Thailand’s Eastern Economic Corridor (EEC)
“Excellent hub for aircraft manufacturing and maintenance”

Muk Sibunruang
Executive Director
U-Tapao Airport City Project Management
According to Thailand 4.0 policy, “AVIATION industry” is set by the government of Thailand as one of key targeted new S-curve industry in order to enhance the country to high value-added economy (i.e. high income level).
Attractive tax and non-tax incentives are provided to investment in New S-Curve business in EEC.

- up to 15 years exemption of corporate income tax
- subsidy from the Fund for Enhancement of Competitiveness for Targeted Industries established by the Act with the government seed money of THB10 billion (around US$285 million) for investment projects engaged in R&D or HRD in specific areas

First S-Curve

Comprehensive Medical Industry

- Digital
- Biofuels & Biochemical
- Aviation & Logistics
- Robotics

New S-Curve

Non-tax incentives
- Maximum personal income tax of 17% for executives and experts
- Long-term land lease (50+49 years)
- Work permit and visa assistance and a 5-year business visa
- Special public-private-partnership (PPP) procedure (3-month approval)
- Fast-track environmental impact assessment (EIA)
- Foreign currency account and use of foreign currencies without exchanging into Thai baht

Source: Krungthai Exclusive Economic and Investment Outlook 2018
EEC is the enhancement of the former Eastern Seaboard (ESB) Development Program that had supported Thailand as a powerhouse for industrial production in Thailand for over 30 years. With good infrastructures, logistic systems and industrial estate areas together with further infrastructure investment program will make EEC become an attractive investment destination.

Existing infrastructures and industrial estates

- 2 Deep sea ports: Laem Chabang and Map Ta Phut ports
- 1 Motorway
- 8 Highways
- 1 Double-track railway: Laekroabang (BKK) – Laem Chabang
- 1 U-Tapao airport
- 3 million passengers per year

- Industrial estates more than 160 sq.km.
- Leading petrochemical complex in AEC
- Leading automotive manufacturing base
- Tourism: Pattaya – more than 10 million visitors

EEC: Focused project and investment plan in 5 years

**Eastern Economic Corridor (EEC)**

**4 Core Areas 15 Projects & 5 High Priority Projects**

1. Aerotropolis: U-Tapao International Airport
2. High speed train linking 3 airports
3. Laem Chabang Port Phase 3
4. Map Ta Phut Port Phase 3
5. Sattahip Commercial Port
6. Dual Track Rails linking 3 seaports
7. Highways & Motorway
8. Next generation Automotive (DV) AV
9. Aviation Industry, Robotics & Smart Electronics
10. Advanced Petrochemical & Bioeconomy
11. Medical Hub
12. Tourism
13. Global Business Hub / Free Trade Zone
14. New cities: Chachoengsao, Pattaya, Rayong
15. Public Utilities

**5 High Priority Projects**

- Infrastructure
- Business/Industry
- Tourism
- New Cities
- + EEC of Innovation
- + EEC of Digital Park
- + Education
5 Infrastructure Projects for PPP
# Master timeline of PPP infrastructure project

<table>
<thead>
<tr>
<th>Project</th>
<th>Timeline</th>
<th>Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Speed Rail Link</td>
<td>Nov 17-Dec 17</td>
<td>SRT</td>
</tr>
<tr>
<td>3 Airports</td>
<td>Jan 18-Feb 18</td>
<td>SRT</td>
</tr>
<tr>
<td>U-Tapao International Airport</td>
<td>Mar 18-Apr 18</td>
<td>RTN</td>
</tr>
<tr>
<td>MRO Center</td>
<td>May 18-Jun 18</td>
<td>TG</td>
</tr>
<tr>
<td>Map Ta Phut Port Phase 3</td>
<td>Jul 18-Aug 18</td>
<td>IEAT</td>
</tr>
<tr>
<td>Laem Chabang Port Phase 3</td>
<td>Sep 18-Sep 18</td>
<td>PAT</td>
</tr>
</tbody>
</table>

- **2023**: TWO PROJECTS—TOR, WINNER, CONTRACT AWARD
- **2024**: TWO PROJECTS—TOR, WINNER, CONTRACT AWARD
- **2025**: ONE PROJECT—TOR, WINNER, CONTRACT AWARD

Note: SRT (State Railway Thailand), RTN (Royal Thai Navy), TG (Thai Airways International Plc.), IEAT (Industrial Estate Authority of Thailand) and PAT (Port Authority of Thailand)
Air traffic in Thailand is forecasted to grow 2.9 times in 20 years.

