

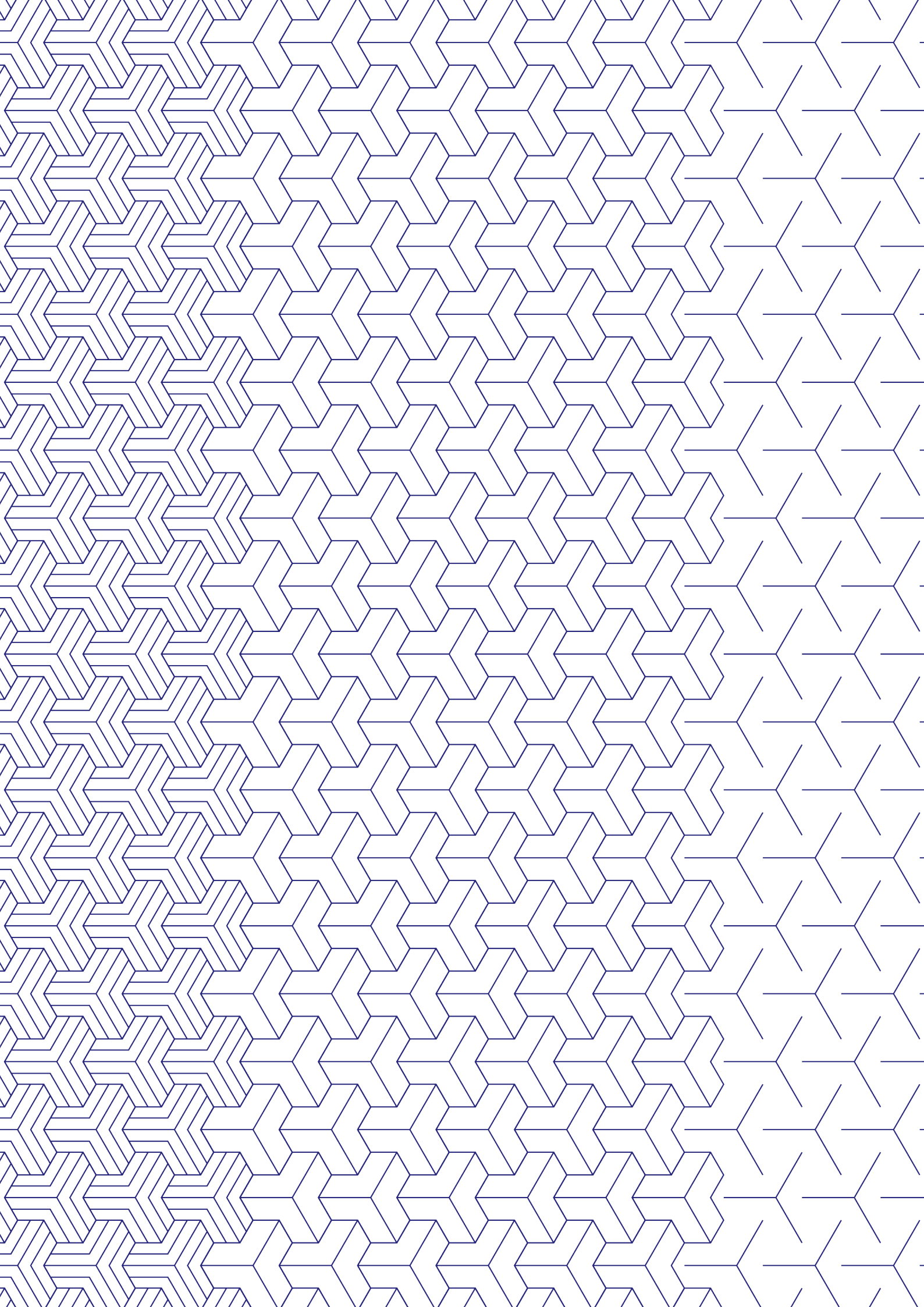


MINISTRY OF INVESTMENT,
TRADE AND INDUSTRY

NEW INDUSTRIAL
MASTER PLAN 2030

AEROSPACE INDUSTRY





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PREFACE

Malaysia's strength in the manufacturing sector has been significantly driven by the implementation of robust and forward-thinking Industrial Master Plans, first launched in 1986.

The success of the IMP3 (2006-2020) was anchored on innovation, research and development (R&D) and human capital development to drive high value-added industries to transform Malaysia into a knowledge-based economy.

The journey towards formulating the NIMP 2030 is underscored by the need to build a robust industrial sector as an important prerequisite to achieve socioeconomic prosperity. Three previous iterations of the Industrial Master Plans have driven industrial development in Malaysia, with the Government adopting industrial development strategies relevant to the period to transform the economy. Malaysia flourished from a low-productivity agrarian-based economy and is heading towards achieving developed nation status, underpinned by robust manufacturing and services sectors. The strategy has successfully raised the living standards of the Rakyat and propelled remarkable growth in Gross National Income (GNI) per capita, increasing 34 times between 1967 to 2019, making Malaysia one of the fastest growing economies in modern history.

Industrial policies have since become more diverse and complex, incorporating new imperatives including the integration into the global value chain (GVC), development of indigenous capabilities in a knowledge economy, evolution of environmental, social and governance (ESG) criteria and disruptions from the new industrial revolution. The question is not about the necessity of such policies, but rather what new policies are required and how to proceed.

Given the current challenging environment, benchmarking and learning from other country's experiences are no longer sufficient. Malaysia needs to embark on its own path into uncharted territory, to steer the nation into the challenging future. The combined impact of the new imperatives and the recent pandemic has compelled the Government to rethink Malaysia's industrial strategy.

With the NIMP 2030, Malaysia intends to transform the industry into greater heights, capitalising on emerging global trends, supply chain disruptions, current geopolitical landscape, digitalisation and ESG considerations. These trends are moving at an unprecedented pace and Malaysia has to act fast.

Therefore, the NIMP 2030 is designed to achieve the aspirations in a span of seven years and takes on a Mission-based approach for industrial development. This approach unites Malaysia by encouraging collaboration between the Government and the private sector to rally the industries.

Purpose of the NIMP 2030

The NIMP 2030 sets forth Malaysia's future direction in industrial transformation. It provides a national integrated plan for resilient industrial development until 2030 – setting the fundamentals for future policy development and enabling the industry at all levels. It articulates Malaysia's position and participation in the global economic environment.

