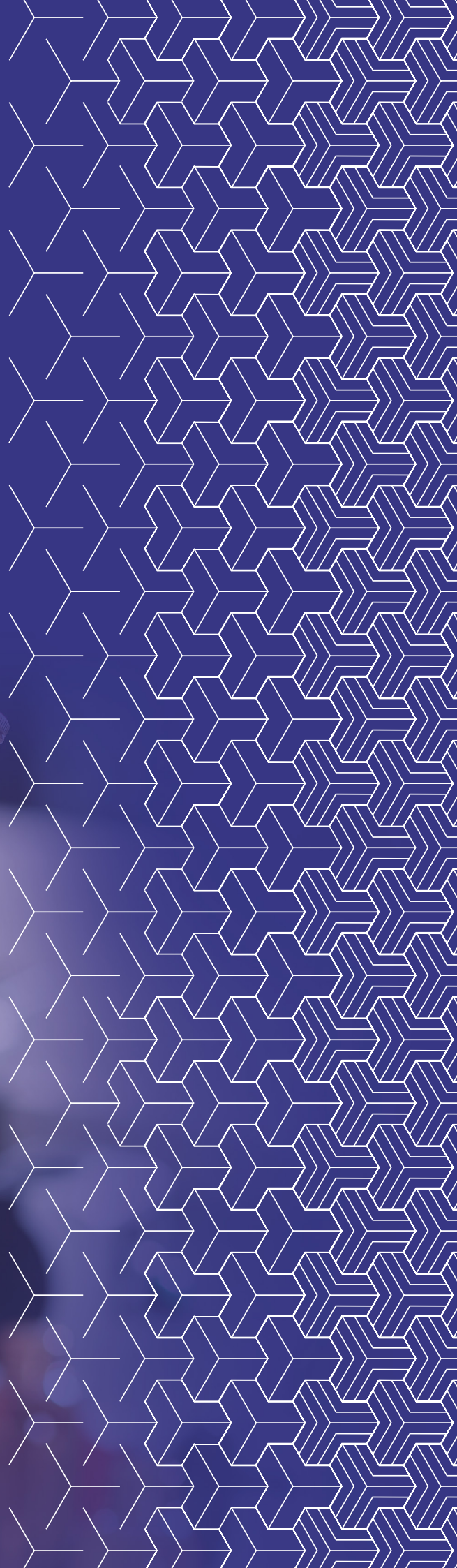


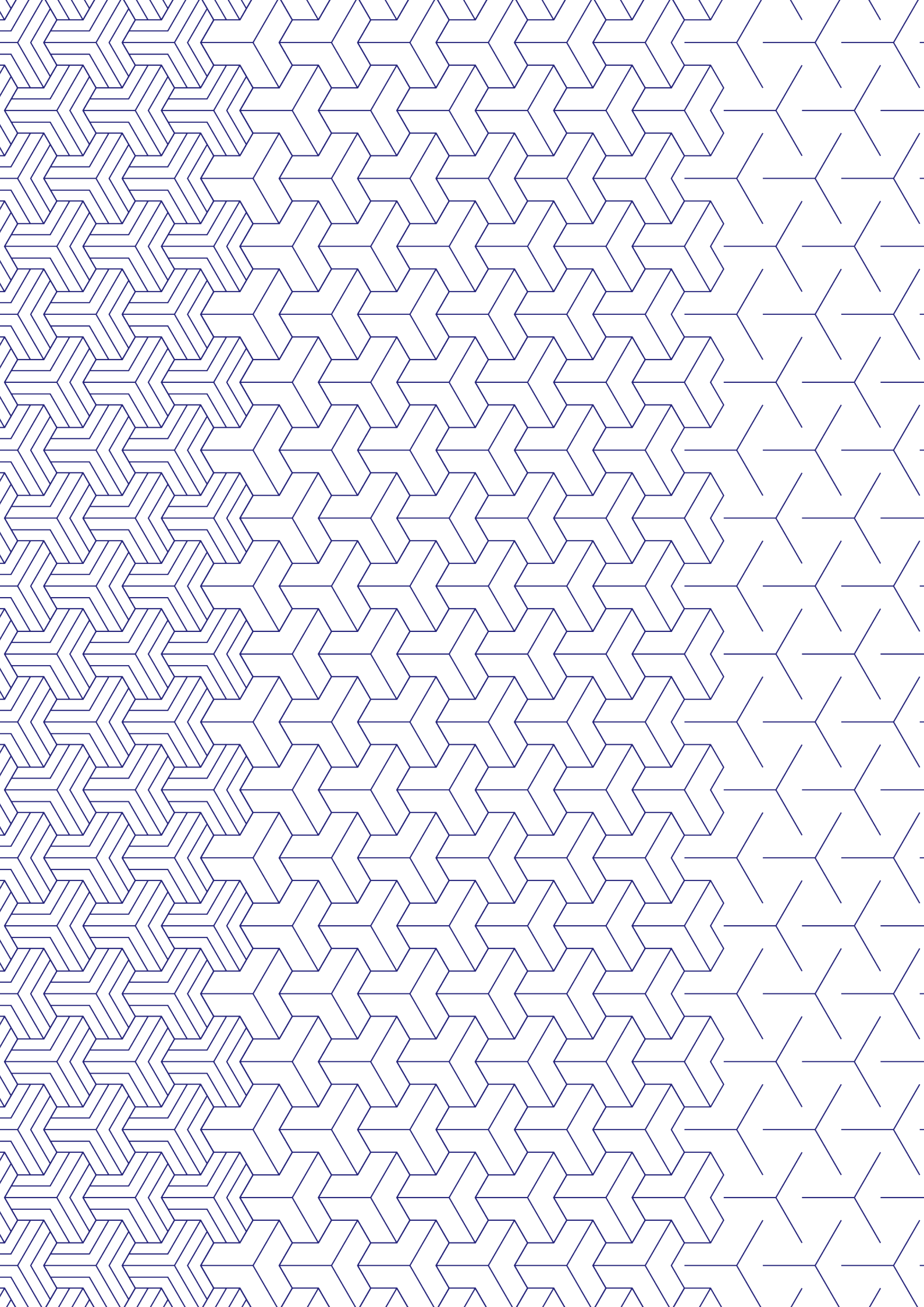


MINISTRY OF INVESTMENT,  
TRADE AND INDUSTRY

NEW INDUSTRIAL  
MASTER PLAN 2030

# CHEMICAL INDUSTRY







e ISBN No. : 978-967-0020-05-1

**PUBLISHED BY:**



MINISTRY OF INVESTMENT,  
TRADE AND INDUSTRY

Menara MITI, No. 7, Jalan Sultan Haji Ahmad Shah,  
50480 Kuala Lumpur, Malaysia.

Tel : 603-8000 8000

Fax : 03-6206 4693

Email : [webmiti@miti.gov.my](mailto:webmiti@miti.gov.my)

© **MINISTRY OF INVESTMENT, TRADE AND INDUSTRY**

MITI, 2023

**All rights reserved**

No part of this document may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior permission from Ministry of Investment, Trade and Industry (MITI). The information in this document has been updated as accurately as possible until the date of publication.

