

# Pursuing Green Growth for Sustainability and Resilience

Introduction

Past Performance,  
2016-2017

Performance of  
Selected Outcomes

Performance of Focus  
Area and Game  
Changer

Issues and Challenges

Conclusion

# 5

## Introduction

---

Malaysia is committed to pursuing green growth and has continuously undertaken efforts to achieve a low-carbon, resource-efficient, resilient and sustainable economy in the Eleventh Malaysia Plan, 2016-2020. A green growth trajectory will safeguard the country's natural endowments for future generations, reduce greenhouse gas (GHG) emissions and improve environmental quality for better wellbeing. During the review period, 2016-2017, measures were undertaken to strengthen enabling environment for green growth, adopt sustainable consumption and production (SCP) concept, conserve natural resources and strengthen resilience against climate change and natural disaster. Nonetheless, challenges remain in improving the quality of environment and safeguarding natural resources, particularly in terms of insufficient integrated planning, coordination and enforcement; limited indigenous green technology; low awareness on environmental issues; and unsustainable development.

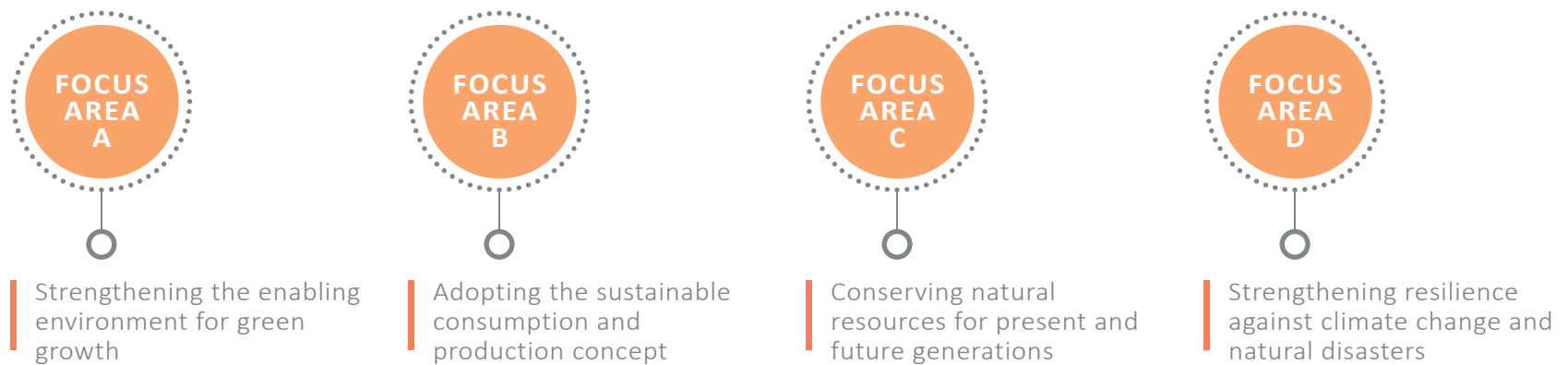
---



## Past Performance, 2016-2017

Environmental sustainability is no longer seen as a trade-off but as a prerequisite for sustained economic growth. As such, embarking on green growth as a game changer is a shift from the conventional

development path towards a more environment-friendly trajectory. During the review period, various initiatives were undertaken to pursue green growth through four focus areas as follows:



## Performance of Selected Outcomes

Programmes and initiatives were implemented in pursuing green growth, namely adopting SCP concept, conserving natural resources, addressing climate change and environmental pollution as well as reducing disaster risks. The Eleventh Plan identified nine