- The growth in aircraft movements of 12.32% is almost 4 times the global CAGR of 3.33% from 2006 to 2016 whereas Passenger Traffic has grown at 11.64% CAGR in the same period.

- Thailand passenger traffic is estimated to grow at 5.4% CAGR over the period of 2017 – 2037

- It is forecasted to grow to 2.9 times the passenger traffic in 20 years time

Source: CAAT (by Frost & Sullivan Analysis)
Thailand fleet is forecasted to grow 2.6 times in 20 years.

- Thailand currently has an operating fleet of 314 aircrafts and this is expected to grow at a CAGR of 4.86% over the next 20 years to reach 811 aircrafts in 2037.
- The narrow-body series, is expected to be the major growth driver.

Source: CAAT (by Frost & Sullivan Analysis)
Thailand MRO spending is forecasted to grow 3 times in 20 years.

- Major chunk of engine MRO & component MRO business goes overseas to Malaysia, Singapore, Philippines etc.
- Close to 60% (engine MRO and component MRO) of Thailand’s MRO spending goes overseas, while the remaining 40% (airframe MRO and line maintenance MRO) stays within Thailand.
Thailand offers great opportunities for aviation business investment

Thailand
“Excellent hub for aircraft OEM/MRO”

- High priority sector
- Ideal geographic location & good infrastructure system
- Strong industrial base & existing aerospace activity
- Strong domestic & regional OEM/MRO demand growth
- Strong gov’t policy on aviation HR development
- Attractive tax and non-tax incentives
- Friendly import/export environment

Thailand
Thank You
Appendix
Thailand is set to create favourable business environment

<table>
<thead>
<tr>
<th>Regional Business Competitiveness Drivers</th>
<th>Thailand</th>
<th>Malaysia</th>
<th>Indonesia</th>
<th>Philippines</th>
<th>Vietnam</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ease of Doing Business 2018</strong></td>
<td>77.44</td>
<td>78.43</td>
<td>66.47</td>
<td>58.74</td>
<td>67.93</td>
</tr>
<tr>
<td>Ease of Starting a Business</td>
<td>92.34</td>
<td>87.38</td>
<td>77.93</td>
<td>68</td>
<td>82</td>
</tr>
<tr>
<td>Ease of Dealing with construction permits</td>
<td>74.5</td>
<td>82</td>
<td>66</td>
<td>66</td>
<td>79</td>
</tr>
<tr>
<td>Ease of Getting Electricity</td>
<td>90.99</td>
<td>94.33</td>
<td>83.87</td>
<td>84.31</td>
<td>78</td>
</tr>
<tr>
<td>Ease of Registering Property</td>
<td>68.75</td>
<td>76</td>
<td>59.01</td>
<td>57.55</td>
<td>70</td>
</tr>
<tr>
<td>Ease of Getting Credit</td>
<td>70</td>
<td>80</td>
<td>65</td>
<td>30</td>
<td>75</td>
</tr>
<tr>
<td>Ease of Paying Taxes</td>
<td>76.73</td>
<td>76</td>
<td>68</td>
<td>69.27</td>
<td>72</td>
</tr>
</tbody>
</table>

| Global Competitiveness Index (2017)       |         |          |           |             |        |
| Global Manufacturing Competitiveness     | 4.64    | 5.16     | 4.52      | 4.36        | 4.31   |
| Index, 2016                              |         |          |           |             |        |

| Manufacturing Labor Costs (2015e) ($/hr) |         |          |           |             |        |
| Manufacturing exports as % of total exports |         |          |           |             |        |
| Infrastructure rating (out of 10)        | 5.8     | 7        | 5         | NA          | 4.9    |

Source: World Bank, World Economic Outlook, Global Manufacturing Indices 2016, Frost & Sullivan Analysis
EEC provides many advantages to aviation business investment

10 Great Opportunities For Aerospace Business in Thailand

- **Strong Industrial Base**
  - Very strong industrial base with 48 industrial estates in 15 provinces focused on automobile, textile, electrical & electronic etc.

