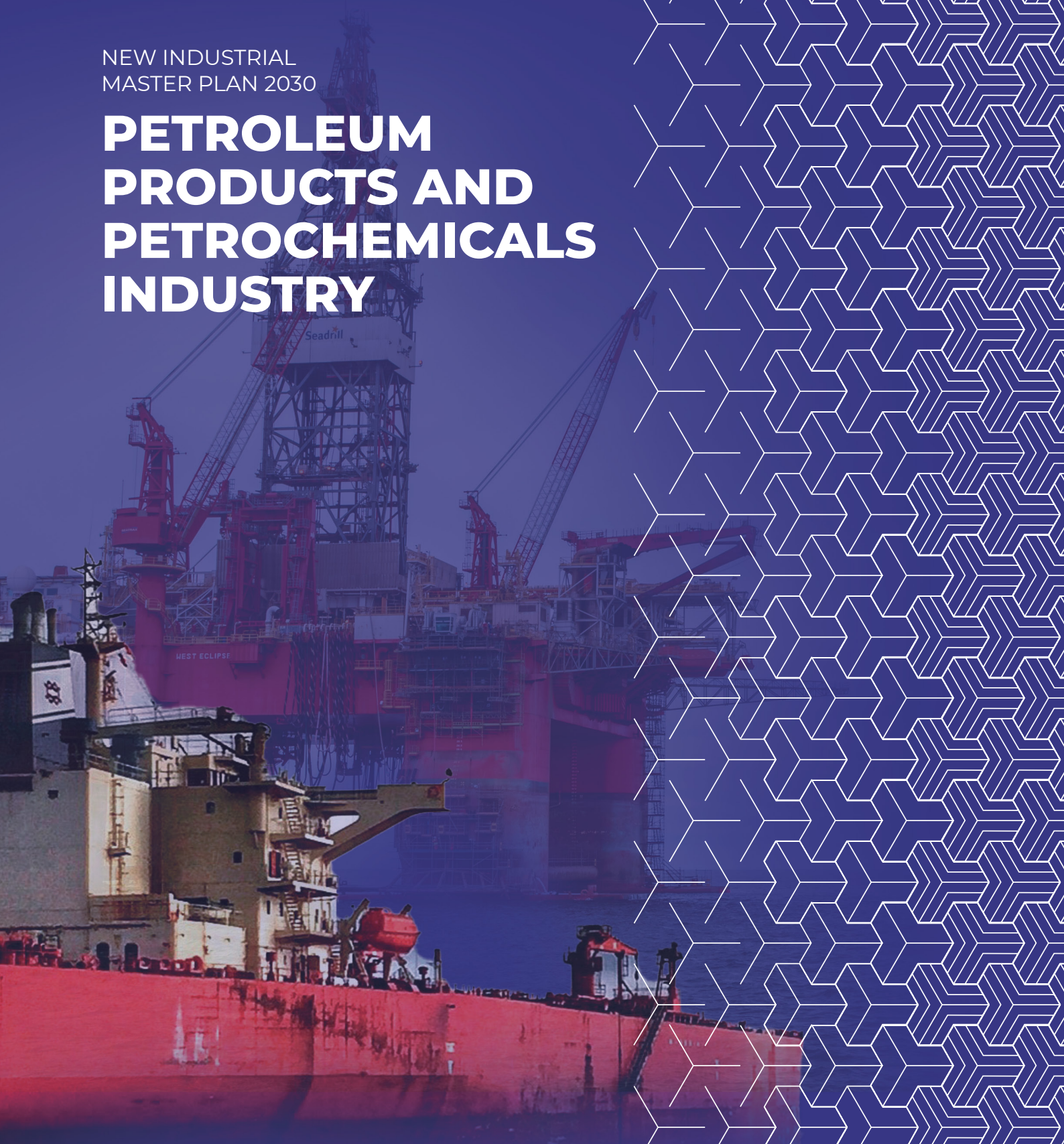


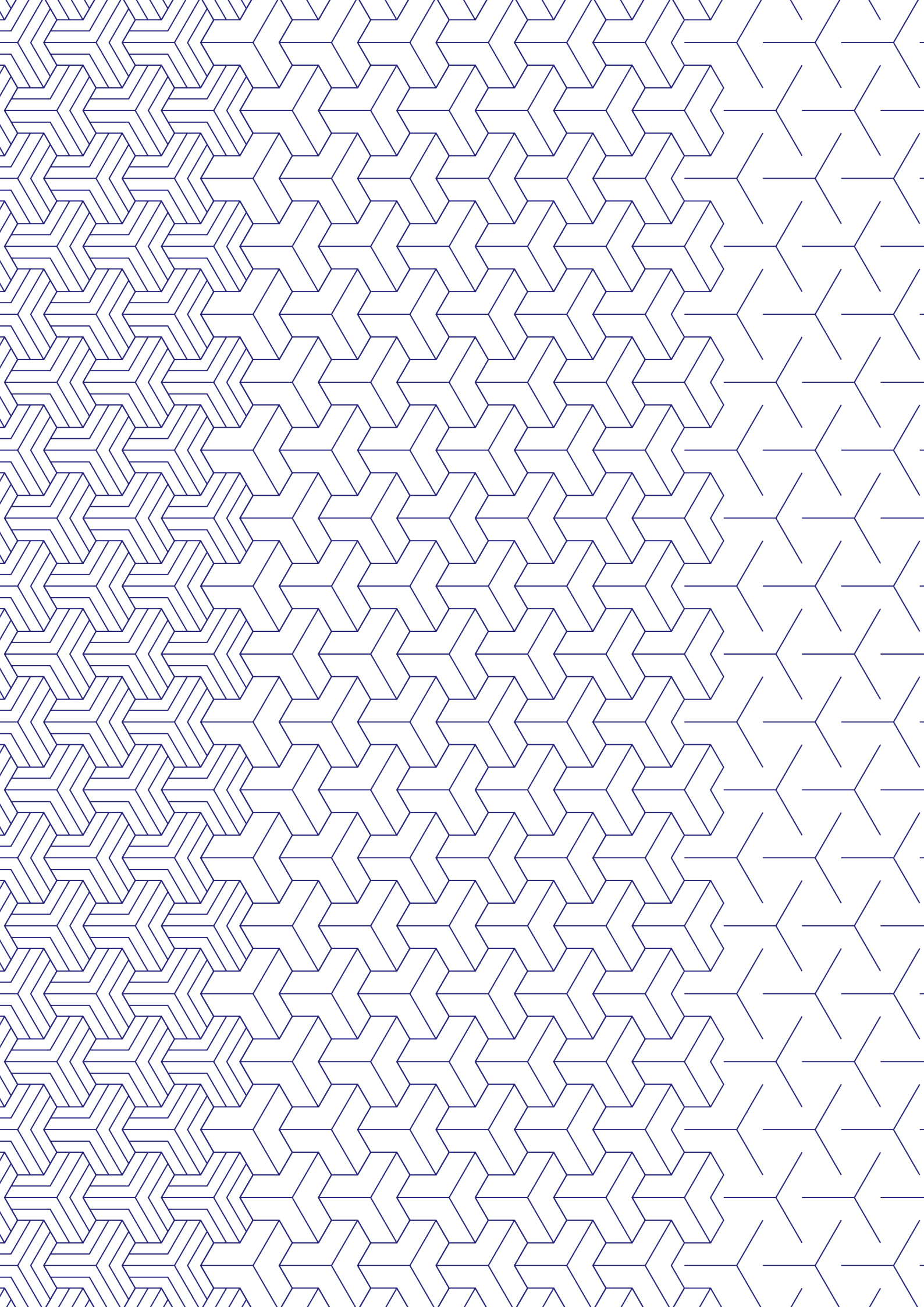


MINISTRY OF INVESTMENT,
TRADE AND INDUSTRY

NEW INDUSTRIAL
MASTER PLAN 2030

PETROLEUM PRODUCTS AND PETROCHEMICALS INDUSTRY





e ISBN No. : 978-967-0020-35-8

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

© **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

	Preface	i
	Introduction	1
	Overview of the Document	4
Section	1 Background	5
	Areas Covered	5
	Value Chain	5
	Market Players	6
	Policies, Laws and Regulations	7
Section	2 Performance	8
	IMP3 Focus and Performance	8
	Investments	8
	Exports	9
	Imports	10
	Value-added	11
	Employment	12
	Labour Productivity	12
	Research and Development	12
	Linkages with Other Industries	13
	Refinery and Petrochemical Integrated Development	14
Section	3 Trends and Opportunities	15
	High Value-added Products and Activities	15
	Diversification and Decarbonisation	16
Section	4 Challenges	17
	Technology Enhancement	17
	Adoption of Smart Manufacturing	17
Section	5 Strategies and Action Plans	18
	NIMP 2030 Focus	18
	Action Plans	18
	Appendix 1: Incentives	19

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:

