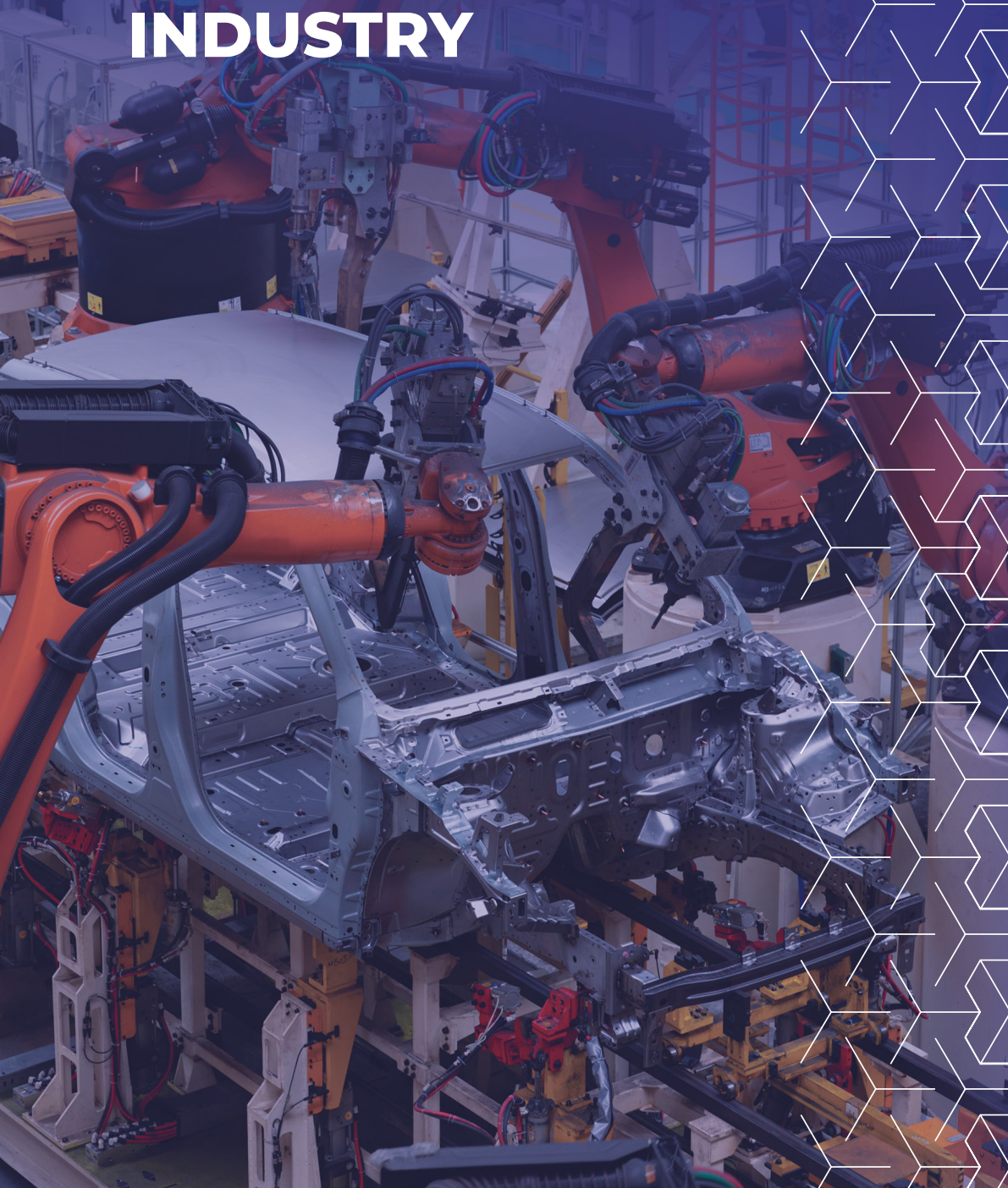


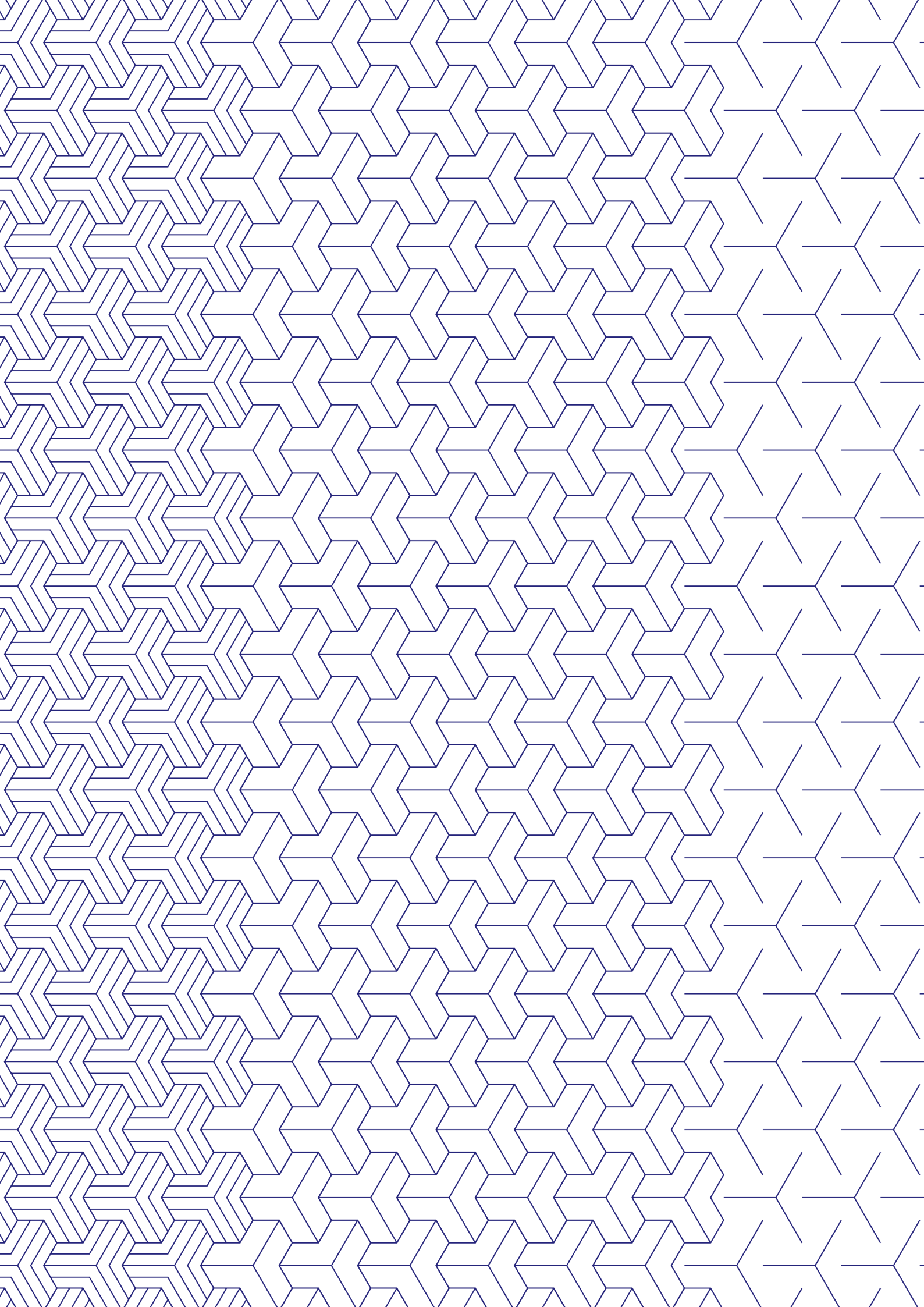


MINISTRY OF INVESTMENT,
TRADE AND INDUSTRY

NEW INDUSTRIAL
MASTER PLAN 2030

AUTOMOTIVE 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:

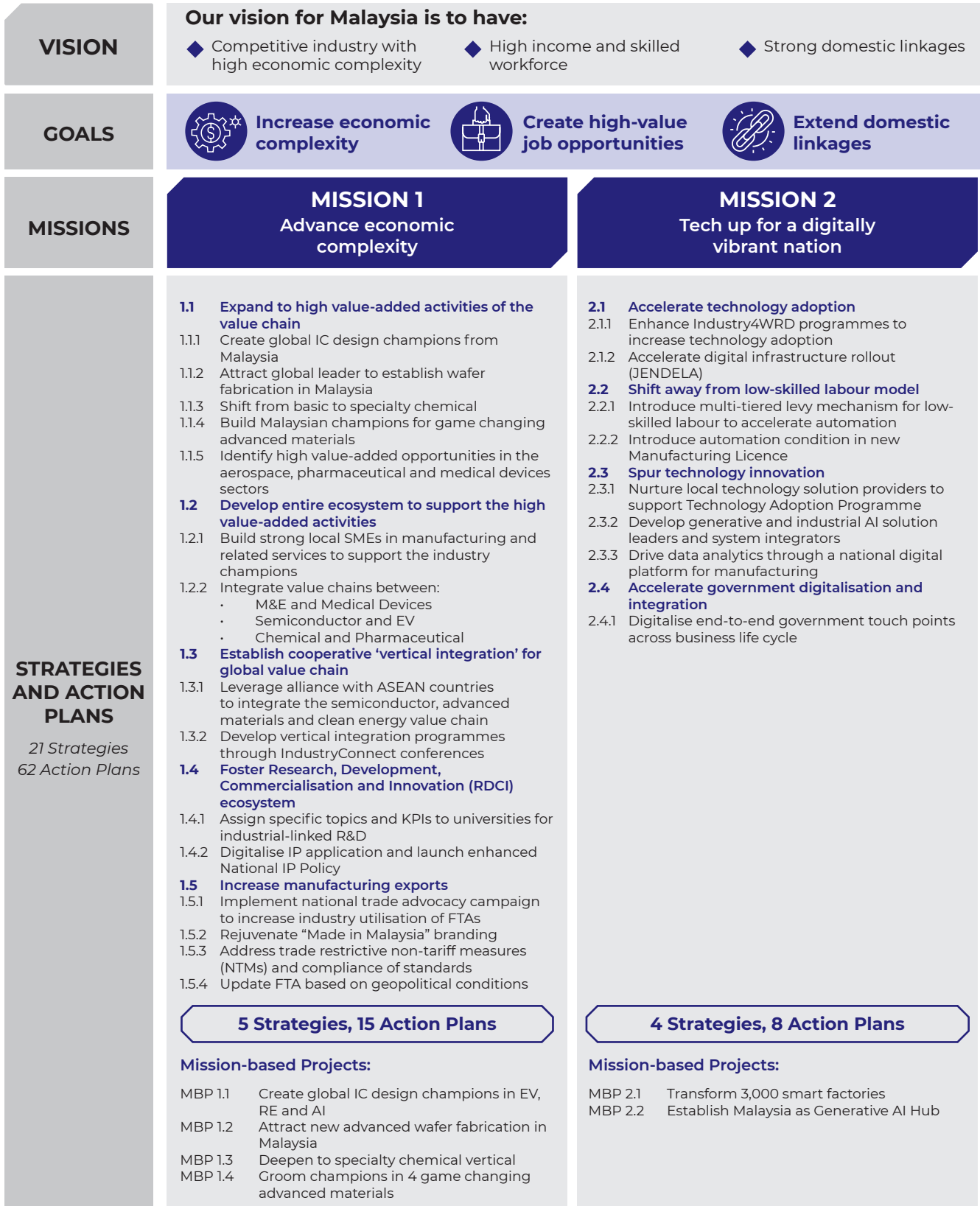
- Provide national strategic direction to lead the industrial development policies;
- Be a conversation piece for investors and other economies on Malaysia's position and direction; and
- Feature the role of the Malaysian Government in shaping the economy.

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 – Automotive Industry](#).

OVERVIEW OF THE DOCUMENT

This NIMP 2030 Sectoral Plan – Automotive 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

1. The automotive industry in Malaysia comprises the production of (Figure 7.1):
 - i. motor vehicles:
 - a. passenger vehicles;
 - b. commercial vehicles; and
 - c. motorcycles.
 - ii. parts and components.

Figure 7.1: Malaysian Automotive Industry Scope



Source: Malaysia Automotive Robotics and IoT Institute (MARii)

2. The automotive manufacturing sector consists of (Figure 7.2):
 - i. manufacturers and assemblers or original equipment manufacturers (OEM), supported by:
 - a. sub-assemblers (Tier 1); and
 - b. parts and components manufacturers (Tiers 2 and 3).
 - c. motorcycles.
 - ii. other automotive players related to Small and Medium Industries (SMI)

Figure 7.2: Automotive Manufacturing Sector (Downstream)



Source: MARii

Value Chain

3. The automotive value chain is segmented into five sectors (Figure 7.3):
- i. resource sector;
 - ii. primary sector;
 - iii. support sector;
 - iv. manufacturing sector; and
 - v. aftermarket sector.

Figure 7.3: Value Chain of Automotive Industry

Value Chain	Resource Sector	Primary Sector	Support Sector	Manufacturing Sector	Aftermarket Sector
Services within Automotive Industry	Natural resources	Large foundries	Engineering and Product Design	Assemblers (OEMs)	Parts & Components Centre
	Iron smelter	Large forgers	Machine Makers	Tier 1: Module manufacturing activity, sub assembler	AATF Centre
	Steel refiners		Too, Die and Mould (TDM)		
	Rolling mills		Jigs and Fixtures	Tier 2: Components manufacturing activity	Remanufacturing Centre
	Refineries		Surface Treatment & Coatings		Vehicle Inspection Centre
	Petrochemical		Fasteners	Markets	Workshop
	Non-ferrous smelters				New/ Used Vehicle Dealership
R&D and Technology Development					

Source: MARii

4. Various sectors have important linkages in ensuring the production of automotive products and services with high value and efficiency throughout the entire automotive supply chain and into the export market.

Market Players

5. Presently, Malaysian automotive is ranked third in terms of vehicles production in ASEAN with current capabilities of:
- i. 38 major vehicle manufacturers/ assemblers;
 - ii. 641 parts and components manufacturers; and
 - iii. 62,387 after sales business companies.
6. Approximately 80.0 per cent of the parts and components manufacturers within the domestic ecosystem are Malaysian-owned companies.

