AEROSPACE INDUSTRY - TAKING OFF TO NEW HEIGHTS
Aerospace Industry Overview

With air travel becoming faster, more accessible, and more comfortable, the aerospace industry has witnessed a huge spike in the number of people travelling both domestically and abroad.

By 2036 it is estimated that there will be approximately 7.8 Billion passengers per year - almost double today’s figure of 4 billion travelers.

This huge spike in demand will result in significant economic opportunities for countries across the globe, not least those in the Asia Pacific. According to the 2017 IATA 20 Year Passenger Forecast, the Asia Pacific region will contribute more than half of new passengers between 2017 and 2036, primarily driven by booming passenger numbers from China, India and Indonesia. This represents an average growth rate of 4.6% per year.

To fully capitalize on these projections, governments, aviation experts and other private sector stakeholders are continuing to forge partnerships in areas including infrastructure, trade liberalization and reduction of barriers to freedom of movement.

---

Market Share of Air Travel by Region’s Carriers in 2017

- **24%** North America
- **26%** Europe
- **7%** Latin America
- **2%** Africa
- **5%** Middle East
- **35%** Asia Pacific

Top 5 Growing Markets in Term of Annual Additional Passengers

- China: 0.92
- USA: 0.40
- India: 0.34
- Indonesia: 0.24
- Turkey: 0.12

Unit: Billions of Passengers

Source: 1. The International Air Transport Association
An Ideal Location for Aerospace Hub

Advantageously located in the heart of South East Asia, Thailand has long been a center of commercial aviation in the region. With a strong domestic economy and thriving tourism sector, it is no wonder that the country has seen a rise in passenger numbers over the past decade.

On average, Thailand’s air traffic has increased three times faster than the global market. It is projected that, during 2018-2028, the number of passengers will increase at 5.6% per year, while the growth rate in the shorter term (2018-2022) is even more impressive at 7.5% per year.

Growing Tourism Sector

In 2018, more than 35 million tourists visited Thailand. The vast majority of Thailand’s tourist arrivals originated from Asia; however, there were also a substantial number of arrivals from countries in other regions including Russia, the United States, the United Kingdom and Germany.

When assessing the drivers behind Thailand’s burgeoning tourism sector, one can primarily attribute their success to two core factors. Firstly, the growth of low-cost airline carriers has significantly increased the affordability of air travel and opened the market to a wider range of individuals. Coupled with a robust and relatively well-developed tourism sector, Thailand has all it takes to be a tourist friendly country, with good accommodation and technology. According to statistics from the World Travel and Tourism Council, the total contribution of travel & tourism to GDP was 28.6% of Thailand’s gross domestic product in 2018.

International Tourist Arrivals to Thailand

Source: 1 The International Air Transport Association and 3 The Civil Aviation Authority of Thailand

Source: 3 Ministry of Tourism & Sports
There are currently a total of 38 commercial airports operating across Thailand, 12 of which operate short and long haul international services. In 2017, Thailand's airports handled a total of 833,084 flights, a significant boost from previous years.
Airports in Thailand have the capacity to accommodate a huge number of passengers. Suvarnabhumi International Airport sees an average of nearly 70 flights flowing in and out per hour. Several other airports across the country accommodate more than 10 fights per hour. To support the increased capacity demands that are primarily resultant from the gradual growth of international visitors, airports across Thailand are investing significant financial and human resources into improving their operations.

Suvarnabhumi
- **Arrival**: 8,280 Passengers/Hour
- **Departure**: 6,660 Passengers/Hour
- **Aircraft Flow**: 68 Flights/Hour

Don Mueang
- **Arrival**: 7,900 Passengers/Hour
- **Departure**: 7,190 Passengers/Hour
- **Aircraft Flow**: 46 Flights/Hour

Phuket
- **Arrival**: 3,600 Passengers/Hour
- **Departure**: 3,600 Passengers/Hour
- **Aircraft Flow**: 20 Flights/Hour

Chiang Mai
- **Arrival**: 1,860 Passengers/Hour
- **Departure**: 2,690 Passengers/Hour
- **Aircraft Flow**: 24 Flights/Hour

