,824	14,24	9,725	8,059	1.1%
HVAC Industry	13,966	13,344	7,154	1,885	1,915	2	2,765	4,779	5,184	6,341	-8.4%
Leather and Leather Products	3,695	3,546	3,427	2,943	3,691	2,892	3,391	3,456	3,754	3,141	-1.8%
Ornamental Plants and Their Products	2	2	9	65	178	92	268	221	153	242	70.4%
Other Industrial Products	88	170	450	200	142	204	62	124	88	99	1.3%
Olive and Olive Oil	7	63	58	8	35	25	47	58	73	72	29.5%
Defense and Aerospace Industry	1	6	1	0	0	0	14	2	54	5	18.5%
Jewelry	5	19	5	0	114	1,976	4,174	26	1	2	-12.4%
Ship and Yacht	1	17	58	0	37	0	3	0	0	0	-100.0%
Total	2,754,797	2,739,106	3,079,173	3,199,067	2,679,901	2,766,607	3,050,331	3,370,191	3,183,427	3,191,333	1.6%

In 2020, the United Kingdom became the top export destination of Denizli with \$437 million in volume, followed by Germany with \$363 million and the USA

with \$293 million. The top 20 export destinations of Denizli are collectively responsible for 73.6 percent of total export of Denizli (Table 47).

TABLE 47. Export Destinations of Denizli (*000 USD)

Denizli	2019	2020	Changing Profile 2019/2020 (%)
United Kingdom	421,481	437,329	3.8
Germany	352,533	363,415	3.1
USA	257,183	293,263	14
Italy	187,842	171,620	-8.6
Israel	159,500	151,806	-4.8
France	145,900	137,312	-5.9
The Netherlands	119,422	134,128	12.3
Romania	71,224	79,013	10.9
Spain	80,695	69,900	-13.4
Austria	62,722	66,252	5.6
Egypt	58,870	50,795	-13.7
Iraq	48,579	50,613	4.2
Bulgaria	43,432	48,092	10.7
Poland	45,903	46,793	1
Switzerland	32,262	46,174	43.1
Saudi Arabia	48,937	44,651	-8.8
Bursa Free Zone	30,457	42,318	38.9
Denmark	43,937	41,731	-5
Morocco	31,093	37,531	20.7
Belgium	36,511	35,109	-3.8
Total Sum of Top 20 Countries	2,278,483	2,347,846	3
The Share of Top 20 Countries	71.6%	73.6%	

Of the top-five export products in 2020, electrical and electronic appliances registered the highest improvement by an annual average of 5.7 percent, followed by textile and raw materials thereof with 4.6 percent. A significant decrease occurred in the export

of ferrous and non-ferrous metals as well as in steel products. The top export products of Denizli have not changed from 2011 to 2020. This data indicates that the flagship products in Denizli export maintain their stability (Figures 48, 49).

FIGURE 48. Development of the Top-Five Export Products in Denizli (*000 USD)

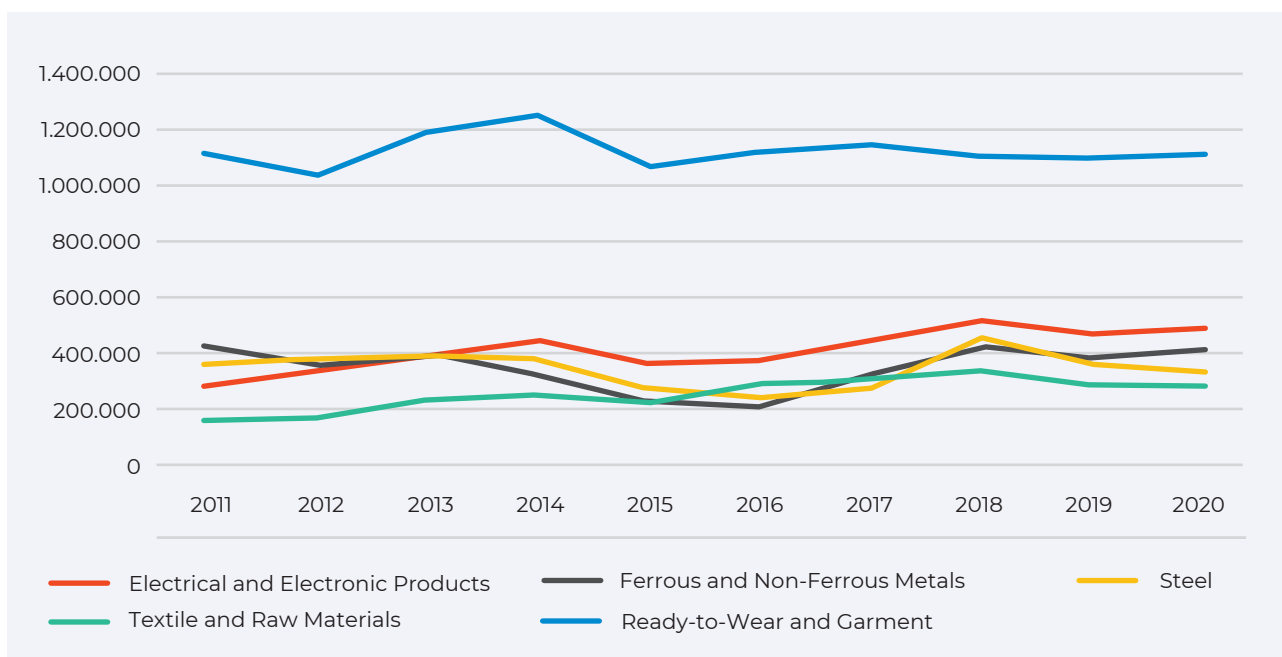
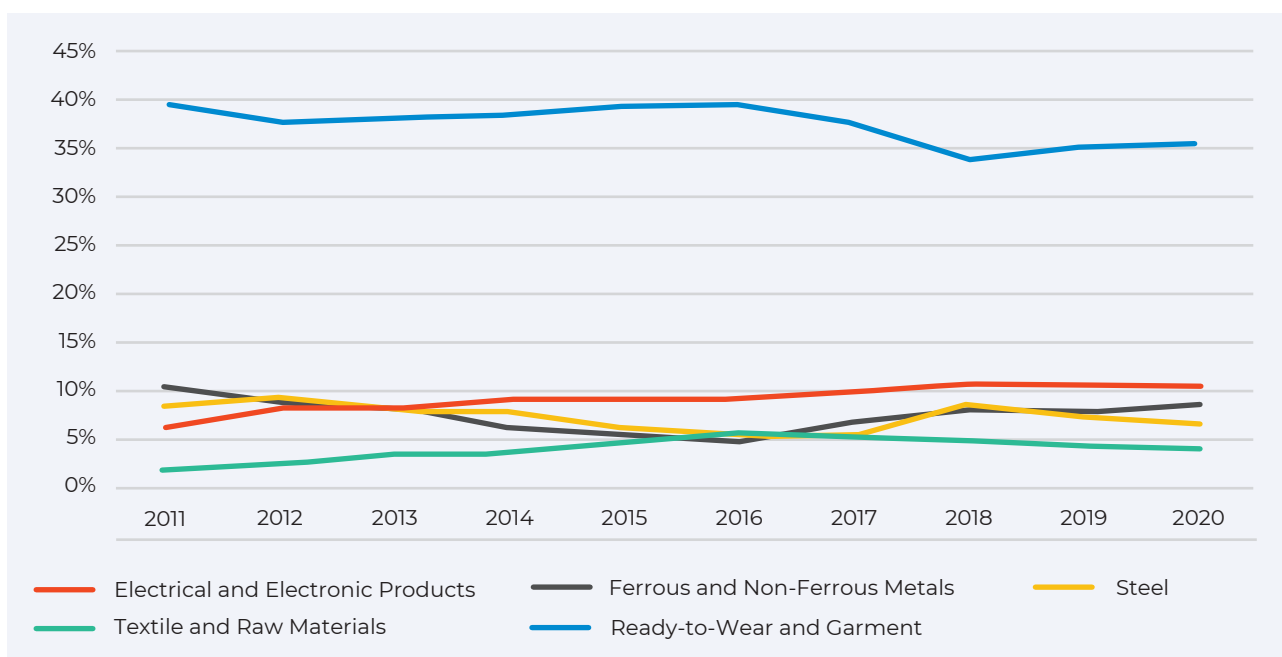


FIGURE 49. Development of the Top-Five Export Products in Denizli in 2011 (%)



The top-five export and import products of Denizli indicate no changes in the assessed period. A low but steady increase was registered. The electrical and electronic appliances moved from the fourth rank in 2011 to the second in 2020 while mining maintained its position in the sixth rank. As the export items below the sixth rank are relatively lower in volume, it would

be more useful to build on the first six items when formulating export strategies for Denizli. The aquatic products also have the potential to be included in the strategic products if the consistent increase by an average of 22.1 percent per year throughout the analyzed period is sustained.

3.2.4. Aydın

Aydın is responsible for 3.5 percent of total regional export with \$660 million in 2020. The province has achieved a steady increase in export volume since 2011 by an annual average of 2.3 percent with mining products and dried fruits and products thereof being the primary export items. These two products collectively comprise 44 percent of the total regional export amount (Table 48).

The top 11 export products of Aydın registered a continuous increase between 2011 and 2020. These 11 products collectively comprise 96 percent of all export products. Italy became the top export destination of Aydın with \$90 million, followed by Spain with \$62 million and Germany with \$57 million. The top 20 export destinations of Aydın collectively account for 75 percent of the total export amount from Aydın (Table 49).

TABLE 48. Development of Export Products in Aydın by Years (*000 USD)

DENİZLİ	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Improvement
Mining Products	101,007	105,526	105,754	104,077	101,279	108,098	125,853	151,793	163,352	152,635	4.7%
Dried Fruits and Dried Fruit Products	92,931	83,629	104,355	130,646	112,179	107,05	112,706	124,949	127,603	141,136	4.8%
Automotive Industry	55,029	59,13	60,524	56,63	49,368	54,354	68,327	75,264	78,744	87	5.2%
Machinery and Equipment	34,752	48,745	40,997	54,375	47,393	39,089	56,388	58,914	63,608	64,313	7.1%
Chemical Substances and Products	21,871	25,779	28,794	32,734	29,346	22,512	28,332	42,523	43,226	39,347	6.7%
Fruit and Vegetable Products	19,754	20,93	22,252	26,6	24,678	26,976	31,581	34,106	33,981	33,093	5.9%
Olive and Olive Oil	25,147	22,358	27,315	23,431	16,562	16,333	26,627	26,235	30,153	27,678	1.1%
Cement, Glass, Ceramic and Earthenware	1,764	1,747	1,586	1,044	1,789	5,398	23,196	36,169	5,064	25,368	34.5%
HVAC Industry	0	17,984	17,765	20,396	17,725	22,832	26,023	20,304	26,544	21,744	N/A
Fresh Fruits and Vegetables	10,282	13,611	14,484	23,597	6,091	7,989	14,948	21,172	19,004	20,308	7.9%
Textile and Raw Materials	12,359	8,456	18,467	24,678	16,552	15,345	22,573	24,1	25,933	20,13	5.6%

DENİZLİ	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Improvement
Ferrous and Non-Ferrous Metals	32,454	11,004	12,134	11,379	11,213	9,297	11,634	12,295	13,801	11,406	-11.0%
Electrical and Electronic Products	45,324	53,179	35,018	6,32	2,385	1,261	2,719	5,853	4,41	3,899	-23.9%
Ready-to-Wear and Garment	58,448	63,476	66,96	61,124	47,498	40,868	35,225	4,665	3,453	2,525	-29.5%
Steel	6,274	4,487	2,701	4,248	2,933	2,509	3,104	4,889	6,76	2,525	-9.6%
Furniture, Paper and Forest Products	4,889	5,022	3,581	4,697	3,949	3,842	2,757	5,041	1,805	2,104	-8.9%
Grains, Pulses, Oily Seeds and Their Products	783	923	1,882	1,172	807	595	1,124	1,968	1,546	2,009	11.0%
Hazelnut and Its Products	96	244	1,9	2,207	1,428	292	1,689	2,491	3,682	1,749	38.1%
Aquatic and Animal Products	10,734	7,949	3,397	1,379	582	843	1,97	2,441	1,085	803	-25.0%
Ornamental Plants and Their Products	41	0	42	0	108	32	0	40	36	102	10.8%
Ship and Yacht	0	5	15	320	0	7	72	40	0	101	N/A
Other Industrial Products	17	3	32	7	1	19	37	6	38	63	15.3%
Carpet	4,257	2,616	3,335	3,211	1,701	1,296	576	1,107	1,499	55	-38.3%
Leather and Leather Products	395	449	235	329	316	342	642	337	154	51	-20.4%
Jewelry	1,001	1,49	310	1,998	1,348	118	1,192	724	3	15	-37.2%
Defense and Aerospace Industry	0	0	34	111	244	0	0	420	156	3	N/A
Tobacco	0	0	0	0	0	1	0	0	0	0	N/A
Total	539,608	558,742	573,869	596,71	497,474	487,298	599,295	657,845	655,64	660,163	2.3%

TABLE 49. Export Destinations of Aydın (*000 USD)

Aydın	2019	2020	Changing Profile 2019/2020 (%)
Italy	84,304	90,325	7.1
Spain	61,418	62,289	1.4
Germany	50,432	57,266	13.6
USA	54,768	55,420	1.2
France	33,990	35,538	4.6
China	36,795	26,634	-27.6
Romania	21,875	23,492	7.4
Russian Federation	22,253	21,042	-5.4
The Netherlands	19,051	20,521	7.7
Israel	14,866	20,117	35.3
United Kingdom	7,848	13,072	66.6
Iraq	9,611	12,142	26.3
Poland	11,345	11,786	3.9
Belgium	8,629	8,856	2.6
Australia	7,941	7,393	-6.9
Bulgaria	5,807	7,357	26.7
Ukraine	5,511	6,629	20.3
Brazil	4,634	6,224	34.3
Belarus	6,180	6,040	-2.3
Saudi Arabia	5,832	5,998	2.9
Total Sum of Top 20 Countries	473,091	498,140	5.3
The Share of Top 20 Countries	72.2%	75.5%	

The improvement graphic of the top-five export products of Aydın in 2020 indicates a steady increase in the export amount (Figure 50). Electrical and electronic products, included in the top five in 2011 with \$45 million, dropped to \$3 million by 2020. In a similar vein, the ready-made garment sector registered \$58

million in export volume in 2011. By 2020, however, these figures dropped to almost \$2 million. These products, once in the top five in 2011, were replaced with chemical substances and products thereof in addition to machinery and equipment (Figure 51).

