



Deloitte Center *for*  
the Edge

Southeast Asia  
Sustainability Ambitions 2022

## Contacts

### Duleesha Kulasoorya

Managing Director, Center for the Edge  
Deloitte Southeast Asia  
duleeshak@deloitte.com

### Michelle Khoo

Director, Center for the Edge  
Deloitte Southeast Asia  
mikhoo@deloitte.com

### Drew Hasson

Director  
US-ASEAN Business Council  
dhasson@usasean.org

### Sarah Lessing

Director  
US-ASEAN Business Council  
slessing@usasean.org

## Acknowledgments

### Research, Writing and Graphics

Avneesh Moghe, Bernie Baskin, Duleesha Kulasoorya, Evan See, Giulia De Benedictis, Jarel Ang, Ji Woo Bae, Kurt Poh, Marc Mealy, Michelle Khoo, Natasha Ang, Stella Matulessya, and Sweeng Hoo.

### We would also like to thank the following individuals for their support and contributions:

Benjamin Ang, Bonar Laureto, Carie-Anne Bak, Christine Wan, Drew Hasson, Guy Williams, James Walton, Jeanette Juay, Kamarul Baharin, Kanyaratt Waiyaput, Kasiti Ketsuriyonk, Kenneth Tay, Kittiya Iamtassana, Lauren Mai, Lim Yu Xin, Narain Chutijirawong, Siriwan Limsakul, Thitachai Apipongcharoen, Woo Qi Yun, and Yvonne Zhang.

# Foreword by Deloitte

Southeast Asia is a region of immense opportunity and growth, boosted by largely favorable demographics of a young population, a growing middle class and rapid urbanization. Yet, to fully reach its economic potential, ASEAN as a bloc will have to grapple with the challenge of developing sustainably. Rapid growth will exacerbate the stresses on already fragile infrastructure foundations in most of the region. On top of that, like the rest of the world, ASEAN will have to face the global climate crisis, where Deloitte estimates that climate inaction could cost Southeast Asia's economy US\$28 trillion by 2070.

Climate change will be won or lost in Asia Pacific. The ambitions and actions of the Asia Pacific region are what will tip the scales for the ultimate outcome of the global challenge of addressing climate change. In this context, due to the geographical location, vulnerability to the changing climate, and developing nature of the region, the stakes are higher for Southeast Asia when compared to other regions in Asia Pacific.

Momentum is starting to shift. In conjunction with the 2021 United Nations Conference on Climate Change (COP26), member states have made commitments to address the climate crisis. Brunei, Laos, Malaysia, Singapore and Vietnam have announced their commitments to achieve net-zero emissions around 2050, Indonesia by 2060, and Thailand by 2065 to 2070.

If these Governments are able to act decisively on these commitments, work in concert with the private sector, and mobilize ground action, tackling the climate and other environmental challenges they could successfully create new engines of growth for the region. As we had noted in our recent report on Southeast Asia's Turning Point, strong climate action could deliver US\$12.5 trillion to Southeast Asia's economy by 2070 in present value terms.

This report is an exploration of the ambitions of the Southeast Asian nations to address their sustainability challenges. Our goal is to provide a resource on where the gaps and opportunities are to drive the most progress towards achieving those goals. We look to highlight the key tenets of each country's sustainability plans that will help align the goals and commitments of private companies with that of the nations', and in so doing, drive more public-private partnerships to collectively address the sustainability needs of the region.

Deloitte Center for the Edge is excited to collaborate with the US-ASEAN Business Council on this report. We believe that, in order to unlock the potential of this region, it requires new alliances among different stakeholders – large and small, public and private, local and multinational. This compendium of insights into the various sustainability aspects by country would hopefully serve as a useful framing for such alliances to take root.

We look forward to working with you to push the boundaries, create new models of collaboration, and lead the way towards a more sustainable and equitable future for Southeast Asia.

### Philip Yuen

Chief Executive Officer,  
Deloitte Southeast Asia  
Chairman, Deloitte Singapore

### Ei Leen Giam

Deloitte Southeast Asia  
Sustainability & Climate  
Leader

### Duleesha Kulasoorya

Managing Director  
Deloitte Center for the Edge  
Southeast Asia

# Foreword by US-ASEAN Business Council

ASEAN faces an unprecedented moment of opportunity and challenge. It is the third fastest growing major Indo-Pacific economy in the past decade after China and India, with a combined GDP of US\$3.2 trillion, and the fifth largest economy in the world. The region is expected to grow to be the fourth largest economy in the world within the decade, and boasts the third largest labor force in the world (after China and India). With a soaring population of more than 660 million, it has more than twice the population of the United States. Nearly 60% of the people living in ASEAN countries today are less than 35 years old, and an astonishing 70% of the population will live in urban centers by 2030 – a migration that will undoubtedly create energy, waste, and infrastructure challenges, but also paves the way for small and medium sized businesses to flourish. All of this spells tremendous opportunity for the region.

And yet, there are also significant challenges ahead. The International Energy Agency (IEA) predicts that by 2040, the region's energy demand will grow by 60% as a result of the factors set out above. Despite a keen interest in renewables, and the considerable potential for renewable and clean energy production, the region currently meets only slightly more than 15% of its overall energy demand with renewables. With Southeast Asia's coal consumption still rising, greenhouse gas emissions will increase steeply unless governments and industry can partner to help ASEAN countries ramp up renewable energy deployment, increase the utilization of cleaner energy sources to enable the pragmatic transition of existing thermal power generation facilities away from coal, and improve land-use and forest management policies.

While the risks of a failure to address climate challenges are truly frightening, the upsides of tackling them head on are also enlightening. According to various estimates, this represents a trillion-dollar opportunity. Several individual ASEAN member states have begun their respective energy transition journeys by putting in place market driven mechanisms to create price signals to investors for reducing the production of carbon. At the ASEAN regional level, the ten Economic & Trade Ministers are also leading in the formulation and implementation of the ASEAN Framework for the Circular Economy.

There are similar challenges and opportunities in addressing the other issues outlined within this report, namely biodiversity, water, waste, and gender equality. ASEAN is home to one of the most biodiverse regions on the planet. The Mekong River, one of the world's great waterways, stretches some 4,500 km from its source, and drains an area of almost 800,000 km squared across six countries. It cuts through the heart of Southeast Asia, harboring an astonishing array of wildlife along its banks. It is widely considered the second most biologically diverse river in the world, after the Amazon River Basin. But increasingly its banks are choked with plastic waste.

Regional imports of plastic waste have surged more than 170% over the past few years. Additionally, single-use plastic continues to grow exponentially in many of the ASEAN countries, with too much of it remaining uncollected, and unfortunately finding its way into the region's waterways and eventually into our oceans. While many ASEAN countries are addressing these challenges directly, and many are succeeding (as you'll see in the report), much more can be done to expedite the speed with which waste management infrastructure is built across the region. Certainly, public private partnerships would aid in this regard.

Similarly, much more can be done around gender equality. ASEAN nations claim more female representation than the entire population of the United States. Earlier this year, the US-ASEAN Business Council released a sustainability oriented report putting forward policy suggestions that could, if implemented, catalyze economic opportunities for millions of women across the ASEAN region. As the Chair of 2022 APEC Summit, the Government of Thailand has elevated the women's economic empowerment work stream by hosting the Women and Economy Summit meeting, which the USG has signaled they will continue as the APEC Chair in 2023.

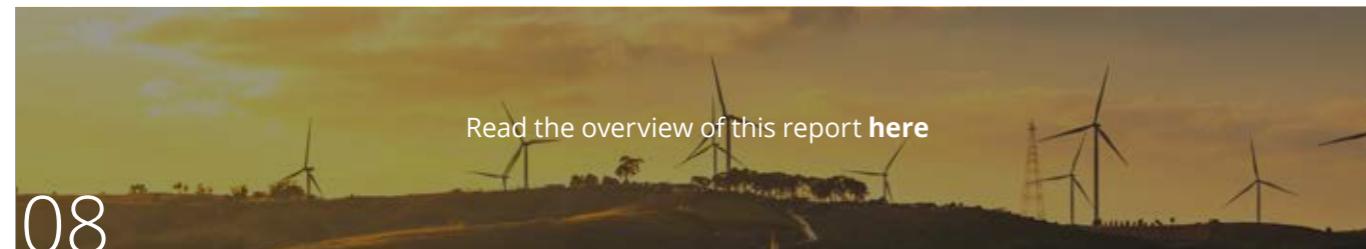
We were proud to play a role in helping put together this important report. We hope readers will take away from it those areas in which greater focus and determination is necessary. Together we can improve the lives of hundreds of millions of people across Southeast Asia, and in so doing, create a stronger community, and an even greater future.

**Amb. Ted Osius**  
President & CEO  
US-ASEAN Business Council

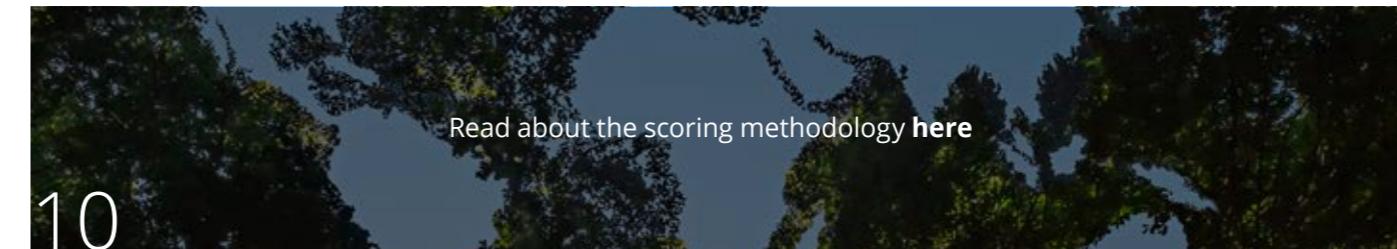
**Drew Hasson**  
Director, Sustainability  
US-ASEAN Business Council



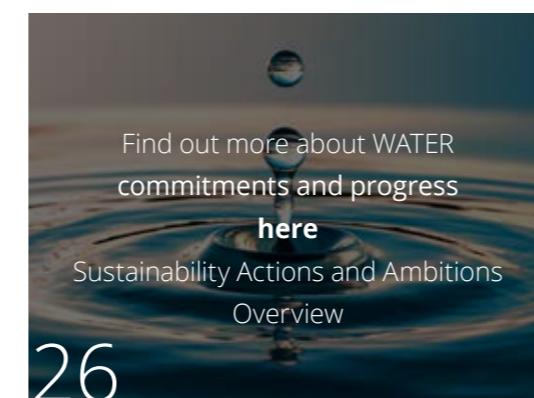
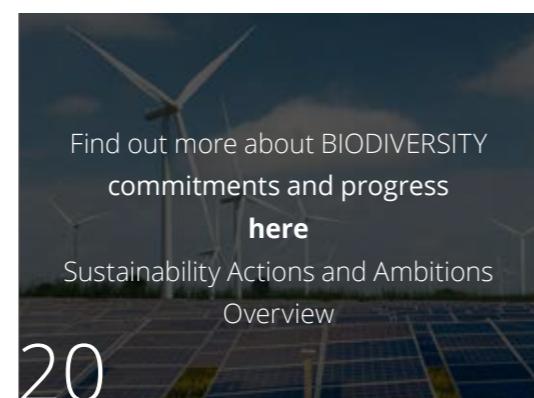
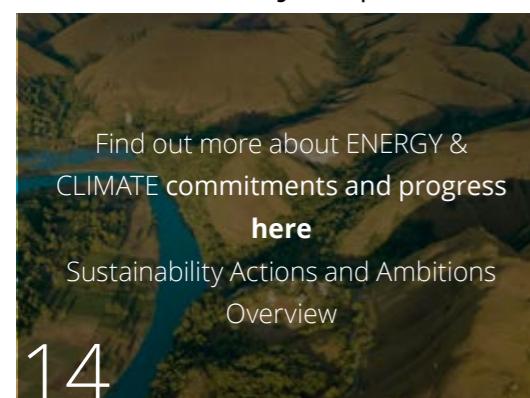
## Introduction



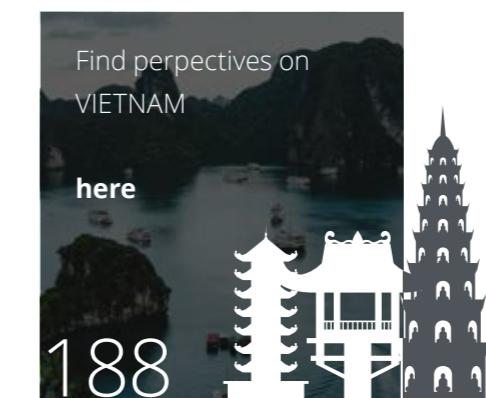
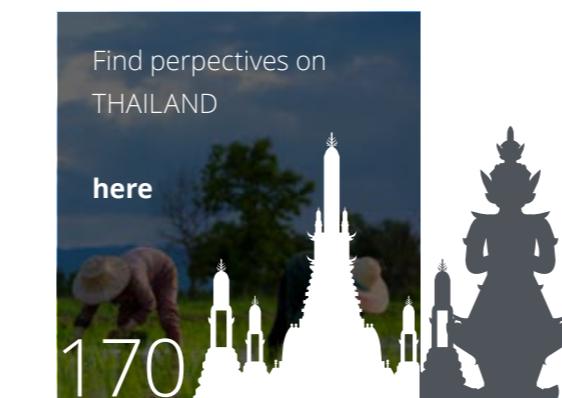
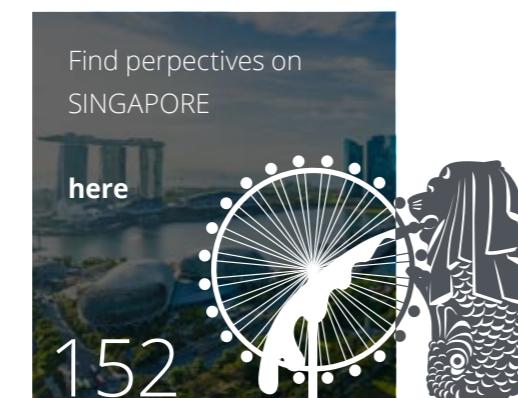
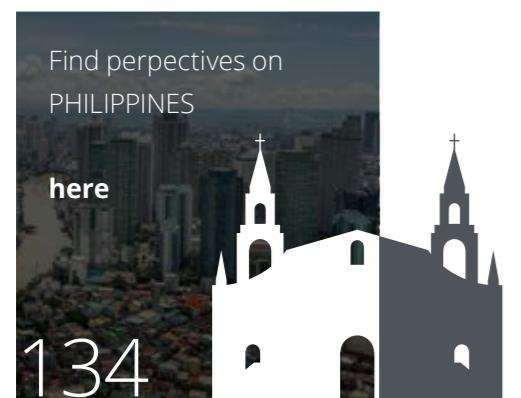
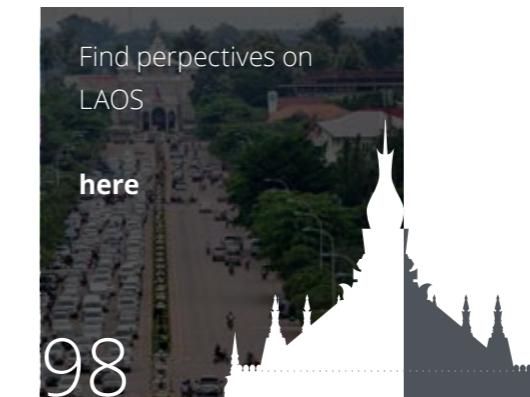
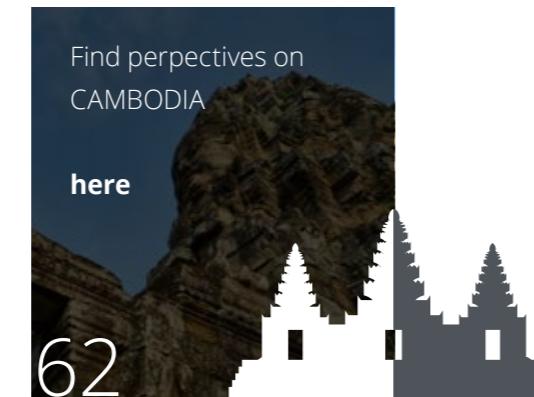
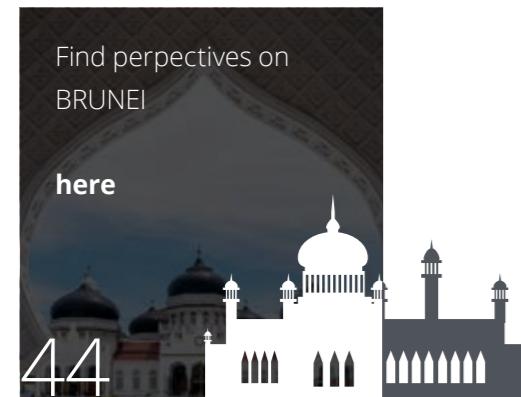
## Methodology



## Sustainability aspects



## Country insights



# Introduction

This report focuses on five key aspects of sustainability selected by US-ASEAN Business Council members. These are areas that are fundamental in supporting the growth potential of the region. These are also where the private sector, particularly multi-nationals with a presence in Southeast Asia, can make a significant impact. We provide country-by-country reports for ASEAN, excluding Myanmar.

With the governments of ASEAN signaling their ambitions, Southeast Asia presents a fertile ground to take advantage of its rich natural capital to develop a strong model of sustainable development. There are many exciting opportunities for international companies to come to the region, partner local governments and non-profits, and tap on not just the economic potential, but also the green potential, of the region.

## Energy & Climate

Southeast Asia's energy demand will likely increase by 2.3 times by 2040, when compared to 2017 levels.<sup>1</sup> In meeting the region's energy needs sustainably, ASEAN targets 25 percent of its energy generation mix to come from renewable sources by 2025.<sup>2</sup> While coal dependent nations such as Indonesia, Philippines and Malaysia have announced that they will no longer build new coal-powered plants, the region is still likely to be dependent on fossil fuels to meet the rapidly growing energy demand. Nevertheless, this presents many opportunities for solar energy, which has been predicted to be a significant growth sector. The region is also rich in other renewable energy resources such as offshore wind, geothermal and hydropower. There is abundant potential for the region to accelerate large-scale adoption of renewable energy and invest in grid infrastructure upgrades to support renewable energy generation.

## Biodiversity

As countries and organizations begin to embark on their net-zero journeys, the demand for high-quality carbon credits will increase in order to offset hard-to-abate emissions. This presents a significant opportunity for Southeast Asia as a region rich in natural capital including forests, peatlands, and mangroves. The establishment and deepening of carbon markets could be a win for Southeast Asian countries, particularly if they collaborate to establish policies and mechanisms to ensure that the region supplies high-quality carbon credits with a high level of transparency. This will be an even greater win for biodiversity, as 42 percent of all species in the region are at risk of being extinct by the end of the century.<sup>3</sup>

## Water

Water security is a major concern of countries around the world. Southeast Asia is no different. Seasonal scarcity will be exacerbated by changing weather patterns due to climate change. There is also increasing pressure on freshwater resources due to increasing industrial activities, population growth and agricultural use. And yet, Singapore, a small island with limited land to collect and store rainwater, was able to overcome its constraints with innovative solutions that are now a model for the world. While different solutions may be needed for the other member states, Singapore shows that this is a challenge that can be surmounted with enough ingenuity and commitment.

## Waste

From 2005 to 2015, the amount of solid waste generated in ASEAN has notably doubled, especially for countries such as Thailand, Singapore and the Philippines.<sup>4</sup> Further, plastic is estimated to account for 90 percent of marine debris in the oceans, where six of the ten ASEAN member states generate over 31 million tons of plastic waste in a year alone.<sup>5</sup> Rising income levels and urbanization rates of its member states will continue to place increasing pressure on waste generation volumes. While ASEAN has launched regional plans to address waste management issues and combat marine debris, the region will require significant research, investment and community mobilization to implement waste management and reduction strategies.

## Gender Equality

Climate change affects the most vulnerable segments of society, particularly women, hardest. Unequal access to land, water, and other resources affects not only women's health and advancement, but also that of their children. Of concern, poverty rates have notably increased in several member states such as Cambodia and Indonesia over the past year, where women are found more likely than men to live below the poverty line. On the flip side, increasing labor force participation and reducing unpaid domestic work through better social provisions, such as childcare and aged care, represents yet another demographic dividend that has yet to be fully tapped. Hence, gender equality and women empowerment could have an outsized impact on climate action and the economy because of the role women play in their communities, in their homes and their families.

1 ASEAN Secretariat, "ASEAN Energy Cooperation: Overview," accessed July 20, 2022.

2 ASEAN Secretariat, "ASEAN Energy Cooperation: Priority Areas," accessed July 20, 2022.

3 Temesek, World Economic Forum, and AlphaBeta, *New Nature Economy: Asia's Next Wave - Risks, Opportunities, and Financing for a Nature-Positive Economy*, 2021, p. 5.

4 Team Revolution, "Solving the Waste Management Problem in ASEAN," presented at Nanyang Technological University Singapore.

5 The World Bank, "ASEAN Member States Adopt Regional Action Plan to Tackle Plastic Pollution," accessed July 22, 2022.

# Methodology

Effectively assessing ASEAN's progress towards sustainability-centered goals is a formidable endeavor that calls for a systematic and holistic scoring approach. The following report aims to concurrently evaluate a country's national level plans and the current progress towards these established goals. In line with the stated objectives for this report, we delineated clear criteria and standards to serve as the backbone for our analysis.

For each of the nine discussed countries, five main categories were rated – Energy & Climate, Biodiversity, Water, Waste and Gender Equality. Each of these categories was in turn divided into subcomponents to facilitate a comprehensive scoring approach. Our scoring consists of two numeric score values, *Current Progress* and *Targets and Commitments*, and one qualitative checklist, *Implementation Factors*.

First, the rating for the Current Progress of a nation was scored on a scale of one to five using a relevant indicator or proxy indicator that reflected the county's performance in a given category. Two different methods were used to generate the score values from the indicator values.

As many of the indicators were found in the UN Sustainable Development Goals Report 2022, we adopted the report's rating system for our scoring system. The UN rates each indicator in four bounds according to optimum values: Major challenges, Significant challenges, Remaining challenges, and SDG achieved. Accordingly, we awarded two, three, four, and five points respectively for the corresponding bound. One point was awarded to countries where no data was available.

Other indicators, which were not adopted from the SDG Report, were developed using public databases from organizations like the World Bank and the UN Statistics Division. For these indicators, the scoring value was developed according to the percentile value that a country is placed at on a global level. Countries falling within the bottom 25 percent in the world were awarded two points, the 25th to 50th percentile awarded three points, 50th to 75th percentile awarded four points, and the 75th to 100th percentile awarded five. Countries lacking data availability were awarded one point.

	1 point	2 points	3 points	4 points	5 points
<b>Subcomponents using UN SDG Indicators</b>	No data found	Major challenges	Significant challenges	Challenges remain	SDG achieved
<b>Subcomponents using other databases</b>	No data found	Country falls within 0-25 percentile globally	Country falls within 26-50 percentile globally	Country falls within 51-75 percentile globally	Country falls within 76-100 percentile globally

Secondly, the *Targets and Commitments* of countries were measured against globally recognized targets and/or region-specific ASEAN targets, including the UN SDG targets and the 2021 United Nations Climate Change Conference (COP 26) pledges. With minimal exceptions, these targets consist of both a numerical target figure and a target year to reach this figure. While many such targets exist, we selected the targets that corresponded with or related strongly to the indicators used for the *Current Progress* score.

Countries were awarded either zero, one, or two points based on whether their commitments met the appropriate global targets. This figure would be added on to the Current Progress score to determine the *Targets and Commitments* score, with a maximum of five points scored.



points to current score



points to current score



points to current score

Absence of target or commitment

Target has a clearly stated numerical figure AND a target year to reach the target, but achieving either will not meet the globally recognized target

Target has a clearly stated numerical figure AND a target year to reach the target, both of which meet the globally recognized target

Thirdly, the presence of *Implementation Factors* was described for each subcomponent of every category. These factors indicate whether there are gaps in implementation of the targets and commitments. The following five factors were used in our checklist, with the results displayed visually on a Yes/No basis within each category's score charts.

 <b>Monitoring and Enforcing Mechanisms</b>	The plans describe how implemented initiatives will be monitored/enforced. They detail the development of systems/incentives to ensure its effective implementation.
 <b>Vulnerable Groups (Women, Children, Minorities, Low-Income)</b>	The plans recognize the need to cater for vulnerable groups in the nation, and in response, develop initiatives specifically targeting these individuals.
 <b>Evidence- Based Plan Development</b>	The plans have been developed/modified based on a data-driven analysis of the nation's situation OR the government has intent to perform data collection to further inform its policy-making.
 <b>Investment</b>	The plans showcase intent to invest in scientific and technological capacity, OR targeted financial investment or budget allocation towards a given target.
 <b>Awareness</b>	The plans include strategies to increase awareness, to ensure individuals across the nation have the relevant information and awareness about a given sustainable goal.

Data cited in this report are the latest available as of June 2022. As sustainability is a constantly evolving field, we may not have captured all of the most recent developments in each country.

## Indicator List

Category	Indicator	Source
 <b>Energy &amp; Climate</b>	Greenhouse gas intensity growth rate	Environmental Performance Index <sup>1</sup>
	Population with access to electricity, %.	UN SDG Report 2022 <sup>2</sup>
	Share of renewable energy in total primary energy supply (%)	SDG Report
	Energy intensity level of primary energy (megajoules per constant 2017 purchasing power parity GDP)	UN Statistics Division <sup>3</sup>
 <b>Biodiversity</b>	Red List Index of species survival (worst 0-1 best)	SDG Report
	Permanent deforestation (% of forest area, 5-year average)	SDG Report
	Mean area that is protected in marine sites important to biodiversity (%)	SDG Report
	Fish caught from overexploited or collapsed stocks (% of total catch)	SDG Report
 <b>Water</b>	Fish caught by trawling or dredging (%)	SDG Report
	Fish caught that are then discarded (%)	SDG Report
	Population using at least basic drinking water services (%)	SDG Report
	Population using at least basic sanitation services (%)	SDG Report
 <b>Waste</b>	Anthropogenic wastewater that receives treatment (%)	SDG Report
	Water-use efficiency (US\$/m <sup>3</sup> )	SDG Report <sup>7</sup>
	Freshwater withdrawal (% of available freshwater resources)	SDG Report
	Total annual Municipal Solid Waste Generated per capita/kg	World Bank What A Waste Global Database <sup>4</sup>
 <b>Gender Equality</b>	Household food waste estimate (kg/capita/year)	UNEP Food Waste Index <sup>5</sup>
	Hazardous waste generated per capita (kg)	World Bank What A Waste Global Database
	Health and Survival index	Global Gender Gap Index <sup>6</sup>
	Educational Attainment index	Global Gender Gap Index
	Economic Participation and Opportunity index	Global Gender Gap Index
	Political Empowerment index	Global Gender Gap Index

1 Yale Center for Environmental Law & Policy, "[Environmental Performance Index: Greenhouse gas intensity growth rate](#)," July 2022.

2 UN, [Sustainable Development Goals Report 2022](#), June 2022.

3 UNDESA Statistics Division, "[SDG Indicators Database](#)".

4 World Bank, "[WHAT A WASTE 2.0: A Global Snapshot of Solid Waste Management to 2050](#)," September 2018.

5 UNEP, [Food Waste Index Report 2021](#), March 2021.

6 World Economic Forum, [Global Gender Gap Report 2021](#), March 2021.

7 United Nations, "UN Water: Progress on Water-Use Efficiency (SDG target 6.4)," 2019.

# Energy & Climate





# Energy & Climate

The ASEAN region has one of the fastest growing populations in the world, and this is reflected in the region's energy demand. Energy demand is projected to increase by 2.3 times by 2040 from 2017 levels. According to the sixth ASEAN Energy Outlook, this demand would most likely be met by fossil fuels.<sup>1</sup>

The region has a target to achieve 23 percent renewable energy in its energy generation mix by 2025.<sup>2</sup> However, due to existing energy policies set by ASEAN countries, as well as the significant impact that COVID-19 has had on the region, it is unlikely that this target would be met. To add to this, two ASEAN countries namely, Vietnam and Indonesia, are part of the five Asian countries currently contributing to 80 percent of the world's planned new coal plants.<sup>3</sup> Nevertheless, there is some cause for optimism with the Asian Development Bank (ADB) piloting an Energy Transition Mechanism (ETM) in Indonesia, the Philippines and Vietnam. The ETM is a collaborative initiative, crowding in both public and private investments from governments, multilateral banks, private sector investors, philanthropies and long-term investors, to finance the retirement of coal power assets on an earlier schedule than if they remained with their current owners.<sup>4</sup>

Beyond the energy mix, energy availability continues to be a concern in rural "last-mile" communities, with approximately 26.4 million people still lacking access to electricity in contrast to 2.7 million in urban areas.<sup>5</sup> This highlights the dilemma facing the region, balancing between the need to ensure electricity is available for a rapidly growing population, but equally, to ensure that electricity sources are decarbonizing to mitigate the climate crisis.

Since COP26, the majority of member states have made commitments to address the climate crisis. Brunei, Cambodia, Laos, Malaysia, Singapore and Vietnam have announced their commitments to achieve net-zero emissions around 2050, Indonesia by 2060, and Thailand by 2065 to 2070. Only the Philippines has not set a net-zero target.



The four categories subject to our analysis are:

## Availability

The scoring for this subcomponent examines plans and initiatives in place that contribute to the achievement of universal and equitable access to affordable, reliable, and modern electricity services.

## Energy Efficiency

Energy efficiency concerns all the initiatives and proposed plans that target the improvement of the national rate in energy efficiency.

## Renewable Energy

Analysis in this category evaluates the nation's efforts and policies that aim to substantially increase the share of renewable energy in the national energy mix.

## Decarbonization

Current progress is based on a country's progress in decoupling emissions from economic growth. Decarbonization targets are evaluated based on the Nationally Determined Contributions (NDC) of each country.

1 ASEAN Secretariat, "ASEAN Energy Cooperation: Overview," accessed July 20, 2022.

2 ASEAN Secretariat, "ASEAN Energy Cooperation: Priority Areas," accessed July 20, 2022.

3 S&P Global Market Intelligence, "5 Asian countries building 80% of new coal power – Carbon Tracker," accessed July 20, 2022.

4 Asian Development Bank, "Energy Transition Mechanism," accessed July 20, 2022.

5 UNESCAP, Regional Energy Trends Report 2020: Tracking SDG 7 in the ASEAN Region, 2020, p. 5.

# Energy & Climate



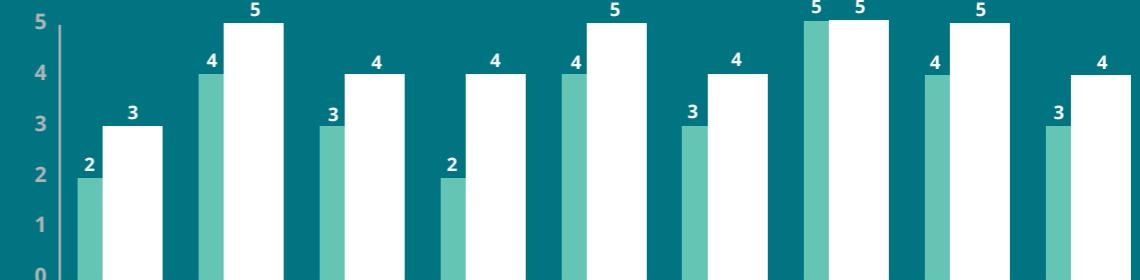
## Decarbonization

Current scores were determined by the indicator:

- Greenhouse gas intensity growth rate based on the EPI

Target scores were measured against the Paris Agreement's objective of limiting global warming to 1.5 °C, by reducing CO2 emissions by 45 percent by 2030 from 2010 levels, or the nation's commitment to net-zero carbon emissions by 2050 in conjunction with the UN Net-zero Coalition.

Brunei Cambodia Indonesia Laos Malaysia Philippines Singapore Thailand Vietnam

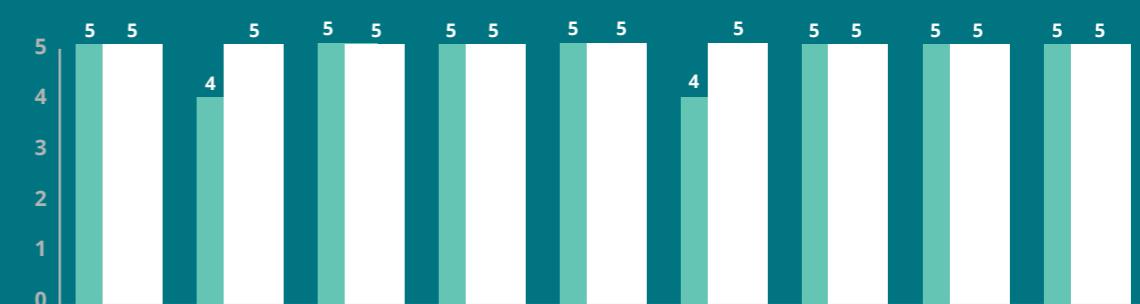


## Availability

Current scores were determined by the indicator:

- Population with access to electricity (% of population) from the UN SDG Report 2022

Target scores were measured against the ASEAN target to achieve near-universal (>99%) electricity access by 2030.

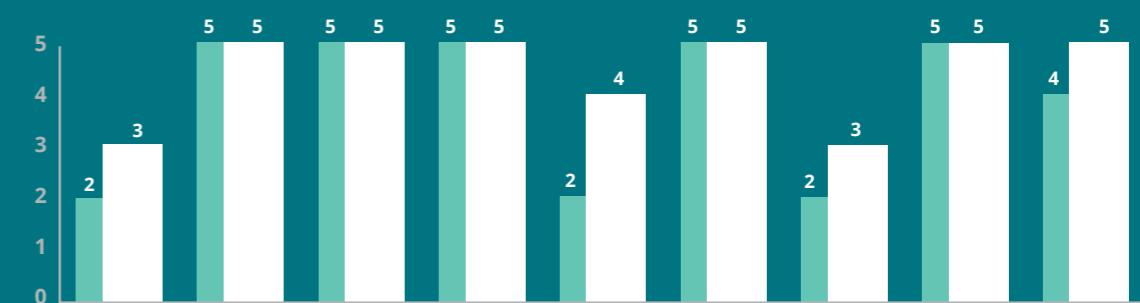


## Renewable energy

Current scores were determined by the indicator:

- Share of renewable energy in total primary energy supply (%) from the UN SDG Report 2022

Target scores were measured against the ASEAN target of achieving a modern renewable primary energy share of 23% by 2025.

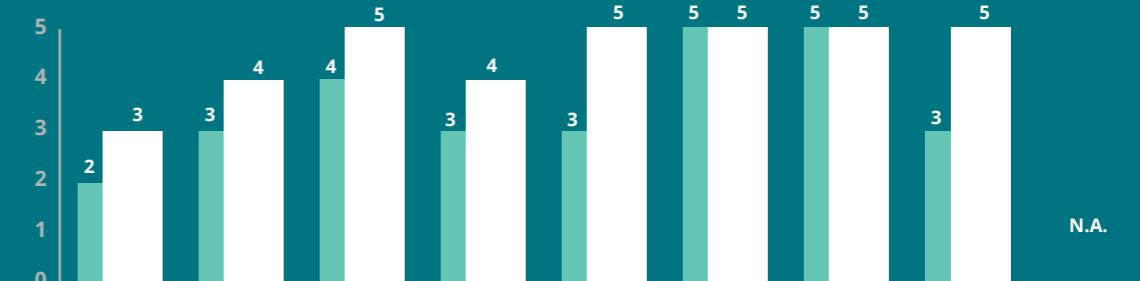


## Energy efficiency

Current scores were determined by the indicator:

- Energy intensity level of primary energy (megajoules per constant 2017 purchasing power parity GDP) from the UN Statistical Division

Target scores were measured against the ASEAN target of reducing regional energy intensity by 20% by 2020 and 30% by 2025, based on 2005 levels.



Current progress

Plans & commitments

# Biodiversity





# Biodiversity

While Southeast Asia only occupies about three percent of Earth's land, the region is home to rich biodiversity comprising four biodiversity hotspots. The ASEAN region contains the largest proportion of endemic bird and mammal species and the second highest proportion of endemic vascular plant species. Three out of 17 of the world's megadiverse nations – Indonesia, Philippines, and Malaysia are represented in the region.<sup>1</sup> Total regional forest area spans 2,065,600 sq km – where Indonesia's forest areas occupy the largest area (921,332 sq km), followed by Malaysia (191,140 sq km).<sup>2</sup>

To ensure the conservation and sustainability of its rich biological diversity, its member states have pledged their commitments through the ASEAN Socio-Cultural Community (ASCC) Blueprint 2025.<sup>3</sup> The ASEAN Centre for Biodiversity was established in 2005 to advise its member states on the development of policies to achieve socially responsible access, equitable sharing, utilization and conservation of natural ecosystems for present and future generations.<sup>4</sup>

Still, urgent steps need to be taken at the community, national and regional levels to ensure sustainable economic development that remains mindful of biodiversity conservation in the long-term. Importantly, the private sector must be actively involved in sustainable growth as businesses seek to pursue new opportunities in the region. Reporting frameworks like the Taskforce on Nature-related Financial Disclosures (TNFD) could help companies consider and disclose nature-related risks and opportunities within their operations and value chains, particularly in this biodiverse region. This is in line with a global shift in focus towards biodiversity, with CEO-led movements such as The World Business Council for Sustainable Development recently announcing biodiversity as part of the Vision 2050.<sup>5</sup>

To analyze the effectiveness of ASEAN countries' biodiversity commitments and progress, the United Nations Sustainable Development Goal 14: Life Below Water and Goal 15: Life on Land were employed as a guiding framework for the ideation and scoring of these four sub-components:

## Ocean Protection

Analysis in this category evaluates the ongoing plans and current progress that aim to sustainably manage and protect marine and coastal ecosystems. Initiatives assessed under this component concern efforts to reduce marine pollution, address the impacts of ocean acidification and establish marine protected areas.

## Inland Ecosystems

Country analysis of this category analyzes the drafted plans and in-place initiatives that are concerned with the identification and prioritization of threatened species, to ultimately improve and sustain their conservation status.

## Sustainable Fishing

This subcomponent examines planned strategies and on-the-ground efforts that address and prevent illegal, unreported and unregulated fishing and destructive fishing practices, including initiatives aimed at restoring fish stocks.

## Forest Conservation

Forest Conservation is centered around the conservation, protection, sustainable management and restoration of forests, and other terrestrial ecosystems. This includes initiatives that promote sustainable rural development through empowering communities and developing profitable, sustainable agriculture, while recognizing the multiple values of forests and the rights of Indigenous Peoples.

1 Percy E. Sajise, "Empowering Communities and Countries to Conserve Biodiversity at the National and ASEAN Levels: Status, Challenges, and Ways Forward," ERIA Discussion Paper Series, December, 2015, p. 6.

2 Food and Agriculture Organization of the United Nations, "Global Forest Resources Assessment: ASEAN Forest Area," accessed July 21, 2022.

3 Association of Southeast Asian Nations, "ASEAN Socio Cultural Community (ASCC) Blueprint 2025," November 22, 2015.

4 Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, "Protection of Biological Diversity in the ASEAN Member States in Cooperation with the ASEAN Centre for Biodiversity," January 2016.

5 World Business Council for Sustainable Development (WBCSD), "Vision 2050: Time to Transform," March 25, 2021.

# Biodiversity

Brunei Cambodia Indonesia Laos Malaysia Philippines Singapore Thailand Vietnam

## Ocean Protection

Current scores were determined using the indicators:

- Mean area that is protected in marine sites important to biodiversity (%) from the UN SDG Report 2022
- Ocean Health Index: Clean Waters score from the UN SDG Report 2022

Target scores were measured against the UN SDG 14 Targets:

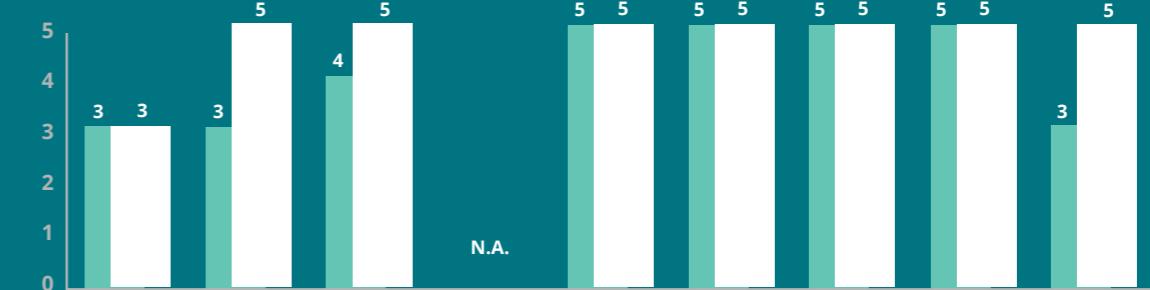
- By 2020, conserve at least 10 percent of coastal and marine areas
- By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution



## Sustainable Fishing

Current scores were determined using the indicators from the UN SDG Report 2022:

- Fish caught from overexploited or collapsed stocks (% of total catch)
- Fish caught by trawling or dredging (%)
- Fish caught that are then discarded (%)

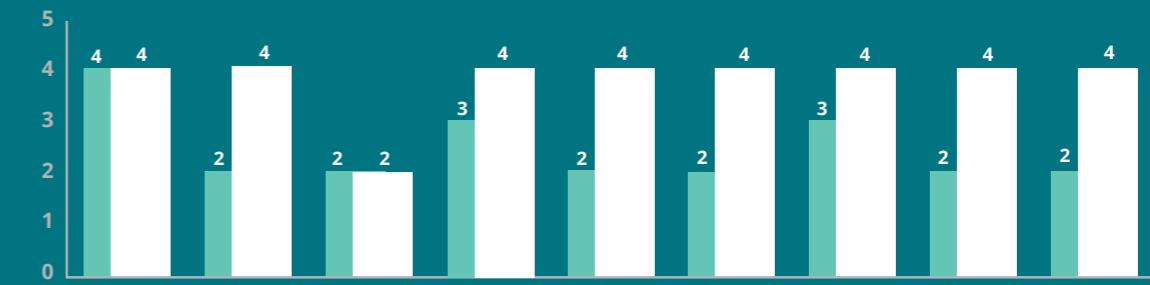


## Inland Ecosystems

Current scores were determined using the indicator:

- Red List Index of species survival (worst 0-1 best) from the UN SDG Report 2022

Target scores were measured against UN SDG 15: to take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and protect and prevent the extinction of threatened species.

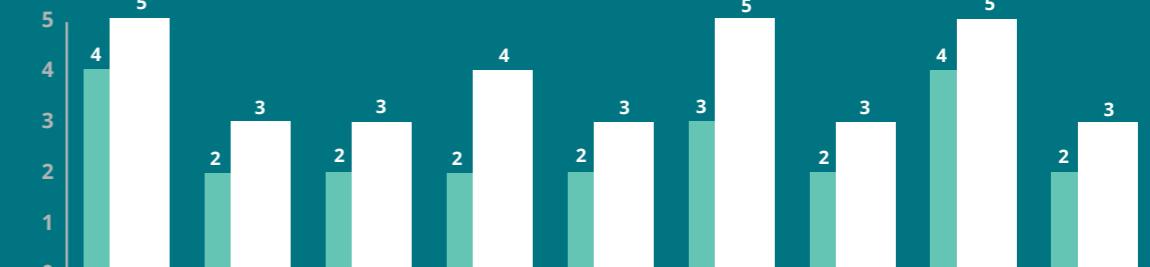


## Forest Conservation

Current scores were determined using the indicator:

- Permanent deforestation (% of forest area, 5-year average) from the UN SDG Report 2022

Target scores were measured against the COP 26 target to halt and reverse forest loss and land degradation by 2030.