7. Industry associations in Malaysia's automotive industry play important roles in representing the interests of industry stakeholders and promoting the industry. Non-exhaustive examples of these associations include:
 - i. Malaysian Automotive Association (MAA);
 - ii. Motorcycle and Scooter Assemblers and Distributors Association of Malaysia (MASAAM);
 - iii. PROTON Vendors Association (PVA);
 - iv. Perodua Suppliers Association (P2SA);
 - v. Electric Vehicle Association Of Malaysia (EVAM);
 - vi. Zero Emission Vehicle Association (ZEVA);
 - vii. Malaysian Automotive Component Parts Manufacturers (MACPMA);
 - viii. Federation of Engineering and Motor Parts Traders' Association (FEMPTAM); and
 - ix. Malaysia Automotive Recyclers Association (MAARA).
8. Several Ministries and Government Agencies have prominent role in Malaysia's automotive industry. These include:
 - i. Ministry of Finance (MOF);
 - ii. Ministry of Investment, Trade and Industry (MITI);
 - iii. Ministry of Transport (MOT);
 - iv. Ministry of Science, Technology and Innovation (MOSTI);
 - v. Malaysia Automotive Robotics and IoT Institute (MARii);
 - vi. Malaysian Investment Development Authority (MIDA);
 - vii. Malaysia External Trade Development Corporation (MATRADE);
 - viii. Department of Environment (DOE);
 - ix. Department of Standards Malaysia (JSM);
 - x. Royal Malaysian Customs Department (JKDM);
 - xi. SIRIM Berhad (SIRIM); and
 - xii. Malaysian Industrial Development Finance Berhad (MIDF).

Policies, Laws and Regulations

9. The industry's development is guided by the following.
 - i. National Automotive Policy (NAP) 2020;
 - ii. National Transport Policy (NTP) 2019-2030;
 - iii. National Energy Policy (DTN) 2022-2040;
 - iv. National Policies on Climate Change;
 - v. Malaysian Intelligent Transportation System (ITS) Blueprint 2019-2023; and
 - vi. Low Carbon Mobility Blueprint (LCMB) 2021-2030.

SECTION 2 PERFORMANCE

IMP3 Focus and Performance

10. During the period of the IMP3 (2006 to 2020), the industry's focus areas were:
 - i. development of a viable production and distribution centre for automotive vehicles and parts and components in the region; and
 - ii. enhancing domestic capabilities through rationalisation and consolidation and promoting global market orientation.
11. Contribution of automotive manufacturing to Gross Domestic Product (GDP) grew by a CAGR² of 2.0 per cent from RM14.4 billion (2006)³ to RM18.9 billion (2020).⁴
12. Under the Twelfth Malaysia Plan, 2021-2025 (RMKe-12), capacity-building and technology adoption programmes were introduced through the Automotive Industry Development Programme (AIDP).
13. As of 2022, the Malaysian automotive industry has seen significant progress in terms of vendor competitiveness.
 - i. 568 vendors achieved Level 3 Competitiveness, the minimum requirement for becoming vendors to the country's Tier 1 OEM that have capabilities in manufacturing process design;
 - ii. 154 vendors have advanced to Level 4 and are able to conduct product design activities; and
 - iii. 68 vendors that have achieved Level 5 Competitiveness are equipped with Research and Development (R&D) capabilities and potential of becoming exporters in the global supply chain.
14. In the field of technology application, 62 automotive companies have participated in the Readiness Assessment Programme for Industry 4.0 technologies adoption.

Investments

15. The investment performance (2006 to 2022) of the automotive industry is recorded in Table 7.1 below.

Table 7.1: Approved Investments of Automotive Industry

Items	Units	IMP3			2021	2022	2021-2022
		2006	2020	2006-2020			
Total Investment	RM billion	0.5	3.6	38.4	1.9	7.5	9.5
Domestic Investment	RM billion	0.3	2.0	26.1	0.8	0.9	1.8
Foreign Investment	RM billion	0.2	1.6	12.3	1.1	6.6	7.7
Number of projects	#	47	75	842	36	42	78
Employment	persons	2,863	4,683	72,002	1,851	3,590	5,441

Source: MIDA

² Compound annual growth rate

³ Based on 2005 constant prices

⁴ Based on 2015 constant prices

16. During the IMP3 period, a total of 842 projects were approved in the automotive industry with a total investment of RM38.4 billion. These investments committed a total of 72,002 job opportunities.
17. In 2021 and 2022, a total of 78 projects were approved with a total investment of RM9.5 billion. These investments committed a total of 5,441 job opportunities.
18. Overall, the industry's investment trend was driven by the lifted restrictions on FDI.
- In 2009, the Government began allowing FDI for vehicles of 1,800 engine size (cc).
 - Subsequently, in 2014, the automotive industry opened up investment for all cc for Energy Efficient Vehicles (EEV).
 - In 2022, the industry recorded its highest investment, mainly due to the announcement of several EEV-friendly policies such as the incentive package in the National Budget 2022.
19. From 2006 to 2022, 685 (74.5 per cent) of the 920 approved projects were implemented.

Exports

20. The export performance (2006 to 2022) of automotive industry is depicted in Table 7.2 below.

Table 7.2: Exports of Automotive Industry

Items	IMP3			2021	2022	2006-2020 CAGR	2020-2021 Annual Growth	2021-2022
	2006	2020	2006-2020					
Total Exports (RM billion)	3.5	8.3	92.7	9.3	11.9	6.4%	12.8%	27.3%
Motor Vehicles (RM billion)	1.0	2.0	25.3	2.0	3.2	5.1%	0.0%	60.0%
Motorcycles (RM billion)	0.9	2.0	23.1	2.4	3.4	5.9%	20.0%	41.7%
Parts and Components (RM billion)	1.6	4.2	44.3	4.9	5.2	7.1%	16.7%	6.1%

Source: MATRADE

21. During the IMP3 period, total exports of automotive products grew by a CAGR of 6.4 per cent from RM3.5 billion (2006) to RM8.3 billion (2020), driven by the growth of parts and components exports.
22. In 2021 and 2022, total exports increased further by 12.8 per cent and 27.3 per cent, amounting to RM9.3 billion and RM11.9 billion respectively.

23. In 2022, major export destinations included:
- Singapore (RM3.5 billion, 30.5 per cent);
 - Thailand (RM1.8 billion, 15.8 per cent);
 - Australia (RM0.7 billion, 5.8 per cent);
 - Indonesia (RM0.6 billion, 5.3 per cent); and
 - Viet Nam (RM0.5 billion, 4.8 per cent).
24. The growth of exports in 2022 was attributed to higher exports of:
- parts and accessories of motor vehicles (RM5.2 billion, 45.2 per cent);
 - parts and accessories of motorcycles (RM3.3 billion, 28.8 per cent);
 - cars (RM2.2 billion, 19.5 per cent);
 - tractors (RM0.2 billion, 1.5 per cent); and
 - work truck, self-propelled for factories or airport and parts (RM0.1 billion, 1.3 per cent).
25. Collectively, these products contributed to an increase of RM2.3 billion (25.9 per cent) of exports of vehicles in 2022.