FIGURE 50. Development of the Top-Five Export Products in Aydın (*000 USD)

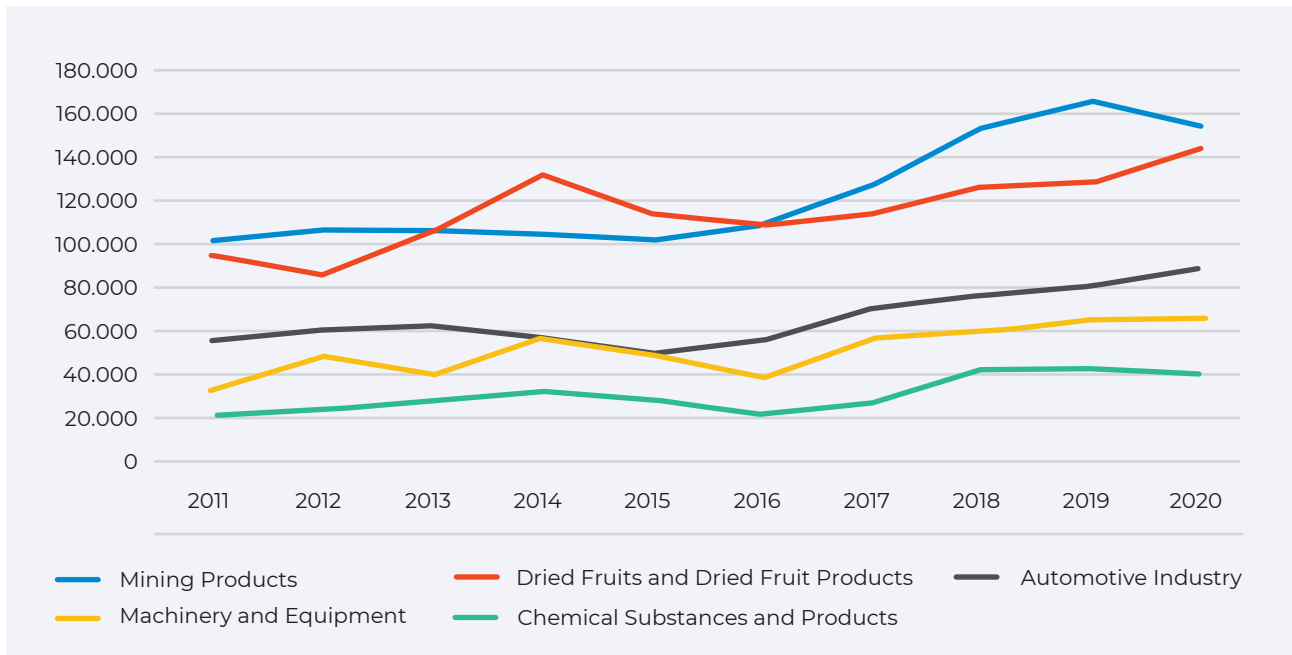
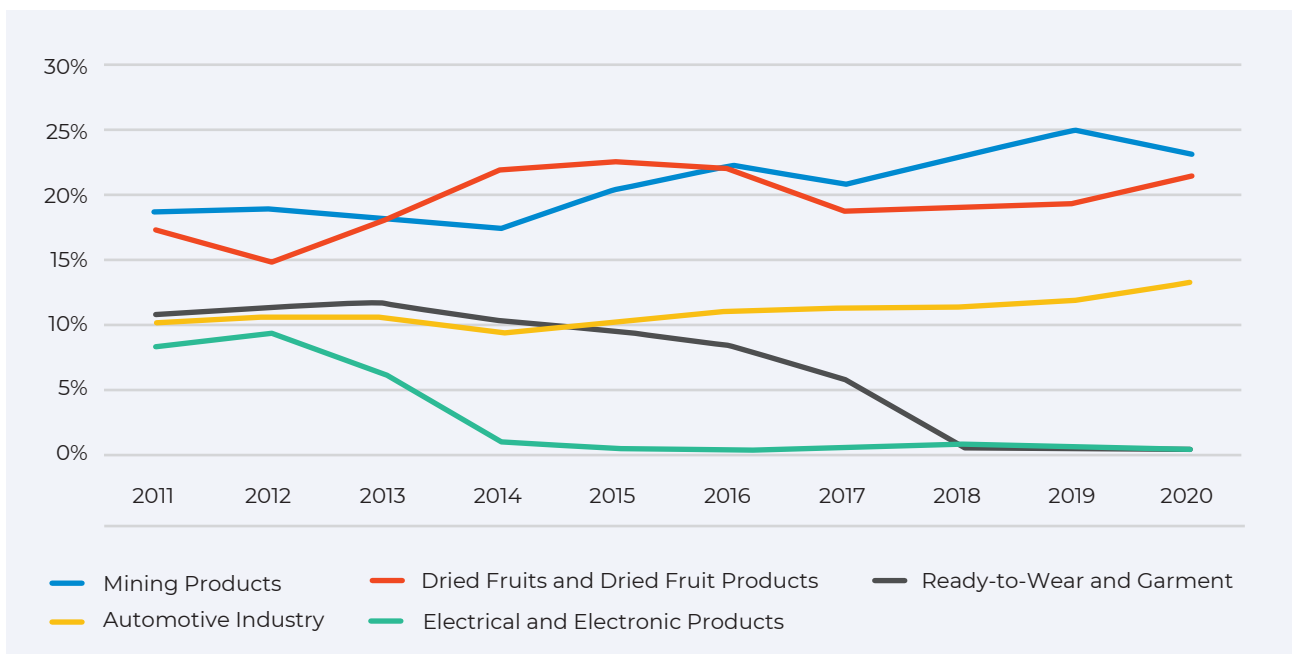


FIGURE 51. Development of the Top-Five Export Products in Aydın in 2011 (%)



These statistics suggest that the strategic products of Aydın consist of low added-value products that do not incorporate industrial manufacturing, such as dried fruits and products thereof as well as mining

products. On the other hand, low-volume sectors, including the automotive, machinery and chemical industries, register a steady increase in the manufacturing strength in Aydın.

3.2.5. Muğla

Aquatic products industry is by far the most important export item of Muğla. A total of \$405 million of aquatic products exported in 2020 is single-handedly responsible for the 69 percent of total export in the city. Mining, fresh fruits and vegetables, cement and ready-made garment sectors comprise the remaining top-five export items of 2020. These five items

collectively comprise 94 percent of the total export amount in the province, which equals to a total of \$556 million (Table 50).

Between 2011 and 2020, Muğla registered an annual average increase of 10.3 percent. The main driver of this increasing trend is the aquatic products.

TABLE 50. Development of Export Products in Muğla by Years (*000 USD)

MUĞLA	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Improvement
Aquatic and Animal Products	164,802	154,954	165,998	198,542	220,832	281,119	296,269	333,002	359,47	405,895	10.5%
Mining Products	31,438	23,968	30,513	33,337	38,271	41,122	49,927	57,274	66,265	77,065	10.5%
Fresh Fruits and Vegetables	17,928	15,57	19,147	20,107	21,241	25,23	22,583	25,938	30,603	41,367	9.7%
Cement, Glass, Ceramic and Earthenware	434	524	512	337	203	403	560	1,95	26,868	20,312	53.3%
Ready-to-Wear and Garment	1,047	865	1,103	2,201	2,449	2,979	3,116	3,951	3,334	11,744	30.8%
Grains, Pulses, Oily Seeds and Their Products	1,236	1,374	2,04	3,037	7,464	9,381	5,681	7,28	7,313	9,454	25.4%
Furniture, Paper and Forest Products	2,391	3,833	4,296	5,728	4,803	4,408	4,674	4,429	4,72	4,721	7.9%
Fruit and Vegetable Products	625	549	1,002	1,492	1,753	2,877	2,566	3,305	4,139	4,544	24.7%
Machinery and Equipment	2,716	2,706	1,83	3,879	9,992	4,105	4,483	5,987	6,495	4,405	5.5%
Ship and Yacht	10,358	15,575	12,287	22,89	18,594	4,781	26,744	28,454	20,603	2,785	-13.6%
Jewelry	3,011	2,077	2,753	2,47	4,155	3,856	3,533	3,144	5,433	2,713	-1.2%

MUĞLA	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Improvement
Chemical Substances and Products	1,295	1,802	2,154	1,634	1,134	588	1,089	822	795	1,27	-0.2%
Ferrous and Non-Ferrous Metals	708	2,173	1,735	1,335	622	345	595	358	792	1,103	5.1%
Steel	1,982	6,42	5,496	3,924	5,163	839	689	1,438	1,208	1,084	-6.5%
Other Industrial Products	418	102	412	628	310	414	808	1,061	1,064	866	8.4%
Textile and Raw Materials	371	278	460	494	891	599	985	840	517	685	7.1%
Leather and Leather Products	511	663	120	272	118	154	213	129	215	436	-1.8%
HVAC Industry	832	566	810	1,177	1,148	1,084	1,261	1	828	382	-8.3%
Automotive Industry	176	873	1,289	1,903	946	1,644	2,004	931	3,204	332	7.3%
Defense and Aerospace Industry	330	13	7	21	48	25	81	16	52	303	-0.9%
Electrical and Electronic Products	613	915	743	412	411	736	590	360	492	296	-7.8%
Dried Fruits and Dried Fruit Products	44	14	77	91	70	85	20	118	60	199	18.3%
Olive and Olive Oil	886	328	176	531	346	177	39	238	508	192	-15.6%
Ornamental Plants and Their Products	108	44	99	30	53	35	57	126	130	73	-4.2%
Carpet	20	29	16	68	6	4	27	49	88	30	4.7%
Hazelnut and Its Products	9	0	0	0	0	0	0	0	0	0	-100.0%
Total	244,28	236,215	255,075	306,54	341,023	386,989	428,594	482,201	545,194	592,258	10.3%

Greece became the top export destination of Muğla with \$76 million, followed by Russia with \$62 million and Italy with \$45 million. The top-20 export

destinations of Muğla are collectively responsible for approximately 86 percent of total export of Muğla (Table 51).

TABLE 51. Export Destinations of Muğla (*000 USD)

Muğla	2019	2020	Changing Profile 2019/2020 (%)
Greece	71,375	76,798	7.6
Russian Federation	46,872	62,571	33.5
Italy	35,044	43,534	24.2
USA	52,454	43,240	-17.6
Germany	46,974	42,351	-9.8
The Netherlands	42,013	37,169	-11.5
Israel	28,038	35,213	25.6
United Kingdom	25,066	26,030	3.8
Portugal	12,716	21,582	69.7
Spain	21,030	20,025	-4.8
Japan	8,530	18,416	115.9
Ukraine	12,845	17,267	34.4
Romania	7,368	16,524	124.3
UAE	10,671	13,013	21.9
Kuwait	3,599	8,152	126.5
Canada	3,046	5,755	88.9
Iraq	5,433	5,709	5.1
Qatar	4,146	5,591	34.8
Bulgaria	3,270	5,074	55.2
Poland	3,302	4,910	48.7
Total Sum of Top 20 Countries	443,792	508,921	14.7
The Share of Top 20 Countries	81.4%	85.9%	

The steady increase in the export volume of aquatic products is clearly visible in Figure 52. The export volumes of other industries, on the other hand, fluctuated during this period.

The jewelry, ship and yacht sectors, included in the top export products of Muğla in 2011, gradually fell from the top five and were replaced by ready-made garments and cement (Figure 53).

FIGURE 52. Development of the Top-Five Export Products in Muğla (*000 USD)

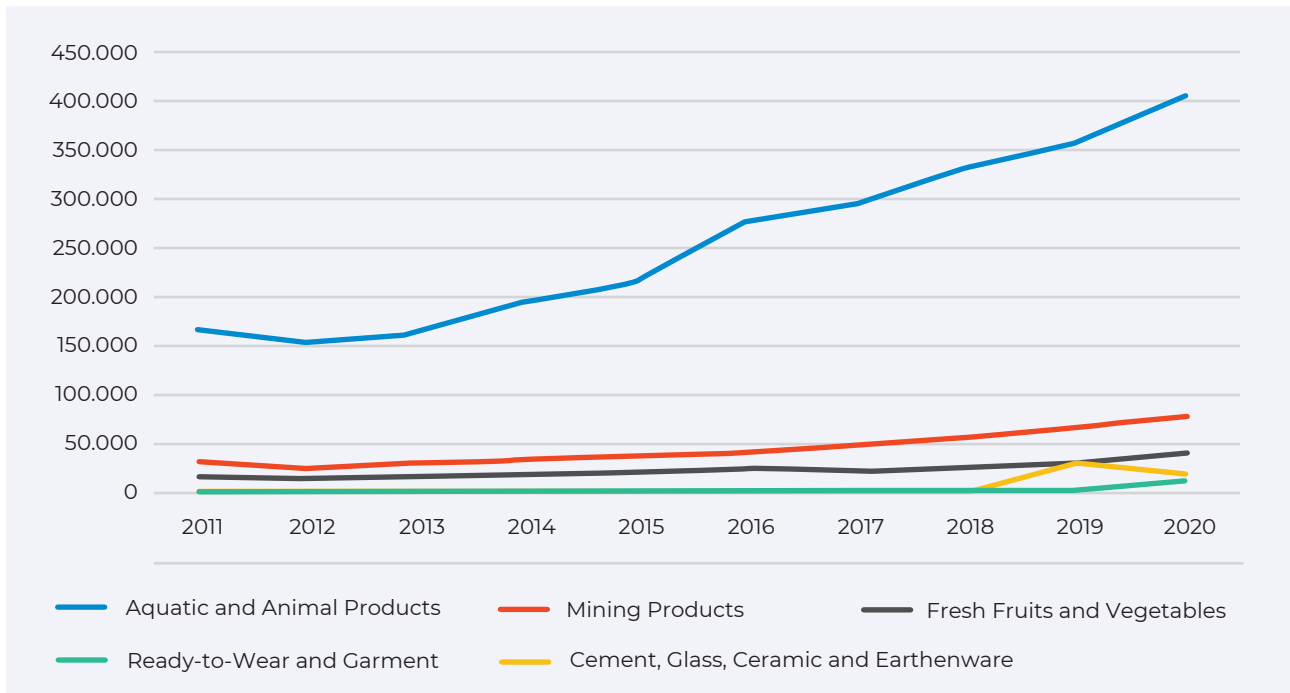
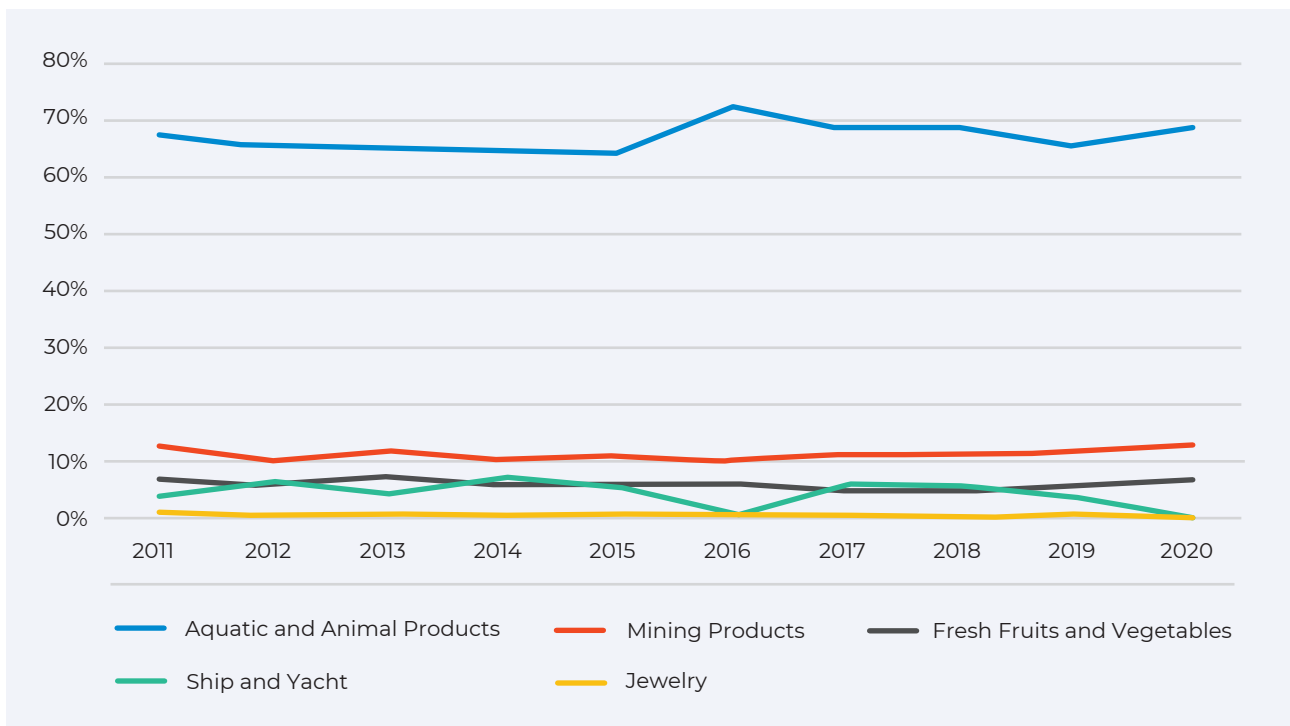