- **Leverage Automobile Industry**
  - Opportunity to leverage automobile manufacturing success due to similarity in industrial process with 500+ Tier 1 and 1700+ Tier 2/3 companies

- **Ample Space for Development**
  - With more than 48 Industrial Estates in 15 provinces and Eastern Economic Corridor covering 3 provinces, Thailand offers ample space for Industrial Developments

- **High Priority Sector**
  - Aerospace is considered as a targeted S-curve industry, one among the 10 targeted industries for Thailand 4.0 agenda

- **Cost Effective Workforce**
  - Thailand has one of the lowest wages in manufacturing industry among Asia Pacific countries such as Singapore & Malaysia

- **Attractive Incentives**
  - Board of Investments Thailand offers extensive incentives for both local and foreign investors in aerospace sectors

- **ASEAN Free Trade Area (AFTA)**
  - You can enjoy zero import duties in the member countries such as Malaysia, Philippines, Indonesia, Singapore

- **Corporate Tax Advantage**
  - Thailand offers competitive tax advantages compared to other ASEAN countries such as Malaysia, Indonesia, Philippines

- **Existing Aerospace activity**
  - Thailand is home to many aerospace companies such as Airbus Group, CCS Aerospace, Senior Aerospace, Triumph Group, Michelin, Zodiac

- **Geographic Location**
  - Thailand leverages its ideal geographic position in the region with Bangkok as the most connected city in ASEAN

Source: CAAT (by Frost and Sullivan and Suranaree University of Technology)
EEC is the most strategic location for firms that aspire to gain access to Thailand and the large ASEAN+4 market (China, Japan, South Korea and India) including CLMV.

Well integrated infrastructures between Bangkok and EEC area

EEC location supports aviation business

1. Capacity integration and linkage of Suvarnabhumi, Don Mueang and U-Tapao airports, Thailand will become the hub of air traffic in Asia.
2. Link to CLMV (Yangon, Mandalay, Phnom Phen, Ho Chi Minh, Hanoi and Vientiane).
3. Link to China (Kunming, Zhengzhou, Peking, Shanghai and Hong Kong). Japan (Tokyo, Osaka). Seoul-Taipei.
4. Link to ASEAN (Kuala Lumpur, Singapore, Manila, Jakarta and Brunei).
5. Link to India (New Delhi, Mumbai, Shehnai and Hyderabad).
Combined Public and Private Investments
1.7 Trillion baht ($49.9 Billion) in the first 5 years

- **U-Tapao International airport**: 200,000 million baht ($5.7 Billion)
- **Map Ta Phut Port Phase 3**: 11,100 million baht ($0.3 Billion)
- **Laem Chabang Port Phase 3**: 150,000 million baht ($24.2 Billion)
- **High Speed Rail**: 200,000 million baht ($5.7 Billion)
- **New Cities / Hospitals**: 400,000 million baht ($11.5 Billion)
- **Tourism**: 200,000 million baht ($5.7 Billion)
- **Industry**: 500,000 million baht ($14 Billion)
- **Motorway**: 35,300 million baht ($1 Billion)
- **Dual-track railway**: 64,300 million baht ($1.8 Billion)
New PPP Procedure for EEC Projects

1. Project Proposal Preparation
   - Full feasibility study
   - PPP business case
   - EIA process

2. Approval of Project Proposal
   - Project approval
   - Budget approval
   - TOR/RFP

3. Private Partner Selection
   - RFP announcement
   - Submission & Selection
   - Negotiation
   - Contract finalization

PPP normal track
- 8-10 Months

PPP EEC track
- 2-3 Months

21-36 Months

PPP 1.5 Months

PPP 4.5-5.5 Months

PPP 8-10 Months

Project objectives: To establish the third main international airport in Thailand for business expansions, as well as to better facilitate the establishment of a Special Economic Zone in anticipation of the EEC expansion. In addition, it will serve a passenger link to Don Muang International Airport and Suvarnabhumi International Airport, while simultaneously supporting growth as a regionally important aviation hub.

Project area: approximately 1,040 hectares.

Investment value: Baht 200 billion or approximately USD 5.7 billion.

