AGENDA

1. Snapshot
2. Turkish Defense & Aerospace Industry
3. Turkish Civil Aviation
Turkish defense and aviation industry offers lucrative opportunities

SPENDING
$17.7 Billion
DEFENSE EXPENDITURES (2020)

TURNOVER
$8.9 Billion
DEFENSE & AEROSPACE INDUSTRY
TURNOVER (2020)

EXPORTS
$3.2 Billion
DEFENSE & AEROSPACE INDUSTRY
EXPORTS (2021)

Clusters
DEFENSE AND AEROSPACE

Strong Support
FOR JOINT VENTURES WITH
INTERNATIONAL COMPANIES

Aviation Hub
INCREASING CONNECTIVITY WITH MORE THAN
300 INTERNATIONAL DESTINATIONS (2021)

CIVIL AVIATION TURNOVER (2020)
$14.3 Billion
$27 BILLION IN 2019

610
AIRCRAFT AIRLINE FLEET
(2021)

AIR PASSENGERS (2021)
128.6 Million
$209 MILLION IN 2019
1. Snapshot

2. Turkish Defense & Aerospace Industry

3. Turkish Civil Aviation
Turkish defense industry has important advantages with a globally-competitive edge.

- Well-developed industrial and human resource ecosystem
- Globally-competitive national defense companies
- High number of strategic agreements with international partners, facilitating defense industry collaboration and trade
- Strong government support to joint ventures, international partnerships and defense cooperation
- Cost-competitive defense products vis-a-vis Western-manufactured equivalents, suitting budgets of the governments with financial constraints
- One of the largest defense budgets globally
Türkiye’s decisive policies have yielded significant results in transforming the defense industry.
Turkish defense industry has been undergoing a profound transformation from solely procurement to design and manufacture.
Türkiye has introduced industrial participation (IP) / offset (O) policies in order to facilitate long-term cooperation with international partners in the field of defense, aerospace and homeland security.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threshold to Require Offset</td>
<td>$5 Million</td>
</tr>
<tr>
<td>IP/O Commitment</td>
<td>At least 70% of the Contract Price</td>
</tr>
<tr>
<td>Subcontractor / SME Portion</td>
<td>30% of the Category-A IP&amp;O 15% of SME share</td>
</tr>
<tr>
<td>Crediting Basis</td>
<td>Domestic Net Added Value (DNAV)</td>
</tr>
<tr>
<td>Type of Agreement</td>
<td>Separate IP&amp;O Agreement with the Contractor</td>
</tr>
<tr>
<td>Bank Guarantee</td>
<td>6% of IP&amp;O Commitment</td>
</tr>
<tr>
<td>Period of Performance</td>
<td>Program Duration + 2 Years</td>
</tr>
<tr>
<td>Penalty</td>
<td>6% of Unfulfilled Commitment</td>
</tr>
<tr>
<td>Temporary Crediting</td>
<td>Allowed (Conditional)</td>
</tr>
<tr>
<td>Banking of Credits</td>
<td>Allowed (Valid for 5 Years)</td>
</tr>
<tr>
<td>Transfer of Excess Credits</td>
<td>Allowed (Causality)</td>
</tr>
</tbody>
</table>

**Category A**
- Direct Turkish Industrial Participation

**Category B**
- Export of products/services in the areas of defense, aerospace and homeland security

**Category C**
- Acquire technology / capability
- New investment and cooperation in the areas of defense, homeland security, space and aerospace.

**General Assessment Score (S) = 0.50 x (T) + 0.40 x (S) + 0.10 x (E)**

**IP / Offset Score (S) = 0.65 x (P_A) + 0.20 x (P_B) + 0.15 x (P_C)**

Source: SSB
Turkish defense expenditures have significantly increased over the past three decades.
Turkish defense & aviation industry turnover has tripled over the last decade

**TURKISH DEFENSE INDUSTRY TURNOVER ($ BILLION)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Turnover ($B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>3.1</td>
</tr>
<tr>
<td>2015</td>
<td>6.0</td>
</tr>
<tr>
<td>2016</td>
<td>6.0</td>
</tr>
<tr>
<td>2017</td>
<td>6.7</td>
</tr>
<tr>
<td>2018</td>
<td>8.8</td>
</tr>
<tr>
<td>2019</td>
<td>10.9</td>
</tr>
<tr>
<td>2020</td>
<td>8.9</td>
</tr>
</tbody>
</table>

**ORDERS ($ BILLION)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Orders ($B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>8.0</td>
</tr>
<tr>
<td>2014</td>
<td>11.0</td>
</tr>
<tr>
<td>2015</td>
<td>7.7</td>
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<td>11.9</td>
</tr>
<tr>
<td>2017</td>
<td>8.0</td>
</tr>
<tr>
<td>2018</td>
<td>12.2</td>
</tr>
<tr>
<td>2019</td>
<td>10.6</td>
</tr>
<tr>
<td>2020</td>
<td>6.2</td>
</tr>
</tbody>
</table>

**TURNOVER BY CATEGORIES (2020)**

- **Air Platforms** 22%: $1.98B
- **Land Platforms** 29%: $2.57B
- **Products for Civil Aviation** 15%: $0.86B
- **WAM** 10%: $0.86B
- **Naval Platforms** 8%: $0.67B
- **MRO** 7%: $0.64B
- **Other** 5%: $0.48B
- **Security** 4%: $0.33B
- **Security & Armament** 9%: $0.43B
- **Other** 5%: $0.33B

* Weapons, Ammunition & Missiles
** Maintenance, Repair & Overhaul
Orders over years and the impact of the pandemic

**TOTAL ORDERS**

$6.2 BILLION

**2020**

**ORDERS**

($ BILLION)