FIGURE 53. Development of the Top-Five Export Products in Muğla in 2011 (%)



While still lower than aquatic products in terms of export volume, the mining industry is another strategic sector in the region that experienced a steady growth by an average of over 10 percent per year

since 2011. Other products that achieved over \$10 million annually in export were fresh fruits and vegetables, cement and ready-made garments.

3.2.6. Afyon

Afyon accounted for 1.7 percent of total regional export with \$323 million in 2020. Mining products are the most important export items with a 62-percent share. Between 2011 and 2020, Afyon registered an annual average increase of 1.3 percent. Mining products are majorly responsible for this rate, having increased by an average of 3.5 percent (Table 52).

Mining products are heavy in weight, but low in added value. The unprocessed, raw exportation of these products (i.e. marble blocks) minimizes the potential advantages of exportation. However, exporters must opt for this if a competitive advantage cannot be achieved in processed mining products.

TABLE 52. Development of Export Products in Afyon by Years (*000 USD)

AFYON	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Improvement
Mining Products	146,664	158,088	180,484	180,989	177,133	170,465	185,432	184,678	200,908	200,482	3.5%
Aquatic and Animal Products	68,729	90,667	110,236	123,267	84,103	67,409	86,092	90,49	55,61	32,65	-7.9%
Cement, Glass, Ceramic and Earthenware	2,219	2,235	2,96	3,97	2,704	3,005	4,29	6,285	17,483	25,418	31.1%
Ferrous and Non-Ferrous Metals	10,704	14,014	13,936	12,142	8,505	9,575	9,058	10,869	13,522	14,892	3.7%
Chemical Substances and Products	12,497	9,563	8,371	6,598	6,798	6,336	6,583	6,867	10,38	10,916	-1.5%
Machinery and Equipment	3,616	1,294	3,041	3,035	1,931	2,488	4,137	4,572	8,759	8,591	10.1%
Fruit and Vegetable Products	3,547	4,676	4,665	4,499	4,185	7,67	5,611	6,694	7,835	6,594	7.1%
Automotive Industry	294	113	1,714	2,801	2,563	1,269	1,18	3,98	11,539	5,887	39.5%
Grains, Pulses, Oily Seeds and Their Products	31,399	21,803	31,129	14,194	9,911	15,257	3,946	20,553	25,392	4,83	-18.8%
HVAC Industry	0	141	92	494	126	211	124	966	3,224	3,125	N/A
Dried Fruits and Dried Fruit Products	697	1,003	1,493	1,718	1,394	1,105	1,156	1,075	1,699	2,369	14.6%

AFYON	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Improvement
Fresh Fruits and Vegetables	267	324	30	64	1,047	1,349	1,294	914	666	2,264	26.8%
Defense and Aerospace Industry	0	110	26	101	215	456	626	1,025	2,002	1,794	N/A
Furniture, Paper and Forest Products	2,314	1,272	1,234	710	413	563	868	653	902	1,022	-8.7%
Ready-to-Wear and Garment	886	1,143	889	671	677	535	997	377	415	847	-0.5%
Electrical and Electronic Products	376	173	243	230	297	1,264	199	901	941	674	6.7%
Hazelnut and Its Products	1,254	410	1,233	320	322	151	31	439	386	585	-8.1%
Steel	1,976	1,327	2,229	2,297	1,57	2,314	1,239	275	1,696	343	-17.7%
Ornamental Plants and Their Products	0	0	62	0	0	0	468	0	3	65	N/A
Textile and Raw Materials	693	246	147	115	272	99	65	36	263	55	-24.5%
Other Industrial Products	1	0	1	0	0	4	4	0	6	16	37.9%
Leather and Leather Products	21	8	62	83	48	6	24	25	12	10	-7.6%
Carpet	49	37	43	45	16	41	19	38	21	6	-20.7%
Jewelry	3	0	0	4	0	0	0	0	0	0	-36.9%
Olive and Olive Oil	0	0	0	0	28	0	0	0	0	0	N/A
Ship and Yacht	0	1	0	0	0	0	0	0	0	0	N/A
Total	288,207	308,648	364,32	358,347	304,26	291,568	313,442	341,714	363,665	323,437	1.3%

The USA became the top export destination with \$56 million, followed by China with \$38 million and France with \$28 million .

The top-20 export destinations of Afyon account for 77 percent of Afyon's total export volume (Table 53).

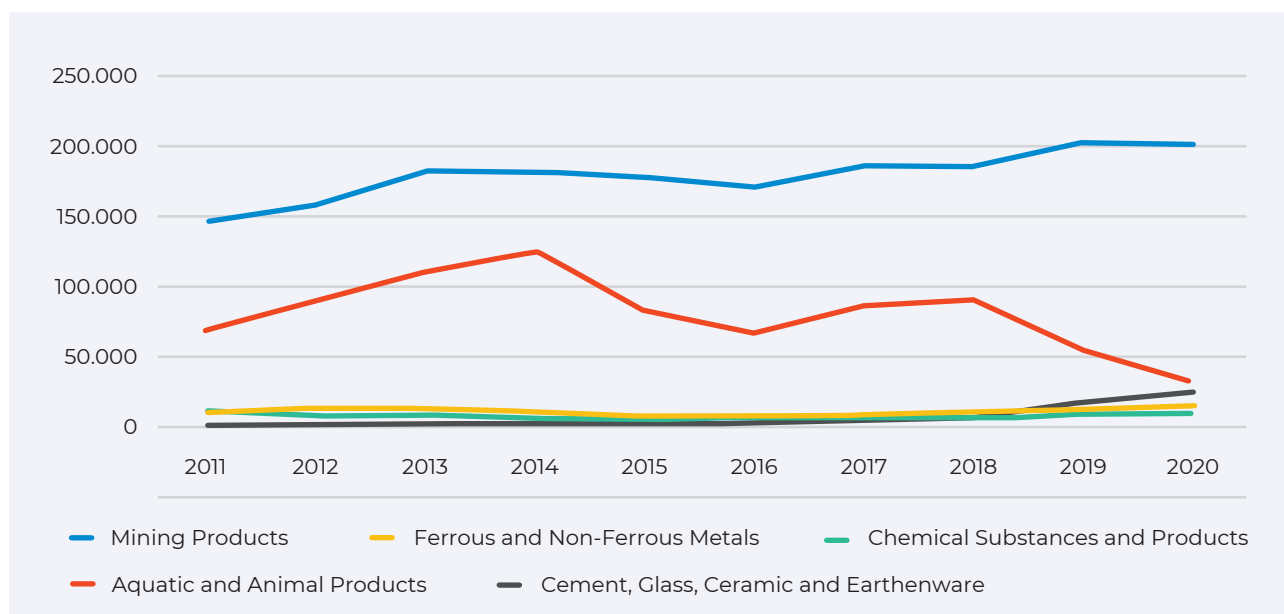
TABLE 53. Export Destinations of Afyon (*000 USD)

Afyon	2019	2020	Changing Profile 2019/2020 (%)
USA	51,845	56,133	8.3
China	55,809	38,716	-30.6
France	24,487	28,868	17.9
Saudi Arabia	12,046	13,152	9.2
Iraq	39,626	12,554	-68.3
Syria	3,758	11,946	217.9
Israel	9,952	11,854	19.1
Germany	9,614	11,222	16.7
Australia	12,659	11,053	-12.7
Kuwait	15,869	10,353	-34.8
Belgium	5,068	6,265	23.6
Ghana	4,628	5,539	19.7
United Kingdom	4,466	5,341	19.6
Libya	5,767	4,861	-15.7
Canada	5,347	4,781	-10.6
Kazakhstan	1,373	4,203	206.2
UAE	4,309	4,172	-3.2
Russian Federation	4,754	4,052	-14.8
Senegal	2,459	3,584	45.7
Mauritania	1,961	3,011	53.5
Total Sum of Top 20 Countries	275,797	251,659	-8.8
The Share of Top 20 Countries	75.8%	77.8%	

Mining products have maintained their status since 2011. While aquatic and animal products also sustained their position in the second place, they registered an annual 7.9-percent average decrease. If the decrease continues at the current rate, the sector is estimated to be replaced by cement product within

the medium term (five years). Furthermore, it is evident that Afyon is failing to produce permanent solutions against other provinces in the region achieving a competitive advantage in the aquatic products sector (Figure 54).

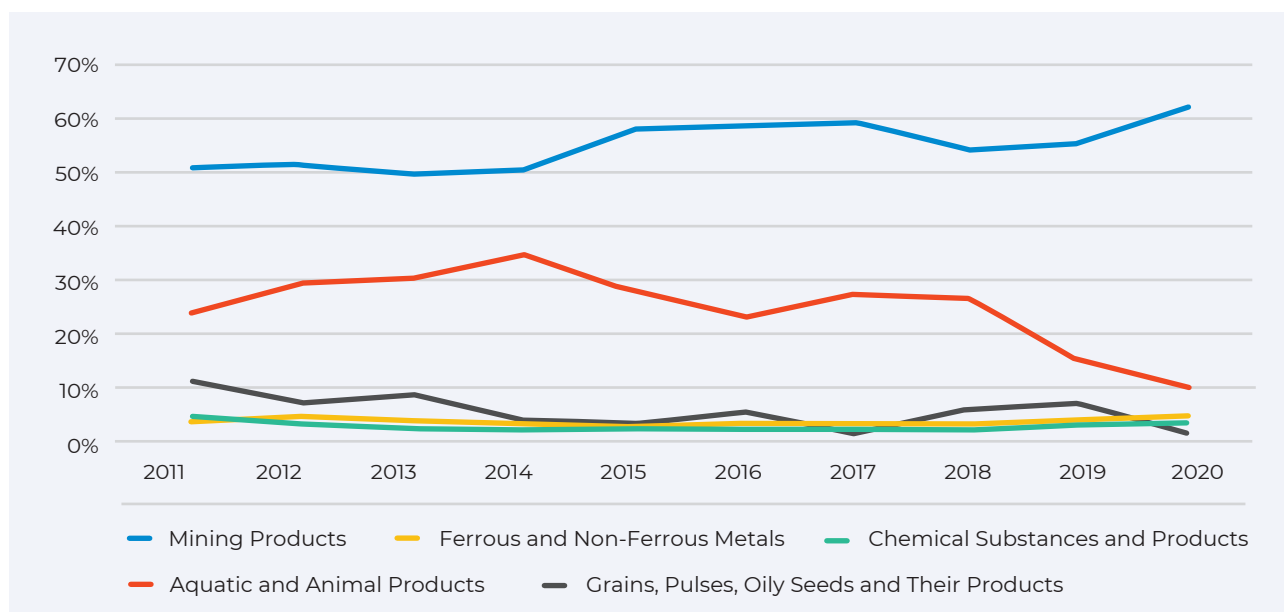
FIGURE 54. Development of the Top-Five Export Products in Afyon (*000 USD)



Comparing the top-five products in 2011 and 2020 indicates that grains, though included in the top five in

2011, reduced in volume over time and were replaced with the cement industry by 2017 as seen in Figure 55.

FIGURE 55. Development of the Top-Five Export Products in Afyon in 2011 (%)



As in Aydın, Kütahya and Uşak, the manufacturing ecosystem in Afyon is also weaker than other provinces in the region. However, it produces certain products with strategic importance. In Afyon, that product is supplied by the mining industry. However,

it is risky to build the future strategy of export in the province on a non-added-value product. In that respect, Afyon bears higher risks than other provinces in the region. Therefore, Afyon must develop a competitive manufacturing infrastructure.

3.2.7. Kütahya

While the export in Kütahya registered an average annual increase by 7.5 percent between 2011 and 2020, it only accounts for 1.5 percent share in the total regional export. Ceramic and earthenware have long been the main strategic export product of Kütahya.

In 2020, this product group comprised 58 percent of total export. Unlike Afyon, Kütahya managed to achieve a sustainable and value-added competitive advantage even if only by one product group.