The NIMP 2030 serves to:

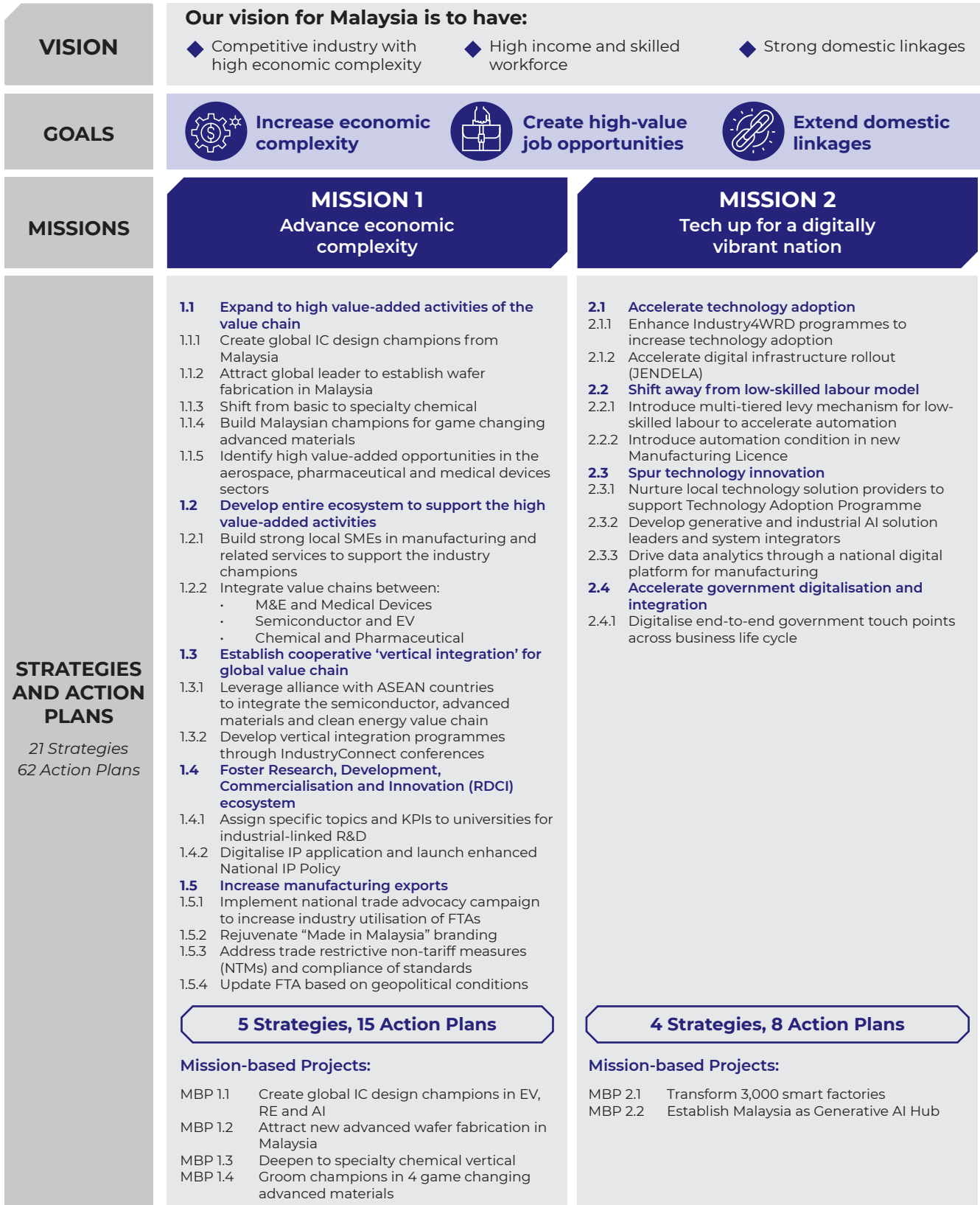
- Provide national strategic direction to lead the industrial development policies;
- Be a conversation piece for investors and other economies on Malaysia's position and direction; and
- Feature the role of the Malaysian Government in shaping the economy.

INTRODUCTION

New Industrial Master Plan 2030

The Missions and Enablers identified will be executed through 21 Strategies and 62 Actions Plans to unlock the needed enabling ecosystems. Several catalytic Mission-based

Projects (MBPs) have been identified to catapult the mission-based implementation. The NIMP 2030 strategic framework is illustrated below:



◆ New and existing industry clusters

◆ Balanced and inclusive participation

◆ Sustainable development

**Develop new & existing clusters****Improve inclusivity****Enhance ESG practices****MISSION 3**
Push for Net Zero**MISSION 4**
Safeguard economic security and inclusivity**ENABLERS****3.1 Accelerate transition towards sustainable practices**

- 3.1.1 Develop sectoral decarbonisation pathways to guide transition
- 3.1.2 Decarbonise "hard-to-abate" sectors
- 3.1.3 Introduce carbon policy, accounting and tax
- 3.1.4 Launch iESG framework and transition programmes

3.2 Transition to renewable and clean energy

- 3.2.1 Enhance adoption scheme for energy efficiency or renewable energy
- 3.2.2 Accelerate availability and accessibility of renewable energy source for the industry

3.3 Catalyse new green growth areas

- 3.3.1 Catalyse EV as a key growth driver
- 3.3.2 Grow carbon capture, utilisation and storage (CCUS) as a new sector
- 3.3.3 Develop circular economy framework for the industry

3.4 Shift towards green infrastructure

- 3.4.1 Accelerate transformation of industrial estates into eco-industrial parks

4.1 Develop resilient supply chain

- 4.1.1 Identify specific supply chain resilience strategies for critical sectors
- 4.1.2 Establish supply chain cooperation and collaboration through G2G and G2B programme
- 4.1.3 Introduce National Mineral Policy for downstream processing of critical minerals

4.2 Foster climate resilient development

- 4.2.1 Develop sectoral adaptation pathways
- 4.2.2 Foster an adaptation industry to provide adaptation products and services (including exports)
- 4.2.3 Instil climate resilience measures for critical economic infrastructure

4.3 Strengthen industrial clusters for regional development

- 4.3.1 Expand clusters for spillover regional impact
- 4.3.2 Align industrial development plan between Federal and States

4.4 Empower Bumiputera participation and create inclusive workforce

- 4.4.1 Uplift capabilities of *Bumiputera* companies in manufacturing via *Tindakan Pembangunan Bumiputera 2030*
- 4.4.2 Develop programme to increase women participation in high-skilled manufacturing employment

E.1 Mobilise financing ecosystem

- E.1.1 Introduce NIMP Industrial Development Fund and NIMP Strategic Co-Investment Fund
- E.1.2 Boost financing for digitalisation and decarbonisation transition
- E.1.3 Establish green *sukuk* to facilitate transition
- E.1.4 Establish supply chain financing for SMEs
- E.1.5 Increase utilisation of the capital market
- E.1.6 Expand the imSME platform to show all available funding options including government funding and capital market
- E.1.7 Review government funding for consolidation

E.2 Foster talent development and attraction

- E.2.1 Leverage mynext and MYFutureJobs for strategic workforce planning to address long-term demand-supply requirement
- E.2.2 Introduce progressive wage system policy
- E.2.3 Improve policy to enable fast and hassle-free access to high-skilled foreign talents
- E.2.4 Expand TVET programmes for high-skilled jobs in critical sectors
- E.2.5 Raise profile of high-tech manufacturing career to attract interest in STEM subjects

E.3 Establish best-in-class investor journey for ease of doing business

- E.3.1 Establish a unified investment strategy and align investment evaluation to new parameters under NIA
- E.3.2 Harmonise and streamline functions and KPIs across IPA landscape
- E.3.3 Review and design competitive, agile and relevant incentives
- E.3.4 Improve One-Stop Portal for seamless investor experience

E.4 Introduce whole-of-nation governance framework

- E.4.1 Establish public-private collaborative councils
- E.4.2 Set up NIMP 2030 Delivery Management Unit
- E.4.3 Develop NIMP 2030 dashboard system

4 Strategies, 10 Action Plans**Mission-based Projects:**

- MBP 3.1 Create decarbonisation pathway role models
- MBP 3.2 Launch locally-manufactured EV
- MBP 3.3 Deploy large-scale CCUS solutions

4 Strategies, 10 Action Plans**4 Strategies, 19 Action Plans**

NIMP 2030 SECTORAL PLAN

There are individual enclosures of 21 sectors included as a supplementary reference to the main NIMP 2030 document.