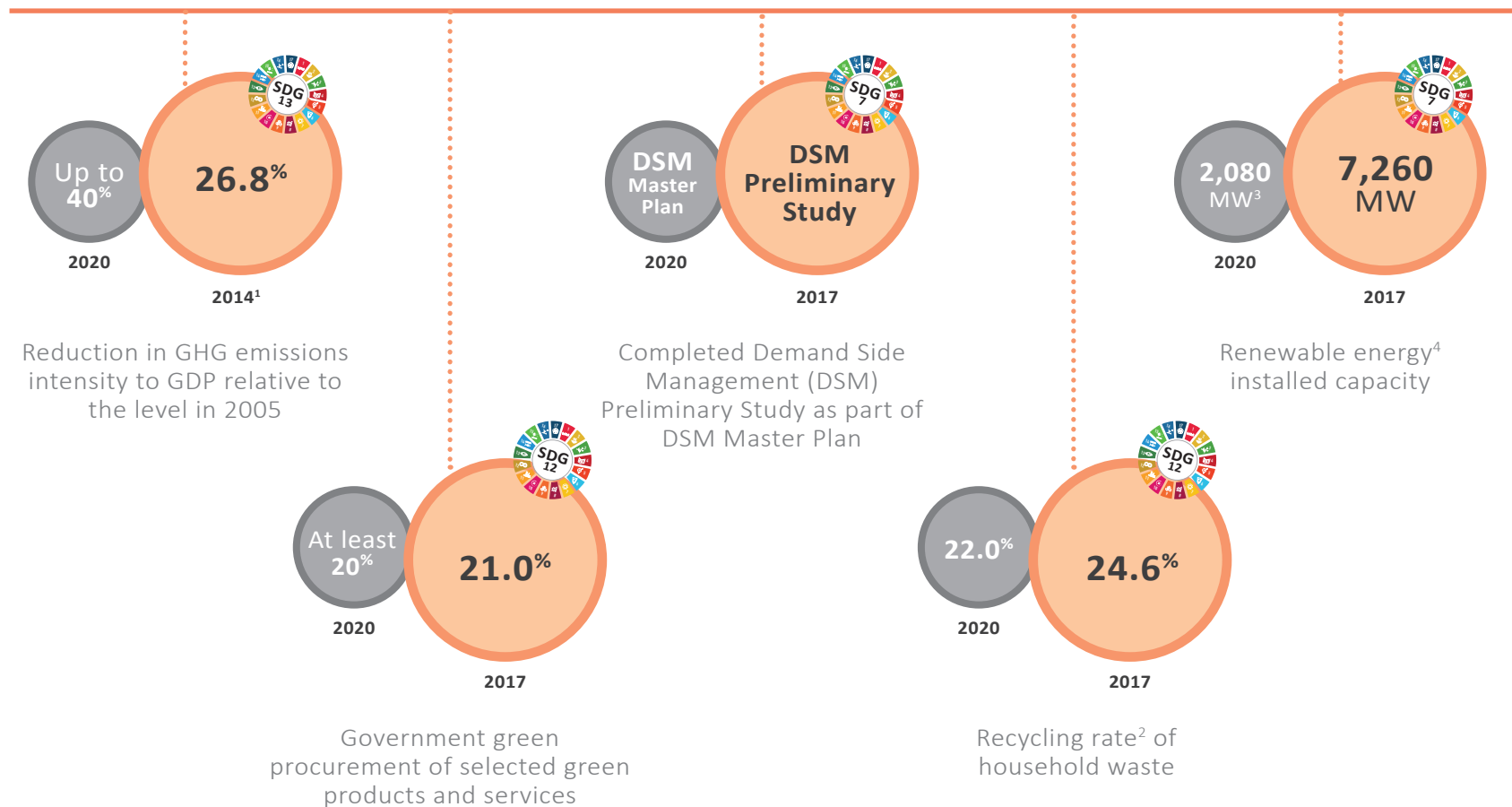
outcomes, four of which have been achieved, four outcomes are on track and one has not achieved significant progress. The selected outcomes and performance are as shown in *Exhibit 5-1*.

## Exhibit 5-1

## Highlights

## Eleventh Malaysia Plan: Selected Outcomes and Performance

## Adopting the sustainable consumption and production concept



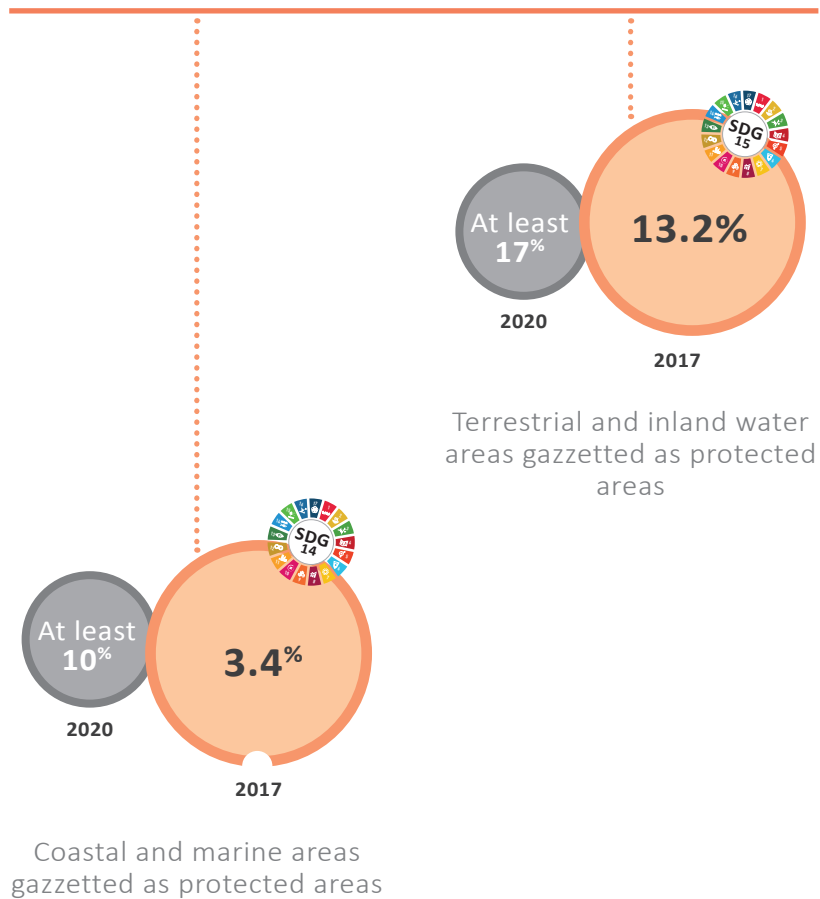
Notes: <sup>1</sup> Based on data availability for analysis by the Ministry of Natural Resources and Environment. United Nations Framework Convention on Climate Change (UNFCCC) allows a maximum of four years lag for greenhouse gas (GHG) data analysis for reporting.