TABLE 54. Development of Export Products in Kütahya by Years (*000 USD)

KÜTAHYA	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Improvement
Cement, Glass, Ceramic and Earthenware	121,23	126,219	126,549	133,3	120,563	130,506	147,892	163,314	170,719	165,56	3.5%
Ferrous and Non-Ferrous Metals	1,162	4,081	12,504	8,223	13,249	16,241	32,363	35,347	35,926	37,32	47.0%
Electrical and Electronic Products	48	1,023	6,158	2,305	4,692	14,529	20,083	27,334	20,992	19,986	95.5%
Ready-to-Wear and Garment	688	975	590	795	764	915	761	1,812	979	17,216	43.0%
Mining Products	8,494	7,897	11,062	16,112	12,607	10,256	9,649	13,714	11,944	10,936	2.8%
Chemical Substances and Products	5,495	7,053	7,846	12,087	14,056	15,156	16,894	17,405	11,144	10,921	7.9%
Furniture, Paper and Forest Products	439	2,224	2,137	2,916	3,269	4,04	5,025	8,075	11,578	10,403	42.1%
Automotive Industry	1	2,907	7,922	12,778	12,96	1,966	2,521	3,632	5,403	3,961	151.0%
Machinery and Equipment	9,879	531	3,242	929	3,651	1,277	1,128	1,294	2,112	2,279	-15.0%
Steel	625	237	242	364	276	376	981	1,301	1,689	1,726	11.9%
HVAC Industry	105	232	613	765	606	1,059	1,25	2,235	1,068	1,557	34.9%

KÜTAHYA	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Improvement
Textile and Raw Materials	345	143	619	2,613	2,507	869	5,594	4,62	1,32	1,298	15.9%
Aquatic and Animal Products	0	0	0	392	1,809	511	1,502	3,233	823	677	N/A
Carpet	119	156	23	65	16	193	26	34	108	425	15.2%
Dried Fruits and Dried Fruit Products	170	61	136	81	61	227	332	515	413	398	9.9%
Grains, Pulses, Oily Seeds and Their Products	123	190	222	169	93	306	202	445	341	295	10.2%
Fruit and Vegetable Products	31	90	125	90	85	47	29	45	153	230	24.9%
Fresh Fruits and Vegetables	0	0	0	0	0	0	15	19	0	72	N/A
Ornamental Plants and Their Products	0	0	0	0	0	0	0	1	76	24	N/A
Leather and Leather Products	5	6	24	73	10	46	40	60	57	14	11.7%
Jewelry	9	1	8	3	5	4	88	1	1	4	-9.0%
Olive and Olive Oil	0	0	0	0	0	0	6	12	1	3	N/A
Defense and Aerospace Industry	0	24	0	0	0	0	2	2	241	3	N/A
Other Industrial Products	1	0	0	0	0	0	1	40	6	2	6.3%
Ship and Yacht	0	0	0	0	0	0	0	2	0	0	N/A
Hazelnut and Its Products	1	0	0	7	0	0	0	176	0	0	N/A
Total	148,969	154,05	180,022	194,067	191,28	198,528	246,385	284,668	277,094	285,309	7.5%

The USA became the top export destination of Kütahya in 2020 with \$32 million, followed by Spain with \$21 million and Germany with \$18 million. The top-20 export destinations of Kütahya collectively account for 77 percent of the total export volume in the city (Table 55).

While the electrical and electronic appliances and ready-made garments replaced the machinery and equipment and chemical substances in the 2011 top-five exports, their overall export volumes remained relatively low.

TABLE 55. Export Destinations of Kütahya (*000 USD)

Kütahya	2019	2020	Changing Profile 2019/2020 (%)
USA	15,280	32,646	113.7
Spain	26,085	21,485	-17.6
Germany	18,893	18,111	-4.1
Israel	16,765	17,041	1.6
France	14,541	16,093	10.7
Bulgaria	20,566	15,543	-24.4
United Kingdom	11,492	14,354	24.9
Poland	8,883	12,234	37.7
Saudi Arabia	9,263	9,800	5.8
Slovakia	6,641	8,007	20.6
Italy	11,474	7,000	-39
Iraq	6,392	6,681	4.5
South Korea	5,541	6,613	19.3
Romania	5,164	5,840	13.1
Switzerland	6,330	5,806	-8.3
Brazil	4,256	5,562	30.7
Belgium	2,234	5,447	143.8
The Netherlands	7,082	4,739	-33.1
UAE	4,854	4,216	-13.2
Republic of South Africa	4,529	3,235	-28.6
Total Sum of Top 20 Countries	206,263	220,451	6.9
The Share of Top 20 Countries	74.4%	77.3%	

FIGURE 56. Development of the Top-Five Export Products in Kütahya (*000 USD)

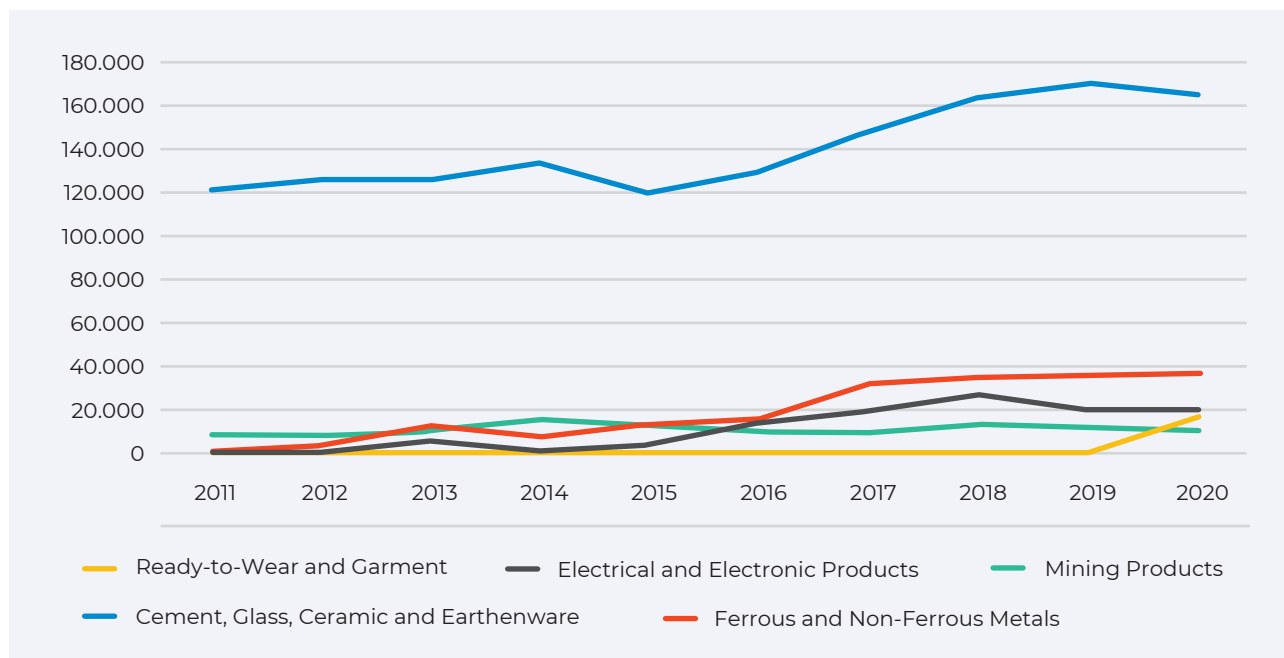
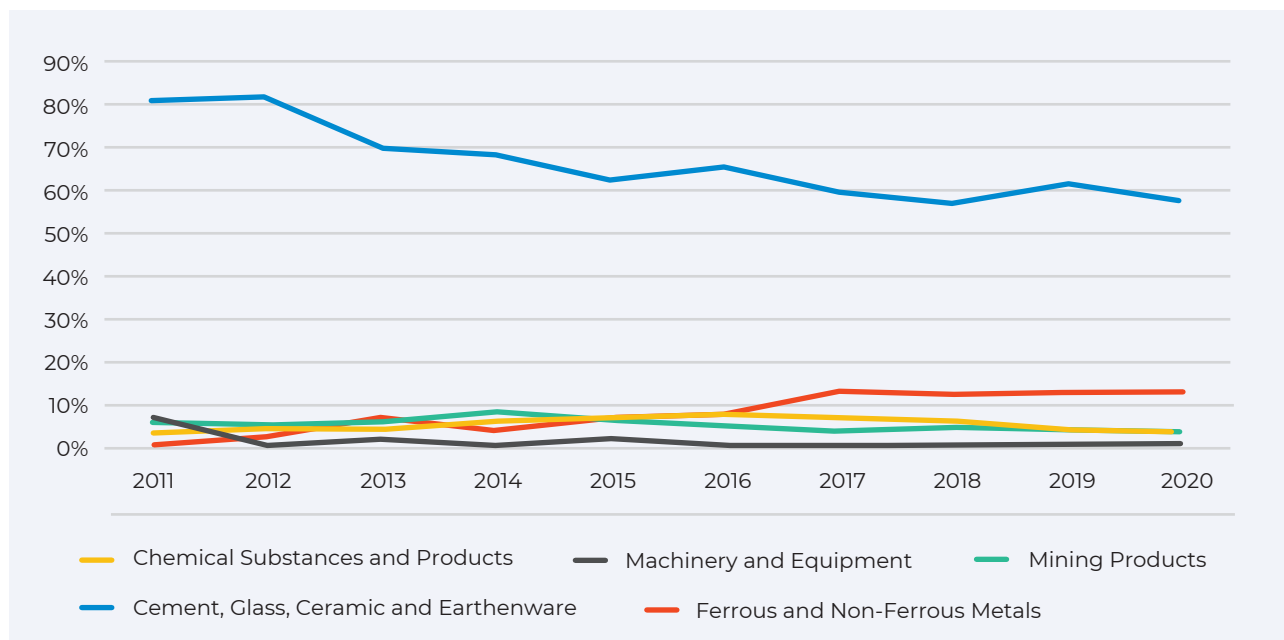


FIGURE 57. Development of the Top-Five Export Products in Kütahya in 2011 (%)



Ceramic and earthenware products, ferrous and non-ferrous metals and mining products maintained their positions within the top-five exports over the years (Figure 56).

While the improvement rates of export volumes are high in Kütahya, the overall volume still remains low in the total regional export (Figure 57). Ceramic and earthenware products are estimated to maintain their position as the most important strategic product group for years to come.

3.2.8. Uşak

Of the provinces in the İzmir hinterland, Uşak ranks last in terms of export volume with \$239 million in 2020. Uşak accounts for 1.3 percent of total regional export. The top-five export products of the province collectively hold an 80-percent share in the total export of the province (Table 56). The increase in the

export of carpet, and aquatic and animal products is striking. This increasing trend prompted a steady growth in the provincial export. Between 2011 and 2020, export in Uşak registered an annual average increase of 4.9 percent.

TABLE 56. Development of Export Products in Uşak by Years (*000 USD)

UŞAK	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Improvement
Carpet	1	8,498	50,908	55,85	49,059	63,883	57,09	54,668	81,519	57,921	57.0%
Textile and Raw Materials	73,805	68,998	69,637	65,703	61,664	58,619	67,857	67,816	49,926	52,465	-3.7%
Ready-to-Wear and Garment	36,244	44,429	67,745	72,904	44,582	55,305	39,085	34,384	34,586	41,992	1.6%
Aquatic and Animal Products	2,408	4,06	9,502	17,622	7,374	8,515	13,907	9,423	10,858	21,948	27.8%
Cement, Glass, Ceramic and Earthenware	17,399	26,881	30,178	20,998	15,67	16,95	19,167	26,516	20,246	18,184	0.5%
Leather and Leather Products	2,216	6,139	7,898	10,376	13,212	21,574	26,654	24,319	18,788	16,336	24.9%
Fruit and Vegetable Products	5,159	5,614	7,025	9,309	10,345	11,087	11,801	15,204	18,38	15,189	12.7%
Machinery and Equipment	2,165	2,423	828	723	732	977	2,061	1,198	1,992	4,965	9.7%
Chemical Substances and Products	3,423	3,552	8,869	7,268	10,402	6,107	4,538	4,716	4,558	3,824	1.2%
Ornamental Plants and Their Products	515	796	421	372	542	744	665	745	1,059	1,858	15.3%
Ferrous and Non-Ferrous Metals	3,512	863	243	189	235	435	984	1,851	1,561	1,515	-8.9%
Mining Products	6,33	5,745	4,057	3,505	3,246	542	898	579	1,974	1,354	-15.7%

UŞAK	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Improvement
Furniture, Paper and Forest Products	212	251	250	470	646	715	517	782	919	1,044	19.4%
Fresh Fruits and Vegetables	o	132	224	424	242	639	749	737	1,382	460	N/A
Steel	26	335	66	31	233	20	43	101	92	240	28.0%
Grains, Pulses, Oily Seeds and Their Products	979	1,01	590	2,006	1,797	1,123	11	270	210	225	-15.1%
HVAC Industry	11	278	85	514	243	28	105	140	158	166	35.2%
Defense and Aerospace Industry	o	o	46	19	o	o	o	o	o	90	N/A
Electrical and Electronic Products	54	114	155	43	229	17	9	56	248	78	4.2%
Hazelnut and Its Products	o	o	o	o	o	o	o	o	o	8	N/A
Olive and Olive Oil	o	o	o	o	4	9	o	11	o	4	N/A
Other Industrial Products	o	o	29	1	o	4	3	o	o	3	N/A
Automotive Industry	177	901	29	25	14	o	1	1	147	2	-38.5%
Jewelry	o	o	o	o	o	999	1,53	o	o	2	N/A
Dried Fruits and Dried Fruit Products	30	19	14	o	o	o	o	1	o	1	-35.0%
Ship and Yacht	o	o	o	o	23	o	o	o	o	o	N/A
Tobacco	o	15	o	o	o	o	o	o	o	o	N/A
Total	155,665	181,038	258,799	268,352	220,494	248,293	247,675	243,519	248,605	239,873	4.9%

Germany became the top export destination with \$32 million, followed by the USA with \$31 million and Spain with \$9 million. The top-20 export destinations

of Uşak collectively account for 72 percent of the total export volume in the province (Figure 57).

TABLE 57. Export Destinations of Uşak (*000 USD)

Uşak	2019	2020	Changing Profile 2019/2020 (%)
Germany	35,853	32,607	-9.1
USA	29,436	31,504	7
Spain	8,611	9,330	8.4
China	8,339	9,318	11.7
India	4,545	8,975	97.5
Italy	11,465	8,907	-22.3
The Netherlands	7,098	8,795	23.9
United Kingdom	9,301	7,137	-23.3
Belgium	5,484	6,886	25.6
Israel	7,818	6,616	-15.4
South Korea	5,302	5,728	8
Romania	4,985	5,559	11.5
Poland	5,956	5,427	-8.9
Iraq	7,939	4,632	-41.7
Egypt	4,663	4,248	-8.9
Russian Federation	5,491	4,181	-23.9
Algeria	3,784	4,013	6.1
The Philippines	183	3,769	1,954.4
Ukraine	4,472	3,670	-17.9
Czech Republic	2,760	3,360	21.7
Total Sum of Top 20 Countries	173,485	174,662	0.7
The Share of Top 20 Countries	69.8%	72.8%	

As mentioned before, carpets were the top export items in 2020. The product group achieved a substantial increase rate of an annual 50-percent average since 2011. In a similar vein, the export of aquatic and animal products also registered an annual average

increase of 24 percent since 2011. Neither products are included in the top-five exports of 2011. The export value of fruits, vegetables and mining products decreased over time (Figures 58 and 59).