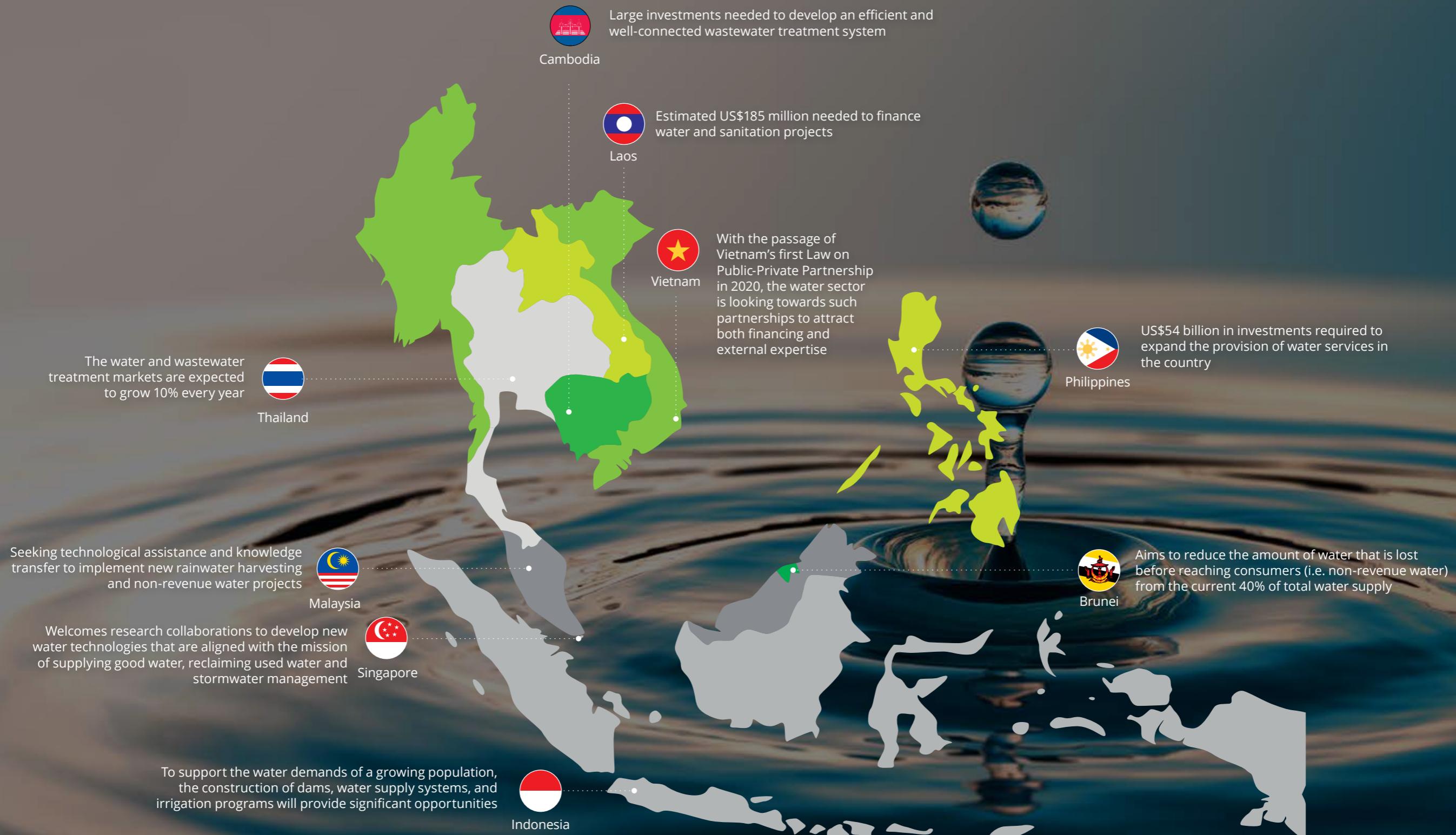
Current progress



Plans & commitments



# Water





# Water

While Asia is home to more than half of the world's population, it contains less freshwater – 3,920 cubic meters per person per year – than any other continent (apart from Antarctica).<sup>1</sup> A closer look at the region's water situation highlights seasonal scarcity and rising pressure on freshwater resources in its member states. Rapid rates of economic development place considerable pressure on countries when it comes to the sustainable development of water supply and sanitation schemes. Reduced access to freshwater will lead to a cascading series of consequences, some of which include disruption in food production, loss of livelihood security, large-scale migration, and rising geopolitical tension and instabilities.<sup>2</sup>

Conditions in these member states vary and have differing implications for water management and resource issues. Nevertheless, sharing of best practices and joint efforts to improve water resource sustainability in ASEAN could help improve outcomes. In recognition of the pressing need for preservation and better management

and use of water resources, ASEAN leaders pledged their commitment and support in ASEAN 2025: Forging Ahead Together. Guided by the ASCC Blueprint 2025, the ASEAN Working Group on Water Resource Management was incorporated as a consultative platform for member states to promote water resource sustainability and ensure equitable accessibility and acceptable quality of water to meet the needs of its people.<sup>3</sup>

Approximately 70 percent of individuals have access to safely managed sanitation across Southeast Asia. Despite the region's progress, countries with large rural populations, such as Cambodia and Laos, face challenges in providing universal access – in 2017, only 54 percent of people in rural areas in ASEAN have access to basic sanitation.<sup>4</sup> Significant investments are required for improvements in sanitation, wastewater reuse infrastructure and sewerage systems, and in efforts to enable access to better water quality and sanitation.

To analyze the effectiveness of an ASEAN's country's water management commitments and progress, the United Nations Sustainable Development Goal 6: Clean Water and Sanitation was employed as a guiding framework for the ideation and scoring of these four sub-components:

## Drinking Water

Analysis in this category evaluates the ongoing plans and current progress that aim to achieve universal and equitable access to safe and affordable drinking water for all. Whereas many Southeast Asian nations have an established a water network in cities and towns, the limited accessibility in rural regions remains a challenge for most.

## Sanitation and Hygiene

This subcomponent examines planned strategies and on-the-ground efforts that aim to achieve access to adequate and equitable sanitation and hygiene for all and end open defecation. This includes increasing the proportions of treated wastewater, and improving public sewerage systems. Similarly, in rural regions, sanitation tends to be at its lowest levels due to poor infrastructure and limited connectivity.

## Water-use Efficiency and Scarcity

This subcomponent is centered around plans and efforts that aim to substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity. Overall, these initiatives target the reduction of the number of people suffering from water scarcity in the nation.

1 Asia Society, "Asia's Next Challenge: Securing the Region's Water Future," accessed July 22, 2022.

2 Asia Society, "Asia's Next Challenge: Securing the Region's Water Future."

3 ASEAN Cooperation on Environment, "ASEAN Cooperation on Water Resources Management," accessed July 22, 2022.

4 UNESCAP, Complementarities between the ASEAN Community Vision 2025 and the United Nations 2030 Agenda for Sustainable Development: A Framework for Action, 2017, p. 38.

# Water



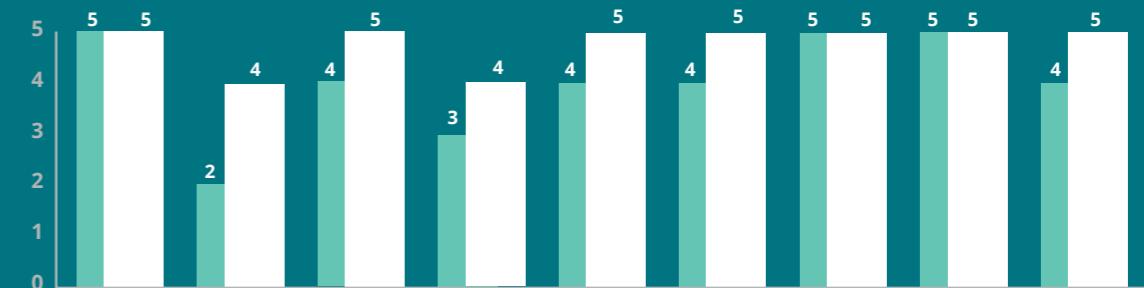
## Drinking water

Current scores were determined using the indicator:

- Population using at least basic drinking water services (%) from the UN SDG Report 2022

Target scores were measured against the UN SDG 6 target of achieving 100% basic drinking water services by 2030.

Brunei Cambodia Indonesia Laos Malaysia Philippines Singapore Thailand Vietnam



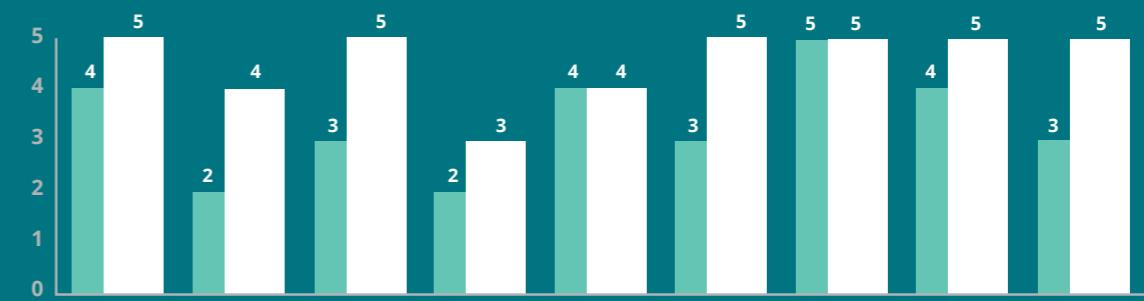
## Sanitation and hygiene

Current scores were determined using the indicators:

- Population using at least basic sanitation services (%) from the UN SDG Report 2022
- Anthropogenic wastewater that receives treatment (%) from the UN SDG Report 2022

Target scores were measured against the UN SDG 6 targets:

- By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations
- By 2030, improve water quality by halving the proportion of untreated wastewater



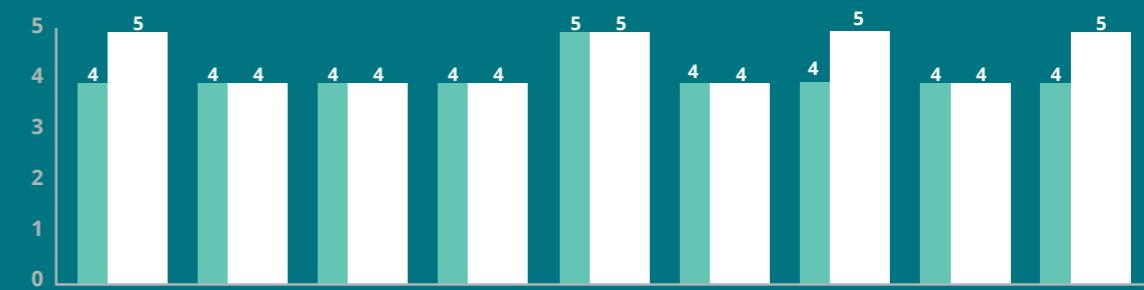
## Water-use efficiency and scarcity

Current scores were determined using the indicators:

- Freshwater withdrawal (% of available freshwater resources) from the UN SDG Report 2022
- Water-use efficiency (US\$/m3)

Target scores were measured against the UN SDG 6 target:

- By 2030, to substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity



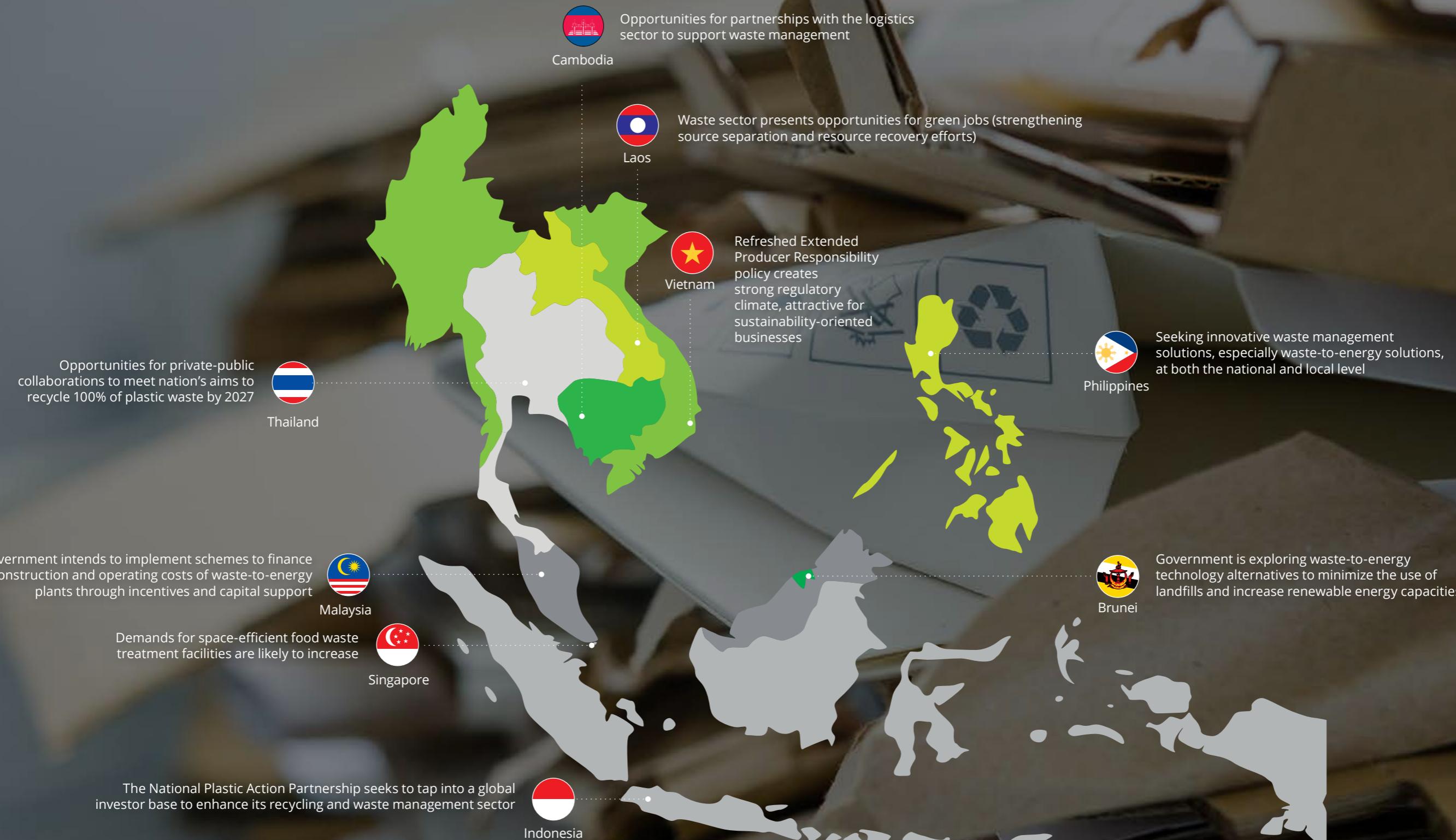
Current progress



Plans & commitments



# Waste





# Waste

From 2005 to 2015, the amount of solid waste generated in ASEAN has notably doubled, especially for countries such as the Philippines, Singapore and Thailand. In fact, the World Bank found that daily waste generation in 2016 reflected 0.6kg of waste generated per capita per day on average.<sup>1</sup> Reduction in food waste across the supply chain is an important area as it represents about 60 percent of all solid waste in ASEAN.<sup>2</sup> Adoption of an integrated model to transform waste into resources could create sustainable incentives for waste management.

Plastic is estimated to account for 90 percent of marine debris in the oceans, where six out of ten ASEAN member states generate over 31 million tons of plastic waste in a year alone. While many of the member states do engage in national efforts for waste management, the sudden rise in single-use plastics and personal protective

equipment due to the COVID-19 pandemic has placed additional stress on the countries' attempts at tackling marine plastic debris as well.<sup>3</sup>

Population growth and rapid industrialization will continue to pose significant challenges for waste management. Improper management of waste leads to detrimental impacts on environment and human health, and thereby stress the need for regional cooperation to address the issue at hand. Apart from its commitment to addressing waste management problems highlighted in the ASEAN Socio-Cultural Community Blueprint, ASEAN has likewise launched its regional plan for combating marine debris in member states (2021 – 2025). The plan outlines a scalable, solution-focused joint strategy to address marine plastic debris across the region and underlies its commitment towards tackling waste management.<sup>4</sup>

To analyze the effectiveness of a country's waste management commitments, we examine three key criteria:

## Solid Waste Management

This subcomponent assesses a country's efforts to collect and manage solid waste generated.

## Food Waste

This subcomponent centers around the level of food that is produced but not eaten by humans. Initiatives include plans to reduce food waste at retail, food service, and household level.

## Hazardous Waste

Largely comprising chemical waste, hazardous waste management is vital to the well-being of human life and sustainable development. This subcomponent focuses on a country's efforts to reduce, classify and manage toxic chemical waste from contaminating the environment. Alarmingly, reliable data on hazardous waste levels is sparse in many areas of the world, particularly in Southeast Asia.



1 Team Revolution, "Solving the Waste Management Problem in ASEAN," presented at Nanyang Technological University Singapore.

2 Team Revolution, "Solving the Waste Management Problem in ASEAN."

3 The World Bank, "ASEAN Member States Adopt Regional Action Plan to Tackle Plastic Pollution," accessed July 22, 2022.

4 ASEAN Cooperation on Environment, "ASEAN Cooperation on Chemicals and Waste," accessed July 22, 2022; ASEAN, "ASEAN Socio-Cultural Community Blueprint 2025," accessed July 22, 2022.

# Waste

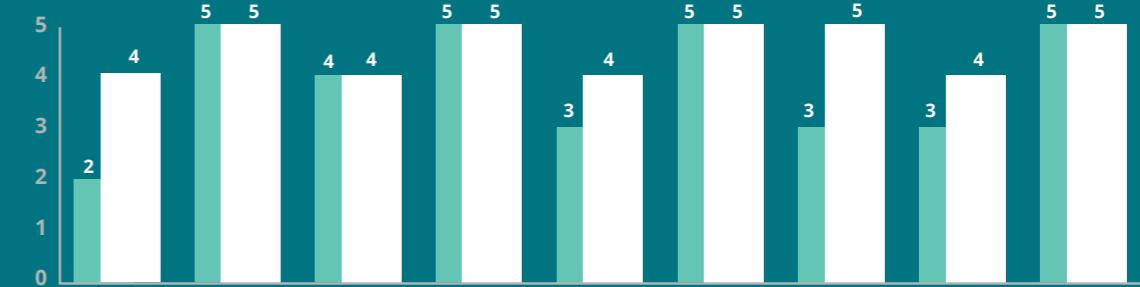
Brunei Cambodia Indonesia Laos Malaysia Philippines Singapore Thailand Vietnam

## Solid waste management

Current scores were determined by the following indicator:

- Overall collection rates (in %) for urban municipal solid waste, from the UNEP Waste Management report.

Target scores were determined against the UN SDG target 12.5 to substantially reduce municipal solid waste through prevention, reduction, recycling and reuse by 2030 (at least 10%)

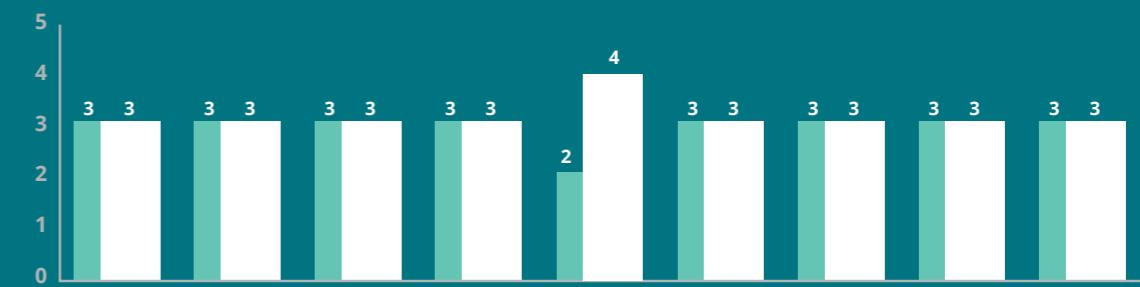


## Food waste

Current scores were determined by the following indicator:

- Household food waste estimate (kg/capita/year) from the UN Environmental Programme (UNEP) Food Waste Index Report 2021

Target scores were determined against the UN SDG Target 12.3 to halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses, by 2030.



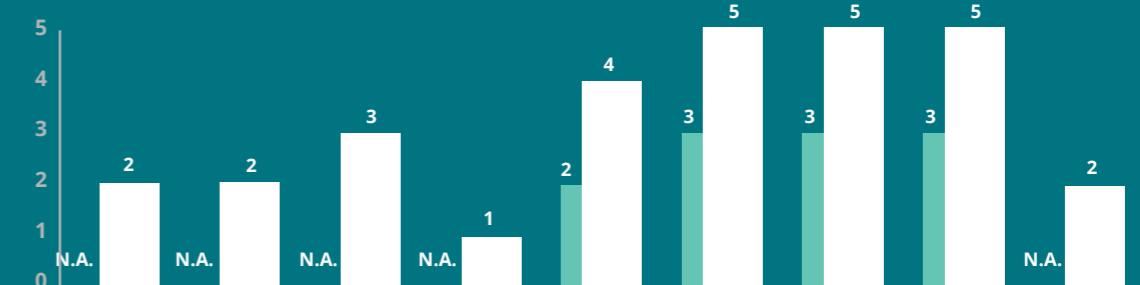
## Hazardous waste

Current scores were determined by the following indicator:

- Hazardous waste generated per capita (kg) from the World Bank What A Waste Global Database

Target scores were generated using analysis from the UNEP's Waste Management in ASEAN report, against the United Nations Centre for Regional Development 3R Forum targets for hazardous waste management:

- Encourage resource efficiency and productivity in the private sector
- Promote the greening of the value chain by encouraging industries and associated suppliers and vendors in socially responsible and inclusive ways
- Promote industrial symbiosis (i.e., recycling of waste from one industry as a resource for another)
- Develop proper classification and inventory of hazardous waste as a prerequisite towards sound management of such waste



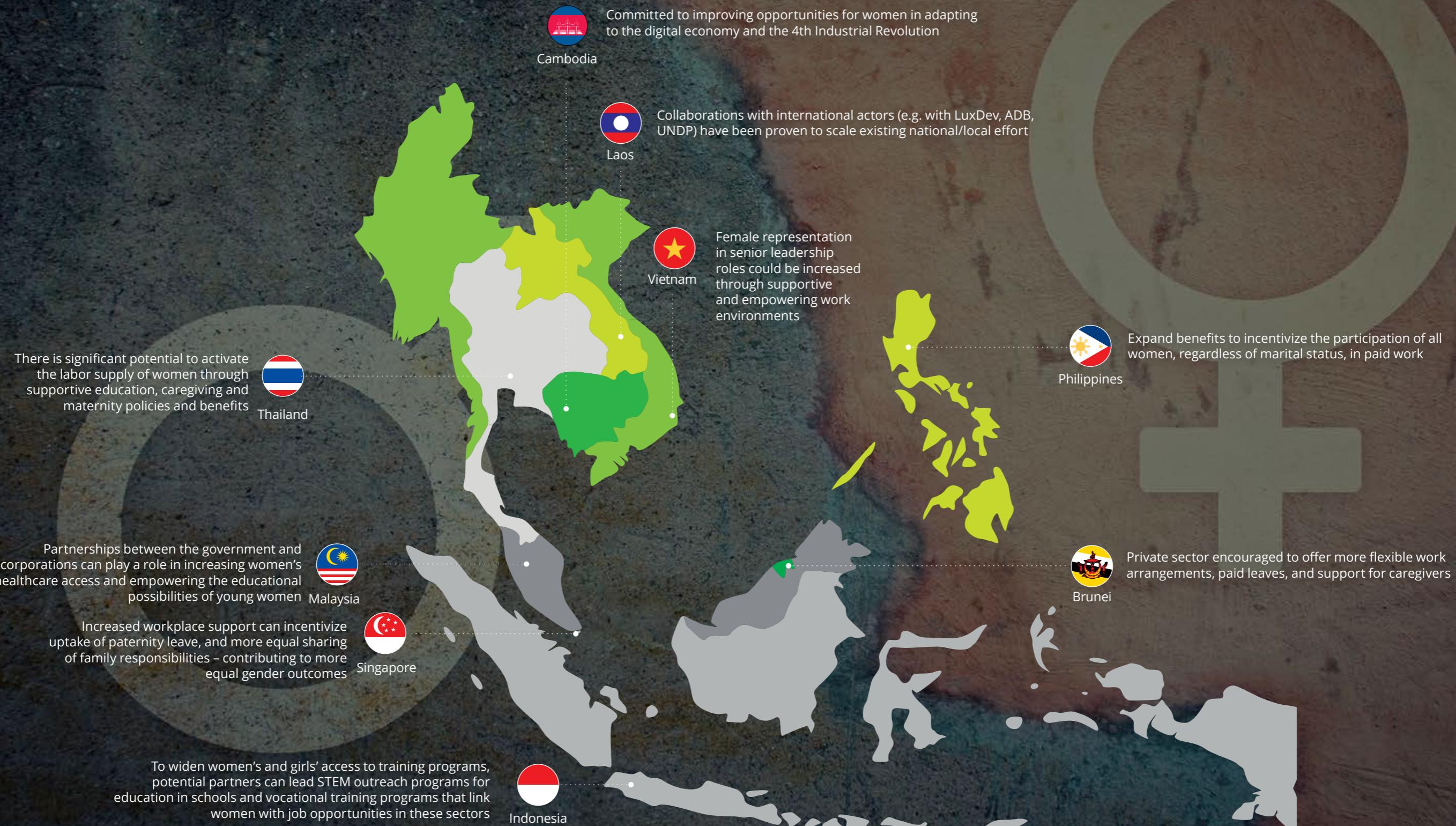
Current progress



Plans & commitments



# Gender Equality





# Gender Equality

While governments in the region have instituted significant reforms, and the private sector has made advancements to promote women's economic participation over the past decade, a significant gender gap remains. Over the past year, poverty rates have notably increased in several member states such as Cambodia and Indonesia; where women are found more likely than men to live below the poverty line.<sup>1</sup> The onset of the COVID-19 pandemic has since further exacerbated the domestic care responsibilities of such women in member states, where 30 percent of them have reported increases in intensity of work.<sup>2</sup>

In terms of employment, 56 percent of women participate in the labor force as compared to 79 percent of men. Of those employed, more than half of them are engaged in informal sectors.<sup>3</sup> According to the World Bank's Women, Business and the Law 2021 Index, member states collectively score an average of 71.1 out of 100 (compared to a global average of 76.1), indicating there is room for growth in implementing protections or removing restrictive laws and regulations.<sup>4</sup> Without the legal foundation to support women in the workforce, the private sector is left to its own policies and practices to ensure the hiring and participation of women.

It is widely accepted by the global community that better health outcomes for women lead to their greater economic participation. Yet, 30 percent of women in the region are unable to see a doctor when needed.<sup>5</sup> Moreover, the poorest women living in remote provinces continue to stagger behind across various dimensions of equality – spanning from accessibility to basic education, health care, safe drinking water and clean energy.

Deeply entrenched attitudes of traditional gender roles have likewise impeded greater female involvement in politics. This is evident from how a greater number of women are participating in decision-making, but parity has yet to be achieved. Accordingly, 20 percent of parliament seats are currently occupied by women, and women only make up 24 percent of middle and senior manager roles in the private sector.<sup>6</sup> Addressing these serious challenges, however, comes with tangible economic benefits.

To analyze a country's commitment towards ensuring gender equality and women's empowerment, we used the United Nations Sustainable Development Goal 5: Gender Equality as a guiding framework for the ideation and scoring of these four sub-components. We examine the following criteria and their respective indicators:

## Ending all forms of discrimination/violence/harmful practices

Analysis in this category evaluates the current progress in establishing legal frameworks/initiatives to eliminate all forms of discrimination, violence and harmful practices against all women and girls.

## Equal Opportunities and Empowerment

Country plans to implement policies/initiatives that ensure access to healthcare, sexual and reproductive health and rights, economic resources and control of various forms of property and gender equality in education. Initiatives to ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life, and overall promoting empowerment of women and girls at all levels.

\* As most countries do not set quantitative targets for gender-based equality, target scores were not awarded.

1 UN Women Regional Office for Asia and the Pacific, "Online Roll-Out of the ASEAN Gender Outlook," accessed July 22, 2022.

2 ASEAN Secretariat, "Gender Equality: Bridge to Progress," The ASEAN, April-May, 2021, p. 38.

3 UN Women Regional Office for Asia and the Pacific, "Online Roll-Out of the ASEAN Gender Outlook."

4 The World Bank, "Women, Business and the Law 2021 Index," accessed July 22, 2022.

5 ASEAN Secretariat, "Gender Equality," p. 38.

6 ASEAN Secretariat, "Gender Equality," p. 38.

# Gender Equality

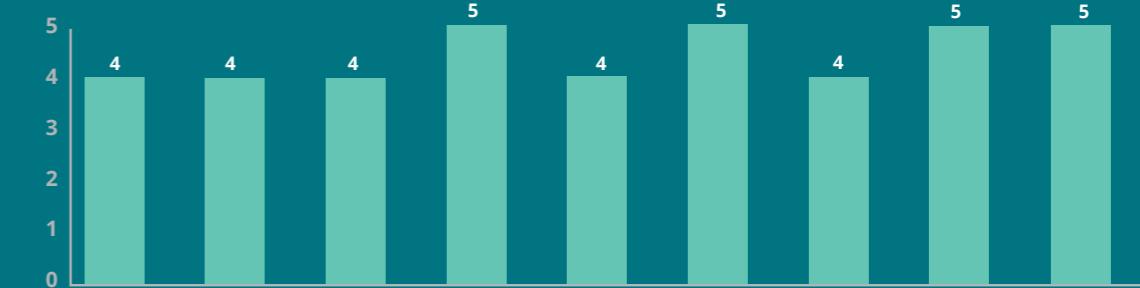


## Ending all forms of discrimination, violence and harmful practices

Current scores were determined using the following indicators:

- Health and Survival score from the Global Gender Gap Index 2021
- Educational Attainment score from the Global Gender Gap Index 2021

Brunei Cambodia Indonesia Laos Malaysia Philippines Singapore Thailand Vietnam

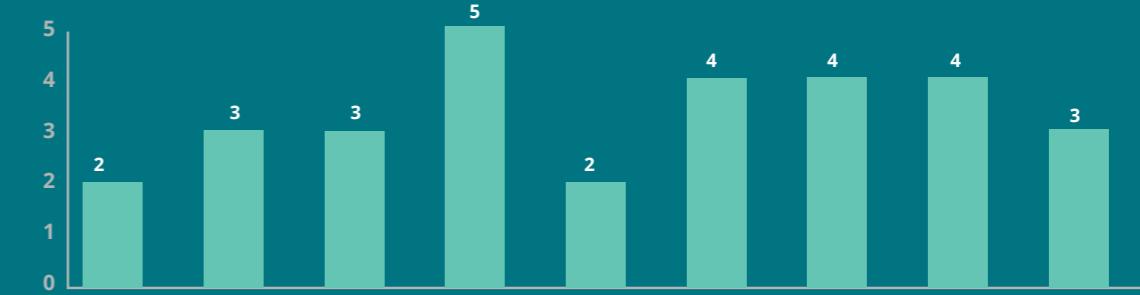


## Equal opportunities and empowerment

Current scores were determined using the following indicators:

- Economic Participation and Opportunity score from the Global Gender Gap Index 2021
- Political Empowerment score from the Global Gender Gap Index 2021

As most countries do not set quantitative targets for gender-based equality, target scores were not be awarded.



Current progress

# Brunei



# Brunei

The small Southeast Asian nation of Brunei Darussalam (Brunei) has one of the highest GDP per capita in the world. Crude oil and natural gas production accounts for approximately 65 percent of its GDP and nearly 100 percent of its exports.<sup>1</sup> The country has a largely English-speaking population, and its citizens enjoy access to free education, medical care, subsidized food, and housing. It has also achieved high gender parity in education and health outcomes.

In 2004, Brunei's leadership formed a Council of Long-term Development Planning responsible for formulating the country's strategic goals. The Council proposed Wawasan Brunei 2035, which is a comprehensive long-term development plan that reinforces Brunei's aspirations to achieve a highly educated workforce, ensure the world-standard quality of living, and sustain a vibrant economy.<sup>2</sup> Among other sustainable goals, the country prioritizes biodiversity conservation and sustainable growth as part of this plan.

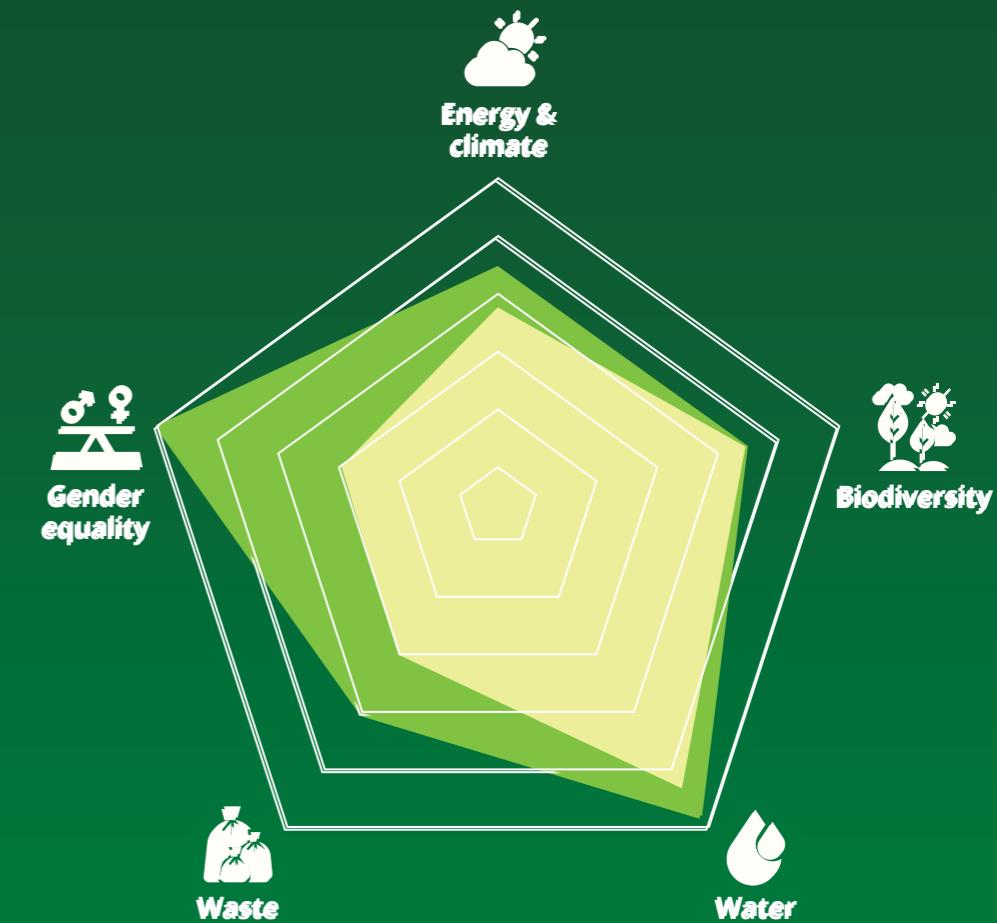
Brunei is moving towards net-zero by 2050 through its energy transition and forest preservation. The Brunei Darussalam National Climate Change Policy (BNCCP), launched in 2020, displays a strong commitment to increasing the reliance on renewable energy sources, which currently accounts for less than one percent of the total power generation. Brunei plans to install up to 100MWp of solar capacity by 2025 as part of its target to increase reliance on renewable energy to 30 percent by 2035.<sup>3</sup> Brunei also targets to increase the use of electric vehicles to 60 percent of total annual vehicle sales by 2035.<sup>4</sup>

Nevertheless, this progress is accompanied by some challenges relating to issues such as wastewater treatment, waste management and the political empowerment of women. For example, on waste management, Brunei is the second ASEAN country to produce the most solid waste per capita and has yet to see an increase in its recycling rates. These issues could pose serious risks to Brunei's sustainable economic growth and may hamper progress in their citizens' overall standard of living.

Current progress:



Targets and commitments:



## Highlights



Plans to increase its reliance on renewable energy – 100MWp of solar capacity by 2025



Sustainability goals such as biodiversity conservation and achieving sustainable growth built into Brunei's comprehensive long-term development plan



Brunei aims to reach net-zero by 2050



## Energy & Climate

Brunei's energy & climate efforts are mainly directed towards the integration of renewable energy sources into its current energy mix, the improvement of the nation's efficient energy use and the development of a robust resilience strategy.

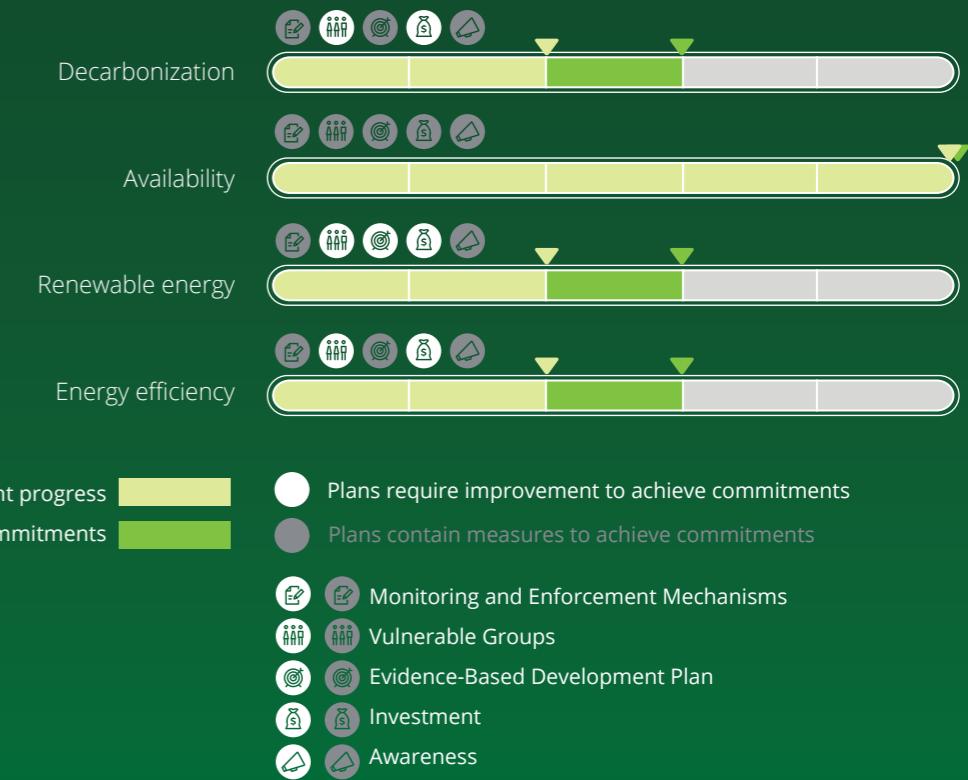
The Brunei Darussalam National Climate Change Policy (BNCCP) outlines a strong intent and plan to shift away from fossil fuels – currently, 99 percent of Brunei's power is generated by natural gas.<sup>5</sup> Less than one percent is generated by renewable sources, and Brunei aims to increase this percentage to 30 percent by 2035, with emphasis on solar energy.<sup>6</sup> Brunei currently has two solar parks and plans to install up to 100MWp of solar capacity by 2025. The BNCCP also details actions to incentivize research on alternative energy sources by establishing collaborations with local higher institutions, government, and industry. Additionally, the government intends to establish attractive FDI packages for various renewable energy sources and technologies.

On the demand side, Brunei intends to integrate energy requirements into building codes, impose mandatory directives to energy intensive users and provide benefits to those utilizing alternative energy sources.<sup>7</sup> By 2035, Brunei also targets to increase the total share of electric vehicles to 60 percent of the total annual vehicle sales by revising policies to facilitate the deployment of electric vehicles and to incentivize their

use.<sup>8</sup> Beyond the renewables sphere, the BNCCP also outlines efforts to improve the national rate of energy efficiency by implementing structural (e.g. LED lights, new transmission line) and regulatory (e.g. decommissioning inefficient power plants) changes.

Brunei's first Nationally Determined Contribution submitted in 2020, committed to a reduction in GHG emissions by 20 percent below business-as-usual levels by 2030. To advance the country's low carbon transition, it intends to implement a carbon pricing mechanism from 2025 onwards. Revenue raised would be used to fund climate mitigation and adaptation efforts. Given Brunei's reliance on fossil fuel exports, it is important that the country selects a carbon pricing policy that is best suited to them. With that, Brunei has recently collaborated with international organizations (like ASEAN Centre for Energy) to discuss the institutional and technical barriers with each potential carbon pricing mechanism.<sup>9</sup> Nevertheless, there is the potential for Brunei to create a green economy.

**“** Brunei currently has two solar parks and plans to install up to 100MWp of solar capacity by 2025. **”**



## Highlights



Target power generation mix to be 30% from renewable energy sources by 2035



Electric vehicles to make up 60% of annual vehicle sales by 2035



Brunei commits to reduce GHG emissions by 20% below-BAU levels by 2030

## Opportunities



Government is exploring implementing policies to incentivize more EV usage



Attractive opportunities in solar energy infrastructural development (e.g., large-scale solar farms and rooftop solar installations)



Future carbon pricing mechanism signals opportunities for green technologies and a green economic framework



## Biodiversity

Tropical evergreen forests cover 81 percent of Brunei land area, and its coastlines are home to 400 reef-building coral species.<sup>10</sup> Brunei ranks second in ASEAN in the Biodiversity Habitat Index,<sup>11</sup> which estimates the effect of habitat loss, degradation, and fragmentation on the expected retention of terrestrial biodiversity. Brunei's biodiversity management strategy has been centered around the conservation of its dense forests and the development of its forest resources. With that, the government has partnered with international and academic institutions to ensure the survival of its rich ecosystems, addressing the environmental challenges inherent in the rich biodiversity of marine and land species.

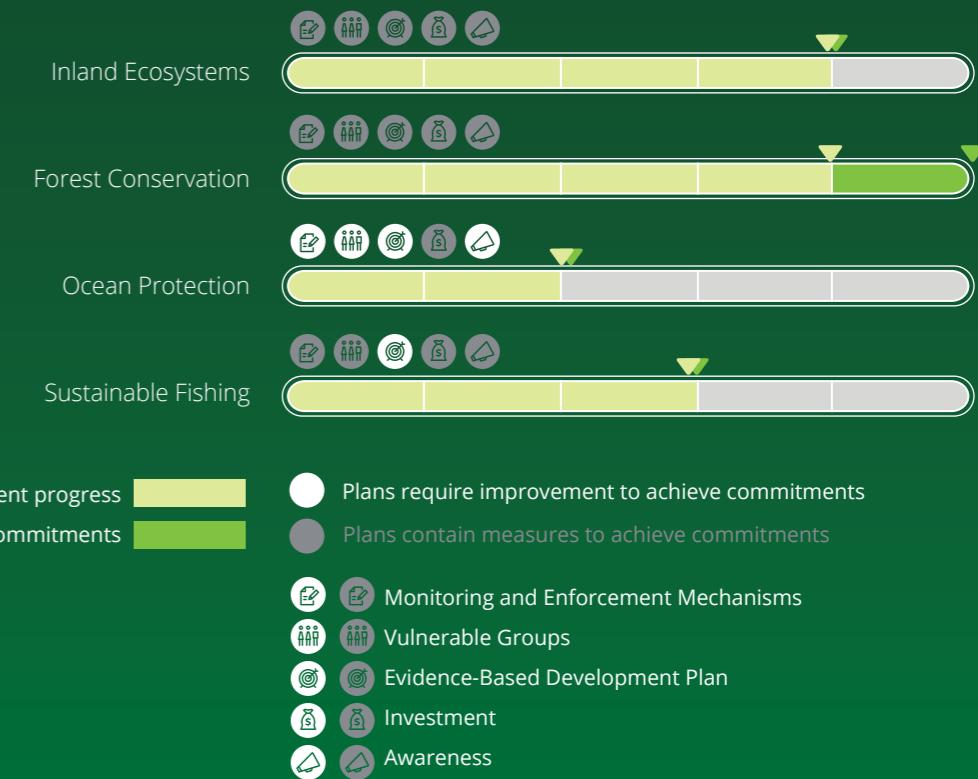
The Brunei Darussalam Long Term Development Plan – Wawasan 2035 highlighted the nation's continuing efforts to conserve its unique biodiversity.<sup>12</sup> Built into its long-term plans, Brunei's environmental strategy seeks to develop forest resources, conserve the natural forest, and expand the ecological tourism industry to be at the forefront of the forestry sector. In 2008, Brunei joined the Convention of Biological Diversity, further strengthening the ongoing conservation initiatives in alignment with national and international standards.

Joint collaborations with international academic institutions are part of the government's overarching goal to enhance local knowledge to better manage

the country's environment and natural resources. For instance, the Brunei Tropical Biodiversity Centre was set up in 2013 to research on biodiversity management. Technical collaborations, such as a collaboration with Japan's National Institution and Technical Evaluation, have been executed in this Centre.<sup>13</sup> Recently, Brunei's Tourism board has introduced tourism promotions in the Belait district, of which the Centre is located in. Apart from biodiversity research, the Centre can also host ecotourism-related activities that educate local and international visitors on Brunei's vast forest reserves.