<sup>2</sup> Recycling rate is the percentage of recycled material collected or processed by recycling manufacturer over the estimated solid waste generated during the year.

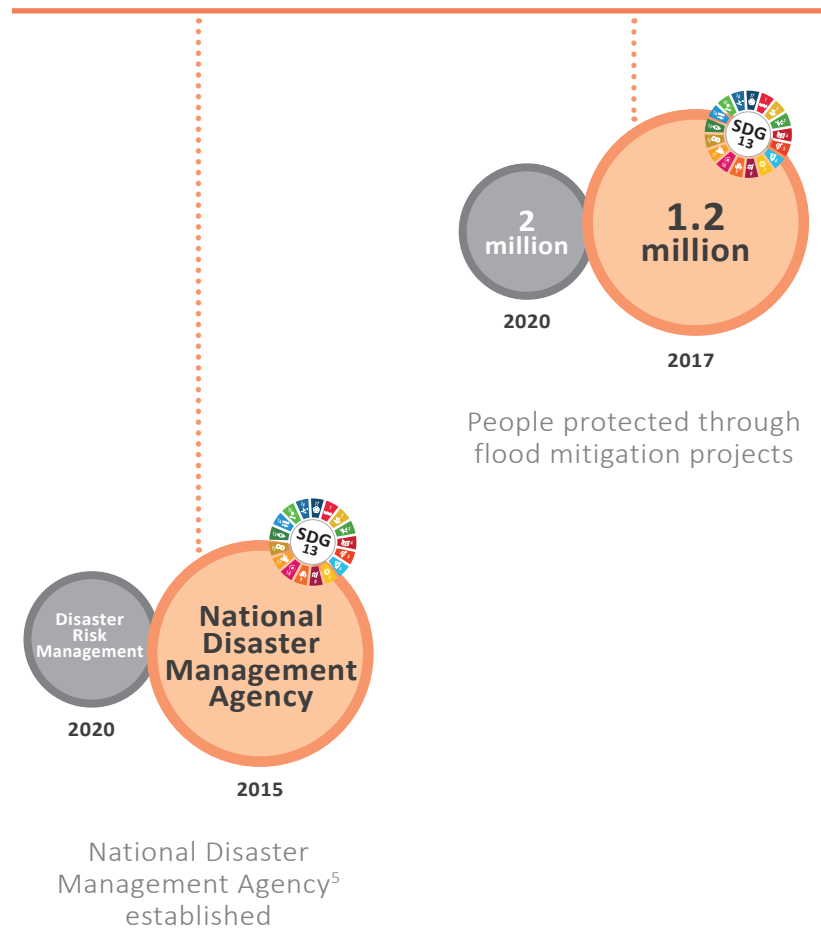
<sup>3</sup> megawatt.

<sup>4</sup> The increase in the total installed capacity of renewable energy is based on the adoption of the ASEAN definition of renewable energy by Malaysia in 2016 which takes into account all types of hydro energy in the calculation without limiting their capacities.

### Conserving natural resources for present and future generations



### Strengthening resilience against climate change and natural disasters



● Original Target    ● Performance

Notes: <sup>5</sup> National Disaster Management Agency (NADMA) was established in October 2015 (after the launching of the Eleventh Malaysia Plan in May 2015) with the objective to manage and coordinate efforts against disasters as well as in reducing disaster risks in the country.

## Performance of Focus Area and Game Changer

In line with the commitment to the 2030 Agenda for Sustainable Development of the United Nations (UN), Malaysia tabled the Voluntary National Review to the UN High Level Political Forum in New York, United States of America in 2017. At the same time, the Sustainable Development Goals (SDGs) Roadmap Phase 1, 2018-2020, is being developed to align the implementation of the 17 SDGs with the Eleventh Plan. In addition, the Paris Agreement to the United Nations Framework Convention on Climate Change (UNFCCC) was signed and ratified in 2016 with a commitment to reduce 45% of the GHG emissions intensity to gross domestic product (GDP) by 2030 relative to the level in 2005. Subsequent to adoption of the Sendai Framework for Disaster Risk Reduction by UN member states in 2015 in Japan, Malaysia established the National Disaster Management Agency (NADMA) as a national focal point for disaster risk management.

In mitigating climate change, SCP concept were adopted across various sectors for efficient use of natural resources and reducing GHG emissions. Current focus is on creating green markets, enhancing demand side management (DSM) for energy, increasing renewable energy (RE) share in generation mix, encouraging low-carbon mobility and managing waste holistically. In increasing adaptive capacity of community against the impact of climate change, programmes to address flooding and coastal erosion as well as development of early warning systems, hazard maps and risk maps were undertaken. Meanwhile, in terms of natural resources conservation, there was an increase in the permanent reserved forests and marine protected areas gazetted as well as formulation of a new policy and legislation to strengthen governance related to the natural resource management.