They provide a view of the respective sectoral perspective in the context of the main NIMP 2030 document, and were developed with reference to individual sectoral roadmaps, where applicable.

The 21 sectors are:

Category	Industry
Priority Sectors	<ol style="list-style-type: none"> 1. Aerospace 2. Chemical 3. Electrical and Electronics (E&E) 4. Pharmaceutical 5. Medical Devices
Sectors	<ol style="list-style-type: none"> 6. Digital and Information and Communication Technology (ICT) 7. Automotive 8. Food Processing 9. Global Services and Professional Services 10. <i>Halal</i> 11. Machinery and Equipment (M&E) 12. Manufacturing-Related Services (MRS) 13. Metal 14. Mineral 15. Palm Oil-based Products 16. Petroleum Products and Petrochemicals 17. Rail 18. Rubber-based Products 19. Shipbuilding and Ship Repair (SBSR) 20. Textile, Apparel and Footwear 21. Wood, Paper and Furniture

This document is the [NIMP 2030 Sectoral Plan – Aerospace Industry](#).

OVERVIEW OF THE DOCUMENT

This NIMP 2030 Sectoral Plan – Aerospace Industry (Document) provides insights into the sector and its prospects during the NIMP 2030 period.

This Document offers a comprehensive understanding of the industry's direction during the NIMP 2030 period based on its historical performance, opportunities and strategies to overcome existing challenges and achieve its targets.

The Document is presented in five sections:

1. Background

- This section sets the foundation to help readers understand the industry.
- It delves into the industry's focus area, encompassing its sub-sectors, for a comprehension of the industry's breadth.¹
- Readers will find details about the industry's value chain and its key players, including the relevant industry associations, in this section.
- The section lists the policies that are related to the industry.

2. Performance

- This section reports the industry's performance during specific periods.
- There are two notable periods for the review of the industry's historical performance:
 - the IMP3 period (2006 to 2020); and
 - from 2021 to 2022.
- The performance review of the industry's development includes its investment trends, export and import dynamics, employment figures, value-added and productivity measures.

3. Trends and Opportunities

- This section highlights the opportunities and potential avenues for growth that the industry can leverage during the NIMP 2030 period.

4. Challenges

- This section provides insights into potential obstacles that could impact the industry's growth and development.

5. Strategies and Action Plans

- The final section of the document outlines the future trajectory for the industry.
- This section provides the Strategies and Action Plans that are intended to catalyse the industry during the NIMP 2030 period.
- The Strategies and Action Plans set in this Document have been aligned to the Missions set in the main NIMP 2030 document.

¹ Incentives available for this industry as of time of writing can be found in Appendix 1

SECTION 1 BACKGROUND

Areas Covered

- The aerospace industry in Malaysia is categorised into five sub-sectors (Table 1.1).

Table 1.1: Sub-sectors of Aerospace Industry

Sub-sectors	Sub-sectors Breakdown
i. Maintenance, Repair and Overhaul (MRO)	<ul style="list-style-type: none"> • Airframe • Engine • Component • Line • Modification • Tear Down and Remanufacturing
ii. Aerospace Manufacturing	<ul style="list-style-type: none"> • Aero-structure (e.g. composites and metallic) • Avionics • Engines • Airframe equipment • Cabin interior
iii. Systems Integration	<ul style="list-style-type: none"> • Monitoring application/ Mission systems/ In-flight entertainment • Flight management systems/ Ground systems • Simulators • Remote sensing and communications satellites • Unmanned Aerial Vehicles (UAV) systems • Missiles and rockets systems
iv. Engineering and Design Services	<ul style="list-style-type: none"> • Engineering and Design
v. Education and Training	<ul style="list-style-type: none"> • Higher learning institutions • Technical training academies • CAAM Part 147 approved training organisations

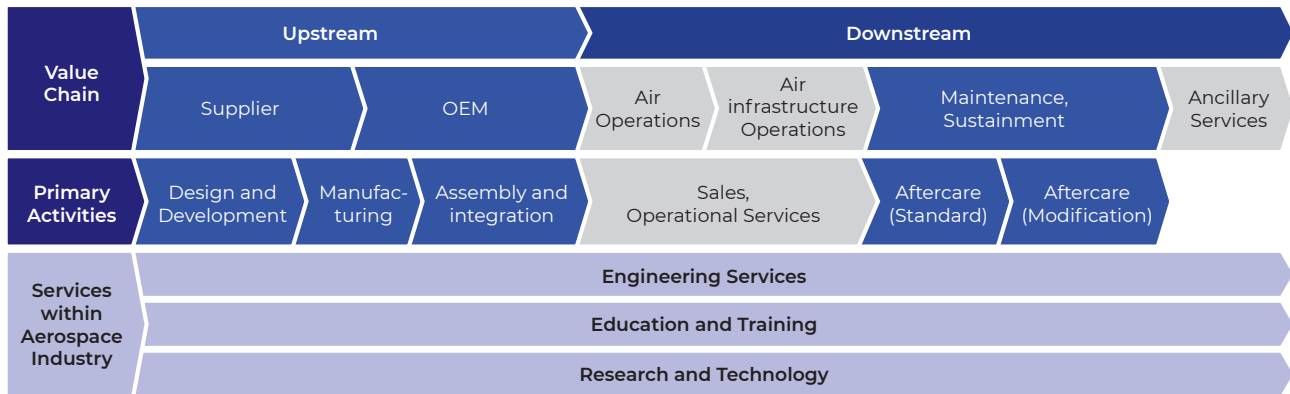
Source: National Aerospace Industry Corporation Malaysia (NAICO Malaysia), Twelfth Malaysia Plan 2021-2025 (RMKe-12)

- As of 2022, MRO and aerospace manufacturing sub-sectors were the main contributors to the industry, contributing 45.0 per cent and 49.0 per cent of total revenue respectively.
- Previously, engineering and design services were recognised as a supporting service for the industry. However, it has recently experienced rapid growth in Europe, America and Asia. As a result, engineering and design services have been recognised as a standalone key sub-sector for the industry.

Value Chain

- The value chain of the industry spans from upstream activities involving Tier 1 to 4 suppliers providing parts to original equipment manufacturers (OEM) to downstream activities focused on the maintenance of those parts and aircraft (Figure 1.1).
 - Upstream activities involve design and development, aerospace manufacturing and systems integration sub-sectors.
 - Downstream activities involve aftercare services which include MRO.
- Engineering services, education and training services, and research and technology supports the entire value chain of the aerospace industry.

Figure 1.1: Value Chain of Aerospace Industry



Source: Ministry of Investment, Trade and Industry (MITI)

6. Certain segments of the ecosystem are not covered as part of the industry's focus area for the NIMP 2030, such as:
- air operations including airliners;
 - air infrastructure operations such as airports and air traffic services;
 - ancillary services such as air travel services; and
 - military and defence operations.