Compared to terrestrial biodiversity, conservation of the marine environment seemed to have received lesser attention. While Brunei does appear to have a plan to maintain ocean health and protect marine ecosystems, the effects of these initiatives remain unclear. In 2009, the Fisheries Order came into force, along with complementary subsidiary legislations under the Fisheries Act to protect marine biodiversity through mesh size regulations, fishing zonings and moratoriums.<sup>14</sup> However, the World Database on Protected Areas reveals that only 0.2 percent of Brunei's marine areas are protected.<sup>15</sup>

**“** Brunei ranks second in ASEAN in the Biodiversity Habitat Index. **”**



## Highlights



Biodiversity strategy largely focused on the development of forest resources and conservation of natural forests



Brunei's Tropical Biodiversity Centre hosts both biodiversity research and educational ecotourism-related activities



Protection of marine areas could be better enforced

## Opportunities



Government's long-term plan encourages partnerships with international and academic institutions to conserve biodiversity



Opportunities for sustained collaborations with international academic institutions on developing biodiversity expertise



Public awareness programs and research in the forest sector alongside government efforts are encouraged



## Water

Brunei has been able to readily address issues of accessibility to potable water and equitable sanitation. According to the Voluntary National Review, 100 percent of the population has access to clean and safe drinking water.<sup>16</sup> This is provided by the Public Works Department, with the Department of Water Services responsible in overseeing the planning, design and demand for the country's water resources. The country has also ensured that 93 percent of its population has access to sanitation and showed a clear willingness to continue to intensify these efforts to increase this percentage to 97 percent by 2035.<sup>17</sup> Brunei ranks 27th out of 180 globally in the Sanitation & Drinking Water category of the Environmental Performance Index (EPI).<sup>18</sup>

To increase water-use efficiency, the government has recently engaged in a 24-month project with private contractors to reduce Non-Revenue Water (NRW). Scheduled to be completed in November 2022, this project highlights the government's renewed emphasis on NRW, which currently accounts for 40 percent of the total water supply.<sup>19</sup> NRW includes water that is lost due to pipe leaks, tanks overflowing, metering inaccuracies and illegal water tapping. The state has also implemented a new water tariff system and Unified Smart Metering System that introduced new rates based on a tiered structure for residential, commercial, and raw water.<sup>20</sup>

The government is also embracing Internet-of-Things (IOT) solutions to create an integrated water management system. One example of a system is a set of ultrasonic sensors, deployed at Brunei Maura, to create preventive alerts for flood events.<sup>21</sup> A separate system also makes use of smart sensors to monitor wastewater pumping stations to ensure wastewater levels remain at a predetermined level. In the future, the government hopes to increase the network coverage to also collect data about its water networks (pressure, flow, leaks, water quality, reservoir levels, pumps).<sup>22</sup>

**"**The government is also embracing Internet-of-Things (IOT) solutions to create an integrated water management system. **"**



## Highlights



Brunei has achieved universal access to clean and safe drinking water



Government is working to increase citizens' access to sanitation from 93% to 97% by 2035



Unified Smart Metering system has been introduced for residential, commercial and raw water

## Opportunities



Government welcomes investments into smart water monitoring technologies



Opportunities for public-private collaborations as government embarks on comprehensive study of Non-Revenue Water



Capacities needed for data collection and data analysis as its network coverage expands



## Waste

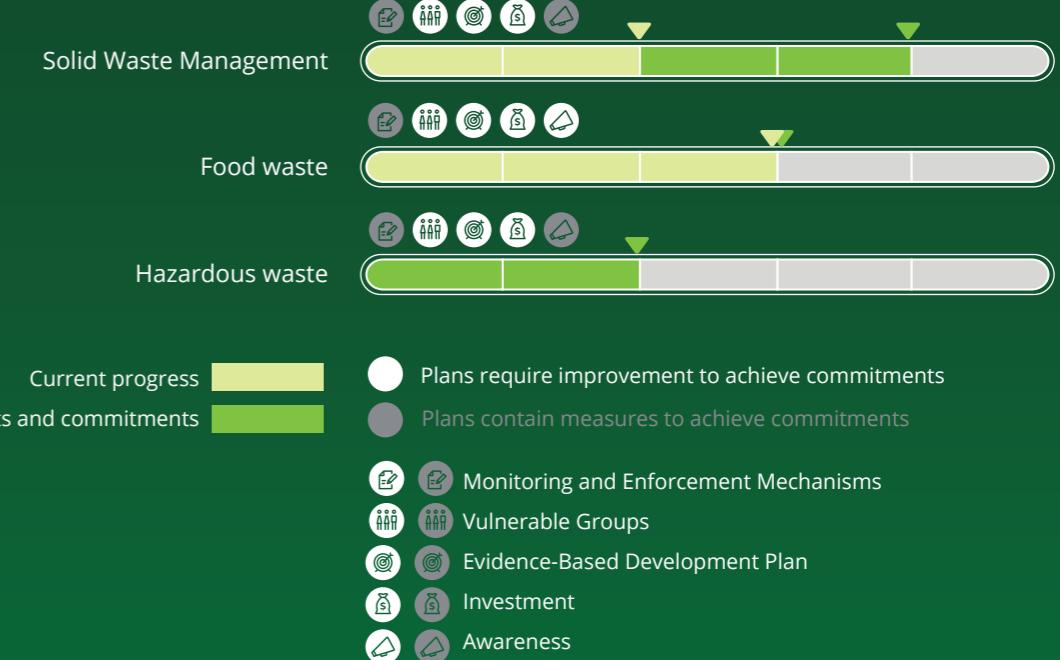
Brunei faces a critical challenge in managing and disposing its waste.<sup>23</sup> In ASEAN, Brunei produces the second-highest amount of solid waste per capita (1.4 kg per day reported by Solid Waste Management Report). Obstacles, such as weak solid waste management practices and rapid urbanization, could derail the nation's efforts towards sustainable waste management.

70 percent of the country's waste ends up in its six landfills.<sup>24</sup> As the country moves towards urbanization, waste produced is expected to increase. Hence, in line with its Wawasan Brunei 2035 long term plan, the government aims to increase recycling rates from 11.3 percent in 2019 to 30 percent by 2035.<sup>25</sup> The government has been aiming at domestic waste minimization through its 3Rs initiative. This includes a 'No Plastic Bag weekend' launched in 2012, and a program to empower youths to participate in environmental initiatives, launched in 2009.<sup>26</sup> However, these initiatives have yet to translate to a meaningful increase in current recycling rates. Hence, the Asian Development Bank Institute recommended that Extended Producer Responsibility policies could be introduced in Brunei to hold producers accountable for waste management for their products.<sup>27</sup>

Brunei also has limited laws and facilities to address hazardous waste. To date, Brunei has not conducted any inventories of mercury waste, which is primarily generated from oil and gas exploration and production.<sup>28</sup> Given the future diversification of their export-oriented petrochemical industry, there has been some international concern over the handling of hazardous waste.<sup>29</sup>

The government is also exploring waste-to-energy technology alternatives to minimize the use of landfills and increase renewable energy capacities.<sup>30</sup> However, there is little information about the direction of the government's future policies. Additionally, there is a lack of research about Brunei's marine plastics pollution. Increased transparency and access to the government's waste management plans could help stimulate investments into this sector.

**"**The government is exploring waste-to-energy technology alternatives to minimize the use of landfills and increase renewable energy capacities. **"**



## Highlights



By 2035, Brunei aims to increase its recycling rate from 11.3% to 30%



The country has limited laws and facilities to address hazardous waste



Waste-to-energy technologies potentially being explored

## Opportunities



Implement Extended Producer Responsibility frameworks to include producers in nation's waste management efforts



Strengthen regulatory frameworks surrounding hazardous waste management



Incentivize investments into waste sector through increased transparency and access to information



## ♂ ♀ **Gender Equality**

Brunei has implemented substantial plans and efforts to minimize discrimination against all women and promote equal participation in the workforce. Nevertheless, there is room for the political empowerment of women.

The Global Gender Gap report revealed that Brunei has been successful in achieving very high gender parity in the educational and health spheres, with a score of 0.992 and 0.965 respectively (1.00 = parity).<sup>32</sup> Economic participation and opportunity scored 0.722, which was attributed to the low percentage of female legislators, senior officials, and managers (33 percent). Importantly, the political empowerment score is critically close to zero (0.031), with no women currently holding ministerial positions and only nine percent in parliament positions. Thus, Brunei's efforts in achieving gender parity have been successful but require policies targeting the political empowerment of women.

**“** Brunei has been successful in achieving very high gender parity in the educational and health spheres. **”**

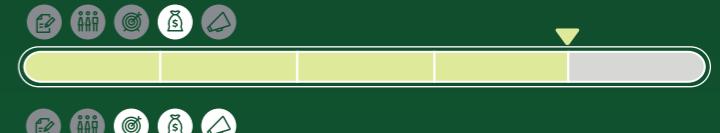
To end discrimination against women, Brunei has developed a plan of action in accordance with the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW). A nation-wide implementation was possible due to the involvement of non-governmental organizations (NGOs). For instance, members of the CEDAW taskforce included the Council of Women of Brunei Darussalam, a major active women NGO.<sup>33</sup> These entities ensured unified action from all the stakeholders involved in women's affairs. Furthermore, equal protection of women is provided through the criminalization of some forms of violence against women.<sup>34</sup>

The government has also introduced policies to promote gender equality in the workplace, such as the Employment Order 2009 and the Workplace Safety and Health Order 2009. In 2019, the Human Resources Ministry also proposed to increase the number of maternity leave days for the private sector (from 60 days to 98 days).<sup>35</sup> The amended Employment Act will also include three days of paternity leave for the private sector.

Ending all forms of discrimination, violence and harmful practices

Equal Opportunities and Empowerment

Current progress



- Plans require improvement to achieve commitments
- Plans contain measures to achieve commitments
- Monitoring and Enforcement Mechanisms
- Vulnerable Groups
- Evidence-Based Development Plan
- Investment
- Awareness

## Highlights



High gender parity in the educational and health spheres



Lacking in representation of women in the political sphere



Lower labor force participation rate of women compared to men (55-58% versus 68-74%)

## Opportunities



Private sector encouraged to offer more flexible work arrangements, paid leaves, and support for caregivers



Room for the political empowerment of women



Collaborations with NGOs to implement initiatives



### Case study: Trans-boundary cooperation in forest conservation

As one of the few countries in Asia that still retains much of its biodiversity, Brunei's Vision 2035 emphasizes its ongoing efforts for the conservation of the country's remarkable biodiversity, rainforests, and natural habitats. Trans-boundary cooperation is crucial in creating a network of productive forests.

The country's sustainable management of forestry is evident from its participation in a joint initiative known as the Heart of Borneo (HoB).<sup>36</sup> Spanning 220,000 sq km on the Southern Asian Island of Borneo, HoB is a uniquely government-led and NGO-supported program initiative by the governments of Brunei, Indonesia, and Malaysia to implement a conservation plan for the region's tropical rainforest and unique wildlife. The HoB is one of the largest transboundary rainforests in the world and provides ecological services

to over 11 million Borneans. To date, the region remains the source of 14 out of 20 major rivers and is thereby considered one of the most notable centers of biological diversity worldwide.

Central to the success of HoB is the transboundary collaboration of governments, engagement of local stakeholders in short and long-term planning, along with the cooperation of the private sector to ensure long-term finance. The HoB initiative is also working closely with forest dependent communities to develop green economic opportunities, which is again testament to the calibrated approach that the government adopts.<sup>37</sup> The careful deliberation and integration of both local and regional strategies is one that demonstrates Brunei's commitment to sustainable resource management.

# Endnotes

- 1 Forbes, [Best Countries for Businesses 2018](#), accessed July 20, 2022.
- 2 The Government of Brunei Darussalam, [THE 5TH NATIONAL REPORT TO THE CONVENTION ON BIOLOGICAL DIVERSITY](#), n.d.
- 3 Channel NewsAsia, [Renewables to make up 30per cent of Brunei's power generation by 2035 -minister](#), October 25, 2021.
- 4 Paultan.org, [Brunei launching two-year EV pilot project this week](#), March 22, 2021.
- 5 Oxford Business Group, [Brunei Darussalam prioritises renewable energy to confront climate change](#), accessed July 20, 2022.
- 6 Channel NewsAsia, [Renewables to make up 30per cent of Brunei's power generation by 2035 -minister](#), October 25, 2021.
- 7 Brunei Darussalam National Council on Climate Change, [10 Key Strategies to shape Brunei Darussalam to a Low-Carbon and Climate-Resilient](#), accessed July 20, 2022.
- 8 Paultan.org, [Brunei launching two-year EV pilot project this week](#), March 22, 2021.
- 9 ASEAN Climate Change and Energy Project, [Workshop on Carbon Pricing Policies for Brunei Darussalam](#), accessed July 20, 2022.
- 10 Convention on Biological Diversity, [Brunei Darussalam - Main Details](#), accessed July 20, 2022.
- 11 Environmental Performance Index, [Biodiversity Habitat Index](#), accessed July 20, 2022.
- 12 The Government of Brunei Darussalam, [THE 5TH NATIONAL REPORT TO THE CONVENTION ON BIOLOGICAL DIVERSITY](#), n.d.
- 13 Azaraimy HH, [Crown Prince launches Brunei Tropical Biodiversity Centre](#), accessed July 20, 2022.
- 14 Borneo Bulletin, [Marine conservation to the fore](#), accessed July 20, 2022.
- 15 Index Mundi, Brunei - [Marine protected areas \(% of territorial waters\)](#), accessed July 20, 2022.
- 16 United Nations High-Level Political Forum on Sustainable Development, [Brunei Darussalam](#), accessed July 20, 2022.
- 17 United Nations, Department of Economic and Social Affairs, [Brunei Darussalam](#), accessed July 20, 2022.
- 18 Environmental Performance Index, [Brunei Darussalam](#), accessed July 20, 2022.
- 19 WSO, [Brunei-Muara DMA Implementation](#), accessed July 20, 2022.
- 20 Darussalam Assets, [Unified Smart Metering System launched](#), February 29, 2020.
- 21 Stormwater, [Brunei deploying rugged smart flood detection](#), January 11, 2022.
- 22 Ibid.
- 23 S. Shams, R. H. M. Juani, Z. Guo, Integrated and sustainable solid waste management for Brunei Darussalam, 2014
- 24 Ibid.
- 25 Borneo Bulletin, [No time to waste](#), February 8, 2021.
- 26 [Country Analysis Paper, Brunei Darussalam](#), 2013
- 27 Anurodh Sacheva, [Extended Producer Responsibility: Lessons for Realizing and Implementing a Circular Economy for Plastics in Asia](#), 2022
- 28 United Nations Environment Programme, Regional Study on Mercury: Waste Management in the ASEAN Countries, 2017
- 29 Department of Environment, Parks and Recreation, [Status Of Hazardous Waste Management In Brunei Darussalam](#), accessed July 20, 2022.
- 30 Energy Smart Communities Initiative, [Brunei Energy Report Whitepaper](#), accessed July 20, 2022.
- 31 Centre for International Law, National University of Singapore, [Brunei Darussalam](#), accessed July 20, 2022.
- 32 World Economic Forum, [Global Gender Gap Report 2021 Insight Report](#), March 2021
- 33 Convention on the Elimination of All Forms of Discrimination against Women, [List of issues and questions in relation to the combined initial and second periodic reports of Brunei Darussalam](#), June 12, 2014, p. 2.
- 34 Ibid, p. 16.
- 35 Brudirect, [98-Day Maternity Leave Proposed](#), October 6, 2019.
- 36 World Wildlife Fund for Nature Inc., [Heart of Borneo](#), accessed July 20, 2022.
- 37 Asian Development Bank, [Protecting the Heart of Borneo through Sustainable Business Practices](#), June 5, 2013

# Cambodia

# Cambodia

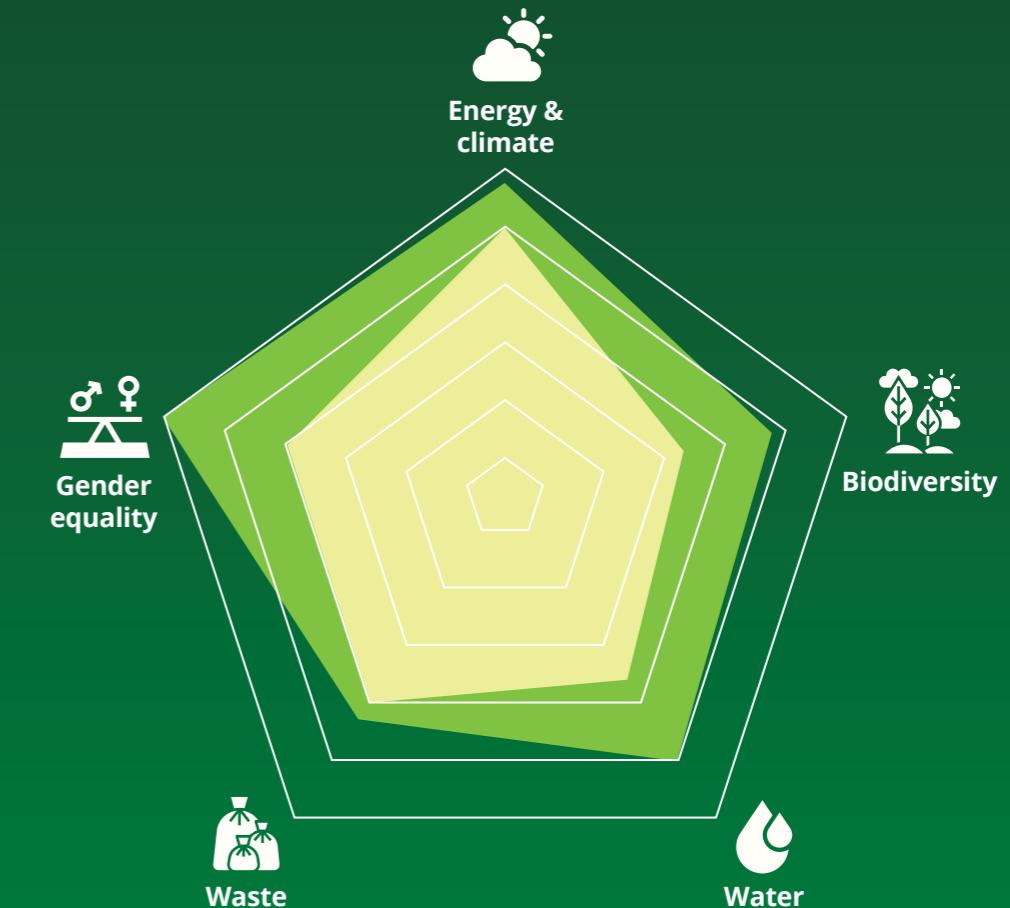
In recent years, Cambodia has had one of the fastest-growing economies in the world, maintaining an average annual growth of 7.7 percent, as reported by the World Bank. In 2015, the country attained lower-middle-income status, planning to reach the upper-middle-income mark by 2030.<sup>1</sup> Cambodia has had successful efforts in sustainability policies, particularly in energy and gender equality. Within ASEAN, Cambodia was the first country to present a carbon-neutrality strategy with a 2050 target.<sup>2</sup> The Environmental Performance Index ranked the country 45th out of 180 on greenhouse gas (GHG) emissions<sup>3</sup>, showing significant progress in reducing the climate impact of its economic growth. In addition, the 2022 Global Gender Gap Report rated Cambodia's gender parity in Educational Attainment and Health & Survival at 0.966 and 0.978, with the score of 1.00 indicating a parity.<sup>4</sup>

Nevertheless, these achievements have come with a set of challenges in biodiversity preservation, air pollution, sanitation, drinking water access, and

women's empowerment. The 2022 EPI ranking for sanitation and drinking water stands at 118th position, while for wastewater treatment it is even lower, at 134th, out of 180 countries.<sup>5</sup> As women only hold 20.80 percent in parliament and 9.38 percent in ministerial positions,<sup>6</sup> serious challenges remain in the political empowerment sphere.

Cambodia's National Determined Contribution (NDC) commitment pledged a 41.7 percent reduction in GHG emissions below business as usual by 2030.<sup>7</sup> To this end, the state has prioritized renewable energy sources, effective monitoring systems, and adaptation strategies. Cambodia's Long-Term Strategy for Carbon Neutrality (LTS4CN) outlined a plan for the diversification of household and community energy generation sources, intending to reach 35 percent renewable energy in the generation mix by 2050.<sup>8</sup> The success of these policies is predicated on both domestic and international investments, offering a unique opportunity for partnerships involving resource mobilization.

Current progress:   
Targets and commitments: 



## Highlights



Reached middle-income status in 2015, aims to reach upper middle-income status by 2030



First country to present a carbon-neutrality strategy with a 2050 target



Gender gap almost closed, room to increase women's representation in the political sphere



## Energy & Climate

Within ASEAN, Cambodia was the first country to present a carbon-neutrality strategy with a 2050 target. Cambodia's updated NDC commitment pledges a 42 percent reduction in greenhouse gas (GHG) emissions below BAU by 2030.<sup>9</sup> To achieve this target in the next decade, the nation has turned towards renewable energy sources, effective monitoring systems, and adaptation strategies.

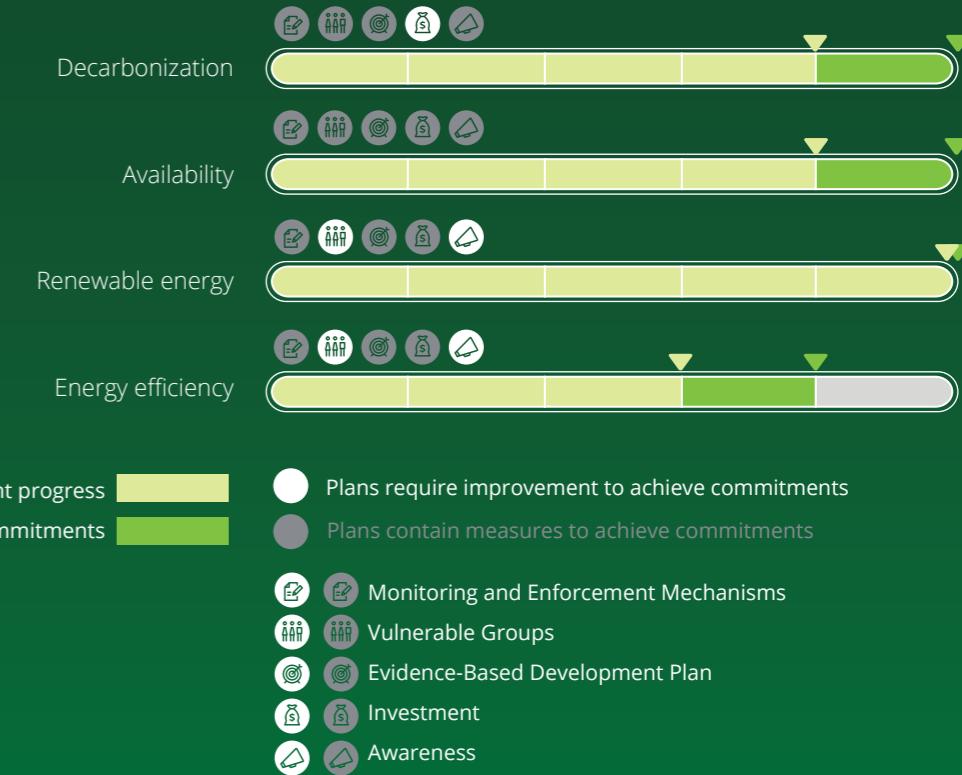
Cambodia's NDC/LTS4CN outlined a plan for the diversification of household and community energy generation sources, with a clear objective of reaching 35 percent of renewable energy in the energy mix by 2050. As part of the green transition strategy, new coal-fired power plants will not be allowed, except those already in operation and/or approved in 2019 and no new dams will be built along the Mekong River. To reduce emissions, Cambodia has prioritized the development of a comprehensive and integrated Monitoring, Reporting, and Verification (MRV) system.

The success of these plans also depends on Cambodia's ability to reduce historical emissions from deforestation by 50 percent.<sup>10</sup> Cambodia is relying on increased afforestation and reforestation to create a significant carbon sink making room for other sectors as they transition towards carbon neutrality. Additionally, Cambodia is increasing its participation in the carbon trading market. In August 2021, an additional 43 sites were identified as carbon credits sources.<sup>11</sup> Between 2016 and 2022, Cambodia has earned approximately US\$12 million from selling carbon credits to international companies.<sup>12</sup>

The implementation of these strategies will require investments and cooperation from both national and international entities, offering a unique opportunity for a partnership involving resource mobilization. Some of the ongoing investments in technological capacity in the first stages of implementation include developing urban planning tools for climate change mitigation to reduce GHG emissions from earth construction, piloting maintenance and emission inspections of vehicles, and improving the sustainability of charcoal production through enforcement of regulations.<sup>13</sup>

Similarly, plans aimed at building resilience have been steadily gaining traction in policy and decision-making. Through a combination of climate risk analysis, improved surveillance, and early-warning systems, Cambodia intends to predict and prepare for climate change-related risks. Furthermore, new disaster resilient construction standards have been introduced and land-use planning now considers climate risk factors.<sup>14</sup>

**"**The success of decarbonization plans depends on Cambodia's ability to reduce historical emissions from deforestation by 50 percent. **"**



Current progress Targets and commitments

- Plans require improvement to achieve commitments
- Plans contain measures to achieve commitments
- Monitoring and Enforcement Mechanisms
- Vulnerable Groups
- Evidence-Based Development Plan
- Investment
- Awareness

## Highlights

### CO<sub>2</sub>



First country in ASEAN to commit to a net-zero target by 2050

Pledges a 41.7 percent reduction in greenhouse gas (GHG) emission below BAU by 2030



Targets 35 percent renewable energy in the energy mix by 2050

## Opportunities



Government commits to connect at least 70 percent of households to the national electricity grid



Expanding involvement in the carbon credit trading market



Increasing the capacity of renewable energy sources in the grid, particularly wind and solar



## Biodiversity

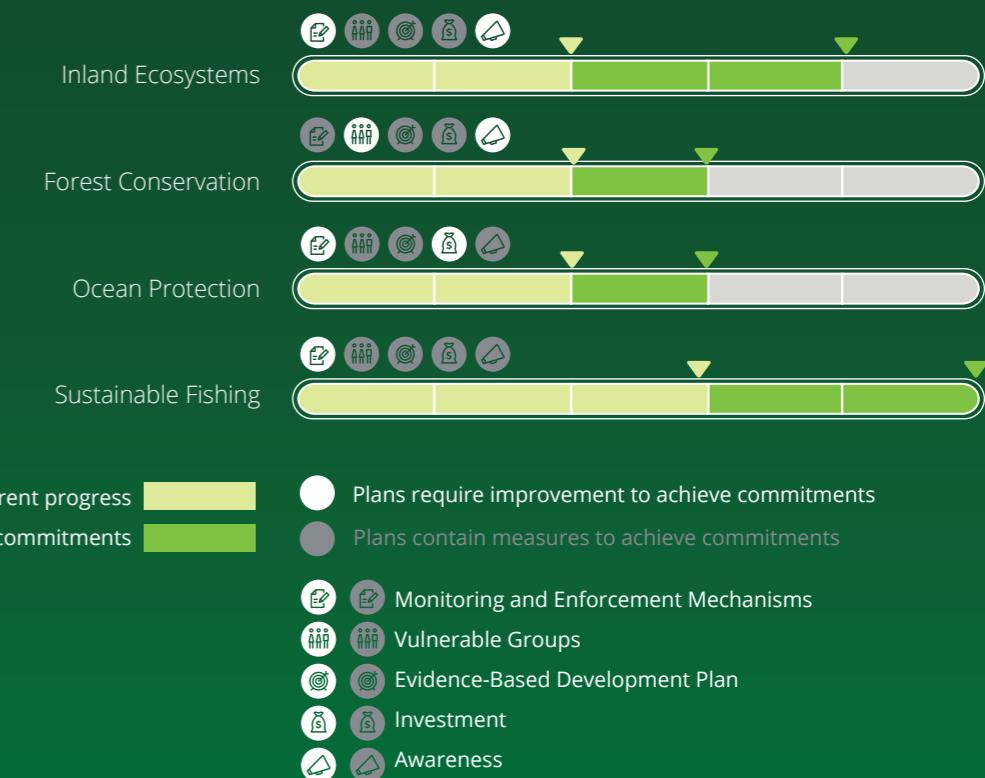
Cambodia is recognized by Fauna and Flora International as one of the most biodiverse countries in Southeast Asia.<sup>15</sup> To protect the numerous species of flora and fauna, the state has developed a series of initiatives for marine and terrestrial conservation. However, the effectiveness of future-orientated plans could be threatened by Cambodia's limited resources.

According to the World Bank, Cambodia's terrestrial protected areas in 2021 were about 39.74 percent of the country's land area, a significant increase from 26.03 percent in 2016.<sup>16</sup> Nevertheless, the absence of a standardized land and biome classification system made it possible for development projects to continue on cultivable land and natural habitats. Limited knowledge of flora and fauna continues to undermine the integration of conservation into land-use planning. The 2022 United Nations Sustainable Development Report showed a decrease in the Red List Index of species survival.<sup>17</sup> This supports the notion that existing efforts have not been as effective as they should be in protecting major species from anthropogenic threats. Focusing resources on increasing its scientific knowledge could help Cambodia ensure that its plans align with desired outcomes.

**"** Cambodia is one of the most biodiverse countries in Southeast Asia. **"**

Cambodia has crafted comprehensive plans to ensure the sustainable management of the ocean ecosystem. By monitoring and gathering information on coastal and marine resources, the country's management approaches are intended to control for the identified direct and indirect factors that negatively impact the marine ecosystem. In 2016, Cambodia's Ministry of Agriculture, Forestry and Fisheries approved the nation's first-ever marine protected area in the Koh Rong Archipelago. However, the marine protected area coverage in 2021 remains only at 1.44 percent.<sup>18</sup>

To support sustainable fishing, the government has taken considerable action toward biodiversity conservation, as highlighted in Cambodia's Fifth National Report to the Convention on Biological Diversity. Since adopting the 2002 National Biodiversity Strategy and Action Plan, the fishing lot system has been canceled to pave the way for community-based fishery management. Sustainable fisheries were further promoted through a range of projects including the Tonle Sap Environmental Management Project and the Tonle Sap Sustainable Livelihoods Project. Nonetheless, the effects of such initiatives are unclear: a study of Tonle Sap Lake published in 2018 highlighted how unusual seasonal changes and Cambodia's growing population resulted in decreasing fish stock. Other direct and indirect factors, such as the construction of dams and destructive, often illegal fishing practices, threaten Cambodia's natural resources.<sup>19</sup>



## Highlights



Terrestrial protected areas make up around 39.7 percent of Cambodia's land area



First marine protected area was approved in 2016, but coverage remains at 1.44 percent



Lack of standardized land and biome classification system results in development projects continuing on cultivable land and natural habitats

## Opportunities



Opportunities to improve effectiveness of community fisheries on sustainable fishing and maintaining natural resources



Increase flora and fauna data collection and improve skills of taxonomists



Formalize standardized land classification system to protect endangered natural habitats



Cambodia is among many developing countries faced with the challenge of achieving clean water supply and sanitation. Only 26 percent of the country had access to a safely managed water supply in 2017. As of 2020, approximately 50 percent of people who have access to piped water services get clean water from Private Water Operators through small-scale piped water supply systems. By 2025, the government of Cambodia has a very ambitious goal to ensure every Cambodian has access to clean water.<sup>20</sup>

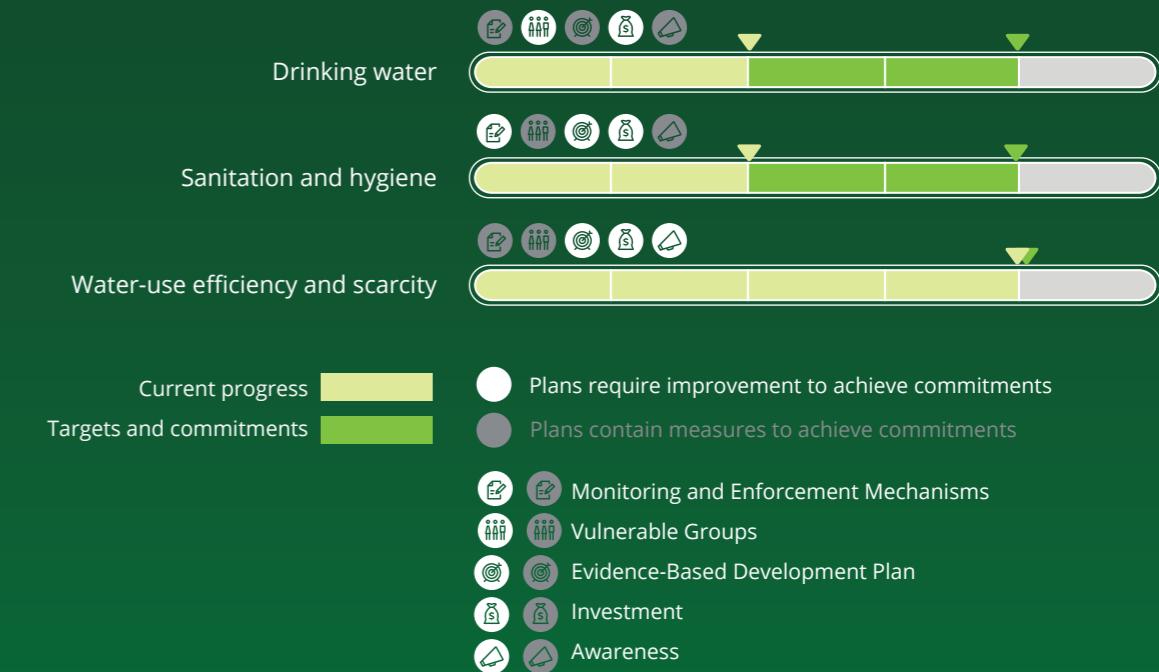
To achieve access to safe drinking water for its population, Cambodia partnered with the World Bank and Stone Family Foundation to implement a technical assistance program called Cambodia Improving Rural Water and Sanitation Services (CIRWSS) program. From 2016 to 2020, the goal of this partnership was to provide clean water to all 12 million rural residents by 2025. The partnerships aided in the enhancement of the nation's institutional capacity to deliver water supply and sanitation services and boosted the capacity of private-owned water operators.

Further investments have been made to improve Cambodia's water and sanitation. In 2019, the Ministry of Water Resources and Meteorology announced that they were planning to establish a water data center to facilitate water management from Cambodia's five river basins and 39 sub-river basins. This data center is a part of the national investment program on water resource management and irrigation system with a timeline from 2019 to 2033.<sup>21</sup>

In the absence of a sewerage master plan and comprehensive wastewater strategy, one of Cambodia's main obstacles remains the management of wastewater. Due to the limited number of treatment facilities, it is common practice to discharge untreated and low-quality treated wastewater. Although the government has passed legislation limiting such discharges, prompting entities to treat the wastewater onsite instead, it remains unclear whether the law is enforced. Large investments in this sector are necessary to develop an efficient and well-connected wastewater treatment system.

The 2022 EPI rankings reflect the long journey Cambodia must undergo to improve its water sector and fulfill its objectives. The combined rank for sanitation and drinking water stands at 118th out of 180, while for wastewater treatment it is even lower, at the 141st position.<sup>22</sup> Given the infrastructural necessities and financial investments required to improve the sector, Cambodia should look towards further partnerships with local and international entities to achieve its objectives.

**"**The combined rank for sanitation and drinking water stands at 118th out of 180, while for wastewater treatment it is even lower, at the 141st position. **"**



## Highlights



Only 26 percent of the country had access to a safely managed water supply in 2017



Targets to ensure every Cambodian has access to clean water by 2025



Aims to provide sanitation access to 91 percent of the rural population

## Opportunities



Plans to develop water data center to improve water management



Investments needed to improve wastewater treatment and sanitation



Opportunities to partner with relevant stakeholders to provide training to reduce illegal discharge of wastewater



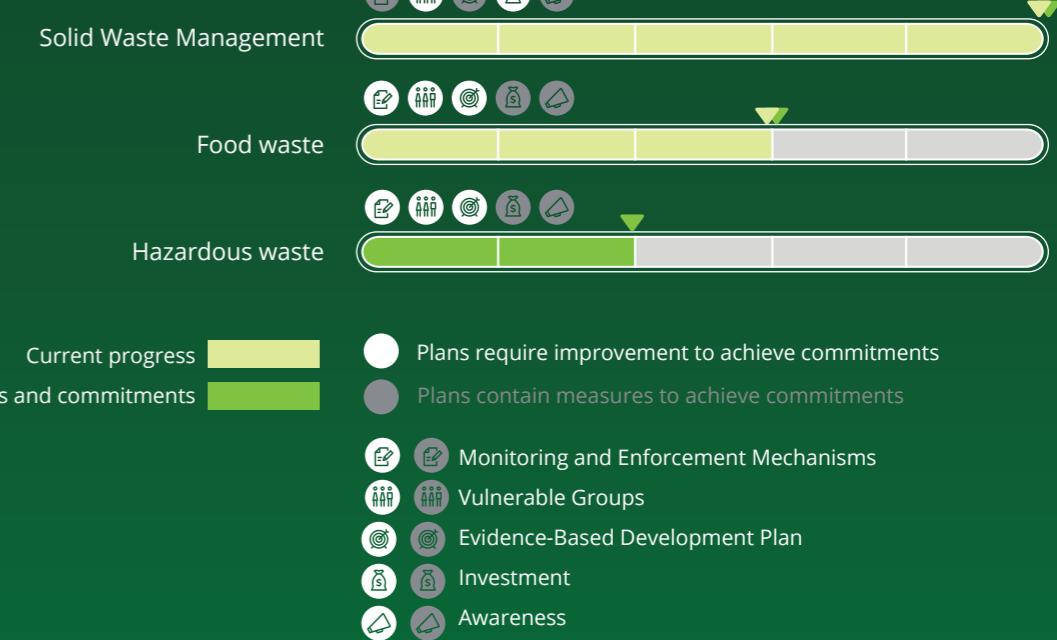
Cambodia is facing challenges in waste management amidst its growing population and increasing consumption levels. Whereas initiatives have been designed to improve the accessibility and effectiveness of waste management, there are several main obstacles Cambodia needs to overcome to achieve its NDC Waste commitments.

Since the decentralization of waste management in 1999, local authorities have been tasked with the administration of waste collection and treatment. In major cities, private companies have taken the lead in offering these services. However, in some towns, local authorities struggle to fulfill their responsibilities, sometimes to the extent that no waste management services are offered at all. Even in Phnom Penh, Cambodia's capital city, waste management demands are not fully met. In 2019, 35.7 percent of urban poor communities in Phnom Penh did not have access to waste management services.<sup>23</sup> A lack of financial resources and land availability to invest in appropriate landfill sites are partial reasons for these statistics. Moreover, given the lack of waste management systems, many households and local businesses turn to burn rubbish or disposing of it in public spaces, waterways, and vacant areas.

To improve Cambodia's approach to waste management, the NDC/LTS4CN commits to building new sanitary landfills with landfill gas extraction at the Dangkor Landfill.<sup>24</sup> Cambodia has also started to focus on composting with a commitment to initiate composting of biodegradable organic fraction of Municipal Solid Waste (MSW).<sup>25</sup> An aspect of composting includes deriving fuel from new MSW and old MSW mined from landfills, which can be sold to relevant industries. These initiatives offer the potential for private sector engagement in the financing, constructing, and operating, both landfills and composting facilities. For example, the Institute for Global Environmental Strategies (IGES) partnered with UNEP to help Cambodia advance toward an efficient waste management strategy for Phnom Penh through a strategy and action plan spanning from 2018 to 2035.<sup>26</sup>

The NDC further showcases Cambodia's plans to develop a circular economy through the implementation of a national 3R (Reduce, Reuse, Recycle) strategy. Specifically, the state wishes to establish a centralized recycling facility for industrial waste from the garment sector.

**"** In 2019, 35.7 percent of urban poor communities in Phnom Penh did not have access to waste management services. **"**



## Highlights



Plans to build new sanitary landfill with landfill gas (LFG) extraction at Dangkor Landfill



Targets to compost biodegradable organic parts of MSW



Lack of plastic recycling facilities within Cambodia, usually exported outside country

## Opportunities



Intends to produce Refuse Derived Fuel from old MSW or newly produced MSW



Using compost to turn waste into animal feed, fertilizer, or other useful products



Opportunities for partnerships with logistics sector to support waste management



## Gender Equality

With a long-term goal of achieving gender equality, Cambodia has been making good progress toward women's empowerment. Cambodia's performance in the 2022 Global Gender Gap Report showed that the state's initiatives have been particularly successful at achieving gender parity in Educational Attainment and Health & Survival, with scores of 0.966 and 0.978, with a score of 1.00 indicating a parity.<sup>29</sup> Economic Participation and Opportunity stands at a moderate score of 0.710, with only 30.99 percent of women in senior positions. In political empowerment, women hold only 20.80 percent in parliament positions and 9.38 percent in ministerial positions.

Its Five-year Strategic Plan for Gender Equality and Women's Empowerment 2014-2018, put out by Cambodia's Ministry of Women's Affairs (MOWA), aimed to strengthen Cambodia's institutional capacity to promote gender equality.<sup>37</sup> Some examples of goals include improving the laws and policies in the educational sector, enabling girls to have better access to education and training, and increasing positive social attitudes on women's participation. Similarly, women's economic participation has been promoted through the establishment of Women's Development Centres (WDC) in 13 provinces, which have been central in delivering business development services to women. Nevertheless, women's limited access to business-related services and resources result in their contributions being concentrated in less productive sectors. Future initiatives could focus on providing access to resources that equip women with the necessary skills to enter these under-represented sectors.<sup>30</sup>

To protect and prevent women from experiencing all forms of violence, the "Minimum Standards for Essential Services for Women and Girl Survivors of Gender-Based Violence" was drafted in 2017. Multiple legal and policy frameworks have been implemented that focus on a victim-centered approach. These include training for law enforcement and local government officials, as well as legal aid.

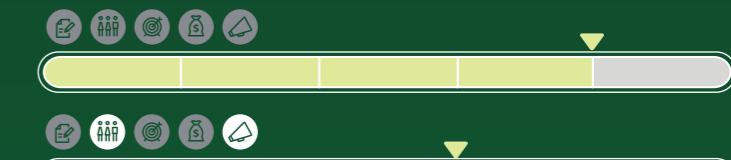
The five-year plan was followed by the Master Plan on Gender and Climate Change (MPGCC) 2018-2030, which is another strategic outline prepared by the Gender of Climate Change Committee of Ministry of Women's Affairs (MOWA).<sup>28</sup> The goal of the Master Plan is to internalize gender mainstreaming as a significant part of Climate Change adaption and mitigation.

**“** Cambodia has been making good progress toward women's empowerment. The nation has been focused on increasing opportunities at all levels, by providing vocational skills for women based on market demand and ensuring equal access to education. **”**

Ending all forms of discrimination, violence and harmful practices

Equal Opportunities and Empowerment

Current progress



Plans require improvement to achieve commitments

Plans contain measures to achieve commitments

Monitoring and Enforcement Mechanisms

Vulnerable Groups

Evidence-Based Development Plan

Investment

Awareness

## Highlights



Achieved close to gender parity in educational attainment and health



Aims to ensure safety for women in families by raising awareness and enforcing relevant regulations



Five-year Master Plan to internalize gender mainstreaming in climate change adaption and mitigation

## Opportunities



Incentivizing and supporting female entrepreneurial businesses and activities



Increasing women's representation in senior leadership in business and politics



Improving opportunities for women in adapting to the digital economy and the 4th Industrial Revolution



### Case study: Success of community fisheries in Cambodia

Fisheries are not only an integral part of Cambodian livelihoods, they are also a major contributor to the country's food security and national economy. In fact, fish consumption accounts for more than 75 percent of the animal protein intake in people's diets. At least six million people in Cambodia are involved in fishing-related activities, and the industry provides more than 1.5 million full-time jobs.<sup>31</sup>

Community fisheries in Cambodia demonstrate how both local livelihoods and natural resources can mutually benefit from collaborative management methods. Tonle Sap Lake is known as Cambodia's geographic and cultural heart. As a great inland fishing resource, the lake previously operated via privately owned and managed sections of the lake which were referred to as "fishing lots". Although the fishermen were only allowed to use the fishing lots during fishing season, the system created a lot of conflict between local fishermen. The biodiversity of the lake was also threatened by various factors such as overfishing, logging, and dam construction.<sup>32</sup>

In 2012, extensive reforms to Cambodia's fisheries resulted in the cancellation of all commercial fishing lots on Tonle Sap Lake. Wealthier locals were still more represented in management policies. Nonetheless, new opportunities arose for establishing community fisheries. By allowing community-based development within the fisheries sector, the Cambodian government was able to empower local communities to participate directly, actively, and equitably in plans, programs, and management of community fisheries.

From 2013 to 2016, the Fisheries Action Coalition Team (FACT) and the International Union for the Conservation of Nature (IUCN) introduced a project to support three target sites on the Tonle Sap Lake.<sup>33</sup> The primary focus of the project was to protect and restore fish stocks and their breeding grounds which were both successful. With strong government support and community patrolling, the area was effectively protected from external threats. Effective collaboration and communication between community groups and local government officials were able to not only restore fish stock but also increase income in local fishing communities.