FIGURE 58. Development of the Top-Five Products in Uşak (*000 USD)

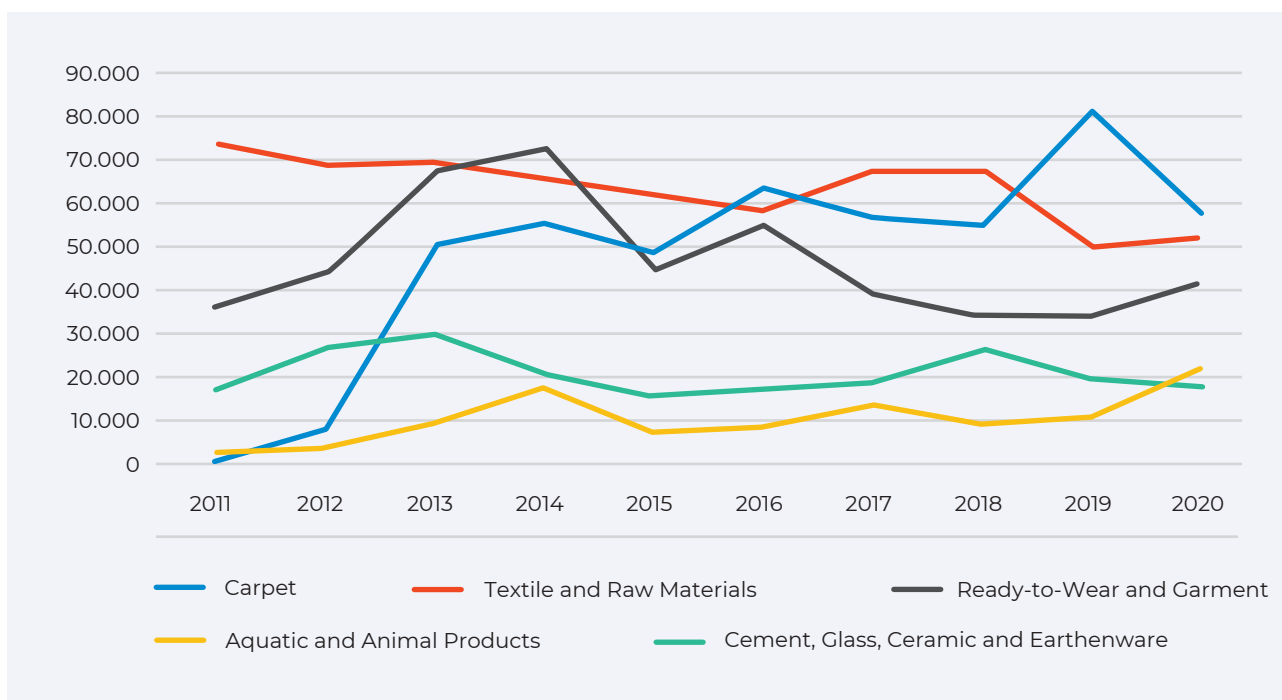
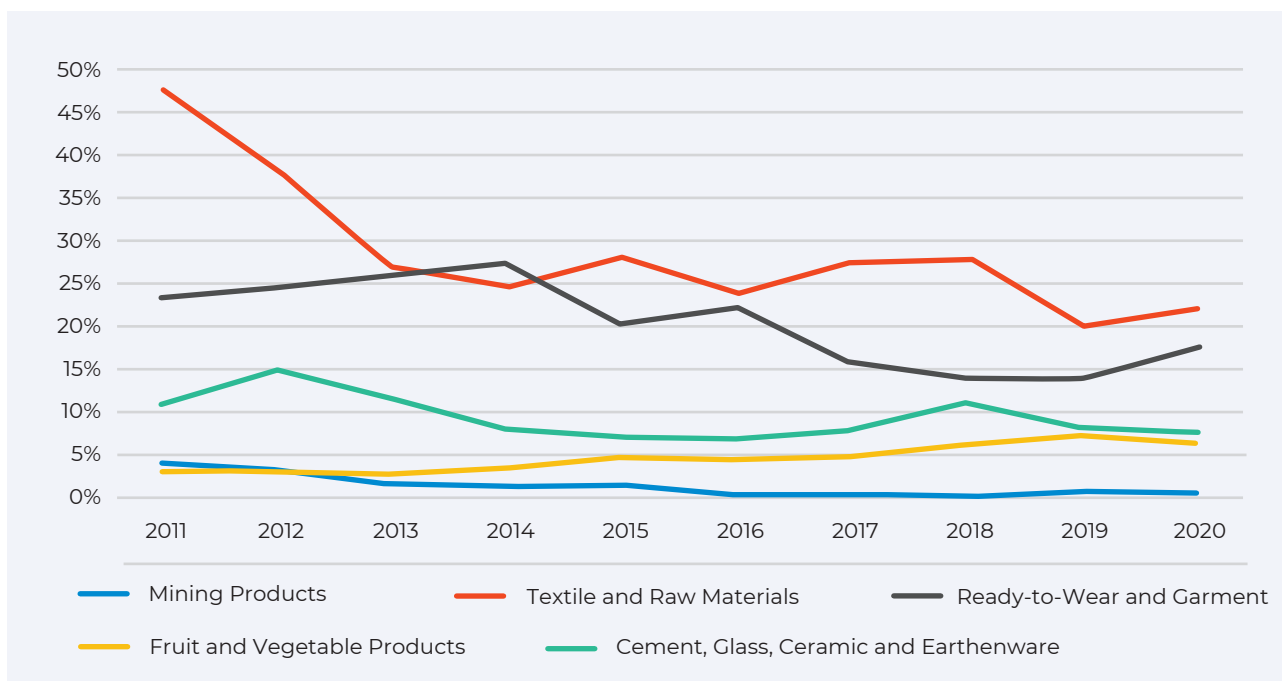


FIGURE 59. Development of the Top-Five Export Products in Uşak in 2011 (%)



Unlike the other provinces in the region, there is no prevalent export product in Uşak. The top-three product groups demonstrate a balanced exporting profile. Carpet, textile and raw materials thereof, as well as ready-made garments, became the most

strategic export products as of 2020. However, given the decrease in textile products and the increase in the animal products in terms of export, it is evident that a potential replacement is required between these two product groups.

3.3. Evaluation of the Impacts of Regional Cargo Development on the Ports of İzmir

This chapter of the study aims to conduct the basic assessments to prevent ports from becoming bottlenecks in the regional development of the Aegean.

So far, the study discussed exportation. However, importation is another significant consideration. The import products have a high share in the input of regional production. It is, therefore, crucial to consider an import-oriented capacity building in the ports to prevent any challenges in production. With that in mind, the following headers will not only discuss the export profile, but also the import in the regional ports.

Before moving on to these assessments, however, it would be beneficial to recall the distribution by regime of cargo handled in the ports of İzmir. According to the data provided by the General Directorate of Maritime Affairs, the handling at the Çeşme Port Authority is primarily carried out with Ro-Ros, while the metric tonnage at the port of Dikili is lower than that of other ports. According to this overview, the evaluations of ports are based on the ports of Aliğa and İzmir, which handle 96 percent of the region's export cargoes, and 98 percent of its import cargoes.

TABLE 58. Cargo at the Ports of İzmir by Regime, 2020 (metric tons)

Region	Export	Import	Cabotage	Transit	Total
Aliğa	20,598,308	39,032,358	9,222,252	93,083	68,946,001
İzmir	4,333,261	4,035,172	990,665	30,914	9,390,012
Çeşme	654,088	559,314	23,002	0	1,236,404
Dikili	451,759	46,258	0	0	498,017
Total	26,037,416	43,673,102	10,235,919	123,997	80,070,434

3.3.1. Export-Focused Evaluation

The previous chapters assessed the hinterlands of İzmir ports in terms of their export cargo and drafted export profiles per provinces. Table 59 gathers and summarizes for the hinterland the origins of cargo

presenting an export-oriented strategic development potential as well as the prioritized cargo types in transportation.

TABLE 59. Cargo Origins and Types in the Aegean

Product Group	Origin	Primary Cargo Type
Electrical and Electronic Products	Manisa, İzmir, Denizli	Container, Ro-Ro
Chemical Substances and Products	İzmir, Manisa, Aydın	Liquid Bulk
HVAC Industry	Manisa, İzmir	Container, Ro-Ro
Ready-to-Wear and Garment	Denizli, İzmir, Uşak	Container, Ro-Ro
Furniture, Paper and Forest Products	İzmir, Manisa, Denizli	Container, Ro-Ro
Tobacco	İzmir	Container
Automotive Industry	İzmir, Manisa, Aydın	Container, Ro-Ro
Steel	İzmir, Denizli	General Cargo
Machinery and Equipment	İzmir, Manisa, Aydın	Container, General Cargo
Fruit and Vegetable Products	İzmir, Manisa	Container, Ro-Ro
Aquatic and Animal Products	Muğla, İzmir, Denizli, Uşak	Container, Ro-Ro
Dried Fruits and Dried Fruit Products	Manisa, Aydın	Container
Cement, Glass, Ceramic and Earthenware	İzmir, Kütahya	Dry Bulk Cargo, Container
Grains, Pulses, Oily Seeds and Their Products	İzmir, Manisa	Dry Bulk Cargo, Container
Ferrous and Non-Ferrous Metals	Denizli, İzmir, Manisa	General Cargo
Mining Products	İzmir, Denizli, Aydın, Muğla, Afyon	Dry Bulk Cargo, Container
Fresh Fruits and Vegetables	İzmir, Muğla	Container, Ro-Ro
Textile and Raw Materials	İzmir, Denizli	Container, Ro-Ro
Leather and Leather Products	İzmir	Container
Fruit and Vegetable Products	İzmir	Container
Defense and Aerospace Industry	İzmir	Container
Olive and Olive Oil	İzmir, Aydın	Container
Hazelnut and Its Products	İzmir	Container
Ship and Yacht	İzmir	General Cargo
Carpet	Uşak	Container

As previously mentioned, cargo handled at ports is evaluated under three main categories. These are bulk cargo, general cargo and passengers. While bulk cargoes are divided into either liquid or dry bulk cargoes, containers and Ro-Ro cargoes are classified under general cargoes. It is evident in the table that container cargo should be the focus to ensure that the ports of İzmir contribute to the regional export volume. This is because products manufactured in the region are primarily exported in containers. Chemical substances and products thereof, on the other hand, are not only a significant export item in the region but also a multifaceted industry that is incorporated within both the electrical/electronics and the machinery and equipment sectors. The transportation of wind turbines, for instance, is classified as general cargo. As both the chemical and energy industries are classified as liquid and general cargo and as the ports of İzmir have sufficient capacity

for both categories, any possibilities of a bottleneck within the medium term are eliminated. In the long term, however, further precautions may be required for wind turbines. And finally, while Ro-Ro transportation is widely preferred in the region, its share in the total is low.

The General Directorate of Maritime Affairs data pertaining to port authorities concerning cargo distribution between ports list container cargo at the top of the metric tonnage list between 2016 and 2020, confirming the cargo distribution in Table 60. Container cargo at the TCDD Port of İzmir is showing a decline due to the lack of investments that would technologically advance the port. However, it has maintained its position as the most strategically beneficial cargo at the port. Besides containers, the most important cargo type at the port is cement (Table 60).

TABLE 60. Top Handled Cargo Types at the TCDD Port of İzmir (Export, Metric Tons)

İzmir Port Authority – Product Groups – Export (metric tons)	2016	2017	2018	2019	2020	Improvement
Various goods and containers	4,186,675	3,706,406	3,505,446	3,327,468	2,916,479	-8.6%
Cement, lime	420,932	600,177	375,404	753,500	1,357,979	34.0%
Other machinery and equipment, engines and parts	15,600	16,373	28,412	45,259	29,917	17.7%
Oilseeds, oily fruits and oils	2,904	0	16,065	12,563	11,850	42.1%
Other manufactured building materials	123	1,460	4,236	14,761	11,253	209.3%
Manufactured materials	802	300	9	3	3,163	40.9%
Tubes, pipes and cast and wrought iron and steel	0	18	455	221	1,215	N/A
Glass, glassware and ceramic products	253	0	704	495	783	32.6%
Other transported goods	5,790	12,421	5,336	4,178	562	-44.2%
Transport equipment	103,182	11,847	9,719	6,782	58	-84.6%
Other manufactured materials	0	54	242	34	2	N/A
Total	4,844,201	4,397,385	4,045,886	4,239,053	4,333,261	-2.7%

In 2020, 1.3 million metric tons of cement (dry bulk cargo) were exported at the TCDD Port of İzmir. Cement has emerged as the second-most important export cargo at the ports operated under Aliğa Port Authority, following containers. In 2020, 3.4 million metric tons of cement were exported through the

ports of Aliğa. It can be estimated that the total weight of cement exported from the ports of İzmir equals 4.8 million metric tons. Export cargoes are also transported in containers at the ports of Aliğa. Other cargoes are handled as liquid and dry bulk cargo, and as general cargo (Table 61).