Project components:
1. Passenger Terminal 3 and the Commercial Gateway
2. Phase II Air Cargo facilities: 72 hectares
3. Phase II Maintenance, Repair and Overhaul (MRO) facilities: 91 hectares
4. Phase II Aviation Training Center: 32 hectares
5. Free Trade Zone: 152 hectares

Construction period: 2019-2023
Contracting  for all consultants

2. EHIA

3. Runway Design

4. MRO&Taxiway Design

2. EHIA

3. Runway Design

4. MRO&Taxiway Design

Dec '17

2nd Runway & MRO Construction

5. PPP Selection for Terminal 3

6. Training Center Design

7. Cargo Design

8. Other PPP Components – Free Trade Zone, Utilities etc.

Dec '18

2nd Runway & MRO Construction

Private Investment & Prepare Design

Training Center Construction

Cargo Terminal by RTN

Dec '19

Terminal 3 Construction

Land preparation

Dec '20

Terminal 3 Construction

Land preparation

Terminal 3 Construction

2nd Runway (Revised Plan)

Dec '21

MRO Open

Tank Farm, Filling System

• Power Supply

• Water Supply

• Waste Water Treatment Plant

• Solid waste Management

• Fire Station

• Service Road

• Others

Dec '22

MRO Open

• Power Supply

• Water Supply

• Waste Water Treatment Plant

• Solid waste Management

• Fire Station

• Service Road

• Others

Terminal 3 Construction

Cargo Terminal Ph.1 PPP-TG & 2 by PPP

Completion of U-TAPAO International Airport Capacity 30 M PAX

Airport High Speed Rail Link – Estimate Open Nov. 2023

Y2023

Dec '17

2nd Runway & MRO Construction

5. PPP Selection for Terminal 3

6. Training Center Design

7. Cargo Design

8. Other PPP Components – Free Trade Zone, Utilities etc.
### Air Force (307)

**AIRCRAFT (272)**
1. **FTR 78**: 1 F-58 Freedom Fighter; 21 F-5E Tiger II; 3 F-5F Tiger II (F-5E/F being upgraded); 38 F-16A Fighting Falcon; 15 F-16B Fighting Falcon
2. **FGA 12**: 8 Gripen C; 4 Gripen D
3. **ATK 17**: AU-23A Peacemaker
4. **ISR 5**: DA42 MPP Guardian
5. **AEW&C**: 2 Saab 340 Erieye
6. **TPT 48**: 
   - 6.1 **Medium 14**: 6 C-130H Hercules; 6 C-130H-30 Hercules; 2 Saab 340B;
   - 6.2 **Light 21**: 3 ATR-72; 3 Beech 200 King Air; 8 BT-67; 1 Commander 690; 6 DA42M;
   - 6.3 **PAX 13**: 1 A310-324; 1 A319CJ; 1 A320CJ; 1 B-737-800; 5 Beech 146; 2 SSJ-100-95LR
7. **TRG 110**: 16 Alpha Jet; 13 CT-4A Airtrainer; 6 CT-4B Airtrainer; 20 CT-4E Airtrainer; 27 L-39ZA Albatros; 21 PC-9; 7 T-41D Mescalero

**HELICOPTERS (35)**
1. **MRH 11**: 2 Bell 412 Twin Huey; 2 Bell 412SP Twin Huey; 1 Bell 412HP Twin Huey; 6 Bell 412EP Twin Huey
2. **CSAR 4**: H225M Super Cougar
3. **TPT 20**: 
   - 3.1 **Medium 3**: S-92A Super Hawk
   - 3.2 **Light 17**: Bell 205 (UH-1H Iroquois)

### Army (283)

**AIRCRAFT (53)**
1. **TPT • Light 20**: 2 Beech 200 King Air; 2 Beech 1900C; 1C-212 Aviocar; 1C-295W; 10 Cessna A188E (U-17B); 2 ERJ-135LR; 2 Jetstream 41
2. **TRG 33**: 11 MX-7-235 Star Rocket; 22 T-41B Mescalero

**HELICOPTERS (230)**
1. **ATK 7**: AH-1F Cobra
2. **MRH 13**: 8 AS550 Fennec; 2 AW139; 3 Mi-17V-5 Hip H
3. **TPT 210**: 
   - 3.1 **Heavy 5**: CH-47D Chinook
   - 3.2 **Medium 12**: 9 UH-60L Black Hawk; 3 UH-60M Black Hawk
   - 3.3 **Light 193**: 93 Bell 205 (UH-1H Iroquois); 27 Bell 206 Jet Ranger; 52 Bell 212 (AB-212); 16 Enstrom 480B; 5 UH-72 Lakota TRG 53 Hughes 300C

### Police (89)

**AIRCRAFT (22)**
1. **ATK 6**: AU-23A Peacemaker
2. **TPT 16**: 
   - 2.1 **Light 15**: 2 CN-235; 8 PC-6 Turbo-Porter; 3 SC-7 3M Skyvan; 2 Short 330UTT;
   - 2.2 **PAX 1**: F-50
3. **HELICOPTERS (67)**
   - 1. **MRH 6**: Bell 412 Twin Huey
   - 2. **TPT • Light 61**: 27 Bell 205A; 14 Bell 206 Jet Ranger; 20 Bell 212 (AB-212)