# Endnotes

- 1 The World Bank, '[Overview: The World Bank In Cambodia](#)', last updated on March 29, 2022
- 2 The National Council for Sustainable Development, '[Cambodia Commits to Achieving Carbon Neutrality by 2050](#)', January 18, 2022
- 3 Environmental Performance Index, '[Cambodia EPI Results 2022](#)', accessed on July 27, 2022
- 4 World Economic Forum, [Global Gender Gap Report 2022](#), July 2022, p.124
- 5 Environmental Performance Index, '[Cambodia EPI Results 2022](#)'
- 6 World Economic Forum, [Global Gender Gap Report 2022](#)
- 7 The National Council for Sustainable Development, '[Cambodia's NDC under the UNFCCC](#)', accessed on July 27, 2022
- 8 The National Council for Sustainable Development, '[About Long-Term Strategy for Carbon Neutrality](#)' accessed on July 27, 2022
- 9 United Nations Framework Convention on Climate Change, [Kingdom of Cambodia Nation-Religion-King Long-Term Strategy for Carbo Neutrality](#), December 2021, p. 6
- 10 Climate and Forests UNDP, '[Financing forest-sector climate solutions through carbon markets: The case of Cambodia](#)', accessed on July 27, 2022
- 11 Open Development Cambodia, '[On the right track to generating carbon credits](#)', August 23, 2021
- 12 Climate and Forests UNDP, '[Financing forest-sector climate solutions through carbon markets: The case of Cambodia](#)'
- 13 National Council for Sustainable Development, [Cambodia's Nationally Determined Contribution \(NDC\) Update](#), September 28, 2020, p. 23
- 14 National Council for Sustainable Development, [Cambodia's Nationally Determined Contribution \(NDC\) Update](#)
- 15 Fauna & Flora International, '[Cambodia](#)', accessed on July 27, 2022
- 16 Index Mundi, '[Cambodia – Terrestrial Protected Areas](#)', accessed on July 27, 2022
- 17 Cambridge University Press, [Sustainable Development Report 2022](#), June 2022, p. 142
- 18 Trading Economics, '[Cambodia - Marine Protected Areas \(% Of Total Surface Area\)](#)', accessed on July 27, 2022
- 19 National Center for Biotechnology Information, '[Evidence of indiscriminate fishing effects in one of the world's largest inland fisheries](#)', June 12, 2018
- 20 The World Bank, '[Partnering for Impact – Strengthening Institutions to Bring Water and Sanitation Services to Cambodia's Rural Areas](#)', July 22, 2020
- 21 Ministry of Information, '[Cambodia To Create Water Data Center](#)', February 14, 2019
- 22 Environmental Performance Index, '[Cambodia EPI Results 2022](#)'
- 23 Sahmakum Teang Tnaut, [Urban Governance: Waste Management in Phnom Penh, January 2019](#), p.1
- 24 National Council for Sustainable Development, '[New sanitary landfills with LFG extraction and LFG extraction at the Dangkor Landfill](#)', accessed on July 27, 2022
- 25 Institute for Global Environmental Strategies, '[Good practices of the 3Rs for organic waste management in Thailand, Laos and Cambodia](#)', accessed on July 27, 2022
- 26 UN Environment Programme International Environmental Technology Centre, '[Phnom Penh Waste Management Strategy and Action Plan \(2018-2035\)](#)', accessed on July 27, 2022
- 27 Ministry of Women's Affairs, [Five Year Strategic Plan for Strengthening Gender Mainstreaming and Women's Empowerment](#), June 24, 2020
- 28 Ministry of Women's Affairs, [Master Plan on Gender and Climate Change 2018-2030](#), February 2018
- 29 World Economic Forum, [Global Gender Gap Report 2022](#)
- 30 World Economic Forum, [Global Gender Gap Report 2022](#)
- 31 Fisheries Administration, '[The Goals, The Strategy](#)', accessed on July 27, 2022
- 32 Fishbio, '[How do Fishers Feel About the Shift to Community Fisheries in Tonle Sap Lake?](#)', June 29, 2020
- 33 International Union for Conservation of Nature, '[Healthy fish stock after six months of an innovative Fish Conservation Area management project ended](#)', July 18, 2017

# Indonesia



# Indonesia

Indonesia has sustained impressive economic growth since the late 1990s, paving the way to become the largest economy in Southeast Asia today. The COVID-19 pandemic has however hindered this expansion, lowering the nation to lower-middle income status as of July 2021. Economic recession coupled with continued urbanization has considerably aggravated existing environmental issues. To address evolving complexities hindering the nation's sustainable development, Indonesia developed a strategic plan composed of one main twenty-year development plan, spanning from 2005 to 2025. The long-term plan is in turn segmented into five medium term plans, the latest running from 2020 to 2024.<sup>1</sup>

These initiatives have prioritized the development of the waste management and sanitation sector, which together comprise the main risks to the country's biodiversity and population. Limited infrastructure for the disposal of both solid and liquid waste has led to the significant amounts of contaminated land and water masses. Consequently, the pollution has caused the spread of waterborne diseases and resulted in Indonesia becoming the second highest contributor to ocean litter. Investments are needed to develop sufficient waste collection and processing facilities.

Indonesia's National Electricity Plan has set objectives for the implementation of renewable energy sources. However, the COVID-19 recovery strategy has overlooked alternative energy sources, with the prioritization of 27GW of coal-fired electricity by 2028.<sup>2</sup> In doing so, Indonesia remains one of only five nations worldwide to start new coal plant construction in this decade. During the recent 26th United Nations Conference of Parties on climate change or COP26, Indonesia announced that it

could phase out coal-fired power plants by 2040, if it receives sufficient financial help from the international community.<sup>3</sup> This announcement is crucial towards securing a net-zero future for Indonesia and globally.

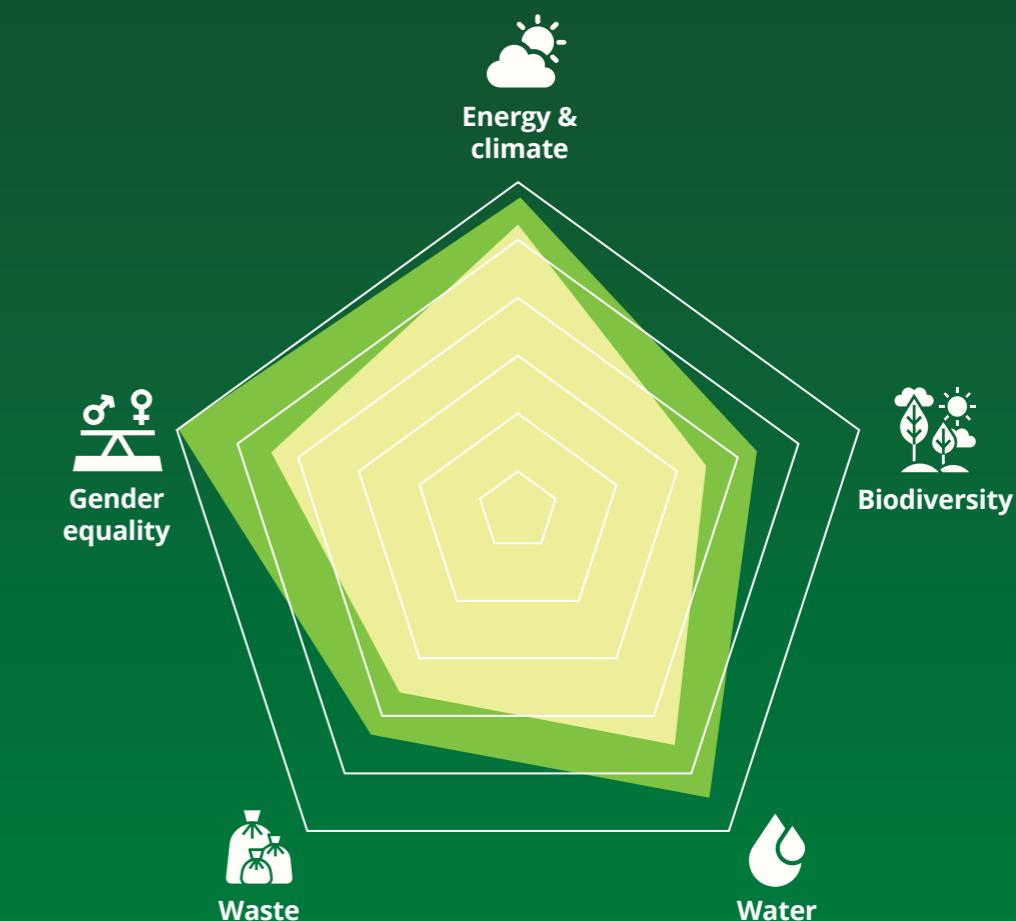
There has been growing demand for better information on natural resources in Indonesia over the last 10 years. The Indonesian government has incorporated natural capital into national accounts to offer detailed statistics for improved natural resources management and the Ministry of Finance has begun to link accounts and make policies to manage the country's natural capital. The Indonesia Natural Resources Fiscal Potential Report, which will discuss physical and monetary values, is expected to be completed in 2025. To advance Indonesia's management of natural capitals, the Wealth Accounting and the Valuation of Ecosystem Services (WAVES) program in Indonesia has also been established to work with sector ministries and the national statistical agency to develop natural capital accounts. WAVES also strengthens the capacity of key planning, financing and sector agencies to use accounts to analyze the impact policies have on natural capital. This will be increasingly important as awareness of investing in natural capital rises among industries and governments.<sup>4</sup>

Partnerships and foreign investments remain a fundamental component for Indonesia's success in sustainable development. The nation's current limitations should be viewed as areas for opportunity and investment by relevant external actors. These investments are undoubtedly necessary: the mounting costs of climate change cannot be ignored and will be devastating unless rapid action is taken now.

Current progress:



Targets and commitments:



## Highlights



Solar power is at the forefront of Indonesia's renewables strategy. Partnerships can accelerate the deployment of solar technology in Indonesia



Indonesia has pledged to end deforestation by 2030, and will need to work with credible partners to finance long-term reforestation projects



Water supply services, wastewater and waste management systems, are critical to the country's livability, with numerous projects for water supply and irrigation to be developed in the coming years



## Energy & Climate

Indonesia achieved the largest annual decrease in emissions of 12 percent from 2019-2020 since 1990. Nevertheless, Indonesia still faces immense challenges ahead in its carbon transition. In 2020, the country was the 10th largest greenhouse gas emitting country and the 19th largest emitter of carbon dioxide per capita.<sup>5</sup> The Climate Action Tracker rated Indonesia's energy efforts as highly insufficient, identifying the nation's current emissions trajectory as not consistent with curbing global warming to below 2°C.<sup>6</sup>

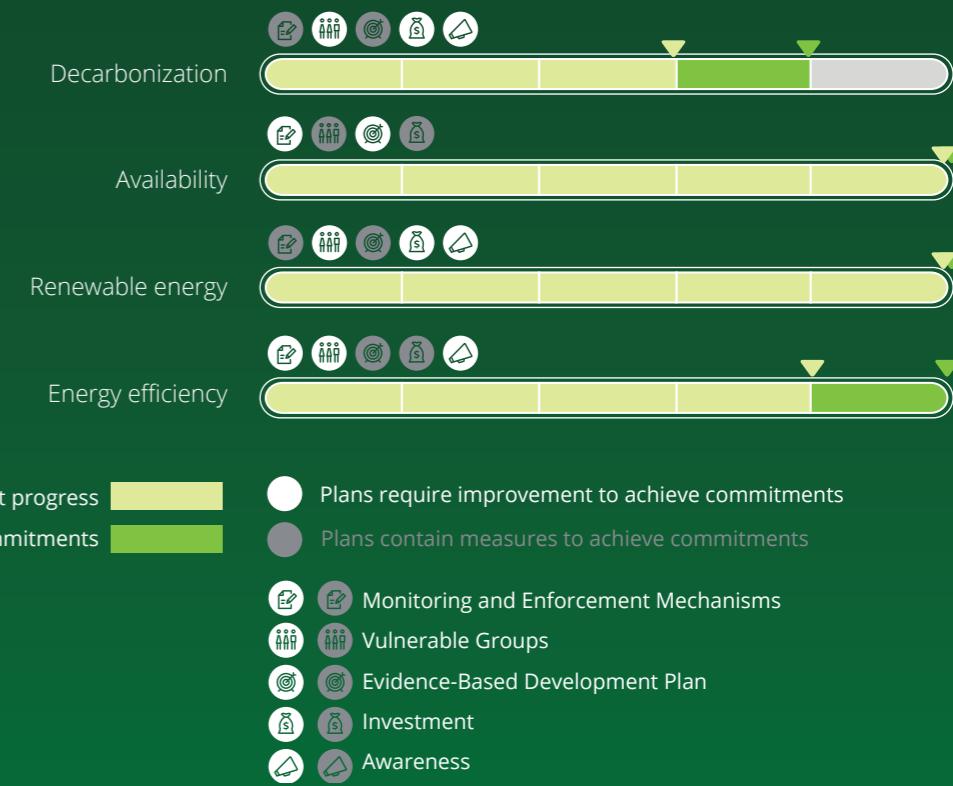
Indonesia's current initiatives to decarbonize focus on incentivizing the use of renewable energy and decreasing dependency on oil and liquefied petroleum gas (LPG). Indonesia announced during COP26 that it could phase out coal-fired power plants by 2040, if it receives sufficient financial help from the international community. The country's state-owned oil and gas company, Pertamina, is also currently exploring Carbon Capture and Storage (CCS) in the country, having signed a memorandum of understanding with ExxonMobil to study possible CCS projects in 2021.<sup>7</sup> Both these types of investments are crucial towards securing a net-zero future for Indonesia and globally.<sup>8</sup>

One area where Indonesia has made recognizable progress is in its efforts to promote renewable energy use. The 2019-2038 National Electricity Plan (RUKN) outlines milestones to increase renewable energy in the country's energy mix from its current level of 13 percent (eight percent from hydropower and five percent from geothermal energy),<sup>9</sup> to 23 and 28 percent in 2025 and 2038 respectively.<sup>10</sup> Indonesia had intended to further expand the geothermal energy sector, but due to a poor

investment climate and policy uncertainties, the sector has experienced setbacks making geothermal projects less viable.<sup>11</sup> Solar power, on the other hand, has shown enormous potential with a sevenfold increase in private rooftop solar panel users from 2018 to 2021. Compared to other regional nations, Indonesia's solar energy potential has remained untapped until recently, with the Indonesia Solar Energy Association predicting that the current solar capacity of 180MW could jump to nearly 5,000MW by 2025.<sup>12</sup> Importantly, Indonesian state-owned banks are providing financing schemes specifically for rooftop photovoltaic (PV) panels to reduce the upfront costs of installing solar panels.<sup>13</sup>

Additionally, Indonesia's rich nickel resources offer enormous potential for the country's renewable energy goals, due to nickel's use in lithium-ion batteries for electric vehicles. In 2021, Indonesia was the biggest nickel producer in the world, producing one million metric tons of nickel, according to the United States Geological Survey. While Indonesia could become a regional or global hub for lithium-ion battery and electric vehicle production, the nation must ensure that sustainable mining and manufacturing practices are prioritized when production accelerates.<sup>14</sup>

**“**Solar power has shown enormous potential with a sevenfold increase in private rooftop solar panel users from 2018 to 2021.**”**



## Highlights



The 2019-2038 National Electricity Plan outlines milestones to increase renewable energy in the country's energy mix to 23% and 28%, in 2025 and 2038 respectively



Indonesia achieved the largest annual decrease in emissions of 12 percent from 1990



The Climate Action Tracker deems Indonesia's efforts to be *highly insufficient*, as the nation's current trajectory is not consistent with holding warming to below 2°C

## Opportunities



The viability of geothermal projects can be restored through the development of funding schemes and establishment of relevant industry incentives



Investments in solar technologies coupled with grid modernization can accelerate renewable energy developments in Indonesia



Indonesia could become a regional or global hub for lithium-ion battery and electric vehicle production due to its large deposits of nickel



## Biodiversity

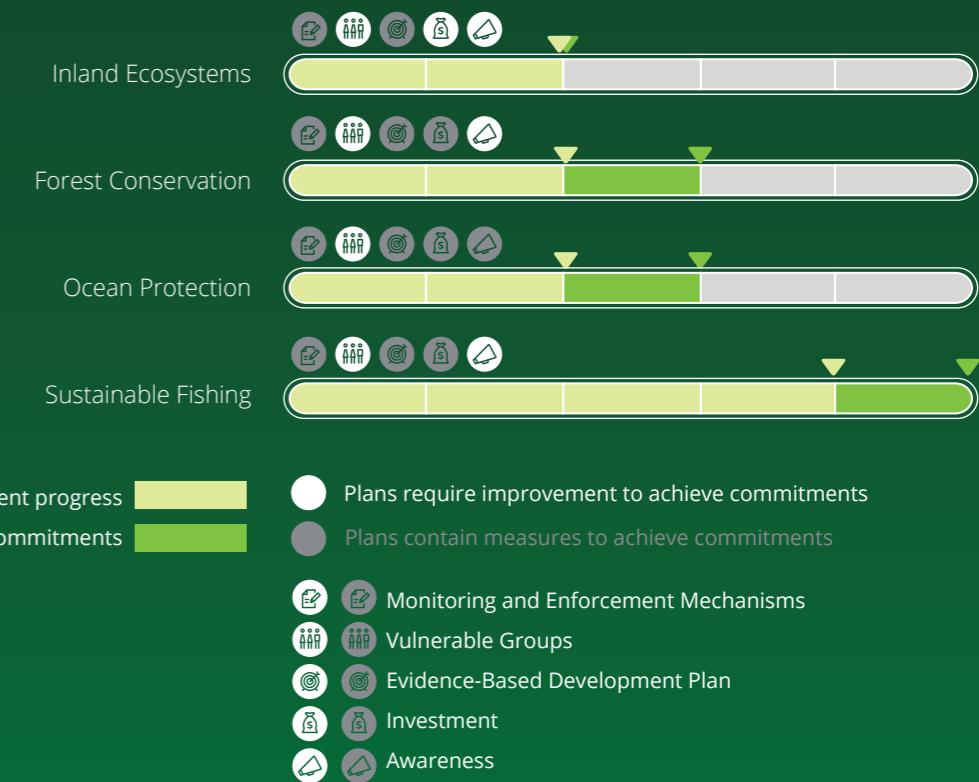
With more than 18,000 islands, the large Indonesian archipelago houses a marine-rich, biodiverse ecosystem. To better protect marine species, Indonesia has committed to reduce marine waste by 70 percent by 2025.<sup>15</sup>

Indonesia has kept its marine conservation efforts high on its biodiversity priorities, having committed to establishing 32.5 million hectares of protected marine areas by 2030. The Ministry of Marine Affairs and Fisheries has developed programs to expand the marine conservation areas of the nation and support sustainable fishing, including coral reef rehabilitation initiatives and banning of harmful fishing practices. As of 2021, 86.5 percent (26.1 million hectares) of the target has already been achieved.<sup>16</sup>

The conservation of threatened land-species is also of importance to Indonesia. In cooperation with NGOs, Indonesia has successfully implemented species rehabilitation programs, such as the conservation of Sumatran tiger through the Tiger Foundation as well as the Orangutan Foundation International.<sup>17</sup> But animals are not the only form of biodiversity in need of conservation. More than half of Indonesia's medicinal plant population will see the reduction of 80 percent of its current distribution area by 2050 due to climate change impacts. These plants, which accounted for an estimated US\$14.6 billion in 2013, will require the cooperation of policymakers, farmers, stakeholders and businesses to develop effective conservation initiatives.<sup>18</sup>

As the nation with the third largest tropical forest area globally, Indonesia can potentially generate revenue through reforestation and forest conservation as demand for high-quality nature-based carbon offsets grows. Estimated to hold around 20 percent of the world's potential for nature-based solutions, greater investment from large private companies will help drive long-term reforestation projects.<sup>20</sup> During COP26, Indonesia joined more than 100 other nations globally in agreeing to end deforestation by 2030.<sup>21</sup> This would be a significant achievement if the nation follows through with the non-binding pledge.

**“**More than half of Indonesia's medicinal plant population will see the reduction of 80 percent of its current distribution area by 2050 due to climate change impacts. **”**



## Highlights



To ensure survival of marine species and habitats, Indonesia is committed to reduce marine waste by 70 percent by 2025



The Biodiversity Strategy and Action Plan (2015-2020) supports cooperation between government and private sector



Indonesia joined more than 100 other nations globally in agreeing to end deforestation by 2030 during COP26

## Opportunities



Potential for Indonesia to generate revenue through reforestation and forest conservation by tapping on demand for nature-based carbon offsets



The government seeks to improve its waste management infrastructure, especially in coastal areas, to reduce marine pollution and damage to marine ecosystems



Scope for cross-sector collaboration to preserve Indonesia's medicinal plant population



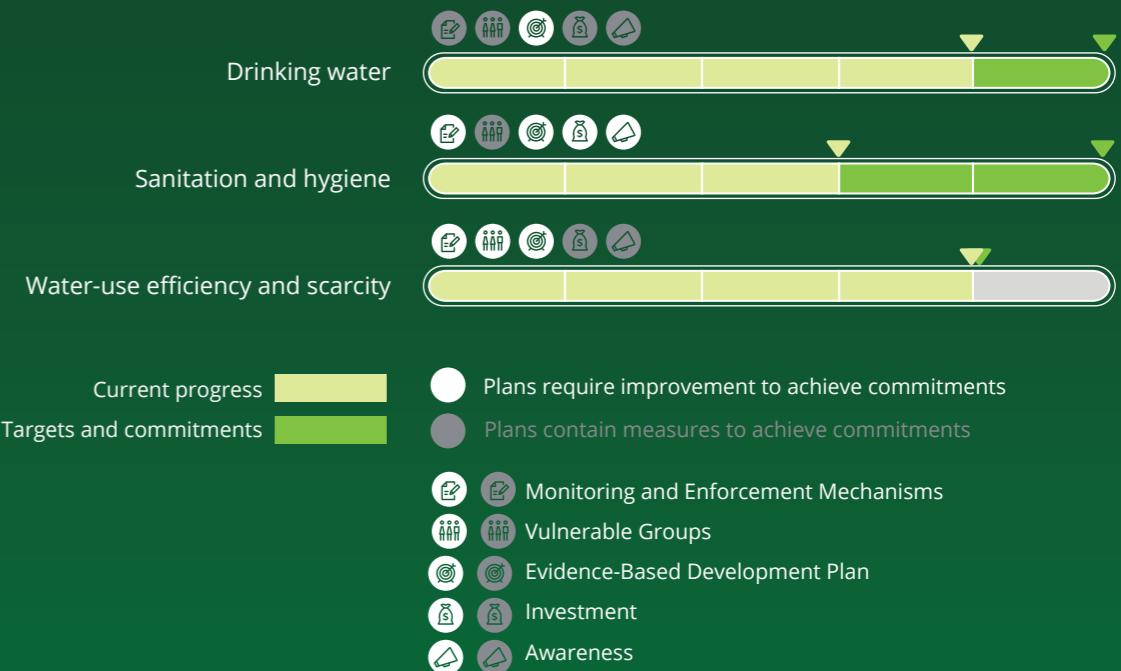
Indonesia targets to provide access to potable drinking water to all households by 2024, up from 87.8 percent of households in 2018, according to its National Medium-Term Development Plan (2020-2024). Currently, potable water is supplied by 391 local government-owned water utilities (PDAMs). However, in 2019, governing body BPPSPAM deemed only 60 percent to be performing well.<sup>22</sup> As the Indonesian government seeks to increase access to water and improve current infrastructure performance, there will be sizeable demand for investments and technical assistance to build up the water supply infrastructure. Loans and grant agreements are being sought for water supply and treatment projects, including seven new water supply and wastewater treatment projects which the US International Trade Administration estimated to be worth US\$1.9 billion in 2020.<sup>23</sup>

Sanitation and wastewater management are also pressing issues, particularly with the rapid rate of urbanization. Currently, nearly 25 million people in Indonesia do not use toilets, circumstances forcing them to defecate in open spaces.<sup>24</sup> Of the sewage that is collected, ADB estimates that less than five percent is appropriately treated.<sup>25</sup> As untreated wastewater and open defecation contaminate the water supply, waterborne diseases such as cholera can be transmitted. A quarter of all children under five in Indonesia suffer from diarrhea, the country's leading cause of child mortality. Eliminating open defecation is therefore critical to improving public health in the nation.<sup>26</sup>

The Medium-Term Development Plan outlines important sanitation targets, such as the elimination of open defecation.<sup>27</sup> Providing sanitation utilities has primarily been the main responsibility of local provincial governments, with some financial support from the central government. However, unclear institutional configurations at the local level mean that budget allocations from the central government are often insufficient for operations. As a result, the government is exploring non-public sector financing, subject to state regulation and supervision.<sup>28</sup>

The predominant wastewater management system in Indonesia is the septic tank, with only a few cities having a centralized piped system for sanitation. For Indonesia to develop the infrastructure necessary for a sustainable and effective water management system, the government will need to form partnerships with the private sector which can bring increased efficiency and financing into the picture.

**"**A quarter of all children under five in Indonesia suffer from diarrhea, the country's leading cause of child mortality. **"**



## Highlights



Indonesia intends to increase access to fresh drinking water through pipe systems to 100% of households by 2024



Indonesia plans to eliminate open defecation, and improve onsite and shared sanitation facilities for 90% of the population



Indonesia will prioritize achieving sustainable sanitation services (i.e. regulation, institution, and financing) at the district level

## Opportunities



Private financing will play a key role in the development of sanitation and wastewater treatment infrastructure in Indonesia



Construction of dams, water supply systems, and irrigation programs required to support growing water demand



Commercial partnerships, loans, and technical assistance to water utilities suppliers needed



As Indonesia's urbanization rate increases from the current 55 percent to 73 percent by 2030, the country's current solid waste management (SWM) infrastructure will be insufficient for the growing levels of waste generation. Indonesia is committed to both reducing the levels of waste generated, while simultaneously expanding its SWM infrastructure. By 2025, the country aims to reduce waste by 30 percent, decrease ocean plastic by 70 percent, and appropriately treat 70 percent of waste produced.<sup>29</sup>

Plastic waste is a key priority of the country's waste management goals, as Indonesia currently dumps 3.22 million tons of plastic waste into the ocean annually. Marine pollution is being addressed primarily through the Marine Plastic Debris Management project (2017-2025), which will improve waste management services and introduce integrated waste collection systems for waste transport, treatment and disposal.

As articulated by the National Plastic Action Partnership (2020-2025), the country intends to double the current recycling capacity to 975,000 tons per year by 2025, and seeks to build or expand plastic sorting and recycling facilities to do so.<sup>31</sup> Because of the prevalence of plastic in consumer goods, the involvement of the Fast Moving Consumer Goods (FMCG) industry is likely to play a crucial role.<sup>32</sup> Presented during the World Economic Forum's Annual Meeting in 2021, Indonesia has developed initiatives aimed at tackling plastic pollution and becoming plastic pollution-free by 2040. The country intends to work with industry leaders in the private sector to find affordable and environmentally friendly alternatives to plastic materials. Similarly, the

government intends to work closely with manufacturers to spearhead an industry-wide shift towards circular plastic.<sup>33</sup>

Besides landfills and incineration, Indonesia is now turning towards advanced waste management technologies such as mechanical and biological treatment (MBT). To make full use of these possibilities, the country has recognized the need for external assistance and public-private partnerships to provide financing for SWM. In 2019, the World Bank approved a US\$100 million loan for Indonesia to improve its SWM services, with a large portion of the loan intended to finance MBT infrastructure.<sup>34</sup> Private firms have been offered the opportunity to operate Refuse-Derived Fuel (RDF) facilities that convert household waste into energy sources.<sup>35</sup> At the same time, Indonesia has acknowledged a lack of appetite among regional investors for waste management and recycling companies in Southeast Asia, likely due to a perception that infrastructure investments are subject to public-sector control and are therefore risky. The NPAP is likely to tackle this issue by improving awareness among regional investors on the waste management sector while tapping into a global investor base in the near future.<sup>36</sup>

**“** Indonesia faces a significant challenge with plastic waste, with the World Bank Indonesia estimating that the country is one of five responsible for more than 50 percent of total plastic waste in the oceans. **”**



## Highlights



By 2025, Indonesia aims to reduce waste by 30%, decrease ocean plastic by 70%, and appropriately treat 70% of waste produced



Indonesia is now turning towards advanced waste management technologies such as mechanical and biological treatment and Refuse-Derived Fuel



To support the creation of a circular economy, the government intends to work closely with manufacturers to spearhead an industry-wide shift towards circular plastic

## Opportunities



Reducing plastic use will require using environmentally friendly alternative materials, and circular plastic economies. These will require the partnerships of manufacturing companies and the private sector



The National Plastic Action Partnership seeks to tap into a global investor base to enhance its recycling and waste management sector



To make full use of advanced SWM technologies, the country will require external assistance and public-private partnerships to provide the necessary financing



## Gender Equality

Gender equality is explicitly guaranteed by Indonesia's constitution. Beyond that, the government enacted the National Gender Mainstreaming Policy in 2000, which became the guiding framework for the National Long-term Development Plan (RPJPN) 2005-2025. All government ministries and agencies are required to include gender mainstreaming in the planning, implementation, monitoring and evaluation of development projects.

The Global Gender Gap Index shows that Indonesia's efforts have closed 68.8 percent of its overall gender gap, ranking 101st out of 153 nations in 2021.<sup>37</sup> However, compared to 2020's ranking of 85th, Indonesia's score has worsened.<sup>38</sup> Whereas the country's Educational Attainment and Health & Survival scores have remained high, at 0.970 and 0.971 (1.000 = parity) respectively, Indonesia has experienced a decline in its Economic Participation and Opportunity score (now at 0.647). This was due to a sharp drop in the percentage of women in senior management positions, from 54.9 percent to 29.8 percent in just one year. Women's participation in the labor market (55.9%) is significantly less than men's (84.1%), with wage and income gaps remaining salient.

Political Empowerment also remains a critical issue area due to its low score of 0.164, demonstrating a lack of female representation in parliament and ministerial positions.

Women workers that are concentrated in small businesses and the informal sector could benefit from more digital support. According to the UN Women's analysis of survey data and big data on digitalization in Indonesia, women-owned micro and small businesses can benefit from using digital platforms to cope with the digitized economy propelled by COVID and balance responsibilities at home and at work.<sup>39</sup> Yet, they are currently unable to access social assistance support, especially for women in the informal sector.<sup>40</sup> Better gender data collection can aid in improving targeting and prioritizing beneficiaries in governmental social protection responses post-pandemic. Offering more stimulus packages to support women-owned businesses and unemployed women is also an important focus in policies to increase women's participation in business.<sup>41</sup>

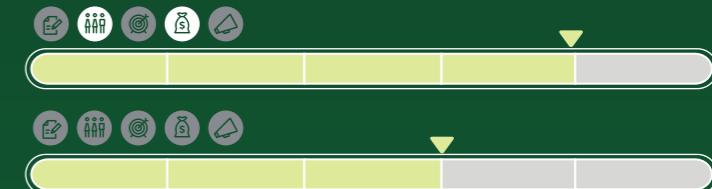
Strategies must center around equipping women with the necessary skills to enter under-represented employment spheres, and creating a non-discriminatory environment conducive to their development.

**"** Better gender data collection can aid in improving targeting and prioritizing beneficiaries in governmental social protection responses post-pandemic. **"**

Ending all forms of discrimination, violence and harmful practices

Equal Opportunities and Empowerment

Current progress



● Plans require improvement to achieve commitments

● Plans contain measures to achieve commitments

● Monitoring and Enforcement Mechanisms

● Vulnerable Groups

● Evidence-Based Development Plan

● Investment

● Awareness

## Highlights



The government enacted the National Gender Mainstreaming Policy in 2000



Indonesia's place in the Global Gender Gap ranking has dropped from 85th in 2020 to 101st in 2021



Women make up 15.9% of boards of listed companies and 10.3% of seats in the Upper House

## Opportunities



To widen women's and girls' access to training programs, potential partners can lead STEM outreach programs for education in schools and vocational training programs that link women with job opportunities in these sectors



Relevant partners can focus on closing the gap in unmet childcare needs by expanding access to affordable and high-quality childcare for working women and women looking for employment



More technical and financial support can be given to women-led businesses and women in the informal sector to help their businesses in the post-COVID economy



## Case study: Low Carbon Development Initiative

In October 2017, the Indonesian government launched the Low Carbon Development Initiative (LCDI) at the Ministry of National Development Planning (BAPPENAS) — declaring its commitment towards integrating climate action into the country's development agenda.

The initiative explicitly incorporates carbon emission reduction targets into Indonesia's social and economic policy planning, in addition to other interventions aimed at conservation of natural resources. In particular, the LCDI explicitly identifies development policies that maintain economic growth, alleviate poverty, and help meet sectoral-level development targets while concurrently steering Indonesia towards achieving its climate goals. The LCDI also focuses primarily on the energy and land use sectors, both of which contribute to 80 percent of Indonesia's greenhouse gas emissions.

Existing findings reinforces how the country's low carbon development will unlock a variety of additional economic, social and environmental

benefits. More specifically, the sustainable use of natural resources and reduction in carbon and energy intensities would allow for Indonesia's total GHG emissions to fall by almost 43 percent by 2030 — 41 percent is conditional. In this regard, Indonesia's achievement down the low carbon path is one that posits significant implications on the global scale as it demonstrates how it is entirely possible and profitable to tackle climate change; countries do not have to choose between ensuring sustainability or economic growth alone.

Evidently, Indonesia's ambitious economic shift will require a well-coordinated policy effort with full engagement from the national government, local governments, private sector and civil society. Along with increased financing from international development finance institutions, private investments and strategic policies, Indonesia's goal for a green economy is a future that is within reach.

# Endnotes

- 1 BAPPENAS, "Long-Term National Development Plan, 2005–2025" (Government of Indonesia, 2005).
- 2 Asian Development Bank, "Indonesia Energy Sector Assessment, Strategy and Road Map Update," 0 ed. (Manila, Philippines: Asian Development Bank, December 2020), 21, <https://www.adb.org/documents/indonesia-energy-assessment-strategy-road-map-update>.
- 3 John Geddie, "Indonesia Could Phase out Coal by 2040 with Financial Help, Finmin Says," Reuters, November 3, 2021, sec. Asia Pacific, <https://www.reuters.com/world/asia-pacific/indonesia-could-phase-out-coal-by-2040-with-financial-help-minister-2021-11-02/>.
- 4 "Indonesia: Embracing Natural Capital Accounting for Better Development Decisions," Wealth Accounting and the Valuation of Ecosystem Services, accessed June 8, 2022, <https://www.wavespartnership.org/en/indonesia-embracing-natural-capital-accounting-better-development-decisions>
- 5 Asian Development Bank, [Indonesia Energy Sector Assessment, Strategy and Road Map Update, December 2020](#).
- 6 "[Indonesia](#)," Climate Action Tracker, November 1, 2021.
- 7 Reuters, "[Exxonmobil Exploring Carbon Capture Storage in Indonesia](#)," Reuters, November 2, 2021, sec. Sustainable Business.
- 8 John Geddie, "[Indonesia Could Phase out Coal by 2040 with Financial Help, Finmin Says](#)," Reuters, November 3, 2021, sec. Asia Pacific.
- 9 "[The Growth of Renewable Energy in Indonesia 2022 – Current State, Opportunities and Challenges](#)," Energy Tracker Asia, May 12, 2022.
- 10 Ministry of Energy and Mineral Resources, [National Electricity Master Plan \(RUKN\) for 2019-2038, 2019](#).
- 11 Tim Ha, "[Indonesia Sets Eyes on Becoming World's Geothermal Superpower](#)," Eco-Business, July 19, 2021.
- 12 Reuters/AJ, "[Coal-Dependent Indonesia Starts Tapping Huge Solar Power Potential](#)," CNA, January 06, 2022.
- 13 Asia News Network, "[Indonesian State Banks Offer Solar Panel Loans to Boost Adoption](#)," The Phnom Penh Post, July 21, 2021.
- 14 Kiki Siregar, "[IN FOCUS: Indonesia Wants to Bag EV Riches, but Locals Are Split over What It Means for Them](#)," CNA, May 14, 2022.
- 15 Nicky Aulia Widadio, "[Indonesia to Reduce Marine Plastic Waste 70% by 2025](#)," Anadolu Agency, December 13, 2019.
- 16 Jayanti Nada Shofa, "[Indonesia Optimistic About 2030 Marine Protected Area Target](#)," Jakarta Globe, February 11, 2022, sec. News.
- 17 Sumatran Tiger Project, "[About Us | Sumatran Tiger Project](#)," accessed June 10, 2022; "Tanjung Puting National Park, "[Orangutan Foundation International Australia](#)," accessed June 10, 2022.
- 18 Ria Cahyaningsih, Joana Magos Brehm, and Nigel Maxted, "[Setting the Priority Medicinal Plants for Conservation in Indonesia](#)," Genetic Resources and Crop Evolution 68, no. 5 (June 1, 2021): pp. 2019–50.
- 19 Syardiansah Syardiansah and Ayu Artlinta, "Business Development Strategy of Family Medicinal Plants From The Economic Side," *International Conference on Science, Technology and Modern Society* 1, no. 1 (2017): pp. 200–4.
- 20 Daniel Oehling, Marc Schmidt, "[Seeding Environmental and Economic Success with Nature-Based Solutions](#)," Jakarta Globe, November 29, 2021.
- 21 Reuters, "[Indonesia to 'walk the Talk' on Deforestation, despite COP26 U-Turn](#)," November 11, 2021, sec. Environment.
- 22 PricewaterhouseCoopers, "[Drinking Water: PDAM Performance Improvement Becomes a Focus](#)," October 21, 2019.
- 23 International Trade Administration, "[Indonesia Water Projects](#)," October 8, 2020.
- 24 UNICEF. "[Water, Sanitation and Hygiene | UNICEF Indonesia](#)." Accessed June 14, 2022.
- 25 Asian Development Bank. [Indonesia Country Water Assessment](#), 2016, p. 54.
- 26 UNICEF. "[Water, Sanitation and Hygiene](#)."
- 27 BAPPENAS, [The National Medium-term Development Plan for 2020-2024](#), 2020, pg VI.19
- 28 World Bank. "Water Supply & Sanitation." In [Indonesia Public Expenditure Review: Spending for Better Results](#), 2020, pp. 272-273.
- 29 Ministry of Environment and Forestry, [National Plastic Waste Reduction Strategic Actions for Indonesia](#), 2020, p. iv.
- 30 World Bank, [Indonesia - Marine Debris Hotspot Rapid Assessment: Synthesis Report](#), 2018, p. 2.
- 31 World Economic Forum, [Radically Reducing Plastic Pollution in Indonesia](#), 2020, p. 6.
- 32 Ministry of Environment and Forestry, [National Plastic Waste Reduction](#), p. 26.
- 33 Tauhid Pandji, William Handjaja, Sri Indrastuti Hadiputran. "[Indonesia Is Battling Plastic Waste Long before It Gets to Sea](#)," March 3, 2022.
- 34 World Bank. "[Cleaning Up Indonesia's Urban Solid Waste](#)," press release, December 5, 2019.
- 35 AHK Indonesien. "[Indonesia's Waste Management Sector Still Going Strong](#)," May 4, 2021.
- 36 NPAP [Indonesia Financing System Change to Radically Reduce Plastic Pollution in Indonesia](#), November 2020, pp. 27-28.
- 37 World Economic Forum, [Global Gender Gap Report 2021](#), 2021, pp. 219-220.
- 38 World Economic Forum, [Global Gender Gap Report 2020](#), 2019, pp. 187-188.
- 39 UN Women, [Leveraging Digitalization to Cope with COVID-19: An Indonesia Case Study on Women-Owned Micro and Small Businesses](#), December 11, 2020, p. 11.
- 40 UN Women, Leveraging Digitalization, p. 7.
- 41 Ibid, p. 25.

Laos

# Laos

Over the past decade, Lao PDR (Laos) has achieved considerable improvement in providing access to critical resources and infrastructure such as electricity and clean water, while also becoming a significant energy exporter. Due to its advancements in the energy sector, Laos has managed to decouple its emissions from economic growth, ranking 24th out of 180 nations for the GHG Intensity Trend.<sup>1</sup> Notably, Laos also topped the Natural Capital Index 2021, which measures a country's ability to sustain the livelihood and health of its population and economy presently and in the future. It also holds the second position in gender parity within ASEAN, which reflects Laos' successful efforts in promoting social equality.

Laos has set an ambitious 60 percent greenhouse gas emissions reduction target by 2030, and net-zero emissions by 2050. This goal was identified to be consistent with the targets set in the Paris Agreement. The government also

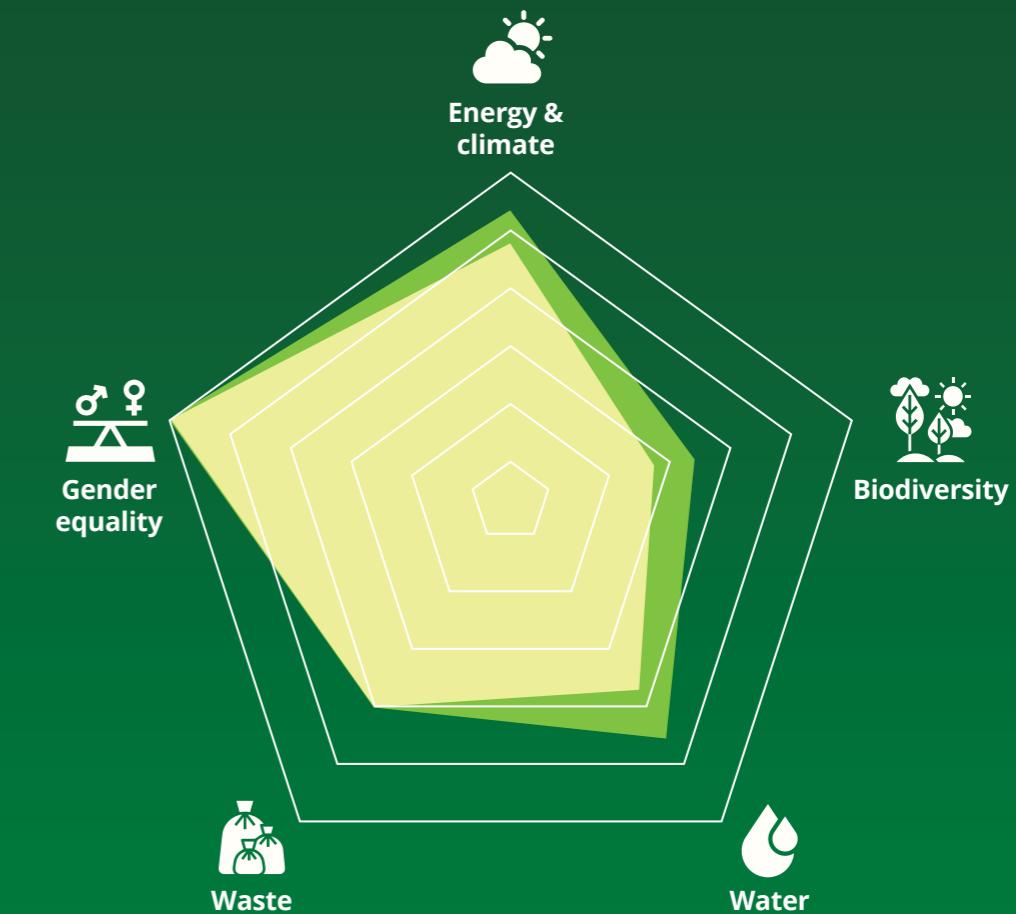
prioritized renewable energy in the country's energy strategy and has plans to diversify its renewable energy mix. Over the next decade, the share of hydropower, solar and wind will increase. Primarily led by hydropower, this whole-of-society green transition has been estimated to potentially generate 1.6 million new green jobs and add US\$16 billion per year to the country's GDP.<sup>2</sup> The sale of the country's first carbon credit in 2022 also signals an emerging green economy.<sup>3</sup>

Nevertheless, these successes did not come without several environmental and social challenges. Firstly, the expansion of agricultural land, deforestation, wildfires, and infrastructure construction has threatened the country's diverse wildlife. Providing universal water and sanitation services, particularly to rural areas, represents another significant gap.

Current progress:



Targets and commitments:



## Highlights



Laos performed well in measurements of natural capital preservation and gender parity



Ambitious 60% greenhouse gas emissions reduction by 2030, and net-zero by 2050



Potential US\$16 billion per year increase in country's GDP from Laos' green transition





## Energy & Climate

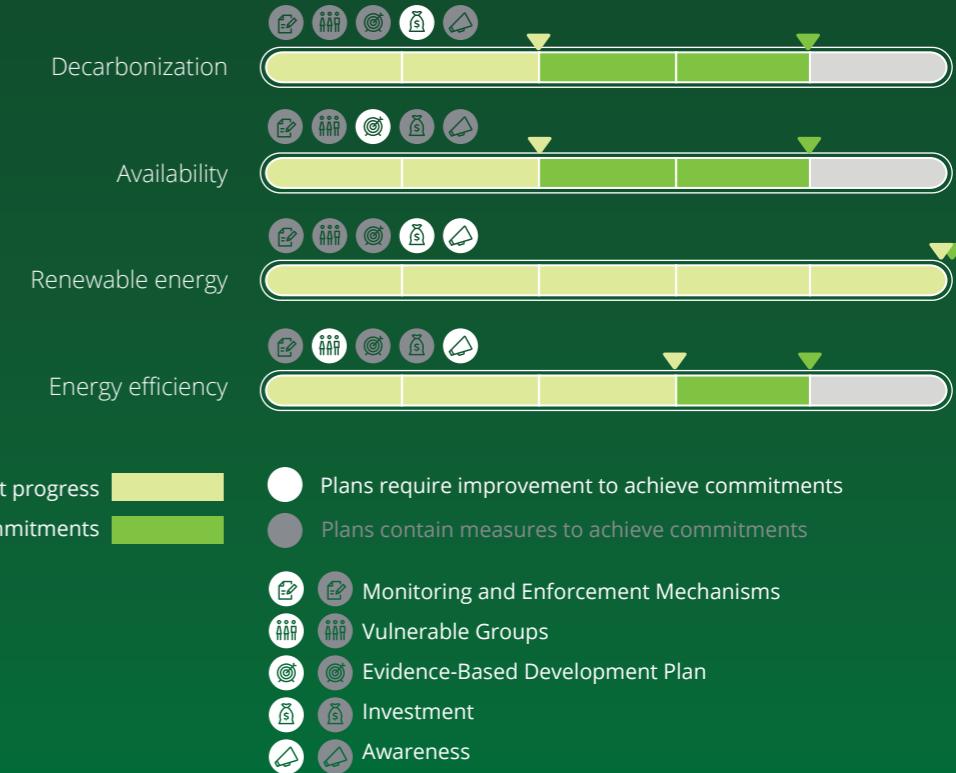
The Laotian government is committed to tackling climate change. As a country vulnerable to climate change,<sup>4</sup> it has recently raised its net-zero ambitions in its revised Nationally Determined Contributions. This includes an unconditional greenhouse gas emissions reduction target of 60 percent by 2030 compared to a business-as-usual scenario, and a transition towards a circular economy to pursue a low-carbon development pathway.<sup>5</sup> The country also aims to reach net-zero greenhouse gas emissions by 2050, aligning its target with the Paris Agreement.