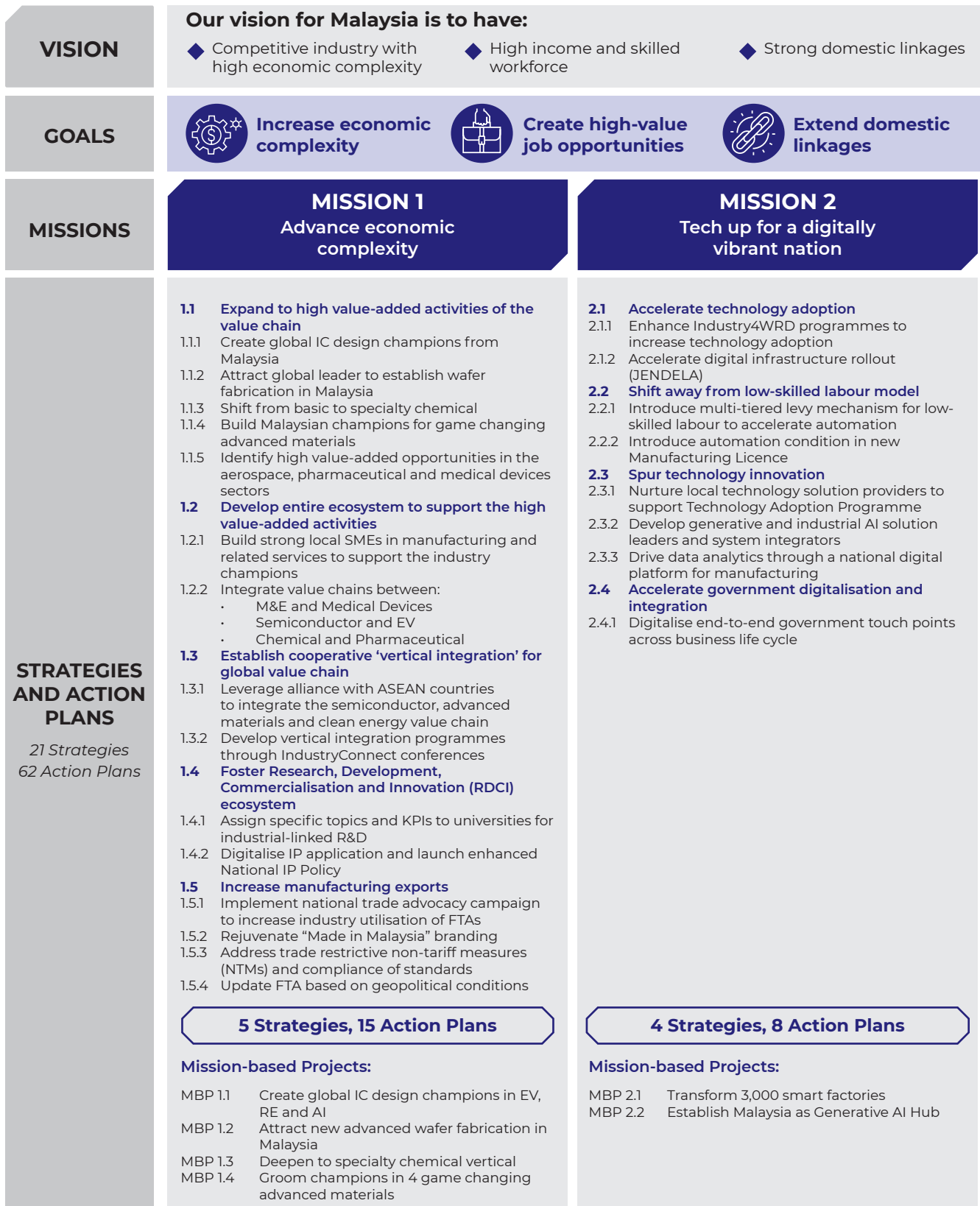
- Provide national strategic direction to lead the industrial development policies;
- Be a conversation piece for investors and other economies on Malaysia's position and direction; and
- Feature the role of the Malaysian Government in shaping the economy.

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 – Petroleum Products and Petrochemicals Industry](#).

OVERVIEW OF THE DOCUMENT

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

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

The Document is presented in five sections:

1. Background

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

2. Performance

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

3. Trends and Opportunities

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

4. Challenges

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

5. Strategies and Action Plans

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

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

SECTION 1 BACKGROUND

Areas Covered

- The industry is categorised into two sub-sectors in Table 16.1 below.