<table>
<thead>
<tr>
<th>Year</th>
<th>Domestic</th>
<th>Overseas</th>
<th>Linear (Domestic)</th>
<th>Linear (Overseas)</th>
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<td>1,6</td>
<td>8,0</td>
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</tr>
<tr>
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<td>4,3</td>
<td>0,8</td>
<td>3,7</td>
<td>2,8</td>
</tr>
<tr>
<td>2015</td>
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<td>-</td>
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<td>2017</td>
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<tr>
<td>2018</td>
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<td>2019</td>
<td>1,6</td>
<td>2,8</td>
<td>0,8</td>
<td>-</td>
</tr>
<tr>
<td>2020</td>
<td>1,6</td>
<td>2,8</td>
<td>0,8</td>
<td>-</td>
</tr>
</tbody>
</table>

**ORDERS BREAKDOWN**

2020

- Civil Aviation 30%
- Air Platforms 25%
- Naval Platforms 3%
- WAM 12%
- Other 21%
- Other 8%
- EU 16%
- US 9%
- Land Platforms 18%
- MRO 4%
- Domestic 54%

Source: SASAD

* Weapons, Ammunition & Missiles
** Maintenance, Repair & Overhaul
Türkiye’s growing and diversifying exports have explored new opportunities in US, EU, Middle East, Africa, Central Asia, and South America.
Although Türkiye has considerably increased its domestic capacity in the defense and aviation industry, civil aerospace products still keep to occupy a significant place in imports.

**IMPORTS BREAKDOWN (2020)**

- US 45%
- EU 45%
- WAM* 12%
- Other 10%
- Other 8%

- **Civil Aviation** 30%
- **Air Platforms** 25%
- **Land Platforms** 18%
- **Naval Platforms** 3%

**TOTAL IMPORTS**

2020: $2.1 BILLION

2013: $1.3
2014: $1.4
2015: $1.1
2016: $1.3
2017: $1.5
2018: $2.4
2019: $3.1
2020: $2.2

Source: SASAD

* Weapons, Ammunition & Missiles
** Maintenance, Repair & Overhaul
Türkiye is located in close proximity of lucrative markets with a significant trade volume of defense and aerospace products.

Source: SIPRI, ITC
* A&S: Aircraft & Spacecraft
** A&A: Arms & Ammunition
TURKISH DEFENSE COMPANIES AMONG WORLD'S TOP 100

Source: DefenseNews, Annual rankings based on preceding years' financials.
**PARTNERSHIPS**

- **TEI, a joint venture of TAI, GE, Turkish Armed Forces Foundation (TAFF) and Turkish Aeronautical Association (TAA),** has been a key player in manufacturing, assembly and testing technology of aircraft engine parts and modules.

- **FNSS, a joint venture owned 51% by Nurol Holding and 49% by BAE Systems,** is a leading manufacturer and supplier of tracked and wheeled armored vehicles and weapon systems for the Turkish and Allied Armed Forces.

- **Kale Pratt & Whitney, a joint venture owned 51% by Kale Group and 49% by Pratt & Whitney,** use state-of-the-art technologies critical to the production of the F135 engine powering the F-35 Lightning II fighter aircraft.

- **BMC, which is a Turkish-Qatari partnership,** manufactures tactical armored vehicles for the defense industry, in addition to buses for public transportation, light and heavy weight trucks for transportation and logistics industry.

- **BAE Systems and TAI signed an agreement, worth £100m, to collaborate on the first development phase of an indigenous fifth-generation fighter jet for the Turkish Air Force – TF-X.**

- **Rolls-Royce and Kale Group, established a joint venture company owned 51% by Kale and 49% by Rolls-Royce 49%, to develop aircraft engines for Türkiye, initially targeting the TF-X National Fighter Jet Project.**
A400M is the first program that enabled TAI to gain capability and responsibility of a whole life cycled aerospace product starting from concept design studies to after sale logistics support activities.

TAI’s workshare in A400M Program includes design and manufacture of structural components as Forward Center Fuselage with Emergency Exit Door, Section 17 Upper Shell with Rear Hatch Door, Paratrooper Doors, Tailcone, Ailerons and Spoilers.

TAI has also manufacturing responsibility of all fuselage harnesses. TAI has first level design and procurement responsibility on lighting system (except cockpit) and water and waste system.

Source: TAI, Airbus Military
In addition to international partnerships, Turkish companies have developed strong domestic capabilities with cutting-edge technologies.

**ANKA**

ANKA, advanced MALE (Medium Altitude Long Endurance) class Unmanned Aerial System, performs day and night, all-weather reconnaissance, target detection/identification and intelligence missions with its EO/IR and SAR payloads, featuring autonomous flight capability including Automatic Take-off and Landing. ANKA incorporates a heavy-fuel engine and electro-expulsive Ice Protection System with an Advanced Ground Control Station and dual datalink allowing operational security and ease. The system is expandable with a Transportable Image Exploitation Station, Radio Relay, Remote Video Terminal and SATCOM.

**BAYRAKTAR TACTICAL UAS**

Bayraktar Tactical UAS is a MALE (Medium Altitude Long Endurance) class system developed for tactical reconnaissance and surveillance missions. Prototype Development Phase started within 2007 based on competition model. Bayraktar Tactical UAS with its critical all subsystems - including Flight Control, INS-GPS, Automatic Take Off-Landing systems developed in house demonstrated fully automatic taxi, take off, cruise, landing, parking phases - was selected as the winner of the program in 2009.

**Technical Specifications**
- Wing Span: 12 m
- Length: 6.5 m
- Powerplant: 100 HP
- Payload Capacity: >55 kg
- Endurance: >24 hours
- Service ceiling: 24,000 ft
- Data range: 150 km
- Cruise Speed: 70 knots

**Users**
- Türkiye
- Qatar
- Ukraine
- Azerbaijan
- Poland – NATO Member
- Morocco
- Kyrgyzstan
- 13 countries in total

**KARAYEL TACTICAL UAV**

KARAYEL Tactical UAV System is the first and only Tactical Unmanned Aerial Vehicle designed and produced according to NATO’s STANAG-4671 for reconnaissance and surveillance purposes. With its capable Payloads on board, KARAYEL can not only detect a target but also mark it with its laser designator. KARAYEL can take off, land and fly a designated mission fully autonomously without assistance from a pilot. Payload capacity and variations are available for both civil and military applications.