Market Players

7. Presently, there are over 240 key players involved in Malaysia's aerospace industry.² Of these:
- 54.0 per cent are involved in MRO activities; and
 - 20.0 per cent are involved in aerospace manufacturing and engineering and design services.
8. Figure 1.2 maps the presence of the aerospace industry players based on their involvement along the value chain.
- In MRO, there is low participation in design and development activities as a majority of the players are focused on aftercare activities.
 - Players in aerospace manufacturing are concentrated in manufacturing activities in comparison to other activities such as design and development, assembly and integration, and aftercare.
 - Players in systems integration are more focused on design and development, and manufacturing and are less focused on assembly and integration and aftercare.
 - In contrast, there is low participation of key players in engineering and design services across the value chain.
 - Education and training players mainly focus on design and development, manufacturing and aftercare activities of the value chain. There is low involvement of players in this sub-sector within the assembly and integration activities.

² Source: NAICO Malaysia

Figure 1.2: Presence of Industry Players along the Value Chain of Aerospace Industry

Primary Activities Along the Value Chain	Design and Development	Manufacturing	Assembly and Integration	Aftercare
MRO	Low Presence	No Presence	No Presence	High Presence
Aerospace Manufacturing	Low Presence	High Presence	Low Presence	Low Presence
Systems Integration	Medium Presence	Medium Presence	Low Presence	Low Presence
Engineering and Design Services	Low Presence	No Presence	No Presence	No Presence
Education and Training	High Presence	High Presence	Low Presence	High Presence

Source: NAICO Malaysia

9. There are industry associations that provide platforms for collaboration and networking, as well as assistance for growth and access into new markets. Non-exhaustive examples include:
 - i. Malaysia Aerospace Industry Association (MAIA);
 - ii. Technological Association Malaysia (TAM); and
 - iii. Institute of Engineers Malaysia (IEM).

10. Ministries and Government Agencies have prominent roles in promoting the growth and development of the aerospace industry. These include:
 - i. Ministry of Transport (MOT);
 - ii. Ministry of Investment, Trade and Industry (MITI);
 - iii. Ministry of Science, Technology and Innovation (MOSTI);
 - iv. National Aerospace Industry Corporation Malaysia (NAICO Malaysia);
 - v. Malaysian Space Agency (MYSA);
 - vi. Malaysian Investment Development Authority (MIDA); and
 - vii. Malaysia External Trade Development Corporation (MATRADE).

Policies, Laws and Regulations

11. The industry's development is guided by the following:
 - i. Malaysian Aerospace Industry Blueprint 2030 (MAIB 2030);
 - ii. Malaysia Space Exploration 2030 (MSE2030);
 - iii. Space Industry Strategic Plan 2030 (SISP 2030);
 - iv. Malaysia Drone Technology Action Plan 2022-2030 (MDTAP30);
 - v. National Space Policy 2030 (DAN2030); and
 - vi. Twelfth Malaysia Plan 2021-2025 (RMKe-12).

12. Industry players adhere to OEM's requirements that are based on regulations by agencies such as:
 - i. Federal Aviation Administration (FAA); and
 - ii. European Union Aviation Safety Agency (EASA)

SECTION 2 PERFORMANCE

IMP3 Focus and Performance

13. During the period of the IMP3 (2006 to 2020), the aerospace industry focused on the following areas:
 - i. developing and promoting potential growth areas;
 - ii. strengthening domestic capabilities;
 - iii. promoting support services; and
 - iv. developing Malaysia as an outsourcing centre for aerospace products and support activities.
14. Several key milestones were accomplished during this period, to name a few:
 - i. launch of the second remote sensing satellite – RazakSAT in 2009;
 - ii. launch of the Aerospace Malaysia Innovation Centre (AMIC) in 2011 to intensify aerospace research and technology (R&T) activities; and
 - iii. highest revenue recorded at RM16.2 billion in 2019.
15. The industry was gradually recovering from the impact of the COVID-19 pandemic. Its Gross Domestic Products (GDP) contribution³ grew by a CAGR⁴ of 17.6 per cent, amounting to RM1.4 billion in 2022.

Investments

16. The investment performance of the aerospace industry for the period of 2006 to 2022 is recorded as follows (Table 1.2)

Table 1.2: Approved Investments of Aerospace Industry

Items	Units	IMP3			2021	2022	2021-2022
		2006	2020	2006-2020			
Total Investment	RM million	113.2	149.7	18,636.6	104.7	146.8	251.5
Domestic Investment	RM million	80.7	58.0	13,684.9	39.7	146.8	185.5
Foreign Investment	RM million	32.6	91.7	4,951.7	65.0	-	65.0
Number of projects	#	3	7	104	2	2	4
Employment	persons	179	278	18,931	247	42	289

*Note: There were no Foreign Direct Investments (FDI) in 2022
Source: MIDA*

17. During the IMP3 period, a total of 104 projects were approved in the aerospace industry with total investment of RM18.6 billion. These investments committed a total of 18,931 job opportunities.
18. In 2021 and 2022, a total of four projects were approved with total investment of RM251.5 million. These investments committed a total of 289 job opportunities.

³ Includes GDP contribution by aerospace and rail industries

⁴ Compound annual growth rate

19. Overall, the industry's investment trend was attributed to:
- increased aerospace manufacturing investments as OEM shifted their focus to Southeast Asia for cost-effective manufacturing;
 - MRO investment growth due to expansion of the low-cost carriers; and
 - increased air travel demands as borders reopen post COVID-19 pandemic.
20. From 2006 to 2022, 78 projects (72.2 per cent) out of 108 approved projects were implemented.

Exports

21. The export performance of the aerospace industry during the period of 2006 to 2022 is recorded as follows (Table 1.3).

Table 1.3: Exports of Aerospace Industry

Item	IMP3			2021	2022	2006-2020	2020-2021	2021-2022
	2006	2020	2006-2020			CAGR	Annual Growth	
Exports (RM billion)	1.6	9.3	66.1	5.8	6.3	13.3%	-38.0%	9.0%

Source: MATRADE

22. During the IMP3 period, the exports of aerospace industry grew by a CAGR of 13.3 per cent from RM1.6 billion (2006) to RM9.3 billion (2020).
23. In 2021, the exports declined by 38.0 per cent to RM5.8 billion. Subsequently in 2022, exports increased by 9.0 per cent to RM6.3 billion, slowly recovering to its pre-pandemic level.
24. The performance of Malaysia's exports was driven by the growth of low-cost carries, resulting in a demand surge for parts and components of aircrafts.
25. In 2022, the industry's products were mainly exported to:
- France (RM1.8 billion, 28.1 per cent);
 - United States (US) (RM1.0 billion, 16.3 per cent);
 - United Kingdom (UK) (RM574.7 million, 9.1 per cent);
 - China (RM539.9 million, 8.5 per cent); and
 - Singapore (RM486.9 million, 7.7 per cent).

Imports

26. The import performance of the aerospace industry during the period of 2006 to 2022 is recorded as follows (Table 1.4).