# TABLE OF CONTENTS

	<b>Preface</b>	i
	<b>Introduction</b>	1
	<b>Overview of the Document</b>	4
<b>Section</b>	<b>1</b> <b>Background</b>	5
	Areas Covered	5
	Value Chain	5
	Market Players	6
	Policies, Laws and Regulations	8
<b>Section</b>	<b>2</b> <b>Performance</b>	9
	IMP3 Focus and Performance	9
	Investments	9
	Exports	10
	Imports	12
	Value-added	13
	Employment	14
	Labour Productivity	14
	Linkages with Other Industries	15
<b>Section</b>	<b>3</b> <b>Trends and Opportunities</b>	16
	11 Priority Sub-segments	16
	Free Trade Agreements and Expedited Approval Process	16
<b>Section</b>	<b>4</b> <b>Challenges</b>	18
	Research, Development, Commercialisation and Innovation	18
	Targeted Investments	18
	Sustainability	19
	Infrastructure	19
	Chemical Parks	20
	Technology Adoption	20
	Talent Pool	21
<b>Section</b>	<b>5</b> <b>Strategies and Action Plans</b>	22
	NIMP 2030 Focus	22
	Action Plans	23
	<b>Appendix 1: Incentives</b>	24

## 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:

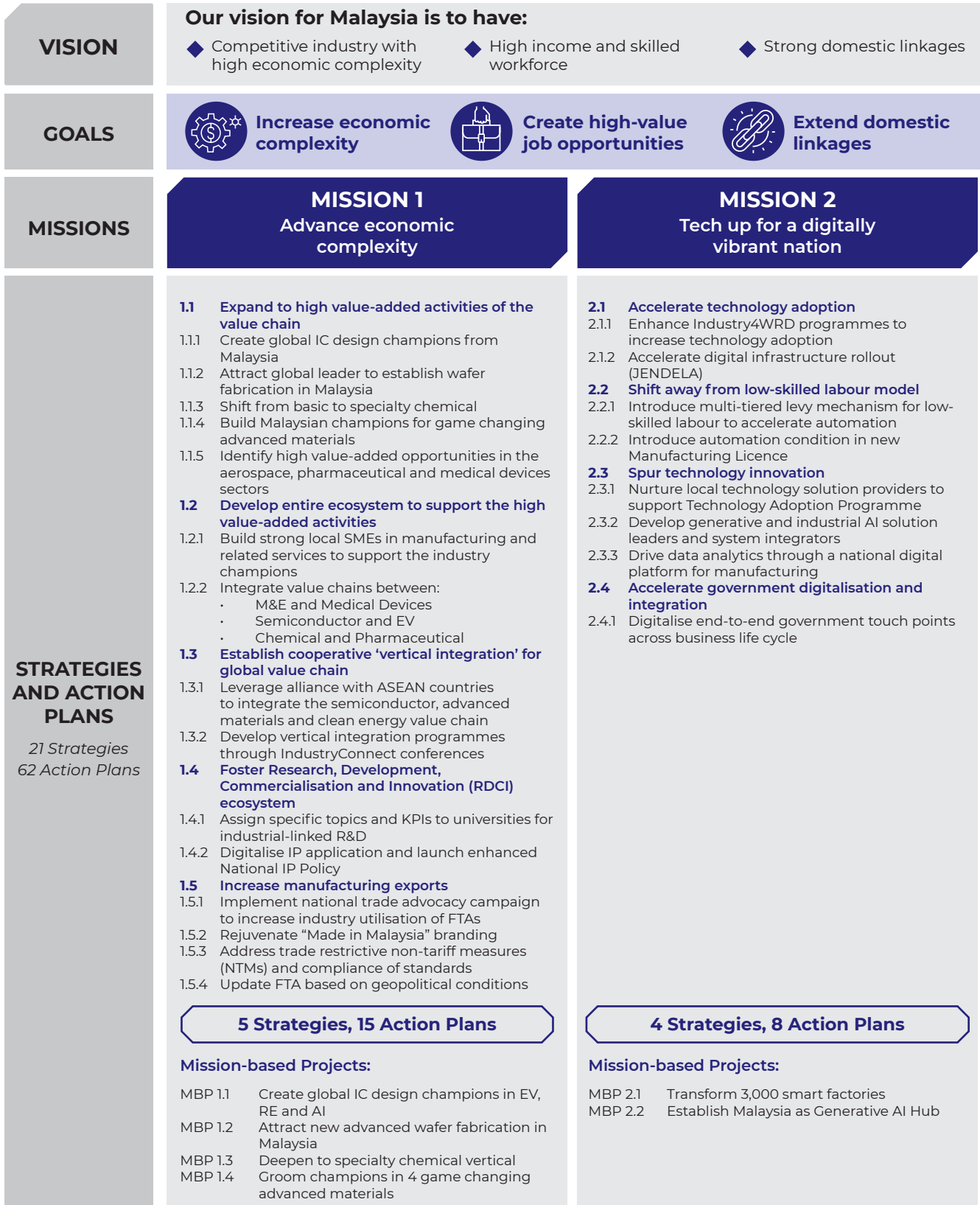
- Provide national strategic direction to lead the industrial development policies;
- Be a conversation piece for investors and other economies on Malaysia's position and direction; and
- Feature the role of the Malaysian Government in shaping the economy.

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

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

# OVERVIEW OF THE DOCUMENT

This NIMP 2030 Sectoral Plan – Chemical 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.<sup>1</sup>
- 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.

<sup>1</sup> Incentives available for this industry as of time of writing can be found in Appendix 1

## SECTION 1 BACKGROUND

### Areas Covered

- The chemical industry covers a wide range of products and can be categorised as below (Table 2.1).

**Table 2.1: Sub-segments of Chemical Industry**

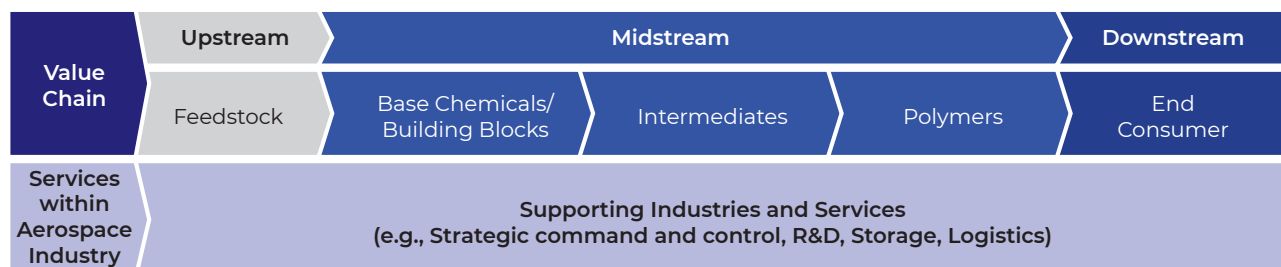
Sub-sectors	Sub-segments	Examples (non-exhaustive)	
i. <b>Organic chemicals</b>	Base chemicals/ building blocks	• Methanol • Ethylene	• Propylene • Benzene
	Organic intermediates	• Acrylic acid • Propylene glycol • Phenol	• MTBE • Paraxylene
	Specialty chemicals	• Agrochemicals	• Care chemicals
	Agrochemicals	• Crop protection	• Seeds
	Fertilisers <sup>2</sup>	• Urea	• Ammonia phosphate
	Plastic and polymers <sup>3</sup>	• Commodity plastics • Water-soluble polymers	• Engineering plastics
ii. <b>Inorganic chemicals</b>	Inorganic building blocks and intermediates <sup>3</sup>	• Sulphur • Phosphorus	• Chlorine • Rare earth elements
	Inorganic specialities	• Electronic chemicals	• Catalyst
iii. <b>Bio-based feedstock</b>	Oleochemicals, biochemicals	• Fatty acids • Methyl esters	• Glycerine

Source: Chemical Industry Roadmap 2030 (CIR 2030)

### Value Chain

- The chemical industry consists of upstream, midstream and downstream processes (Figure 2.1).

