

Kingdom of Cambodia
Nation Religion King

GGGI Cambodia Country Planning

Framework 2021-2025



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Global Green Growth Institute
Jeongdong Building 19F
21-15 Jeongdong-gil
Jung-gu, Seoul 04518
Republic of Korea

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CAMBODIA COUNTRY PLANNING FRAMEWORK (CPF)



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Acronyms

ADB	Asia Development Bank
BAU	Business-as-usual
C&D	Construction and demolition
CCCSP	Cambodian Climate Change Strategic Plan
CPF	Country Planning Framework
EE	Energy efficiency
EU	European Union
EV	Electric vehicle
GDP	Gross domestic product
GHG	Greenhouse gas
GOPs	Global Operational Priorities
GGGI	Global Green Growth Institute
GSSD	General Secretariat for Sustainable Development
LMIC	Lower middle-income country
NCSD	National Council for Sustainable Development
NDC	Nationally Determined Contribution
NSDP	National Strategic Development Plan
PV	Photovoltaic
REDD+	Reducing emissions from deforestation and forest degradation
RGC	Royal Government of Cambodia
SDG	Sustainable Development Goal
SME	Small and medium-sized enterprises
SOs	Strategic Outcomes
PRC	People's Republic of China
UNDP	United Nations Development Programme

Foreword

by Dr. Frank Rijsberman, Director General of GGGI

Cambodia is a founding member of the Global Green Growth Institute. The Royal Government of Cambodia (RGC) was one of the countries that joined forces in 2012 to set up the Institute, dedicated to supporting and promoting strong, inclusive, and sustainable economic growth in developing countries and emerging economies. Since then, GGGI has developed a strong in-country presence, assisting the government in establishing national policies and institutional frameworks for inclusive green growth and creating enabling conditions for green investment in the country. Housed in the General Secretariat of the National Council for Sustainable Development, with project offices in other key institutions, GGGI actively supports the RGC in their transition to a green economic development model.

The transition to a green growth model has never been more urgent. Heavier floods, worsening droughts, landfills heaping up: the climate and sustainability crisis has become very tangible, in Cambodia too. At the same time, opportunities to address these challenges are right in front of us. GGGI supports its Members to take action in implementing their Nationally Determined Contributions (NDCs) under the Paris Agreement on Climate Change as well as their obligations under the 2030 Sustainable Development Goals (SDG). This Country Planning Framework 2021-2025 (CPF) sets out GGGI's response to some of Cambodia's most pressing environmental challenges. The CPF lays the foundations for GGGI's program over the next five years, guiding the strategic alignment of GGGI's vision and goals with Cambodia's green growth aspirations. The CPF offers GGGI the opportunity to evaluate its in-country advantage and identify the areas where it can make significant environmental, social, and economic impacts. With programs cutting across the waste management, green building, clean manufacturing and sustainable transport and a particular attention for economic players and sectors hardest hit by the COVID-19 pandemic, such as garment, tourism and SMEs, the CPF articulates GGGI's contribution to Cambodia's green recovery. I am proud to present this ambitious strategy showing how continued strong cooperation between the Institute and the government can help Cambodia on its trajectory of fulfilling its green growth potential.



DR. FRANK RIJSBERMAN
GGGI Director General

Message

from H.E. Say Samal, Minister of Environment and Chair of the National Council for Sustainable Development

Green growth is an economic development model that seeks economic growth, all while striving for social inclusion and sustainable use of natural resources. As rising climate vulnerability leaves Cambodia at risk of suffering from droughts and flooding at an unprecedented rate, it is clear that green growth is critical to the country's development. The Royal Government of Cambodia (RGC) applies green growth principles throughout its strategic planning and development. We are committed to climate action and achieving sustainable development across all sectors by prioritizing green growth approaches.

Since 2012, the RGC has worked in close collaboration with GGGI to design and implement urban development strategies and projects. This collaboration has resulted in the development of sustainable city plans, which have been mainstreamed into the existing planning processes and implemented by the cities and the national government, with exciting initiatives in waste management, sanitation, mobility, and green industry.

The Country Planning Framework 2021-2025 (CPF) provides a practical overview of GGGI's contribution to Cambodia's green growth priorities. It demonstrates the alignment of GGGI's interventions with the RGC's national targets and how we will continue to cooperate to achieve the objectives set out in our sustainable city plans while also identifying new areas for future cooperation. The CPF provides strategies for achieving some of Cambodia's ambitious international commitments, such as the Nationally Determined Contribution (NDC) for the Paris Agreement and the Sustainable Development Goals (SDGs). In doing so, the CPF pays particular attention to strengthening the capacity of our cities, as they have become key players in the country's sustainable development.

The next five years will be critical for Cambodia's sustainable development, and I believe that the RGC's cooperation with GGGI will play an important role in keeping our country on the right track as we aim for a green recovery from the COVID-19 crisis. As we look forward to Cambodia's future and face rising urbanization and the effects of climate change, this cooperation will be more important than ever. ឯ. សាយ សមល

Chair of the National Council for Sustainable Development

Minister of Environment



H.E. SAY SAMAL

Minister of Environment

Chair of the National Council for Sustainable Development

Executive Summary

Cambodia's vulnerability to climate change is ever more apparent as it faces floods and droughts on a seasonal basis with devastating effects on the predominantly agrarian country.¹ The RGC has developed national strategies and committed to ambitious international targets, joining the global effort to mitigate the effects of climate change. Cambodia was one of the first national governments to have established green growth plans and policies. The CPF is designed to ensure that the Government's national development priorities remain at the center of GGGI's interventions.

Building on the Phnom Penh Sustainable City Plan, the Secondary City Strategic Plan for seven secondary cities, extensive consultations, experience with projects on the ground, and the use of GGGI analytical tools such as the Green Growth Potential Assessment, the Green Growth Index, and the Green Industry Scenario for Cambodia, several green growth challenges were identified.