The key results by focus areas for green growth as game changer are as follows:

Focus Area	Key Result, 2016-2017
<div data-bbox="526 1185 691 1342"> </div> <p data-bbox="243 1362 691 1427"><b>Strengthening the Enabling Environment for Green Growth</b></p> <div data-bbox="560 1459 691 1641"> </div> <p data-bbox="576 1649 675 1701"><b>Game Changer</b></p>	<p data-bbox="782 1165 953 1197"><b>Governance</b></p> <ul data-bbox="782 1231 1802 1876" style="list-style-type: none"> <li data-bbox="782 1231 1387 1264">○ Policy, regulatory and institutional framework           <ul data-bbox="838 1292 1802 1876" style="list-style-type: none"> <li data-bbox="838 1292 1594 1324">○ Establishment of the National Disaster Management Agency</li> <li data-bbox="838 1358 1659 1391">○ Establishment of the National Committee on Waste Management</li> <li data-bbox="838 1425 1766 1487">○ Establishment of the Planning and Development for Environment Statistics Committee</li> <li data-bbox="838 1522 1681 1554">○ Establishment of 3 committees on Government green procurement</li> <li data-bbox="838 1588 1699 1620">○ Launching of the Green Technology Master Plan, 2017-2030, in 2017</li> <li data-bbox="838 1655 1709 1687">○ Formulation of government green procurement long term action plan</li> <li data-bbox="838 1721 1776 1753">○ Launching of the National Policy on Biological Diversity, 2016-2025, in 2016</li> <li data-bbox="838 1788 1802 1876">○ Access to Biological Resources and Benefit Sharing Act 2017 (Act 795) passed by Parliament</li> </ul> </li> </ul>

Focus Area	Key Result, 2016-2017
	<ul style="list-style-type: none"><li>○ Monitoring and evaluation mechanism<ul style="list-style-type: none"><li>○ Establishment of the Green Economy Indicators Malaysia</li><li>○ Establishment of the Roadmap for System of Environmental-Economic Accounting (MySEEA), 2016-2020</li><li>○ Completion of MySEEA Water Account and Physical Supply and Use Table for Energy in 2017</li></ul></li></ul> <p><b>Sustainable financing mechanism</b></p> <ul style="list-style-type: none"><li>○ Tax incentive for green projects approved under Promotion of Investments Act 1986 and Income Tax Act 1967<ul style="list-style-type: none"><li>○ 83 renewable energy solar projects with total investment of RM652.8 million</li><li>○ 6 renewable energy biomass projects with total investment of RM344 million</li><li>○ 11 recycling projects with total investment of RM979 million</li><li>○ 2 integrated waste management projects with total investment of RM382 million</li></ul></li><li>○ Financing from green <i>sukuk</i><ul style="list-style-type: none"><li>○ The first green <i>sukuk</i> launched with an initial value of RM250 million in 2017, with an additional issuance of RM1 billion</li></ul></li><li>○ Green Technology Financing Scheme (GTFS)<ul style="list-style-type: none"><li>○ 94 projects received financing offer under GTFS during the review period, amounting to RM1.1 billion, in addition to 225 projects amounting to RM2.5 billion between 2010-2015</li></ul></li></ul> <p><b>Awareness for shared responsibility</b></p> <ul style="list-style-type: none"><li>○ Initiative to increase natural resources security<ul style="list-style-type: none"><li>○ First National Tiger Survey is being implemented to determine tiger population in collaboration with the Department of Wildlife and National Parks (DWNP), World Wide Fund for Nature (WWF-Malaysia) and Wildlife Conservation Society (WCS). As of 2017, an area covering 22,000 square kilometre have been surveyed</li></ul></li></ul>



Focus Area	Key Result, 2016-2017
	<ul style="list-style-type: none"> <li>○ Initiatives to enhance awareness and preparedness against disasters               <ul style="list-style-type: none"> <li>○ 4 Local Disaster Risk Management Plan (LDRMP) developed for local governments</li> <li>○ 10 LDRMP developed for hospitals and health centres</li> <li>○ 100 community-based LDRMP developed for villages and settlements</li> <li>○ Disaster awareness programmes conducted in 500 schools</li> <li>○ Tsunami training and awareness programme organised with selected schools in Kuala Muda, Kedah</li> </ul> </li> <li>○ Initiatives to enhance awareness on climate change               <ul style="list-style-type: none"> <li>○ Organised the annual Earth Hour City Challenge</li> <li>○ Organised the annual climate change dialogue</li> </ul> </li> <li>○ Initiatives to enhance awareness on waste reduction, reuse and recycling (3R)               <ul style="list-style-type: none"> <li>○ Organised 3R programmes in schools and kindergartens</li> <li>○ Establishment of teaching module to promote recycling activities in schools</li> <li>○ Organised talks and exhibitions on 3R for college and university students, the private sector and non-governmental organisations</li> </ul> </li> </ul>