Imports

26. Table 7.3 presents the import performance of the industry (2006 to 2022).

Table 7.3: Imports of Automotive Industry

Items	IMP3			2021	2022	2006-2020	2020-2021	2021-2022
	2006	2020	2006-2020			CAGR	Annual Growth	
Total Imports (RM billion)	11.3	18.6	289.7	24.2	32.2	3.6%	30.0%	33.0%
Motor Vehicles (RM billion)	6.6	7.4	158.8	9.6	12.5	0.8%	29.7%	30.2%
Motorcycles (RM billion)	0.7	1.6	18.4	2.8	2.7	6.1%	75.0%	-3.6%
Parts and Components (RM billion)	4.0	9.6	112.4	11.8	17.0	6.5%	22.9%	44.1%

Source: MATRADE

27. During the IMP3 period, total imports of automotive industry grew by a CAGR of 3.6 per cent, from RM11.3 billion (2006) to RM18.6 billion (2020).
28. In 2021 and 2022, the industry's total imports increased further by 30.0 per cent and 33.0 per cent, totaling RM24.2 billion and RM32.2 billion respectively.

29. Major import sources in 2022 included:
- Thailand (RM7.6 billion, 23.2 per cent);
 - Japan (RM7.0 billion, 21.4 per cent);
 - China (RM6.5 billion, 19.9 per cent);
 - Germany (RM4.9 billion, 14.9 per cent); and
 - Indonesia (RM2.2 billion, 6.7 per cent).
30. Growth in imports from 2021 to 2022 were mainly attributed by higher imports of:
- parts and accessories of motor vehicles (RM16.3 billion, 49.8 per cent);
 - cars (including station wagon) (RM6.6 billion, 20.3 per cent);
 - trucks, motor vehicles for the transport of goods (RM4.6 billion, 14.0 per cent);
 - motorcycles and sidecars (RM1.2 billion, 3.7 per cent); and
 - parts and accessories of motorcycles (RM1.1 billion, 3.4 per cent).

Value-added

31. The industry's value-added (GDP) during the period of 2006 to 2022 is recorded below (Table 7.4).

Table 7.4: Value-added of Automotive Industry

Item	IMP3		2021	2022	2006-2020	2020-2021	2021-2022
	2006	2020			CAGR	Annual Growth	
Value-added⁵ (RM billion)	14.4	18.9	19.2	23.6	2.0%	1.8%	23.0%

Source: Department of Statistics Malaysia (DOSM)

32. During the IMP3 period, the industry's contribution to GDP grew by a CAGR of 2.0 per cent from RM14.4 billion (2006) to RM18.9 billion (2020).
33. In 2021 and 2022, the industry's contribution to GDP grew further by 1.8 per cent and 23.0 per cent to RM19.2 billion and RM23.6 billion respectively.
34. The growth of the industry was attributed to supportive Government policies, increased production and exports as well as introduction of new technologies.

⁵ Value added is measured by the GDP of the industry; 2006 GDP data is based on constant 2005 prices, while 2020 to 2022 data are based on constant 2015 prices

Employment

35. The automotive industry's employment during the period of 2019 to 2022 is tabulated below (Table 7.5).

Table 7.5: Employment in the Automotive Industry

Items	IMP3		2021	2022	2021-2022
	2019	2020			CAGR
Total Employment⁶ (persons)	105,591	97,482	98,419	102,081	-1.1%
Motor Vehicles (persons)	26,330	23,829	24,246	25,340	-1.3%
Motorcycles (persons)	11,934	11,021	11,399	11,782	-0.4%
Parts and Components (persons)	55,113	52,586	53,048	54,158	-0.6%
Others⁷ (persons)	12,214	10,045	9,726	10,801	-4.0%

Source: DOSM

36. Total employment declined by a CAGR of 1.1 per cent, from 105,591 (2019) to 102,081 persons (2022).
37. The COVID-19 pandemic caused a decrease in demand for vehicles, which led to production cuts and some job losses.

Labour Productivity

38. The industry's labour productivity during the period of 2019 to 2022 is recorded below (Table 7.6).

Table 7.6: Labour Productivity of Automotive Industry

Item	IMP3		2021	2022	2019-2022
	2019	2020			CAGR
Labour Productivity⁸ (RM)	183,469	193,580	195,110	231,447	8.1%

Source: DOSM

39. The industry's labour productivity grew by a CAGR of 8.1 per cent from RM183,469 (2019) to RM231,447 (2022).
40. Overall, the growth was contributed by the adoption of Industry 4.0 technologies, increased use of skilled labour, improvement of education and training as well as the Government's policies to promote the automotive and industry.

⁶ This employment data is based on Monthly Manufacturing Statistics December 2022. Due to the change in methodology for employment statistics tabulation in 2019, industry's employment breakdown from 2006 to 2018 is not available

⁷ Include manufacture of bodies (coachwork) for motor vehicles, manufacture of trailers and semitrailers and manufacture of bicycles and invalid carriages

⁸ Annual labour productivity is derived from value added per employment

Production

41. The total production volume of the automotive industry is measured by the production of:
- motor vehicles; and
 - motorcycles.
42. Production volume of motor vehicles during the period of 2006 to 2022 is recorded below (Table 7.7).

Table 7.7: Production of Motor Vehicles

Items	IMP3			2021	2022	2006-2020	2020-2021	2021-2022
	2006	2020	2006-2020			CAGR	Annual Growth	
Total Production (units)	503,048	485,186	8,114,825	481,651	702,275	-0.3%	-0.7%	45.8%
Passenger Vehicles (units)	459,640	457,755	7,445,257	446,431	650,190	0.0%	-2.5%	45.6%
Commercial Vehicles (units)	43,408	27,431	669,568	35,220	52,085	-3.2%	28.4%	47.9%

Source: MAA

43. During the IMP3 period, production of motor vehicles declined by a CAGR of 0.3 per cent from 503,048 units (2006) to 485,186 units (2020).
44. In 2021, production declined slightly by 0.7 per cent to 481,651 units.
45. Subsequently, production grew by 45.8 per cent to 702,275 units in 2022.
46. Production volume of motorcycles during the period of 2012 to 2022 is recorded below (Table 7.8).

Table 7.8: Production of Motorcycles

Item	IMP3			2021	2022	2012-2020	2020-2021	2021-2022
	2012	2020	2012-2020			CAGR	Annual Growth	
Production (units)	581,926	492,490	4,300,861	496,136	685,828	-2.1%	0.7%	38.2%

Source: MASAAM

47. From the period of 2012 to 2020, production of motorcycles declined by a CAGR of 2.1 per cent from 581,926 units (2012) to 492,490 units (2020).
48. In 2021 and 2022, production grew by 0.7 per cent and 38.2 per cent to 496,136 units and 685,828 units respectively.
49. The COVID-19 pandemic affected the production of motor vehicles and motorcycles, as factories were shut and global supply chain were disrupted in 2020. Simultaneously, production grew in 2021 and 2022 as the industry recovered from the impact of the pandemic.

Sales

50. Sales of motor vehicles during the period of 2006 to 2022 is recorded below (Table 7.9).

Table 7.9: Sales of Motor Vehicles

Items	IMP3			2021	2022	2006-2020	2020-2021	2021-2022
	2006	2020	2006-2020			CAGR	Annual Growth	
Total Sales (units)	490,768	529,514	8,774,109	508,911	720,658	0.5%	3.9%	41.6%
Passenger Vehicles (units)	446,172	480,971	7,853,607	452,663	641,773	0.5%	-5.9%	41.8%
Commercial Vehicles (units)	44,596	48,543	920,502	56,248	78,885	0.6%	15.9%	40.2%

Source: MAA

51. During the IMP3 period, sales of motor vehicles grew by a CAGR of 0.5 per cent from 490,768 units (2006) to 529,514 units (2020).
52. In 2021 and 2022, sales increased further by 3.9 per cent and 41.6 per cent to 508,911 units and 720,658 units respectively, as the Malaysian economy recovered from the impact of the pandemic.
53. Meanwhile, sales of motorcycles during the period of 2012 to 2022 is recorded below (Table 7.10).