**Technical Specifications**
- Wing Span: 10.5 m
- Length: 6.5 m
- Powerplant: 97 HP
- Payload Capacity: 70 kg
- Endurance: 10 hours
- Service ceiling: 22,500 ft
- Data range: 150 km
- Cruise Speed: 60-80 knots

**Users**
- Türkiye
- S. Arabia

**Technical Specifications**
- Wing Span: 17.3m
- Length: 8 m
- Powerplant: 150 HP
- Payload Capacity: 200 kg
- Endurance: 24 hours
- Service ceiling: 30,000 ft
- Data range: 200 km
- Cruise Speed: 110 knots

**Users**
- Türkiye
- Tunisia
- Kazakhstan
**ANKA AKSUNGUR**

**HIGH PAYLOAD CAPACITY UAS**

AKSUNGUR is a Medium Altitude Long Endurance (MALE) class UAV System, capable to perform day and night Intelligence, Surveillance and Reconnaissance (ISR) and strike missions with EO/IR, SAR and SIGINT payloads, and a variety of air to ground weapons. ANKA-AKSUNGUR is powered by two PD-170 twin-turbocharged diesel engines enabling long endurance operations up to 40,000ft.

**Technical Specifications**
- Wing Span: 24.2 m
- Length: 12.5 m
- Powerplant: 2 x 170 HP Turbo Diesel
- Payload Capacity: 750+ kg
- Endurance: 50 hours
- Service ceiling: 40,000 ft
- Data range: 250+ km
- Cruise Speed: 135 knots

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**BAYRAKTAR AKINCI**

AKINCI is an Unmanned Air Vehicle System designed to meet rigorous operational requirements. It is capable of conducting operations that are performed with fighter jets and carries a variety of payloads for reconnaissance, survey, intelligence, electronic warfare, designation and attack missions, and can fly extended hours at high altitudes. Advanced autonomy reduces operator burden. With an infrastructure allowing for integration of all nationally-developed air-to-air and air-to-ground munitions, the system reduces operational necessities and costs relative to manned systems with comparable capability. A robust satellite data link enables performing missions in regions with no communication infrastructure, and advanced navigation systems enable the aircraft to fly within electronic warfare environments. Akinci has an augmented situational awareness and can sense the environment thanks to the Artificial Intelligence onboard.

**Technical Specifications**
- Wing Span: 20 m
- Length: 12.2 m
- Powerplant: 2 x 750 Hp or 2 x 450 Hp Turboprop
- Payload Capacity: 1.350Kg
- Endurance: 24 hours
- Service ceiling: 40,000 ft
- Data range: LÖS & BLOS
- Cruise Speed: 150 knots
In order to meet Turkish Air Force (TurAF) requirements beyond 2030s, Türkiye has introduced an indigenous design and development program (TF-X) to replace the aging F-16 fleet of TurAF.

**TF-X Program**

Within the scope of TF-X Program, Türkiye will become one of the few countries to possess the necessary technologies, engineering infrastructure and production capabilities, once the engineering activities on all the critical technologies are accomplished (e.g., increased situational awareness, sensor fusion, low observability, weapon bay,...etc), which are needed by a 5th generation (or beyond) jet fighter aircraft.

TF-X aircraft is planned to be kept operational in the TurAF inventory until 2070s and will be interoperable with other critical assets of TurAF such as F-35As.

The TF-X indigenous design and development program prime contract between the Presidency of Defense Industries (SSB) and Turkish Aerospace Industries Inc. (TAI) has been signed on 5th of August 2016.

The timing of this signature alone, is a key demonstrator of Türkiye's determination of running mega-projects uninterrupted, even under extraordinary conditions.

Currently, the prime contract covers the initial four (4) years (starting after signature of major subcontracts) which will end up with completion of preliminary design phase. Within this period beyond the design and development of TF-X Aircraft, engineering capabilities, technology development activities (for key sensors like radar, electronic warfare,...etc.), test infrastructures establishment and certification processes will be performed and extensive capabilities for a new generation jet fighter design, development and production will be gained by Turkish industry. TF-X aircraft will be a multi-role aircraft, it will be designed mainly for air-to-air role with a consideration to air-to-surface roles as well. Upon engineering analysis, TF-X aircraft will be a multi-role aircraft, it will be designed mainly for air-to-air role with a consideration to air-to-surface roles as well. Upon engineering analysis, preliminary calculations, based on received information of suppliers of candidate engines, TF-X aircraft is decided to be a twin engine configuration.

In this regard a Heads of Agreement (HoA) was signed between TAI and BAE Systems on 28th of January 2017, in the presence of the Prime Ministers of Türkiye and the United Kingdom. In addition, the Letter of Agreement (LOA) was signed during the IDEF 2017. The TAI-BAE Systems Collaboration Agreement was signed and entered in to effect on 25th of August 2017.