### Navy (52)

**AIRCRAFT (27)**
1. **ASW 2**: P-3A Orion (P-3T)
2. **ISR 9**: Sentry O-2-337
3. **MP 1**: F-27-200 MPA
4. **TPT • Light 15**: 7 Do-228-212; 2 ERJ-135LR; 2 F-27-400M Troopship; 3 N-24A Searchmaster; 1 UP-3A Orion (UP-3T)

**HELICOPTERS (25)**
1. **ASW 8**: 6 S-70B Seahawk; 2 Super Lynx 300
2. **MRH 2**: MH-60S Knight Hawk
3. **TPT 15**: 
   - 3.1 **Medium 2**: Bell 214ST (AB-214ST)
   - 3.2 **Light 13**: 6 Bell 212 (AB-212); 2 H145M; 5 S-76B

Source: The Military Balance 2017 – The annual assessment of global military capabilities and defence economics (The International Institute for Strategic Studies)

Note: AEW (Airborne Early Warning), ASW (Anti-Submarine Warfare), ATK (Attack/Ground Attack), CSAR (Combat Search and Rescue), FGA (Fighter Ground Attack), FTR (Fighter), ISR (Intelligence, Surveillance and Reconnaissance), MP (Maritime Patrol/Military Police), MRH (Multi-Role Helicopter), PAX (Passenger/Passenger Transport Aircraft), TPT (Transport) and TRG (Training)
## PHASE 1: PRE-APPLICATION

The applicant’s representative, normally the quality manager, is invited to a meeting with CAAT to better understand the application process. You can contact CAAT to make an appointment via airworthiness@caat.or.th

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## PHASE 2: FORMAL APPLICATION

In this phase, the applicant must submit letter of intent, application form and all required documents to CAAT.

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## PHASE 3: DOCUMENT EVALUATION

CAAT will review application documents to ensure that organisation’s processes and procedures comply with CAAT announcement on repair station approval.

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## PHASE 4: DEMONSTRATION AND INSPECTION

CAAT will arrange an audit at the applicant facility to verify their compliance with the documented processes and procedures.

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## PHASE 5: CERTIFICATION

Once the applicant meets the regulatory requirements of CAAT announcement on repair station approval and certification fees have been paid, CAAT will issue the repair station certificate and operations specifications with the appropriate ratings.

Source: CAAT
BOI & EEC recognize the importance of aerospace and offer a wide range of tax and non-tax incentives for projects that meet national development objectives.

**BOI standard corporate tax incentives**

<table>
<thead>
<tr>
<th>Group</th>
<th>Eligible activities</th>
<th>Incentives</th>
<th>Exemption of import duty*</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>• Manufacture of Aircraft or Aircraft Parts&lt;br&gt;• Manufacture of Aerospace Devices and Equipment&lt;br&gt;• Aerospace Operating Systems&lt;br&gt;• Vocational training centres&lt;br&gt;• Scientific laboratories&lt;br&gt;• Calibration services</td>
<td>Corporate income tax exemption</td>
<td>8 years without cap</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>A2</td>
<td>Repair of Aircraft or Aircraft Parts</td>
<td>Corporate income tax exemption</td>
<td>8 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>A3</td>
<td>• Manufacture of Onboard Devices and Equipment (except disposable and reusable aircraft utilities and supplies)&lt;br&gt;• Aviation or Aerospace Industrial Zones or Industrial Estates</td>
<td>Corporate income tax exemption</td>
<td>5 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>A4</td>
<td>Repair of Onboard Devices and Equipment (except disposable and reusable aircraft utilities and supplies)</td>
<td>Corporate income tax exemption</td>
<td>3 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>B1-B2</td>
<td>Trade and investment support offices (TISO): Engineering service</td>
<td>Only Non-tax Incentives</td>
<td></td>
</tr>
</tbody>
</table>

**BOI non-tax incentives**

These activities also receive the following non-tax incentives:

- Permit to bring in expatriates
- Permit to own land
- Permit to take or remit foreign currency abroad

Note: * Exemption of import duty on raw or essential materials and machinery used in manufacturing export products.