Table 1.4: Imports of Aerospace Industry

Item	IMP3			2021	2022	2006-2020	2020-2021	2021-2022
	2006	2020	2006-2020			CAGR	Annual Growth	
Imports (RM billion)	6.0	7.1	154.0	8.0	17.7	1.3%	13.1%	120.3%

Source: MATRADE

27. During the IMP3 period (2006 to 2020), the imports of aerospace industry grew by a CAGR of 1.3 per cent, from RM6.0 billion (2006) to RM7.1 billion (2020).
28. In 2021, the imports further increased by 13.1 per cent to RM8.0 billion. Following that, the imports in 2022 increased significantly to RM17.7 billion.
29. Import growth was mainly driven by the increased acquisition of spare parts for MRO activities.
30. In 2022, the industry's products were mainly imported from:
- US (RM11.7 billion, 66.0 per cent);
 - France (RM2.8 billion, 15.7 per cent);
 - China (RM0.9 billion, 5.0 per cent);
 - UK (RM0.3 billion, 1.9 per cent); and
 - Singapore (RM0.3 billion, 1.9 per cent).
31. In 2022, key imported products were:
- aircraft of an unladen weight >15,000 kg (RM7.4 billion, 42.0 per cent);
 - parts of planes or helicopters (RM4.7 billion, 26.6 per cent);
 - aircraft parts (RM3.4 billion, 19.3 per cent);
 - parts of goods of powered and non-powered aircraft, spacecraft and unmanned aircraft (RM1.1 billion, 6.3 per cent)⁵; and
 - spacecraft, satellites, sub-orbital launch vehicles (RM0.6 billion, 3.2 per cent).

Value-added

32. The value-added (GDP) of the aerospace industry for the period of 2006 to 2022 is recorded in Table 1.5 below.

Table 1.5: Value-added of Aerospace Industry

Item	IMP3		2021	2022	2006-2020	2020-2021	2021-2022
	2006	2020			CAGR	Annual Growth	
Value-added ⁶ (RM billion)	1.2	1.3	1.2	1.4	1.1%	-13.9%	17.6%

Source: DOSM

33. During the IMP3 period, the industry's GDP contribution had grown by a CAGR of 1.1 per cent from RM1.2 billion (2006) to RM1.3 billion (2020).
34. In 2021, the industry's GDP contribution dropped by 13.9 per cent to RM1.2 billion. It recovered with a growth of 17.6 per cent, achieving RM1.4 billion in 2022.

⁵ Includes part of goods of heading 8801 (Balloons and dirigibles; gliders, hang gliders and other non-powered aircraft), 8802 (Powered aircraft (e.g. helicopters and aeroplanes); spacecraft including satellites, and suborbital and spacecraft launch vehicles) or 8806 (Unmanned aircraft)

⁶ Value added is measured by the GDP of the industry; GDP from 2010 onwards includes GDP contributed by rail and aerospace industries, which includes manufacture of railway locomotives, rolling stock, air and spacecraft, related machinery, military fighting vehicles and transport equipment; 2006 GDP data is based on constant 2005 prices, while 2020 to 2022 data are based on constant 2015 prices

35. The growth in GDP was primarily driven by increased air traffic, leading to growing demands in MRO and aerospace manufacturing activities.

Employment

36. The employment in the aerospace industry for the period of 2019 to 2022 is recorded in Table 1.6.

Table 1.6: Employment in Aerospace Industry

Item	IMP3		2021	2022	2019-2022
	2019	2020			CAGR
Employment ⁷ (persons)	15,890	13,839	14,129	14,244	-3.6%

Source: DOSM

37. Employment declined by a CAGR of 3.6 per cent, from 15,890 persons in 2019 to 14,244 persons in 2022.
38. While the industry was recovering from the impact of the COVID-19 pandemic, there was an increased demand for skilled workers to meet the requirements of high value-added activities.

Labour Productivity

39. The labour productivity of the aerospace industry from 2019 to 2022 is recorded in Table 1.7.

Table 1.7: Labour Productivity of Aerospace Industry

Item	IMP3		2021	2022	2019-2022
	2019	2020			CAGR
Labour Productivity ⁸ (RM)	86,983	97,345	82,129	95,761	3.3%

Source: DOSM

40. The labour productivity of the industry increased by a CAGR of 3.3 per cent from RM86,983 (2019) to RM95,761 (2022).
41. The growing industry productivity was attributed to the use of automation and adoption of new technologies such as 3D printing.

⁷ This employment data is based on Monthly Manufacturing Statistics December 2022; data includes employment in aerospace and rail industries which includes manufacture of railway locomotives, rolling stock, air and spacecraft, related machinery, military fighting vehicles and transport equipment. Due to the change in methodology for employment statistics tabulation in 2019, industry's employment breakdown from 2006 to 2018 is not available

⁸ Annual labour productivity is derived from value added per employment

SECTION 3 TRENDS AND OPPORTUNITIES

42. Globally, the aerospace industry is expected to grow to RM2.6 trillion⁹ by 2030, at a growth of 5.9 per cent.¹⁰ This is supported by air traffic growth of 6.1 per cent and fleet growth of 3.5 per cent.¹¹
43. Particularly in the Asia-Pacific, MRO spending is projected to grow with a CAGR of 5.3 per cent to RM519.7 billion¹² by 2030, increasing at a higher rate than the global average of 3.9 per cent.¹⁰
 - i. The growth is driven by fleet expansion in the past decades.
 - ii. The region is projected to become the largest global airline market, receiving approximately one-third of new jet deliveries.
44. Globally, 40,850 new passenger and freighter aircrafts are projected over the next 20 years¹³, providing great opportunities to Asia-Pacific.
 - i. Presently, Primes (i.e. Boeing and Airbus) and first-tier suppliers are progressively outsourcing a greater share of work to Asia. This shift aims to reduce costs, focus on core business areas and meet the Primes' demand more effectively.
 - ii. The large backlog faced by the Primes provides growth potential for the aerospace parts and components manufacturing market.
45. Being the second largest market shareholder in terms of revenue and activity in Southeast Asia, Malaysia can leverage on the growth trends by strengthening its competencies and supply chain within the industry ecosystem.
46. Opportunities for Malaysia include astronautics, unmanned aerial vehicles (UAV), composite, avionics, teardown and remanufacturing services, high-skilled talents and digitalisation.

Astronautics

47. By 2030, the global space economy is expected to exceed triple its size, reaching RM6.3 trillion.^{14,15}
48. Malaysia's strategic geographical location presents a strong advantage for space launching.
 - i. Its position near the equator provides higher rotational speed, reducing required thrust and fuel consumption.
 - ii. Its location west of the South China Sea offers a safety buffer for launch risks and eases the collection of discarded launch parts.
49. Malaysia has a strong foundation in astronautics due to its satellite programmes, international relationships with the International Telecommunications Union, and strong Government support through policies such as the DAN2030 and MSE2030.
50. However, as this industry is still in its early stages, technology and regulations are yet to mature. Malaysia has the opportunity to explore these opportunities by strengthening local capabilities.
51. Refer to Action Plan 2 (AP2) in Section 5 for strategies and action plans related to developing technologies in astronautics.

⁹ USD573.6 billion, converted based on exchange rate USD1 to RM4.48

¹⁰ Source: MAIB 2030

¹¹ Source: Boeing

¹² USD116.0 billion, converted based on exchange rate USD1 to RM4.48

¹³ Source: Airbus

¹⁴ USD1.4 trillion, converted based on exchange rate USD1 to RM4.48

¹⁵ Source: Bank of America

Unmanned Aerial Vehicles

52. By 2030, the global drone technology services market is expected to reach RM1.3 trillion.^{16,17}
53. Recognising the importance of the market, the Government launched the MDTAP30 as the national agenda. The key focus of MDTAP30 includes the development of:
 - i. national Unmanned Traffic Management (UTM) system;
 - ii. digital drone registration portal;
 - iii. special drone use-case adoption in key sectors; and
 - iv. talent such as the accreditation of the Remote Pilot Training Organisations (RPTO).
54. Based on the MDTAP30, the Malaysian market has the potential to contribute RM50.7 billion GDP to the country and create 100,000 new employment opportunities by 2030.
55. Malaysia's unmanned aerial vehicles (UAV) landscape exhibits promising growth potential, with use cases in sectors such as Oil and Gas (O&G) and Agriculture. Additional opportunities arose amid the COVID-19 pandemic, in areas such as disaster operations and delivery of medical supplies.
56. Hence, Malaysia has the opportunity to achieve market leadership in the UAV industry by developing new drone technologies by leveraging on the Government's support and the presence of leading players in Malaysia.
57. Refer to Action Plan 2 (AP2) in Section 5 for strategies and action plans related to developing drone technologies.