One of the key ambition and consideration of SSB and TurAF, which is shared by the Turkish industry as well, is the exportability of TF-X aircraft to key allies and friendly countries. In this regard, Türkiye also welcomes any opportunities for participation of interested countries in a win-win model.
Turkish defense industry has an attractive ecosystem supported by a qualified workforce, incentives and know-how

Source: SASAD, Higher Education Council, Ministry of Trade, Ministry of Science, Industry and Technology
Turkish defense and aerospace investments are eligible for a wide range of incentives offered by the government, lucrative incentives schemes boost project economics substantially

MANUFACTURING INVESTMENTS IN DEFENSE AND AEROSPACE RECEIVE INCREMENTAL BENEFITS
- Corporate Tax deductions (up to 100%)
- Tax credits (up to %90)
- Land Allocation
- Project Financing Support
- Social Security Premium Exemptions
- VAT and Customs Duty Exemptions
- Training support

INVESTMENTS IN DEFENSE AND AEROSPACE ARE PRIORITY AREAS WITH STRATEGIC FOCUS

RESEARCH, DEVELOPMENT, AND DESIGN ACTIVITIES ARE BACKED BY GENEROUS SUPPORT PROGRAMS
- 100% deductible R&D expenditures
- Corporate Tax exemptions
- Income Tax exemption for R&D personnel
- VAT exemptions on final products
- Dedicated Technology Development Zones
- Early stage financing for start-ups
- Export support

Grants, incentives, and supports are available at all stages of new product development life cycle

Lowering upfront costs, improving cash flow, and accelerating returns on investment

Industry Participation / Offset
- Product based supports/loans
- Industry development programs
- Exemptions for duties
Turkish defense industry has an attractive ecosystem supported by a qualified workforce, incentives and know-how

**EMPLOYMENT IN DEFENSE AND AEROSPACE INDUSTRY (2020)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Employment</th>
</tr>
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<tbody>
<tr>
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<tr>
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<td>31,242</td>
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<td>44,740</td>
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<tr>
<td>2018</td>
<td>67,239</td>
</tr>
<tr>
<td>2019</td>
<td>73,771</td>
</tr>
<tr>
<td>2020</td>
<td>77,566</td>
</tr>
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</table>

**AVAILABILITY OF SKILLED LABOR (2021)**

<table>
<thead>
<tr>
<th>Country</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turkey</td>
<td>6.13</td>
</tr>
<tr>
<td>Ukraine</td>
<td>5.87</td>
</tr>
<tr>
<td>Germany</td>
<td>5.06</td>
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<tr>
<td>Austria</td>
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</tr>
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<td>Brazil</td>
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<td>Romania</td>
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<tr>
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<td>Bulgaria</td>
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<tr>
<td>Croatia</td>
<td>3.67</td>
</tr>
<tr>
<td>Hungary</td>
<td>3.30</td>
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**QUALIFIED ENGINEERS (2001)**

<table>
<thead>
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<th>Country</th>
<th>Qualified Engineers</th>
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</thead>
<tbody>
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<td>4.99</td>
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<tr>
<td>Croatia</td>
<td>4.73</td>
</tr>
</tbody>
</table>

Source: SASAD, IMD, IMD World Competitiveness Executive Opinion Survey based on an index from 0 to 10
As the industry developed, important aerospace clusters have emerged across Türkiye.
Türkiye hosts important events with significant international participation:

1. **TEKNOFEST**
   - Aerospace and Technology Festival
   - Date: March 23-27, 2022

2. **SAHA EXPO**
   - Defence & Aerospace Exhibition
   - Date: 6-8 October 2022
   - Location: Ataturk Airport

3. **IDEF'21**
   - 15th International Defence Industry Fair
   - Date: August 17 - 20, 2021

4. **EURASIA AIRSHOW**
   - Date: March 23-27, 2022

5. **ISTANBUL AIRSHOW**
   - Date: 6-8 October 2022
   - Location: Ataturk Airport

6. **MILITARY RADAR + BORDER SECURITY TURKEY SUMMIT**
   - Date: 5-8 October 2021
   - Location: Ankara
PRESIDENCY OF DEFENSE INDUSTRIES (SSB)

SSB was established in 1985 with a mandate to develop policies establishing a modern defense industry infrastructure in Türkiye and has the authority and responsibility to implement these policies. As per its mandate, SSB carries out major systems procurement, industry policymaking, localization strategy, R&D and international industry relations. SSB is responsible for reorganizing and integrating the existing national industry in line with defense industry requirements; supporting new enterprises; exploring the opportunities with foreign investment and technology contributions; supporting enterprises to partner with foreign investors.

DEFENSE & AEROSPACE INDUSTRY MANUFACTURERS ASSOCIATION (SaSaD)

SaSaD was established in 1990 with a mission to contribute to the development, strengthening, and competitiveness of the Turkish defense and aerospace industry. As the representative of the Turkish defense and aerospace industry, both in Türkiye and international platforms, SaSaD aims to facilitate the business environment for the industry players in coordination with the procurement authorities and contractors. Having started the business with 12 founding members at the beginning, SaSaD currently has 113 full members and 75 special members in the communication network as of 2017.

DIRECTORATE GENERAL OF CIVIL AVIATION (DGCA)

DGCA is in charge of regulating the civil aviation industry in accordance with the national and international regulations and standards in order to ensure flight safety and security of the civil aviation. Its main duties, among others, are to issue relevant documentation and to register aircraft; to audit licenses of flight crew; to determine the licensing terms of personnel working in the civil aviation; to regulate the terms and conditions for the permissions to be granted to real or legal persons to perform air transportation activities in or out of Türkiye; to regulate and audit air navigation of commercial aircraft, as well as traffic communication services in Turkish airspace.