Source: Board of Investment (BOI)

**Additional corporate tax incentive for investment projects located in the EEC area**

<table>
<thead>
<tr>
<th>Zone</th>
<th>Additional Incentives (Specific business types defined)</th>
<th>Training Conditions for S&amp;T students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Special promotional zone (Aerotropolis, EECi and EECd)</td>
<td>• Corporate income tax exemption for 2 more years&lt;br&gt;• 50% corporate income tax reduction for 5 more years</td>
<td>≥ 10% of staffs or ≥ 50 people whichever is lower</td>
</tr>
<tr>
<td>2. Target industry promotion zone (10 targeted industries)</td>
<td>50% corporate income tax reduction for 5 more years</td>
<td>≥ 5% of staffs or ≥ 25 people whichever is lower</td>
</tr>
<tr>
<td>3. Industrial estates or general industrial zones in EEC</td>
<td>50% corporate income tax reduction for 3 more years</td>
<td></td>
</tr>
</tbody>
</table>

Note: Applications for the additional investment packages must be filed with the BOI during the period of 1st January 2018 to 30th December 2019.

**On top of additional tax incentive, EEC offers...**

- Maximum personal income tax of 17% for executives and experts
- Eligible foreign investors will be permitted 50-year leases for residential development and 99-year leases for commercial and industrial areas
- Work permit and visa assistance and a five-year business visa
- 3-month public-private-partnership (PPP) procedure
- Fast-track environmental impact assessment (EIA)
- Foreign currency account and use of foreign currencies without exchanging into Thai baht
In between, South East Asia MRO spending is forecasted to grow 4 times in 20 years.

Source: CAAT (by Frost & Sullivan Analysis)
Thai AirAsia is expected to drive the bulk of the growth and it is expected to become the largest airline in terms of fleet size. Thai Airways will continue to be the largest wide-body operator in the country.

20-year Fleet growth by Airline

Source: CAAT (by Frost & Sullivan Analysis)
In terms of human resource, Thailand offers skilled labour at competitive costs compared to other Asia-Pacific countries. Also, Thailand creates over 180,000 engineers and 200,000 scientists annually.

There are many curricula in aerospace engineering and technology in Thailand such as:

<table>
<thead>
<tr>
<th>Institution</th>
<th>Curricular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil Aviation Training Centre</td>
<td>Bachelor of Engineering in Aviation Engineering Program (AEE)</td>
</tr>
</tbody>
</table>
| Kasetsart University | ▪ Bachelor of Engineering in Aerospace Engineering  
                          ▪ Bachelor of Engineering in Aerospace Engineering and Business Administration (International Program)  
                          ▪ Master of Engineering in Aerospace Engineering |
| Chulalongkorn University | Bachelor of Engineering in Aerospace Engineering (International Program) |
| King Mongkut’s University of Technology North Bangkok | ▪ Bachelor of Engineering in Aerospace Engineering  
                                                       ▪ Master of Engineering in Aerospace Engineering |
| Thammasat University: Sirindhorn International Institute of Technology (SIIT) | Bachelor of Engineering in Mechanical Engineering - Aerospace |
| Assumption University of Thailand | Bachelor of Engineering in Aeronautic Engineering |
| Suranaree University of Technology | Bachelor of Engineering in Aeronautical Engineering |
| Southeast Asia University | Bachelor of Engineering in Aircraft Maintenance Engineering |

Source: BOI
The recommended target segments in component MRO for Thailand

- Wheels & Brakes
- Auxiliary Power Units
- Inflight entertainment (IFE) Components
- Engine Fuel & Control
- Landing Gear