Composite Materials

58. The global composite market is expected to grow up to RM211.9 billion¹⁸ at 8.8 per cent by 2020.¹⁹
59. This is driven by the global airlines seeking ways to use lightweight airframe materials to improve fuel efficiency to reduce greenhouse gas emissions.
60. Malaysia has strong fundamentals to grow in this sub-segment, driven by the presence of several research and manufacturing facilities such as Composites Technology Research Malaysia (CTRM) and Aerospace Composites Malaysia (ACM).
61. Refer to Action Plan 2 (AP2) in Section 5 for strategies and action plans related to developing technologies in composites.

Avionics

62. The global commercial avionics market is estimated to reach RM283.6 billion²⁰ by 2030, with a growth rate of 6.1 per cent.²¹
63. The market growth is expedited by:
 - i. regulatory mandates from the FAA and the EASA that have been implemented to ensure aviation safety; and
 - ii. increased emphasis on improving flight operations through enhancements in digital glass displays, connected flight management systems and head-up displays.

¹⁶ USD300.0 billion, converted based on exchange rate USD1 to RM4.48

¹⁷ Source: Fortune Business Insight

¹⁸ USD47.3 billion, converted based on exchange rate USD1 to RM4.48

¹⁹ Source: Globe Newswire

²⁰ USD63.3 billion, converted based on exchange rate USD1 to RM4.48

²¹ Source: Frost & Sullivan

64. The market is driven by growing UAV and astronautics markets as the aircrafts and spacecrafts communicate via avionics systems such as flight control systems, navigation systems and communication systems.
65. Collaboration between avionics with the emerging markets such as UAV and astronautics is essential to ensure holistic development of new technologies.
66. Refer to Action Plan 2 (AP2) in Section 5 for strategies and action plans related to the development of avionic technologies.

Teardown and Remanufacturing Services

67. In the next 20 years, the global market is expected to have over 1,100 dismantled and recycled aircraft, and 2,200 cabins that require upgrades or refurbishment.²²
68. The emergence of these end-of-life services is mainly driven by several factors:
 - i. growing emphasis on sustainability and circular economy;
 - ii. increasing cost of raw materials; and
 - iii. development of new technologies.
69. Malaysia has the potential to grow the market domestically as it hosts the first MRO facility in Southeast Asia that handles full life cycle of aviation assets including aircraft teardown, aircraft material recycling and parts trading.
70. Collaboration between industry players is important, as observed in the development of the MRO hub in Malaysia. This provides an opportunity to promote Malaysia as Asia-Pacific's hub for MRO, with focus in aircraft teardown and recycling activities.
71. Refer to Action Plan 8 (AP8) in Section 5 for strategies and action plans related to sustainability measures.

High-Skilled Talents

72. The expansion of the industry will demand for more high-skilled talents. Therefore, emphasis is required on education and training services.
73. Cumulatively across the next 20 years, expected global workforce demand in the aerospace industry are:
 - i. 640,000 technicians;
 - ii. 585,000 pilots; and
 - iii. 875,000 cabin crews.²²
74. Malaysia is currently the Southeast Asia's market leader – supplying 54.0 per cent of skilled talents with various competency across the region.
75. Malaysia has the opportunity to go beyond the region by aligning the education programmes with the latest technology and industry trends.
76. Refer to Action Plan 10 (AP10) in Section 5 for strategies and action plans related to strengthening education and training services.

²² Source: Global Service Forecast

Digitalisation

77. Prior to the pandemic, adoption of technologies such as automation and robotic were limited.
78. The pandemic has pushed industry players to realise the importance of digital technologies. Industry players leveraged on technology advancements to improve their competitiveness through real-time information on resource availability, production capacity and performance monitoring.
79. Digital technologies such as 3D printing and augmented reality have been used in various activities including engineering and design, and aerospace manufacturing.
 - i. With increasing digitalisation, there is potential for Malaysia to establish a centralised data repository that connects all stakeholders in the industry.
 - ii. This provides the Government a platform to regulate and monitor industry development, and the industry players to gain access to real-time information of the industry
80. Refer to Action Plan 6 (AP6) in Section 5 for strategies and action plans related to adoption of digital technology for information sharing.

SECTION 4 CHALLENGES

Position in the Global MRO Market

81. In Malaysia, MRO operations mainly focus on line and base maintenance, with limited involvement in high value-added activities such as component and engine repairs which are more profitable and complex.
82. As such, Malaysia requires more participation in these high value-added activities to strengthen its position in the global MRO market and improve its economic potential. Competitiveness of the local MRO industry is compromised due to the outsourcing of these activities, resulting in increased costs and longer turnaround times.
83. To tackle this challenge, it is essential to implement clustering and zoning strategies to develop specialised capabilities in MRO.
84. Clusters will be formed based on areas of expertise such as line maintenance, component repairs and engine maintenance – fostering synergy and emphasising the industry's strengths. Zoning allows these clusters to specialise and deliver products and services of higher complexity and value.
85. Refer to Action Plan 1 (AP1) in Section 5 for strategies and action plans related to the clustering and zoning of aerospace activities.

Coordinated Support

86. The aerospace industry encounters various challenges in maintaining its competitiveness and sustainability, particularly regarding ecosystem support.
87. Local players, in particular small and medium enterprises (SMEs), encounter difficulties due to:
 - i. the complex certification process of different regulatory bodies related to aerospace;
 - ii. limited understanding of industry standards and requirements;
 - iii. limited awareness of industry demand.
88. Fragmented governance and a non-streamlined approaches hinder the industry's progress and clarity in its overall direction.
89. To address these challenges, efforts can be made through:
 - i. establishment of a one-stop centre to improve efficiency and streamline processes – reducing the time and effort involved in navigating complex regulations; and
 - ii. implementation of the Industrial Collaboration Programme (ICP) between the Government and industry players to enhance the competitiveness of local players.
90. NAICO Malaysia will continue to play a vital role in facilitating such collaboration among all stakeholders in the Aerospace industry.
91. Refer to:
 - i. Action Plan 3 (AP3) in Section 5 for strategies and action plans related to establishment of collaboration programme for the growth of local industry; and
 - ii. Action Plan 4 (AP4) in Section 5 for strategies and action plans related to the one-stop centre

Research and Technology

92. R&T activities in the industry are limited, despite the presence of specialised research institutions.
93. Institutions such as the Central Aerospace Engineering Services Establishment (CAESE) and the Science & Technology Research Institute for Defence (STRIDE) have not been fully optimised, therefore constraining the advancement of strategic areas such as composites.
94. Establishing an aerospace centre of excellence (CoE) designed to facilitate collaboration between institutions and research universities becomes essential to broaden the scope of aerospace activities.
95. Refer to Action Plan 5 (AP5) in Section 5 for strategies and action plans related to establishing aerospace CoE.