Table 7.10: Sales of Motorcycles

Items	IMP3			2021	2022	2012-2020	2020-2021	2021-2022
	2012	2020	2012-2020			CAGR	Annual Growth	
Sales (units)	576,260	498,327	4,294,705	497,262	680,749	-1.8%	-0.2%	36.9%

Source: MASAAM

54. During the period of 2012 to 2020, sales of motorcycles declined by a CAGR of 1.8 per cent from 576,260 units to 498,327 units.
55. In 2021, sales declined by 0.2 per cent to 497,262 units. Subsequently, in 2022, sales grew by 36.9 per cent to 680,749 units.

56. Sales of Electrified Vehicles (xEV)⁹ is recorded below (Table 7.11).

Table 7.11: Sales of Electrified Vehicles

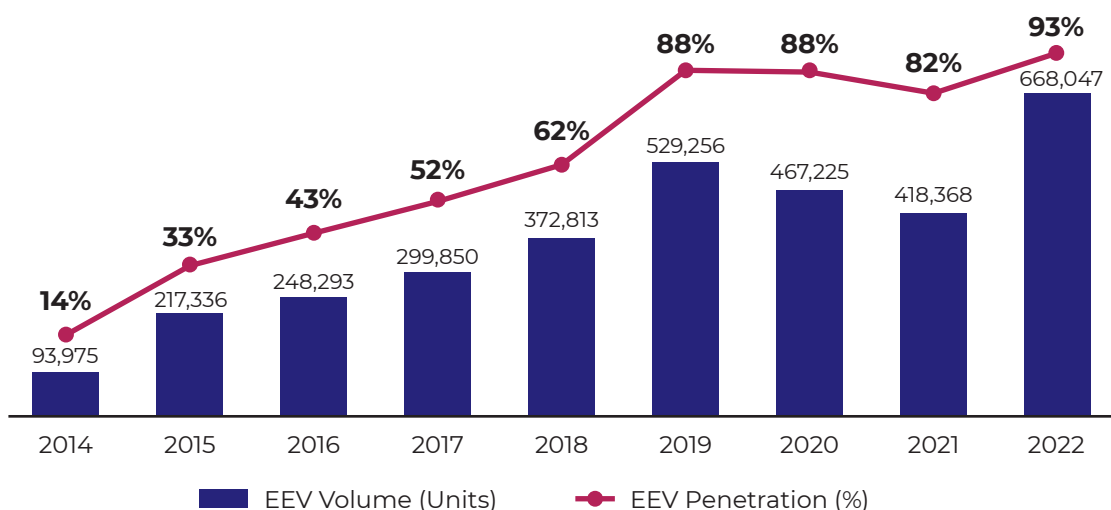
Items	IMP3			2021	2022	2011-2020	2020-2021	2021-2022
	2011	2020	2011-2020			CAGR	Annual Growth	
Total Sales (units)	655	2,445	80,941	3,366	21,900	14.3%	54.5%	550.6%
Passenger and commercial vehicles								
Commercial Vehicles (units)	393	2,052	78,167	3,235	21,624	20.2%	57.7%	568.4%
Hybrid including Plug-in Hybrid (units)	387	1,985	77,859	2,979	18,513	19.9%	50.1%	521.5%
Electric Vehicle (units)	6	67	308	256	3,111	30.7%	282.1%	1,115.2%
Motorcycles								
Total Sales (units)	262	127	2,743	125	211	-7.7%	-1.6%	68.8%
Bus								
Total Sales (units)	0	0	31	6	65	0	0	983.3%

Source: MAA

57. During the period of 2011 to 2020, sales of xEV grew by a CAGR of 14.3 per cent from 655 units (2011) to 2,445 units (2020), driven by the growth in sales of passenger and commercial vehicles.

58. In 2021 and 2022, sales of xEV grew further to 3,366 units and 21,900 units respectively. EEV penetration (2014 to 2022) is depicted in the figure below (Figure 7.4).

Figure 7.4: EEV Penetration



⁹ Electrified vehicles (xEV) include hybrid and battery electric vehicles (BEV)

59. The growth in sales and EEV penetration was driven by:
- i. Government incentives – the Malaysian Government offered customised incentives for EEVs such as tax exemption, making EEV more affordable for consumers;
 - ii. increased awareness of the benefits of EEV – environmental impact and lower running costs led to more consumers to consider EEV as an option when purchasing a new vehicle. The EEV Labelling Scheme by MARii is one of the initiatives to encourage EEV penetration in Malaysia;
 - iii. improved technology – the technology of EEVs improved significantly in recent years, making them more practical and reliable for everyday use; and
 - iv. increased availability of EEV in Malaysia with a broader selection from various manufacturers – making it easier for consumers to find an EEV which meets individuals' needs.

Research and Development

60. During the IMP3 period, seven centres of excellence (CoE) were established to develop the automotive industry, including:
- i. MARii Simulation and Analysis Centre (MARSAC)
 - a. Developed as a standalone facility within MARii's headquarters in Cyberjaya, in collaboration with PROTON.
 - b. Furnished with 15 cutting-edge workstations, driven by MARii's High Performance Computing servers which enable real-time data analysis and cloud-based operations.
 - c. MARSAC aims to accelerate high-value design, cost optimisation and talent development among automotive and mobility component manufacturers.
 - ii. MARii Additive Manufacturing Technology Centre (MAMTEC)
 - a. A comprehensive end-to-end online service platform for automotive suppliers and public to access a wide range of additive manufacturing services from design optimisation, simulation and validation, 3D scanning, reverse engineering and post-processing.
 - b. MAMTEC aims to enhance the capability of local automotive suppliers in R&D of new parts and components for Next Generation Vehicles (NxGV).
 - iii. National Emission Test Centre (NETC)
 - a. An independent entity and recognised as a national full-fledged emissions testing facility established by MARii.
 - b. NETC provides testing facilities in measuring vehicle emission pollutants and fuel consumption.
 - c. In addition, NETC is recognised by the Road Transport Department (JPJ) as one of the Technical Services providers capable to test United Nations (UN) Regulations related to exhaust emission and fuel consumption.
 - iv. MARii Design Centre
 - a. Established to enhance the implementation of Industry 4.0 technologies in the automotive industry specifically in design engineering, simulation and prototyping.
 - v. MARii Academy of Technology
 - a. A technology commercialisation centre to undertake technology transfer, validation and adoption of automation practices.
 - b. Serve as one stop centre for Industry 4.0 technologies, Human Capital Development in automotive and connected mobility ecosystem.
 - vi. National Digitalisation Centre (NDC)
 - a. MARii offers comprehensive training programmes to encourage the use of Virtual Reality (VR) and Augmented Reality (AR) in the Malaysian manufacturing sector.
 - b. The NDC, developed in collaboration with PERODUA, serves as a shared facility and visualisation centre to speed up design reviews by eliminating the need for physical clay modelling prototypes.
 - c. These efforts are in line with Malaysia's goal of becoming a regional hub for high-tech industries, as AR and VR are gaining traction globally.
 - vii. MARii Automotive Cloud Web Service (MACWES)
 - a. MACWES is the Government private cloud computing service offered by MARii as a strategic initiative for automotive related software as a service (SaaS), infrastructure as a service (IaaS) & platform as a service (PaaS) that provides compliant, secure, and cost-effective hyper-scale cloud service for automotive and NxGV high-technology platform.
 - b. MACWES provides readily available high-tech engineering IaaS and PaaS for the Digital Engineering Platform (DEP), NxGV – blockchain powered Electric Vehicle (EV) charging and Autonomous Vehicle (AV), mobility as a service (MaaS) for transportation and mobility sectors and ITS platform.