Table 16.1: Sub-sectors of Petroleum Products and Petrochemicals Industry

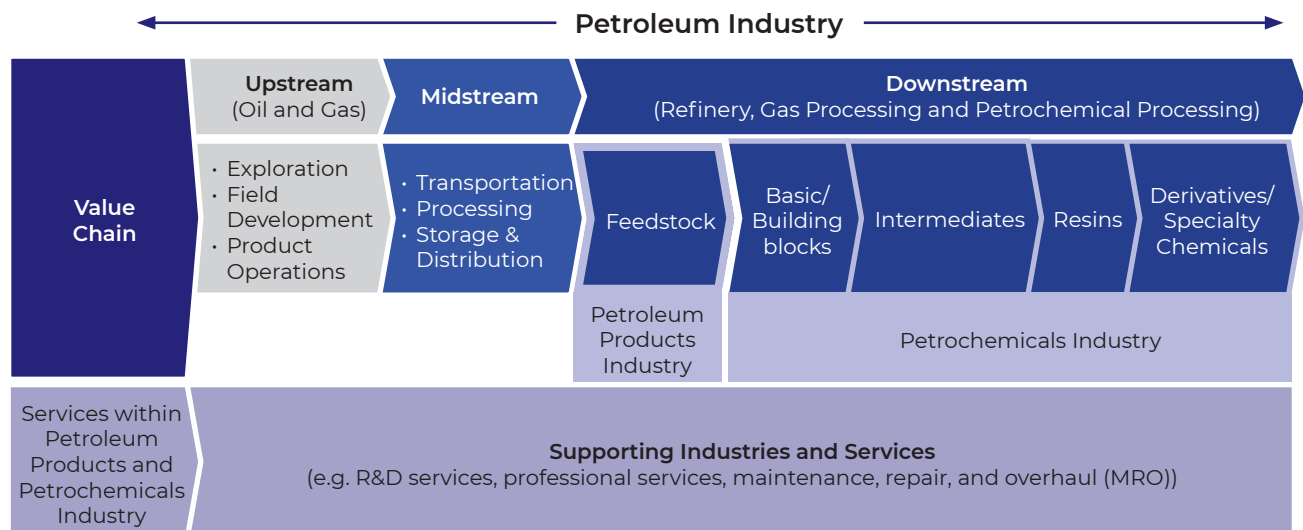
Sub-sectors	Petroleum products	Petrochemicals
Examples	Include lubricating oils and refinery products such as: <ul style="list-style-type: none"> • Liquefied petroleum gas; • Naphtha; • Gasoline; • Kerosene; • Fuel oils; • Gas oils; • Jet oils; • Diesel; and • Bitumen. 	Derived from petroleum products and other hydrocarbon sources, with examples such as: <ul style="list-style-type: none"> • Olefins; • Polyolefins; • Aromatics; • Ethylene oxides; • Glycols; and • Oxo-alcohols.

Source: Malaysian Investment Development Authority (MIDA)

Value Chain

- The petroleum industry consists of upstream, midstream and downstream processes (Figure 16.1).

Figure 16.1: Value Chain of Petroleum Products and Petrochemicals Industry



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

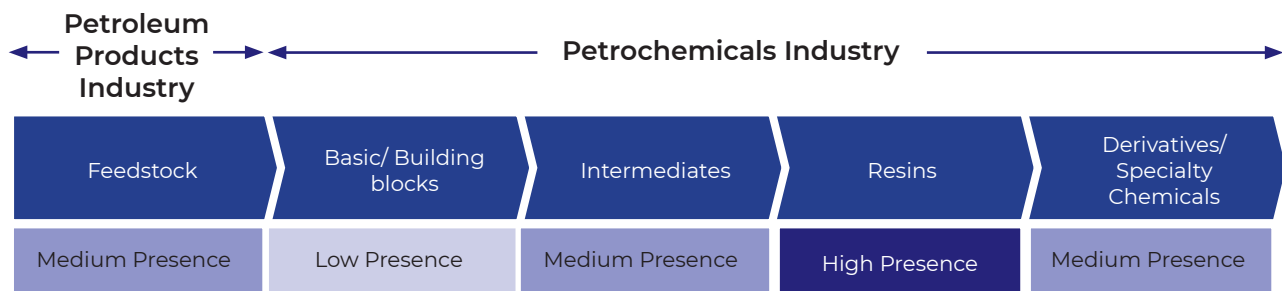
- The upstream segment covers activities in the extraction of feedstock, which include exploration, appraisal, drilling, well development and production of feedstock.
- The midstream segment covers activities related to the transportation, processing, storage and distribution of petroleum feedstock.

5. The downstream segment includes refinery, gas processing and petrochemical processing.
6. The upstream and midstream processes are not covered as part of the industry's focus area in the NIMP 2030.
7. The focus area of the NIMP 2030 covers the downstream process of the petroleum industry, which are the petroleum products and petrochemical industry.
 - i. The petroleum products industry covers the refinery and processing of petroleum to generate petroleum products.
 - ii. The petrochemicals industry covers the processing of petroleum products and other hydrocarbon sources to create industrial or end-consumer products, which can be a commodity feedstock for other industries.
8. The industry is supported by industries and services such as:
 - i. research and development (R&D) services;
 - ii. professional services; and
 - iii. maintenance, repair and overhaul (MRO).

Market Players

9. PETRONAS has a significant presence throughout the entire value chain:
 - i. The corporation owns exclusive rights over all oil and gas resources in Malaysia.
 - ii. It has a strong presence in petroleum products and petrochemicals industry through its subsidiary, PETRONAS Chemical Group Berhad (PCG).
10. Within the industry, there are seven refineries in operations located in Terengganu, Melaka, Negeri Sembilan and Johor. The total daily refining capacity is over 700,000 barrels of crude oil.
11. PETRONAS has gas processing facilities with a combined capacity of over 2,000 million standard cubic feet per day of feed gas. These include:
 - i. four major liquefied natural gas (LNG) facilities at the PETRONAS LNG complex in Sarawak;
 - ii. six gas processing plants in Terengganu; and
 - iii. two regasification terminals in Melaka and Johor.
12. There are four integrated petrochemical complexes, focusing on basic and specialty petrochemical production. The complexes are located in:
 - i. Kerteh, Terengganu;
 - ii. Gebeng, Pahang;
 - iii. Pasir Gudang, Johor; and
 - iv. Pengerang, Johor.
13. The production of petroleum products and petrochemicals is mainly driven by multinational corporations (MNC). Their presence is strong in the production of resins, followed by feedstock, intermediates, resins, derivatives and specialty chemicals (Figure 16.2).