During the review period, the focus was on setting the foundation for the implementation of green growth initiatives through the establishment of numerous committees as well as formulation of policies, legislations and action plans. These were to enhance coordination between stakeholders, enable effective problem solving and expedite implementation. Meanwhile, NADMA was established to enhance disaster risk management, including risk reduction. This is done through collaboration with various government agencies, statutory bodies, private sector and non-governmental organisations (NGO) and communities throughout the pre-, during and post-disaster stages. Such collaboration enables effective utilisation of existing manpower and assets

among various stakeholders. Focus was also given to establish green indicators to support monitoring and evaluation of green growth initiatives.

Sustainable financing mechanisms, such as the green *sukuk* was introduced to finance green projects, while Green Technology Financing Scheme (GTFS) was introduced to encourage the development of green technologies and green industries. Meanwhile, various efforts were made to enhance awareness towards creating a sense of shared responsibility among all stakeholders. Several initiatives related to natural resource security, preparedness and disaster risk reduction as well as climate change were implemented.



Focus Area	Key Result, 2016-2017
 <p data-bbox="247 713 667 818"><b>Adopting the Sustainable Consumption and Production Concept</b></p>  <p data-bbox="552 1064 655 1120"><b>Game Changer</b></p>	<p data-bbox="753 540 1116 572"><b>Creation of green market</b></p> <ul data-bbox="753 604 1786 1411" style="list-style-type: none"><li data-bbox="753 604 1661 794">○ Government green procurement (GGP)<ul data-bbox="814 657 1661 794" style="list-style-type: none"><li data-bbox="814 657 1493 689">○ All ministries and agencies implemented GGP in 2017</li><li data-bbox="814 709 1645 741">○ 20 products and services endorsed for green procurement in 2017</li><li data-bbox="814 762 1661 794">○ GGP value of RM137.7 million in 2016 and RM286.3 million in 2017</li></ul></li><li data-bbox="753 822 1786 1024">○ Green product and services<ul data-bbox="814 874 1786 1024" style="list-style-type: none"><li data-bbox="814 874 1786 939">○ Green products and services registered in the MyHijau recognition scheme by GreenTech Malaysia increased from 221 in 2016 to 1,029 in 2017</li><li data-bbox="814 959 1741 1024">○ Eco-labelling criteria developed by SIRIM for 81 types of products and 113 products certified as Ecolabel by SIRIM as of 2017</li></ul></li><li data-bbox="753 1052 1786 1411">○ Green buildings<ul data-bbox="814 1104 1786 1411" style="list-style-type: none"><li data-bbox="814 1104 1749 1169">○ Launching of Malaysian Carbon Reduction and Environmental Sustainability Tool (MyCREST<sup>1</sup>) in 2016</li><li data-bbox="814 1189 1786 1221">○ 54 building projects registered for green building certification under MyCREST</li><li data-bbox="814 1241 1786 1306">○ 50 qualified professionals accredited by Construction Industry Development Board (CIDB) to monitor the construction of buildings registered for MyCREST</li><li data-bbox="814 1326 1534 1358">○ 25 qualified MyCREST assessors were accredited by CIDB</li><li data-bbox="814 1378 1251 1411">○ MyCREST portal being developed</li></ul></li></ul> <p data-bbox="753 1439 854 1471"><b>Energy</b></p> <ul data-bbox="753 1503 1749 1725" style="list-style-type: none"><li data-bbox="753 1503 1749 1725">○ Enhancing Demand Side Management<ul data-bbox="814 1556 1749 1725" style="list-style-type: none"><li data-bbox="814 1556 1628 1588">○ National Energy Efficiency Action Plan (NEEAP) rolled out in 2016</li><li data-bbox="814 1608 1749 1673">○ Implementation of audit, retrofit and energy management projects under NEEAP for 13 government, 103 industrial and 84 commercial buildings</li><li data-bbox="814 1693 1749 1725">○ Completion of the Preliminary Study on Demand Side Management in 2017</li></ul></li></ul> <p data-bbox="753 1757 1806 1858">Notes: <sup>1</sup> MyCREST (Malaysian Carbon Reduction and Environmental Sustainability Tool), a sustainability rating tool introduced by the Ministry of Works through the Public Works Department and the Construction Industry Development Board, aims to quantify and lower the carbon footprint of construction projects, by guiding the design, construction and operation of buildings in a low-carbon and sustainable manner.</p>