The country is implementing plans to transition to a low-carbon and circular economy. As a resource-rich country, a report by the United Nations Development Program has outlined 17 leading possibilities for improving resource efficiency in the country — including the support for agroforestry and the electrification of transport.<sup>6</sup> By 2030, the government aims to increase forest cover to 70 percent of land area (from 41.5 percent in 2020).<sup>47</sup> There are also plans to increase the use of electric vehicles to make up 30 percent of its national vehicle mix.<sup>8</sup> Not only is this green transition in line with its net-zero ambitions, but it is also estimated to generate 1.6 million green jobs and add US\$16 billion per year to Laos' GDP by 2050.<sup>9</sup>

To aid in this transition, the Ministry of Energy and Mines has prioritized renewable energy in its Power Development Plan (2016-2030). It plans to leverage on its natural resources to increase the share of renewable energy (13GW total hydropower capacity, 1GW for solar and wind, and 300MW for biomass).<sup>10</sup> However, paradoxically, the government also plans to expand the capacity of its single coal-fired plant from 1.9GW to 2.5GW.<sup>11</sup> Such coal ventures are counterproductive to the country's ongoing efforts at increasing its renewable energy capacities. With that, some attribute this to a lack of information on renewable energy investment opportunities, and a subsequent lack in international financial support towards Laos' renewable energy projects.<sup>12</sup>

While there are currently no green bonds issued by Laos, the country can leverage on international initiatives like the ASEAN Catalytic Green Finance Facility to finance its climate projects.<sup>13</sup> The initiative is supported by the Asian Development Bank and is intended to complement existing climate finance and infrastructure initiatives in the ASEAN region. The Green Climate Fund is another example that also endeavors to incentivize private sector climate investments into Laos.<sup>14</sup>

**"** The green transition is estimated to generate 1.6 million green jobs and add US\$16 billion per year to Laos' GDP by 2050. **"**



## Highlights



Laos plans to reduce GHG emissions unconditionally by 60% by 2030, and net-zero emissions by 2050



Laos is gearing up for a green transition towards increased resource efficiencies (e.g., agroforestry, EV)



Hydropower is a key component of Laos' renewable energy mix, with plans to increase hydropower capacity to 13GW by 2030

## Opportunities



International financial support directed towards Laos' renewable energy potential, and away from coal energy projects



Green transition could generate 1.6 million green jobs



Emerging green economy present with initial support from the ADB



## Biodiversity

The landlocked country in mainland Southeast Asia boasts environmentally diverse landscapes and species. The country is in one of the 10 most important global biodiversity ecoregions, and benefits from this biodiversity.<sup>15</sup> It is estimated that demand for its natural attractions and wildlife (which drives its tourism sector) could account for 10 percent of its GDP by 2030, up from 4.3 percent in 2019.<sup>16</sup> It is also estimated that 67 percent of the Lao population are rural and therefore depend on Laos' forests for their livelihoods.<sup>17</sup> Hence, biodiversity conservation is relevant not only to the country's economic development, but to its people as well.

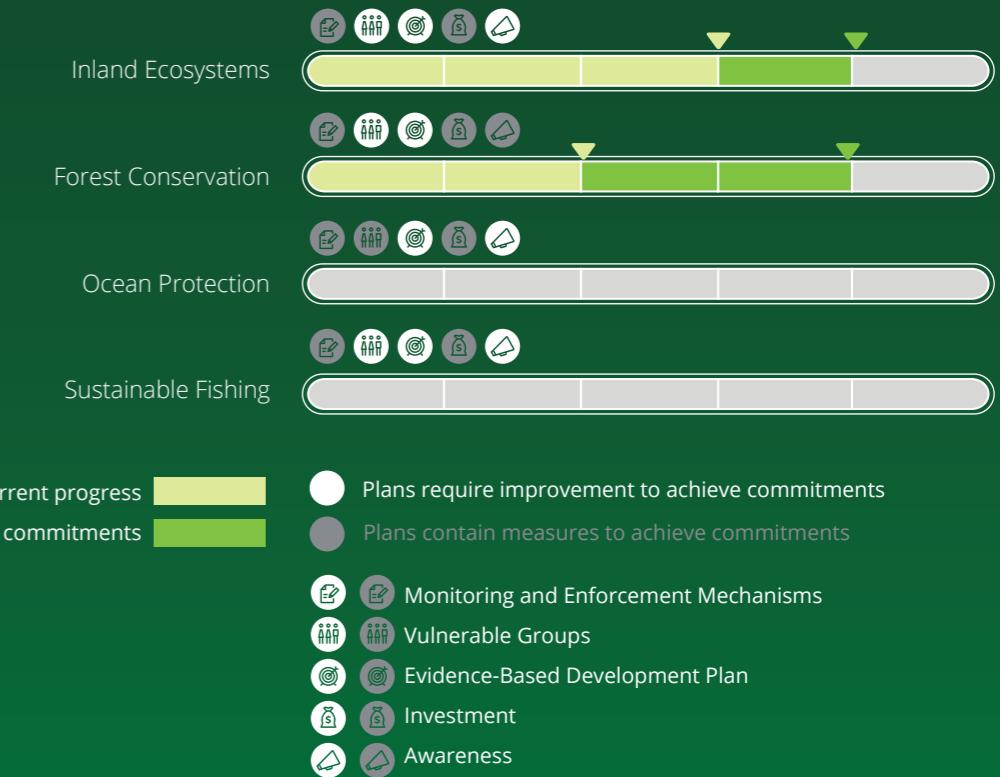
Laos incorporates biodiversity values into its national strategies, demonstrating its commitment to biodiversity conservation. Their first National Biodiversity Strategy and Action Plan (NBSAP) was crucial in kickstarting biodiversity research and the participation of Laos to multilateral environment agreements.<sup>18</sup> Laos' second NBSAP (2016-2025) builds on the success of the first by enhancing the role of biodiversity as a contributor to poverty alleviation and resilient economic growth. Biodiversity is also a central feature in its National Green Growth Strategy (2019-2030). These political commitments to biodiversity translated to immediate nationwide impacts, such as the halting of illegal timber across Laos' international borders, and the strict management of wild fauna and flora.<sup>19</sup>

There are significant existing markets for ecotourism in Laos. Inter-Asian tourism grew by 10 percent in 2018.<sup>20</sup> While landlocked, the completion of the China-Laos Railway in 2021 opens Laos to a major driver of growth in

the region. Increasing flight and rail connectivity will likely increase the number of Thai and Malaysian tourists as well. To fully optimize the potential for tourism to benefit the Lao economy, the World Bank has recommended several priorities. This includes the need for private sector investments into conservation efforts, and well-managed ecotourism businesses to ensure that tourist sites are not degraded over time.<sup>21</sup>

A recent report by the Convention on Biological Diversity (CBD) has found that Laos' current actions for its protected areas do not meet the Aichi biodiversity targets.<sup>22</sup> Laos' national protected areas account for 18.7 percent of the country's area, and the country has established a comprehensive set of laws, directives, and regulations on protected area management. However, none of its protected areas have management effectiveness evaluations reported in the global database (managed by the CBD). The country's current performance thus falls short of the 60 percent target for completed management effectiveness evaluations. As protected areas have been found to mitigate forest cover loss,<sup>23</sup> there is an added incentive for Laos to improve the quality of management for its protected areas.

**It is estimated that demand for its natural attractions and wildlife (which drives its tourism sector) could account for 10 percent of its GDP by 2030.**



## Highlights



Biodiversity could contribute to poverty alleviation and resilient economic growth



Improvements in inter-Asian transport places Laos as an attractive ecotourism destination



Room for improvement in Laos' management of its protected areas

## Opportunities



Need for private sector investments into biodiversity conservation efforts



Well-managed ecotourism businesses are crucial such that ecosystems in tourist sites are not disrupted



Opportunities present for Laos' protected areas to be recognized by CBD's global database on effectively managed protected areas



## Water

Despite Laos' steady improvements in clean water provision and access to sanitation, its progress is limited by the many communities residing in rural areas. The country has met its Millennium Development Goal of 54 percent access to improved sanitation, but over half of the rural population are without access.<sup>24</sup>

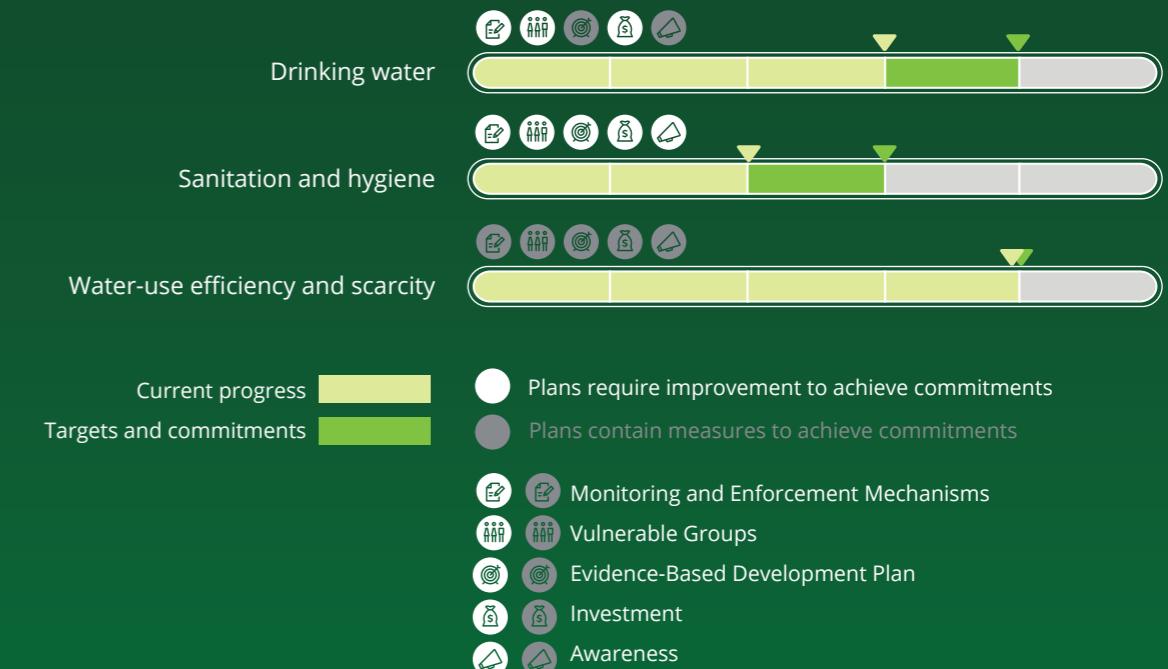
In line with SDG 6 'Clean Water and Sanitation', Laos has set the important target of reaching 100 percent access to basic water supply and sanitation by 2030. The Sustainable Development report reveals that the nation is on track to reaching their objectives, with 80 percent of the country's population having access to basic sanitation, and 85 percent to water facilities.<sup>25</sup> The government has proposed two main strategies to ensure equitable access to water: the National Policy on Water Supply, Sanitation and Hygiene (2019) and the Strategic Framework for Rural Water Supply, Sanitation and Hygiene (2019–2030).<sup>26</sup> The country's partnership with the Asian Development Bank also prioritizes productive infrastructure projects in rural areas, including that of water control systems and irrigation systems.<sup>27</sup>

The government also partners with international organizations and local communities to provide better water and sanitation services. For example, Laos' Water, Sanitation and Hygiene (WASH) program is guided by UNICEF's Global WASH Strategy (2016-2030).<sup>28</sup> With the support from the Ministry of Health, UNICEF's district

level approach successfully turned Bolikhhamxay into the first open defecation-free province in 2020. The communities involved also received village development funds to upgrade existing water facilities. The Lao Government will continue its cooperation with UNICEF and other organizations to make all seventeen provinces and one capital area open defecation-free by 2025.

Nonetheless, significant challenges hamper the nation's progressive strides. On the Environmental Performance Index, Laos ranks 131st out of 180 nations globally in Sanitation & Drinking Water. Its score makes it the lowest performing country in ASEAN.<sup>29</sup> The latest Lao Social Indicator Survey reveals critical disparities in the effects of implemented water and sanitation initiatives. For instance, on quality of water, 86.3 percent of water samples collected tested positive for E-Coli. To that end, a report by UN-Water estimated that US\$185 million is required from the government, household, and external support agencies for Laos to achieve its sector targets.<sup>30</sup>

**"**In line with SDG 6 'Clean Water and Sanitation', Laos has set the important target of reaching 100 percent access to basic water supply and sanitation by 2030. **"**



## Highlights



Laos sets target of reaching 100% access to basic water supply and sanitation by 2030



Collaborative approach to make all 17 provinces and 1 capital area open defecation-free by 2025



Significant disparities between water and sanitation initiatives and its effects

## Opportunities



Government is open to collaborations with international agencies to aid in its efforts at improving its water and sanitation services



Estimated US\$185 million needed to finance water and sanitation projects



Demand for infrastructure likely to increase, as water networks expand into rural areas



## Waste

Laos' sustainable development is hindered by prominent issues relating to solid waste management, which are exacerbated by population increase and rapid urbanization. Today, waste management remains an immediate priority in the government's national plans, with several cross-agency collaborations in the works to implement improved waste management strategies.

Waste management statistics vary, but approximately 40 to 60 percent of waste is collected in urban areas.<sup>31</sup> The country does not have any formal waste-to-energy or recycling infrastructure, relying instead on landfill dumping and open burning to dispose of its solid waste. Of the 141 district towns in the country, 14 have controlled landfills.<sup>32</sup> However, these landfills are usually only semi-managed, and the effectiveness of its treatment processes remains unknown.<sup>33</sup> The pollution stemming from the country's inadequate waste management is unsustainable. A recent World Bank study found that Laos' inefficient waste management has health effects on its citizens, presenting an urgent imperative for the government.<sup>34</sup>

To address these concerns, the government has published a Sustainable Waste Management Strategy and Action Plan (2021-2030).<sup>35</sup> Central to the plan is a framework for a paradigm shift from waste management towards resource management. The plan was developed by the Vientiane City Office for Management and Services, with technical support from the Global Green Growth Institute and financial support from both the Korea International Cooperation Agency and the Environment Protection Fund. In 2021, the government

also introduced its first national standard pertaining to the management, monitoring and disposal of hazardous waste.<sup>36</sup> It includes collaborations between provincial governments and relevant ministries.

The 2021-2030 action plan will hopefully maximize waste-to-energy opportunities in Laos. By 2030, the government intends to reach 100 percent waste collection and 40 percent recycling rates.<sup>37</sup> Together with these medium-term targets, one of the strategic outcomes of the plan is to maximize waste-to-resource opportunities by prioritizing source separation efforts. This strategic outcome will be complemented by introducing Extended Producer Responsibility schemes, decentralizing compost/bio-gas plants at commercial and residential buildings, and improving waste transport mechanisms. Business entities will also be provided guidance on adequate waste storage and separation.

Another strategic outcome presented in the plan is to foster green job opportunities for the informal sector in waste management.<sup>38</sup> This outcome recognizes the contributions by informal workers, like waste pickers. Hence, there are plans to explore how income generating opportunities can be fostered in tandem with the country's aim to increase recycling rates.

**“**Central to the plan is a framework for a paradigm shift from waste management towards resource management. **”**

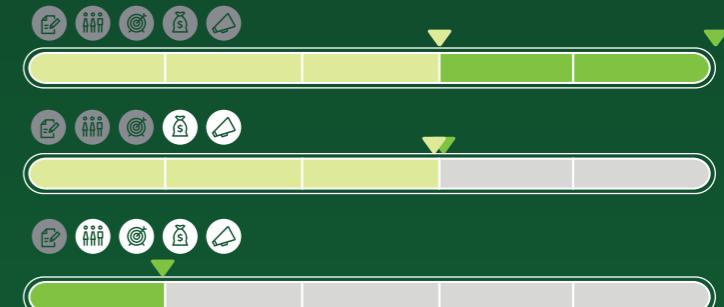
### Solid Waste Management

### Food waste

### Hazardous waste

Current progress

Targets and commitments



● Plans require improvement to achieve commitments

● Plans contain measures to achieve commitments

● Monitoring and Enforcement Mechanisms

● Vulnerable Groups

● Evidence-Based Development Plan

● Investment

● Awareness

## Highlights



Sustainable Waste Management Strategy and Action Plan (2021-2030) focuses on resource management



National targets of 100% waste collection and 40% recycling rates by 2030



Extended Producer Responsibility schemes, among other efforts, to be implemented

## Opportunities



National focus on sustainable waste management signals preference towards sustainably managed business entities



Opportunities in developing waste treatment facilities and recycling infrastructure to accelerate nation's waste management plan



Waste sector presents opportunities for green jobs (e.g., strengthening source separation and resource recovery efforts)



## Gender Equality

In general, Laos has made significant strides towards gender parity, as demonstrated by the Global Gender Gap Report.<sup>39</sup> Its performance places it as the second-most gender equal country in ASEAN. It has the smallest Economic Participation and Opportunity gap globally (0.915, with 1.000 = parity). Whereas most nations struggle with achieving gender parity in senior positions, Laos has successfully closed this gap: nearly 60 percent of the managerial roles are occupied by women. Laos also performs well in Educational Attainment and Health & Survival. Affecting these results is Political Empowerment, which remains at a low score of 0.146 — only 27.5 percent of parliamentarians and 10 percent of ministers are women.

The Lao Women's Union (LWU), represented across all ministries, has been central for the drafting of government policies on gender equality and the advancement of women. Considering how 68 percent of the population live in rural areas, it is crucial that the LWU's national network of more than a million members extends past the country's capital into the villages.<sup>40</sup> The LWU has also collaborated with international agencies to scale its impact. For example, LWU collaborates with the United Nations Development Program to economically empower vulnerable rural youth through inclusive employment training.<sup>41</sup>

Another example of international collaboration is between Laos, Luxembourg, and Switzerland.<sup>42</sup> The Luxembourg Development Cooperation Agency (LuxDev) has implemented skills development programs to promote gender equality, reaping considerable success. One of the programs was a vocational training program targeted at providing employment opportunities for the tourism and hospitality industries. Considering how 62 percent of workers in tourism are women,<sup>43</sup> and how nature-based tourism is expected to increase in popularity, such training programs can meaningfully empower women.

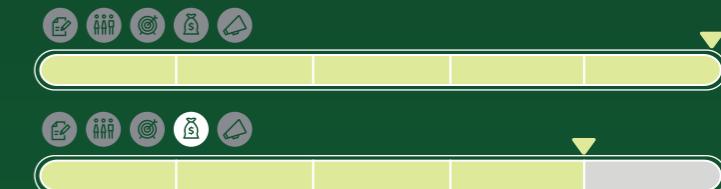
A recent report by the Asian Development Bank emphasized the need for improvements in key socioeconomic areas that impact women's resilience in Laos.<sup>44</sup> The report recognizes Laos' new gender-responsive policy, the National Action Plan on Gender Equality (2021-2025). This ambitious plan includes gender positive targets like introducing quotas for women in leadership roles in areas such as climate change and disaster risk reduction.<sup>45</sup> The report also includes recommendations on how to ensure the effective implementation of Laos' gender equality legislation.

**"**The Lao Women's Union's network of more than a million members extends past the country's capital into the villages. **"**

Ending all forms of discrimination, violence and harmful practices

Equal Opportunities and Empowerment

Current progress



Plans require improvement to achieve commitments

Plans contain measures to achieve commitments

Monitoring and Enforcement Mechanisms

Vulnerable Groups

Evidence-Based Development Plan

Investment

Awareness

## Highlights



According to the Global Gender Gap Report 2021, Laos is the second-most gender equal country in ASEAN



The Lao Women's Union has over one million members present in all segments of the country



Collaborations with international actors (e.g., with LuxDev, ADB, UNDP) have been proven to scale existing national/local efforts

## Opportunities



Increasing representation of women leaders in areas such as climate change and disaster risk reduction



Economic empowerment of women through public/private knowledge sharing (mentorships, vocational training)



Investment into women-led Micro, Small and Medium enterprises



### Case study: The Hydropower “Battery of Southeast Asia”

With a hydropower potential of 26.5GW, Laos could be a significant source of renewable energy for the region. With current installed capacity of about 7.2GW, the country already exports two-thirds of the hydropower it generates.<sup>47</sup> In June 2022, Singapore started importing hydropower from Laos through the Lao PDR-Thailand-Malaysia-Singapore Power Integration Project (LTMS-PIP), the first multilateral cross-border electricity trade involving four ASEAN countries.<sup>47</sup> Relying on existing interconnections, the project is a step towards the development of a regional market that enables ASEAN countries to tap on low-carbon and renewable energy sources while improving energy security and stability.

Laos has been leveraging on its hydropower resources as a key driver of its economic growth, aspiring to become the “Battery of Southeast Asia”.<sup>48</sup> The country recognizes the importance of sustainable resource management and has implemented a national policy to assess the potential environmental impacts of power generation projects. Approved in 2015, Laos’ national policy on Sustainable Hydropower Development, supported by the World Bank, provides hydropower developers with a clearer direction on how to sustainably develop the sector.<sup>49</sup> Laos’ partnership with the World Bank Group is one that demonstrates its commitment towards best-practice environmental and social standards in the hydropower sector.

Nevertheless, it has not been a smooth journey for Laos’ hydropower sector. In 2018, a devastating dam collapse displaced at least 7,000 people and killed at least 71.<sup>50</sup> Besides such dangers, there have also been concerns about the social and environmental consequences, including the effects of climate change and droughts potentially exacerbated by hydropower construction as well as displacement of indigenous communities.

The government has been working towards raising awareness and ownership among provincial-level authorities about the national policy for sustainable development. The policy emphasizes the studies that hydropower projects should implement, such as technical and engineering aspects, environmental and social assessments, and progress reporting on the performance of implanting the policy. The government is also taking active steps to reach out to local developers to educate them on the policy roll-out in the form of workshops and field visits. Over 100 large hydropower projects, all above 15MW each, have been identified for monitoring and evaluation. Given the complexity of large hydropower projects, the Laotian government continues to work towards improving inter-ministerial coordination and efficiency, and engagement with stakeholders.

# Endnotes

- 1 Environmental Performance Index, '[Laos](#)', accessed July 26, 2022.
- 2 United Nations Development Programme, '[IN LAO PDR, THE FUTURE IS LOW-CARBON AND CIRCULAR](#)', accessed July 26, 2022.
- 3 Xinhua Net, '[Laos expects to earn income from sale of carbon credit in 2022](#)', January 29, 2021.
- 4 United Nations Development Programme, '[LAO PDR](#)', accessed July 26, 2022.
- 5 Ibid.
- 6 United Nations Development Programme, '[Circular GHG mitigation opportunities Lao PDR](#)', November 25, 2021, p. 38.
- 7 Ibid, p. 61.
- 8 Ibid, p. 89.
- 9 United Nations Development Programme, '[IN LAO PDR, THE FUTURE IS LOW-CARBON AND CIRCULAR](#)', accessed July 26, 2022.
- 10 Ibid.
- 11 United Nations Development Programme, '[Circular GHG mitigation opportunities Lao PDR](#)', November 25, 2021, p. 24.
- 12 Eco-Business, '[Development dilemma: How did coal sneak into Laos' energy plans?](#)', July 16, 2020.
- 13 Green Climate Fund, '[ASEAN Catalytic Green Finance Facility \(ACGF\)](#)', February 16, 2022.
- 14 Green Climate Fund, '[Country Programme, Lao People's Democratic Republic](#)', December 2021.
- 15 The World Bank, '[Lao Biodiversity : A Priority for Resilient Green Growth](#)', July 17, 2020.
- 16 Ibid.
- 17 Ibid.
- 18 Ministry of Natural Resources and the Environment (MoNRE), '[National Biodiversity Strategy And Action Plan for Lao PDR 2016-2025](#)', p. 1.
- 19 The World Bank, Lao Biodiversity, '[A Priority for Resilient Green Growth](#)', p. 27.
- 20 Ibid, p. 15.
- 21 Ibid, p. 16.
- 22 Convention on Biological Diversity, '[Aichi Biodiversity Target 11 Country Dossier: LAO PEOPLE'S DEMOCRATIC REPUBLIC](#)', 2021.
- 23 Ibid, p. 27.
- 24 The World Bank, '[Improving Rural Sanitation in Lao PDR](#)', accessed July 26, 2022.
- 25 Sustainable Development Report, '[Lao PDR](#)', accessed July 26, 2022.
- 26 Asia and the Pacific Finance Ministers' Meeting, '[Lao People's Democratic Republic Country Overview](#)', 2020.
- 27 Asian Development Bank, '[Proposed Loan, Grant, and Administration of Grant Lao People's Democratic Republic: Sustainable Rural Infrastructure and Watershed Management sector project](#)', August 2019, p. 4.
- 28 UNICEF Lao PDR, '[Lao People's Democratic Republic Water, Sanitation and Hygiene \(WASH\) Thematic Report 2018 - Grant No SC149903](#)', March 2019.
- 29 Environmental Performance Index, '[Sanitation & Drinking Water](#)', accessed July 26, 2022.
- 30 Asia and the Pacific Finance Ministers' Meeting, '[Lao People's Democratic Republic Country Overview](#)', 2020, p. 5.
- 31 World Bank Blogs, '[Reducing plastic waste to get "clean and green" in Lao PDR](#)', March 22, 2022.
- 32 Open Development Laos, '[Environment and natural resources](#)', February 9, 2018.
- 33 Global Green Growth Institute, '[Solid Waste Management in Vientiane, Lao P.D.R. Situation assessment and opportunities for waste-to-resource](#)', 2018, p. 16.
- 34 World Bank Blogs, '[Reducing plastic waste to get "clean and green" in Lao PDR](#)', March 22, 2022.
- 35 Global Green Growth Institute, '[Sustainable Solid Waste Management, Strategy and Action Plan for Vientiane 2021-2030](#)', 2022.
- 36 Envilience ASIA, '[Laos announces a standard for hazardous waste management](#)', September 20, 2021.
- 37 Global Green Growth Institute, '[Sustainable Solid Waste Management, Strategy and Action Plan for Vientiane 2021-2030, 2022](#)', p. 26.
- 38 Ibid, p. 31.
- 39 World Economic Forum, '[Global Gender Gap Report 2021 Insight Report](#)', March 2021.
- 40 United Nations Development Programme, '[66 Years in the Fight Against Violence: How the Lao Women's Union Works to Protect Women in Lao PDR](#)', July 19, 2021.
- 41 United Nations Development Programme, '[ENHANCING SOCIAL AND ECONOMIC OPPORTUNITIES FOR YOUTH IN THE LAO PDR](#)', July 19, 2021.
- 42 LUXDEV, '[Skills for Tourism – Human Resources Development in the Tourism and Hospitality Sector](#)', accessed July 26, 2022.
- 43 Borgen Project, '[NATURE-BASED TOURISM IN LAOS](#)', accessed July 26, 2022.
- 44 Relief Web, '[Women's Resilience in the Lao People's Democratic Republic: How Laws and Policies Promote Gender Equality in Climate change and Disaster Risk Management \(June 2022\)](#)', June 10, 2022.
- 45 Ibid.
- 46 International Hydropower Association, '[Laos](#)', accessed July 26, 2022.
- 47 Channel NewsAsia, '[Singapore begins importing renewable energy from Laos through Thailand and Malaysia](#)', June 23, 2022.
- 48 International Hydropower Association, '[Laos](#)', accessed July 26, 2022.
- 49 Asia Pacific Energy, '[LAO PDR: Policy on Sustainable Hydropower Development \(PSHD\) in Lao PDR \(Decree of the Government No. 02/GoL of 2015\)](#)', accessed July 26, 2022.
- 50 ASEAN Today, '[A broken dam and broken promises: Laos doubles down on hydropower despite risks](#)', July 27, 2020.

# Malaysia



# Malaysia

In 2015, Malaysia embedded the United Nations' Sustainable Development Goals (SDGs) in the country's agenda. Considering national circumstances, Malaysia has made efforts to formulate indicators and databases, to appropriately align competencies and organizations with SDGs.<sup>1</sup>

In October 2021, Malaysia released its Twelfth Malaysia Plan and announced its commitment to become a carbon neutral nation as early as 2050. The plan also aims to set up a voluntary carbon market, domestic emissions trading scheme, and increase the renewable energy installed capacity target (particularly solar energy). Malaysia's emissions have had an upwards trajectory over the past decade, and ranks 104th out of 180 countries for its carbon dioxide (CO<sub>2</sub>) emissions growth rate. Additionally, only 24 percent of Malaysia's energy is produced from renewable sources.

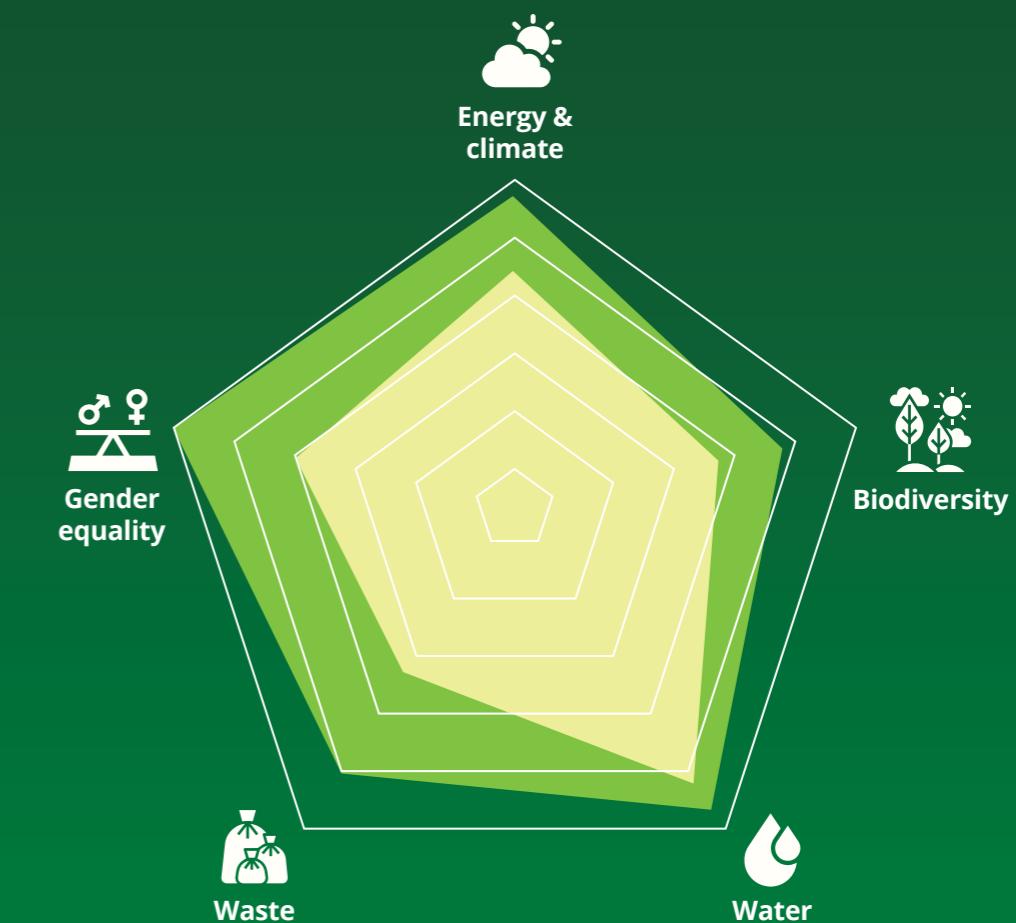
Waste-to-Energy thermal plants have the potential to simultaneously alleviate the nation's reliance on fossil fuels and address growing waste production. Malaysia's landfills have been unable to adequately keep up with the increasing rate of population growth. However, the wide-spread implementation of this high technology solution is limited by the high costs of building required infrastructure and upskilling of staff.

Beyond infrastructure-based investments, the Malaysian government should direct its resources towards building robust monitoring and legal frameworks, to ensure the enforcement of state-mandated policies and initiatives.

Current progress:



Targets and commitments:



## Highlights



Malaysia has a vision of reaching net-zero emissions as early as 2050



Advancements of analytical tools and detection technologies are required to improve the efficiency of Malaysia's water network distribution



To eradicate open dumping landfills, there are opportunities for involvement in awareness campaigns and the creation/establishment of monetary incentives



## Energy & Climate

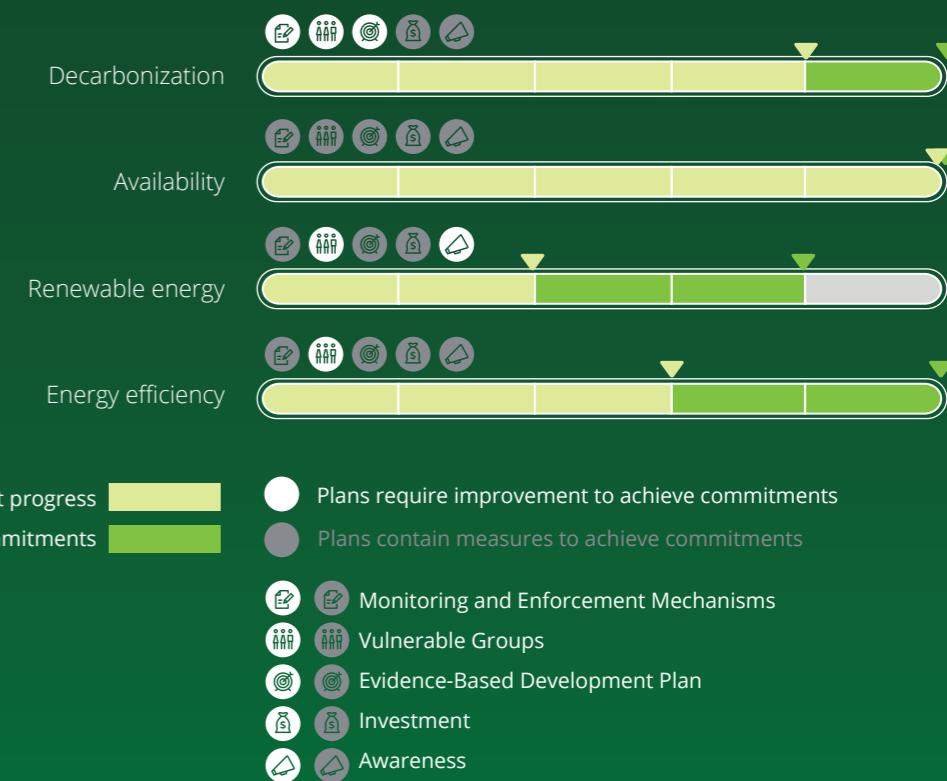
At the forefront of Malaysia's Nationally Determined Contribution (NDC) is an ambitious commitment to reduce the nation's greenhouse gas (GHG) emission intensity of GDP by 45 percent by 2030, compared to 2005.<sup>2</sup> In the 2021 Twelfth Malaysia Plan, the nation announced its commitment to become a carbon neutral nation as early as 2050.<sup>3</sup> The country has also made recognizable commitments to reduce emissions apart from carbon, including support for the Global Methane Pledge, which seeks to reduce global methane emissions by at least 30 percent from 2020 levels by 2030.

However, the road to a net-zero Malaysia will not be simple given the major role fossil fuels play in driving Malaysia's present-day economy, along with pressures of population growth and widespread poverty that will impede decarbonization. Currently, Malaysia ranks 104th out of 180 countries for its carbon dioxide (CO<sub>2</sub>) emissions growth rate according to the Environmental Performance Index (EPI), and ranks 147th (out of 180) in the world for its overall climate policy.<sup>4</sup>

Malaysia's strategic plans to reach its goals are underlined in the Green Technology Master Plan (2017-2030), which outlines multi-sectoral efforts to reduce greenhouse emission intensity. Included in the strategy

is the expansion of Malaysia's renewable energy to decrease reliance on fossil fuel.<sup>5</sup> Currently, Malaysia's installed capacity for renewable energy is estimated at 24 percent (mostly hydropower), and the country aims to increase this percentage to 31 percent by 2025, and 40 percent by 2035.<sup>6</sup> Solar energy is leading the way as the fastest growing renewable sector, having expanded 66 percent in the last decade.<sup>7</sup> To incentivize investments in renewable energy, policies such as the Green Technology Financing Scheme have been adopted that facilitate the approval of loans from private banks for users that possess green certified technology.<sup>8</sup> In 2022, Malaysia is also set to launch a carbon credit trading platform at the national stock exchange Bursa Malaysia to further its transition to a green economy.<sup>9</sup> Private investments will therefore play a major role in Malaysia's targets to reduce its carbon emissions while simultaneously increasing its renewable energy capacity.

**"** Solar energy is leading the way as the fastest growing renewable sector, having expanded 66 percent in the last decade. **"**



## Highlights



Malaysia's NDC commits to the reduction of the nation's greenhouse gas emission intensity of GDP by 45% by 2030, compared to 2005 levels



Malaysia aims to have net-zero carbon emissions by 2050



The government aims to increase the percentage of power produced from renewable sources to 40% by 2035

## Opportunities



Malaysia's renewable energy sector seeks private investments for long-term projects, especially solar energy



Malaysia is implementing policies like the Green Technology Financing Scheme which will facilitate loans from private banks for users that possess green certified technology



In 2022, Malaysia is set to launch a carbon credit trading platform at the national stock exchange Bursa Malaysia



## Biodiversity

Qualifying as one of the 12 mega-biodiverse countries in the world, Malaysia's commitment to conserving its biodiversity is an important component of its national strategy. The National Policy on Biological Diversity 2016-2025 (NPBD) contains five overall goals, 17 targets, and 57 actions that encompass the nation's detailed approach to biodiversity management.<sup>10</sup>

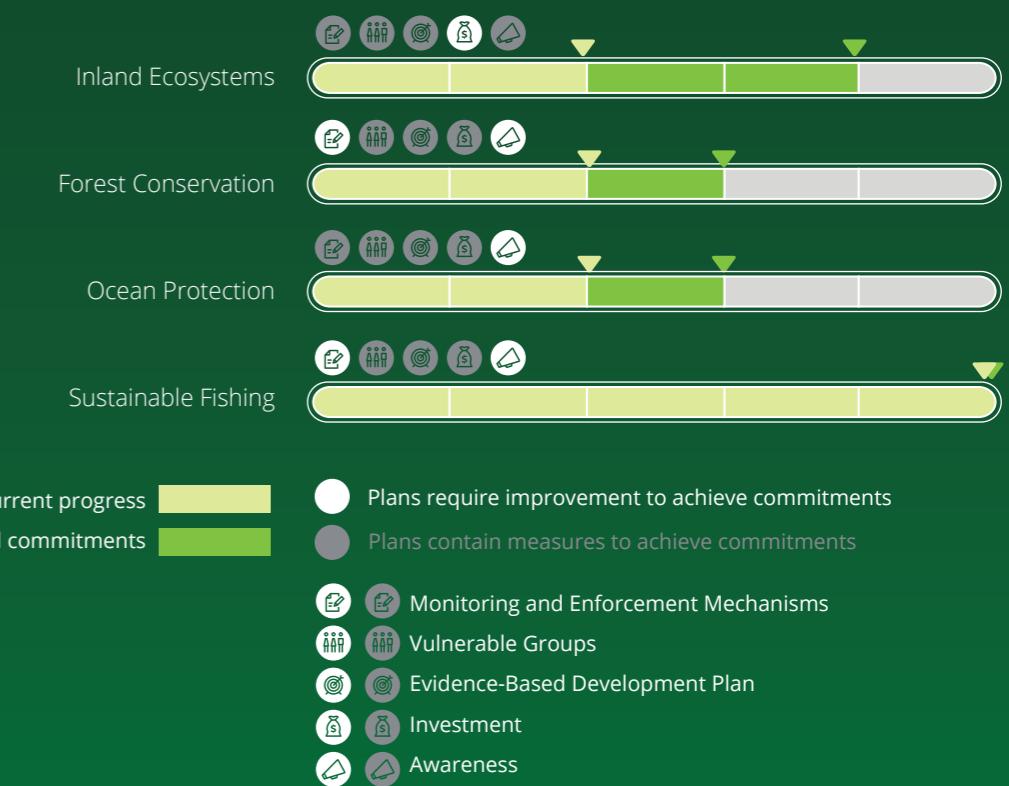
Malaysia's approach to biodiversity and conservation has focused on the establishment of protected areas, where biodiversity is protected under legal gazetttement. As of 2016, protected areas comprise 13.2 percent of Malaysia's land area.<sup>11</sup> Nonetheless, in accordance with the 1992 Convention on Biological Diversity, the Malaysian government is increasing the amount of protected areas in the country, with a target of 30 percent of State land by 2025.<sup>12</sup> In 2017, the government supported the establishment of new state parks in Terengganu, the Setiu Wetlands and the Kenyir State Park.<sup>13</sup> The gazetting of these protection zones is central to safeguard threatened species that fall prey to poachers and climate-induced threats.

For ocean management, the National Plan of Action for the Management of Fishing Capacity outlines all the main conservation strategies that are embedded in fisheries management, such as establishing fishing zones, prohibiting destructive fishing gear and controlling fishing efforts.<sup>14</sup> The NPBD has adopted the Ecosystem Approach to fisheries management, which outlines the decentralization of fisheries management to regional fisheries management centers.<sup>15</sup> In the marine conservation sphere, Malaysia has around 200 gazetted Marine Protected Areas (MPAs), making up just 4.3 percent of Malaysia's oceans.<sup>16, 17</sup> Current efforts are underway to expand conservation zones, with

several new marine parks in the process of gazetttement in Johor, Kedah and Melaka.<sup>18, 19, 20</sup> Public-private sector partnerships have been explored in protected area management, with successful models like Mutiara Taman Negara Resort partnering with Taman Negara National Park in Pahang.<sup>21</sup>

The effectiveness of the implemented initiatives is jeopardized by growing environmental threats as indicated by the Red List Index falling from 0.74 to 0.70 over the past decade.<sup>22</sup> This decline can be attributed to a variety of factors, including illegal trade of wildlife, rapid urbanization, development of road network and overfishing.<sup>23</sup> The Malaysian government has been cooperating with the private sector to address some of these issues. As private sector contributions increase with Corporate Social Responsibility programs, the Malaysian government has also been supporting long-term conservation programs through collaboration and endorsement, providing tax incentives, and regulations on reporting and voluntary standards. Companies like Petroliam Nasional Berhad (PETRONAS) and Shell Malaysia have contributed significant funding towards biodiversity environmental conservation, education, and research. By 2025, the number of collaborative projects with the private sector is expected to double from the 2016 level.<sup>24</sup>

**"**The Malaysian government is increasing the amount of protected areas in the country, with a target of 30 percent of State land by 2025. **"**





## Water

To manage water resources of the nation, the Government of Malaysia has employed a demand-based approach in the development of its new Green Technology Master Plan for water management. The prevailing focus of the government is to increase water efficiency through integrated water management, monitoring of water usage, reducing losses and non-revenue water, and boosting overall water availability and reliability.<sup>25</sup>

To improve water efficiency, the government has introduced the mandatory implementation of the Water Efficient Products Labelling Scheme, which consists of labelling products with a water efficiency rating to aid consumers in purchasing more water-efficient products.<sup>26</sup> Irrigation efficiency will also be targeted heavily under the developing Water Master Plan, given that the agriculture sector comprises 68 percent of total water consumption in Malaysia.<sup>27</sup>

To boost overall water availability and maximize usage of resources, the government intends to incorporate rainwater harvesting systems in its cities, with current rainwater collection standing at just seven percent of total annual rainfall. The government has initiated collaborations with the private sector to develop technical guidelines and awareness programs to increase rainwater harvesting capabilities. The ministry is also focusing on increasing water treatment and distribution capabilities, particularly to reduce the levels of non-revenue water (i.e., water that is "lost" before reaching consumers). Currently amounting to 35.5 percent of distributed water, non-revenue water in Malaysia is

largely caused by an old network of pipes and poor workmanship.<sup>28</sup> Collaboration between the government and the private sector will likely increase, as the country seeks technological assistance and knowledge transfer to implement new rainwater harvesting and non-revenue water projects.<sup>29</sup>

With an estimated average water supply coverage of 92.5 percent,<sup>30</sup> the Environmental Performance Index recognizes Malaysia's success in water management. In the Sanitation & Drinking Water category, Malaysia is the third best performer among ASEAN nations, ranking 59th out of 190 countries.<sup>31</sup> However, parts of Malaysia's population, predominantly rural communities in Kelantan, Sabah, and Sarawak, still lack access to water.<sup>32</sup>

Malaysia's Wastewater Treatment score is also low, indicating that only 12.6 percent of household wastewater is treated.<sup>33</sup> Infrastructure upgrades, while necessary, are hindered due to limited finances which are in turn caused by the high operational costs of the sewage treatment plants and low revenue from sewage tariffs.<sup>34</sup> The country has set a 2030 target to treat 100 percent of sewage sludge produced and recycle 33 percent of the treated effluent.