TABLE 61. Top Handled Cargo Types at the Ports of Aliğa (export, metric tons)

Aliğa Port Authority – Product Groups – Export (metric tons)		2016	2017	2018	2019	2020	Improvement
1	Various goods and containers	414,951,096	512,441,222	616,841,882	716,931,661	813,851,747	16.9%
2	Cement, lime	5,131,785	3,521,584	7,751,630	210,451,101	314,301,975	60.8%
3	Fuel derivatives	310,671,191	310,621,342	211,031,138	514,411,882	312,381,507	1.4%
4	Iron and steel bars, angles, wire rods and tramway construction materials	216,121,881	212,901,350	216,841,614	216,681,374	213,561,044	-2.6%
5	Other chemical products	591,890	291,162	341,480	6,041,889	112,641,088	114.3%
6	Essential chemicals	3,751,520	4,171,592	3,801,592	6,301,846	4,901,086	6.9%
7	Non-fuel derivatives	161,550	51,470	61,175	5,041,536	4,211,827	124.7%
8	Manufactured materials	2,631,226	2,241,986	3,721,353	3,301,003	2,901,081	2.5%
9	Coal-derived chemicals	1,501,400	1,581,049	1,171,780	1,631,280	1,561,212	1.0%
10	Gaseous hydrocarbons, liquid or compressed	941,384	2,081,412	1,481,444	2,171,664	1,161,685	5.4%
11	Iron and steel waste and blast furnace flue dust	1,841,933	1,071,911	1,291,785	1,341,100	1,001,600	-14.1%
12	Oilseeds, oily fruits and oils	111,200	211,950	461,250	1,361,412	981,350	72.1%
13	Soils and minerals from other stones	241,225	141,750	381,820	761,026	881,863	38.4%

Aliğa Port Authority – Product Groups – Export (metric tons)		2016	2017	2018	2019	2020	Improvement
14	Semi-finished rolled steel products	51,000	631,927	681100	1,371,930	341,989	62.6%
15	Salt, iron pyrite and sulfur	331,625	731,481	111138	841,326	271,108	-5.2%
16	Other machinery and equipment, engines and parts	51,866	191,014	391341	181,589	231,188	41.0%
17	Grains	21,000	0	51,963	0	201,000	77.8%
18	Non-ferrous ores and waste	441,750	791426	371,900	221,812	191,640	-18.6%
19	Chemical fertilizers	201,250	51,595	291,738	221,400	131,526	-9.6%
20	Sand, gravel, clay and slag	471,710	371,053	351,000	281,669	91,019	-34.1%
21	Coke	0	0	0	0	51,500	N/A
22	Tubes, pipes and cast and wrought iron and steel	0	0	0	0	51,015	N/A
23	Other transported goods	81,385	101,775	8,1621	31,137	21,100	-29.3%
24	Other manufactured building materials	325	0	0	401,000	110	-23.7%
25	Weapons and ammunition	111,042	533	11,521	167	25	-78.2%
26	Other manufactured materials	211,848	251,599	221,068	983	14	-84.1%
27	Plasters	0	0	0	0	7	N/A
28	Leather, textiles and clothing	0	0	0	0	2	N/A
Total		12,267,798	12,520,971	13,782,869	21,006,802	20,598,308	13.8%

In 2020, 4.3 million metric tons of export cargo was handled at the TCDD Port of İzmir, and 20.5 million metric tons at the ports of Aliağa. A combined assessment of both ports indicates that containers,

cement, fuel, iron and steel products and other chemical substances are the most-handled cargo (Table 62). Forty-five percent of the total exports from both ports were transported by containers.

TABLE 62. Top Handled Cargo Types at the Ports of İzmir and Aliağa (Export, Metric Tons)

İzmir and Aliağa Port Authority – Product Groups – Export (metric tons)		2016	2017	2018	2019	2020	Improvement
1	Various goods and containers	8,681,771	8,950,628	10,190,328	11,021,129	11,302,226	6.8%
2	Cement, lime	934,717	952,761	1,151,034	2,798,601	4,788,954	50.4%
3	Fuel derivatives	3,067,191	3,062,342	2,103,138	5,441,882	3,238,507	1.4%
4	Iron and steel bars, angles, wire rods and tramway construction materials	2,613,876	2,290,350	2,684,614	2,668,374	2,356,044	-2.6%
5	Other chemicals	59,891	29,216	34,480	604,891	1,264,088	114.3%
6	Basic chemicals	375,520	417,592	380,592	630,846	490,086	6.9%
7	Non-fuel derivatives	16,550	5,470	6,175	504,536	421,827	124.7%
8	Manufactured materials	264,028	225,286	372,362	330,006	293,244	2.7%
9	Coal-derived chemicals	150,400	158,049	117,780	163,280	156,212	1.0%
10	Gaseous hydrocarbons, liquid or compressed	94,384	208,412	148,444	217,664	116,685	5.4%
11	Oilseeds, oily fruits and oils	14,104	21,950	62,315	148,975	110,200	67.2%
12	Iron and steel waste and blast furnace flue dust	184,933	107,911	129,785	134,100	100,600	-14.1%
13	Soils and minerals from other stones	24,225	14,750	38,820	76,026	88,863	38.4%
14	Other machinery and equipment, engines and parts	21,466	35,387	67,753	63,848	53,105	25.4%
15	Semi-finished rolled steel products	5,000	63,927	68,100	137,930	34,989	62.6%
16	Salt, iron pyrite and sulfur	33,625	73,481	11,138	84,326	27,108	-5.2%
17	Grains	2,000	o	9,021	o	20,000	77.8%
18	Non-ferrous ores and waste	44,750	79,426	37,900	22,812	19,640	-18.6%
19	Chemical fertilizers	20,250	5,595	29,738	22,400	13,526	-9.6%
20	Other manufactured building materials	448	1,460	4,236	54,761	11,363	124.4%
Total Sum of the Top-20 Products		16,609,129	16,703,993	17,647,753	25,126,387	24,907,267	10.7%
Total Sum		17,111,999	16,918,356	17,828,755	25,245,855	24,931,569	9.9%
The Share of the Top-20 Products		97.1%	98.7%	99.0%	99.5%	99.9%	0.7%

Analysis of the cargo handled over 1 million metric tons in the Aegean in terms of annual improvement rates between 2016 and 2020 indicates that a substantial increase occurred by an average of 114 percent within the last five years in the chemical substances product group, which holds the fifth position in the export products⁸⁵. Cement export also achieved a high increase by an annual average of 50 percent during the same period. Steel and iron products regressed while fuel export maintained a balanced

fluctuation of 1 percent and container cargo gained a steady increase by an annual average of 6.8 percent. As listed in the table at the beginning of this chapter, the average export value of cement is \$0.04 while for chemical substances the price remains below \$2. Similarly, the average kilogram value of iron and steel products is \$0.62. Given that the containers carry finished or semi-finished products, it becomes highly critical strategically to prevent any potential bottlenecks in container transportation.

3.3.2. Import-Focused Evaluation

The export-related data in the previous chapters were obtained from the Turkish Exporters' Assembly (TIM) given their expertise in exportation. This chapter uses data from the Ministry of Trade in Table 63 as it will focus on the analysis of import data.

In 2020, the total import of all provinces in the Aegean Region reached \$13 billion, which equates to a 6-percent share of Türkiye's total import. The Aegean registered an export surplus of \$5.7 billion

in 2020, contradicting the overall profile in Türkiye (Table 63). On another note, while the total figures of 2019 and 2020 reveal a decreasing trend as a result of the COVID-19 pandemic, the share of the Aegean export in the total Turkish export volume increased by 2.7 percent in 2020 compared to the previous year. Between 2016 and 2020, a steady increase by an annual average of 1.5 percent has been registered. Conversely, the import rate continued to decrease.

TABLE 63. The Share of the Aegean in Turkish Foreign Trade (Million USD)⁸⁶

	2016	2017	2018	2019	2020	2019/2020 Change (%)	2016/2020 Improvement (%)
Export in the Aegean	15,699	17,596	19,656	19,689	18,980	-3,6	4,9
Import in the Aegean	14,628	16,905	16,145	13,331	13,244	-0,6	-2,5
Total in the Aegean	30,328	34,501	35,801	33,019	32,224	-2,4	1,5
Export in Türkiye	149,247	164,495	177,169	180,833	169,669	-6,2	3,3
Import in Türkiye	202,189	238,715	231,152	210,345	219,510	4,4	2,1
Total in Türkiye	351,436	403,210	408,321	391,178	389,179	-0,5	2,6
The Share of the Aegean in Export (%)	10,5	10,7	11,1	10,9	11,2	2,7	1,5
The Share of the Aegean in Imports (%)	7,2	7,1	7	6,3	6	-4,8	-4,4
Total Share of the Aegean (%)	17,8	17,8	18,1	17,2	17,2	0	-0,8

85 This increasing trend is directly related to the SOCAR Terminal commissioned in Aliağa.

86 Data courtesy of the Ministry of Trade

As for metric tonnage, 34 percent of the import cargo handled at the Port of İzmir in 2020 consisted of containers, and 28 percent consisted of grains (dry

bulk cargo). The remaining 38 percent consisted of dry bulk, general cargo and small amount of liquid bulk cargoes (oils, etc.) (Table 64).

TABLE 64. Top Handled Cargo Types at the Port of İzmir (Import, Metric Tons)

İzmir and Aliağa Port Authority – Product Groups – Import (metric tons)		2016	2017	2018	2019	2020	Improvement
1	Various goods and containers	2,392,224	2,306,268	1,992,183	1,597,872	1,377,505	-12.9%
2	Grains	410,765	892,033	711,851	1,234,988	1,132,964	28.9%
3	Animal feed and food residues	458,547	643,224	533,811	587,224	674,346	10.1%
4	Oilseeds, oily fruits and oils	232,173	262,339	215,608	266,274	296,318	6.3%
5	Pulp and waste paper	171,392	176,983	167,997	183,109	204,119	4.5%
6	Sugar	43,240	60,406	58,085	49,902	96,596	22.3%
7	Other non-perishable food	7,882	8,299	51,557	40,575	54,717	62.3%
8	Sand, gravel, clay and slag	74,672	84,960	78,305	59,831	35,565	-16.9%
9	Iron and steel bars, angles, wire rods and tramway construction materials	55,374	0	62,136	30,782	29,299	-14.7%
11	Glass, glassware and ceramic products	66,460	45,933	9,386	16,445	25,620	-21.2%
12	Soils and minerals from other stones	12,111	10,832	5,020	0	25,313	20.2%
13	Chemical fertilizers	0	0	9,491	30,925	21,350	N/A
14	Other machinery and equipment	85,781	61,012	62,027	17,757	11,027	-40.1%
15	Basic chemicals	16,028	13,652	13,990	15,135	9,583	-12.1%
16	Other manufactured building materials	0	0	0	0	5,028	N/A
17	Other transported goods	11,220	9,170	12,343	5,422	4,736	-19.4%
18	Tubes, pipes and cast and wrought iron and steel	0	0	240	0	4,412	N/A
19	Perishable foods	0	0	0	0	999	N/A
Total			4,709,120	4,064,832	4,166,864	4,035,172	-1.1%

On the other hand, evaluation of the product groups imported at the ports of Aliğa shows that crude oil is the most imported commodity at 15 million metric tons with a significant rate of 39 percent. Crude oil is followed by scraps at 5.8 million metric tons with a share of 15 percent, and liquefied gases such as LPG and LNG at 5.4 million metric tons with a share of 14

percent. While these three products transported in bulk account for 67 percent of the import operations at the ports of Aliğa, this rate rises to 87 percent with all the bulk cargoes in the top 10. The share of containers in import operations at the ports of Aliğa is at 2.8 million metric tons with 7 percent (Table 65).

TABLE 65. Top Handled Cargo Types at the Ports of Aliğa (Import, Metric Tons)

İzmir and Aliğa Port Authorities – Product Groups – Import (metric tons)		2016	2017	2018	2019	2020	Improvement
1	Crude oil	11,051,446	10,793,445	9,576,058	16,953,889	15,104,759	8.1%
2	Iron and steel waste and blast furnace flue dust	4,668,429	5,325,820	4,847,539	5,649,012	5,781,461	5.5%
3	Gaseous hydrocarbons, liquid or compressed	2,380,671	5,236,838	4,761,918	3,964,834	5,383,769	22.6%
4	Various goods and containers	1,762,241	1,995,655	2,291,692	2,434,280	2,867,175	12.9%
5	Hard coal	2,534,278	2,413,477	1,820,069	1,892,651	2,442,489	-0.9%
6	Oilseeds, oily fruits and oils	838,848	1,077,674	1,215,979	1,212,843	1,333,392	12.3%
7	Semi-finished rolled steel products	1,664,374	1,457,896	1,726,365	809,585	1,220,327	-7.5%
8	Fuel derivatives	3,228,309	3,925,882	3,685,594	1,354,146	995,516	-25.5%
9	Animal feed and food residues	1,060,565	1,181,143	710,782	810,544	811,385	-6.5%
10	Other chemical products	71,665	94,467	174,176	132,332	717,645	77.9%
11	Grains	432,617	684,890	690,765	635,710	713,698	13.3%
12	Chemical fertilizers	655,001	596,594	586,033	785,027	503,971	-6.3%
13	Iron and steel bars, angles, wire rods and tramway construction materials	345,554	428,789	258,821	229,380	284,787	-4.7%

İzmir and Aliğa Port Authorities – Product Groups – Import (metric tons)		2016	2017	2018	2019	2020	Improvement
14	Non-fuel derivatives	359,957	361,112	518,783	202,659	249,680	-8.7%
15	Essential chemicals	323,239	273,961	220,083	193,922	187,753	-12.7%
16	Coke	499,605	304,199	320,424	168,117	139,509	-27.3%
17	Pig iron, crude steel, ferro metal alloys	147,389	162,582	117,078	77,639	88,312	-12.0%
18	Non-ferrous metals	123,993	134,476	98,839	40,316	56,235	-17.9%
19	Non-ferrous ores and waste	9,439	14,780	19,367	46,688	44,674	47.5%
20	Sand, gravel, clay and slag	54,216	47,448	29,517	23,964	22,340	-19.9%
21	Natural fertilizers	3,000	4,200	0	9,461	22,000	64.6%
22	Other non-perishable foodstuffs and hops	9,082	2,805	65,770	32,541	16,780	16.6%
23	Trees and mushrooms	2,796	3,905	0	0	16,502	55.9%
24	Manufactured materials	176,101	10,028	38,553	34,799	9,775	-51.5%
25	Pulp and waste paper	10,073	23,237	9,146	2,192	9,465	-1.5%
26	Other transported goods	94,500	69,031	20,876	2,076	4,818	-52.5%
27	Other machinery and equipment, engines and parts	41,859	14,777	10,574	19,431	3,263	-47.2%
28	Tubes, pipes and cast and wrought iron and steel	9,277	10,851	1,757	2,002	875	-44.6%
29	Other manufactured materials	10,830	45,550	8,767	4,290	3	-87.1%
Total		32,603,211	36,778,033	33,828,478	37,781,433	39,032,358	4.6%

Cargoes handled in both ports are assessed collectively and the top-20 import products in terms of metric tonnage are provided in Table 66. Evaluation of the cargoes in the table shows that 54 percent of the first 20 cargo groups, which account for 99 percent of the import operations in the ports of İzmir, consist of liquid bulk cargoes such as crude oil, oils

and chemicals. The port administration system and current capacity indicate no future bottlenecks in this cargo type in the medium term. However, creating new capacities will also introduce new requirements at the port. The strategic importance of container cargo and the urgency of further development were mentioned in the previous chapter.