GENERAL DIRECTORATE OF STATE AIRPORTS AUTHORITY (DHMİ)

DHMİ is a state-owned enterprise in charge of the management of Turkish airports and controlling Turkish airspace. It main activities are; management of airports, ground services at airports and air traffic control services, establishment and operation of air navigation systems and facilities and other related facilities and systems, and to maintain them at the level of modern aeronautics.
1. Snapshot

2. Turkish Defense & Aerospace Industry

3. Turkish Civil Aviation
World passenger traffic collapses with unprecedented decline in history

-47 to -49% decline in world total passengers in 2021* vs. 2019

-60% decline in world total passengers in 2020

Source: ICAO Air Transport Reporting Form A and A-S plus ICAO estimates.
YEAR 2020 RESULTS AND 2021 OUTLOOK: WORLD TOTAL PASSENGER TRAFFIC

MONTHLY PASSENGER NUMBERS IN 2020-21 VS. 2019

Source: ICAO
THE COVID-19 IMPACT ON WORLD SCHEDULED PASSENGER TRAFFIC

FOR THE YEAR 2020 (ESTIMATED ACTUAL RESULTS), COMPARED TO 2019 LEVELS:
- Overall reduction of 50% of seats offered by airlines
- Overall reduction of -60% of passengers (2,699 million)
- Approx. USD 371 billion loss of gross passenger operating revenues of airlines

FOR THE YEAR 2021 (PRELIMINARY ESTIMATES), COMPARED TO 2019 LEVELS:
- Overall reduction of 39% to 40% of seats offered by airlines
- Overall reduction of -47% to -49% of passengers (2,108 to 2,196 million)
- Approx. USD 310 to 323 billion loss of gross passenger operating revenues of airlines

Source: ICAO
CIVIL AVIATION

YEAR 2020 RESULTS AND 2021 OUTLOOK: WORLD TOTAL PASSENGER TRAFFIC

INTERNATIONAL PASSENGER TRAFFIC

2020 VS 2019
• Overall reduction of 66% of seats offered by airlines
• Overall reduction of 1,376 million passengers (-74%)
• Approx. USD 250 billion loss of gross operating revenues of airlines

2021 VS 2019
• Overall reduction of 60% to 62% of seats offered by airlines
• Overall reduction of 1,309 to 1,356 million passengers (-71% to -73%)
• Approx. USD 245 to 253 billion loss of gross operating revenues of airlines

DOMESTIC PASSENGER TRAFFIC

2020 VS 2019
• Overall reduction of 38% of seats offered by airlines
• Overall reduction of 1,323 million passengers (-50%)
• Approx. USD 120 billion loss of gross operating revenues of airlines

2021 VS 2019
• Overall reduction of 23% to 25% of seats offered by airlines
• Overall reduction of 798 to 840 million passengers (-30% to -32%)
• Approx. USD 65 to 69 billion loss of gross operating revenues of airlines

Source: ICAO
THE YEAR FOR RECOVERY: 2021
EUROCONTROL NEWTORK FLIGHTS
SINCE 1ST JANUARY 2021

- After a continuous increase from mid-May to end-August, the traffic at network level has decreased slowly since early September (increased demand related to holidays).

- Since the beginning of the year 2022, the number of flights continued to decrease due to the tightened travel restrictions to fight the Omicron wave.

- The traffic at network level reached its maximum on Friday 27 August 2021 with 26,773 flights (-27.7% vs 2019).

Source: EUROCONTROL
SCENARIOS
EUROCONTROL TRAFFIC SCENARIOS:
PUBLISHED ON 15 OCT 2021 (BASE YEAR 2019)

As of January 2022, network traffic is at 69% compared to the same period in 2019.

The network traffic was in line with the most optimistic scenario between July and October 2021. But since October a shift from the best case scenario to the base one, and as of 2022 to low scenario is being observed.

With the vaccination process, the recovery period has probably started, which is in line with the best case scenario.

Source: EUROCONTROL Comprehensive Assessment, Sep 2021
RPKs recovered to 42% of 2019 levels in 2021
Air cargo remained strong (up 7% vs. 2019)

Source: IATA Monthly Statistics, 25 January 2022
### Number of Air Passengers in Türkiye

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Air Passengers</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>118,292,000</td>
</tr>
<tr>
<td>2012</td>
<td>131,029,516</td>
</tr>
<tr>
<td>2013</td>
<td>149,995,868</td>
</tr>
<tr>
<td>2014</td>
<td>166,181,339</td>
</tr>
<tr>
<td>2015</td>
<td>181,437,004</td>
</tr>
<tr>
<td>2016</td>
<td>174,153,146</td>
</tr>
<tr>
<td>2017</td>
<td>193,576,844</td>
</tr>
<tr>
<td>2018</td>
<td>210,947,639</td>
</tr>
<tr>
<td>2019</td>
<td>208,911,338</td>
</tr>
<tr>
<td>2020</td>
<td>81,703,685</td>
</tr>
<tr>
<td>2021</td>
<td>128,387,569</td>
</tr>
</tbody>
</table>

Source: DGCA
CİVİL HAVA TURLARI

SAYI CİVİL HAVA TURLARI İÇİN TÜRKİYE

DOMESTIC PASSENGERS
MİLLİON

9 9 14 21 29 32 36 41 51 58 65 76 85 97 102 110 100 50 69

CAGR 10.7 %

INTERNATIONAL PASSENGERS
MİLLİON

25 25 31 35 33 38 44 44 52 59 66 73 80 84 71 83 98 108 32 60

CAGR 4.5 %

Kaynak: DHMI, Airports Council International (ACI)
Türkiye's civil aviation has been rapidly growing.