Figure 16.2: Presence of Industry Players along the Value Chain of Petroleum Products and Petrochemicals Industry



Source: MIDA

14. Future development is leaning towards the production for high value-added derivatives and specialty chemicals, which have a relatively lower local industry presence within the value chain, as well as the development of feedstock for these productions.
15. The industry associations 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. Malaysian Petrochemical Association (MPA);
 - ii. Malaysian Oil and Gas Engineering Council (MOGEC); and
 - iii. Malaysian Oil, Gas and Energy Services Council (MOGSC).
16. Several Ministries and Government Agencies have prominent roles in regulating, promoting and developing Malaysia's petroleum products and petrochemicals industry. These include:
 - i. Ministry of Investment, Trade and Industry (MITI);
 - ii. Ministry of Domestic Trade and Cost of Living (KPDN);
 - iii. Ministry of Natural Resources, Environment and Climate Change (NRECC);
 - iv. Malaysia Petroleum Resources Corporation (MPRC);
 - v. Department of Environment (DOE);
 - vi. Malaysian Investment Development Authority (MIDA); and
 - vii. Malaysia External Trade Development Corporation (MATRADE).

Policies, Laws and Regulations

17. Laws and regulations related to the petroleum products and petrochemicals industry are:
 - i. Petroleum Development Act 1974;
 - ii. Pesticides Act 1974;
 - iii. Poisons Act 1952;
 - iv. Drugs Act 1952;
 - v. Approved Permit of Import of Plastic Waste;
 - vi. Classification, Labelling and Safety Data Sheet of Hazardous Chemical Regulations 2013 (CLASS Regulations);
 - vii. Use and Standard of Exposure Chemical Hazardous to Health Regulations 2000 (USECHH Regulations); and
 - viii. Environment and Health Risk Assessments and Environment Hazardous Substances by Department of Environment.

SECTION 2 PERFORMANCE

IMP3 Focus and Performance

18. During the period of the IMP3 (2006 to 2020), the petroleum products and petrochemicals industry was focused on:
 - i. expanding and enhancing the value add of existing capacities and broadening the range of petrochemicals produced;
 - ii. diversifying into manufacturing related services and support industries;
 - iii. enhancing linkages with the downstream industries, in particular plastics and oleochemicals;
 - iv. intensifying the development of technologies in materials and product applications;
 - v. improving chemical process technologies and the application of catalysts to increase yield;
 - vi. undertaking the full integration of existing petrochemical zones and establishing new zones;
 - vii. making available feedstock at competitive prices;
 - viii. improving market access through free trade agreements (FTAs); and
 - ix. enhancing the technological and management skills and expertise of the workforce.
19. The increased demand from China and India have prompted the growth of the industry. The Gross Domestic Product (GDP²) of the industry increased by a CAGR³ of 2.9 per cent from RM34.3 billion (2015) to RM41.9 billion (2022).
20. Apart from that, Malaysia has transformed from a net importer to exporter of major petrochemical products driven by the increased number of petroleum and petrochemical plants. The industry's total exports grew by a CAGR of 12.7 per cent from RM23.9 billion (2006) to RM163.0 billion (2022).

Investments

21. The investment performance of the petroleum products and petrochemicals industry for the period of 2006 to 2022 is recorded in Table 16.2 below.

Table 16.2: Approved Investments of Petroleum Products and Petrochemicals Industry

Items	Units	IMP3			2021	2022	2021-2022
		2006	2020	2006-2020			
Total Investment	RM billion	10.8	15.5	166.5	0.2	5.9	6.2
Domestic Investment	RM billion	10.8	12.6	106.2	0.2	0.4	0.5
Foreign Investment	RM billion	0.003	2.9	60.3	0.04	5.6	5.6
Number of projects	#	7	11	181	5	9	14
Employment	persons	1,324	765	13,880	147	805	952

Source: MIDA

² Based on constant 2015 prices

³ Compound annual growth rate

22. During the IMP3 period, a total of 181 projects were approved in the petroleum products and petrochemicals industry with a total investment of RM166.5 billion. These investments committed a total of 13,880 job opportunities.
23. In 2021 and 2022, a total of 14 projects were approved with a total investment of RM6.2 billion. These investments committed a total of 952 job opportunities.
24. Overall, the trend was influenced by investors shifting its investments out of the energy sector due to market volatility. Specifically in 2022, the performance was driven by an investment project in Sabah which contributed RM5.1 billion investment and approximately 500 new job opportunities.
25. From 2006 to 2022, 151 (77.4 per cent) of the 195 approved projects were implemented.

Exports

26. The export performance of the petroleum products and petrochemicals industry during the period of 2006 to 2022 is recorded in Table 16.3 below.

Table 16.3: Exports of Petroleum Products and Petrochemicals Industry

Items	IMP3			2021	2022	2006-2020	2020-2021	2021-2022
	2006	2020	2006-2020			CAGR	Annual Growth	
Total Exports (RM billion)	40.6	93.5	1,125.9	140.1	207.9	6.1%	49.8%	48.4%
Petroleum Products (RM billion)	23.9	61.9	767.3	96.2	163.0	7.0%	55.4%	69.4%
Petrochemicals (RM billion)	16.7	31.6	358.6	43.9	44.9	4.7%	38.8%	2.3%

Source: MATRADE

27. During the IMP3 period, the industry's total exports grew by a CAGR of 6.1 per cent, from RM40.6 billion (2006) to RM93.5 billion (2020).
28. In 2021 and 2022, exports grew significantly by 49.8 per cent and 48.4 per cent to RM140.1 billion and RM207.9 billion respectively.
29. The growth was driven by product diversification as the number of petroleum products and petrochemical plants in Malaysia increased.
30. In 2022, top export countries of the industry in Table 16.4 below.