**Figure 2.1: Value Chain of Chemical Industry**



Source: CIR 2030

<sup>2</sup> Comprise both organic and inorganic chemicals

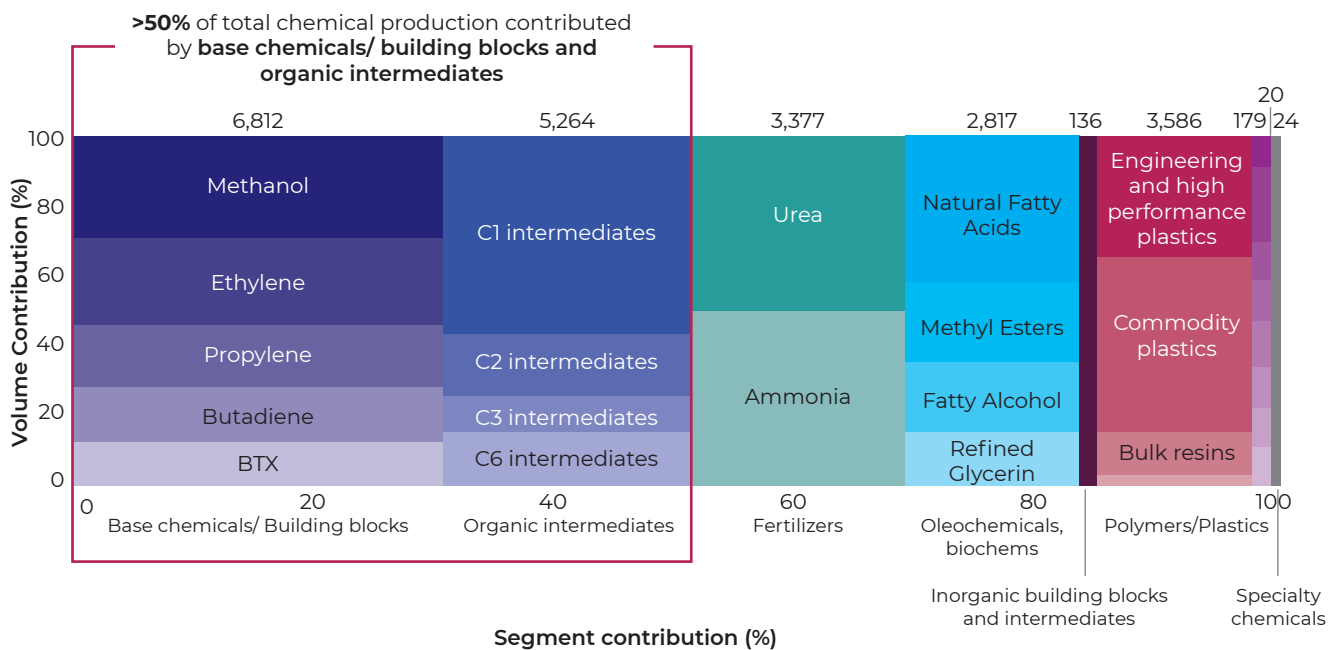
<sup>3</sup> Strategy and action plans for the development of inorganic building blocks and intermediates are not covered under this NIMP 2030 Sectoral Plan as they are covered under the purview of the National Mineral Industry Transformation Plan 2021-2030

3. The upstream processes include refining<sup>4</sup>, cracking and purification of feedstocks. Feedstocks are acquired or extracted from raw materials as base chemicals for further processing. Non-exhaustive examples of raw materials include crude oil, natural gas, naphtha, palm kernel oil and biomass.
4. Feedstocks undergo rounds of processing to produce building blocks, intermediates and polymers in midstream processes.
5. In downstream processes, chemical products are used to produce specialised chemicals or final consumer general and industrial goods.

## Market Players

6. Small and medium enterprises (SME) constitute 92.0 per cent of the industry's total establishments. The remaining 8.0 per cent are multinational corporations (MNC).
7. The presence of MNC is strong in upstream activities, whereas SME are more focused on midstream activities. There is a limited number of players involved in downstream activities of the industry.
8. The MNC largely contribute to the production of base chemicals or building blocks and organic intermediates – more than half of the total industry's production (Figure 2.2).

**Figure 2.1: Value Chain of Chemical Industry**



Source: CIR 2030

<sup>4</sup>Refinery of petroleum and crude palm oil are excluded as they are covered under the NIMP 2030 Sectoral Plans for petroleum products and petrochemicals industry and palm oil-based products industry respectively

9. Industry associations in Malaysia's chemical industry play important roles in representing the interest of manufacturers, influencing regulations and safeguarding the welfare of manufacturers and consumers. Non-exhaustive examples of these associations include:
  - i. Chemical Industries Council of Malaysia (CICM);
  - ii. Federation of Malaysian Manufacturers (FMM);
  - iii. Institution of Engineers, Malaysia (IEM);
  - iv. Malaysian Petrochemicals Association (MPA);
  - v. Malaysian Plastics Design Centre (MPDC);
  - vi. Malaysian Plastics Manufacturers Association (MPMA);
  - vii. Plastic Resins Producers' Group (PRPG);
  - viii. Plastics Technology Group (PTG) under SIRIM Berhad;
  - ix. SME Association of Malaysia; and
  - x. The Plastics and Rubber Institute Malaysia (PRIM).
  
10. Several Ministries and Government Agencies have prominent roles in regulating, promoting and developing Malaysia's chemical industry. These include:
  - i. Ministry of Investment, Trade and Industry (MITI);
  - ii. Ministry of Natural Resources, Environment and Climate Change (NRECC);
  - iii. Malaysian Investment Development Authority (MIDA); and
  - iv. Malaysia External Trade Development Corporation (MATRADE).