Institutional Support

61. NAP 2020, the fourth edition of Malaysia's National Automotive Policy, was launched in February 2020 with a focus on enhancing the country's automotive industry towards connected mobility, along with the new national automotive vision:
- i. a comprehensive integration mechanism within the automotive and mobility supply chain;
 - ii. emphasis on local manufacturing;
 - iii. improving engineering capabilities;
 - iv. adopting, deploying and localising latest technologies; and
 - v. ensuring sustainable development through application of environmentally friendly products and processes to reduce carbon emission.

Linkages with Other Industries

62. The automotive industry drives the growth and advancement of various industries including electrical and electronics (E&E), plastics, steel and rubber. Apart from that, Malaysia has an advantage in the services related to the mobility industry.

SECTION 3 TRENDS AND OPPORTUNITIES

63. Malaysia's total automotive industry volume is expected to reach 1.22 million units in 2030 from 600,000 units in 2020.¹⁰ This increase is driven by:
- i. growing demand of EVs as there has been a shift in consumer preferences for environmentally friendly vehicles;
 - ii. growth of the after sales market, particularly the expansion of the market for spare parts, repairs and maintenance services; and
 - iii. Malaysia's efforts to achieve its aspiration to be the regional leader in manufacturing, engineering and technology through NAP 2020.
64. The future growth areas for automotive industry that are outlined in the NAP 2020 include:
- i. NxGV;
 - ii. MaaS; and
 - iii. Fourth Industrial Revolution (4IR).
65. To ensure smooth transition towards mobility, it is essential to integrate the mobility services and E&E sectors into the automotive industry.
- i. For example, in the EV segment, integration with E&E sector is essential for areas such as embedded systems at the component level, where hardware and software applications are built to integrate and perform specific tasks.
 - ii. This shall include incorporating high value-added activities in manufacturing of critical parts and components such as motor, battery management system, compressor and intelligent systems.
 - iii. Integration of the services and E&E sectors can be realised by:
 - a. strengthening vendor development in the manufacture of components and parts as well as improving export performance;
 - b. full implementation of Industry 4.0 technologies for transformation in the automotive sector;
 - c. promoting NxGV in Malaysia; and
 - d. creation of a new ecosystem known as MaaS to further strengthen and improve the automotive industry.
66. It is essential to develop R&D to become a technology leader in the region and be globally competitive. The growth of R&D is determined based on the following activities including:
- i. testing and homologation (standards or regulations);
 - ii. R&D expert development;
 - iii. engineering design;
 - iv. styling;
 - v. R&D total planning; and
 - vi. repair, reuse, recycle and remanufacturing (4R).

¹⁰ Source: NAP 2020

Next Generation Vehicle (NxGV)

67. NxGV is categorised as a vehicle that meets the criteria for EEV classifications and is equipped with intelligent mobility applications, specifically at a minimum Level 3 Vehicle Automation known as Conditional Automation. NxGV vehicle technology is classified according to five levels of Autonomous/ Automated and Connected Vehicle (AACV).
68. In the premium automotive market, new vehicles have incorporated an expanded range of connectivity features as part of its package offerings. Reducing latency is key in vehicle connectivity as instantaneous decisions while a car is moving need to be made within a very short time frame.
69. This advancement lays the groundwork for the development of the NxGV, eventually leading to complete vehicle autonomy.
70. The development of the connectivity ecosystem necessitates a significant number of highly skilled professionals in fields including:
 - i. mechanical;
 - ii. electronics;
 - iii. manufacturing;
 - iv. chemical engineering; and
 - v. experts and entrepreneurs in new fields that expand the utilisation and application of NxGV technologies.
71. Therefore, it is imperative for Malaysia to produce the required talent to meet the future demands of the industry.
72. Apart from that, Zero-Emission Vehicles (ZEV), including Battery Electric Vehicle (BEV) is identified as a catalyst for new mobility for the NxGV. BEV provides an opportunity for Malaysia to pivot from internal combustion engine (ICE) cars and build an industry of regional and global presence.
73. Malaysia should build its presence in the full spectrum of the value chain to support the development of BEV.
 - i. Malaysia seeks to become the assembly hub for ASEAN and Asian markets for BEVs, leveraging its manufacturing capabilities and regional positioning.
 - ii. Malaysia aims to develop the export market for BEVs assembled within the country, taking advantage of its position as a major transshipment hub.
 - iii. Malaysia targets to be the manufacturing and design centre for right-hand drive BEVs and a leading country in manufacturing BEV 2-wheelers, with Government-established battery swap standards.
 - iv. Finally, Malaysia strives to be the market leader among ASEAN countries and a test bed for new mobility ideas, including autonomous vehicles.
74. With its ongoing projects, improvements, and forthcoming initiatives within the automotive, E&E and semiconductor industries, Malaysia is well-positioned to become a prominent manufacturer of components and parts for BEVs.
75. In particular, the development of fast charging technologies and new battery materials that could help to improve the performance and affordability of BEVs are areas that are worth to be explored.
76. Malaysia has the potential to consider EV battery safety, in the event of an accident, and during battery disposal.
77. Refer to Action Plan 1 (AP1), Action Plan 2 (AP2), Action Plan 3 (AP3), Action Plan 11 (AP11) and Action Plan 12 (AP12) in Section 5 for strategies and action plans related to NxGV.

Mobility as a Service (MaaS)

78. MaaS is the evolution from personal transportation to mobility solutions that are consumed as a service.
79. This entails the development of sharing concept in transportation and logistics, multimodal transportation, connected living, telematics and e-payment.
80. Services focused on mobility, like food delivery and ride sharing, have now become customary.
81. The rise of MaaS have transformed how people move from one point to another, as it leverages on the digital platforms that integrate end-to-end trip planning, booking, payment services and solutions.
82. Refer to AP2 in Section 5 for strategies and action plans related to local development activity.