TABLE 66. Top Handled Cargo Types at the Ports of İzmir and Aliğa (Import, Metric Tons)

İzmir and Aliğa Port Authorities – Product Groups – Import (Metric Ton)		2016	2017	2018	2019	2020	Improvement
1	Crude oil	11,051,446	10,793,445	9,576,058	16,953,889	15,104,759	8.1%
2	Iron and steel waste and blast furnace flue dust	4,668,429	5,325,820	4,847,539	5,649,012	5,781,461	5.5%
3	Gaseous hydrocarbons, liquid or compressed	2,380,671	5,236,838	4,761,918	3,964,834	5,383,769	22.6%
4	Various goods and containers	4,154,465	4,301,923	4,283,875	4,032,152	4,244,680	0.5%
5	Hard coal	2,534,278	2,413,477	1,820,069	1,892,651	2,442,489	-0.9%
6	Grains	843,382	1,576,923	1,402,616	1,870,698	1,846,662	21.6%
7	Oilseeds, oily fruits and oils	1,071,021	1,340,013	1,431,587	1,479,117	1,629,710	11.1%
8	Animal feed and food residues	1,519,112	1,824,367	1,244,593	1,397,768	1,485,731	-0.6%
9	Semi-finished rolled steel products	1,664,608	1,504,841	1,727,368	809,585	1,220,327	-7.5%
10	Fuel derivatives	3,228,309	3,925,882	3,685,594	1,354,146	995,516	-25.5%
11	Other chemical products	74,441	94,467	174,927	132,332	717,645	76.2%
12	Chemical fertilizers	655,001	596,594	595,524	815,952	525,321	-5.4%

İzmir and Aliğa Port Authorities – Product Groups – Import (Metric Ton)		2016	2017	2018	2019	2020	Improvement
13	Iron and steel bars, angles, wire rods and tramway construction materials	400,928	428,789	320,957	260,162	314,086	-5.9%
14	Non-fuel derivatives	359,957	361,112	518,783	202,659	249,680	-8.7%
15	Pulp and waste paper	181,465	200,220	177,143	185,301	213,584	4.2%
16	Essential chemicals	339,267	287,613	234,073	209,057	197,336	-12.7%
17	Coke	499,605	304,199	320,424	168,117	139,509	-27.3%
18	Sugar	49,200	60,406	58,085	60,672	96,596	18.4%
19	Pig iron, crude steel, ferro metal alloys	147,389	165,933	117,078	77,639	88,312	-12.0%
20	Other non-perishable foodstuffs and hops	16,964	11,104	117,327	73,116	71,497	43.3%
Total Sum of Top 20 Countries		35,839,938	40,753,966	37,415,538	41,588,859	42,748,670	4.5%
Total Sum		36,815,460	41,487,153	37,893,310	41,948,297	43,067,530	4.0%
The Share of Top 20 Countries		97.4%	98.2%	98.7%	99.1%	99.3%	0.5%

Meanwhile, the evaluation of other cargoes with significant shares in imports in the ports of the Aegean reveals that dry bulk cargoes such as scraps, hard coal, grains, animal feeds and fertilizers have a share of 31.7 percent and a volume of 13.2 million metric tons. The previous chapters of the report indicated that the dry bulk and general cargo capacity was 26.8 million. Subsequently, no bottlenecks are estimated for dry bulk cargo in the medium or long term

On another note, the share of general cargo, excluding the containers, dropped below 5 percent. No bottlenecks are envisioned for general cargo in the medium or long term as the existing ports have sufficient capacity to address this volume. The main strategic cargo to develop and to continuously upgrade at the ports of İzmir is containers.

CHAPTER 4.

Suggestions for the Improvement of the Maritime Transport and Ports of İzmir

One of the most ancient settlements in Anatolia, İzmir's character as a port city dates back over 5000 years. This might explain why İzmir is the only surviving port city despite being surrounded by notable ancient cities including the UNESCO World Heritage Sites Ephesus, Bergama, Teos, Miletus and Aspendos. The thousands of years' worth of marine culture and knowledge gains İzmir a substantial advantage in the new port projects.

Geographic location has always benefited major ports. Historically significant ports were all located on critical trade paths. While each experienced a downfall or stagnation period, they all utilized their geographic location to revive their significance in time.

In this chapter, we will provide suggestions to improve the ports of İzmir in light of the information provided so far. Within this scope, we will first summarize the work in İzmir, then analyze the two projects, Expansion Project for the Port of İzmir and the North Aegean (Çandarlı) Port Project, that are of substantial significance for the Aegean Region. We will then assess the region's share in the Mediterranean and Black Sea transport, with a particular interest in transit cargo potential. Finally, given the purpose of the report, we will provide suggestions to improve the ports in İzmir in the light of all information provided.

4.1. Previous Studies on the Ports of Aegean

Private sector port investments towards third parties in Türkiye began in the 1980s. That is why the TCDD Port of İzmir was the single and largest port in the Aegean for a long while. It was also the only container port in the area until 2009. Since then, private sector port authorities developed significantly with the commissioning of the Nemport and Ege Fertilizer ports in the Aliağa region, followed by the SOCAR Terminal, initially established by Petkim. As these privately owned ports are recent, long-term development plans, master plans and other research by or on behalf of the relevant ministries only included the TCDD Port of İzmir and the Port of Çandarlı within the scope of container ports.

Completing the second part construction of the TCDD Port of İzmir and completing and commissioning the North Aegean Port as included in development plans and specialized commission reports dating different years are underlined as state policies. For instance, the Eighth Development Plan envisions the Dredging and Expansion of the Port of İzmir as well as the survey of the North Aegean Port within a 10-year period (1990–1999).

The first comprehensive study focusing on the Port of İzmir was conducted by OECF, a Japanese state organization, in 1998. The report, titled “Special Assistance for Project Formation (SAPROF) for İzmir Port Development Project in Republic of Türkiye Final Report” analyzes the TCDD Port of İzmir in detail, identifies the water depth at the approaching channels to be the most important limitation, and explains in detail the need for an approaching channel. The report suggested the expansion of the port to meet the increasing cargo volume based on a 2030 cargo demand estimation. With that in mind, four unique alternatives were reviewed. The option to extend the TMO dock by filling the area up until the breakwater of the Manda stream to establish a terminal site was considered the most feasible. The report suggests dredging the 150-meter wide and -12 meter deep

approaching channel to extend it up to 250-meter width and -14 meter depth. The study also included feasibility reports on dredging and the new container terminal. Financial feasibility, on the other hand, was demonstrated through the conducting of a thorough financial analysis. The economic analysis also evaluated the impact of dredging and expanding the Port of İzmir on regional economy and concluded a high socio-economic value on the regional economy.

The study by “The Overseas Coastal Area Development Institute of Japan” (2000) financed by the Japanese state organization JICA and covering all ports in Türkiye, affirmed that the Port of İzmir was to be completed within two years and that a North Aegean Port of 1 million TEU capacity was initially needed. The report also included that the Port of İzmir was located at an advantageous position for transshipment to Black Sea.

The Main Transport Strategy Report (2004) was commissioned by the former Republic of Türkiye Ministry of Transport to the Istanbul Technical University. The report emphasized that the North Aegean container ports would be improved as “hub ports.”

The Maritime Transport Specialization Commission Report of the Ninth Development Plan (2007–2013) asserts that the master plans formulated since 1985 had suggested initiating the construction of the second part of the container terminal at the TCDD Port of İzmir and that the “Port of İzmir Expansion Project” was drafted to improve the port into a transshipment port in the international competition.

The challenges as well as the recently conducted or scheduled improvements at the Port of İzmir were included in the thorough report by the Specialization Commission. The report also includes that EU sources will be sought to realize the 1-million TEU-capacity North Aegean (Çandarlı) project, for which the medium-term feasibility and the EIA have already been completed. The North Aegean Port is considered as

ideally located as a transshipment port and that the second stage will boost the envisioned capacity to 2 million TEUs.

The 2010 “Transportation Shore Facilities Master Plan” by the former Ministry of Transportation, the General Directorate of Railways, Harbors and Airports Construction also includes comprehensive analysis and evaluation of the ports of Türkiye. The master plan calls for the completion of the works on the Port of İzmir that are soon to augment the container capacity to 2 million TEUs and for commissioning by 2020 the first stage of the North Aegean Port that will accommodate transshipment cargo. The Master Plan also stipulates, in an effort to realize the fundamental policies included in the Seventh Five-Year Development Plan, the expansion of the approaching channel at the Port of İzmir and the construction of the North Aegean Port.

The benefits of the North Aegean Port were listed as below in the master plan.

National Benefits:

- ▶ The North Aegean Port Project will accommodate Western Anatolia, which has a dynamic industrial and agricultural hinterland;
- ▶ It will enable transshipment between the Aegean and the Black Sea, thus reducing the number of ships passing through Istanbul;
- ▶ It will benefit the country economically and strategically as a hub port.
- ▶ International Benefits:
- ▶ The Port of Çandarlı will be linked to an international intermodal transport system and the railway connection will present a pathway not only to the Black Sea but also to the Caucasian region as well as the landlocked Asian countries and the Commonwealth of Independent States.
- ▶ The master plan stipulates that, should the modern port facilities in İskenderun, Mersin, North Aegean and Filyos be completed within the schedule, Türkiye will become a critical actor in the container traffic.

The Technical consultancy for the Port of Çandarlı by the Altınok – Areas – CSM consortium was completed in 2010. The study harmonized with the European Union standards the engineering, feasibility and Environmental Impact Assessment conclusions of the North Aegean port, developed to meet the increasing cargo load in the Aegean Region and to accommodate the transshipment cargo in the region.

The project study advises the construction of an approximate 1-million-square-meter port site, an 800,000-square-meter logistics area and a 2,000-meter dock in the port. Demand forecasting as part of the study estimated the port’s annual capacity is 4 million TEUs. The report scheduled the port to be commissioned by late 2014.

The last two analysis studies on the TCDD Port of İzmir (TCDD Port of İzmir Management Plan⁸⁷ and the Feasibility Report on the Approaching Channel Dredging and the Second Part of the Container Terminal for the TCDD Port of İzmir⁸⁸) were conducted by the General Directorate of Turkish State Railways in 2011.

The TCDD Port of İzmir Management Plan analyzed the current situation of the port, analyzed all cargo types, including liquid bulk, and assessed the potential increase in ships and cargo in case the approaching channel is dredged. The same study calculated port capacity individually for each cargo type. The capacity analysis by the TCDD standards (with the existing five-wheeled cranes and two mobile cranes) concluded, for the annually accommodated 1,968 ships, the number of containers as 731,025 boxes (1,030,745 TEUs), and the dry bulk-handling capacity as 2,482,414 metric tons/year. The TCDD Port of İzmir Management Plan closely examines the demand and supply balance in the region. As the SOCAR Terminal was not even at the planning stage by the time this report was prepared, it only included the then-existing ports (Ege Fertilizer, Nemport, etc.) and the North Aegean Port, which, at the time, was at the planning stage. The study notes that a new port would be necessitated

87 Oral, E. Z., (2011), “TCDD İzmir Limanı İşletme Planının Hazırlanması Danışmanlık Raporu”, 296 Sf., İzmir.

88 Oral, E. Z., (2011), “TCDD İzmir Limanı Yaklaşım Kanalı Taraması ve II. Kısım Konteynir Terminali Fizibilite Raporu”, 378 Sf., İzmir.

after 2015. It therefore underlines that the first stage of the North Aegean Port should be commissioned by 2015. As for general cargo, an insufficient capacity has been estimated as of 2020.

The Management Plan advises taking the actions below to increase capacity at the TCDD Port of İzmir:

- ▶ Completing the Second Part of the Filling Works and Commissioning the New Dock for the TCDD Port of İzmir
- ▶ Dock Arrangements (Moving Docks No. 10–16 towards the Sea)
- ▶ Extending the Ro-Ro dock until the TMO dock and thus expanding the hinterland
- ▶ Completing the Second Part of the TCDD Port of İzmir Expansion Project
- ▶ Increasing the water depth
- ▶ Building a multiple-story parking lot (to accommodate wheeled cargo)
- ▶ Assigning a new gate once the new container terminal is completed
- ▶ Constructing an administrative building for the new terminal site
- ▶ Constructing a social facility for the new terminal site
- ▶ Completing the construction of the CFS and container washing units.

The report also includes the additional equipment and personnel requirements by 2035, and evaluates all infrastructure, superstructure and equipment investments in the short, medium and long term. The management plan focuses on the services, operational processes and marketing strategies, and formulates the preliminary projects for the infrastructure investments and business processes.

The Feasibility Report on the Approaching Channel Dredging and the Second Part of the Container Terminal for the TCDD Port of İzmir, which includes financial and economic analysis on the infrastructure, superstructure and equipment investment within the TCDD Port of İzmir Management Plan, was prepared in compliance with the format endorsed by the former Ministry of Transport and approved by all relevant institutions. The feasibility study concluded that the port investments were financially and economically feasible at the time of the report.

However, the delay in the commissioning of the North Aegean Port failed the transshipment cargo goals. All current studies advised completing the dredging and expansion of the TCDD Port of İzmir within a short term to accommodate local cargo in particular, and commissioning the North Aegean Port within the medium term to accommodate transshipment cargo. Based on these studies, it is clear that both projects should have been completed by now.

4.2. Evaluation of the Ports of İzmir in Terms of Mediterranean Cargo Traffic

The general cargo and dry bulk cargo consist almost entirely of local cargo. The coal cargo bound for the East Anatolian Region is handled at the ports situated at İskenderun Bay. Fertilizer and steel & iron cargo are handled at the regional ports including Erdemir, Isdemir, Ege Fertilizer and Toros, surrounding the plants processing these products. Therefore, competition and cargo traffic in the Mediterranean predominantly refers to container cargo. This chapter evaluates container cargo in the region in terms of local and transit container potentials.

İzmir is the westernmost port on the Asian continent. As the investors shifted their focus towards the Marmara Region, new ports were commissioned in the area. As the cargo intensified in a certain region, the number and rounds of container lines increased accordingly. The Istanbul–Ankara railway is shorter and more efficient than the Ankara–Istanbul highway or the İzmir–Ankara railway, and so the Central Anatolian cargo shifted towards the Marmara Region. Eventually, the Central Anatolian cargo, which had long been in the hinterland of the Port of İzmir, began to opt for the Marmara Region. Redirecting the cargo to the ports of İzmir will only be possible with the completion of the İzmir–Ankara highway and the renovation of the İzmir–Ankara railway. In that case,

the cargo will bypass the Çanakkale Strait and connect directly with the ports of the world through İzmir.

Today, transfer container lines prefer layovers in ports of busy local cargo in addition to as little diversion as possible from the main route. That is why the ports in the Marmara Region (particularly the ports in Ambarlı) accommodate transshipment cargo traffic despite being a relatively far distance from the main routes. The transshipment cargo projected for the ports of North Aegean (Çandarlı) and İzmir are currently handled at the ports of the Marmara Region. However, the ports of İzmir (TCDD İzmir and Aliağa ports) are more convenient for transshipment container cargo due to their geographic location.

They are located on the Mediterranean, Asian and European main maritime trade routes. Ships coming through the Suez Canal drop off their cargo in one or more ports in the Mediterranean and the Black Sea before moving on to Europe (Rotterdam, Hamburg, etc.). Again in their return routes, they layover at a few ports in the Mediterranean to load cargo that is destined for Far-East Asia and then continue to the Chinese, Japanese and Korean ports. The Aegean Region is, geographically speaking, located in the middle of the Eastern Mediterranean.