## Policies, Laws and Regulations

11. The industry's development is guided by the following:
  - i. Chemical Industry Roadmap 2030 (CIR 2030); and
  - ii. Malaysia Plastics Sustainability Roadmap 2021-2030.
12. Laws and regulations related to the chemical industry are:
  - i. Industrial Co-ordination Act (ICA) 1975;
  - ii. Petroleum Development Act 1974;
  - iii. Pesticides Act 1974;
  - iv. Poisons Act 1952;
  - v. Drugs Act 1952;
  - vi. Explosives Act 1957;
  - vii. Explosives Rules 1923;
  - viii. Strategic Trade Act (STA) 2010;
  - ix. Approved Permit of Import of Plastic Waste;
  - x. Classification, Labelling and Safety Data Sheet of Hazardous Chemical Regulations 2013 (CLASS Regulations);
  - xi. Use and Standard of Exposure Chemical Hazardous to Health Regulations 2000 (USECHH Regulations); and
  - xii. Environment and Health Risk Assessments and Environment Hazardous Substances.
13. There are international standards and requirements for the industry, including but not limited to:
  - i. Minamata Convention;
  - ii. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal; and
  - iii. Chemical Weapons Convention Act, 2005.

## SECTION 2 PERFORMANCE

### IMP3 Focus and Performance

14. During the period of the IMP3 (2006 to 2020), the chemical industry focused on:
  - i. exploring high value-added downstream activities, particularly oleochemicals; and
  - ii. developing green chemical products to capitalise on growth of green products.
15. As a result, the chemical industry's products are one of the top five export products for Malaysia, contributing to 6.5 per cent of total national exports in 2020.
16. In 2020, the industry had been temporarily affected by COVID-19 pandemic due to change in demand patterns and supply chain dynamics. The industry recovered post-pandemic by showing growth in GDP contribution and exports.
  - i. In 2022, the industry's GDP contribution grew by 2.9 per cent reaching RM36.6 billion, the highest since 2006.
  - ii. Similarly, export grew by 12.9 per cent, from RM86.7 billion in 2021 to RM97.9 billion in 2022.

### Investments

17. The investment performance of the chemical industry for the period of 2006 to 2022 is recorded as follows (Table 2.2). Investment within the chemical industry is classified into two categories:
  - i. chemicals and chemical products<sup>5</sup>; and
  - ii. plastic products.

**Table 2.2: Approved Investments of Chemical Industry**

Items	Units	IMP3			2021	2022	2021-2022
		2006	2020	2006-2020			
<b>Chemicals and Chemical Products</b>							
<b>Total Investment</b>	RM billion	10.0	6.3	92.9	5.8	7.4	13.1
<b>Domestic Investment</b>	RM billion	6.1	1.6	35.4	2.3	1.6	3.9
<b>Foreign Investment</b>	RM billion	3.9	4.6	57.4	3.5	5.7	9.2
<b>Number of projects</b>	#	164	74	1,310	89	71	160
<b>Employment</b>	persons	6,642	3,562	56,843	3,048	2,860	5,908
<b>Plastic Products</b>							
<b>Total Investment</b>	RM billion	0.9	1.1	14.5	0.8	1.4	2.2
<b>Domestic Investment</b>	RM billion	0.3	0.9	7.5	0.5	0.8	1.3
<b>Foreign Investment</b>	RM billion	0.5	0.3	7.0	0.3	0.6	0.9
<b>Number of projects</b>	#	69	64	794	45	82	127
<b>Employment</b>	persons	6,817	2,639	51,513	2,006	3,788	5,794

Source: MIDA

<sup>5</sup> The scope of investment covers chemicals, cosmetics and toiletries, pharmaceuticals and oleochemicals

## Chemicals and Chemical Products

18. During the IMP3 period, a total of 1,310 projects were approved in the chemicals and chemical products category with a total investment of RM92.9 billion. These investments committed a total of 56,843 job opportunities.
19. In 2021 and 2022, a total of 160 projects were approved with a total investment of RM13.1 billion. These investments committed a total of 5,908 job opportunities.
20. From 2006 to 2022, 1,114 (75.8 per cent) of the 1,470 approved projects were implemented.

## Plastic Products

21. During the IMP3 period, a total of 794 projects were approved in the plastic products category with a total investment of RM14.5 billion. These investments committed a total of 51,513 job opportunities.
22. In 2021 and 2022, a total of 127 projects were approved with total investment of RM2.2 billion. These investments committed a total of 5,794 job opportunities.
23. From 2006 to 2022, 776 (84.3 per cent) of the 921 approved projects were implemented.
24. Overall, investments in the chemical industry were mainly driven by large investments such as projects in Gebeng in 2014, which worth RM2.9 billion.

## Exports

25. The industry's export performance during 2006 to 2022 is recorded in Table 2.3.

**Table 2.3: Exports of Chemical Industry**

Items	IMP3			2021	2022	2006-2020	2020-2021	2021-2022
	2006	2020	2006-2020			CAGR	Annual Growth	
<b>Total Exports (RM billion)</b>	32.3	63.9	728.6	86.7	97.9	5.0%	35.6%	12.9%
<b>Chemicals and Chemical Products<sup>6</sup> (RM billion)</b>	24.5	50.7	559.5	70.7	80.6	5.3%	39.3%	14.0%
<b>Plastic Products (RM billion)</b>	7.8	13.2	169.0	16.0	17.3	3.8%	21.1%	8.1%

Source: MATRADE

26. During the IMP3 period, total exports of the industry grew by a CAGR of 5.0 per cent, from RM32.3 billion (2006) to RM63.9 billion (2020).
27. In 2021 and 2022, the chemical industry experienced growth of 35.6 per cent and 12.9 per cent in total exports, amounting to RM86.7 billion and RM97.9 billion respectively.

<sup>6</sup> Include pharmaceutical products

28. Generally, export growth was driven by several factors.
- i. Abundance of raw materials in key sub-sectors and rapid industrialisation.
  - ii. The trade tension between the United States (US) and China encouraged supply chain diversification, which has led to a surge in market demand for chemical and plastic products.
  - iii. Industry players, who had recovered to their pre-pandemic production capacity, increased the demand for chemical and plastic products.
29. In 2022, top export countries for the chemical industry are in Table 2.4 below.

**Table 2.4: Top Export Countries of Chemical Industry**

Chemicals and Chemical Products	Plastic products
i. China (RM19.2 billion, 23.8%)	i. Singapore (RM3.2 billion, 18.7%)
ii. Thailand (RM8.6 billion, 10.6%)	ii. Japan (RM1.9 billion, 11.2%)
iii. Indonesia (RM7.7 billion, 9.6%)	iii. US (RM1.7 billion, 10.1%)
iv. India (RM6.8 billion, 8.5%)	iv. Australia (RM1.6 billion, 9.5%)
v. Singapore (RM5.7 billion, 7.1%)	v. Indonesia (RM1.2 billion, 7.1%)

Source: MATRADE

30. In 2022, top exported products of the industry are in Table 2.5 below.

**Table 2.5: Top Exported Products of Chemical Industry**

Chemicals and Chemical Products	Plastic products
i. other plastics in primary forms (RM8.6 billion, 10.7%)	i. plates, sheets, film, foil and strip of plastics (RM6.8 billion, 39.2%)
ii. ethylene polymers in primary forms (RM8.4 billion, 10.4%)	ii. plastic containers (including stoppers, lids, caps) (RM4.9 billion, 28.5%)
iii. inorganic chemical elements, oxides and halogen salts (RM7.0 billion, 8.6%)	iii. other articles of plastics (RM3.3 billion, 18.9%)
iv. manufactured fertilisers (RM6.9 billion, 8.5%)	iv. tubes, pipes and hoses of plastics (RM1.0 billion, 5.7%)
v. polyacetals and polycarbonates in primary forms (RM6.1 billion, 7.6%)	v. builders' ware of plastics (RM0.5 billion, 2.7%)