Chiang Rai
- **Arrival**: 785 Passengers/Hour
- **Departure**: 1,939 Passengers/Hour
- **Aircraft Flow**: 11 Flights/Hour

Hat Yai
- **Arrival**: 1,200 Passengers/Hour
- **Departure**: 1,000 Passengers/Hour
- **Aircraft Flow**: 12 Flights/Hour

U-Tapao
- **Arrival**: 1,000 Passengers/Hour
- **Departure**: 1,000 Passengers/Hour
- **Aircraft Flow**: 15 Flights/Hour

Source: The Civil Aviation Authority of Thailand
Despite the already strong capacity of Thailand’s airports, further improvements are on the way. Upgrades to Don Mueang and Suvarnabhumi International Airport are currently in progress, while U-Tapao International Airport will also increase its capacity with the addition of a second runway and the redesign of its airport space.

The Thai government has also committed 224.54 billion baht towards the construction of the High-Speed Rail Linked 3 Airport Project. Connecting Don Mueang, Suvarnabhumi and U-Tapao Airports, the completed project will cover a total distance of more than 220 kilometers. Due to be officially launched and open to the public in 2025, it is expected that the project will contribute to the progress of the Eastern Economic Corridor of Aerotropolis (EECa). Also known as the Eastern Airport City, the EECa is an airport-centered development area covering 6,000 rai in Rayong and Chonburi provinces and incorporating a re-developed U-Tapao airport as well as other facilities such as air cargo and a commercial gateway.

As demand within the aerospace industry increases over the next few decades, it is expected that the workforce in this industry in Thailand will also continue to grow. The Civil Aviation Authority of Thailand (CAAT) forecasts that the workforce will rise from 15.9 thousand persons in 2017 to 20.8 and 29.4 thousand persons in 2027 and 2037, respectively.

In meeting such increasing demand for skilled personnel, many universities and institutions have initiated academic programs aimed at furnishing the country’s human resources with the relevant skill sets. In 2017, 33,857 engineering students graduated in Thailand, with a further 23,873 science and technology students also graduating. In the same year, 2,512 graduates were from the fields of aviation and aviation management.1

A number of leading universities offer specific courses in aerospace maintenance

These include:

- Chulalongkorn University
- Kasetsart University
- King Mongkut’s University of Technology
- Assumption University
- Rangsit University
- Rajamangala University of Technology Krungthep
- Thammasat University
Aviation Training Centers Approved by CAAT

Other than institutions with academic programs, various types of aviation training centers approved by CAAT are also operating across the country. Currently, CAAT certifies 6 types of organizations and devices including Flying Training Organizations (FTO), Air Traffic Control Training Organizations (ATCTO), Aviation Language Testing Service Providers (TSP), Air Traffic Control Synthetic Training Devices (STD), Aircraft Maintenance Engineer Training Organizations (AME), and Flight Synthetic Testing Devices (FSTD).

As for the FTO, there are 13 centers for pilot training approved by CAAT. The Bangkok-based centers are:
- Civil Aviation Training Center
- Bangkok Aviation Center Co., LTD
- Royal Sky Aviation Center Flying School
- Thai Flight Training Co., Ltd.
- Asia Aviation And Technology Co., Ltd.
- Thai Inter Flying Co., LTD.
- Premium Airlines Co., LTD.

Other centers include:
- International Aviation College
  Nakhon Phanom University
- Thai General Aviation
  Technology School
- Sriracha Aviation Co.,Ltd.
- D-0507 Flight Training
  Company Limited
- AFA Aeronautical Co., LTD
- Thai Aviation Co., LTD

Source: Civil Aviation Authority of Thailand
Thailand’s future in this sector is clear for all to see. With the expansion of U-Tapao International Airport as part of the EECa development; the airplane purchase orders made by low-cost carriers; and the emergence of the Maintenance, Repair, and Overhaul (MRO) sector, it can be expected the further infrastructure improvements required to accommodate the production of aircraft parts and aircraft-related products will be forthcoming. Recognizing the sector’s significant potential, many key international aircraft manufacturing companies have already invested in Thailand. These include Ducommun, Leistritz, Michelin, Revima, Senior Aerospace, Triumph Structures (Thailand), and Zodiac Aerospace.