Table 16.4: Top Export Countries of Petroleum Products and Petrochemicals Industry

Petroleum Products	Petrochemicals
i. Singapore (RM37.9 billion, 23.2%)	i. China (RM13.4 billion, 29.8%)
ii. Indonesia (RM25.9 billion, 15.9%)	ii. Indonesia (RM5.7 billion, 12.6%)
iii. Australia (RM15.9 billion, 9.8%)	iii. India (RM4.6 billion, 10.2%)
iv. Bangladesh (RM12.6 billion, 7.7%)	iv. Thailand (RM3.5 billion, 7.8%)
v. Viet Nam (RM6.2 billion, 3.8%)	v. Viet Nam (RM3.5 billion, 7.8%)

Source: MATRADE

31. In 2022, top exported products of the industry in Table 16.5.

Table 16.5: Top Exported Products of Petroleum Products and Petrochemicals Industry

Petroleum Products	Petrochemicals
i. Light petroleum distillates (RM104.6 billion, 64.2%)	i. Polyethylene having a specific gravity of less than 0.94 (RM3.5 billion, 7.9%)
ii. Petroleum spirit for motor vehicles (RM47.0 billion, 28.8%)	ii. Polyethylene (RM2.5 billion, 5.5%)
iii. Petroleum gases and other gaseous hydrocarbons in gaseous state (RM3.8 billion, 2.3%)	iii. Methanol (methyl alcohol) (RM2.3 billion, 5.1%)
iv. Petroleum bitumen (RM1.6 billion, 1.0%)	iv. Polyethylene having a specific gravity of 0.94 or more (RM2.1 billion, 4.9%)
v. Liquefied petroleum gases and other gaseous hydrocarbons (RM1.6 billion, 1.0%)	v. Acrylonitrile-butadiene-styrene (ABS) copolymers (RM2.0 billion, 4.4%)

Source: MATRADE

Imports

32. The industry's import performance during the period of 2006 to 2022 is recorded in Table 16.6.

Table 16.6: Imports of Petroleum Products and Petrochemicals Industry

Items	IMP3			2021	2022	2006-2020	2020-2021	2021-2022
	2006	2020	2006-2020			CAGR	Annual Growth	
Total Imports (RM billion)	39.1	92.5	1,167.7	132.2	195.3	6.3%	42.9%	47.7%
Petroleum Products (RM billion)	21.8	60.0	775.7	89.5	148.7	7.5%	49.2%	66.1%
Petrochemicals (RM billion)	17.3	32.5	392.0	42.7	46.6	4.6%	31.1%	9.1%

Source: MATRADE

33. During the IMP3 period, the industry's total imports grew by a CAGR of 6.3 per cent, from RM39.1 billion (2006) to RM92.5 billion (2020).

34. In 2021 and 2022, imports grew further by 42.9 per cent and 47.7 per cent to RM132.2 billion and RM195.3 billion respectively.

35. The import trend was attributed to the demand from other downstream industries which relied on imported petrochemical products of lower cost for production.

36. In 2022, top import countries of the industry in Table 16.7.

Table 16.7: Top Import Countries of Petroleum Products and Petrochemicals Industry

Petroleum Products	Petrochemicals
i. Singapore (RM51.6 billion, 34.7%)	i. China (RM8.9 billion, 19.0%)
ii. China (RM19.1 billion, 12.9%)	ii. Singapore (RM6.0 billion, 13.0%)
iii. Korea (RM16.9 billion, 11.4%)	iii. Saudi Arabia (RM4.8 billion, 10.2%)
iv. Taiwan (RM8.1 billion, 5.5%)	iv. Japan (RM4.2 billion, 9.0%)
v. India (RM7.6 billion, 5.1%)	v. United States (US) (RM4.0 billion, 8.6%)

Source: MATRADE

37. In 2022, top imported products of the industry in Table 16.8 below.

Table 16.8: Top Imported Products of Petroleum Products and Petrochemicals Industry

Petroleum Products	Petrochemicals
i. Light petroleum distillates (RM75.0 billion, 50.4%)	i. Acyclic ethers and derivatives of acyclic ethers (RM3.5 billion, 7.3%)
ii. Petroleum spirit for motor vehicles (RM64.9 billion, 43.6%)	ii. Ethylene-alpha-olefin copolymers, having a specific gravity of less than 0.94 (RM3.0 billion, 6.4%)
iii. Petroleum bitumen (RM2.0 billion, 1.3%)	iii. Polyethylene having a specific gravity of 0.94 or more (RM2.6 billion, 5.6%)
iv. Liquefied petroleum gases and other gaseous hydrocarbons (RM1.8 billion, 1.2%)	iv. Polypropylene (RM2.5 billion, 5.4%)
v. Residues of petroleum oils or of oils obtained from bitumen minerals (RM1.0 billion, 0.7%)	v. Polyethylene having a specific gravity of less than 0.94 (RM2.3 billion, 4.9%)

Source: MATRADE

Value-added

38. The industry's value-added (GDP) is recorded in Table 16.9 below.

Table 16.9: Value-added of Petroleum Products and Petrochemicals Industry

Item	IMP3		2021	2022	2006-2020	2020-2021	2021-2022
	2006	2020			CAGR	Annual Growth	
Value-added⁴ (RM billion)	17.8	35.3	39.9	41.9	5.0%	13.0%	5.2%

Source: Department of Statistics Malaysia (DOSM)

39. During the IMP3 period, the industry's GDP contribution grew by a CAGR of 5.0 per cent from RM17.8 billion (2006) to RM35.3 billion (2020).
40. In 2021 and 2022, the industry's GDP contribution grew further by 13.0 per cent and 5.2 per cent to RM39.9 billion and RM41.9 billion respectively.
41. The rise in GDP contribution was attributed to the growing global demand for petroleum products and petrochemicals which was driven by the growth of other industries such as automotive, packaging and construction.

⁴ 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

42. The employment in the petroleum products and petrochemicals industry for the period of 2019 to 2022 is recorded in Table 16.10 below.

Table 16.10: Employment in Petroleum Products and Petrochemicals Industry

Item	IMP3		2021	2022	2019-2022
	2019	2020			CAGR
Employment ⁵ (persons)	34,372	30,533	28,376	29,230	-5.3%

Source: DOSM

43. Industry employment declined by a CAGR of 5.3 per cent, from 34,372 persons (2019) to 29,230 persons (2022).
44. The employment dropped during the COVID-19 pandemic with slow recovery in 2022.

Labour Productivity

45. The labour productivity of the petroleum products and petrochemicals industry for the period of 2019 to 2022 is recorded in Table 16.11 below.

Table 16.11: Labour Productivity of Petroleum Products and Petrochemicals Industry

Item	IMP3		2021	2022	2019-2022
	2019	2020			CAGR
Labour Productivity ⁶ (RM million)	1.1	1.2	1.4	1.4	8.1%

Source: DOSM

46. The industry's labour productivity grew by a CAGR of 8.1 per cent from RM1.1 million (2019) to RM1.2 million (2022).
47. The increased labour productivity was an outcome of the usage of automation.

Research and Development

48. The R&D efforts were mainly driven by MNC as they are required to allocate a minimum of 1.0 per cent of their total sales towards R&D.
49. Primarily, the focus of R&D was on developing solutions to promote sustainability and support circular economy. The key R&D areas included:
- i. carbon capture, utilisation and storage (CCUS);
 - ii. renewable energy; and
 - iii. low-carbon hydrogen production.