Source: MATRADE

## Imports

31. The import performance of the chemical industry for the period of 2006 to 2022 is recorded in Table 2.6 below.

**Table 2.6: Imports of Chemical Industry**

Items	IMP3			2021	2022	2006-2020	2020-2021	2021-2022
	2006	2020	2006-2020			CAGR	Annual Growth	Annual Growth
<b>Total Imports (RM billion)</b>	39.4	85.8	960.4	110.0	131.1	5.7%	28.2%	19.1%
<b>Chemicals and Chemical Products<sup>7</sup> (RM billion)</b>	33.4	74.3	839.0	96.6	115.5	5.9%	30.0%	19.6%
<b>Plastic Products (RM billion)</b>	6.0	11.5	121.4	13.4	15.5	4.8%	16.9%	15.6%

Source: MATRADE

32. During the IMP3 period, total imports of the industry grew by a CAGR of 5.7 per cent from RM39.4 billion (2006) to RM85.8 billion (2020).
33. In 2021 and 2022, the industry's total imports grew further by 28.2 per cent and 19.1 per cent, to RM110.0 billion and RM131.1 billion respectively.
34. The rise in imports was due to rapid growth of other manufacturing sectors that increased the demand for chemical and plastic products. The spike during COVID-19 period reflected the surge in demand due to supply chain diversification.
35. In 2022, top import countries for the chemical industry are in Table 2.7 below.

**Table 2.7: Top Import Countries of Chemical Industry**

Chemicals and Chemical Products	Plastic Products
i. China (RM28.6 billion, 24.8%)	i. China (RM6.5 billion, 41.9%)
ii. Singapore (RM9.7 billion, 8.4 %)	ii. Japan (RM1.7 billion, 11.1%)
iii. US (RM9.3 billion, 8.1 %)	iii. Singapore (RM1.5 billion, 9.9%)
iv. Japan (RM7.3 billion, 6.3%)	iv. US (RM1.4 billion, 8.8%)
v. Thailand (RM6.7 billion, 5.8%)	v. Korea (RM0.9 billion, 5.8%)

Source: MATRADE

<sup>7</sup> Include pharmaceutical products

36. In 2022, top imported products of the industry are in Table 2.8 below.

**Table 2.8: Top Imported Products of Chemical Industry**

Chemicals and Chemical Products	Plastic Products
i. other plastics in primary forms (RM9.9 billion, 8.5%)	i. plates, sheets, film, foil and strip of plastics (RM6.7 billion, 42.9%)
ii. chemical elements or compounds for electronics (discs, wafers, etc.)(RM9.6 billion, 8.3%)	ii. other articles of plastics (RM4.5 billion, 28.8%)
iii. miscellaneous chemical products; residual products of the chemical or allied industries; waste (RM9.2 billion, 7.9%)	iii. containers of plastics (including stoppers, lids, caps) (RM2.0 billion, 13.1%)
iv. manufactured fertilisers (RM8.8 billion, 7.6%)	iv. tubes, pipes and hoses of plastics (RM1.1 billion, 6.9%)
v. ethylene polymers in primary forms (RM8.5 billion, 7.3%)	v. floor, wall or ceiling coverings, household articles and toilet articles of plastics (RM0.8 billion, 5.4%)

Source: MATRADE

## Value-added

37. The industry's value-added (GDP) for 2006 to 2022 is recorded in Table 2.9 below.

**Table 2.9: Value-added of Chemical Industry**

Item	IMP3		2021	2022	2006-2020	2020-2021	2021-2022
	2006	2020			CAGR	Annual Growth	
<b>Value-added<sup>8</sup> (RM billion)</b>	22.0	42.7	47.3	48.7	4.9%	10.7%	2.9%

Source: Department of Statistics Malaysia (DOSM)

38. During the IMP3 period, the industry's GDP contribution grew by a CAGR of 4.9 per cent from RM22.0 billion (2006) to RM42.7 billion (2020).

39. In 2021 and 2022, the industry's GDP contribution continued to rise by 10.7 per cent and 2.9 per cent to RM47.3 billion and RM48.7 billion respectively.

40. The GDP growth was driven by the increased production of base chemicals and organic intermediates.

<sup>8</sup> 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

41. The employment in the chemical industry for the period of 2019 to 2022 is recorded as follows (Table 2.10).

**Table 2.10: Employment in Chemical Industry**

Item	IMP3		2021	2022	2019-2022
	2019	2020			CAGR
<b>Employment<sup>9</sup> (persons)</b>	227,782	229,556	228,786	236,414	1.2%

Source: DOSM

42. Industry employment grew by a CAGR of 1.2 per cent, from 227,782 persons (2019) to 236,414 persons (2022).
43. The rise in employment was driven by rising market demands for chemical products. However, the employment dropped in 2021 as manufacturers reduced the workforce during the pandemic due to the prospects of long-term economic downturn.

## Labour Productivity

44. The industry's labour productivity for the period of 2019 to 2022 is tabulated as follows (Table 2.11).

**Table 2.11: Labour Productivity of Chemical Industry**

Item	IMP3		2021	2022	2019-2022
	2019	2020			CAGR
<b>Labour Productivity<sup>10</sup> (RM)</b>	193,242	186,107	206,791	205,851	2.1%

Source: DOSM

45. The industry's labour productivity increased by a CAGR of 2.1 per cent, from RM193,242 (2019) to RM205,851 (2022).
46. The productivity growth in 2021 was due to the increased demand for chemical products, especially for essentials during the pandemic.

<sup>9</sup> This employment data is based on Monthly Manufacturing Statistics December 2022 and includes basic industrial chemicals, other chemical products and plastic products. Due to the change in methodology for employment statistics tabulation in 2019, industry's employment breakdown from 2006 to 2018 is not available

<sup>10</sup> Annual labour productivity is derived from value added per employment