**" Parts of Malaysia's population, predominantly rural communities in Kelantan, Sabah, and Sarawak, still lack access to water. "**



## Highlights



By 2030, the government plans to recycle 100% of sewage sludge produced, and 33% of the treated effluent will be recycled



To increase overall water availability and maximise usage of resources, the government plans to incorporate rainwater harvesting systems in most of the nation's cities



With the agriculture sector comprising 68% of total water consumption in Malaysia, the government plans to improve the design of irrigation systems for increased water efficiency

## Opportunities



More sophisticated water distribution systems are set to be built, particularly in rural and newly developed areas



The high operational costs of sewage treatment plants and low revenue from the tariffs are hindering the upgrade of Malaysia's wastewater system



Malaysia is seeking technological assistance and knowledge transfer to implement new rainwater harvesting and non-revenue water projects



Like other ASEAN countries, Malaysia is facing unprecedented growth in its waste generation because of unrelenting urbanization. Combined with inadequate infrastructure and land scarcity, waste management has become a priority area for the government. As part of Malaysia's initiative to move towards a more sustainable economy, the Malaysian government has pledged to increase recycling rate to 40 percent by 2025 and implement zero waste at landfills.<sup>35</sup>

Recycling rates have been progressing steadily in the last five years. Recorded at 17.5 percent in 2016, the recycling rate has jumped to 30.7 percent in 2020. The country aims to increase household recycling rates by two percent each year to meet the target of 40 percent by 2025.<sup>36</sup> Producers will play a major role in reaching this target – in the country's current Twelfth Malaysia Plan (2021-2025), the government established sustainability and circularity as key goals and identified extended producer responsibility (EPR) schemes as a core strategy. Under an EPR system, the producer's responsibilities would include waste collection, recycling, financial contributions, and innovation along supply chains.<sup>37</sup>

However, open dumping is still common practice in many areas, resulting in illegal dumpsites and open burning, which negatively impact water quality in rivers and air quality.<sup>38</sup> Nevertheless, Malaysia has still ranked fairly decently (33rd out of 180 countries) on the Environmental Performance Index for Waste Management, indicating that Malaysia's solid waste does not pose a serious threat to human health.<sup>39</sup>

Under an EPR system, the producer's responsibilities would include waste collection, recycling, financial contributions, and innovation along supply chains. ■

The most widespread disposal method for Municipal Solid Waste (MSW) is landfills. In 2016, only 14 sanitary landfills were identified (i.e., landfills that treat leachate before releasing them into the environment), while the other 147 were deemed non-sanitary.<sup>40</sup> As a more permanent alternative to landfills, the government intends to increase the viability of Waste-to-Energy (WtE) thermal plants. By creating energy through the combustion of MSW, WtE plants reduce waste while simultaneously producing electricity.<sup>41</sup> Currently, Malaysia's first WtE plant in Kuala Lumpur is expected to start commercial operations in 2022. The plant's operator, Cypark Resources, has also been awarded tenders for WtE plants in Johor and Melaka.<sup>42</sup> However, the high capital and operating expenditure required for WtE plants have limited the attractiveness of WtE technology to the private sector.<sup>43</sup> Through initiatives such as TN50 – Waste to Wealth, the government intends to stimulate corporate investment in WtE through government incentives and support on waste volume guarantees.<sup>44</sup>



## Highlights



To decrease the nation's reliability on landfills, the government aims to achieve a 40% recycling rate by 2025.



Malaysia ranks 33rd out of 180 countries for waste management on the Environment Performance Index



Malaysia aims to construct three waste-to-energy plants by 2030

## Opportunities



The government intends to implement schemes to finance the construction and operating costs of Waste to Energy plants through incentives and capital support



To eradicate open dumping landfill, awareness campaigns on its dangers, and monetary incentives to encourage recycling should be established.



Government efforts to establish circularity and extended producer responsibility schemes will advantage sustainably-operated businesses



## Gender Equality

Although Malaysia's Federal Constitution explicitly prohibits gender-based discrimination, the absence of robust legal framework guaranteeing equality of outcomes has made this Constitution article impotent.

Compared to its ASEAN neighbors, Malaysia's Global Gender Gap Index 2021 scores the lowest, with an overall rating of 0.676 (1.000 = parity). Ranking 112th out of 156 nations, Malaysia's larger gender gap can be attributed to the underrepresentation of women in the overall economy and political sphere. The labor force participation rate for women is only 55.5 percent, in contrast to 80 percent male participation – the lowest in the ASEAN region. This may be attributed to rigid policies in workplaces, such as nonflexible work arrangements that disallow nurseries<sup>45</sup> or breast-pumping facilities,<sup>46</sup> and a culture of working late.<sup>47</sup> Women hold only 23.3 percent of positions as legislators, senior officials, and managers, demonstrating that capability-building and targeted opportunities are necessary to upskill women's abilities for managerial roles. Malaysia scores poorly for Political Empowerment (0.102), with women in parliament and ministerial roles holding only 14.9 percent and 16.1 percent of positions respectively.<sup>48</sup>

There is a huge economic incentive for Malaysia to include more women in their workforce. The Asian Development Bank estimated that the country's national GDP could go up two to four percent yearly, if women's employment rate increased to 70 percent. Therefore, Malaysia must encourage women to be involved in the labor market to stimulate economic growth.<sup>49</sup> Increasing

women's access to healthcare is one of the avenues to increase women's participation in the economy. Improving women's access to reproductive healthcare and contraception for family planning purposes is especially important to unlock the economic potential of women – globally, it is estimated that every US\$1 spent on contraceptive needs yields an estimated US\$120 of accrued benefits in the long-term.<sup>50</sup>

Yet, women continue to face challenges regarding access to healthcare and health awareness. Besides improving governmental services, private companies that share the vision to uplift women could fulfill their corporate social responsibility by working with governments to support women's healthcare needs. For example, Kimberly-Clark has been promoting menstrual health to young girls in Malaysia under their feminine hygiene brand Kotex. Kotex launched their #SheCan Project in 2021, collaborating with 109 schools to educate 100,000 high school girls on menstrual health and hygiene, as well as setting up a fund to support better learning facilities in 10 participating schools.<sup>51</sup> This example attests how cooperation between government and industry can play an instrumental role in not simply increasing healthcare access, but also to empower young girls to pursue opportunities despite current challenges.

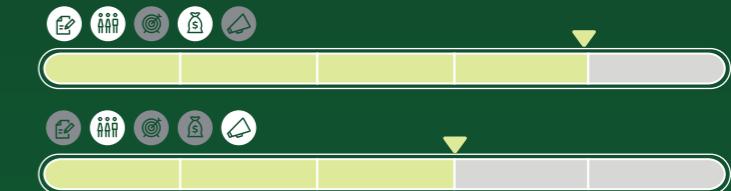
**"**Malaysia must encourage women to be involved in the labor market to stimulate economic growth. **"**

Ending all forms of discrimination, violence and harmful practices

Equal Opportunities and Empowerment

Current progress

Targets and commitments



Plans require improvement to achieve commitments

Plans contain measures to achieve commitments

Monitoring and Enforcement Mechanisms

Vulnerable Groups

Evidence-Based Development Plan

Investment

Awareness

## Highlights



Women's participation in the labor force remains at 55.5% in contrast to men at 80%



Malaysia's place in the Global Gender Gap ranking dropped from 104th in 2020 to 112nd in 2021



Women hold only 23.3 percent of senior positions as legislators, senior officials and managers in the country

## Opportunities



Upskilling women for managerial roles and putting in place family-friendly policies and facilities could enable more women to thrive in the workplace



Partnerships between the government and corporations can play a role in increasing women's healthcare access and empowering the educational possibilities of young women



Up to 4% increase in national GDP can be achieved by increasing the percentage of women in the labor force in Malaysia to 70%



## Case study: Green Technology Application for the Development of Low Carbon Cities (GTALCC) in Malaysia

Data has shown that cities consume 78 percent of the world's primary energy. Furthermore, with most of Malaysia's carbon emissions condensed within urban areas, the government has recognized the importance of focusing closely on transforming these areas into sustainable and low-carbon cities.<sup>52</sup>

In collaboration with the United Nations Development Programme, and with funding support from the Global Environment Facility, the Ministry of Environment and Water and the Sustainable Energy Development Authority launched the Green Technology Application for the Development of Low Carbon Cities (GTALCC) project to generate lower carbon and greenhouse gas (GHG) emissions over five years.

Five Malaysian cities participated in the project, namely Cyberjaya, Iskandar Malaysia, Melaka, Petaling Jaya, and Putrajaya. When first developed, the project was expected to generate direct GHG emission reductions of 346,442 tons of carbon dioxide equivalent (tCO<sub>2</sub>eq)

over the five years. This would be achieved through 1) policy support, (2) awareness and institutional capacity development, and (3) low carbon technology investments in cities. The project was also intended to demonstrate a clear and integrated approach towards low carbon development.

Since its genesis, the project has seen the introduction of several knowledge products such as the Institutional Framework for Low Carbon Cities, and engaged over 47,200 stakeholders to receive capacity building on low carbon cities.<sup>53</sup> An office-shared e-bicycle pilot program was also rolled out in Putrajaya and Cyberjaya, complete with GPS tracking to monitor GHG emissions reductions from the scheme.<sup>54</sup> In 2021, the UNDP reported that the suite of solutions implemented by the GTALCC project - together with its partners at the national government, its nine partners of local authorities, and private sector partners - have indirectly reduced carbon emissions by 909,180 tCO<sub>2</sub>eq, on top of the 346,442 tCO<sub>2</sub>eq directly targeted by the project.<sup>55</sup>

# Endnotes

- 1 Economic Planning Unit, "[Sustainable Development Goals](#)," accessed June 22, 2022.,
- 2 UNDP Climate Promise, "[Malaysia](#)," accessed June 20, 2022.
- 3 CNA, "[12th Malaysia Plan: What You Need to Know about the 2050 Carbon Neutral Goal and Other Green Measures](#)," 28 Sep 2021.
- 4 "Malaysia | Environmental Performance Index," accessed June 20, 2022, <https://epi.yale.edu/epi-results/2022/country/mys>.
- 5 Ministry of Energy, Green Technology and Water Malaysia, [Green Technology Master Plan \(2017-2030\)](#), 2017, p. 24.
- 6 Reuters, "[Malaysia Targets Renewable Energy at 40 per Cent of Total Capacity by 2035](#)," The Straits Times, October 27, 2021; [Green Technology Master Plan](#), p. 29.
- 7 Dave Sivaprasad, Priyanshu Kumbhare, "[Growing Champions: Malaysia's Renewable Energy Opportunity](#)," The Edge Markets, April 2, 2021.
- 8 Malaysian Green Technology and Climate Change Corporation "[Green Technology Financing Scheme](#)," (blog), accessed June 20, 2022.
- 9 Anis Hazim, "[Govt Agrees for Voluntary Carbon Markets Development](#)," The Malaysian Reserve, September 20, 2021.
- 10 Ministry of Natural Resources and Environment, [National Policy on Biological Diversity](#), 2016-2025, 2016, pp. 13-15.
- 11 [Sixth National Report of Malaysia to the Convention on Biological Diversity \(CBD\)](#), 2016, p. 8
- 12 Ibid., p. 44.
- 13 "[Terengganu Declares Two State Parks at Setiu and Kenyir](#)," The Star, August 15, 2018.
- 14 Department of Fisheries, National Plan of Action for the Management of Fishing Capacity, 2015, p. 15.
- 15 [Review of Malaysian Laws and Policies and EAFM in Malaysia](#)
- 16 Ibid, p. 8
- 17 "[Only 4.3pc of Malaysian Waters Gazetted as Marine Protected Areas](#)," New Straits Times, November 22, 2021, sec. nation.
- 18 "[Islands in Melaka to Be Gazetted as Marine Park](#)," The Star, October 2, 2021.
- 19 Bernama, "[Only 4.3pc of Malaysian Waters Gazetted as Marine Protected Areas](#)," New Straits Times, November 11, 2021.
- 20 BERNAMA, "[Sabah in the Process to Gazette Two Marine Parks](#)," BERNAMA, March 30, 2021.
- 21 [Sixth National Report](#), p. 30
- 22 "[Red List Index, Malaysia](#)" Our World in Data, accessed June 20, 2022.
- 23 [Sixth National Report](#), p. 4
- 24 [Sixth National Report](#), p. 30
- 25 Ministry of Energy, Green Technology and Water, [Green Technology Master Plan \(2017-2030\)](#), 2017, p. 133.
- 26 Ibid., p. 139.
- 27 Ibid., p. 144.
- 28 Ibid., p. 135
- 29 Ibid., p. 144
- 30 Ibid., p. 135.
- 31 Environmental Performance Index, "[Malaysia](#)," accessed June 20, 2022.
- 32 Ministry of Energy, Green Technology and Water, [Green Technology Master Plan](#), p. 133.
- 33 Environmental Performance Index, "[Malaysia](#)."
- 34 Ibid., p. 135.
- 35 Ministry of Energy, Green Technology and Water Malaysia, [Green Technology Master Plan \(2017-2030\)](#), 2017, p. 110.
- 36 "[Malaysia Is on Track to Achieve a 40% Recycling Rate by 2025](#)," The Star, accessed June 21, 2022.
- 37 [Twelfth Malaysia Plan](#), 2021-2025, 8.15 – 8.18
- 38 Ministry of Energy, Green Technology and Water Malaysia, [Green Technology Master Plan](#), p. 118.
- 39 Environmental Performance Index, "[Malaysia](#)," accessed June 20, 2022.
- 40 Ibid.
- 41 Ibid., p. 115.
- 42 Farah Adilla, "[Cypark Resources' WTE Plant to Achieve Commercial Operation Date in FY22](#)," NST Online, April 1, 2022.
- 43 Ministry of Energy, Green Technology and Water Malaysia, [Green Technology Master Plan](#), p. 118-9.
- 44 Ibid., p. 128.
- 45 Bernama, "[Employers Welcome Setting up Nurseries but Face Constraints, Says Minister](#)," Yahoo News, March 25, 2015; John Bunyan, "[Why Aren't Childcare Centres Common in the Workplace](#)? Bosses Explain," Malay Mail, July 8, 2018.,
- 46 Kamal Hassan and Norsuhaida Che Musa, "Women's Right to Breastfeed in the Workplace: Legal Lacunae in Malaysia," Asian Women 30 (June 1, 2014): 85-108.
- 47 Asian Development Bank, "[Women in the Workforce: An Unmet Potential in Asia and the Pacific](#)," 2015.
- 48 World Economic Forum, [Global Gender Gap Report 2021, 2021](#), pp. 265-6.
- 49 Asian Development Bank, "[Gender Equality: Bridging the Gap](#)," 2020.
- 50 FP2020, "[Family planning's return on investment](#)," 2018.
- 51 Kotex, "[Kotex aims to empower 100,000 high school girls in Malaysia to manage their periods with dignity](#)," press release, 17 June 2021.
- 52 UNDP Climate, "[Our Secret Weapon by UNDP Climate on Exposure](#)," accessed June 24, 2022,
- 53 Nasha Lee, "[Low Carbon Cities – Malaysia's Response to Global Climate Emergency](#)," UNDP, December 13, 2019.
- 54 GTALCC Project and Putrajaya Corporation, "[Urban Mobility for City Bikers](#)," For Tomorrow, accessed June 24, 2022.
- 55 UNDP Climate, "Our Secret Weapon by UNDP Climate on Exposure."

# Philippines



# Philippines

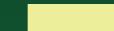
The Philippines is a sprawling archipelago of over 7,000 tropical islands, and its capital, Manila, is located on the island of Luzon. Its major economic sectors include agriculture, industry, and services. The country is expecting GDP growth rates seven to nine percent for 2022, and a six to seven percent growth rate in 2023 and 2024.<sup>1</sup> Recently, the central bank (Bangko Sentral ng Pilipinas) has been considering a series of interest rate hikes to tame inflationary pressures.<sup>2</sup> Still, the Philippine economy continues to expand faster than expected, with the Philippine government optimistic that growth will accelerate in 2022.

The Philippine government has been committed to their medium-term development plan, the Philippine Development Plan (2017-2022). The comprehensive plan outlines a series of roadmaps to sustainably develop the economy, the environment, and the people in the country. This plan is part of a long-term vision "AmBisyon Natin 2040", a vision signed by President Rodrigo Duterte in 2016 to guide development planning. This vision is the result of a whole-of-society visioning process and is symbolic of the country's ambition towards inclusive growth. Under the Development Plan, tangible progress has been made. This includes public-private partnerships, infrastructure renewals, policy reforms and more.

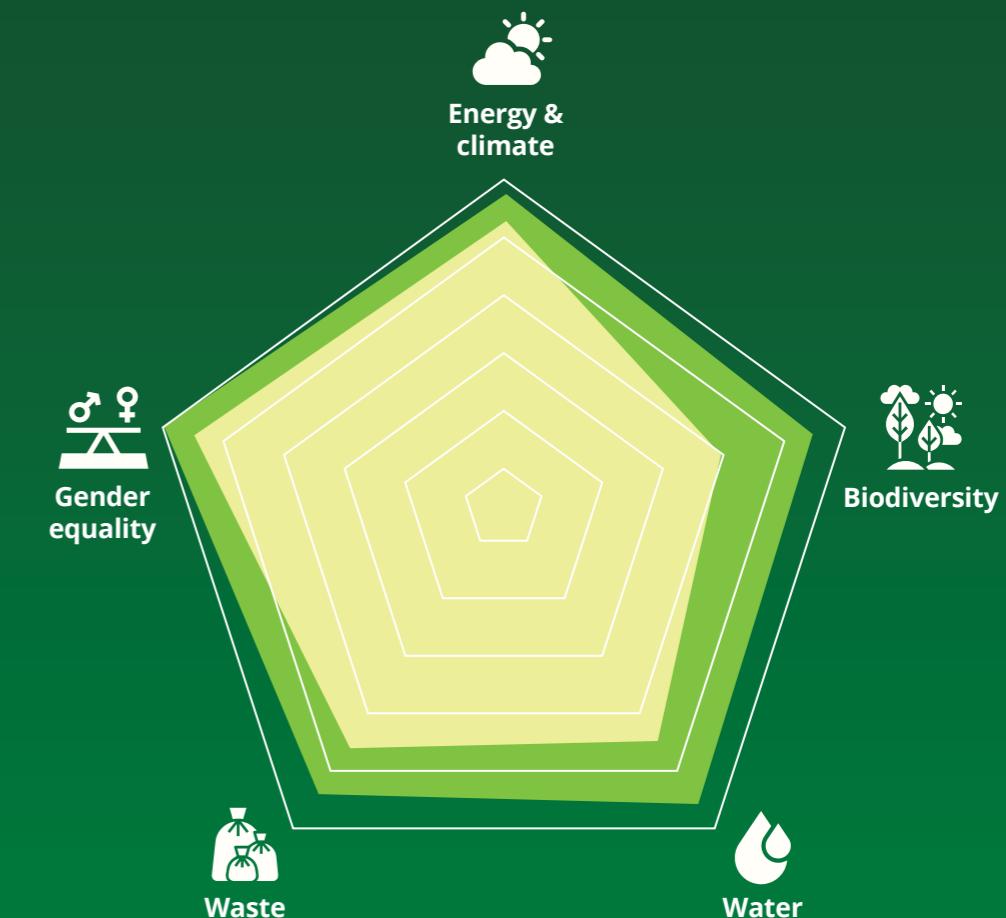
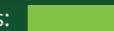
The Philippines is making strides towards fulfilling its international commitments. As one of the original 51 charter members that created the United Nations, the Philippines works closely with the UN to achieve their 2030 Agenda for Sustainable Development. However, their 2022 Voluntary National Review acknowledged the impact of COVID-19 on their gains in SDG outcomes.<sup>3</sup> The government is balancing between risk mitigation and economic recovery, and innovation and collaboration was highlighted to guide the country's road to recovery.

While the Philippine government remains committed to its agenda, it will simultaneously have to address rising tensions across several sectors. There have been calls by environmental coalitions for the country to take more ambitious steps towards decarbonization and banning single-use plastics. Additionally, increasingly adverse weather patterns exacerbate the provision of water services across the country, and its female labor force participation rate remains the lowest in Southeast Asia. These challenges are pressing, but strong public-private partnerships will alleviate these pressures.

Current progress:



Targets and commitments:



## Highlights



The Philippine Development Plan (2017-2022) outlines development pathways in the economy, environment, and people



Adverse weather patterns threaten water security



Calls for action on single-use plastics



## Energy & Climate

The Philippines has one of the lowest carbon emissions per capita in the region. The Philippines has further committed to a 75 percent emissions reduction from business-as-usual levels by 2030, as part of its April 2021 submission for its Nationally Determined Contributions.<sup>4</sup> Nevertheless, the country has neither a net-zero greenhouse gas target nor an emissions trading scheme. COP26 saw six new SEA countries commit to net-zero targets while the Philippines remained silent on this. This led to calls by activists and organizations alike for the Philippine government to take more ambitious steps towards decarbonization and an inclusive energy transition.<sup>5</sup>

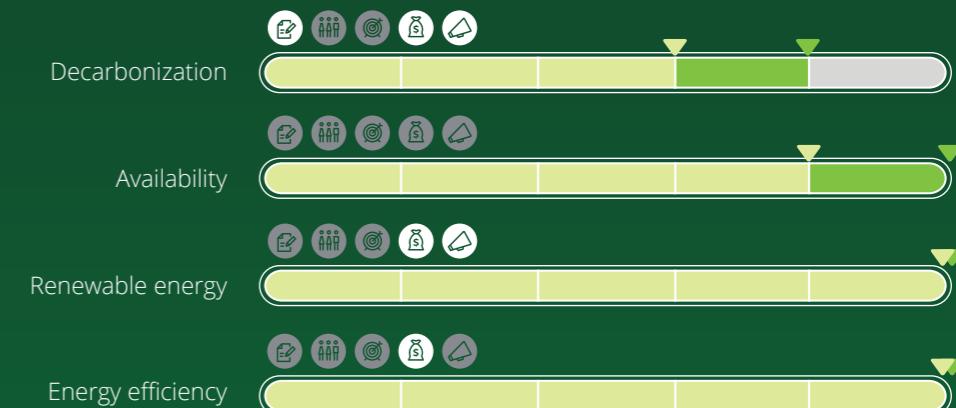
The Philippine government has set targets of having 35 percent of its electricity generated from renewable sources by 2030 and 50 percent by 2040.<sup>6</sup> However, WWF-Philippines noted that the Philippines has the potential to reach 100 percent renewable energy by 2030.<sup>7</sup> The country has a large renewable energy potential, especially in solar energy. With the country having abundant sunlight and sufficient expertise in the domain,<sup>8</sup> the Philippine government is aiming for an additional 18.6GW of solar power by 2030. This commitment by the government attracted many solar energy projects and significant investments.<sup>9</sup>

**"**The Philippines has the potential to reach 100 percent renewable energy by 2030. **"**

Offshore wind facilities, with a wind potential of 178GW, are being considered.<sup>10</sup> Green hydrogen production routes are also being explored, in tandem with fuel cell systems, as cost-competitive alternatives to power provision. In general, the government is keen to accelerate its transition from coal to clean energy and forecasts the need for US\$120 billion in investments towards renewable energy to fulfil its ambitions.<sup>11</sup>

The IMF recommends that the Philippine government utilize carbon-pricing instruments to aid in the region's efforts towards achieving their emissions targets.<sup>12</sup> If implemented gradually and coordinated with existing social transfer schemes, a low-carbon economy can be competitive. A US\$25-a-ton carbon tax would not only cut emissions by 15 percent but achieve the region's aggregate Paris Agreement target.<sup>13</sup> Similar to how they issued a coal power moratorium, the Philippine government could create a fiscal space for investment into green growth if a carbon-pricing instrument was utilized.

Another domain of opportunity is a transition to electric vehicles. The government needs to create a clear roadmap for adoption, with targets on when to mandate for 100 percent electric vehicles for new vehicles sold in the country.



Current progress Targets and commitments

Plans require improvement to achieve commitments  
Plans contain measures to achieve commitments

- Monitoring and Enforcement Mechanisms
- Vulnerable Groups
- Evidence-Based Development Plan
- Investment
- Awareness

## Highlights



As of April 2021, the Philippines raised its carbon emission reduction target to 75% by 2030, up from the 70% target that was set 4 years ago



Solar and wind energy present a large power potential



The country aims to increase renewable share in energy generation mix to 35% by 2030, and 50% by 2040

## Opportunities



Whole-of-society approach, involving especially local organizations and businesses, is needed for an inclusive energy transition



Need for clear roadmap for EV transition



Carbon-pricing mechanisms, if implemented, reinforce the government's commitment to green growth



## Biodiversity

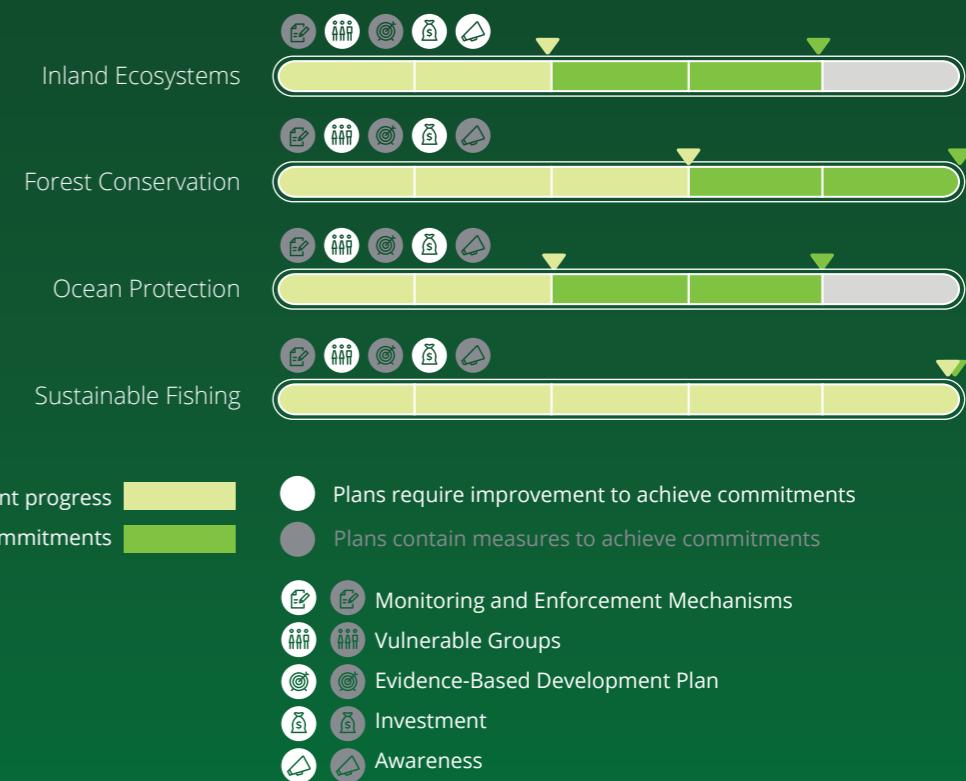
As the world's second-largest archipelago, the Philippines contains two-thirds of the Earth's biodiversity and nearly 80 percent of the world's plant and animal species.<sup>14</sup> More than half of the 52,100 species are endemic, found nowhere else in the world.<sup>15</sup> Its status as a biodiversity hotspot makes it one of the top global conservation areas. The country has, over the past decade, increased the number of its protected areas to 15.4 percent of the country's total land area.

The Philippine Biodiversity Strategy and Action Plan (2015-2028) is the most recent plan aimed at preserving biodiversity.<sup>16</sup> Notably, the action plan emphasizes on the importance of multi-sectoral collaborations across all levels (regional, national and local).<sup>17</sup> This call for synergy is largely unanswered – the Biodiversity Finance Initiative Project, managed by UNDP and supported by the Philippine government, reported that the annual public expenditure on biodiversity falls short of the action plan's targets by nearly 80%.<sup>18</sup> It currently has 21 finance solutions aimed to narrow the gap in funds.<sup>19</sup> One of them is an investment platform that supports and promotes investments, capacities and technologies from the private sector.<sup>20</sup>

Illegal wildlife trafficking, unsustainable harvesting and deforestation has placed significant stress on biodiversity. ■

According to Conservation International, increasing human activity in the country has placed significant stress on the biodiversity.<sup>21</sup> Illegal wildlife trafficking, unsustainable harvesting and deforestation are examples of negative practices in the country. Poor communications infrastructure in certain areas further prevents citizens and law enforcers from reporting violations. In response, the Biodiversity Management Bureau is striving to implement harsher penalties for wildlife crimes,<sup>22</sup> but local environmentalists and wildlife law enforcers argue that these penalties are not targeted at the leaders of the trafficking syndicates.<sup>23</sup>

Besides legal reforms, the Philippines has been exploring innovative, tech-enabled collaborations to combat organized environmental crime. The Asian Development Bank embarked on a three-year project that serves as a role model for its multi-stakeholder engagement, multi-agency collaboration, and multi-pronged approach. One of the initiatives of the project utilized artificial intelligence and machine learning to detect illegal wildlife trade on digital media. The new WildALERT mobile application is another tech-based solution that the government is exploring, to expedite reporting and increase the enforcement of prevailing laws.<sup>24</sup>



## Highlights



The Philippine Biodiversity Strategy and Action Plan calls for multi-sectoral collaborations to effectively implement its roadmaps



Increasing human activity, combined with inadequate infrastructure and lax penalties, exacerbates biodiversity pressures



A recent project by the Asian Development Bank highlights the effectiveness of collaboration and innovation in biodiversity management

## Opportunities



More private sector investment needed to operationalize the Biodiversity Strategy and Action Plan



Increasing regulations and law enforcement showcase the government's commitment towards meeting their biodiversity targets



Government is open to collaboration on applying new technologies and innovative approaches to preserve biodiversity



## Water

The 2021 UN Water Progress Update reported that 47 percent of the population in the Philippines use safely managed drinking water services, and 61 percent of the population use safely managed sanitation services.<sup>25</sup> While both indicators are on an uptrend, they illustrate the absence of universal access to safe water and sanitation services. By 2030, the country aims for universal and equitable access to safe and affordable drinking water for all. This is in line with SDG 6, 'Clean Water and Sanitation'. However, a combination of inefficient irrigation systems, uncoordinated initiatives, and insufficient financing contribute to the current situation.

Natural disasters, like typhoons and droughts, disrupt the efficient provision of water across the country. The effects of these events are increasingly exacerbated by climate change. To cushion the impact of El Nino and other adverse weather phenomena on the country's irrigation systems, the Philippine Development Plan included an integrated watershed management approach to promote water efficiency in the country's 143 critical watersheds.<sup>26</sup> The construction of climate-resilient irrigation systems has also been expedited in areas with high irrigation development potential.<sup>27</sup> For example, in 2022, three fast-tracked irrigation projects costing PHP2.5 billion (US\$46 million) were inaugurated. The irrigation systems would benefit close to 3,000 farmers and help in the food security of the country.<sup>28</sup>

NGOs like Water.org aid the government in empowering local communities by providing no-interest loans to help rural communities gain access to clean water.<sup>29</sup> Other community initiatives include the distribution of portable water filters for families and communities in water-scarce regions. These ground-up initiatives, when combined with governmental efforts to expand water distribution networks and improve water services, will play a part in ensuring that more communities have a reliable access to clean water.

The Philippine government is embarking on an inter-agency effort to coordinate efforts and encourage investments into the sector. With that, institutional reforms are being pursued. For example, in September 2021, the National Economic and Development Authority announced the formation of an independent economic regulatory body for the sector.<sup>30</sup> Current plans for the sector call for investments valued at PHP1.1 trillion (US\$54 billion), and for a strengthened regulatory environment that will attract investments from the private sector. These investments will go towards critical reforms in infrastructure necessary to keep up with the rates of population growth and urbanization.

**“Ground-up initiatives will play a part in ensuring that more communities have reliable access to clean water.”**



## Highlights



47% of the population has access to safely managed drinking services, and the Philippine government aims to increase this to 100% by 2030



The Philippine Development Plan includes climate-resilient solutions to combat irrigation inefficiencies



An inter-agency effort is underway to create a regulated environment for investments into the sector

## Opportunities



US\$54 billion in investments needed to expand the provision of water services in the country



Community-centric approaches are important to supplement the efforts of the government



Technologies or systems that optimize water services are welcomed



Plastic packaging waste is one of the most common waste products in the Philippines. In a 2020 WWF report, it was estimated that Filipinos recycle approximately 9 percent of the total plastic waste generated.<sup>31</sup> Another 35 percent were leaked into the environment, and 33 percent were disposed in landfills and dumpsites. Environmental activists have advocated for the passing of a national law on single-use plastics to allow local governments to scale up the successes of their zero-waste approaches.<sup>32</sup>

The Philippine government has responded to the calls for regulating single-use plastic. The Extended Producer Responsibility Act of 2022 (EPR Act) was enacted into law in July 2022.<sup>33</sup> The EPR Act mandates companies to manage plastic waste used in their products sold and distributed within the Philippines or be subject to fines. These companies will be required to meet specific targets by 2030 to qualify for certain tax incentives and avoid penalties. While not an outright ban on single-use plastics, this law is seen by many as a crucial first step in a country-wide zero-waste approach.

There is low compliance by local governments to the Ecological Solid Waste Management Act of 2000, an act meant to guide solid waste management plans and establish environmentally sound disposal systems in the country.<sup>34</sup> The Philippine Development Plan (2017-2022) noted a 37 percent compliance to the Act. Insufficient funds for the required facilities was cited as the reason

by the majority who have yet to comply.<sup>35</sup> Following that, the Development Plan included a roadmap to provide assistance for local governments. This includes incentives for local recycling centers to participate in local waste management efforts and plans to adopt alternative waste management technologies (like waste-to-energy). Common waste management facilities will also be clustered and shared for local governments to reap benefits from economies of scale.

Both local governments and private companies have begun to source for and implement innovative technologies in the waste management sector. There are 13 waste-to-energy plants registered with the Department of Energy, with seven more in different stages of development.<sup>36</sup> In line with the country's shift away from coal power, the Department of Energy is also looking to repurpose coal-fired power plants to biomass plants. There have also been innovations by private sector companies, including one company that recycles plastics into waterproof planks to use in building construction.<sup>37</sup>

**“**Companies will be required to meet specific targets by 2030 under the EPR Act to qualify for certain tax incentives and avoid penalties. **”**



## Highlights



EPR Act to better manage plastic waste enacted



Increased assistance provided to local governments to comply with the country's solid waste management development plan



Both public and private sector are increasingly embracing innovative waste management solutions

## Opportunities



Innovative waste management solutions, especially waste-to-energy solutions, are being sought after at both the national and local level



Local governments welcome investments towards waste management facilities



Efforts by the private sector to manage waste supported by the public sector



## Gender Equality

The recent 2021 Gender Equality Rating by the World Economic Forum ranked the Philippines first in Asia.<sup>38</sup> Over the years, the country has narrowed its overall gender gap by over 78 percent. The report also tracks gaps in Educational Attainment and Health and Survival, both of which the country has virtually closed. Additionally, the Philippine government has managed to improve wage equality and literacy rates for all.

The Philippine government is committed to numerous gender-responsive legal and policy initiatives. The Gender Equality and Women's Empowerment Plan (2019-2025) is one example. Women are also generally well represented in senior and managerial positions. For example, women make up over 50 percent of all managers in the country, surpassing the global average of 33 percent.<sup>39</sup>

However, at 49.1 percent, the country's female labor force participation rate remains the lowest in Southeast Asia.<sup>40</sup> Assessments of the labor market reveal that the employment growth has not been inclusive for women. Strong gendered divisions of labor persist, with women assuming primary commitments to unpaid household and care work. Some attribute this to the unsafe climate that women find themselves in, with a study labelling the Philippines as the third-most dangerous country in ASEAN for women.<sup>41</sup> Another study also found that discrimination and harmful gender norms undo any meaningful progress made by policy changes and new laws.<sup>42</sup>

The Asian Development Bank proposed a set of recommendations for a gender inclusive labor market.<sup>43</sup> These include the strengthening of current employment policies, reducing women's domestic work and care burden, and increasing social dialogue on the issue. Social protection coverage for informal workers, majority of whom are women, can be achieved through public-private partnerships.

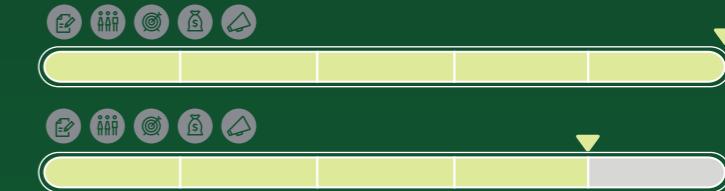
Improving digital access and literacy could empower women-owned businesses, opening up more e-commerce opportunities for them to generate economic value. The COVID-19 pandemic has presented a window for women to enter a traditionally masculine and male-dominated technology market. For example, the Department of Information and Communication Technology is actively promoting women's roles in the digital economy.<sup>44</sup> Highlighting the roles that women have played in developing cryptocurrencies and cybersecurity frameworks, the Department is heavily invested in increasing women's participation in the labor force. In tandem with this, local organizations can support communities with the necessary digital expertise required to transform their businesses.

**“** Social protection coverage for informal workers, the majority of whom are women, can be achieved through public-private partnerships. **”**

Ending all forms of discrimination, violence and harmful practices

Equal Opportunities and Empowerment

Current progress



- Plans require improvement to achieve commitments
- Plans contain measures to achieve commitments
- Monitoring and Enforcement Mechanisms
- Vulnerable Groups
- Evidence-Based Development Plan
- Investment
- Awareness

## Highlights



The Gender Equality and Women's Empowerment Plan (2019-2025) highlights the country's commitment to investing in gender equality



The country's female labor force participation rate remains at 49.1%



Improvements in current policies can create a more gender-inclusive labor market

## Opportunities



Foster private-public partnerships to provide technological resources and funding to uplift women-led business in the digitized economy



Create inclusive workplaces by providing training materials to eliminate discrimination patterns and harmful social norms



Expand benefits to incentivize the participation of all women, regardless of marital status, in paid work



### Case study: Gender equality in the Philippines

According to the Global Gender Gap Report 2021 by the World Economic Forum, the Philippines continues to rank first in Asia. Over the years, it has closed over 78 percent of its overall gender gap. The Global Gender Gap calculates the gap based on four categories: Economic Participation and Opportunity, Educational Attainment, Health and Survival and Political Empowerment. The Philippines performs above average in all four categories. Notably, it performs well in representation of women in senior management roles, educational attainment, and political representation.

The government's full commitment was instrumental. The Gender Equality and Women's Empowerment Plan (2019-2025) served as a guide for government agencies to plan and budget for a gender-equal economy. A comprehensive set of indicators, including the employment data of women in ICT, technology and engineering, is being tracked to monitor the progress of the plan. These indicators are coordinated and tracked by the Philippine

Commission on Women, the primary policy-making body on women and gender equality concerns. Recently, the Commission directed government agencies to a Gender-Fair Media playbook, an inter-agency resource to help ensure that communication materials are gender-sensitive.<sup>45</sup>

However, further improvements in specific areas, such as the female labor force participation rate (LFPR), will solidify the country's status as a frontrunner in gender equality. Currently at 49.1 percent, the female LFPR remains the lowest in Southeast Asia. A study by the National Economic and Development Authority was conducted to identify the factors influencing the female LFPR in the country. Focus group discussions were conducted to obtain these results. Policy recommendations were provided to increase the LFPR by counteracting harmful gender norms. Extended paternity leave and improved working environments for working adults with young children will also help in incentivizing women to enter the labor force.

# Endnotes

- 1 Channel NewsAsia, "[Philippine GDP beats forecasts in Q4, government sees 2022 acceleration](#)", January 27, 2022.
- 2 Channel NewsAsia, "[Philippine central bank to raise rates by 25 bps in June, some call for 50bps](#)", June 21, 2022.
- 3 United Nations High-Level Political Forum on Sustainable Development, "[Philippines](#)", accessed June 23, 2022.
- 4 ASEP-CELLS, "[Conferences And Commitments: The COP26 And The Philippine NDC](#)", December 3, 2021.
- 5 Asian Development Bank, "[ADB President Reiterates Need for “Just, Inclusive” Energy Transition at G20 Event](#)", March 17, 2022.
- 6 REN21, [Asia and The Pacific Renewable Energy Status Report, 2019](#), p. 11.
- 7 WWF-Philippines, [Building Momentum for Low Carbon Development in the Philippines, 2014](#), p. 9.
- 8 GIZ, It's more sun in the Philippines, 2013, p. 9.
- 9 Jonathan Burgos, "[Ayala-Backed AC Energy To Invest \\$274 Million In Philippine Solar, Wind Energy Projects](#)", December 30, 2021.
- 10 Keiron Greenhalgh, "[Offshore wind capacity in the Philippines may hit 21 GW: World Bank](#)", April 22, 2022.
- 11 Kris Crismundo, "[PH needs \\$121-B investments in renewable energy: DOE](#)", June 15, 2021.
- 12 Louise Maureen Simeon, "[Carbon tax to aid Philippine's green recovery](#)", May 5, 2021.
- 13 Ben O. de Vera, "[PH urged to impose \\$75/ton carbon tax](#)", March 27, 2021.
- 14 Convention on Biological Diversity, "[Main Details](#)", accessed June 23, 2022.
- 15 Conservation International Philippines, "[PROTECTING BIODIVERSITY IN THE PHILIPPINES](#)", accessed June 23, 2022.
- 16 Biodiversity Management Bureau (BMB) Department of Environment and Natural Resources (DENR), [Philippine Biodiversity Strategy and Action Plan \(2015-2028\): Bringing Resilience to Filipino Communities](#), 2016, pp. 1-252.
- 17 Ibid.
- 18 BIOFIN, "[A boost for financing protected areas in Philippines](#)", accessed June 23, 2022.
- 19 BMB DENR, "[DRIVING INVESTMENT AND ACCOUNTABILITY THE FOCUS OF NEW MONITORING PLATFORM FOR BIODIVERSITY FINANCE IN THE PHILIPPINES](#)", March 4, 2019.
- 20 United Nations Global Compact, [Communication on Progress ADEC Sustainability Report 2019](#), 2020, p. 4.
- 21 Conservation International Philippines, "[PROTECTING BIODIVERSITY IN THE PHILIPPINES](#)".
- 22 BMB DENR, "[ILLEGAL WILDLIFE TRADE: A CONDUIT THROUGH WHICH CORONAVIRUS TRANSMITTED TO HUMAN](#)", accessed June 23, 2022.
- 23 Oxfam, "[Philippine wildlife criminals get away with a slap on the wrist](#)", accessed June 23, 2022.
- 24 Mongabay, "[Philippine wildlife reporting app promises to upgrade fight against trafficking](#)", September 3, 2020.
- 25 UN Water, "[Summary Progress Update 2021: SDG 6 — water and sanitation for all](#)", February 21, 2021, p. 43.
- 26 National Economic Development Agency, "[Philippine Development Plan 2017-2022](#)", p. 8-8.
- 27 Ibid.
- 28 National Irrigation Administration, "[3 FAST-TRACKED IRRIGATION PROJECTS TO BENEFIT 2,828 FARMERS IN CARAGA REGION](#)", March 11, 2022.
- 29 Water.org, "[Philippines' water and sanitation crisis](#)", accessed June 23, 2022.
- 30 National Economic Development Agency, "[NEDA LAUNCHES PH WATER MASTER PLAN, SUPPORTS CREATION OF WATER DEPARTMENT AND REGULATORY BODY](#)", September 16, 2021.
- 31 WWF-Philippines, [EPR Scheme Assessment for Plastic Packaging Waste in the Philippines](#), 2020, p. 35.
- 32 Jed Alegado, Froilan Grate, "[A zero-waste Philippines is possible](#)", February 7, 2019.
- 33 Vic Dimagiba, "[Extended producer responsibility](#)", February 5, 2022.
- 34 Department of Environment and Natural Resources, "[SOLID WASTE MANAGEMENT PROGRAM](#)", accessed June 23, 2022.
- 35 National Economic Development Agency, "[Philippine Development Plan 2017-2022](#)"
- 36 Danessa Rivera, "[Waste-to-energy: A boon or bane for Philippines?](#)", May 31, 2022.
- 37 Adrian Portugal, "[A Filipino company is turning plastic waste into building materials](#)", October 27, 2021.
- 38 World Economic Forum, Global Gender Gap Report 2021 Insight Report, March 2021, p. 10.
- 39 World Economic Forum, Global Gender Gap Report 2021 Insight Report, p. 14.
- 40 World Economic Forum, Global Gender Gap Report 2021 Insight Report, p. 38.
- 41 The ASEAN Post, "[Most Unsafe Countries For Women In ASEAN](#)", July 11, 2020.
- 42 OXFAM, [Intersecting injustices: the links between social norms, access to sexual and reproductive](#), August 2020.
- 43 Asian Development Bank, [Gender equality in the labor market in the Philippines](#), 2013.
- 44 Connected Women, "[Meta PH and Connected Women Champion Digital Inclusion in Latest Women-Led Forum](#)", April 25, 2022.
- 45 Philippine Commission on Women, "[PCW reminds gov't agencies on gender-sensitive IEC materials](#)", October 13, 2020.

# Singapore



# Singapore

Singapore has been touted as a city-state that managed to become an advanced economy while preserving its environment as it modernizes. Over the span of its 50-odd years post-independence, Singapore has meticulously planned for and adhered to its vision of being a global green powerhouse. It ranks highly among other global cities for the performance of its green buildings,<sup>1</sup> and is one of the cities with the highest area of green spaces.<sup>2</sup> Singapore is consistently ranked as one of the most competitive economies, with a business-friendly regulatory environment, close connectivity to the region and well-educated human capital. Leveraging on its innovation ecosystem and significant finance sector, Singapore has the capacity to create world-leading technological solutions to tackle environmental challenges, and drive climate action through the development of its sustainable finance sector.