⁵ 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

⁶ Annual labour productivity is derived from value added per employment

50. There are ongoing efforts to develop and commercialise technologies through strategic collaboration with industry partners such as the Malaysian Technology Development Corporation (MTDC) and the Universiti Teknologi PETRONAS (UTP).
51. As sustainability continues to be prioritised, R&D will continue in fields such as:
- i. specialty petrochemical products;
 - ii. green petrochemical products;
 - iii. alternative petrochemical feedstock;
 - iv. recovery and recycling of petrochemical products with optimised yield; and
 - v. nano-scale petrochemical products and derivatives.

Linkages with Other Industries

52. The industry has extensive forward linkages with other downstream industries. Plastic parts and components, plastic fabrication and specialty chemicals derived from petrochemicals are largely used in other industries (Table 16.12).

Table 16.12: Industries with Forward Linkages with Petroleum Products and Petrochemicals Industry

Products	Industries
Petroleum products: polymers and plastics resins	<ol style="list-style-type: none"> i. Plastics ii. Electrical and Electronics (E&E) iii. Construction and Building Technology iv. Automotive v. Aerospace vi. Textiles vii. Medical Devices viii. Furniture
Petrochemicals: fertilisers	<ol style="list-style-type: none"> ix. Agriculture
Petrochemicals: specialty and fine chemicals (e.g. food additives, flavours and preservatives)	<ol style="list-style-type: none"> x. Food Processing xi. Personal Care

Source: MITI

Refinery and Petrochemical Integrated Development

53. The Refinery and Petrochemical Integrated Development (RAPID) project is a commitment under PETRONAS to boost the growth of Malaysia's petrochemical industry by offering a wider range of raw material supplies to potential investors.
54. RAPID provides supporting services to the industry, including:
 - i. connected waste material handling;
 - ii. smart warehousing;
 - iii. advanced metering infrastructure for utilities; and
 - iv. a R&D centre.
55. This project enables Malaysia's transition into becoming the petrochemical hub in ASEAN by attracting investments and setting up facilities for the development and production of complex specialty petrochemicals.
56. A total of 10 RAPID projects have been approved to be undertaken in the Pengerang Integrated Complex (PIC). One of the projects is a refinery facility that is expected to provide a refining output of 300,000 barrels per day to cater to both export and domestic need for petrol and diesel that adhere to the European Union's Euro 5 standards.
57. The refining output, such as naphtha, liquefied petroleum gas (LPG) or raffinate-1 will be used as feedstock in the petrochemical complex to produce 3.3 million tonnes of petrochemical products per annum.
58. The RAPID projects are focused on the production of polymers, high value-added specialty chemicals such as polyethylene, polypropylene, derivatives of ethylene glycols (e.g. monoethylene glycol, diethylene glycol and triethylene glycol) and isononanol which are aligned to the NIMP 2030's direction.

SECTION 3 TRENDS AND OPPORTUNITIES

59. By 2030, the global petroleum products and petrochemicals market size is expected to grow by 7.0%, reaching RM4.5 trillion.^{7,8}
60. Malaysia has a strong presence in petroleum products and petrochemicals industry due to its large natural gas and crude oil reserves and production.
61. However, during the COVID-19 pandemic, the oversupply and deficiency of crude oil storage capacity have resulted in low demand of petroleum.
62. The tension between Russia and Ukraine has further impacted the global economic recovery post COVID-19, as the crude oil output has been limited under the Organization of the Petroleum Exporting Countries (OPEC) agreement in response to the low crude oil price.
63. However, the supply and demand imbalance has created new trends and opportunities for industry players. These opportunities include focusing on high value-added products and activities, diversification and decarbonisation.

High Value-added Products and Activities

64. The industry has shifted its focus towards producing high value-added downstream petrochemical products and activities. Table 16.13 illustrates non-exhaustive examples of high value-added activities and products.

Table 16.13: Examples of High Value-added Activities and Products

High value-added activities	High value-added products
<ul style="list-style-type: none"> R&D 	<ul style="list-style-type: none"> Specialty petrochemicals and derivatives Advanced biofuels Circular products (e.g. recycled plastics and bio-based polymers)

Source: MITI, PETRONAS

65. Focusing on high value-added activities and products is important as it contributes towards attracting investments and sustaining the industry's competitiveness.
66. Presently, small and medium enterprises (SME) have limited involvement in high value-added activities. They are mainly involved in equipment assembly and manufacturing.
67. The majority of SME face challenges in achieving economies of scale, as well as accessing capitals and expertise to participate in high value-added activities.
68. Further efforts to support SME development can be made by:
 - allowing technology transfers, cost efficiencies and market access through business development programmes or strategic collaborations; and
 - identifying, streamlining, promoting and implementing high value-added activities within the industry.
69. Refer to Action Plan 1 (AP1) and Action Plan 2 (AP2) in Section 5 for strategies and action plans related to focusing on high value-added activities and promoting the growth of local SME.

⁷ USD1.0 trillion, converted based on exchange rate USD1.0 to RM4.48

⁸ Source: Grand View Research

Diversification and Decarbonisation

70. There are more carbon off-setting initiatives implemented by the industry, driven by rising awareness of sustainability and technology maturity.
71. Presently, investors are shifting towards directing their investments in new and renewable energy sectors. This can be seen as the industry players are transitioning to adopt a cleaner, sustainable route with a diversified portfolio of energy sources, such as gas and renewable energy.
72. Apart from that, there is an increasing number of initiatives adopted by the industry players to reduce GHG emissions to contribute to green economy. These initiatives include incorporating additional features in existing oil processing activities to monitor or reduce GHG emissions.
73. As a result of the mature technologies, the production of new green products such as green hydrogen can emerge as a viable option, given the reduced cost of renewable electricity and electrolyser technology.
74. There is a need for Malaysia to adopt the relevant technologies and a national accounting framework that promotes carbon off-setting initiatives.
75. The potential areas or technologies of diversification and decarbonisation are shown in Table 16.14.

Table 16.14: Potential Areas for Diversification and Decarbonisation

Diversification	Decarbonisation
For new and alternative energy: <ul style="list-style-type: none"> hydrogen technology biogas and energy storage technology 	<ul style="list-style-type: none"> Waste gas monetization
For Electric Vehicle (EV): <ul style="list-style-type: none"> battery technology components to address EV efficiency beyond powertrain (e.g., adhesive, sealants) 	<ul style="list-style-type: none"> Gas as energy source Green products (e.g. green hydrogen, green ammonia, green petrochemical)
For rare earth metal industry: <ul style="list-style-type: none"> technology to replace rare earth elements for high-performance magnets 	<ul style="list-style-type: none"> CCUS including direct air capture technology for removing carbon dioxide from the air and fuel cells

Source: MITI

76. A clear and streamlined national energy and emissions accounting framework is required to ensure consistency in principles and reporting systems.
77. Presently, data sources for measurement are fragmented where data is normally obtained through different sources such as Government Agencies and publications. For data which are not available locally, measurement will be based on data that are extrapolated as per international guidelines.
78. Consistency in accounting principles is crucial for the industry players to comply with regulatory requirements and facilitate their investment decisions.
79. Refer to Action Plan 4 (AP4) and Action Plan 5 (AP5) in Section 5 for strategies and action plans related to adopting carbon off-setting technologies and developing energy and emissions accounting principles.