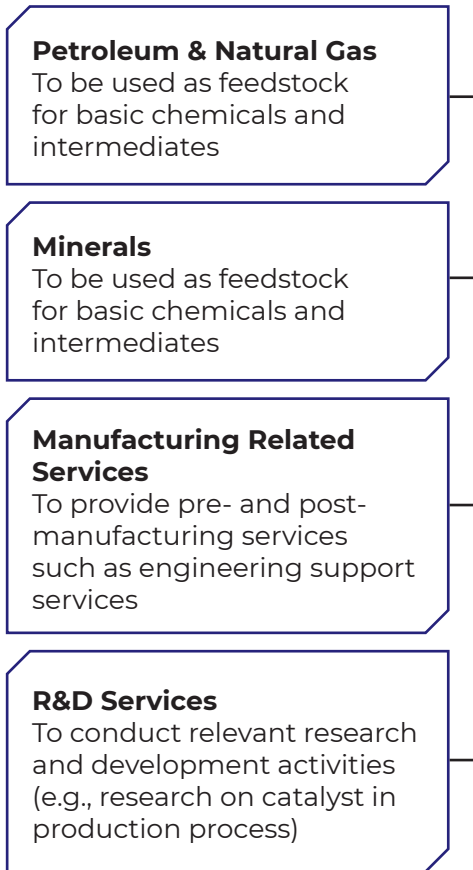
## Linkages with Other Industries

47. The chemical industry has extensive backward and forward linkages with other industries (Figure 2.3).

**Figure 2.3: Industries with Backwards and Forward Linkages with Chemical Industry**

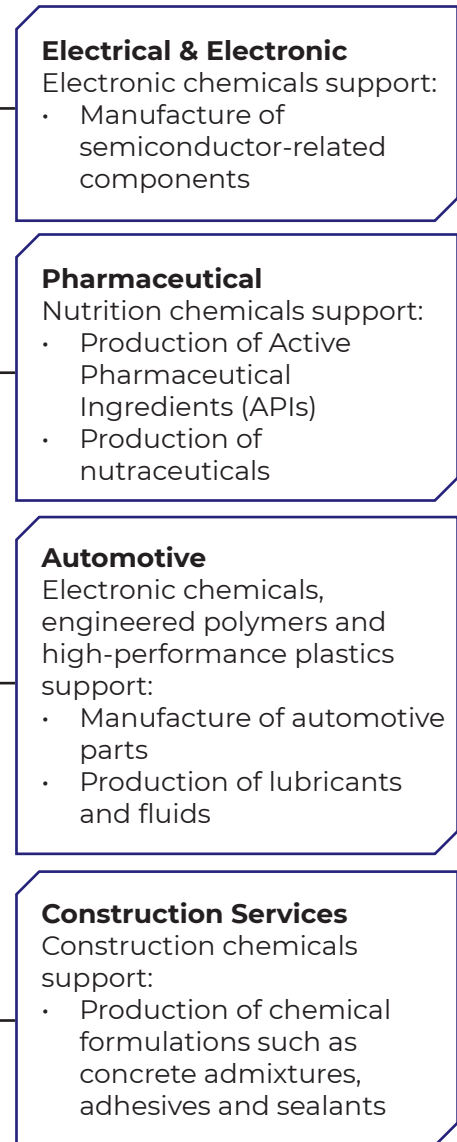
### Backward Linkages:

Industries required to support the development of Chemical Industry:



### Forward Linkages:

Industries that benefit from the innovation multiplier effect from Chemical Industry:



Source: MITI

## SECTION 3 TRENDS AND OPPORTUNITIES

48. The global chemical industry is expected to reach a market size of RM26.4 trillion<sup>11</sup> by 2030, with a growth of 4.5 per cent.<sup>12</sup>
49. Malaysia can capture this industry growth by further expanding into higher value-added products – leveraging its strong foundation in building blocks and derivatives such as:
- i. nitrogen-based fertilisers;
  - ii. basic oleochemical;
  - iii. C1 intermediates (acetic acids, PVA, formaldehyde and UF resins); and
  - iv. commodity plastics.

### 11 Priority Sub-segments

50. The CIR 2030 has identified opportunities in 11 priority sub-segments which offers the most attractive development proposition for Malaysia (Table 2.12).

**Table 2.12: 11 Priority Sub-segments of Chemical Industry**

Categories	Base Chemicals and Intermediates	Plastics and Polymers	Specialty Chemicals
Sub-segments	<ol style="list-style-type: none"> <li>1. Fertilisers</li> <li>2. Oleochemicals</li> <li>3. C1 Intermediates</li> </ol>	<ol style="list-style-type: none"> <li>4. High Performance Composites</li> <li>5. Synthetic Rubber<sup>13</sup></li> <li>6. Plastics (commodity, engineering, high performance)</li> </ol>	<ol style="list-style-type: none"> <li>7. Agrochemicals</li> <li>8. Care Chemicals</li> <li>9. Nutrition Chemicals</li> <li>10. Electronic Chemicals</li> <li>11. Construction Chemicals</li> </ol>

Source: CIR 2030

51. These growth opportunities are mainly driven by five key trends:
- i. Demand for lightweight vehicles, electrification and alternative fuels
    - a. There is an increasing need for chemical-derived products such as battery and electronic chemicals, engineered polymers and high performance plastics.
    - b. The growing demand for semiconductors to support the rapid development of the electronics and Electric Vehicle (EV) battery manufacturing sectors in Asia Pacific is expected to drive the growth of specialty electronic chemicals.
    - c. High value-added activities across the semiconductor value chain (e.g. integrated circuit (IC) packaging and wafer fabrication) use specialty chemicals (e.g. electronic chemicals) in production processes (e.g. doping, etching, cleaning, photolithography and deposition).

<sup>11</sup> USD5.9 trillion, converted based on exchange rate USD1.0 to RM4.48

<sup>12</sup> Source: Oxford Economics

<sup>13</sup> Synthetic rubber is covered under rubber-based product industry

- ii. Nutrition and health lifestyle changes
  - a. This drives the growth of nutrition and care chemicals.
  - b. The nutraceuticals and functional food market, and care market<sup>14</sup> are expected to grow.
  - c. This is due to the ageing population, as well as the increased awareness of health and cleanliness following the COVID-19 pandemic.
- iii. Demand for agri-science applications
  - a. The growing importance of food security and the need to improve productivity in the agriculture sector drive the demand for agrochemicals, particularly for crop protection, crop production and seed health applications.
  - b. Other potential needs include improved seed solutions, mitigation of toxic ingredients, customised formulations and increased product's shelf life.
- iv. Demand for newer construction materials and technologies
  - a. More construction chemicals, especially the concrete admixtures, adhesives and sealants are needed due to growing urbanisation and increased mobility.
  - b. These chemicals are required to facilitate the development of city building and the EV adoption through the use of newer materials and technologies in infrastructure development.
- v. Demand for Industry 4.0 technologies
  - a. The demand for high performance composites, which are used for advanced materials such as carbon nanotubes, graphene and silicon are increasing.
  - b. These advanced materials are widely used in connected and data-driven technologies such as multi-functional sensors and 3D printing.

## Free Trade Agreements and Expedited Approval Process

- 52. Moving forward, there will be growing number of trade corridors between the ASEAN with the US and the European Union (EU).
- 53. In this case, Free Trade Agreements (FTA) are essential to strengthen Malaysia's competitiveness of chemical exports.
- 54. As Malaysia's FTA are mainly focused on the Asia-Pacific region, the country can leverage this opportunity to pursue FTA with the US and EU, taking advantage of the trade corridor shift.
- 55. The EU countries are the major importers of Malaysia's agrochemicals and fertilisers. However, the exports to these countries are hindered by complex and length product registration approval processes which typically exceeding a duration of three to four months.
- 56. An express and simplified process is needed to foster international trade.
- 57. Refer to Action Plan 3 (AP3) in Section 5 for strategies and action plans related to ease of trade.