Financial Support and Incentives

96. There is a need to improve the financial support and incentives to drive research and development activities towards innovative and high value-added investments within the industry.
97. This is particularly important in the context of recovering from the economic impact of COVID-19 pandemic as well as seizing opportunities in the global value chain.
98. Investments from strategic players such as raw material suppliers and Aircraft General Supplies companies are necessary to address the existing gaps. Concurrently, it is important to provide support to improve market access for greater participation of SMEs.
99. Hence, investment and financial support such as tax incentives are required to sustain Malaysia's competitiveness in the global value chain.
100. Refer to Action Plan 9 (AP9) in Section 5 for strategies and action plans related to incentives and financial assistance.

Sustainability

101. There is a rising trend for aircraft equipment manufacturers to adopt green manufacturing methods, driven by global emphasis on sustainability requirements.
 - i. Global efforts to reduce aviation emissions have intensified, as seen through the requirements of schemes and systems such as:
 - a. Carbon Offsetting and Reduction Scheme for International Aviation (CORSA);
 - b. European Union Emissions Trading System (EU ETS);
 - c. the EU Sustainable Aviation Fuels Directive; and
 - d. the EU Green Deal.
 - ii. As a result, demand for green aircraft that use alternative fuels such as sustainable aviation fuel (SAF) and have features to reduce carbon emissions is booming.
102. However, Malaysia's limited availability of renewable energy (RE) infrastructure has led to a shortage of green energy – hindering industry players' from adopting green manufacturing practices.
103. This imposes a challenge for operations to achieve carbon compliance especially for aerospace manufacturing which are energy-intensive and require high electricity and gas usage.

-
104. As a result, attracting FDI becomes difficult given the increasing number of foreign investors having committed to comply with global environmental, social and governance (ESG) requirements.
105. Hence, the industry must step up the ESG adoption with the support of green infrastructure and R&T.
- i. Focus is required on the development of infrastructure that supplies green electricity and bio-gas.
 - ii. Leveraging its abundant feedstock resources, Malaysia has the potential to venture into the production of SAF such as bio-jet fuel through R&T initiatives.
 - iii. This will facilitate the industry players to adhere to local and global ESG requirements such as the Malaysia Association of Public Advocacy for Nature (MAPAN) and International Civil Aviation Organisation (ICAO) regulations.
106. Refer to:
- i. Action Plan 7 (AP7) in Section 5 for strategies and action plans related to bio-jet fuel; and
 - ii. Action Plan 8 (AP8) in Section 5 for strategies and action plans related to sustainability measures.

SECTION 5 STRATEGIES AND ACTION PLANS

NIMP 2030 Focus

107. During the period of the NIMP 2030, the industry will continue to:
- i. increase competitiveness and capabilities of local players for upcoming significant projects;
 - ii. encourage the growth of technology suppliers by investing more in R&T activities;
 - iii. improve Malaysia's aircraft content and increase participation in the upstream market through international aircraft development programmes;
 - iv. reduce dependency on foreign designs for military aircraft upgrades by prioritising local design and engineering solutions; and
 - v. sustain competitiveness through strong comparative advantage in identified focus areas.
108. Specific targets are set for each sub-sector to be achieved by 2025 and 2030 (Table 1.8).

Table 1.8: Targets of Aerospace Industry by Sub-sectors

Sub-sectors	Measures	Yearly Target	
		2025	2030
i. MRO	Global Market Share	4.0%	5.0%
ii. Aerospace Manufacturing	Position in Southeast Asia	#1	#1
iii. Systems Integration	Local Content	50.0%	70.0%
iv. Engineering and Design Services	Global Market Share	3.0%	3.5%
v. Education and Training	Position in Southeast Asia	#1	#1

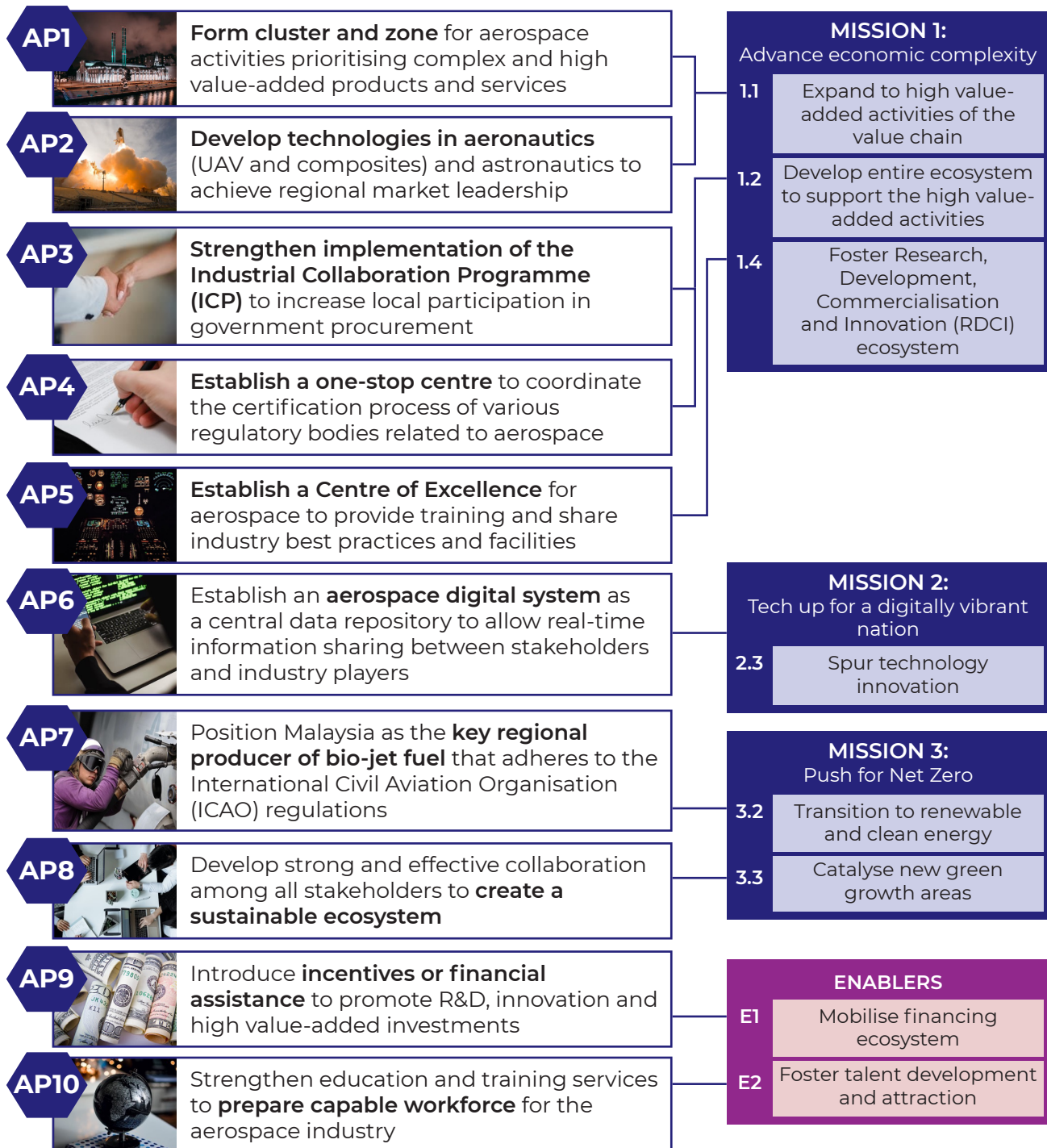
Source: MAIB 2030

Action Plans

109. Strategies and Action Plans relating to the NIMP 2030's Missions and Enablers are applicable to this industry (Figure 1.3).
110. Further action plans specific to this industry shall be guided by the MAIB 2030.