SECTION 4 CHALLENGES

Technology Enhancement

80. Technology enhancement is vital for the industry, especially in specific areas such as high-end polymer applications, engineering plastics and composite materials.
81. However, the industry faces challenges in technology enhancement due to limited funding access, talent and policies. The challenges relate to:
 - i. optimising the use of R&D centres for chemical processes and process technologies at local institutions of higher learning;
 - ii. developing expertise in catalyst management and utilisation; and
 - iii. adopting technologies used in new product research, which are relatively new and costly.
82. Therefore, the industry has the opportunity to develop centralised hubs for strategic and focused areas, which can promote development in several ways such as:
 - i. facilitating collaboration and knowledge sharing such as best practices and technical expertise among Government Agencies, industry players and research institutions;
 - ii. allowing efficient resource allocation by connecting infrastructure, services and facilities;
 - iii. accelerating technology development through collaborative R&D activities;
 - iv. attracting domestic and foreign investments attributed to the concentration of expertise, resources and opportunities; and
 - v. fostering talent development.
83. Refer to Action Plan 6 (AP6) in Section 5 for strategies and action plans related to enhancing the industry via centralised hubs.

Adoption of Smart Manufacturing

84. Smart manufacturing is an enabler to boost productivity. Existing efforts in smart manufacturing can be seen by PETRONAS in its engineering data management system.
 - i. The smart plant system provides a single platform to integrate and manage the engineering applications and solutions across all plants and facilities.
 - ii. This saves time and cost as it allows full traceability and effective data sharing, as well as avoid duplication of resources.
85. However, the high cost has impeded the adoption of smart manufacturing among the industry players in Malaysia – especially for SME. The high initial investments are associated with acquiring and integrating new technologies, upgrading existing systems and training employees.
86. Therefore, to encourage the uptake of smart manufacturing and technologies, there is a need to incentivise:
 - i. local industry players to adopt smart plant systems; and
 - ii. foreign investors to invest in smart plants.
87. Refer to Action Plan 3 (AP3) in Section 5 for strategies and action plans related to enhancing the adoption of smart plants.

SECTION 5 STRATEGIES AND ACTION PLANS

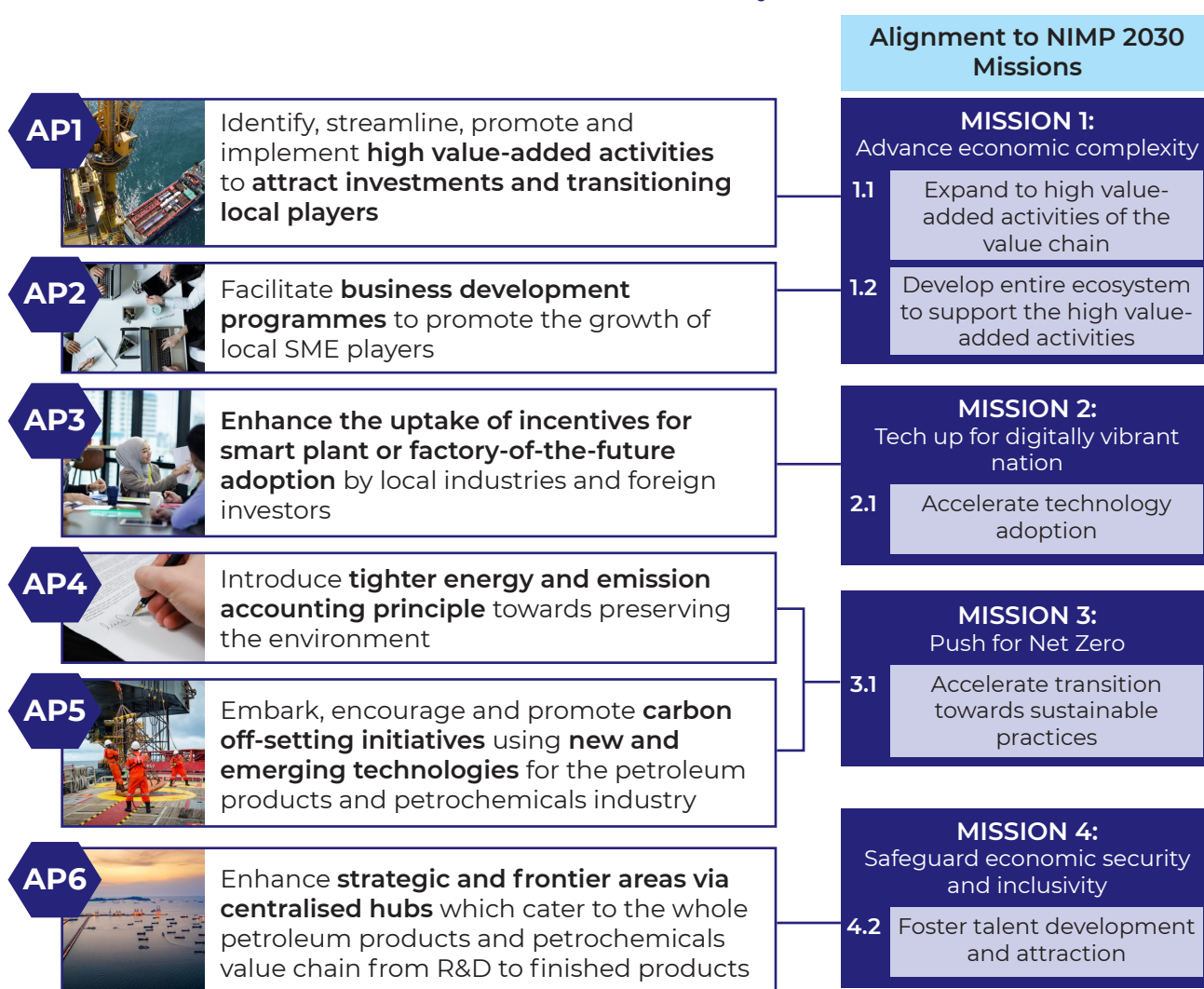
NIMP 2030 Focus

88. During the period of the NIMP 2030, the industry will continue to:
- implement new regulations and adopt digitalisation and technology to enhance environmental sustainability;
 - centralise resources and facilitate SME advancement to promote industry growth; and
 - participate in high value-added activities and introduce smart technologies to maintain attractiveness to investors.