<sup>14</sup> Includes home care, personal care and industrial cleaning products

## SECTION 4 CHALLENGES

### Research, Development, Commercialisation and Innovation

58. Technology capability is extremely crucial in the chemical industry, especially for high value-added areas such as the formulation of specialty chemicals.
59. Apart from that, the capability to commercialise technologies is important to allow easier and quicker market entry.
60. Presently, the research, development, commercialisation and innovation (RDCI) capabilities in Malaysia are limited compared to leading chemical producing countries such as Germany and Japan. This is due to:
  - i. limited integration between industry and academia;
  - ii. limited relevant expertise;
  - iii. insufficient funding; and
  - iv. low awareness on key technical standards.
61. In this regard, efforts that promotes RDCI activities are crucial. These include:
  - i. establishing a platform to promote collaboration among all stakeholders;
  - ii. providing incentives and financial assistance to encourage new technology innovation; and
  - iii. setting up a technical committee to provide guidance on technical standards for local players.
62. Refer to Action Plan 2 (AP2) in Section 5 for strategies and action plans related to promoting the RDCI ecosystem.

### Targeted Investments

63. Currently, Malaysia has a strong and supportive investment landscape. Various incentive levers are provided by the Government across the manufacturing industries to support FDI and DDI.
64. However, the existing incentives are blanket – typically applies to the entire manufacturing ecosystem. Instead of a broad-based approach, there is a need for targeted incentives that are designed to support the chemical industry.
65. To strengthen the industry's global competitiveness, it is crucial to improve the investment landscape – by building an attractive environment through access to financial incentives, start-up support and business processes.
66. A more focused investment strategy is required to further drive investment in targeted growth areas and promote innovation in Malaysia.
67. Refer to Action Plan 9 (AP9) in Section 5 for strategies and action plans related to targeted investment.

## Sustainability

68. The chemical industry is shifting towards circular ecosystem, responding to the sustainability demands which are driven by regulations and consumer expectations.
69. With this in mind, the green-based chemicals market size is expected to reach RM134.4 billion<sup>15</sup>, growing at 10.0 per cent.<sup>16</sup>
70. Malaysia has developed various regulatory roadmaps to promote sustainability and offers incentives for sustainable operations, including tax allowances and financial assistance for innovation and adoption of green technologies.
71. However, only a limited number of SME and start-ups are currently involved in the development of sustainable products.
72. This may be contributed by limited policies and regulations in areas such as:
  - i. carbon reduction;
  - ii. plastic recycling;
  - iii. adoption of alternative materials; and
  - iv. chemical waste management.
73. The absence of digital platform solutions, education support and best-practice guidance could impede implementation of sustainability measures.
74. The following measures will further enable sustainability engagement and implementation.
  - i. Providing support and guidance on sustainability measures via a new policy framework and the help of circular economy think tanks.
  - ii. Onboarding local players into circular ecosystem via promotion of digital platform solutions.
  - iii. Facilitating knowledge sharing, technology transfer and collaboration via establishment of an industry consortia.
75. Refer to Action Plan 5 (AP5), Action Plan 6 (AP6) and Action Plan 7 (AP7) in Section 5 for strategies and action plans related to promoting sustainability.

## Infrastructure

76. The advancement of the industry remains constrained despite being supported by infrastructure provision such as electricity, transportation and utilities. This is due to limited infrastructure in supporting auxiliary services namely testing facilities and waste management facilities.
77. The capability of testing facilities is limited for growing sub-segments such as agrochemicals. Currently, Malaysia has no private research institutions and advanced material testing labs. Existing facilities are limited to certain areas such as final products structural testing.

<sup>15</sup> USD30.0 trillion, converted based on exchange rate USD1.0 to RM4.48

<sup>16</sup> Source: CIR 2030



78. Apart from testing facilities, the industry faces challenges in waste management.
  - i. Development of chemical waste management that is in parallel to the industry's growth is crucial to prevent adverse effects on the environment and human health.
  - ii. However, the special waste management systems, that dispose over 50.0 per cent of chemical waste, are operated by the Government – low private participation due to limited enterprise resource planning (ERP) facilities.
79. Initiatives to encourage responsibility for chemical waste management and to increase testing facilities for targeted products are vital to be implemented.
80. Refer to Action Plan 8 (AP8) in Section 5 for strategies and action plans related to improving infrastructure in waste management and testing capabilities.

## Chemical Parks

81. Malaysia has the world-class chemical parks such as Gebeng Integrated Petrochemical Complex (GIPC) and Kerteh Integrated Petrochemical Complex (KIPC).
82. However, these chemical parks have a limited focus on high value-added products such as high performance composites, green chemicals and polymer.
83. In this regard, to attract foreign participation and enhance value chain integration, Malaysia has the opportunity to:
  - i. improve the attractiveness and utilisation of existing chemical parks; and
  - ii. identify potential new chemical parks for emerging chemical products.
84. Refer to Action Plan 1 (AP1) in Section 5 for strategies and action plans related to improving the chemical parks.

## Technology Adoption

85. Presently, there is limited adoption of Industry 4.0 and automated technologies in the industry, which hinders productivity and growth.
86. This is impacted by the limitation in areas such as:
  - i. collaboration between chemical manufacturers and Industry 4.0 technology providers;
  - ii. financing support for technology adoption; and
  - iii. participation of private technology providers in the chemical industry.
87. Operations can be further modernised through:
  - i. advanced track and trace systems to increase visibility and obtain real-time data insight;
  - ii. advanced analytics to improve predictive maintenance; and
  - iii. business-to-business e-commerce solutions to save costs and boost sales.
88. Refer to Action Plan 4 (AP4) in Section 5 for strategies and action plans related to adoption of modernised technologies.

## Talent Pool

89. Currently, the chemical industry in Malaysia is confronted with challenges in attracting and retaining talent to meet the manufacturing sector's requirement of a minimum 80.0 per cent local workforce.
90. This is due to:
  - i. unstandardised industry entry requirements and accreditation centres;
  - ii. dated educational programmes; and
  - iii. comparatively lower salaries compared to other regional players.
91. In this regard, it is essential to build a larger base of talent pool by:
  - i. enhancing the educational ecosystem through technical and vocational education and training (TVET) programmes and higher education training; and
  - ii. easing the employment of skilled labour through Residence-Pass Talent (RPT) programmes.
92. Refer to Action Plan 10 (AP10) in Section 5 for strategies and action plans related to developing a large base of skilled labour.

## SECTION 5 STRATEGIES AND ACTION PLANS

### NIMP 2030 Focus

93. There are five aspirations under the CIR 2030 that the industry aims to achieve:
- increase industry value-add from building blocks;
  - enhance industry downstream integration;
  - increase competitiveness of chemical industry;
  - improve sustainability of chemical industry; and
  - introduce technology to advance state of chemical industry.
94. NIMP 2030 is aligned to each aspiration of CIR 2030 – focusing on the 11 priority sub-segments (Table 2.13).