Focus Area	Key Result, 2016-2017
	<ul style="list-style-type: none"> <li>○ Completion of the study on Combined Heat and Power Policy Framework for Malaysia in 2017</li> <li>○ Establishment of the Energy Performance Contracting Fund to finance energy-efficient projects in building sector in 2017</li> </ul> <p><b>Low-carbon mobility</b></p> <ul style="list-style-type: none"> <li>○ <b>Energy efficient transport</b> <ul style="list-style-type: none"> <li>○ Completion of Light Rail Transit 2 (LRT 2) , extension of Kelana Jaya and Ampang lines in 2016</li> <li>○ Completion of Mass Rapid Transit (MRT) 1, from Sungai Buloh-Kajang in 2017</li> <li>○ Construction of the MRT 2 from Sungai Buloh-Serdang-Putrajaya commenced in 2016</li> </ul> </li> <li>○ <b>Adoption of higher fuel standards</b> <ul style="list-style-type: none"> <li>○ Voluntary implementation of EURO 5 for diesel by petrol station owners in Peninsular Malaysia in 2016</li> <li>○ Continuation of B7 bio-diesel programme (blending of 7% palm methyl ester), with 351,873 tonnes of palm methyl ester utilised in 2016</li> </ul> </li> </ul> <p><b>Waste management</b></p> <ul style="list-style-type: none"> <li>○ <b>Reduce, reuse and recycle of household waste</b> <ul style="list-style-type: none"> <li>○ Recycling rate of household waste increased from 15.7% in 2015 to 24.6% in 2017</li> <li>○ Improvement of public access to recycling facilities in stratified housing areas through provision of 2,460 recycling cages in 2016</li> <li>○ 7 sanitary landfills in operation in 2017 in addition to existing 11 sanitary landfills that contributed towards better management of waste</li> </ul> </li> </ul>



A proactive approach was adopted to catalyse the creation of green market by implementing Government green procurement where 21% procurement of selected 20 products and services were green in 2017 against the target of 20%. In line with the launching of MyCREST in 2016, all government building projects worth RM50 million and above are mandated to adopt the MyCREST, in a bid to reduce carbon emissions in the construction industry. These approaches show government efforts to lead by example on its commitment towards reducing GHG emissions as a whole. However, the limited availability of green products and services hampered efforts towards greening the market.

In the energy sector, focus has shifted from increasing supply to meet demand towards reducing energy consumption through the implementation of energy-efficient and conservation initiatives under the National Energy Efficiency Action Plan. In this regard, studies were also completed to guide the formulation of an energy efficiency and conservation act. Meanwhile, energy-efficient initiatives undertaken in the transport sector to encourage low-carbon mobility, among others, included the extension of LRT 2 and commissioning of MRT 1, which is to reduce dependency on private vehicles. However, measures towards making the transportation

sector more environment-friendly need to be stepped up despite the rolling out of higher fuel standards on a voluntary basis since 2016 and introduction of cleaner fuels.

Enforcement of waste separation at source in 2015, partly contributed to the increase in household waste recycling rate from 15.7% in 2015 to 24.6% in 2017. However, this level is still very low despite the fact that recycling initiatives have been promoted

in Malaysia since the 1990s. Malaysia is far behind compared with developed countries. A report by the European Environment Agency in 2017 revealed that municipal solid waste recycling rate in 2015 was highest in Germany (66%), followed by Austria (57%), Slovenia (54%), Switzerland (53%) and Belgium (53%). The low recycling rate in Malaysia indicates that there are still large portions of solid waste being disposed in landfills, thus giving pressure to provide more sanitary landfills.

Focus Area	Key Result, 2016-2017
<div style="text-align: center;">  <p><b>Conserving Natural Resources for Present and Future Generations</b></p>  <p><b>Game Changer</b></p> </div>	<p><b>Conservation of natural resources</b></p> <ul style="list-style-type: none"> <li>○ Gazettement of terrestrial, inland water and marine protected areas <ul style="list-style-type: none"> <li>○ Total terrestrial and inland water areas gazetted as protected areas increased from 12.1% in 2015 to 13.2% in 2017</li> <li>○ Total coastal and marine areas gazetted as protected areas increased from 1.1% in 2013 to 3.4% in 2017 <ul style="list-style-type: none"> <li>○ Gazettement of 8,987 square kilometres of the Tun Mustapha Park in Sabah as a marine protected area in 2016</li> </ul> </li> <li>○ 2,697 hectares gazetted as new protected areas in addition to existing 24,211 hectares (18,866 hectares in Perak, 4,396 hectares in Kedah and 949 hectares in Pahang) under the Central Forest Spine initiative<sup>1</sup></li> <li>○ 210,867 hectares (127,865 hectares in Sabah and 83,002 hectares in Sarawak) gazetted as new protected areas in addition to existing 2,254,245 hectares (1,779,030 hectares in Sabah and 475,215 hectares in Sarawak) under the Heart of Borneo initiative</li> </ul> </li> <li>○ Restoration, protection and reforestation <ul style="list-style-type: none"> <li>○ 11,425,356 trees planted by Forestry Department of Peninsular Malaysia and related agencies in collaboration with the private sector, non-governmental organisations, local governments as well as local communities</li> <li>○ Documentation of 10,495 biodiversity specimen collections which include 6,924 floras, 1,634 fungi and insects as well as 1,915 faunas</li> </ul> </li> </ul> <p>Notes: <sup>1</sup> Areas of Central Forest Spine initiative include (i) Banjaran Titiwangsa-Banjaran Bintang-Banjaran Nakawan; (ii) Taman Negara-Banjaran Timur; (iii) South East Pahang wetlands, Chini Lake and Bera Lake; and (iv) Endau Rompin Park-Kluang Wildlife Reserve, covering most states in Peninsular Malaysia.</p>