Source: CATT (by Frost & Sullivan)
<table>
<thead>
<tr>
<th>Landing gear and Wheels &amp; Brakes</th>
<th>Engine fuel &amp; Control</th>
<th>Auxiliary Power Unit (APU)</th>
<th>Inflight Entertainment (IFE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Messier-Bugatti-Dowty</td>
<td>HEICO</td>
<td>Honeywell Aerospace</td>
<td>Panasonic Avionics</td>
</tr>
<tr>
<td>Megjtt Aircraft Braking Systems Corporation</td>
<td>WENCOR</td>
<td>UTC Aerospace Systems, Air Management Systems</td>
<td>Rockwell Collins</td>
</tr>
<tr>
<td>UTC Aerospace Systems, Landing Systems</td>
<td>Triumph Engine Control Systems</td>
<td>Pratt &amp; Whitney AeroPower (Hamilton Sundstrand)</td>
<td>Thales</td>
</tr>
<tr>
<td>Parker Aerospace Aircraft Wheel &amp; Brake</td>
<td>Secondo Mona SpA</td>
<td>Barry Controls Aerospace</td>
<td>Zodiac</td>
</tr>
<tr>
<td>Crane Aerospace/Hydro-Aire Inc.</td>
<td>UTC Aerospace Systems - Engine Systems</td>
<td>Microtubo S.A.S.</td>
<td>Lumexis</td>
</tr>
<tr>
<td>MECAER Aviation Group</td>
<td>Woodward Aircraft Turbine Systems</td>
<td>Aerosilta Joint Stock Co.</td>
<td>Gogo</td>
</tr>
<tr>
<td>Liebherr-Aerospace Lindenberg GmbH</td>
<td>Aerazur - Zodiac Group</td>
<td>AcousticFab, Inc.</td>
<td>Row 44</td>
</tr>
<tr>
<td>NIACC-Avitech Technologies</td>
<td>Intertechnique</td>
<td>Motor Sich JSC</td>
<td></td>
</tr>
<tr>
<td>Beringer SA</td>
<td>Sofrance</td>
<td>LMI Aerospace, Inc.</td>
<td></td>
</tr>
<tr>
<td>ECE</td>
<td>Engineered Fabrics Corp.</td>
<td>LORD Corporation</td>
<td></td>
</tr>
<tr>
<td>Héroux-Devtek Inc.</td>
<td>Eaton Ltd</td>
<td>Eaton Fuel Systems Division</td>
<td></td>
</tr>
<tr>
<td>CIRCOR Aerospace</td>
<td>Parker Aerospace, Air &amp; Fuel Division</td>
<td>Pratt &amp; Whitney Canada</td>
<td></td>
</tr>
<tr>
<td>Sumitomo Precision Products Canada Aircraft Inc.</td>
<td>PTI Technologies Inc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Crane Aerospace &amp; Electronics – Lear</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Romec</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GKN Aerospace Services</td>
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<tr>
<td></td>
<td>Nichols Airborne Division</td>
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</tbody>
</table>

Source: CAAT (by Frost & Sullivan)
### Human resource in OEM and MRO industry in Thailand (2017)

<table>
<thead>
<tr>
<th>MRO Company</th>
<th>Engineers and technicians</th>
<th>Other employees</th>
<th>Total employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>TG Technical Department [1]</td>
<td>2,418</td>
<td>1,233</td>
<td>3,651</td>
</tr>
<tr>
<td>Chromalloy</td>
<td>300</td>
<td>200</td>
<td>500</td>
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<tr>
<td>Cosmo Thai</td>
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<td>5</td>
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<tr>
<td>AEPS</td>
<td>27</td>
<td>13</td>
<td>40</td>
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<tr>
<td>Aircraft Engineering Consultant</td>
<td>7</td>
<td>3</td>
<td>10</td>
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<tr>
<td>Airborne Support</td>
<td>40</td>
<td>15</td>
<td>55</td>
</tr>
<tr>
<td>Bangkok Airways</td>
<td>230</td>
<td>53</td>
<td>283</td>
</tr>
<tr>
<td>Triumph Aviation Services</td>
<td>124</td>
<td>66</td>
<td>190</td>
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<tr>
<td>Thai Aviation Industries</td>
<td>160</td>
<td>79</td>
<td>239</td>
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<tr>
<td>Thai Aerospace Industries [2]</td>
<td>141</td>
<td>72</td>
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<tr>
<td>Thai Air Asia</td>
<td>435</td>
<td>221</td>
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<tr>
<td>Thai Lion Air</td>
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<td>Nok Air</td>
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<td>Thai Smile</td>
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<td>30</td>
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<tr>
<td>NokSkoot</td>
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<td>5</td>
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<tr>
<td>Thai AirAsia X</td>
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<td>Sabaidee Airways</td>
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<td>Thai VietJet</td>
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<td>Asia Atlantic Airlines</td>
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<td>Slam Air Transport</td>
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<td>15</td>
<td>45</td>
</tr>
<tr>
<td>Jet Asia Airways</td>
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<td>12</td>
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<tr>
<td>SkyView</td>
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<td>8</td>
<td>25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4,996</strong></td>
<td><strong>2,516</strong></td>
<td><strong>7,512</strong></td>
</tr>
</tbody>
</table>

Source: Secondary Research, Primary data from interviews conducted in 2017, CAAT Manpower Document

Note: Other employees include planners, admin and other support functions.