Singapore's 2030 Green Plan is a holistic whole-of-nation movement to advance the national agenda on sustainable development. This multi-ministerial effort will include plans to double the

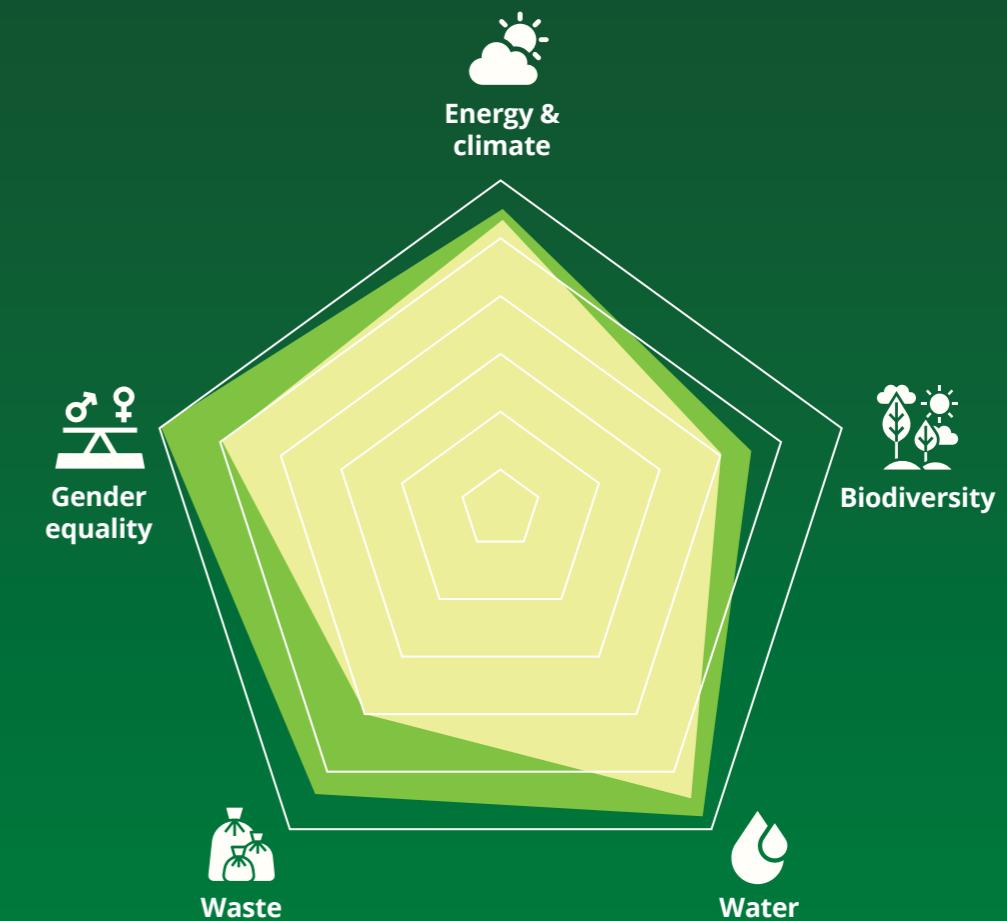
number of electric vehicles on the roads, reduce waste sent to landfills by 30 percent, restore ecological habitats and so on. The government will also involve the public and other partners to co-create solutions for sustainability. Ambitious targets presented under this plan signal the country's commitments to the UN 2030 Sustainable Development Agenda and Paris Agreement.

The island nation-state is the first country in Southeast Asia to introduce a carbon pricing mechanism (in 2019, at S\$5 per ton, or tCO<sub>2</sub>e). This price will be raised to S\$25/tCO<sub>2</sub>e in 2024-2025 and further raised to reach S\$50-S\$80/tCO<sub>2</sub>e by 2030 in line with the country's net-zero ambitions.<sup>3</sup> Currently accounting for 40 percent of the country's total carbon emissions, the energy sector aims to decarbonize and reach net-zero emissions by 2050. As a country with few alternative energy sources, its energy transition presents economic growth potential for the region through renewable energy imports and hydrogen technologies in the near future.

Current progress:



Targets and commitments:



## Highlights



Singapore aims to be a City in Nature



The country's 2030 Green Plan will advance the national agenda on sustainable development



The country's energy sector aims to decarbonize and reach net-zero emissions by 2050



## Energy & Climate

Singapore has recently shown strong intent in operationalizing its long-term low-emissions development strategy. In line with its renewed ambitions to achieve net-zero by or around 2050,<sup>4</sup> the country has recently announced a progressive increase in its carbon tax rates. Notably, Singapore is the first country in Southeast Asia to introduce a carbon pricing mechanism (in 2019, at S\$5 per ton, or tCO<sub>2</sub>e). This price will be raised to S\$25/tCO<sub>2</sub>e in 2024-2025 and further raised to reach S\$50-\$80/tCO<sub>2</sub>e by 2030.<sup>5</sup> The carbon tax revenue will support decarbonization efforts and the transition to a green economy.<sup>6</sup>

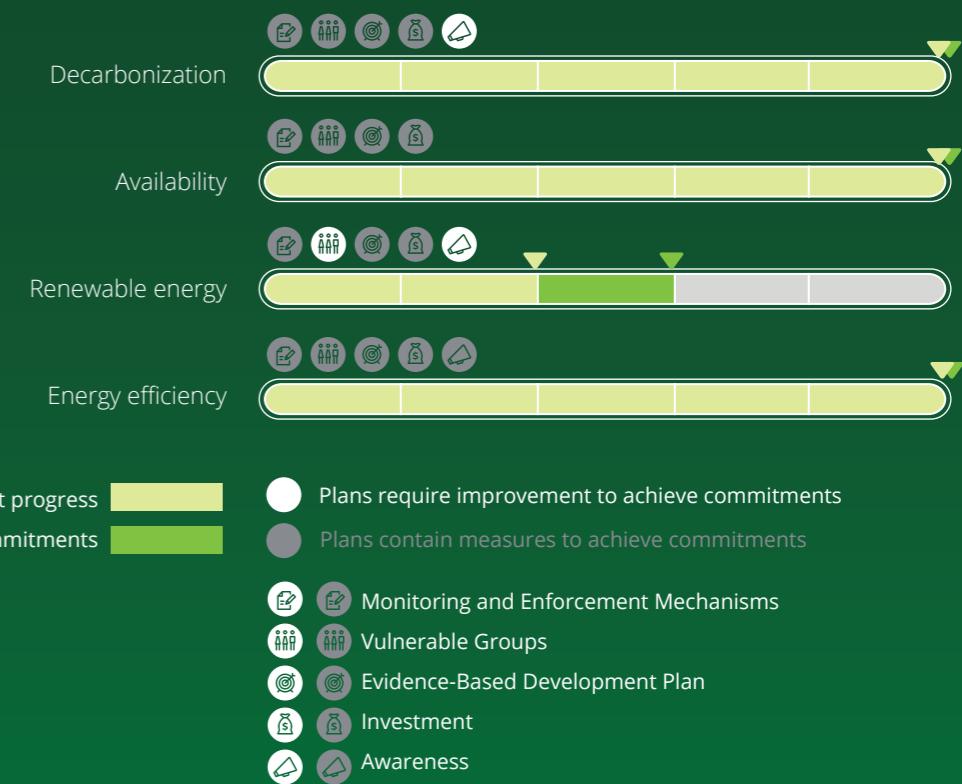
Singapore's power sector aims to decarbonize and transform its energy supply. While the sector currently accounts for 40 percent of the country's carbon emissions, the Energy Market Authority has reported that its net-zero ambitions are realistic.<sup>7</sup> Natural gas remains the country's predominant fuel, making up approximately 95 percent of the country's energy mix.<sup>8</sup> Nevertheless, promising developments have been made in renewable energy development. As one of the most solar dense cities in the world, Singapore has embraced innovative solutions to deploy PV systems on water bodies and sheltered walkways.<sup>9</sup> Singapore is also intending to tap on regional power grids, importing up to 4GW of low-carbon electricity by 2035 (30% of the country's projected supply).<sup>10</sup> Additionally, a recent S\$25 million investment by the government into hydrogen technologies signals the country's interest in creating a hydrogen economy.<sup>11</sup>

Singapore is also actively developing its green bond market, with the Government announcing during Budget 2022 that the public sector will issue up to US\$25 billion of green bonds by 2030. It has since introduced the Singapore Green Bond Framework and announced US\$0.7 billion in green bonds to fund new sustainable public housing.<sup>12</sup>

Given Singapore's large finance sector, it has also rolled out multiple schemes to promote sustainable finance. The Monetary Authority of Singapore committed US\$2 billion to invest in public market investment strategies with a strong green focus.<sup>13</sup> The Green Finance Industry Taskforce issued implementation guidelines for climate-related disclosures. The Singapore Exchange invested S\$20 million in ramping up ESG solutions for customers and developing new ESG products, services, and platforms.<sup>14</sup>

The Land Transport Authority also aims to achieve its vision of 100 percent cleaner energy vehicles by 2040. There is a strong push for electric vehicles while new diesel car registrations will be disallowed from 2025. Encouraged by generous tax incentives, between end-2020 and end-July 2021, the number of electric vehicles on the road has increased by 39 percent.<sup>15</sup>

**“** Singapore is the first country in Southeast Asia to introduce a carbon pricing mechanism. **”**



## Highlights



Singapore leads the region in implementing a carbon tax, with a current tax of S\$5/tCO<sub>2</sub>e and a projected tax of S\$50-\$80/tCO<sub>2</sub>e by 2030



Extensive plans have been made to decarbonize the country's energy sector and diversify the electricity mix



Government agencies utilizing policy and funding levers to spur sustainability in sectors such as finance, housing and transportation

## Opportunities



Research and innovation on decarbonization welcomed, funded by carbon tax revenues



Opportunities in sustainable finance and tapping green bond markets



Electric vehicles and other cleaner-energy models expected to see increase in demand



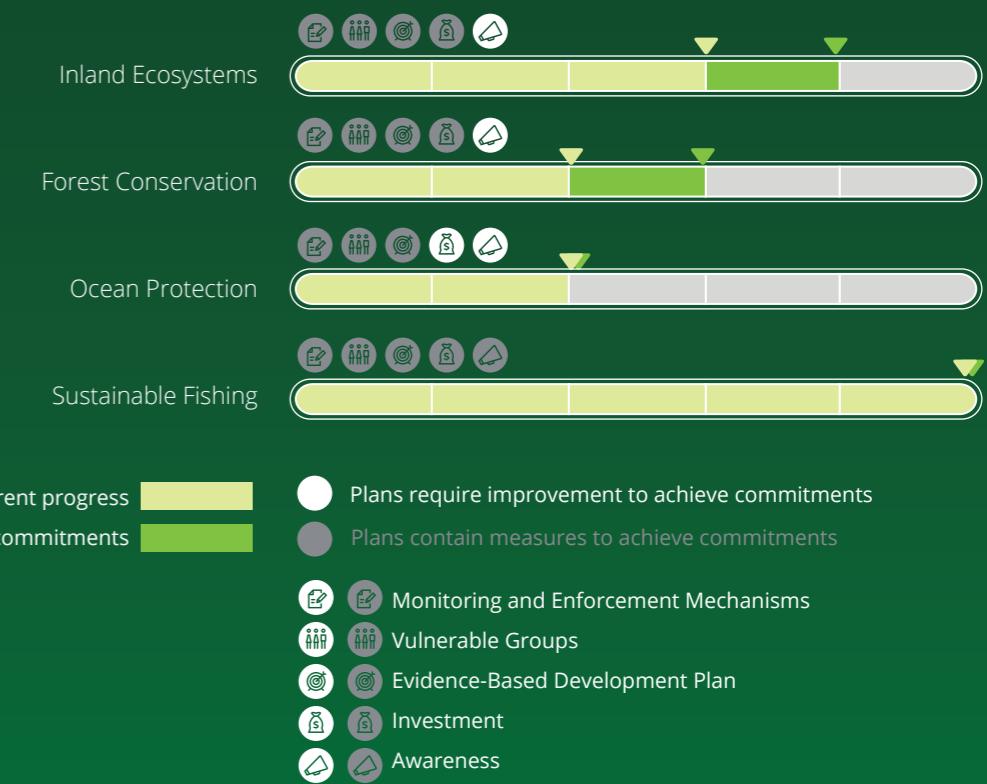
## Biodiversity

Singapore has evolved from a 'Garden City' to a 'City in a Garden', and now has ambitions of transforming into a 'City in Nature'. As of today, more than 10 percent of the total land area has been safeguarded to form nature reserves, gardens, and parks.<sup>16</sup> Singapore was ranked as the city with the highest density of greenery out of 17 cities ranked by MIT's Senseable City Lab and the World Economic Forum in the 2017 Green View Index.<sup>17</sup> By 2030, the country plans to add an additional 700 hectares of nature parks, gardens and skyscraper greenery. Species recovery plans for over 160 plants and animal species will also be implemented by then.<sup>18</sup>

Given its unique constraints as a land-scarce island nation, Singapore is applying a science-based approach to preserving natural capital while managing urban development pressures. It is creating more ecological corridors to connect fragmented nature habitats, so that the sum is more than the parts when it comes to biodiversity conservation. The National Parks Board has developed ecological profiling tools to monitor the movement patterns of animal and bird species, and uses this data to inform urban planning. For example, the new Sungei Buloh Nature Park Network, introduced in 2020, safeguards a variety of complementary wetland habitats over an area three times the size of the core Sungei Buloh Wetland Reserve, Singapore's first ASEAN Heritage Park.<sup>19</sup> Members of the public who are passionate about local wildlife can also join the Sungei Buloh Volunteers in Reserve Service, where they would support education programs, tours and outreach efforts.<sup>20</sup>

Singapore has also made strides in stakeholder engagement on balancing nature and urban planning needs.<sup>21</sup> This commitment was seen in the long-drawn engagement process for constructing a new underground Cross Island train line, whose construction works could potentially upset the equilibrium of the country's largest nature reserve. The Land Transport Authority conducted a comprehensive two-phased Environmental Impact Assessment before deciding on the final development plan.<sup>22</sup> Importantly, the concerns about habitats and species raised by NGOs and public institutions were captured and addressed in the impact assessment.<sup>23</sup> Since then, actively stewarding the nation's green and blue resources has featured prominently in the government's consultations on long term urban development plans.

**"**Given its unique constraints as a land-scarce island nation, Singapore is applying a science-based approach to preserving natural capital while managing urban development pressures.**"**



## Highlights



Singapore has evolved from a 'Garden City' to a 'City in a Garden', and now has ambitions to transform into a 'City in Nature'



The country's 2030 Green Plan includes species recovery plans and the restoration of ecological habitats



Singaporean authorities consciously apply ecological principles into land use planning to balance urbanization pressures and habitat conservation

## Opportunities



Building owners and real estate developers can utilize government ecological data to mitigate effects of redevelopment on wildlife



Businesses and non-profit organizations can collaborate with government agencies to enhance existing biodiversity in communal spaces (such as community gardens and rooftops)



Increased education on biodiversity can be coupled with collaborations with local interest groups and businesses



## Water

Singapore has built a diversified and robust supply of water well-known as the “Four National Taps”, comprising (1) water from local catchment areas, (2) imported water, (3) NEWater, and (4) desalinated water. This system allows for the country to meet their water needs in an integrated and cost-effective way. Singapore is an emerging Global Hydrohub, a leading center for business opportunities and expertise in water technologies, with 180 water companies and more than 20 research centers in its ecosystem.<sup>24</sup> Singapore also hosts a biennial Singapore International Water Week, providing a platform for new innovations and to foster partnerships among industry players. Close to US\$500 million (S\$670 million) has been committed since 2006 to research.

Singapore’s Green Plan 2030 promotes a circular economy by including a closed water loop through the treatment and purification of used water into reclaimed NEWater. The country’s tap water falls well within the World Health Organization (WHO) guidelines for drinking water, where water is suitable for drinking without further filtration. To complement the country’s existing efforts, Singapore’s national water agency (PUB) seeks to leverage digital solutions and smart technologies in strengthening its operational resilience. **”**

Singapore’s water demand could double by 2060 from the current 430 million gallons a day (mgd), with the non-domestic sector accounting for about 70 percent.<sup>25</sup> By this period, NEWater and desalination will meet up to 85 percent of future water demand in the country. As demand for water continues to rise in tandem with population and economic growth, it is imperative for Singapore to plan and implement water infrastructure well ahead to secure adequate and affordable supply of water for future generations.

**”** Singapore’s national water agency (PUB) seeks to leverage digital solutions and smart technologies in strengthening its operational resilience. **”**



## Highlights



Singapore’s ‘Four National Taps’ allow the country to meet its water demands well



PUB leverages on smart, technology-enabled solutions in its water resource management



By 2060, NEWater and desalination will account for 85% of future water demand

## Opportunities



Singapore International Water Week fosters dialogue between policymakers, water experts and industry leaders



Singapore’s status as a Global Hydrohub signals the water industry’s importance as a key growth industry



PUB welcomes local and international collaborations to develop and commercialize new products and solutions



## Waste

Singapore's recycling rate in 2021 was 55 percent, or about 3.83 million tons of the 6.94 million tons of solid waste generated.<sup>26</sup> The amount of waste disposed of in Singapore has increased seven-fold over the last 40 years. At the current rate, Semakau Landfill (Singapore's only landfill) will run out of space by 2035. As such, Singapore's inaugural Zero Waste Masterplan maps out Singapore's key strategies in building a sustainable and resource-efficient nation. Singapore is also intending to build the world's largest integrated waste management facility, with the first phase targeted for completion by 2025.<sup>27</sup>

The domestic recycling rate was only 13 percent, with plastic recycling rate at a low six percent. In 2020, under the new Mandatory Packaging Reporting framework, producers of packaged goods are required to submit packaging data and 3R plans to the National Environment Agency.<sup>28</sup> This is to implement an Extended Producer Responsibility framework, which serves to improve recycling rates for packaging, and to reduce the amount of packaging waste sent to the landfill.

Singaporeans generate approximately 60,000 tons of electronic waste (e-waste) each year.<sup>29</sup> In July 2021, Singapore introduced a nation-wide electrical and e-waste management system to make recycling more convenient for consumers, with more than 300 e-waste recycling bins have been distributed at public locations.

Food waste currently accounts for about 12 percent of the total waste generated. Starting from 2021, developers of new large commercial and industrial premises must set aside space for on-site food waste treatment systems. From 2024, large commercial and industrial food waste generators will also have to segregate their food waste for treatment. The National Environmental Agency has set aside S\$1.76 million for applicants to cover the capital cost of these food waste treatment systems.<sup>30</sup>

**"** Singapore is intending to build the world's largest integrated waste management facility. **"**



## Highlights



Singapore's Zero Waste Masterplan highlights a circular economy approach to waste and resource management practices



Increased emphasis on raising both domestic and non-domestic recycling rates



Mitigating food waste, especially from large commercial food waste generators, to become a priority

## Opportunities



Scope for a whole-of-society approach to raising domestic recycling rates



Innovative packaging solutions required to reduce packaging waste under Extended Producer Responsibility framework



Demand for space-efficient food waste treatment facilities likely to increase



## Gender Equality

Singapore ranked fifth in the region and 54th out of 156 countries in the 2021 Global Gender Gap Index, largely hampered by the low representation of women in the political sphere.<sup>31</sup> There have been significant improvements in female economic participation and opportunity. The resident labor force participation rate of women in the country has been increasing steadily from 57 percent in 2010 to 64.2 percent in 2021, narrowing the gap with men (77.2 percent in 2021).<sup>32,33</sup> Nevertheless, the representation of women in senior leadership could be further improved – In 2021, 13 percent of Singapore companies were helmed by a female CEO.<sup>34</sup>

In April 2022, Singapore's first White Paper on women's development was presented for Parliament to debate.<sup>35</sup> This was the culmination of feedback from a year-long nationwide "Conversations on Singapore Women's Development".<sup>36</sup> The White Paper proposed 25 action plans across five broad areas – equal opportunities in the workplace, recognition and support for caregivers, protection against violence and harm, other support measures and mindset shifts. The White Paper was unanimously endorsed by Members of Parliament, signifying the government's commitment to advancing the issues presented within. These action plans will be implemented over a 10-year period. This includes a new set of Tripartite Guidelines on Flexible Work Arrangements to be introduced in 2024 and schemes and grants to support caregivers.

In response to the White Paper, AWARE, a non-profit organization that advocates for gender equality in Singapore, highlighted that more could be done for groups such as migrant domestic workers, and religious and ethnic minorities.<sup>37</sup>

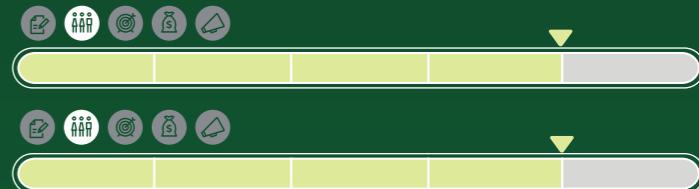
Better workplace support for fathers to share caregiving burdens could also contribute to more equal gender outcomes. The Ministry of Social and Family Development reported that the take-up rate of paternity leave was 55 percent in 2019,<sup>38</sup> citing the lack of workplace support as the main reason for fathers not to use their paternity leave.<sup>39</sup>

**"** There have been significant improvements in female economic participation and opportunity. **"**

Ending all forms of discrimination, violence and harmful practices

Equal Opportunities and Empowerment

Current progress



- Plans require improvement to achieve commitments
- Plans contain measures to achieve commitments
- Monitoring and Enforcement Mechanisms
- Vulnerable Groups
- Evidence-Based Development Plan
- Investment
- Awareness

## Highlights



Recent White Paper on Singapore Women's Development unanimously endorsed by Parliament



25 action plans proposed by the White Paper to be implemented over a 10-year period



The White Paper is built on the premise that men and women are 'equal partners and contributors to society'

## Opportunities



Significant scope to support women in entering leadership positions in both business and political spheres



Workplaces can embrace flexible work arrangements, making them the new norm



Increased workplace support can incentivize uptake of paternity leave, and more equal sharing of family responsibilities



Aerial shot of the Eco-Link@BKE. Source: NParks

## Case study: Creating A Wildlife Paradise in A City in Nature

According to a 2003 study by Brook and Sodhi, the loss of 95 percent of Singapore's forest cover to urban development had contributed to a 28 percent species extinction rate for local biodiversity.<sup>40</sup> Since then, Singapore has reshaped their urban plans to not just conserve the remaining biodiversity but bring back wildlife to its shores. This includes the wild oriental pied hornbill and smooth-coated otters, which disappeared from Singapore in the late 19th century to mid-20th century but are common sightings today.

One effective strategy was to address the fragmentation of habitats where smaller isolated habitat patches made it challenging for native biodiversity to find food, shelter and reproduce. In 2013, Singapore built Eco-Link, a highway for animals that connects two nature reserves which was bifurcated by an expressway in 1986.<sup>41</sup> The National Parks authority, NParks, also embarked on an Ecological Profiling Exercise to understand the dispersal patterns of individual

organisms. Based on this computational model, urban planners then identified key ecological corridors between core habitats which they will conserve and enhance as part of the Long-Term Plan, Singapore's 50-year urban development plan. This includes a new ecological corridor, the Khatib Nature Corridor, where more than 90ha of new green spaces will be introduced. Three other nature corridors are under study, while a fourth could be identified when the old Paya Lebar Air Base is redeveloped.<sup>42</sup> Such ecological profiling data could also inform building owners and developers if their properties are along key nature pathways so that they may minimize or mitigate environmental damage.

This case study provides optimism that wildlife could live in harmony with urban redevelopment, and that it is possible to restore biodiversity even in dense built-up cities.

# Endnotes

- 1 Business Times, "[Singapore ranks 2nd among global cities for green buildings](#)", accessed July 15, 2022.
- 2 WorldAtlas, "[Cities With The Most Green Space](#)", accessed July 15, 2022.
- 3 National Environmental Agency, "[Carbon Tax](#)", accessed July 15, 2022.
- 4 National Climate Change Secretariat Singapore, "[Singapore Will Raise Climate Ambition to Achieve Net Zero Emissions By or Around Mid Century, and Revises Carbon Tax Levels from 2024](#)", accessed July 15, 2022.
- 5 National Environmental Agency, "[Carbon Tax](#)", accessed July 15, 2022.
- 6 National Climate Change Secretariat Singapore, "[Singapore's Long-Term Low-Emissions Development Strategy](#)", accessed July 15, 2022.
- 7 Energy Market Authority, "[Expert Study Affirms Net-Zero Feasibility for Singapore Power Sector by 2050](#)", accessed July 15, 2022.
- 8 Energy Market Authority, "[Electricity Generation](#)", accessed July 15, 2022.
- 9 Energy Market Authority, "[Advancing Singapore's Energy Transition Towards a More Sustainable Future](#)", accessed July 15, 2022.
- 10 Ibid.
- 11 The Straits Times, "[Singapore eyes green hydrogen as energy source with \\$25m institute](#)", accessed July 15, 2022.
- 12 The Straits Times, "[Inaugural \\$1 billion in green bonds to fund new sustainable HDB projects](#)", accessed July 15, 2022.
- 13 Monetary Authority of Singapore, "[New US\\$2 billion Investments Programme to Support Growth of Green Finance in Singapore](#)", accessed July 15, 2022.
- 14 Business Times, "[SGX to invest S\\$20m to boost market access to ESG information and solutions](#)", accessed July 15, 2022.
- 15 The Straits Times, "[Electric vehicle sales accelerate further in Singapore as carrot-stick measures sink in](#)", accessed July 15, 2022.
- 16 National Parks, "[Singapore, a City in Nature](#)", accessed July 15, 2022.
- 17 The Straits Times, "[Singapore tops list of 17 cities with highest greenery density](#)", accessed July 15, 2022.
- 18 National Parks, "[Singapore, a City in Nature](#)", accessed July 15, 2022.
- 19 National Parks, "[Sungei Buloh Wetland Reserve](#)", accessed July 15, 2022.
- 20 National Parks, "[Volunteer](#)", accessed July 15, 2022.
- 21 National Parks, "[Singapore's National Targets \(Addendum, 20 May 2019\)](#)", accessed July 15, 2022.
- 22 Land Transport Authority, "[Cross Island Line](#)", accessed July 15, 2022.
- 23 Land Transport Authority, [Environmental Impact Assessment on Central Catchment Nature Reserve for the Proposed Cross Island Line](#), 2019, p.5-10
- 24 Public Utilities Board, "[Singapore Water Story](#)", accessed July 15, 2022.
- 25 Ibid.
- 26 National Environmental Agency, "[Waste Management](#)", accessed July 15, 2022.
- 27 National Environmental Agency, "[Waste Management Infrastructure](#)", accessed July 15, 2022.
- 28 The Straits Times, "[Manufacturers and retailers report packaging use for new scheme to cut waste](#)", accessed July 15, 2022.
- 29 National Environmental Agency, "[New Nationwide E-Waste Management System Kicks In On 1 July 2021](#)", accessed July 15, 2022.
- 30 The New Paper, "[NEA launches \\$1.76m fund to help minimise food waste](#)", accessed July 15, 2022.
- 31 World Economic Forum, Global Gender Gap Report 2021 Insight Report, March 2021
- 32 The World Bank, "[Labor force participation rate, female \(% of female population ages 15-64\)](#)", accessed July 15, 2022.
- 33 Manpower Research and Statistics Department, [Labour Force in Singapore](#), 2021, p. 17.
- 34 Channel NewsAsia, "[White Paper on Women's Development proposes 25 action plans to be implemented over 10 years](#)", accessed July 15, 2022.
- 35 Channel NewsAsia, "[MPs unanimously endorse White Paper on Singapore Women's Development](#)", accessed July 15, 2022.
- 36 Channel NewsAsia, "[White Paper on Women's Development proposes 25 action plans to be implemented over 10 years](#)", accessed July 15, 2022.
- 37 Association of Women for Action and Research, "[AWARE welcomes the White Paper on Singapore Women's Development, identifies "missed opportunities" that deserve more attention](#)", accessed July 15, 2022.
- 38 Channel NewsAsia, "[IN FOCUS: Child's play? Why many fathers don't take paternity leave and why experts say they should](#)", accessed July 15, 2022.
- 39 Ibid.
- 40 Barry Brook, Navjot Sodhi, Peter Ng, [Catastrophic extinctions follow deforestation in Singapore](#), 2003, accessed July 15, 2022.
- 41 Channel NewsAsia, "[IN FOCUS: How urbanised Singapore is learning to live with its wildlife](#)", accessed July 15, 2022.
- 42 Urban Redevelopment Authority, "[Stewardship of Natural Capital](#)", accessed July 15, 2022.

# Thailand



# Thailand

Thailand is located at the center of mainland Southeast Asia. Urbanization in the country is largely led by the capital, Bangkok, which accounts for over 80 percent of the total urban area in Thailand. Thailand is also located in one of the most bio-diverse regions in the world, with the country itself having one of the world's highest biodiversity per unit area. This places Thailand in the unique position of not only being a commercial business hub, but also a leader in green and clean technologies.

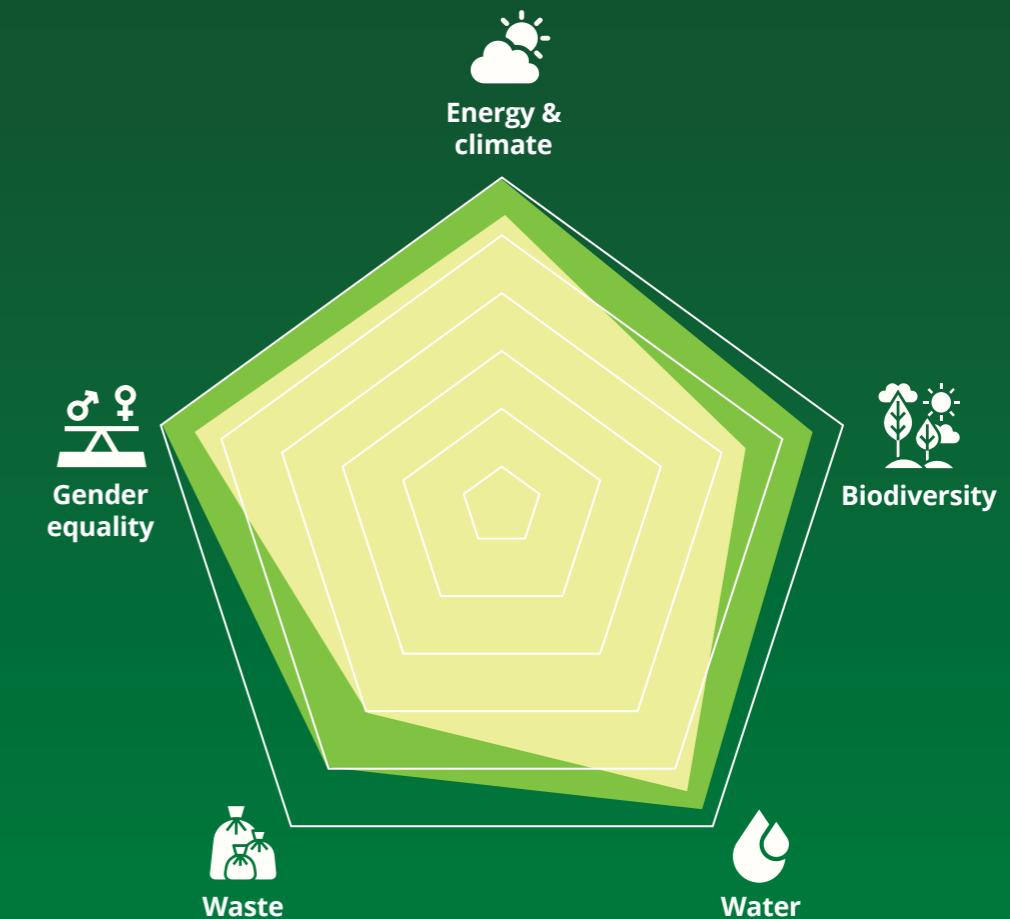
Thailand has a comprehensive 20-Year National Strategy (2018-2037), which the 17 UN SDGs are incorporated into. The country also remains committed to implementing their 2030 Agenda for Sustainable Development. Thailand was part of the 2021 Voluntary National Review on Sustainable Development, which determined that the Thai SDG landscape was well-established. The outlook of Thailand's economic competitiveness will be dependent on its Bio-Circular-Green Economy, Thailand's recent orientation towards environmentally conscious practices, policies, and industries.

Urbanization and climate change present challenges for the country's development. In 2020, slightly over 50 percent of the population live in urban areas, and the country has been facing a decreasing rate of urbanization over the past decade. With a significant proportion of the population living in rural areas, persistent challenges remain, like the provision of water services and the efficient management of municipal waste. Climate change presents extreme weather patterns, which exacerbate and compound these challenges.

Empowering the labor force is crucial while the country transitions from a developing to a developed one, a goal that the Thai government calls 'Thailand 4.0'. Better access to employment opportunities and increased support would increase the labor force participation rate of women, which was at 59 percent in 2021. This whole-of-society transition includes multi-agency and multi-stakeholder collaborations. In tandem with that, a sustained implementation of policies aimed at an equitable distribution of resources for all will be necessary.

Current progress: 

Targets and commitments: 



## Highlights



Electricity generation from biomass has become a priority in Thailand



Food waste valorisation alternatives (i.e., composting) could become an economic opportunity



Expansion of the wastewater network through relevant infrastructural projects and technical capacity building



## Energy & Climate

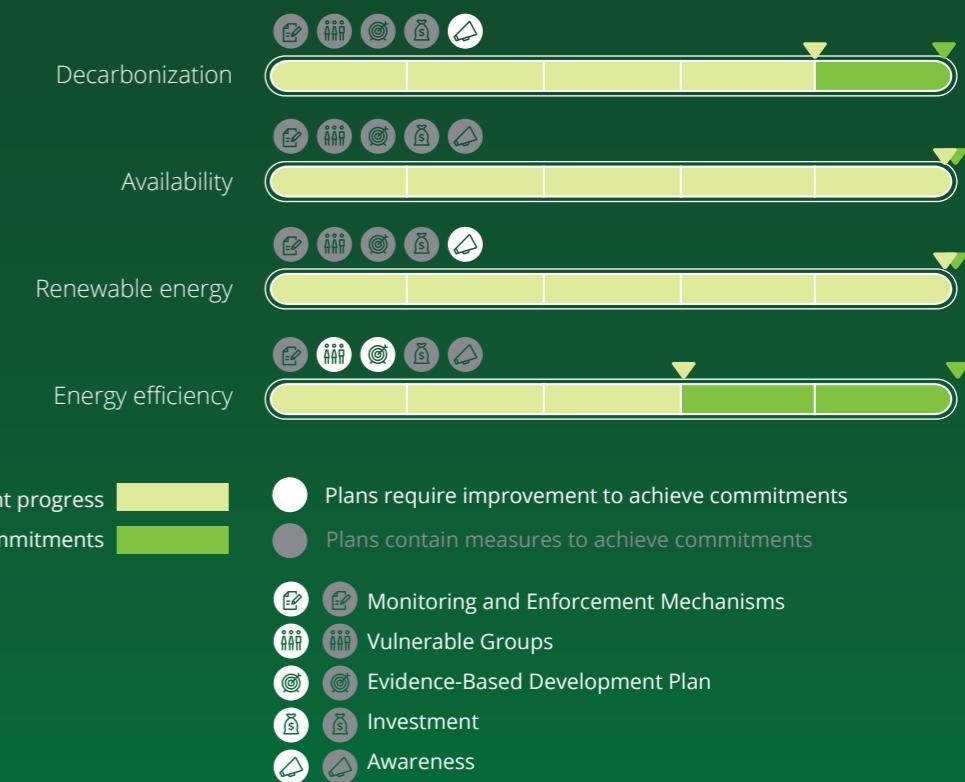
Ranked ninth in the 2021 Global Climate Risk Index, Thailand has a vested interest in mitigating future climate change impacts.<sup>1</sup> Thailand has gradually reduced its reliance on fossil fuels from 90 percent of electricity generated in 2016 to 82 percent in 2020.<sup>2</sup> As part of the updated Power Development Plan (2018-2037), the country plans to reduce this further to 65 percent by 2037 with a target energy mix of 53 percent natural gas, 12 percent coal, and 35 percent renewable energy.<sup>3</sup> This is a significant shift in stance from the earlier Power Development Plan, which had a higher emphasis on coal. With the energy sector accounting for 88 percent of the country's CO<sub>2</sub> emissions, the target energy mix will contribute meaningfully to Thailand's updated mid-term target of 40 percent GHG emissions reduction and net-zero emissions by 2050.<sup>4</sup> At 3,300MW, Thailand's solar capacity already accounts for more than 60 percent of ASEAN's total installed capacity.<sup>5</sup> Thailand plans to more than double its solar capacity from 6,000MW to 15,574MW by 2037. Thailand also has a 2036 wind target of 3,000MW and a hydropower import target of 5,857MW.<sup>6</sup> The country has partnered with the Asian Development Bank on several renewable energy projects, including the country's first wind generation energy plants, which would enhance energy efficiencies and the resilience of the energy grid.<sup>7</sup>

Signaling the country's commitment to becoming a low-carbon society, Thailand has integrated climate change into its economic development plans driven by the 20-Year National Strategy. Coined the Thailand

4.0 initiative, Thailand's ambitious plan to transform its economy emphasizes environmental protection as one of its 4 pillars. Thailand 4.0 identified 10 "S-Curve industries" as new engines of growth, including next-generation automotive, food for the future, agriculture and biotechnology, and the digital sector.<sup>8</sup> The government aims to promote an active role for the private sector in these industries through grants, incentives, and investments in infrastructure and education.

The Thai government has also introduced several financial mechanisms to fund green projects. The Thailand Voluntary Emission Reduction Scheme (T-VER), a domestic carbon reduction scheme, has contributed 5.8 MtCO<sub>2</sub>e of total emissions reductions from 153 registered projects as of October 2020.<sup>9</sup> Thailand's Ministry of Finance also issued the first sustainability bond in 2020, setting a strong foundation for future green finance projects. Totaling US\$964 million, bond proceeds will finance green infrastructure, such as the expansion of public transit.<sup>10</sup>

**"**As a sign of the country's commitment to becoming a low-carbon society, Thailand has integrated climate change into its economic development plans driven by the 20-Year National Strategy. **"**



## Highlights



Mid-term target of 40 percent GHG emissions reduction and net-zero emissions by 2050, if it gains technological and financial support from the international community



Energy mix to transition from about 20% renewable energy to 35% by 2037



Economic transition to Thailand 4.0 aims to position Thailand as a high-income and low-carbon society

## Opportunities



Significant expansion in solar and wind capacities by 2037



Opportunities to introduce green technologies and business models in the energy, automotive, food and agriculture sector



Sustainable finance is set to play a significant role in financing green technologies and infrastructure



## Biodiversity

Thailand is one of the most biodiverse countries in Southeast Asia. It is committed to achieving its Aichi Biodiversity Targets, a set of 20 specific targets established by the UN Convention of Biological Diversity that aims to holistically address and mitigate biodiversity loss. The Thai government has also integrated biodiversity management strategies into its 20-Year National Strategy and the 20-Year Strategy of the Ministry of Natural Resources and Environment.<sup>11</sup>

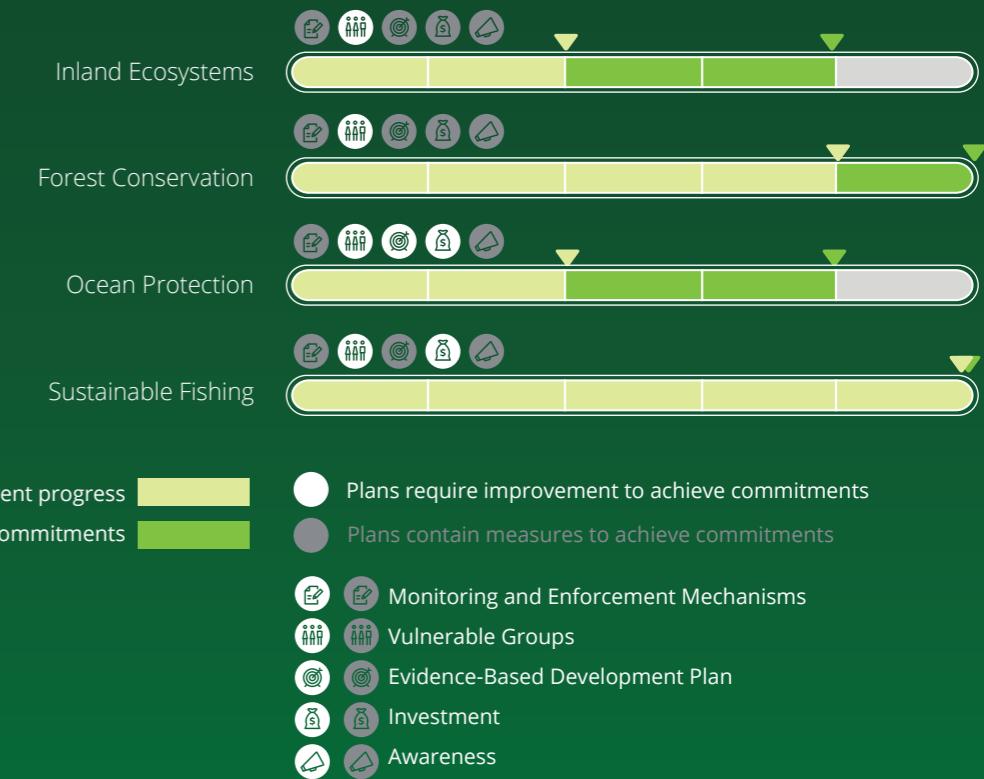
Thailand has successfully protected 10 percent of coastal and marine areas, a target that aligns with SDG 14 – to ‘conserve and sustainably use the oceans, seas and marine resources for sustainable development’.<sup>12</sup> This is the result of coordinated efforts between the public and private sectors, such as efforts to discourage overfishing. In a demonstration of commitment, the two sectors made a joint declaration to ensure the sustainable use of oceans and marine resources.<sup>13</sup>

Government funding has been set aside to support biodiversity conservation projects involving the private sector and the community. For example, the Global Environment Facility has been supporting some of Thailand’s environmentally responsible conservation and biodiversity projects, with more than 30 small projects being funded.

There is a concerted effort to raise public awareness on biodiversity and how the public can participate in existing conservation efforts. This includes the inclusion of biodiversity content in the National Education Plan (2017-2036), where curriculums at educational institutes at every level have been revised to cover biodiversity topics.

The Thai government has also been championing the Bio-Circular-Green economic model, a model leveraging on Thailand’s strengths in biodiversity and agriculture. The Government estimates that the Bio-Circular-Green economy will account for nearly 25 percent of Thailand’s Gross Domestic Product by 2025, up from 21 percent in 2020.<sup>14</sup> In line with the UN SDGs, the Thailand Board of Investment is promoting economic development through investment promotion incentives to Bio-Circular-Green industries. The Government will also implement other supportive legal and financial measures, including increased R&D spending. With the goal of being the leader in Bio-Circular-Green economy within ASEAN by 2027, Thailand shows its commitment to leveraging on its current position within the bioeconomy ecosystem.

**“**The Government estimates that the Bio-Circular-Green economy will account for nearly 25 percent of Thailand’s Gross Domestic Product by 2025, up from 21 percent in 2020. **”**



## Highlights



Biodiversity remains a high priority across the Thailand government, with biodiversity management strategies integrated into several of its long-term development plans



Growing awareness of biodiversity through public education efforts helps to bolster conservation efforts



The government is focused on reducing habitat loss rates and restoring degraded ecosystems to maintain their ecological services for climate change mitigation

## Opportunities



A growing Bio-Circular-Green economy in Thailand signals high growth potential in related industries like food and agriculture, and bioenergy and biochemicals



Government funding has been set aside to support biodiversity conservation projects involving the private sector and the community



In line with the UN SDGs, the Thailand Board of Investment is promoting economic development through investment promotion incentives for Bio-Circular-Green industries



Thailand's agricultural sector uses over 70 percent of Thailand's total water demand, while the industrial and domestic sector account for approximately 10 percent.<sup>15</sup> 98 percent of households have access to drinking water, and the Thai government has strengthened their efforts to mitigate water scarcity, especially in rural areas.<sup>16</sup> However, with growing demands for water from rapid urbanization and economic sectors, water management is crucial. This is particularly so, as Thailand has been facing water shortages, droughts, and floods in recent times.

In response to these pressures, the Thai government has set up the Office of National Water Resources (ONWR), a government agency that acts as a command center to regulate integrated national water resources management. The ONWR intends to mitigate threats of water scarcity, a threat estimated to hit Thailand by 2025.<sup>17</sup> In 2020, the Thai National Water Vision outlined a series of demand-side management interventions for an 'equitable and sustained use of water resources', including the development of water supply systems to an additional 7,490 villages, and the optimizing of water supply systems of 9,093 villages.

The water and wastewater treatment markets are expected to grow 10 percent every year.<sup>18</sup> With only 21 out of 50 Bangkok's districts having their wastewater properly treated, wastewater treatment is of concern especially for municipal governments.<sup>19</sup> The Master Plan for Water Quality Management (2018-2037) seeks to prevent and reduce wastewater, and to increase

efficiencies around wastewater management. As commercial properties comply with new regulations under the Master Plan, the water and wastewater treatment markets are expected to grow. The Thailand water pump market, for example, is projected to grow at a six percent compound annual growth rate.<sup>20</sup> Initiatives such as the Thai Water Expo, a biennial international event showcasing water and wastewater technologies, brands and products, promote innovation, business, and investment opportunities within these industries.<sup>21</sup>

Some of the country's actions to mitigate water scarcities have not been without controversy. For example, groundwater extraction and the building of dams have garnered criticisms by affected communities.<sup>22</sup> A consultative approach to development is crucial. Private companies, government agencies and other professionals should involve local communities in the implementation of water management projects and policies. This way, the interests of all parties can be represented, and local knowledge can be captured and utilized in project and policy planning.