### Sources:
- **AVCA**
- **DOCA**
- **Aviation industry, general aviation, business jets, aerial agriculture, balloon**
- **As of September 31**
10 airline companies are operating in Türkiye as of 2021

<table>
<thead>
<tr>
<th>Airline Companies</th>
<th>Passenger Aircraft</th>
<th>Seat Capacity</th>
<th>Cargo Aircraft</th>
<th>Freight Capacity</th>
<th>Total Aircraft</th>
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<tbody>
<tr>
<td>TURKISH AIRLINES</td>
<td>351</td>
<td>74.960</td>
<td>20</td>
<td>2.002.360 kg</td>
<td>371</td>
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<tr>
<td>PEGASUS AIRLINES</td>
<td>94</td>
<td>12.930</td>
<td>-</td>
<td>-</td>
<td>94</td>
</tr>
<tr>
<td>SunExpress</td>
<td>58</td>
<td>10.962</td>
<td>-</td>
<td>-</td>
<td>58</td>
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<tr>
<td>Onurair</td>
<td>33</td>
<td>7.778</td>
<td>-</td>
<td>-</td>
<td>33</td>
</tr>
<tr>
<td>MNG</td>
<td>-</td>
<td>-</td>
<td>6</td>
<td>318.000 kg</td>
<td>6</td>
</tr>
<tr>
<td>FREEBIRD</td>
<td>10</td>
<td>1776</td>
<td>-</td>
<td>-</td>
<td>10</td>
</tr>
<tr>
<td>ULS</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>121.575 kg</td>
<td>3</td>
</tr>
<tr>
<td>Corendon Airlines</td>
<td>27</td>
<td>5.103</td>
<td>-</td>
<td>-</td>
<td>27</td>
</tr>
<tr>
<td>AirACT</td>
<td>-</td>
<td>-</td>
<td>5</td>
<td>586,5 kg</td>
<td>5</td>
</tr>
<tr>
<td>Tailwind Airlines</td>
<td>5</td>
<td>840</td>
<td>-</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>572</strong></td>
<td><strong>114.349</strong></td>
<td><strong>38</strong></td>
<td><strong>2.442.521,5 kg</strong></td>
<td><strong>610</strong></td>
</tr>
</tbody>
</table>

Source: DGCA
Shares of International and Intra-Region passenger traffic decreased almost in all regions in 2020 vs 2019. Türkiye is in the heart of the three regions kept their international mobility quite high.

% SHARE OF INTERNATIONAL-DOMESTIC PASSENGER TRAFFIC BY REGION
2020 VS 2019, BASED ON FROM/TO STATE

Source: ICAO
Türkiye’s convenient location and its significant investments in airport infrastructure make it an outstanding international aviation hub.

<table>
<thead>
<tr>
<th>2003</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>50</strong></td>
<td><strong>120+</strong></td>
</tr>
<tr>
<td>COUNTRIES</td>
<td>COUNTRIES</td>
</tr>
<tr>
<td><strong>60</strong></td>
<td><strong>300+</strong></td>
</tr>
<tr>
<td>INTERNATIONAL DESTINATIONS</td>
<td>INTERNATIONAL DESTINATIONS</td>
</tr>
<tr>
<td><strong>2</strong></td>
<td><strong>10</strong></td>
</tr>
<tr>
<td>DOMESTIC HUBS</td>
<td>DOMESTIC HUBS</td>
</tr>
<tr>
<td><strong>26</strong></td>
<td><strong>57</strong></td>
</tr>
<tr>
<td>DOMESTIC DESTINATIONS</td>
<td>DOMESTIC DESTINATIONS</td>
</tr>
</tbody>
</table>

Source: DGCA
## THE BUSIEST AIRPORTS IN EUROPE

<table>
<thead>
<tr>
<th>Country</th>
<th>Code</th>
<th>Airport</th>
<th>2021</th>
<th>2020</th>
<th>2019</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Türkiye</td>
<td>IST</td>
<td>İSTANBUL AIRPORT</td>
<td>37.17</td>
<td>23.40</td>
<td>52.00</td>
<td>67.98*</td>
</tr>
<tr>
<td>Russia</td>
<td>SVO</td>
<td>SHEREMETYEVO INT. AIRPORT</td>
<td>30.94</td>
<td>19.56</td>
<td>49.43</td>
<td>45.34</td>
</tr>
<tr>
<td>France</td>
<td>CDG</td>
<td>CHARLES DE GAULLE</td>
<td>26.19</td>
<td>22.25</td>
<td>76.15</td>
<td>72.22</td>
</tr>
<tr>
<td>Netherlands</td>
<td>AMS</td>
<td>AMSTERDAM AIRPORT SCHIPOL</td>
<td>25.49</td>
<td>20.88</td>
<td>71.70</td>
<td>71.05</td>
</tr>
<tr>
<td>Russia</td>
<td>DME</td>
<td>MOSCOW DOMO DEDovo</td>
<td>25.06</td>
<td>16.38</td>
<td>28.25</td>
<td>29.40</td>
</tr>
<tr>
<td>Germany</td>
<td>FRA</td>
<td>FRANFURKT AM MEIN</td>
<td>24.81</td>
<td>18.76</td>
<td>70.55</td>
<td>69.51</td>
</tr>
<tr>
<td>Spain</td>
<td>MAD</td>
<td>A.S. MADRID-BARAJAS AIRPORTS</td>
<td>24.13</td>
<td>17.11</td>
<td>61.73</td>
<td>57.89</td>
</tr>
<tr>
<td>UK</td>
<td>LHR</td>
<td>HEATHROW AIRPORT</td>
<td>19.39</td>
<td>22.10</td>
<td>80.88</td>
<td>80.12</td>
</tr>
<tr>
<td>Spain</td>
<td>BCN</td>
<td>J.T. BARCELONA-EL PRAD AIRPORT</td>
<td>18.87</td>
<td>12.73</td>
<td>52.68</td>
<td>50.17</td>
</tr>
<tr>
<td>Russia</td>
<td>LED</td>
<td>PULKovo-AIRPORT</td>
<td>18.03</td>
<td>10.94</td>
<td>19.58</td>
<td>18.12</td>
</tr>
</tbody>
</table>

Source: DIHA (Türkiye Hava Yolları İstatistikleri)