Action Plans

89. Strategies and Action Plans relating to the NIMP 2030's Missions and Enablers are applicable to this industry (Figure 16.3).

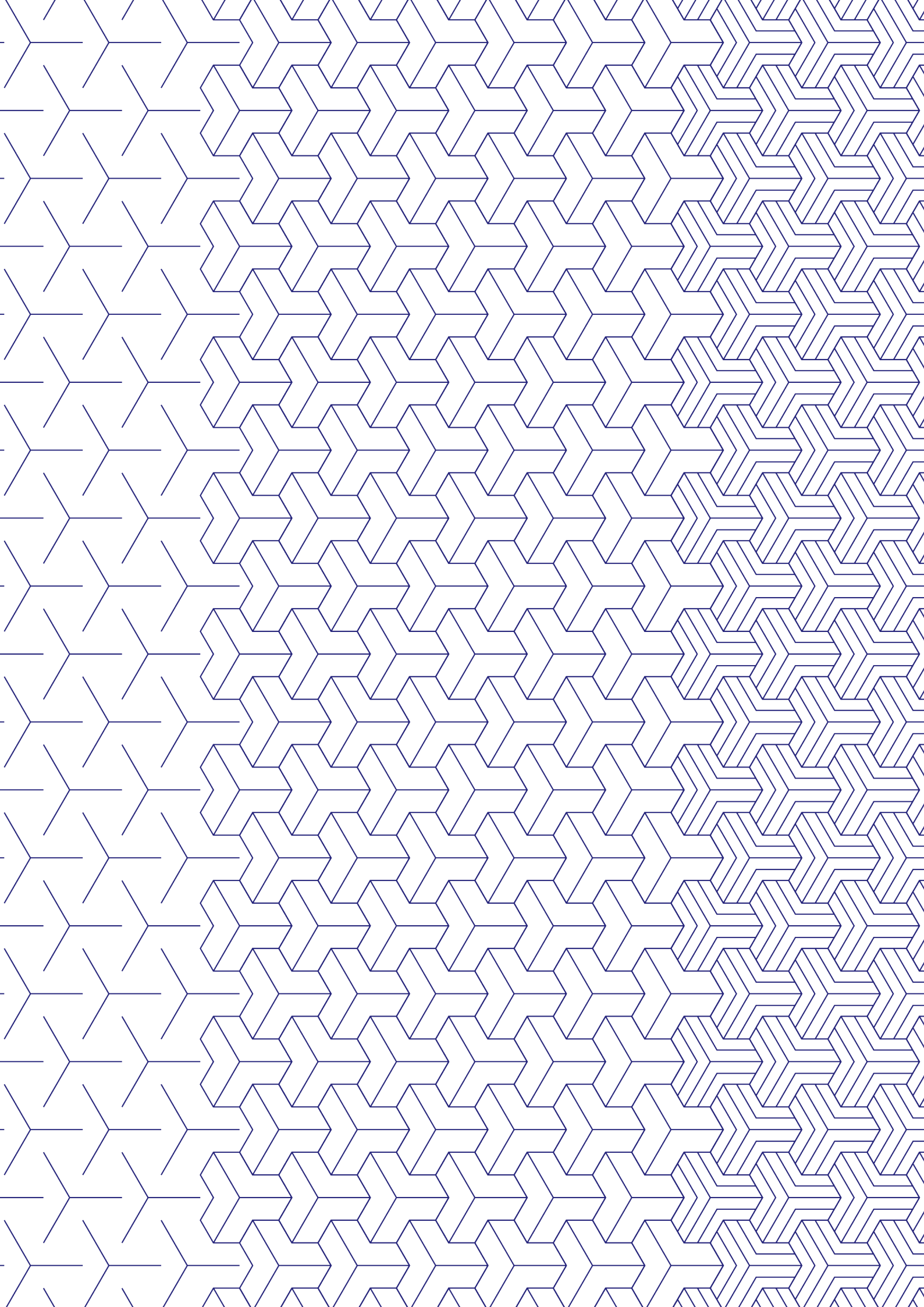
Figure 16.3: Strategies and Action Plans for Petroleum Products and Petrochemicals Industry

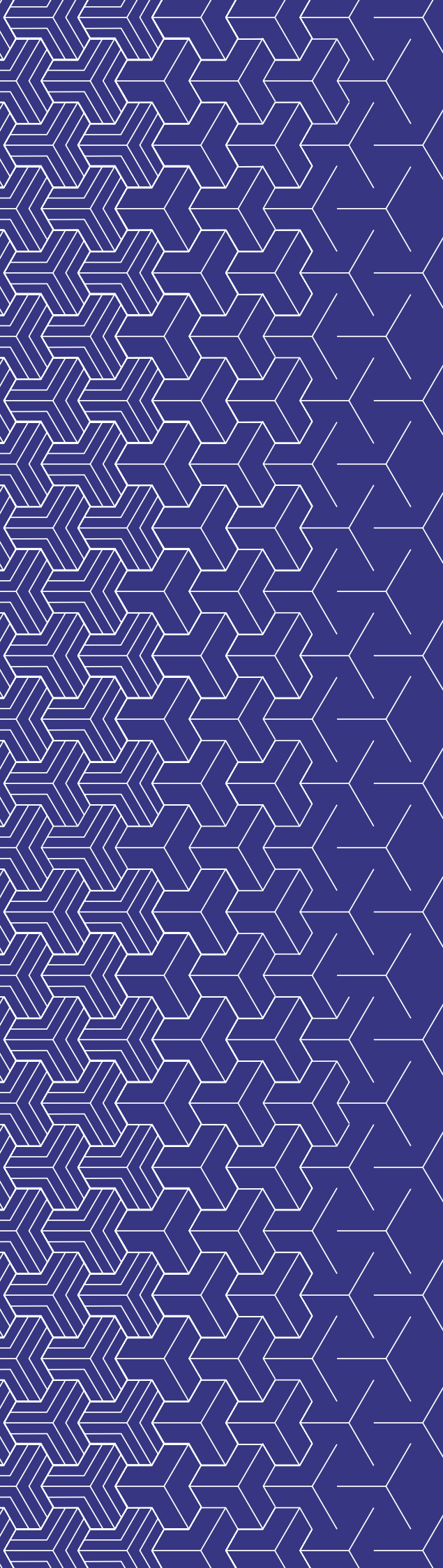


APPENDIX 1 INCENTIVES

There is an array of incentives offered for key players of petroleum products and petrochemicals industry, these include the following:

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





e ISBN 978-967-0020-35-8



9 789670 020358