The new National Policy on Biological Diversity, 2016-2025 was launched in 2016 as a guide for a more sustainable biodiversity management. The policy provides clear targets, actions and timelines for the implementation of conservation, sustainable utilisation and the sharing of benefits from natural resources in a fair and equitable manner. It also supports the efforts to fulfill the obligation under Aichi Biodiversity Targets which requires at least 17% of terrestrial and inland water areas as well as at least 10% of coastal and marine areas to be gazetted as protected areas. However, currently only 3.4% of coastal and marine areas was gazetted as protected areas. This calls for the active involvement of all stakeholders, including state governments, as well as the establishment of appropriate financial instruments, similar to payment for ecosystem services, to fund biodiversity conservation efforts.

The total forest cover area is at risk of reduction due to conflicting priorities between conservation efforts and socioeconomic development needs. Thus, restoration and reforestation measures, namely the replanting of 1,640 hectares of trees for degraded areas is in progress. As for the marine areas, live coral cover of total coral areas decreased from 47.3% in 2015 to 44.5% in 2016. This is caused among others by climate change impacts, marine pollution, unsustainable coastal development and fisheries activities that are detrimental to marine areas. This indicates that the existing efforts are insufficient and all relevant parties need to work together to restore the increasingly degraded terrestrial, inland waters, coastal and marine areas as well as to protect other existing areas by minimising threats.

Focus Area	Key Result, 2016-2017
<div data-bbox="536 1050 701 1211" data-label="Image"> </div> <p data-bbox="229 1231 701 1326"><b>Strengthening Resilience Against Climate Change and Natural Disasters</b></p> <div data-bbox="570 1378 701 1560" data-label="Image"> </div> <p data-bbox="586 1568 687 1620"><b>Game Changer</b></p>	<p data-bbox="780 1044 1161 1070"><b>Climate change adaptation</b></p> <ul data-bbox="780 1100 1810 1588" style="list-style-type: none"> <li>○ 13 coastal erosion prevention and rehabilitation projects implemented in critical coastal areas, particularly in Johor, Pahang, Perak, Sarawak and Terengganu to address severe coastal erosion</li> <li>○ Completion of the National Coastal Erosion Study in 2017 to assess and update coastal erosion-related data</li> <li>○ Coastal areas planted with mangroves and other suitable species increased from 2,502 hectares in 2015 to 2,711 hectares in 2016</li> <li>○ Development of a National Water Balance Management System involving 18 river basins</li> <li>○ Implementation of Peatland Fire Prevention Programme in Johor, Kelantan, Negeri Sembilan, Pahang, Sabah, Sarawak, Selangor and Terengganu to reduce the risk of peatland fires during dry season</li> </ul> <p data-bbox="780 1614 1151 1641"><b>Disaster risk management</b></p> <ul data-bbox="780 1671 1810 1870" style="list-style-type: none"> <li>○ Publication of Malaysia National Annex to Eurocode 8: Design of structures for earthquake resistance Part 1: General rules, seismic actions and rules for buildings</li> <li>○ Seismic Hazard Map of Malaysia published in 2017</li> <li>○ An integrated weather and flood forecasting as well as early warning system for flood is being developed</li> </ul>

Focus Area	Key Result, 2016-2017
	<ul style="list-style-type: none"> <li>○ Development of risk maps for active faults in selected areas in Negeri Sembilan, Pahang, Perak, Sabah, Sarawak, Selangor and Terengganu</li> <li>○ 6 flood mitigation projects completed in Negeri Sembilan, Pulau Pinang and Terengganu</li> <li>○ 69 new flood mitigation projects approved nationwide</li> <li>○ Development of the second phase for Flood Masterplans and Hazard Maps</li> </ul>

Measures to increase resilience and adaptive capacity to climate change are complementary to disaster risks reduction measures. These measures aim to reduce economic and social losses as well as provide multidisciplinary approaches to combat climate change and disaster risks in a holistic manner. Among the ongoing measures include coastal erosion prevention and rehabilitation programmes, development of the National Water Balance Management System (NAWABS<sup>1</sup>) and implementation of the Peatland Fire Prevention Programme.

Efforts to protect and rehabilitate coastal areas from erosion include construction of coastal erosion prevention structures such as bunds, groynes and rock revetments as well as plantation of mangroves and other suitable species. The National Coastal Erosion Study that was completed in 2017 also reviewed the effectiveness of existing guidelines for erosion control and provided appropriate recommendations. NAWABS is being developed to help water managers identify and account for available water resources and enable water use optimisation based on demand and priorities. It enables water availability prediction two months ahead of a crisis. In addition, the Peatland Fire Prevention Programme is being continuously implemented as peatland is extremely flammable when dry. The programme helps in preventing the occurrence of haze and emissions of GHG, subsequently contributing towards better air quality.