## THE BUSIEST AIRPORTS IN TÜRKİYE

<table>
<thead>
<tr>
<th>Code</th>
<th>Airport</th>
<th>Domestic</th>
<th>International</th>
<th>Total (2021)</th>
<th>2020</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>IST</td>
<td>İSTANBUL</td>
<td>10,59</td>
<td>26,58</td>
<td>37,17</td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td>SAW</td>
<td>SABIHA GOKCEN</td>
<td>16,12</td>
<td>8,84</td>
<td>24,96</td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>AYT</td>
<td>ANTALYA</td>
<td>3,86</td>
<td>17,14</td>
<td>22,00</td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>ADB</td>
<td>İZMIR</td>
<td>5,86</td>
<td>1,80</td>
<td>7,66</td>
<td></td>
</tr>
<tr>
<td>5th</td>
<td>ESB</td>
<td>ANKARA</td>
<td>5,72</td>
<td>1,29</td>
<td>7,02</td>
<td></td>
</tr>
<tr>
<td>6th</td>
<td>ADA</td>
<td>ADANA</td>
<td>2,98</td>
<td>0,39</td>
<td>3,37</td>
<td></td>
</tr>
<tr>
<td>7th</td>
<td>BJV</td>
<td>MUĞLA MILAS</td>
<td>1,92</td>
<td>1,01</td>
<td>2,93</td>
<td></td>
</tr>
<tr>
<td>8th</td>
<td>TZX</td>
<td>TRABZON</td>
<td>2,37</td>
<td>0,24</td>
<td>2,61</td>
<td></td>
</tr>
<tr>
<td>9th</td>
<td>DLM</td>
<td>MUĞLA DALAMAN</td>
<td>1,52</td>
<td>0,92</td>
<td>2,44</td>
<td></td>
</tr>
<tr>
<td>10th</td>
<td>GZT</td>
<td>GAZİANTEP</td>
<td>1,70</td>
<td>0,16</td>
<td>1,87</td>
<td></td>
</tr>
</tbody>
</table>

Source: DIHA (Türkiye Hava Yolları İstatistikleri)
## TOP 20 AIRPORTS IN EUROPE IN DIRECT CONNECTIVITY - 2021

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>-3,243</td>
<td>-3,158</td>
<td>-3,158</td>
<td>AMS</td>
<td>-33%</td>
<td>29%</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>-2,840</td>
<td>-2,543</td>
<td>-2,534</td>
<td>FRA</td>
<td>-44%</td>
<td>47%</td>
</tr>
<tr>
<td>8</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>-2,243</td>
<td>-2,183</td>
<td>-2,183</td>
<td>CDG</td>
<td>-32%</td>
<td>35%</td>
</tr>
<tr>
<td>7</td>
<td>12</td>
<td>6</td>
<td>3</td>
<td>-2,151</td>
<td>-1,983</td>
<td>-1,983</td>
<td>SVO</td>
<td>-43%</td>
<td>51%</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>7</td>
<td>2</td>
<td>-2,141</td>
<td>-1,929</td>
<td>-1,835</td>
<td>MAD</td>
<td>-52%</td>
<td>37%</td>
</tr>
<tr>
<td>9</td>
<td>17</td>
<td>8</td>
<td>1</td>
<td>-2,112</td>
<td>-1,920</td>
<td>-1,920</td>
<td>LHR</td>
<td>-38%</td>
<td>51%</td>
</tr>
<tr>
<td>21</td>
<td>7</td>
<td>9</td>
<td>10</td>
<td>-2,152</td>
<td>-1,932</td>
<td>-1,932</td>
<td>BCN</td>
<td>-42%</td>
<td>51%</td>
</tr>
<tr>
<td>14</td>
<td>20</td>
<td>11</td>
<td>12</td>
<td>-1,838</td>
<td>-1,920</td>
<td>-1,745</td>
<td>SEA</td>
<td>-11%</td>
<td>-26%</td>
</tr>
<tr>
<td>26</td>
<td>3</td>
<td>12</td>
<td>13</td>
<td>-1,830</td>
<td>-1,920</td>
<td>-1,920</td>
<td>PMI</td>
<td>-23%</td>
<td>-26%</td>
</tr>
<tr>
<td>32</td>
<td>18</td>
<td>14</td>
<td>14</td>
<td>-1,662</td>
<td>-1,635</td>
<td>-1,635</td>
<td>DME</td>
<td>-3%</td>
<td>-41%</td>
</tr>
<tr>
<td>12</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>-1,635</td>
<td>-1,531</td>
<td>-1,531</td>
<td>VIE</td>
<td>-3%</td>
<td>-41%</td>
</tr>
<tr>
<td>34</td>
<td>13</td>
<td>16</td>
<td>16</td>
<td>-1,531</td>
<td>-1,480</td>
<td>-1,480</td>
<td>LED</td>
<td>-3%</td>
<td>-41%</td>
</tr>
<tr>
<td>16</td>
<td>14</td>
<td>17</td>
<td>17</td>
<td>-1,480</td>
<td>-1,476</td>
<td>-1,476</td>
<td>OSL</td>
<td>-39%</td>
<td>-55%</td>
</tr>
<tr>
<td>17</td>
<td>10</td>
<td>18</td>
<td>18</td>
<td>-1,476</td>
<td>-1,476</td>
<td>-1,476</td>
<td>ORY</td>
<td>-39%</td>
<td>-55%</td>
</tr>
<tr>
<td>10</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>-1,476</td>
<td>-1,476</td>
<td>-1,476</td>
<td>FCO</td>
<td>-39%</td>
<td>-55%</td>
</tr>
<tr>
<td>13</td>
<td>22</td>
<td>20</td>
<td>20</td>
<td>-1,476</td>
<td>-1,476</td>
<td>-1,476</td>
<td>CPH</td>
<td>-39%</td>
<td>-55%</td>
</tr>
</tbody>
</table>

Istanbul has recovered 56% of its pre-pandemic (2019) hub connectivity levels in 2021 – the best performance amongst European hubs.