**Table 2.13: Linkage between Priority Sub-segments and Aspirations**

Sub-sectors	Increase value add	Enhance downstream integration	Increase competitiveness	Improve sustainability	Introduce new technology
1. Fertilisers	✓		✓	✓	
2. Oleochemicals	✓	✓	✓	✓	✓
3. C1 Intermediates	✓				
4. High Performance Composites		✓			✓
5. Synthetic Rubber		✓	✓	✓	
6. Plastics			✓	✓	✓
7. Agrochemicals		✓		✓	✓
8. Care Chemicals	✓	✓			
9. Nutrition Chemicals	✓	✓	✓		
10. Electronic Chemicals		✓	✓		✓
11. Construction Chemicals		✓			

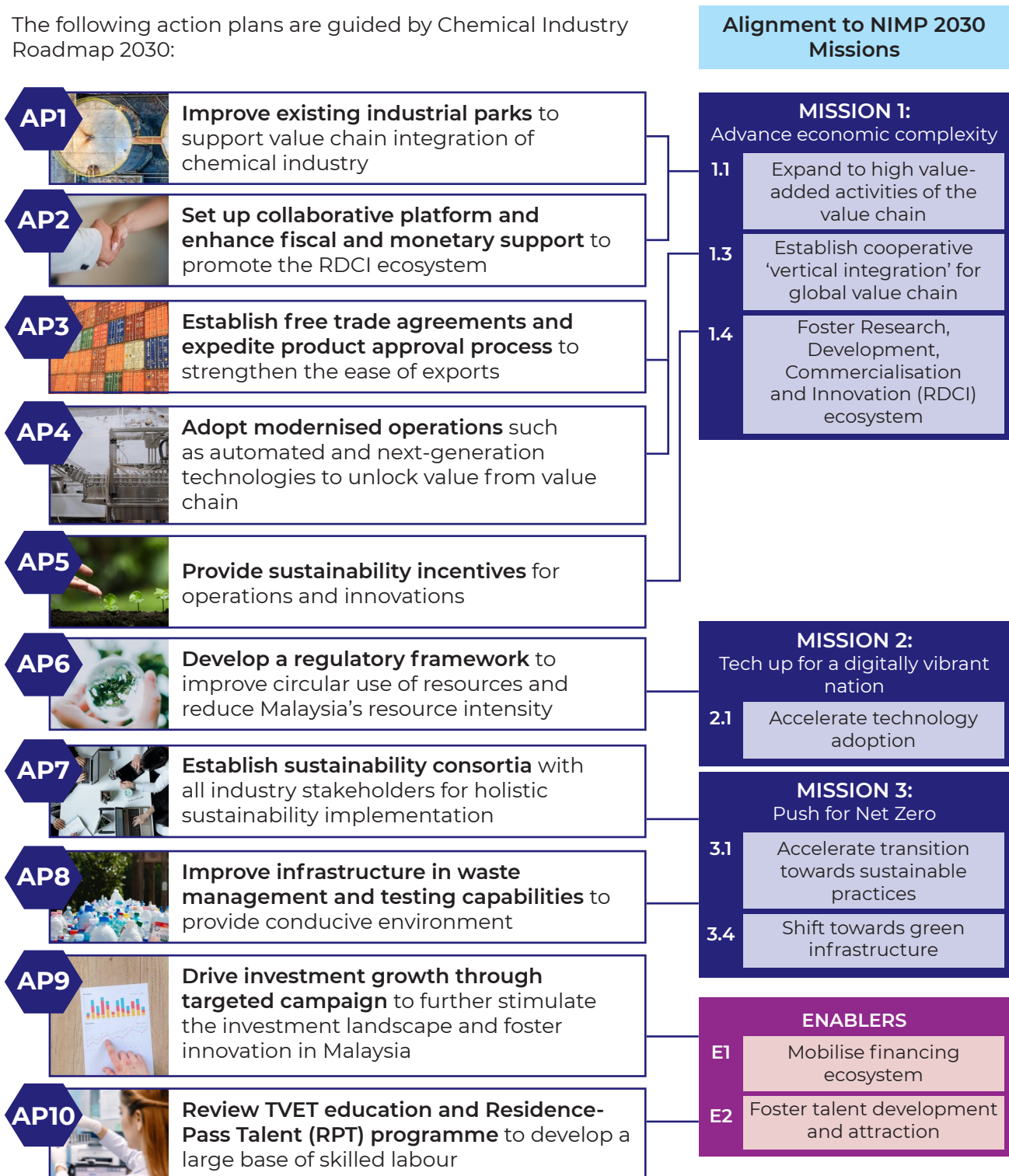
Source: CIR 2030

### Action Plans

- 95. Strategies and Action Plans relating to the NIMP 2030’s Missions and Enablers are applicable to this industry (Figure 2.4).
- 96. Further action plans specific to this industry shall be guided by the CIR 2030.

**Figure 2.4: Strategies and Action Plans for Chemical Industry**

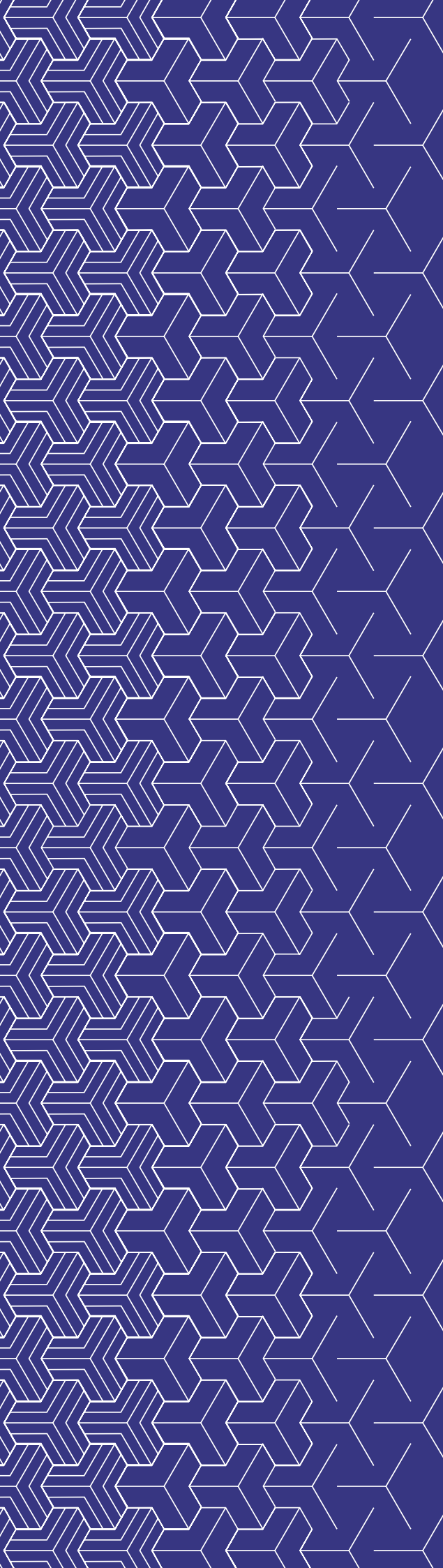
The following action plans are guided by Chemical Industry Roadmap 2030:



## APPENDIX 1 INCENTIVES

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

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



e ISBN 978-967-0020-05-1



9 789670 020051