Uncontrolled development and non-compliance to development guidelines have been linked to an increase in the occurrences of disasters such as flooding and landslides. The increase in the occurrences of disasters which adversely affect economic activities, putting lives at risk and causing extensive damage to infrastructure, as well as public and private properties. Malaysia faced its worst flooding disaster between December 2014 to January 2015, with Kelantan, Terengganu, Pahang and Perak being the worst-hit states and affecting more than 200,000 people. In 2017, Pulau Pinang experienced severe flash floods affecting about 12,000 people, as well as a landslide in Tanjung Bungah, which claimed 11 lives. In this regard, flood mitigation programmes will continue to be prioritised and to date, 1.2 million people benefited from the programme.

An integrated weather and flood forecasting as well as early warning system for flood is being developed as part of the efforts in managing flood. In facilitating better decision making for land development, the Seismic Hazard Map of Malaysia was launched in 2017, while the risk maps for active faults, flood and landslides are being developed. In line with international standards, Malaysia National Annex to Eurocode 8: Design of structures for earthquake resistance Part 1: General rules, seismic actions and rules for buildings was published in 2017 to increase resilience of buildings against earthquakes.

<sup>1</sup> NAWABS is a comprehensive water resources management instrument that facilitates an integrated approach to ensure the sustainability of water resources by providing updated information on water availability, water demand, options for water transfer, water storage and allocation as well as the integration of surface water and groundwater.

## Issues and Challenges

Numerous efforts were undertaken to strengthen the enabling environment for green growth. However, several issues and challenges pertaining to insufficient integrated planning, coordination and enforcement; limited indigenous green technology; low awareness on environmental issues; and unsustainable development continue to persist and needs to be addressed.

Comprehensive **policy planning and coordination** is hampered as the environmental agenda covers jurisdictions of various ministries and agencies as well as state and local governments. Inadequate and uncoordinated efforts by these stakeholders to review existing policies and legislations have contributed to ineffective planning and inability to translate national policies into action in line with the environmental agenda. In certain cases, conflicting priorities between the national and state development agenda further dampened efforts to address environmental issues and conserve natural resources.

Constraints in the **enforcement of environmental legislation** are attributed to the limited capacity and capability of enforcement agencies, including insufficient personnel and equipment. Ineffective enforcement has led to the over-exploitation of natural resources. Rare and valuable plants and wildlife in protected areas are illegally harvested or poached, traded and smuggled out of the country. These have threatened the survival of vulnerable and endangered species, resulting in the loss of valuable flora and fauna resources.

A systematic mechanism has yet to be established to **report, monitor and evaluate** the effectiveness of the implementation of environment-related policies and programmes, as well as efforts to reduce disaster risks. Currently, data collection is fragmented, undertaken on an ad hoc basis and not widely shared between agencies. Official data that is not updated, unavailable and inaccessible have led users to rely on unofficial sources of information, which resulted in inaccurate assessment of environmental conditions.

Insufficient basic and applied **research and development (R&D)** in the fields of environment, natural resource, climate change and disaster risks as well as low commercialisation of indigenous green technology have also constrained efforts towards green growth. This was attributed to the lack of interest and awareness on the need for R&D and the limited funds for R&D activities. Furthermore, financial institutions are more risk averse in financing the development or acquisition of green technology due to lack of knowledge and expertise in the evaluation of green projects.

The **level of awareness** and understanding among the public on environmental issues and the role of natural resources in providing ecosystem services<sup>2</sup> is still low. Environmental education in school has not been translated into habits and culture, which is imperative in changing the mindset and behaviour as well as to inculcate sustainable lifestyle amongst the younger generation. In addition, community involvement and shared responsibility are still insufficient, particularly in addressing environmental issues and cleanliness.

Climate change, environmental degradation and natural disaster are generally perceived as environmental issues, but in reality, they are mainly caused by **uncontrolled and unsustainable development** activities. Uncontrolled development and non-compliance to development guidelines resulted in difficulties to manage and curb activities that are detrimental to the environment. Unsustainable production processes are closely related to the inefficient use of resources, including raw materials, energy and water. A large number of small and medium enterprises continue to practice unsustainable production processes, mainly due to the low tariff rates of utilities as well as the absence of requirement to comply with international green standards and the lack of awareness on efficient use of resources. These unsustainable development activities have led to high emissions of GHG and other pollutants as well as substantial generation of wastes.

**Fossil fuels**, namely coal, natural gas and oil remain as major sources in the generation mix, despite the impact on the environment. However, coal still becomes the preferred fuel for base load operation due to lower market prices over rising natural gas prices. This situation comes as a result of the Government's strategy on gradual removal of natural gas subsidy.

<sup>2</sup> Based on the United Nations Environment Programme (UNEP), ecosystem services are the benefits people obtain from ecosystems. These benefits include provisioning services such as food and water; regulating services such as flood and disease control; cultural services such as spiritual, recreational, and cultural benefits; and supporting services such as nutrient cycling that maintain the conditions for life on Earth.