Thailand is also a hub of auto parts production, an industry whose relevant skills and technologies can be utilized to produce aircraft-related products. This provides Thailand with a wealth of expertise in Tier 3 component manufacturing and Tier 4 composite manufacturing for original parts manufacturing (OEMs).
Indicating the strong potential of its aircraft industry, Thailand has reported a positive trend in the trade of aircraft-related products over the past decade. In this respect, the country has recorded overall growth in both its import and export numbers. Imports in particular have undergone a period of strong growth, with a CAGR of 21.73% between 2010 and 2018. Thailand’s imports of aircraft-related products hit a value of 5.82 billion in 2017. While exports performed less spectacularly over the same period, with a CAGR of 6.89%, there was a strong upward trend from 2015 to 2018, indicating a promising future for this area of trade.

### Import and Export of Aircraft-related Products

<table>
<thead>
<tr>
<th>Year</th>
<th>Import</th>
<th>Export</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>984</td>
<td>1,869</td>
</tr>
<tr>
<td>2011</td>
<td>2,311</td>
<td>2,166</td>
</tr>
<tr>
<td>2012</td>
<td>3,251</td>
<td>1,897</td>
</tr>
<tr>
<td>2013</td>
<td>5,680</td>
<td>1,848</td>
</tr>
<tr>
<td>2014</td>
<td>4,323</td>
<td>1,801</td>
</tr>
<tr>
<td>2015</td>
<td>4,554</td>
<td>1,676</td>
</tr>
<tr>
<td>2016</td>
<td>3,949</td>
<td>2,228</td>
</tr>
<tr>
<td>2017</td>
<td>5,824</td>
<td>2,825</td>
</tr>
<tr>
<td>2018</td>
<td>4,747</td>
<td>3,184</td>
</tr>
</tbody>
</table>

**CAGR Growth 2010-2018**
- Import: 21.73%
- Export: 6.89%

---

### Top 5 Imported Products in 2018

1. Aeroplanes and other powered aircraft of an unladen weight > 15000 kg
2. Turbojets of a thrust > 25 kN
3. Aeroplanes and other powered aircraft of an unladen weight <= 2000 kg
4. Spark-ignition reciprocating or rotary internal combustion piston engine
5. Ignition wiring sets and other wiring sets for vehicles, aircraft or ships

---

### Top 5 Exported Products in 2018

1. Spark-ignition reciprocating or rotary internal combustion piston engine
2. Ignition wiring sets and other wiring sets for vehicles, aircraft or ships
3. Parts of aeroplanes or helicopters, n.e.s. (excluding those for gliders)
4. Aeroplanes and other powered aircraft of an unladen weight > 15000 kg
5. New pneumatic tyres, of rubber, of a kind used for aircraft

---

*Source: International Trade Centre*
Across the globe, the airline industry remains characterized by strong growth, primarily due to the continued increase in air travelers in both the domestic and international travel markets. Similarly, in 2018 the airport business in Thailand also continued to see a steady rise in the number of outbound travelers, and the continued expansion and popularity of low-cost carriers.

Example of Airlines Operating in Thailand

Domestic Routes

- Bangkok Airways
- Nok Air
- Kan Air
- AirAsia
- THAI
- Thai Smile
- Lion Air
- VietJet Air
- Jetstar
- Orient Thai Airlines

International Routes

- Qatar Airways
- ANA
- THAI
- Emirates
- Lufthansa
- Eva Air
- Singapore Airlines
- Cathay Pacific

Source: The Civil Aviation Authority in Thailand
Demand in Domestic Market

A significant amount of growth within the Thai market remains driven by the domestic demand for low cost carriers. At present, low cost airlines now account for more than 70% of the domestic market share. Interestingly, Thailand’s international market has also experienced rapid growth as a result of low cost carriers. In 2017, they accounted for approximately 13.5 million international seats, an increase of more than 8 million in just over five years.