TABLE 67. Distances to Ports in the Black Sea (NM)

Ports	Aliağa	İzmir	Piraeus
Batumi (Crimea)	854	879	954
Costanza (Romania)	454	479	554
Odessa (Ukraine)	599	624	699
Novorossiysk (Russia)	725	750	825
Total	2,632	2,732	3,032

TABLE 68. Distances to Ports in the Mediterranean (NM)

Ports	Aliğa	İzmir	Piraeus
Haifa (Israel)	659	672	670
Alexandria (Egypt)	515	528	502
Beirut (Lebanon)	660	673	681
Mersin (Türkiye)	554	565	648
Total	2,388	2,438	2,501

The Aegean Region, where the ports of İzmir are located, is the most suitable transfer port for cargo headed towards the Black Sea. It rivals the Port of Piraeus in terms of geographic advantages. Concerning the

nautical mile of select ports from the feeder lines, the connection and distribution distances between the feeder lines are negligible for the Far-East Line, which crosses over 10,000 nautical miles (Table 67 and 68).

TABLE 69. Distances to Main Ports (NM)

Ports	Aliğa	İzmir	Piraeus
İzmir (Türkiye)	45	–	190
Aliğa (Türkiye)	–	45	208
Piraeus (Greece)	190	208	–
Gioia Tauro (Italy)	630	645	485
Port Said (Egypt)	640	653	602
Total	1,505	1,551	1,485

TABLE 70. Total Distances to Ports (NM)

Ports	Aliğa	İzmir	Piraeus
Black Sea	2,632	2,732	3,032
Mediterranean	2,388	2,438	2,501
Main	1,505	1,551	1,485
Total	6,525	6,721	7,018

On a different note, the Ports of İzmir and Aliğa are more advantageous than the Port of Piraeus in terms of feeder line nautical miles, and therefore in distribution time and transport costs. The main advantage of the Port of Piraeus, however, is that is located on mainland Europe. Ports of İzmir have similar

advantages to the Port of Piraeus when it comes to transshipment cargo that will continue through maritime routes. The ports in the Aegean will gain significant importance once the Çanakkale Bridge and the connection roads are completed (Table 69 and 70).

4.3. Analyses on the Development of the Ports of İzmir

Under normal conditions, the sustainable development of ports requires the actions below:

- ▶ Optimal management of resources,
- ▶ Sustainable capacity to meet the regional needs,
- ▶ Supporting the supply chain sustainability outside of the port ecosystem (Supply chain resilience),
- ▶ Contributing to the environmental and social awareness in and out of the port,
- ▶ Creating value to all port shareholders.

This report covers increasing the sustainable capacity and supply chain resilience to meet regional requirements as part of the development goals for the ports.

Two aspects stand out given a port's contributions in the regional economy. First, maritime transport is a significant alternative in long-distance transportation (Distance economy). In fact, maritime transport is often the only alternative in heavy metric tonnage trade with the Americas, Africa, India or China. And secondly, millions of metric tons of coal, grains, iron-steel or any other material cannot be traded between countries, let alone continents at bulks at a time if not for maritime transport (Economies of scale).

Heavy or large-scale cargo is critical for ports. This is because these are the real parameters that limit a port's capacity. In textile, for instance, tens of thousands of shirts can be stacked into a container. In a similar vein, a container can carry thousands of mobile phones at a time. Large-scale cargoes such as iron-steel, marble, or automobiles, however, are critical in terms of metric tonnage and size. Other large-scale cargo, such as dry bulk including grains and fertilizers, and liquid bulk including petroleum or chemicals, comprise the main cargo type at ports.

The analyses on the development of the ports of İzmir highlight the two main components:

- ▶ the development area should contribute to regional employment. The employment capacity of

each sector varies and, while higher qualified employment brings added value, it remains limited in its contribution to overall regional employment. In that respect, the employment capacity of ports should also be considered.

- ▶ The second aspect is the growth strategy's potential in contributing in the development of foreign trade and various other sectors.

It is evident that increasing the container-handling capacity of existing ports will correspond to the cargo development in the medium term. As for the long term, the Port of Çandarlı and its hinterland present a significant opportunity for the regional development areas. Further strengthening the role of Çandarlı as a main hub port will improve the project's image. Another critical point is the coherence of sectors that will serve as development areas.

In that vein, based on both national urgencies and the foreign trade potential as well as the current port projects in the region, two sectors stand out as compatible development areas in a port setting. Energy and chemical industries are two compatible sectors of high employment and added value potential and could prove beneficial if cultivated together. Further deductions and estimations concerning both sectors are provided below to further explore this advisement.

▶ Chemical Industry

The chemical industry in Türkiye approaches \$60 billion in foreign trade volume. The industry achieves over \$40 billion in imports and over \$16 billion in exports. The chemical industry provides final products in a range of fields from plastics to cosmetics, medicine and paint, and provides intermediate goods and raw materials to many other sectors. It is, therefore, a key actor in the economy. The chemical industry is a vital field that improves our standard of living, secures protection and cure against illnesses, boosts cleaning and hygiene, and corresponds to the

fundamental needs of clothing and nourishment.⁸⁹

The chemical industry accounts for the highest input in industrial activities, corresponding to 64.4 percent of total input, and is the main provider for many sectors including rubber and plastic, construction, paper, automotive, textile, metal production, health and social needs. It is, therefore, highly important to include the industry in the scenarios concerning the North Aegean (Çandarlı) Port and to consider allocating production and logistics areas that will contribute in the port development.

A production area within the port hinterland will encourage many sectors that use chemicals to settle in the area. Obtaining the necessary chemicals within the shortest distance, time and cost will provide a competitive advantage to companies that opt to settle in the Aegean Region.

The advanced transportation infrastructure of the Aegean leverages the region in the domestic and foreign trade of the chemical industry. While China stands out in the chemical industry, which entices global buyers, its geographic distance from the European continent renders it disadvantaged compared to Türkiye in chemical export. The chemical industry in Türkiye, on the other hand, primarily addresses the high domestic demand. Therefore, investments made towards an organized industrial zone and a logistics center specialized in chemicals and connected to the port in Çandarlı will create a new perspective for the Aegean Region.

The chemical industry is a sustainable field as it provides fundamental raw materials to numerous sectors. Any potential decreases in any sub-sector will not impact the industry. China, the United States of America and European countries comprise the

largest markets in foreign trade. Today, there are over a thousand chemical forms in use in the industry. An export-oriented approach will facilitate the manufacturing of imported chemicals to create the demanded forms and ensure they are channeled towards global markets. As liquid bulk cargo is carried and stored within closed systems, they have a low impact on the environment except when in adverse conditions such as a fire or an accident. It is possible to minimize environmental impacts by taking precautions against such problems.

► Energy Industry

Still limited in metric tonnage as it is still developing, the energy industry is the second most vital field that could benefit the ports of the İzmir region. New and renewable energy investments have significantly advanced over the last 20 years and reducing carbon emissions has become a priority in the development strategies of many countries.

The Law Amending the Law on the Utilization of Renewable Energy Sources for the Purpose of Generating Electrical Energy introduced a new subsidy mechanism for renewable energy in Türkiye. In 2017, the Renewable Energy Resource Areas (YEKA) was launched to promote electricity production on renewable sources.⁹⁰

Solar energy is considered the source of all other energy types in the world, and the other forms, all derived from solar energy, are called “transformed types of energy.” This is because all renewable energies and even fossil fuels are powered by the sun. The sources of energy can be combined under three main categories. The first are the fossil fuels that are created through the transformation of layers of plants and other beings in swamps below the ground.

89 Chemical Industry Working Group Report (2018), 11th Development Plan (2019–2023) Ministry of Development

90 Domestic Production in Energy Technologies Working Group Report (2018), 11th Development Plan (2019–2023) Ministry of Development

The second are the high-potential “new” energy sources in increasing demand based on technological advances. The third are the inexhaustible, non-decreasing “renewable” energy sources. Below are the new and renewable energy sources that are alternatives to the known sources:

- ▶ Hydroelectric energy,
- ▶ Solar energy,
- ▶ Wind energy,
- ▶ Geothermal energy,
- ▶ Wave energy,
- ▶ Tidal energy,
- ▶ Ocean thermal energy,
- ▶ Hydrogen energy, and biomass and biogas energies.⁹¹

Various expectations stemming from 2025 estimations are as below⁹²:

- ▶ Renewable energy to comprise approximately 95 percent of the total power capacity increases achieved by 2025.
- ▶ ▶ Total installed solar and wind power to exceed that of natural gas by 2023 and that of coal by 2024,
- ▶ Solar power to comprise 60 percent and wind power to comprise 30 percent of total renewable energy sources by 2025,
- ▶ Renewable energy sources to takeover coal by 2025 following a 50-year monopoly and to become the most efficient energy source,
- ▶ Renewable energy to account for one third of the global power demand and hydroelectric power to account for half of the renewable energy sources by 2025,
- ▶ Major petroleum and gas companies to increase their renewable energy investments by at least 10 times by 2025.

Of the three largest Asian economies, Japan and South Korea are committed to achieving the goal of zero emission by 2050 and China is expected to

follow suit by 2060. Other countries that account for 79 percent of global carbon emissions have all committed to zero emissions within the last year⁹³. Estimations for this new era, which were accelerated with the onset of COVID-19,

include prioritizing emission goals and energy transformation, green energy transition and increased renewable energy investments.

Evidently, the use of new and renewable energy sources are expected to soar significantly over the next 25 years. Investments in this area will guarantee a substantial growth in our foreign trade. The energy sector is employment heavy. It will provide employment at all levels. The EU countries' demand in the renewable energy market is constantly growing. Türkiye has the potential to become a major new and renewable energy supplier to these EU countries as it is in close geographic proximity and has an abundance of qualified workforce, advanced industries and sub-industries.

The hinterland of the North Aegean (Çandarlı) Port is a suitable area to develop the new and renewable energy sector. The ports in the Aliağa region, as well as the North Aegean Port that will be completed and commissioned, will provide the required infrastructure for this export heavy sector. Creating a wide range of production plants from wind turbines to solar panels will contribute to regional employment and ensure foreign exchange inflow to our economy. In light of the recent advances in the production plants in İzmir, it has been concluded that focusing in particular on the production of wind power equipment will achieve the target outcomes. The continuously magnifying equipment sizes and the vast development potential in the offshore and onshore facilities highlight the benefits of port specialization in wind power equipment.

91 Energy Policies, Domestic, New and Renewable Energy Sources Report (2006), UCTEA Chamber of Mechanical Engineers

92 Renewables 2020 Analysis and forecast to 2025, IEA (<https://www.iea.org/reports/renewables-2020>)

93 Renewables 2020 Analysis and forecast to 2025, IEA (<https://www.iea.org/reports/renewables-2020>)

4.4. The Proposed Port to Encourage the Suggested Development Sectors: The North Aegean Port in Çandarlı

Ports in the İzmir region already have sufficient infrastructure, superstructure and equipment for the export and import of new and renewable energy equipment. However, as the wind turbines continue to grow in size, these project cargoes will require dedicated road and port infrastructure to ensure safe transfer from manufacturing plants to ships. At this point, the Port of Çandarlı will present an efficient opportunity in proximity to manufacturing plants, port sizes and suitable hinterland area for new industrial and logistics development.

The North Aegean Port will go out on tender based on the build-operate-transfer model and, once completed, it will feature a 2,000-meter dock and a 1-million-square-meter hinterland area. The breakwater construction initiated in 2011 and was completed in 2014. The entire cost of 294 million Turkish lira of the 1,500-meter breakwater was undertaken by the state budget. Planned in two stages, the first stage of the North Aegean Port will comprise a 1,000-meter dock that will yield an annual capacity of 2 million TEUs/year. The dock will be extended to 2,000 meters by 2035 to increase the annual capacity to 4 million TEUs/year. The total investment amount of the project (per stage) is €917 million ⁹⁴.

If these two sectors are incorporated within the hinterland of the North Aegean Port, the currently container-based functions of the port will expand to include liquid bulk cargo and project loads. The North Aegean Port is designed to accommodate transfer container cargo, although it is also suitable for liquid bulk and project cargo. The existing port area is sufficient for container cargo while the hinterland is large enough for the suggested industries. Given the container cargo capacity in neighboring ports, adding liquid bulk and general cargo services to container cargo in the North Aegean Port will create an enabling environment for both the regional economy and port investors. Further assessment and review of this advice in future studies will contribute to the development of scenarios concerning the Port of Çandarlı.

The ports in the Aegean Region are located in the middle of the Aegean Sea, Black Sea and the Eastern Mediterranean. This location enables convenient access to all regional ports. It also is ideally located for transfer cargo traffic. Should the Aegean Region improve its infrastructure as a transfer port, it will already possess a competitive advantage to share the transfer cargo traffic that has shifted towards the Marmara Region.

94 Çandarlı Port CFCU, IPA Form (2009)



OVERALL ASSESSMENT AND CONCLUSION

The main purpose of this report is to provide a regional development analysis by examining the port-centric logistics structure as well as the export-oriented strategic cargo structure in the ports of the region. A current and potential status assessment has been conducted based on the examined components. Subsequently, advice was submitted concerning the supporting of regional trade potential through the ports of İzmir and on a structure to prevent potential bottlenecks.

If the current trade and economy mechanisms are maintained in the region, container cargo will be the strategic cargo to improve and sustain in the ports of İzmir. Evidently, the ports of İzmir must focus on container cargo to support regional exports as the manufacturing in the region revolves around container-loaded export products. The ports of İzmir are currently capable of responding to cargo development in the short and medium terms. The export cargo character of the region, on the other hand, is a particularly critical aspect in preventing potential bottlenecks in ports in terms of their container-handling capacity.

Previous fails in building that capacity resulted in significant losses (particularly in the Marmara Region). Despite these consequences, the efforts of private port authorities sustained the region's competitive advantage in trade development and grew it to the current levels. Current expansion plans of the private

container terminals will sufficiently correspond to the capacity requirements in the medium term. Investments in the TCDD Port of İzmir, on the other hand, will ensure long-term sustainability in the regional export.

Analysis concludes that the chemical and energy industries have development potential in the region. Incorporating this potential within the design of the North Aegean Port will introduce significant opportunities. The port-centric logistics structure of the North Aegean Port qualifies the area as both a container hub and an important part of the sectoral manufacturing and logistics.

The hinterland of the North Aegean Port offers a suitable area to chemical and renewable energy projects, which will, in turn, bolster the port's economic feasibility. The port will therefore attract local and foreign investors who are seeking to invest in these sectors.

Furthermore, if these manufacturing and logistics centers to be established in the hinterland of the North Aegean Port gain Free Zone status, it will establish a logistics chain that will reach across Türkiye and abroad. This project will attract local and foreign investors and has the potential to contribute to the regional economy and employment. Subsequently, a significant alternative will rival the supply chain far from the markets, such as the Far East, whose resilience was significantly tested during the pandemic.

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