According to ACI’s World Airport Traffic Forecast, **Türkiye** will be amongst the top 15 fastest growing countries in the upcoming period to 2040 with **4.6% CAGR**, though not a single other European country appears in this list.

Istanbul has rapidly developed into an international hub in last decade.

Source: Airports Council International (ACI) EUROPE Airport Industry Connectivity Report 2021
NEW ISTANBUL AIRPORT

- 200 Million Passenger Capacity
- 500 Airplane Parking Capacity
- 350 Destinations
- 2,000 Daily Landing & Departures
- 6 Runways
- Operational Since 2018

«Best Airport in Europe»
«Accessible Airport»
Total Flight Locations

- Europe: 43%
- Middle East: 13%
- Africa: 22%
- America: 7%
- Far East: 15%

127 Countries  319 Cities  322 Airports

2nd airline in Europe with 1,200 flights per day (2021)
Turkish Airlines has shown an incredible growth over the past decade, taking competition to a higher level.

**5th International RPK Ranking**

**5th International Passengers Carried**

**8th International CTK Ranking**

**7th International FTK Ranking**

### Source:
IATA, Turkish Airlines

**RPK**: Revenue Passenger-Kilometers

**CTK**: Cargo Ton-Kilometers

**FTK**: Freight Ton-Kilometers

*expects to receive 8 new narrowbodies and 10 new widebodies in 2022.*
Competition and cooperation go hand in hand in the Turkish aerospace industry

The Turkish Engine Center is a joint venture with Turkish Technic specializing in CFM56 and V2500 engine overhaul and repair. The Turkish Engine Center unites the long histories of engineering and maintenance excellence of its parent companies. Established in 2009, the facility is located at Istanbul’s Sabiha Gokcen Airport and has performed more than 400 engine overhauls.

SunExpress was founded as a subsidiary of Turkish Airlines and Lufthansa. Today, SunExpress has a fleet of 70 aircrafts with 13,950 seats capacity, flying to more than 100 destinations. It carried around eight million passengers in 2016. With its 26 years of experience and thus the long-term commitment in the traffic between the home markets of Türkiye and Germany, the airline has acquired the reputation of the holiday specialist even beyond Türkiye.

Kale Pratt & Whitney Aircraft Motor Industry Inc. has been established in 2010 with the partnership of Kale Group with Pratt & Whitney, which is part of United Technologies Corporation (UTC). Established with a 51% Kale Group and 49% Pratt & Whitney partnership, the company’s main field of activity is the manufacture and assembly of engines and body parts for aircraft. The company started its production activities in its current factory in 2014.

A joint venture owned 51% by Turkish Technic and 49% by TAI, the company manufactures galleys and their inserts (like trolleys, std. containers etc.), crew rests, cabin dividers, wind screens, miscellaneous stowage, coatrooms, video control compartments, aircraft textile, leather and most of other cabin interior parts except for the aircraft seats.
Established in 2008, acquired by HNA in 2010 myTECHNIC is World’s first lean greenfield MRO with a total closed area of 48,400 m² and one of its kind in the region with a 15,788 m² hangar area, 12,115 m² office area and 20,500 m² warehouse and shop area under one roof. Located in Sabiha Gökçen Airport, myTECHNIC has established business with 130+ customers in 10 regions.

Turkish Nacelle Center established in December 2010, upon signing of Joint Venture Agreement between Turkish Technic Inc. and Collins Aerospace (formerly UTC Aerospace Systems) Aerostructures Business Unit. Turkish Nacelle Center provides repair, maintenance, overhaul and modification of thrust reverser and nacelle systems for almost all types of engine platforms being used on commercial aircraft.

TUSAS Engine Industries Inc. (TEI) is an incorporated company established in 1985 as a joint venture owned 50,5% by Turkish Aerospace Industries Inc. (TAI), 46,2 % by General Electric (GE), 3,3 % Turkish Armed Forces Foundation (TAFF) and Turkish Aeronautical Association (TAA). TEI. The company has become an international manufacturer and a global design center today with the high quality products and services it offers to aviation industry.

TSI Aviation Seats was established as a joint venture owned 50% by Turkish Airlines and 50% by Assan Hanil, with the target of designing, producing, repairing and marketing all types of aircraft seats and supplying their spare parts. TSI conducts design, engineering, manufacturing and R&D activities in its new facilities in HABOM (Aviation Maintenance Repair and Overhaul Center).
Türkiye’s macro fundamentals have been a key driver of civil aviation

- **Average Annual Real GDP Growth Over the Past 18 Years**: 5.1% (2nd in OECD)
- **GDP as of 2020 up from $236 billion in 2002**: $717 billion
- **Largest Economy in the World**: 11th
- **Income per Capital at PPP as of 2020**: $30K (up from $10,997 in 2002)
- **Air Passengers in 2021**: 128 million (209 million in 2019)

**Proximity to Major Markets**

1.5 Billion people, $24T GDP and 45% global trade at 4-hour flight distance.
## WHAT CAN INVESTMENT OFFICE DO FOR YOU?

Investment Office will assist you before, during and after your entry to Türkiye.

https://www.invest.gov.tr

<table>
<thead>
<tr>
<th>A governmental body attached to H.E. President</th>
<th>Private sector approach with public sector capabilities</th>
<th>Acting as your solution partner</th>
</tr>
</thead>
<tbody>
<tr>
<td>General &amp; customized business information &amp; sectoral analysis &amp; reports</td>
<td>Facilitating your investment at all stages</td>
<td>Aftersales</td>
</tr>
<tr>
<td>Site selection support to find appropriate location/land for your investment</td>
<td>Matchmaking with local partners &amp; establishing business linkages</td>
<td>Facilitating your visit to Türkiye</td>
</tr>
<tr>
<td>Arrangements of meetings with governmental bodies and other stakeholders</td>
<td>Project launch &amp; Press release Services</td>
<td></td>
</tr>
</tbody>
</table>