Thailand’s Fleet Size

<table>
<thead>
<tr>
<th>Year</th>
<th>Unit: Number of Aircraft in Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>42</td>
</tr>
<tr>
<td>2014</td>
<td>59</td>
</tr>
<tr>
<td>2015</td>
<td>83</td>
</tr>
<tr>
<td>2016</td>
<td>107</td>
</tr>
<tr>
<td>2017</td>
<td>120</td>
</tr>
<tr>
<td>2018</td>
<td>136</td>
</tr>
</tbody>
</table>

While Thailand has historically operated a relatively limited MRO sector, this is changing. In its Commercial Market Outlook 2018, Boeing predicted that aircraft fleets in the Asia-Pacific would almost triple from the 6,000 aircraft currently based in the region to approximately 17,000 by 2036. Such growth would make the Asia-Pacific the world’s largest market and lead to the center of the MRO industry shifting from North America and Europe to the Asia-Pacific region. With the region leading the way in the aerospace industry’s seemingly insatiable global growth and the significant opportunity this presents for regional MRO services, Thailand is in a strong position to build on its existing importance as an aviation hub and establish itself as regional center for MRO services.
Growth Opportunities

Example of MRO Companies Operating in Thailand

Airbus is an international pioneer in the aerospace industry. This company is a leader in designing, manufacturing and delivering aerospace products, services and solutions to customers on a global scale.

Chromalloy is an integrated solutions provider — for original equipment manufacturers, commercial airlines, militaries, oil and gas companies, and power companies — that delivers innovative solutions designed to reduce manufacturing and operating expenses and extend the life of gas turbine engines.

Triumph Aviation Services Asia, Ltd. provides repairs and overhauls complex aircraft operational components in Thailand and acts as a Single-Source Service Center for all commercial aviation across the region. The company was founded in 2005 and is based in Chonburi.

TurbineAero is an independent aerospace component maintenance, repair, and overhaul service provider focused on APU's and related products. It provides military, commercial, and regional airline customers with a comprehensive maintenance solution for legacy and new APU engine models.

Development in U-Tapao Airport

An important factor contributing to the prospects of the MRO sector in Thailand is the development plan of the Eastern Economic Corridor of Aerotropolis (EECa) which features the expansion of U-Tapao International Airport. This will provide excellent opportunities for a range of related companies.

Important components of the development plan include:

- Passenger Terminal 3 and Commercial Gateway
- Air Cargo Facilities
- Maintenance, Repair and Overhaul (MRO) Facilities
- Aviation Training Facilities
- Free Trade Zone

A new passenger terminal and runway will boost passenger numbers at U-Tapao to 15 million per year within the next five years.

Expected MRO Value in the Future

Unit: Million USD

Source: Prachachart and Aviation Week Database, Frost & Sullivan
In June 2018, Thai Airways International and Airbus signed an MOU to establish an MRO facility at U-Tapao International Airport. It is expected this facility will be one of the most modern and extensive service centers in the Asia-Pacific region, offering heavy maintenance and line services for all wide-body aircraft types.

Unmanned Aerial Vehicle (UAV)

Unmanned Aerial Vehicles (UAV), commonly known as drones, have undergone a significant growth in popularity worldwide over the past few years. Thailand is no exception. The drone market in Thailand has grown enormously, as can be observed from the increase in the number of registered drones in the country. The figure surged from 109 units in 2016 to 949 units in 2017, before skyrocketing to 7,708 in 2018.

Thai Airways-Airbus Coordination

- MRO Center Establishment
- Technician Training School
- Aircraft Composite Repair Shop
- Technology Support for Smart Hangar
- Parts Store and Logistic Center
- Design for Building and Construction
- Equipment Maintenance Office

Total Number of Registered Drones

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>109</td>
</tr>
<tr>
<td>2017</td>
<td>949</td>
</tr>
<tr>
<td>2018</td>
<td>7,708</td>
</tr>
</tbody>
</table>

The increase in the popularity of drones is mainly attributed to the sharp fall in prices. As is the case with other technologies, it is likely that high-quality drones will become more affordable in the years to come, and this indicates a continued growth for the foreseeable future.