Figure 1.3: Strategies and Action Plans for Aerospace Industry

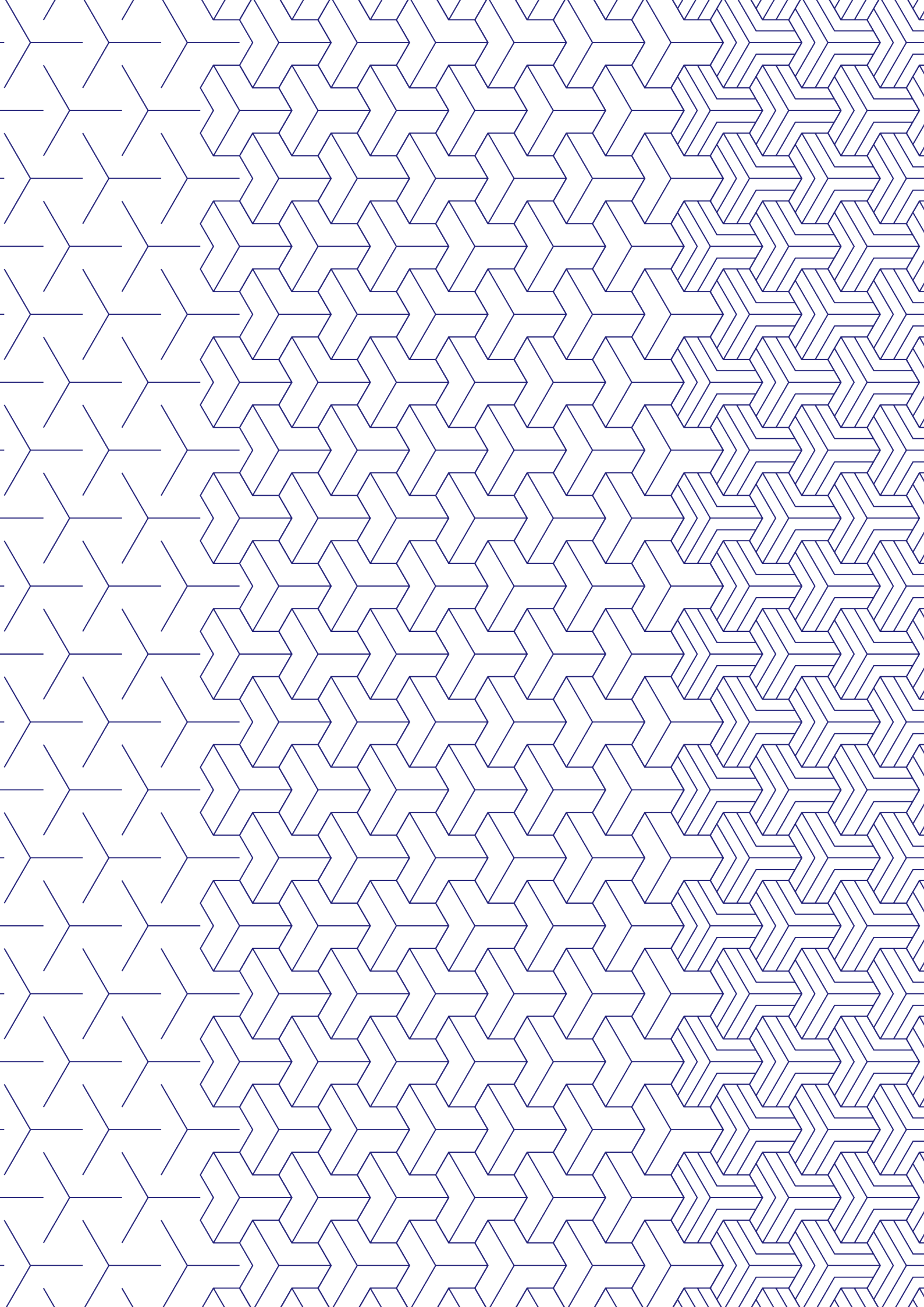
The following action plans are guided by Malaysian Aerospace Industry Blueprint 2030 (MAIB 2030):

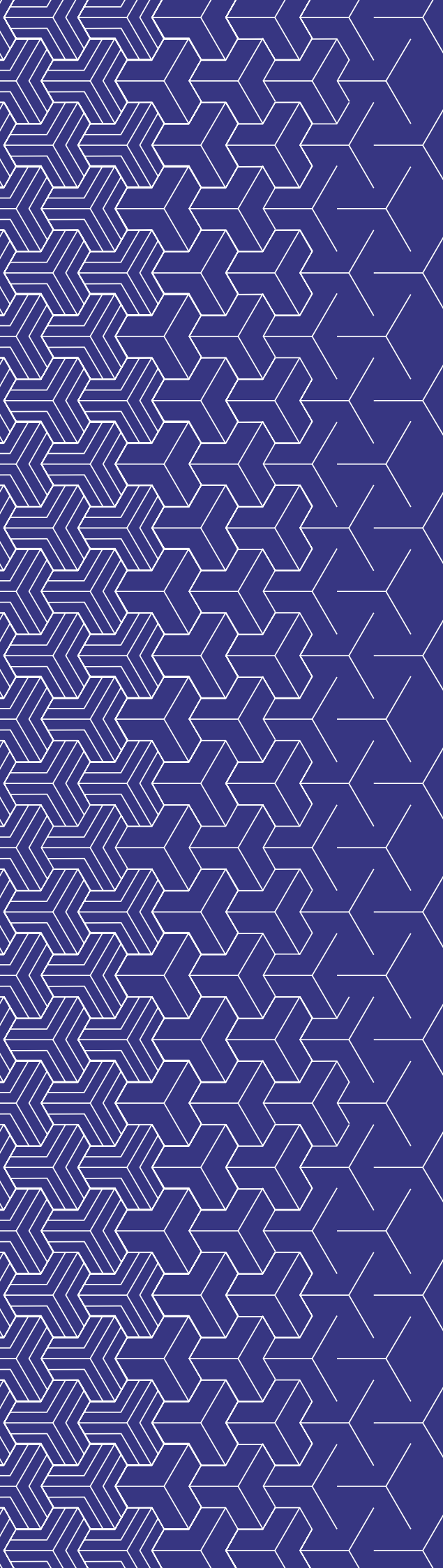


APPENDIX 1 INCENTIVES

There is an array of incentives offered for industry players. At the point of writing, this includes the following incentives:

Incentives	Agency
Incentive for Aerospace Industry	Malaysian Investment Development Authority (MIDA)
Special Tax Incentive (Relocation)	
Incentive for R&D <ul style="list-style-type: none"> • In-House R&D • Contract R&D Company • R&D Company 	
Commercialisation of Public Sector R&D Findings in Resource-based and Non-Resource-Based Industries	
Incentive for Automation Capital Allowance (Automation CA)	
Import Duty and/or Sales Tax Exemption on Machinery/ Equipment/ Raw Materials/ Components	
Reinvestment Allowance	





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