Fourth Industrial Revolution

83. The use of Industry 4.0 technology applications especially artificial intelligence (AI), big data analytics (BDA) and Internet of Things (IoT) will enable the implementation of NxGV and MaaS.
84. In 4IR, automation and intercommunication are the basis for the optimisation of design and production processes in a smart factory, which allows manufacturing of highly customised, flexible and efficient products. It affects the entire lifecycle of a product, ensuring its vertical and horizontal integration.
85. The enabling technologies will soon drive the industry towards envisioning a connected and integrated environment, a system of vehicle-to-vehicle communications, cameras, variety of sensors (e.g. RADAR, LiDAR, RFID) and other devices integrated with advanced algorithms that can monitor all type of roads, weather and traffic conditions to enable driverless systems.
86. As Industry 4.0 technologies are transforming the automotive industry, it is essential to:
 - i. ensure automotive manufacturers adopt a holistic cybersecurity approach to protect vehicles from cyberattacks;
 - ii. training programmes are developed for the industry to pivot towards smart manufacturing; and
 - iii. develop new system integrator companies.
87. Refer to Action Plan 4 (AP4), Action Plan 5 (AP5), Action Plan 6 (AP6), AP11 and AP12 in Section 5 for strategies and action plans related to Industry 4.0 technologies and talent development and attraction.

SECTION 4 CHALLENGES

Regional Arrangements and Production

88. A well-established ecosystem for the supply chain of vehicle components have been developed in other countries.
89. This provides a vehicle producing brand with greater economies of scale for exporting their products.
90. As a result, the plan for localising domestic components is affected, as it will be limited to assembly rather than involving product R&D and tooling.
91. Apart from that, foreign vehicle manufacturers in Malaysia are restricted to selling its assembled products within the domestic market, while non-tariff barriers continue to pose restrictions in the ASEAN region, especially in countries with high population and significant demand.
92. This compels vehicle producing brands to establish assembly plants in those countries, consequently limiting opportunities for making Malaysia as exporting hub.
93. Presently, luxury vehicle producing brands face challenges in localising activities due to:
 - i. imposition of rigorous standards;
 - ii. demanding high levels of quality; and
 - iii. substantial investment costs.
94. It is crucial for Malaysia to promote local activities in order to support local companies. These circumstances have made the process of localising operations more challenging due to limited production volume.
95. Refer to AP2 in Section 5 for strategies and action plans related to local development activities.

Carbon Emissions

96. Automobiles contribute significantly to Malaysia's carbon emissions. Within the transport sector, road transport accounts for more than 90.0 per cent of energy consumption, with cars accounting for 58.0 per cent, goods vehicles at 23.0 per cent and motorcycles at 12.0 per cent.
97. Reducing ICE cars on the road would significantly reduce emissions. Thus, it is important to encourage EV adoption.
98. Malaysia can develop a comprehensive view of the environmental impact of EVs and identify opportunities to reduce the emissions from EVs.
99. Apart from that, remanufacturing activities such as engine remanufacturing have the potential to help to reduce emissions in the industry.
100. Refer to Action Plan 7 (AP7), Action Plan 8 (AP8), Action Plan 9 (AP9) and Action Plan 10 (AP10) in Section 5 for strategies and action plans related to EVs and reducing carbon emissions. Source: Low Carbon Mobility Blueprint (LCMB).

SECTION 5 STRATEGIES AND ACTION PLANS

NIMP 2030 Focus

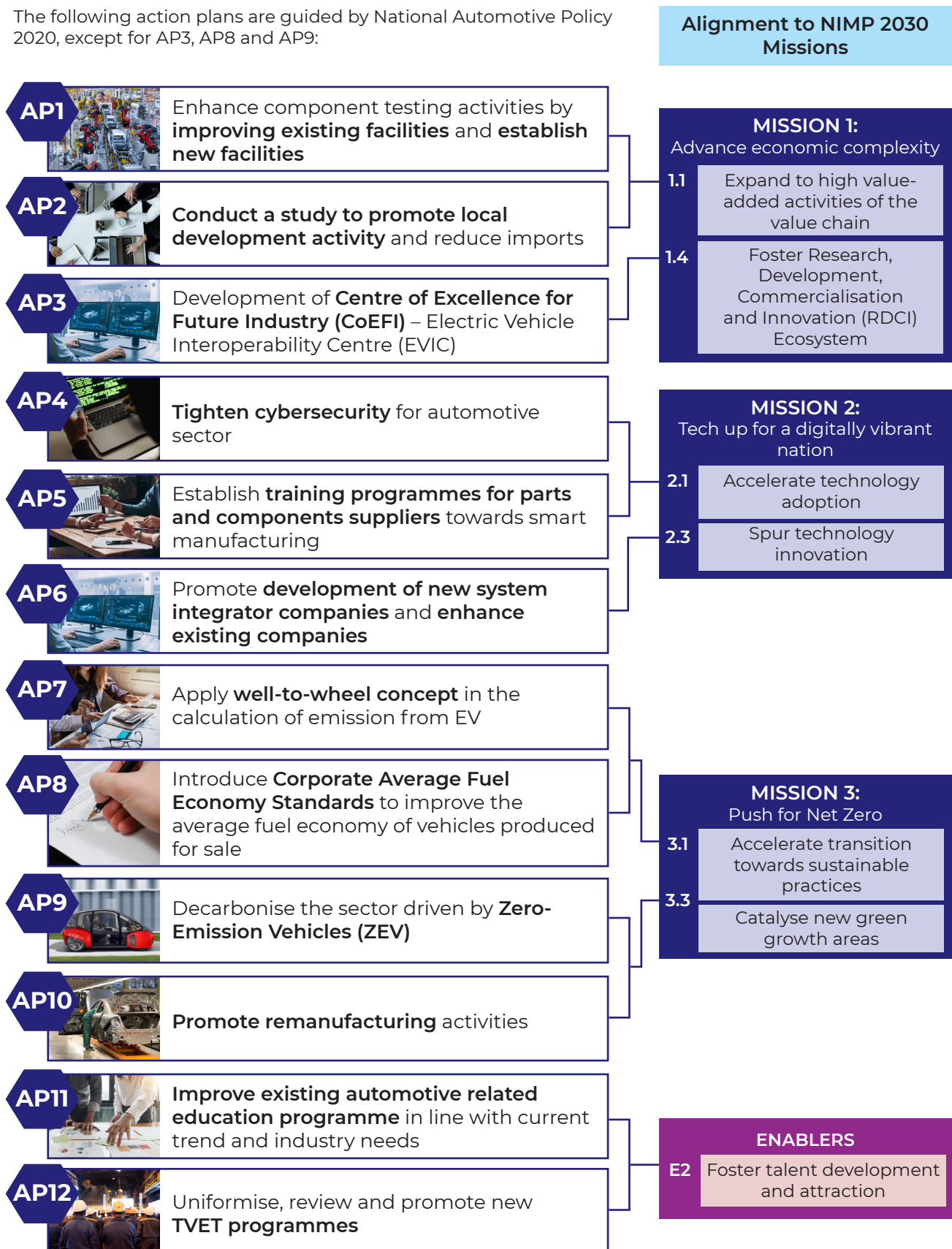
101. During the period of the NIMP 2030, in line with NAP 2020, the industry will focus on:
- i. expansion of EEV technology and engineering of the automotive industry to NxGV, MaaS and Industry 4.0 technologies;
 - ii. offering more comprehensive mechanism for competitive investment opportunities;
 - iii. expanding access to international markets, including companies in the after sales and services sector, and parts and components;
 - iv. improving the competitiveness of the value chain by producing high-quality products that meet the standards of both vehicle manufacturers and consumer requirements;
 - v. overcoming the high production costs of components through the utilisation of Industry 4.0 technologies, specifically additive manufacturing and AI;
 - vi. ensuring the development of human capital keeps pace with advancements in current and future automotive technology; and
 - vii. encouraging the adoption of new, environmentally friendly technologies to address pollution concerns, prioritise vehicle and consumer safety to:
 - a. reduce road accidents; and
 - b. incorporate consumerism elements to protect consumer rights related to spare parts, services, vehicle maintenance, and automotive recall processes.