According to SZ DJI Technology, a Chinese drone maker, Thailand is among the top-five markets in term of consumer enthusiasm for drone technology. With tech-savvy consumers who love to take pictures and a large number of small farmers who can utilize drones to spray fertilizers or pesticides, Thailand offers a large potential market for drone makers and distributors.
In an effort to support the development and growth of Thailand’s aerospace industry over the short and medium term, the relevant government agencies embark on a series of policy reforms. Some broad policy initiatives include increased assistance to domestic companies; undertaking comprehensive research & technology development; developing new industry talents; and fully implementing aerospace standards and certification programs.

Supporting Policy and Organizations

BOI offers a wide range of tax and non-tax incentives for eligible activities.

<table>
<thead>
<tr>
<th>Group</th>
<th>Activities</th>
<th>Tax Incentives</th>
<th>Exemption of Import Duty</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Manufacture of aircraft or aircraft parts such as airframe, critical parts (e.g. engine and parts, propeller), appliance (e.g. flight recorder, radar), equipment and other components</td>
<td>8 years CIT exemption (no cap)</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Manufacture of aerospace devices and equipment such as devices or equipment related to rockets/ spacecraft/space vehicles/propulsion units and auxiliary equipment, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aerospace operating systems such as search, detection, navigation, guidance, aeronautical, nautical systems and instruments, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A2</td>
<td>Repair of aircraft or aircraft parts</td>
<td>8 years CIT exemption</td>
<td>✓</td>
</tr>
<tr>
<td>A3</td>
<td>Manufacture of onboard devices and equipment (except disposable and reusable aircraft utilities and supplies) such as seats, life vests, trolley, galley, etc.</td>
<td>5 years CIT exemption</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Aircraft or Aerospace Industrial Zone or Industrial Estate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A4</td>
<td>Repair of onboard devices and equipment (except disposable and reusable aircraft utilities and supplies)</td>
<td>3 years CIT exemption</td>
<td>✓</td>
</tr>
</tbody>
</table>

Notes: *Exemption of import duty on machinery and raw materials used in production of export products
**Incentives for Investment in the Eastern Economic Corridor (EEC)**

The BOI also recognizes the importance of investment in relevant activities in targeted locations. It has therefore been providing additional incentives for investment in the EEC. The promoted zone for specific industries related to aerospace is the Economic Corridor of Aerotropolis (EECa). Eligible activities located in one of the 21 promoted zones for targeted industries or other industrial estates / industrial parks in the EEC may also receive additional incentives, on top of the basic package granted by the BOI.

### Incentives for Investment in the EECa

<table>
<thead>
<tr>
<th>Eligible Activities</th>
<th>Additional Incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacture of aircraft or aircraft parts such as airframe, critical parts, appliance, equipment and other components</td>
<td>4 years of CIT exemption</td>
</tr>
<tr>
<td>Repair of aircraft or aircraft parts</td>
<td></td>
</tr>
<tr>
<td>Manufacture of aerospace devices and equipment such as devices or equipment related to rockets/ spacecraft/ space vehicles/propulsion units and auxiliary equipment, etc.</td>
<td></td>
</tr>
<tr>
<td>Aerospace operating systems such as search, detection, navigation, guidance, aeronautical, nautical systems and instruments, etc.</td>
<td></td>
</tr>
<tr>
<td>Manufacture of onboard devices and equipment (except disposable and reusable aircraft utilities and supplies) such as seats, life vests, trolley, galley, etc.</td>
<td>2 years of CIT exemption and a 5-year 50% CIT reduction</td>
</tr>
</tbody>
</table>

Applications for incentives under the EEC scheme must be submitted by 30 December 2019. In addition, investment projects under the scheme must establish a collaboration with education or research institutions in forms such as Co-operative Education (CoE), Dual Vocational Training (DVI), Work Integrated Learning (WiL), or a similar cooperation, under the condition that the number of students participating in the collaborative program is at least 10% of the project employees or 50 people, whichever is lower.