Private companies, government agencies and other professionals should involve local communities in the implementation of water management projects and policies.



## Highlights



In recent times, Thailand has been facing water shortages, droughts, and floods



This puts pressure on the production of food as agriculture is the main user of water



Thailand aims to implement demand-side measures to conserve the use of water, while also increasing the efficiency of wastewater treatment systems

## Opportunities



The water and wastewater treatment markets are expected to grow 10% every year



The biennial Thai Water Expo is a platform for foreign businesses interested in water and wastewater treatment markets to enter the local markets



There is room for better engagement of local communities in water projects



## Waste

Waste management has been identified as a national agenda in Thailand. Plans surrounding two broad categories of waste, Municipal Solid Waste (MSW) and Waste electrical and electronic equipment (WEEE), dominate the agenda.<sup>23</sup> In line with the Bio-Circular-Green economic model, an economic model that the Thai government is transitioning to, several bioenergy projects are already in commercial practice. Sustainable waste management, in tandem with the creation of a circular economy, is therefore a central priority in Thailand's waste management strategies.

The amount of WEEE generated has increased by approximately seven percent from 2017 to 2020. Studies done by Chulalongkorn university and King Mongkut's Institute of Technology Ladkrabang estimate annual solar cell waste and electric vehicle batteries to increase ten-fold and twenty-fold respectively by 2037.<sup>24</sup> To mitigate this, a WEEE management bill has been proposed, drafted, and in 2021, circulated for public hearing.<sup>25</sup> The regulatory process of this bill involves both private and public spheres, where a collaborative approach would facilitate policy implementation and facilitation of the action plan. Notably, in line with future consumption trends, one of the targets of the action plan is to achieve an average collection rate of 5 percent or higher for solar cells and electric vehicle batteries by 2026.<sup>26</sup> To that end, related industries should expect operational changes from business-as-usual when it comes to WEEE disposal.

Plastic waste recycling is heavily promoted in the country, with the aim of 50 percent of plastic waste being recycled by 2022, and 100 percent by 2027.<sup>27</sup> Stricter restrictions surrounding single-use plastics were introduced by the government in 2022, including bans on single-use plastics in national parks. A 2018-2030 roadmap by the government also outlines the gradual phasing out of single-use plastics and the eventual shifting towards a circular economy.<sup>28</sup>

Thailand's road to sustainability in waste management is, as with most countries, non-linear. Local activist groups and coalitions have been applying pressure on the Thai government to stop the import of plastic waste into the country. There have also been calls for more efficient management of recyclables and MSW treatment facilities, and more stringent enforcement throughout the entire waste disposal chain.<sup>29</sup> Additionally, there have also been requests for transparency and accessibility, as the official website of, and reports by, the Pollution Control Department are only in Thai, resulting in communication barriers. The waste management sector, therefore, has the potential for future collaborations once these hurdles are addressed.

**"**Sustainable waste management, in tandem with the creation of a circular economy, is a central priority in Thailand's waste management strategies. **"**

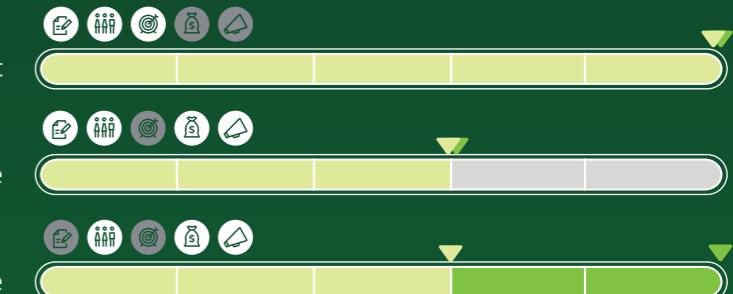
### Solid Waste Management

### Food waste

### Hazardous waste

Current progress

Targets and commitments



Plans require improvement to achieve commitments

Plans contain measures to achieve commitments

Monitoring and Enforcement Mechanisms

Vulnerable Groups

Evidence-Based Development Plan

Investment

Awareness

## Highlights



Waste management is a key focus of the Thai government and aligns with the Bio-Circular-Green economic model



The nation aims for 50% of plastic waste to be recycled by 2022, with 100% of plastic waste recycled by 2027



Future-oriented policies that remove the language barrier could incentivize collaborations between the Thai government and regional or international companies and agencies

## Opportunities



In the transition to renewable energy and electric cars, concerted efforts are needed to reduce electric waste



Growing demand for waste-to-energy projects given to support rising energy consumption



Manufacturers play a key role in reducing single-use plastics and promoting circularity



## Gender Equality

The 2021 Global Gender Gap Report by the World Economic Forum ranked Thailand at 79th out of 156 countries.<sup>30</sup> Out of four broad dimensions in the report, Thailand fared above average in economic participation and opportunity, and below average in political empowerment. Thailand's mid-market companies have women hold 32 percent of senior leadership positions, higher than the regional and global average of 26 percent and 27 percent respectively.<sup>31</sup> In 2019, UN Women in Thailand announced a set of Women's Empowerment Principles, principles aimed at sustainable, inclusive, and equitable economic growth. Following that, in 2020, 110 companies in Thailand committed to the principles, joining over 3,600 companies worldwide who have also agreed to be held accountable in implementing the principles.<sup>32</sup>

Cross-sector partnerships among the Thai government, civil society, and community-based organizations to advance gender equality are common. In 2021, Thailand participated in the Academy for Women Entrepreneurs for the first time, a program by the U.S. Bureau of Educational and Cultural Affairs, connecting women entrepreneurs from 50 countries.<sup>33</sup> Thailand is also the host country of the 2022 Global Summit of Women, a business and economic forum attended by women leaders from different countries.

However, women remain underrepresented in Thailand's parliament. In 2019, while there was a three-fold increase in the percentage of female Members of Parliament, from 5.4 percent to 16.2 percent, it falls short of the regional average of 20.5 percent, and the global average of 24.9 percent.<sup>34</sup> An increase in the representation of women in parliament would be a strong signal of Thailand's commitment to gender equality.

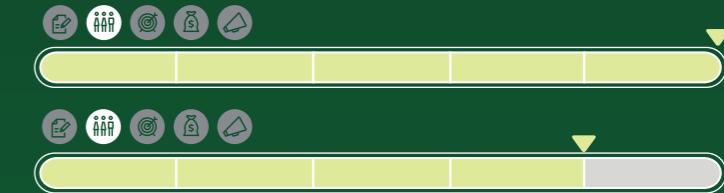
The labor force participation rate of women in Thailand was 59 percent in 2021, down from 66 percent in 2011. Better access to employment opportunities, caregiving support and maternity benefits would empower more women to participate in the labor force. Improvements in public goods like healthcare and access to information technology would also enable women, particularly in rural areas. Increasing the participation of women in the workforce may help Thailand achieve its ambitious economic goals.

“ Cross-sector partnerships among the Thai government, civil society, and community-based organizations to advance gender equality are common. ”

Ending all forms of discrimination, violence and harmful practices

Equal Opportunities and Empowerment

Current progress



- Plans require improvement to achieve commitments
- Plans contain measures to achieve commitments
- Monitoring and Enforcement Mechanisms
- Vulnerable Groups
- Evidence-Based Development Plan
- Investment
- Awareness

## Highlights



Women are relatively well-represented in key leadership positions in business



In Thailand's political arena, women remain comparatively underrepresented, especially when compared to regional and global averages



The labor force participation rate of women has dropped from 66% in 2011 to 59% in 2021

## Opportunities



Strong female representation in business could indicate a favorable attitude towards diversity and inclusion policies



Significant potential to activate the labor supply of women through supportive education, caregiving and maternity policies and benefits



Opportunity to help women transition from rural and informal sectors to formal jobs



## **Case study: Thailand's Hydrochlorofluorocarbons (HCFC) Phase-out Project**

Demand for HCFCs is met through imports for Thailand, given that the country does not produce any HCFCs. HCFCs are Ozone Depleting Substances (ODS) subject to consumption and production control measures of the Montreal Protocol. These substances are mostly used as refrigerants in air-conditioning equipment and refrigeration and also are a source of potent Greenhouse Gas Emissions (GHGs) – thereby posing a detrimental impact on both ozone depletion and climate change.

As a party to The Montreal Protocol on Substances that Deplete the Ozone Layer, Thailand has enacted various regulations to ban the use and import of HCFC since 2017. Along with regulatory development, Thailand's phase-out project funded by the World Bank presents the country with the unique opportunity for the reduction of direct and indirect GHG emissions through lower global warming potential (GWP) alternatives. This accelerates the energy efficiency of projects and the improvement of product design, thereby leading to trickle down benefits for the global environment.

Thus far, Thailand has committed to eliminating consumption of HCFCs in 2013 and reduction of HCFC consumption by 67.5 percent in 2025 and 100 percent by 2030. The project's implementation demonstrates promising results, with an outcome evaluated to be highly satisfactory where monitoring and evaluation quality proved substantial. In view of this, the project's first stage allowed Thailand to comply with its 2013 and 2015 reduction targets.

Moving forward, the project's second stage (2020-2023) aims to assist Thailand in reducing at least 35 percent of HCFC consumption by 2020 and ensuring that the country adheres to the agreed reductions from its initial stage.

Overall, Thailand's phase-out project will support refrigeration and air-conditioning technicians in maintaining and utilizing climate-friendly cooling equipment, while simultaneously supporting skills training for government agencies. These activities undoubtedly seek to improve energy efficiency in the aforementioned applications, thereby contributing to emission reduction and decreased demand for electricity.

# Endnotes

- 1 David Eckstein, Vera Künzel and Laura Schäfer, [Global Climate Risk Index 2021](#), Germanwatch, January 2021, p. 13.
- 2 Climate Action Tracker, "[Thailand Policies and Action](#)", accessed June 16, 2022.
- 3 /bid.
- 4 Bangkok Tribune, "[Thailand to reach net-zero emissions by 2050 if supported: PM Prayut](#)", November 2, 2021.
- 5 The ASEAN Post, "[Solar rooftop potential in Thailand](#)", April 2, 2018.
- 6 Climate Action Tracker, "[Thailand Policies and Action](#)".
- 7 Asian Development Bank, "[ADB Finances First Wind Power and Battery Storage Project in Thailand](#)", press release, May 18, 2020.
- 8 Bangkok Post, "[New S-curve industries get event airing](#)", November 20, 2020.
- 9 Climate Action Tracker, "[Thailand Policies and Action](#)".
- 10 Asian Development Bank, "[ADB Supports Thailand's Green, Social, and Sustainability Bonds for COVID-19 Recovery](#)", press release, September 24, 2020.
- 11 Convention on Biological Diversity, [Thailand's Sixth National Report on the Implementation of the Convention on Biological Diversity](#), June 2019, pp. 1-183
- 12 United Nations Department of Economic and Social Affairs, "[Thailand towards sustainable management of marine and coastal habitats](#)", accessed June 15, 2022.
- 13 Convention on Biological Diversity, Thailand's Sixth National Report on the Implementation of the Convention on Biological Diversity, June 2019, pp. 1-183.
- 14 Bangkok Post, "[BCG economy thriving on rich biodiversity and technological strengths](#)", August 5, 2020.
- 15 Sacha Sethaputra, Suwit Thanopanuwat, Ladawan Kumpa and Surapol Pattanee, "[THAILAND'S WATER VISION: A CASE STUDY - Sacha Sethaputra, Suwit Thanopanuwat, Ladawan Kumpa & Surapol Pattanee](#)", accessed June 16, 2022.
- 16 Open Development Thailand, "[SDG6 Clean water and sanitation](#)", accessed June 16, 2022.
- 17 Sahisna Suwal, "[For 1 Billion People](#)", The Water Project, accessed June 16, 2022.
- 18 Thai Water, "[Thai Water Expo](#)", accessed June 16, 2022.
- 19 Bangkok Post, "[Wastewater treatment fee plan resurfaces, 15 years on](#)", March 31, 2018.
- 20 OpenPR, "[Thailand Water Pump Market : Industry Research, Growth Trends and Opportunities During 2029](#)", May 11, 2020.
- 21 Thai Water, "[Thai Water Expo](#)"
- 22 Pakamas Thinphanga, "[The challenge of water management in Thailand](#)", Asia & The Pacific Policy Society, September 28, 2021.
- 23 EnvilienceAsia, "[Thailand, Draft WEEE Action Plan 2022-2026](#)", accessed June 16, 2022.
- 24 /bid.
- 25 EnvilienceAsia, "[Thailand releases latest Draft WEEE Act for public consultation](#)", May 7, 2021.
- 26 EnvilienceAsia, "[Thailand, Draft WEEE Action Plan 2022-2026](#)"
- 27 Pratch Rujivanarom, "[Thailand's Plastic Waste Conundrum](#)", Heinrich Boll Stiftung Southeast Asia, October 26, 2021.
- 28 Thailand Now, "[Thailand's roadmap on Plastic Waste Management 2018-2030](#)", accessed June 16, 2022.
- 29 Firstpost, "[How Thailand is hurtling towards a massive waste disposal crisis](#)", September 1, 2014.
- 30 World Economic Forum, [Global Gender Gap Report 2021 Insight Report](#), March 2021, p.10.
- 31 UN Women Asia and the Pacific, "[Thailand](#)", accessed June 16, 2022.
- 32 Leah Rodriguez, "[110 Companies in Thailand Pledge to Strengthen Women's Economic Empowerment](#)", Global Citizen, accessed June 16, 2022.
- 33 U.S. Embassies & Consulates in Thailand, "[Academy for Women Entrepreneurs \(AWE\) Thailand](#)", accessed June 16, 2022.
- 34 UN Women Asia and the Pacific, "[Thailand](#)"
- 35 The World Bank, "[Labor force participation rate, female \(% of female population ages 15+\) \(modeled ILO estimate\) - Thailand](#)", accessed June 16, 2022.

# Vietnam

# Vietnam

Vietnam is the world's 15th most populous country. It is located on the eastern edge of mainland Southeast Asia and is mostly densely forested. As one of the world's emerging economies, Vietnam's GDP growth is forecasted at 6.5 percent.<sup>1</sup> Key industries that drive the country's GDP include its manufacturing industries (textiles and garments, as well as electronics). Tourism and agriculture are two other industries that are expected to rebound in the wake of the COVID-19 pandemic.

The country has a series of National Strategies that outline its national development in the medium term. These strategies cover areas like biodiversity and gender equality, among others. Home to tens of thousands of marine and land species, and encompassing 122 key biodiversity areas, biodiversity conservation is an important area of concern for the government and those who rely on it for a living. The COVID-19 pandemic has stymied progress on gender equality, and a whole-of-society approach is also needed to ensure the continued economic empowerment of women. These National Strategies will guide ministries in their planning, budgeting and strategizing.

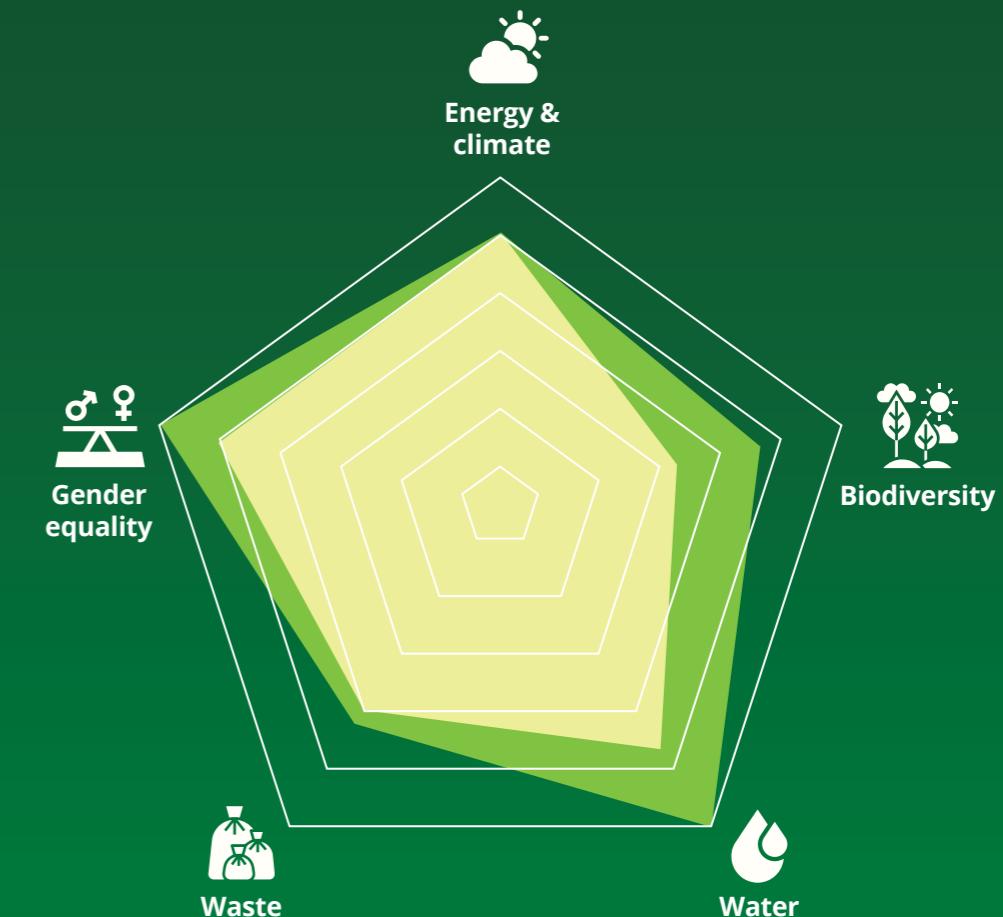
Vietnam has also been fulfilling its international commitments through policy reforms and increased regulation. It has committed to net-zero emissions by 2050 and aims to reduce greenhouse gas emissions by 27 percent below business-as-usual, if given sufficient international support. Coal-fueled power generation will also be phased out by the 2040s. Additionally, the Vietnamese government is spearheading efforts to create a circular economy, which would contribute to its net-zero target. Renewed laws and increased regulation places Vietnam in a good position to achieve its international commitments.

Ambitious renewable energy targets are also set. The country aims for a 50 percent share of wind and solar power in Southeast Asia by 2045, from a previous target of 40 percent. Investments into these sectors will be necessary to support the country's ambitions to increase its renewable energy capacities. These targets also demonstrate the government's determination to transition to clean energy and green growth.

Current progress:



Targets and commitments:



## Highlights



Vietnam's GDP growth is forecasted at 6.5% as the country bounces back from the pandemic



Vietnam intends to further accelerate growth in its renewable energy capacities



The country's transition towards a green economy signals opportunity in related sectors, such as clean energy and green finance



## Energy & Climate

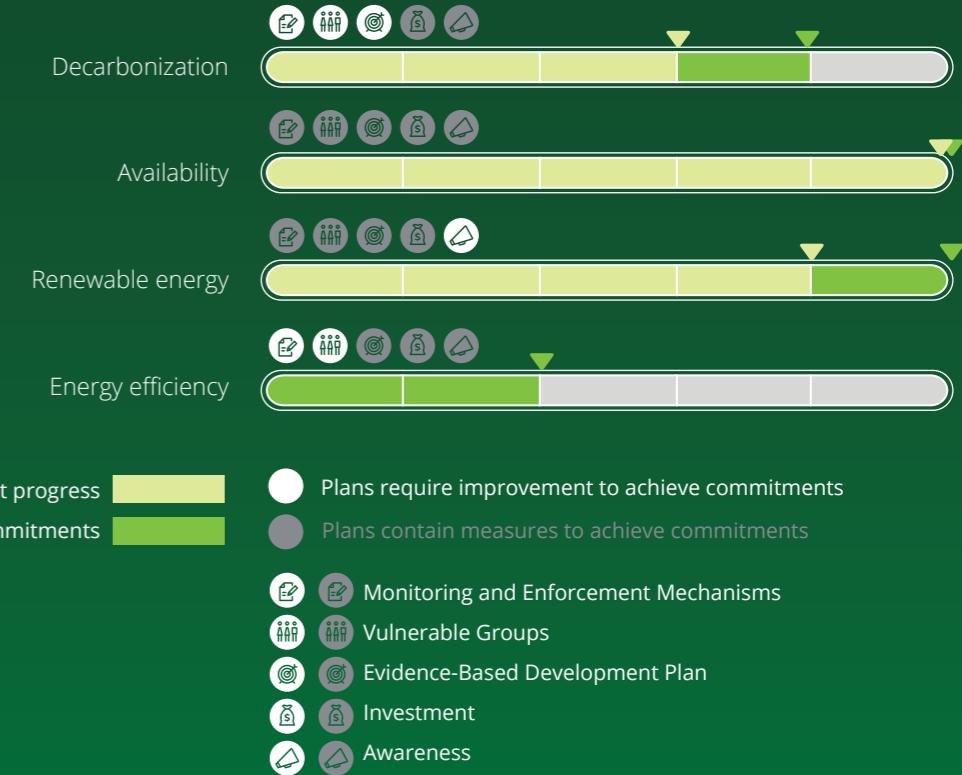
Vietnam has updated its Nationally Determined Contributions (NDC) in 2020 with a slightly more ambitious emissions reductions target. By 2030, the country aims to reduce greenhouse gas emissions by nine percent, and by 27 percent with international support.<sup>2</sup> The country also targets to reach net-zero carbon emissions by 2050 and to phase out coal-fueled power generation by the 2040s.

Vietnam is positioned to lead the green transition in Southeast Asia as a key player in solar and wind power. Its Power Development Plan 8 is a national electricity development plan for 2021-2030, and the latest draft proposed diversifying the country's energy sources and transitioning to renewable energy sources.<sup>3</sup> Key portions of the draft reveal Vietnam's ambitions in increasing its renewable energy capacities. It is aiming for a 50 percent share of wind and solar power in SEA by 2045, from a previous target of 40 percent. In other words, by 2045, the country would have 42.7GW and 54GW of onshore and offshore wind capacity respectively, and 54.8GW of solar capacity. Generous feed-in-tariffs has encouraged growth in the wind sector, but it is unclear if the Ministry of Industry and Trade will shift to an auction system after 2023.<sup>4</sup>

To fulfil its international commitments, a domestic carbon emission trading scheme was implemented in 2022.<sup>5</sup> This scheme is expected to be applied to big emitters first, before including smaller emitters. Apart from raising revenue for the state budget, this scheme will help reduce greenhouse gas emissions and help increase its FDI attractiveness and export competitiveness. A carbon tax could also be developed in the future, which would both allow Vietnam to achieve its emissions reduction target and promote the investment into low-emission technologies.

The country is also the second largest source of green debt issuance in ASEAN behind Singapore. In 2021, green, social and sustainability bond issuance reached US\$1.5 billion, a five-fold increase from 2020.<sup>6</sup> The Ministry of Finance has implemented policies in line with the country's National Strategy on Green Growth (2021-2030). For example, tax policies were revised to encourage investments into production utilizing green technology.<sup>7</sup> To achieve its net-zero targets, the country needs US\$350-400 billion in climate financing. With that, recommendations have been made to revise its energy pricing policies to further encourage investment into renewables.<sup>8</sup>

**"**Vietnam is positioned to lead the green transition in Southeast Asia as a key player in solar and wind power."**"**



## Highlights



Vietnam aims to reduce emissions by 9% by 2030, and by 27% with international support



The country is ambitious in increasing its renewable energy capacities, especially through onshore and offshore wind energy



An emission trading system was implemented in 2022, applicable to big emitters

## Opportunities



Potential investment opportunities to achieve ambitious wind energy targets



New emission trading scheme likely to increase FDI inflows



Potential sustainable finance opportunities to finance the country's green projects



## Biodiversity

Vietnam is an incredibly biodiverse country within Asia. The country boasts six priority ecoregions, three world heritage sites and 122 key biodiversity areas.<sup>9</sup> Lush tropical and subtropical forests cover approximately 40 percent of the country, but wetland and marine ecosystems are common as well.

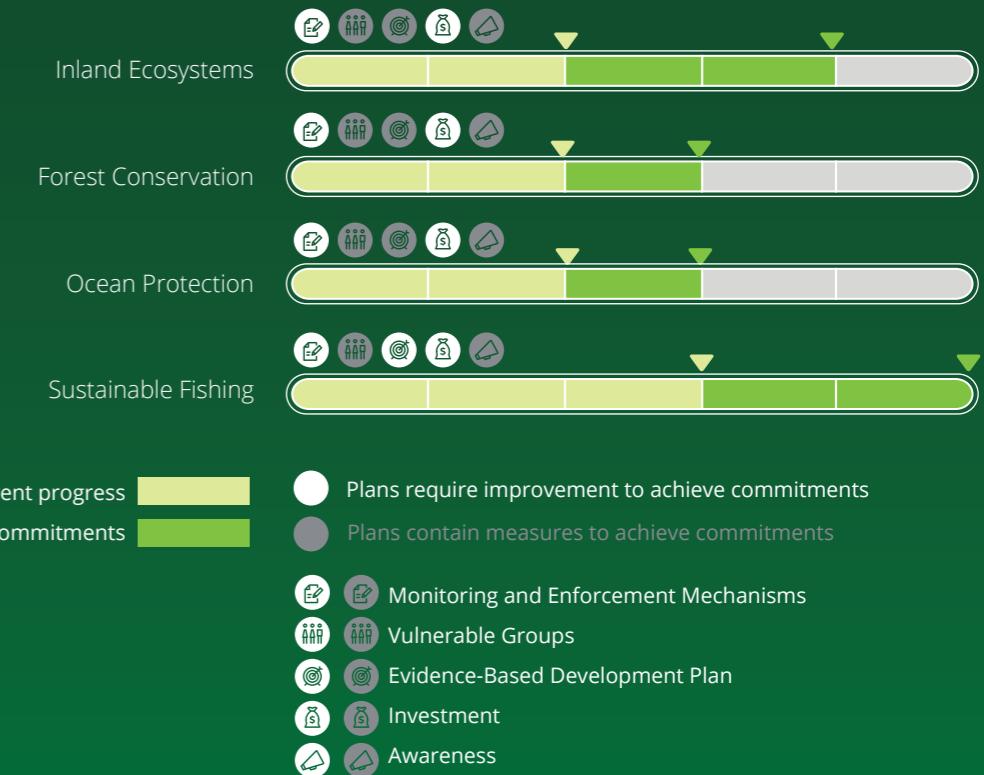
In line with Vietnam's National Biodiversity Strategy, the Biodiversity Conservation Agency has a set of strategic objectives in place to restore degraded ecosystems by 2050.<sup>10</sup> Targets include increasing land and marine protected areas and sustaining the country's forest cover at 42-43 percent.<sup>11</sup> However, priority will be given to the conservation of wildlife species. For instance, given its central location in the region, the flight routes of migratory and endemic birds intersect with the country. The Ministry of Agriculture and Rural Development was therefore tasked to collaborate with forest forces and local authorities to patrol and prevent the illegal poaching of these wild birds.<sup>12</sup> The Ministry of Public Security also directed environmental police forces to handle any violations of prevailing conservation laws.

Community groups and non-profits have their own conservation programs, and these community-based initiatives can strengthen conservation efforts by the government. For example, the People Resources and Conservation Foundation supports numerous villages in northern Tuyen Quang in their efforts to preserve the endangered Francois Langur and its habitat.<sup>13</sup> Villagers are trained to conduct patrols and feed patrolling data

into a monitoring database. The National Biodiversity Strategy also includes roadmaps for community-based biodiversity management, but recent reporting on the progress of these roadmaps are unavailable, with most reports either outdated or in Vietnamese. Insufficient coverage of biodiversity developments in English also disincentivize foreign organizations from entering the sector.

Financing the sector is a key component of the strategy. The Biodiversity Finance Initiative (BIOFIN) estimated that an additional US\$600 million is required from 2020-2025 to fund the government's projects. Currently, innovative financing solutions are explored, such as eco-tourism fees. Notably, private investments towards biodiversity constitute a small portion of funds, with over 95 percent of total biodiversity expenditure provided by the state budget.<sup>14</sup> Therefore, there is a potential for investments in biodiversity to be financially attractive. The Vietnamese government could therefore emphasize on the economic importance of biodiversity to generate additional investments into the sector. For example, there is the potential to scale up existing national payment for ecosystems services schemes.

**"**The country boasts six priority ecoregions, three world heritage sites and 122 key biodiversity areas. **"**



## Highlights



Vietnam's 2050 biodiversity vision aims to restore degraded ecosystems, increase protected areas, and sustain forest cover



US\$600 million is required from 2020-2025 to fund the government's projects



Little coverage of biodiversity developments in English, with most coverage either outdated or in Vietnamese

## Opportunities



Increased reporting on the sector in English for an international audience could facilitate more investment



Governmental efforts to conserve biodiversity can be strengthened through community involvement



Existing national payment for ecosystems services schemes can be revitalized to finance future biodiversity efforts



## Water

The Vietnamese population's access to improved water supplies increased from 65 per cent in 2000 to 95 per cent in 2017, while access to basic sanitation increased from 52 to 84 per cent.<sup>15</sup> While Vietnam's progress in water supply over the past two decades has been significant, there remain sizeable disparities between big cities and smaller urban centers. Furthermore, only 51 percent of rural households have access to clean water that meets the Ministry of Health's water quality standard.<sup>16</sup>

By far, the largest challenge to Vietnam's government is increasing levels of sanitation, especially among rural populations. 10.7 million people (10.15 million in rural areas and 550,000 in urban areas) still practice open defecation. This inaccessibility of sanitation has contributed to high rates of diarrhoea, pneumonia, and parasitic infections, and has resulted in one in four Vietnamese children suffering from stunted growth.<sup>17</sup>

Currently, Vietnam has developed several strategies related to water management, the most recent of which is the National Strategy in Rural Water Supply and Sanitation by 2030, with a vision to 2045. By 2030, the plan has targeted for 65 percent of the population to have access to clean water that meets standards set by the Ministry of Health, and for 100 percent of households, schools and health stations to have basic toilets. By 2045, 100 percent of people will gain access to clean water and safe and sustainable sanitation; and 50 percent of rural residential areas will have domestic wastewater collection systems.<sup>18</sup>

To achieve these targets, the government has been reviewing its policies on financing this transition. While previously limited to the purview of state-owned enterprises, the government is now opening up water utilities in Vietnam to the private sector. With the passage of Vietnam's first Law on Public-Private Partnership in 2020, the water sector is looking towards such partnerships to attract both financing and external expertise.<sup>20</sup> All these suggest the major role that the private sector will play in achieving the targets set by the government for 2030 and 2045.

An additional US\$10 billion is also required to upgrade existing wastewater infrastructure.<sup>21</sup> This includes drainage facilities and wastewater treatment plants. Wastewater collection in urban areas remains at 12-15 percent, with most wastewater discharged directly into canals. The Vietnamese government will attempt to have a synchronous upgrade of the infrastructure in the sector, but this will not be feasible without long-term investments.

**"** Vietnam has developed several strategies related to water management, the most recent of which is the National Strategy in Rural Water Supply and Sanitation by 2030. **"**



## Highlights



In rural populations, 10.15 million in rural areas still practice open defecation



By 2030, Vietnam aims for 65% of the population to have access to clean water, and for 100% of households, schools and health stations to have basic toilets



By 2045, 100% of people will gain access to clean water and safe and sustainable sanitation; and 50% of rural residential areas will have domestic wastewater collection systems

## Opportunities



The water utilities industry is currently transitioning from sovereign financing to private financing, with two projects in the private sector under development



The government is open to international partnership and collaboration with the private sector to transfer innovative technologies, such as climate-resilient solutions for water supply



The passage of Vietnam's first Law on Public-Private Partnership in 2020, paves the way for partnerships for financing and external expertise



## Waste

Vietnam has recently announced a long-term strategy (2030-2050) on environmental protection, with broad emphasis on the importance of developing a circular economy and reinforcing waste management. As Vietnam ranks fourth globally in plastic waste generation, the strategy includes the ban of single-use plastic products and non-biodegradable plastic packaging by 2030.<sup>22</sup> Domestically manufactured and imported goods will similarly be required to be free from microplastics by then. These developments highlight the Vietnamese government's concerted effort to shift towards a green economy.

Vietnam's emphasis on building a circular economy is in line with its international commitments to achieve net-zero carbon emissions by 2050.<sup>23</sup> The Vietnamese government tackles this by firstly revising the Law on Environmental Protection.<sup>24</sup> Coming into effect in early 2022, the law mandates ministries to integrate circular economy concepts in development plans, waste management and recycling. This is coupled with the introduction of a refreshed Extended Producer Responsibility policy, legally requiring producers and importers to take on waste management responsibilities of their products.<sup>25</sup> Packing recycling and product recycling obligations are segmented according to packaging and product type, and these obligations will be adjusted every three years. These concrete steps

in policy implementation supports local industries who benefit from a decrease in pollution levels, like tourism and fishing. Additionally, it is expected to incentivize private sector investments into their own sustainable development practices.

There is potential for the waste-to-energy sector in Vietnam. As a steadily urbanizing country, Vietnam generates over 28 million tons of waste. Of that, 76 percent ends up in landfills. Vietnam's energy demand is also forecasted to increase fourfold by 2030 when compared to 2014 demands. Combined, these needs point to the potential of waste-to-energy technologies. Investment incentives by the government, such as tax holidays and low interest loans, have been given to attract investments into waste-to-energy projects. Waste-to-energy technologies are expected to be increasingly relevant to Vietnam's context. With the country's focus on clean energy, demand for investment into clean technologies will increase in tandem.

**“**Waste-to-energy technologies are expected to be increasingly relevant to Vietnam's context.**”**



## Highlights



Vietnam's waste management strategies revolve around the development of a circular economy and reinforcing existing waste management strategies



The revised Law on Environmental Protection requires ministries to integrate circular economy concepts into their respective domains



Vietnam ranks fourth globally in plastic waste generation

## Opportunities



Refreshed Extended Producer Responsibility policy creates strong regulatory climate, attractive for sustainability-oriented businesses



Untapped waste-to-energy sector has the potential to be a key contributor to Vietnam's clean energy transition



Domestically manufactured and imported goods must be free from micro-plastics by 2030



## Gender Equality

According to the Global Gender Gap Report, Vietnam comes in fifth in ASEAN for gender equality. Women in Vietnam actively participate in the labor force and represent 52.6 percent of skilled workers.<sup>29</sup> Over the years, the country has closed 70.1 percent of its gender gap. The country has made significant strides in several areas, such as meeting gender parity in tertiary enrolment rates and achieving a relatively small income gap by international standards – a woman's income in Vietnam is 81.9 percent of a man's income.

Many of these initiatives are underpinned by the newly adopted National Strategy on Gender Equality (2021-2030). This strategy puts Vietnam on the path to achieving SDG 5 on gender equality and women's empowerment. Some notable targets include increasing the percentage of women holding key leadership positions to 60 percent in all state management agencies by 2025, and 75 percent by 2030.<sup>30</sup> In the private sector, Vietnam also aims for female directors or owners of businesses to reach at least 27 percent by 2025, and 30 percent by 2030.<sup>31</sup> Beyond increasing the percentage of women in leadership positions, the nation is targeting to include gender equality into the curriculum for all schools by 2025.

Women are also underrepresented at the ministerial level, with only 26.7 percent of parliamentarians being women.<sup>32</sup> Some attribute this to prejudices about women being unsuitable for leadership roles.<sup>33</sup> Nevertheless, the recent National Women Congress

acknowledged an increase in the number of women participating in party building and political system building. The Vietnam Women's Union will play an important role in advocating for gender-equal policies, having developed more than 600 policies to date.<sup>34</sup> The Union is also invested in the economic empowerment of women, partnering with various agencies and private organizations in efforts to reduce gender inequality in economic activities.

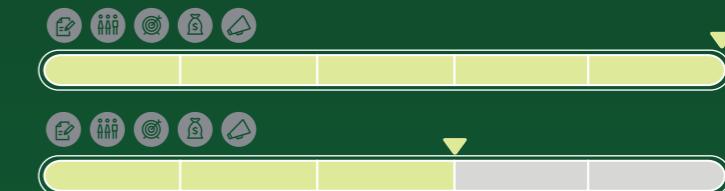
Like all countries, the COVID-19 pandemic has exacerbated existing inequalities within Vietnam. The International Labor Organization has found that women were disproportionately affected by the pandemic.<sup>35</sup> In the second quarter of 2020, more women were unemployed than men. The subsequent quarters of 2020 saw women re-employed but taking on more work hours on average than men, on top of their caregiving responsibilities. While women participate actively in the labor force, they are effectively taking on a 'double burden' of labor work and domestic work.<sup>36</sup> To prevent this double burden, traditional gender roles must be challenged and eradicated. A whole-of-society approach to re-examine gender roles would align with the country's international commitment to SDG 5.

Women in Vietnam actively participate in the labor force and represent 52.6 percent of skilled workers. <sup>29</sup>

Ending all forms of discrimination, violence and harmful practices

Equal Opportunities and Empowerment

Current progress



Plans require improvement to achieve commitments

Plans contain measures to achieve commitments

Monitoring and Enforcement Mechanisms

Vulnerable Groups

Evidence-Based Development Plan

Investment

Awareness

## Highlights



The country is 5th in ASEAN for gender equality, with 70.1% of its gender gap closed



In line with its National Strategy on Gender Equality, the country aims to increase the percentage of women in leadership positions



COVID-19 has reversed progress on gender equality, where it disproportionately affected the economic security of women

## Opportunities



Female representation in senior leadership roles could be increased through supportive and empowering work environments



Gender-based policies could reduce the disproportionately impact of crises on women



A whole-of-society approach to re-examine gender roles to prevent 'double burden' of women



### Case study: Electric vehicle market in Vietnam

Vietnam is predominantly an export-oriented economy, and recent trends point towards its ambitions to break into the electric vehicle (EV) market. 2022 is marked as a crucial year in the development of the country's EV market, with the excise tax on electric cars (with less than nine seats) dropping from 15 percent to three percent in March 2022.<sup>37</sup> The Vietnam Automobile Manufacturers Association has proposed a roadmap for Vietnam's electric car market. By 2040, it is expected that the local production capacity of EVs will reach 3.5 million units.<sup>38</sup> This is an increase from less than 285,000 units in 2020, but the roadmap showcases Vietnam's ambitions in becoming an EV export hub.

VinFast, a Vietnam-based private automotive startup, is expected to lead the country's transition to be an EV export hub. Founded in 2017, the automotive manufacturing company sold an impressive 31,500 cars and 45,400 electric motorcycles in 2020.<sup>39</sup> The installation of 40,000 EV charging ports around Vietnam

is also being planned. In 2021, the company received a license from California to permit the testing of autonomous EVs there.<sup>40</sup> The U.S. state is expected to be VinFast's first global market. The company is also in talks with Foxconn, the world's largest contract electric manufacturer, to produce batteries for its EVs.<sup>41</sup>

As local conglomerates and companies scale their technologies, Vietnam is poised to capture a dominant share of the EV market. The presence of private players such as VinFast point towards the potential for an ecosystem of manufacturers, suppliers, and customers within the country. When the price gap between EVs and gasoline-powered vehicles decreases, and infrastructure for EVs increases, the sector will grow. Generous tax incentives, a whole-of-society transition to clean energy, and an increasingly environmentally conscious consumer base create the conditions necessary for Vietnam to turn into an EV leader in the region.

# Endnotes

- 1 Vietnam Plus, "[QUB maintains Vietnam's GDP growth forecast at 6.5 percent](#)", June 22, 2022.
- 2 Allen & Gledhill, COP26: "[Vietnam targets net zero carbon emissions by 2050](#)", December 20, 2021.
- 3 Vietnam Briefing, "[Vietnam's Power Development Plan Draft Incorporates Renewables, Reduces Coal](#)", April 29, 2022.
- 4 Vietnam Briefing, "[How Can Investors Seize Vietnam's Wind Power Potential](#)", January 10, 2022.
- 5 Asia & the Pacific Policy Society, "[Carbon pricing insights from Vietnam](#)", October 7, 2021.
- 6 Vietnam Plus, "[Vietnam ranks second in green bond issuance in ASEAN](#)", June 20, 2022.
- 7 National Institute for Finance, "[Prioritize financial resources for green growth](#)", April 28, 2022.
- 8 Asian Development Bank, [Green Finance in Viet Nam: Barriers and Solutions](#), November 2018.
- 9 BIODEV 2030, [Biodiversity Decline in Viet Nam](#), Policy Brief, 2021.
- 10 Vietnam Investment Review, "[National biodiversity strategy to 2030 approved](#)", February 8, 2022.
- 11 Ibid.
- 12 Socialist Republic of Viet Nam Government News, "[Gov't takes action to protect migrating wild birds](#)", May 18, 2022.
- 13 People Resources and Conservation Foundation, "[PRCF Vietnam](#)", accessed June 24, 2022.
- 14 The Biodiversity Finance Initiative, [Viet Nam: Biodiversity Expenditure Review](#), May 15, 2019.
- 15 UNICEF, [Policy Brief on Water, Sanitisation and Hygiene in Vietnam](#), February 2020 p. 2.
- 16 UNICEF, "[National Strategy on Rural Water Supply and Sanitation by 2030, with a Vision to 2045](#)," press release, December 21, 2021.
- 17 UNICEF, [Policy Brief](#), p. 2.
- 18 Trung Quan, "[National strategy for rural clean water supply and sanitation announced](#)," Nông Nghiệp Việt Nam, December 23, 2021, sec. News.
- 19 Asian Development Bank, "[How a Provincial Water Company Secured the First Private Sector Financing in Viet Nam's Water Sector](#)," August 30, 2021, Viet Nam.
- 20 Donald Lambert, "[Water Pressure: Eight Reforms to Boost Investment into Viet Nam's Water Sector](#)," July 5, 2021.
- 21 UNICEF, "[National Strategy on Rural Water Supply and Sanitation by 2030, with a Vision to 2045](#)."
- 22 Vietnam Briefing, "[Opportunities in the Waste-to-Energy Sector in Vietnam](#)", June 14, 2018.
- 23 Allen & Gledhill, COP26: "[Vietnam targets net zero carbon emissions by 2050](#)"
- 24 Vietnam Briefing, "[Vietnam's Circular Economy: Revised Law on Environmental Protection](#)", June 14, 2018.
- 25 Global Compliance News, "[Vietnam: New extended producer responsibility regime – recycling and waste treatment obligations for certain producers and importers](#)", March 19, 2022.
- 26 Vietnam Briefing, "[Opportunities in the Waste-to-Energy Sector in Vietnam](#)"
- 27 Ibid.
- 28 Vietnam Net Global, "[Vietnam needs US\\$10 billion for urban wastewater treatment](#)", November 23, 2021.
- 29 World Economic Forum, [Global Gender Gap Report 2021 Insight Report](#), March 2021, p.39.
- 30 Vietnam Briefing, "[Vietnam Implements Gender Equality Strategy but Challenges Remain](#)", December 6, 2021.
- 31 Ibid.
- 32 World Economic Forum, [Global Gender Gap Report 2021 Insight Report](#)
- 33 Lam Le Ha Phuong, "[Vietnamese female politicians' battle to the top: what makes it extra hard?](#)", April 5, 2016.
- 34 Viet Nam News, "[PM promotes important role of women in national development goals](#)", March 10, 2022.
- 35 International Labor Organization, [Gender and the labour market in Viet Nam, An analysis based on the Labour Force Survey](#), Research Brief, March 2021.
- 36 Ibid.
- 37 Vietnam Net Global, "[2022 expectations: Electric car manufacturing to boom in Vietnam](#)", February 9, 2022.
- 38 Vietnam Investment Review, "[Vietnam's electric car market expected to blossom in 2022](#)", February 13, 2022.
- 39 The Diplomat, "[Can VinFast Turn Vietnam Into an Electric Vehicle Powerhouse?](#)", January 5, 2022.
- 40 Nikkei Asia, "[Vingroup and Foxconn in talks over electric cars](#)", March 22, 2021.
- 41 Ibid.

# Deloitte.

Deloitte refers to one or more of Deloitte Touche Tohmatsu Limited ("DTTL"), its global network of member firms, and their related entities (collectively, the "Deloitte organization"). DTTL (also referred to as "Deloitte Global") and each of its member firms and related entities are legally separate and independent entities, which cannot obligate or bind each other in respect of third parties. DTTL and each DTTL member firm and related entity is liable only for its own acts and omissions, and not those of each other. DTTL does not provide services to clients. Please see [www.deloitte.com/about](http://www.deloitte.com/about) to learn more.

Deloitte Asia Pacific Limited is a company limited by guarantee and a member firm of DTTL. Members of Deloitte Asia Pacific Limited and their related entities, each of which are separate and independent legal entities, provide services from more than 100 cities across the region, including Auckland, Bangkok, Beijing, Hanoi, Hong Kong, Jakarta, Kuala Lumpur, Manila, Melbourne, Osaka, Seoul, Shanghai, Singapore, Sydney, Taipei and Tokyo.

This communication and any attachment to it is for internal distribution among personnel of Deloitte Touche Tohmatsu Limited ("DTTL"), its global network of member firms and their related entities (collectively, the "Deloitte organization").

It may contain confidential information and is intended solely for the use of the individual or entity to whom it is addressed. If you are not the intended recipient, please notify us immediately by replying to this email and then please delete this communication and all copies of it on your system. Please do not use this communication in any way.

None of DTTL, its member firms, related entities, employees or agents shall be responsible for any loss or damage whatsoever arising directly or indirectly in connection with any person relying on this communication. DTTL and each of its member firms, and their related entities, are legally separate and independent entities.