Action Plans

102. Strategies and Action Plans relating to the NIMP 2030's Missions and Enablers are applicable to this industry (Figure 7.5).
103. Further action plans specific to this industry shall be guided by NAP 2020.

Figure 7.5: Strategies and Action Plans for Automotive Industry

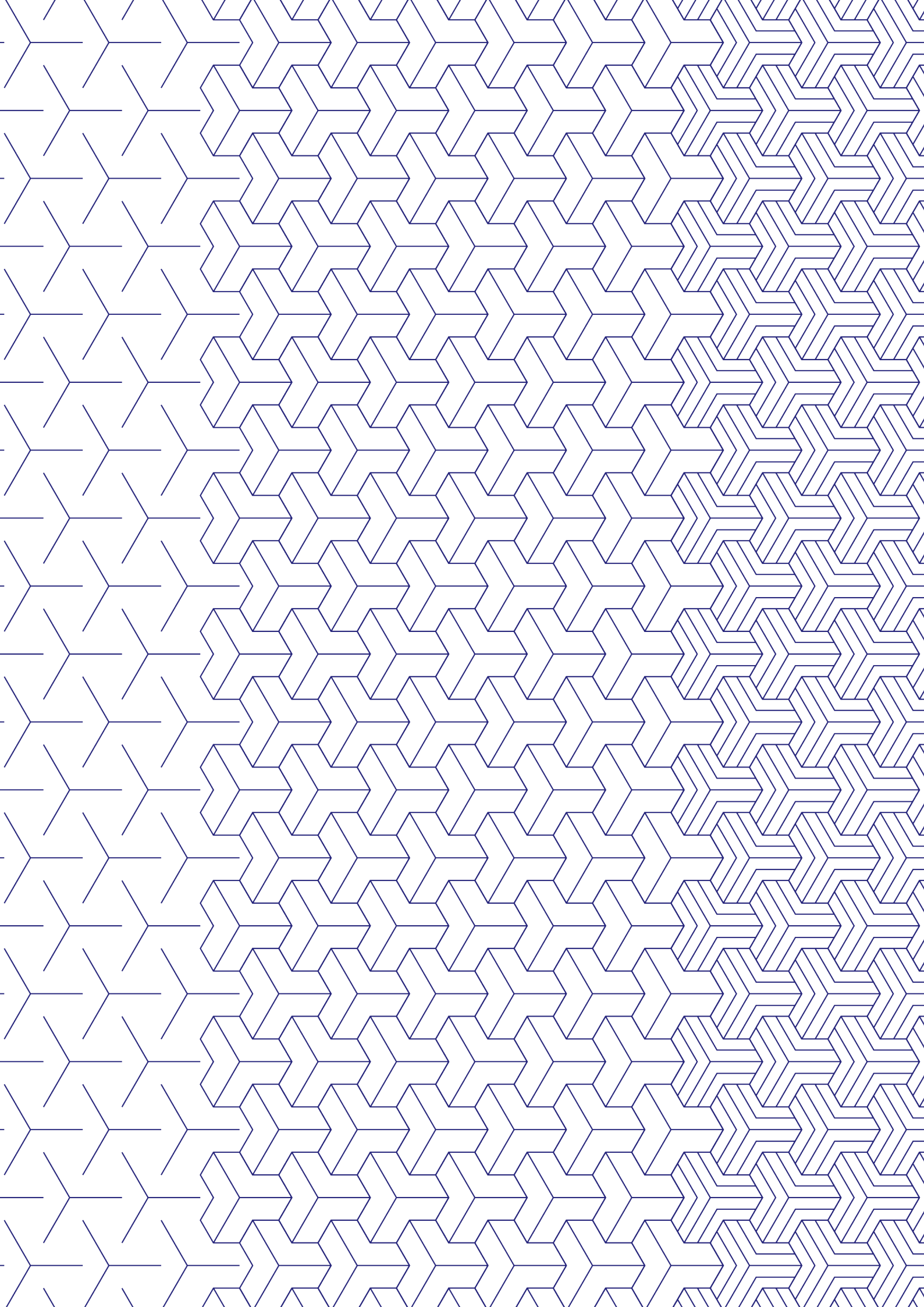
The following action plans are guided by National Automotive Policy 2020, except for AP3, AP8 and AP9:

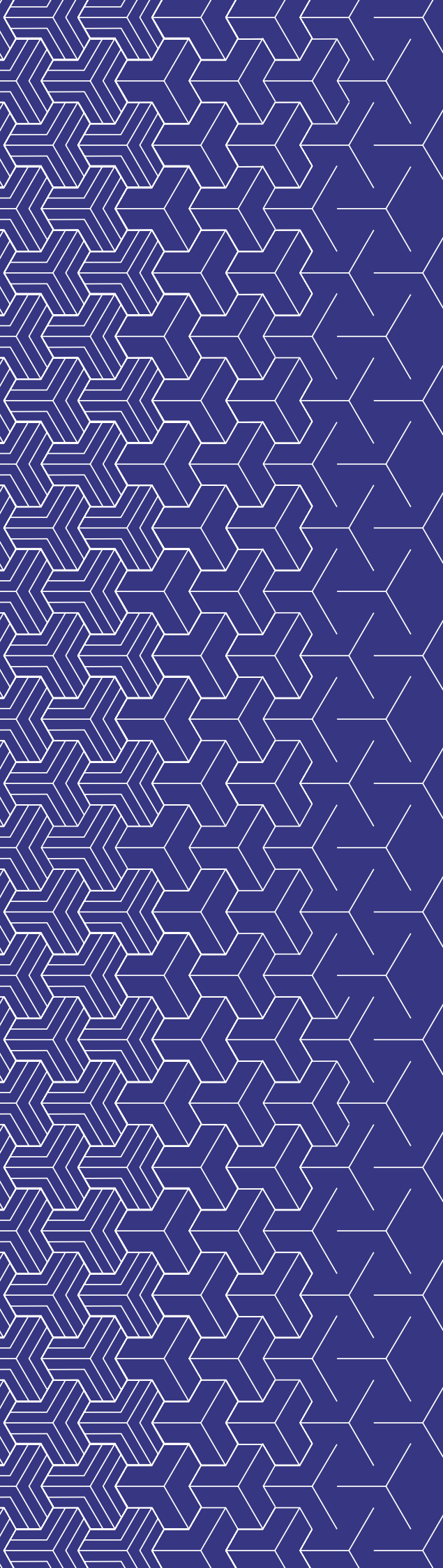


APPENDIX 1 INCENTIVES

There is an array of incentives offered for key industry players of automotive industry, these include the following:

Incentives	Agency
Pioneer Status (PS)	Malaysian Investment Development Authority (MIDA)
Investment Tax Allowance (ITA)	
Import Duty Exemption	
Individual Income Tax Relief	Inland Revenue Board of Malaysia (LHDN)
Reinvestment Allowance	
Special Tax Incentive	National Economic Recovery Plan (PENJANA)
New Customised Incentives Mechanism	Automotive Business Development Committee (ABDC) consists of MOF, MITI, JKDM, MARii and MIDA





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