Major international OEM companies in Thailand

Triumph Structures is a Tier II integrator of aircraft parts and assemblies. The company is the industry leader in swaged tubular products and wire rope mechanical cables. Triumph Structures is also an industry leader in high technology composites including acoustically treated engine liners, aircraft structures and medical applications. Triumph Structures produces a number of products in Thailand, including machined and composite parts, and assemblies.

Senior Aerospace

Senior aerospace specializes in the manufacture of both structures components and assemblies, and compressor aero foils for high volume aero-engine programs. It is located in Chonburi province.

Driessen

Driessen Aircraft Interior Systems, part of Zodiac Aerospace, specializes in designing, manufacturing, and marketing high quality galleys, galley equipment and cargo equipment. Driessen’s manufacturing facilities in Lamphun and Samutprakan province specialize in galley, galley parts, airline products, trolley and trolley parts.

Cobra International Co., Ltd. In Chonburi province, Thailand, is the world leading OEM manufacturer of high-end composite products. Cobra manufactures a wide range of products, components, and parts for aerospace and industrial applications. The company’s focus is providing customers with production solutions to deliver the highest quality products to meet each customer’s specific needs.

Leistritz

Leistritz, a German company, was founded in 1905. Leistritz has manufactured turbine blades for aircraft and rocket engines, gas and steam turbines. Leistritz is a global supplier of components for the international aero engine and power generation industry. Leistritz has signed a manufacturing agreement with Rolls-Royce, a global power systems company. Leistritz established a manufacturing base in Chonburi, Thailand for the forging of compressor blades to be as a Tier II supplier of Rolls-Royce.

Goodyear Thailand manufactures and distributes a range of tires for automobiles, trucks and aircraft. The Goodyear brand has been visible in Thailand for over 50 years, while manufacturing facilities were established here in 1968 to serve the local and overseas markets. For the better part of a century, Goodyear’s corporate values have been centered on the phrase, “Protect Our Good Name.” Goodyear Thailand is listed on the Stock Exchange of Thailand.

Michelin

Established in 1987, Michelin Siam Group is a leading manufacturer and distributor of tire products covering a wide range of sections from passenger car and light truck, truck and bus, motorcycle, earthmover to airplane tires under the brand names “Michelin”, “BF Goodrich” and “Siam Tyre”. Michelin Aircraft Tyre supplies bias tyres, radial tyres, and tubes for the worldwide aviation community.
Major international MRO companies in Thailand

Triumph Aviation Services - Asia. This new company was formed to become Triumph Group’s Asia-Pacific aftermarket services headquarters and one-stop service center for all of Triumph Group’s in-region MRO activity. The company has invested over $25 million USD in the new facility which is poised to be recognized among the finest MRO centers anywhere in the world.

**TASA Capabilities include:**
- Auxiliary power units (APU) and related accessories (LRU)
- Engine nacelle
- Components including thrust reversers, nose cowls and fan cowls
- Accessory (LRU) support
- Composites & bonded airframe structures
- Core APU & piece part repairs
- Structural repairs
- Aircraft accessories

**CHROMALLOY**

Chromalloy Thailand, first established in 1989, is trusted worldwide to provide commercial aviation engine manufacturers with a wide range of innovative, high-technology repair options to support ever-growing long term service agreements and power-by-the-hour programs.

**Chromalloy Process Capabilities Include:**
- Engineering
- Coatings
- Machining
- Joining technology
- Thermal processing

Scandinavian Aircraft Maintenance (SAMTHAI) was founded in 2009 as a subsidiary of SAM AERO AS. The company entered into a joint venture with Thai Aviation Industries to plan and develop the construction and operation of the Aviation MRO & Centre of Excellence in Bangkok. SAMTHAI also signed an agreement with the Directorate of Aeronautical Engineering (DAE) to support & supply the Thai Royal Flight, Royal Thai Air Force, Royal Thai Army and Thai Police with spare parts for numerous aircraft & helicopters through the Associated Aircraft Group (AAG) Canada. SAMTHAI is also cooperating with Geven to supply and install new seating for Thai International Airways aircraft.

Rolls-Royce has developed strong long-term relationships with key businesses in Thailand including Thai Airways International, Bangkok Airways and all three military branches; Royal Thai Air Force, Royal Thai Army, and Royal Thai Navy.

Rolls-Royce has recently signed a long-term TotalCare® service support contract with Thai Airways International Public Company Limited (THAI) for Trent 1000 engines that power six Boeing 787-8 Dreamliner aircraft.