To address these challenges, the CPF identifies GGGI's in-country comparative advantage and determines priority interventions where GGGI can make significant environmental, social, and economic impacts through policy advice, investment advice and capacity development. As a result, four programmatic solutions are proposed for implementation over the next five years:

1. Waste Management

Solid waste and wastewater management is an increasing challenge in Cambodia due to a limited capacity to collect or treat waste and an insufficient regulatory environment. Through this programmatic solution, GGGI aims to promote a circular economy by increasing financially sustainable facilities and systems to collect all waste, recycling rates, and functional fee-paying mechanisms.

2. Green Industries

The industrial sector in Cambodia generates a high level of greenhouse gas (GHG) emissions. The garment sector, the largest industry, also produces large amounts of waste and consumes more than 300 000 tons of wood per year, mostly sourced unsustainably. The sector has suffered tremendously from the COVID-19 pandemic, through supply chain disruptions and a drop in demand. GGGI aims to boost the recovery and competitiveness of the Cambodian industrial sector, while decreasing its environmental footprint, by mobilizing finance for cleaner production and promoting sustainable energy practices. This will include energy efficiency and renewable energy solutions. GGGI will scope out opportunities to promote the sustainable use and sourcing of fuelwood.

3. Sustainable Mobility

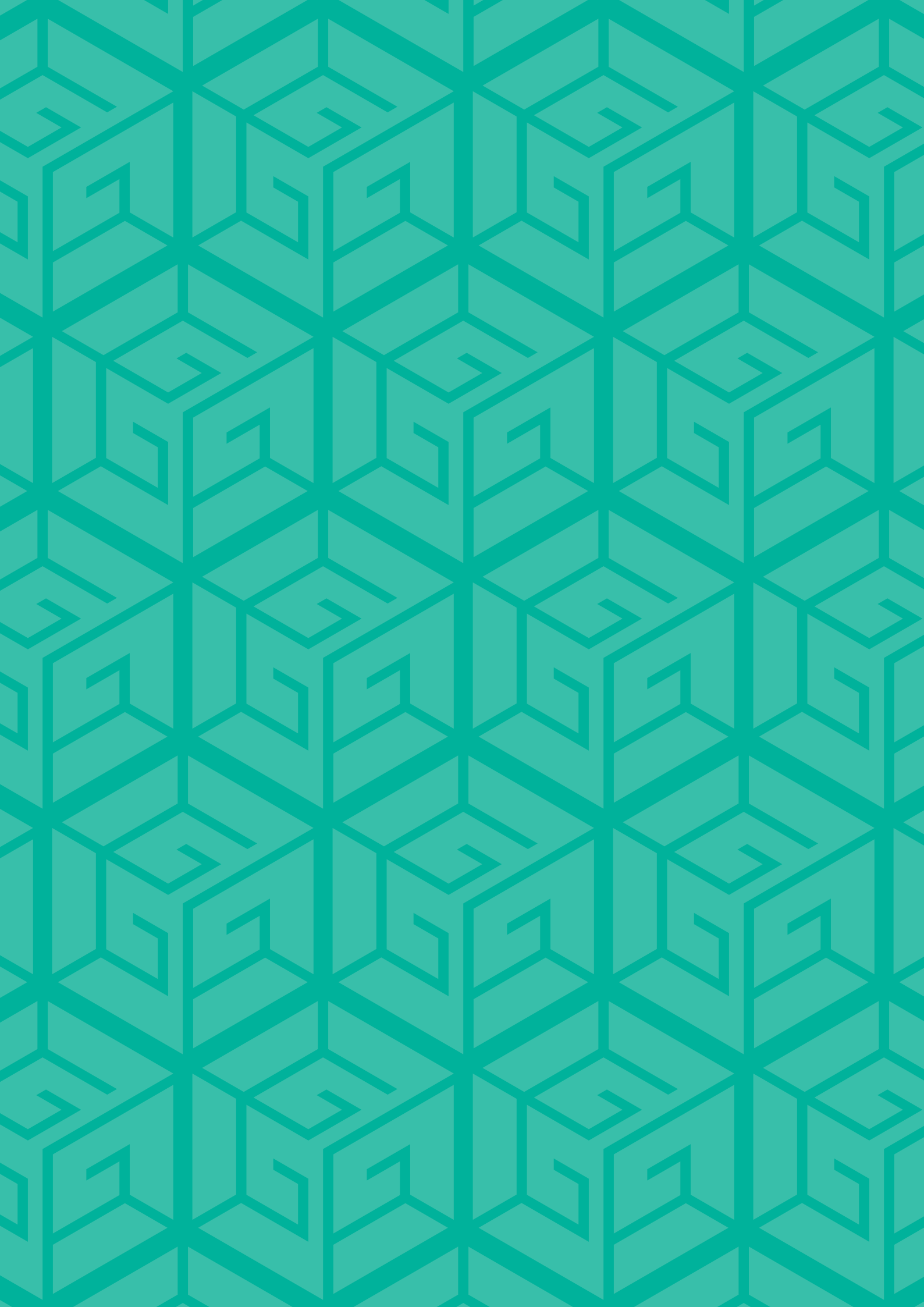
Cambodia's transport sector is a large contributor to GHG emissions and air pollution. Increasing traffic congestion and limited public transport are exacerbating the challenge. Through this programmatic solution, GGGI aims to increase access to sustainable transport solutions, including electric motorcycles and buses, by designing financing schemes and bankable projects to attract investment. Priority will be given to mobility solutions in tourist areas to support the recovery of the tourism sector.

4. Green Buildings

With a booming construction sector, buildings in Cambodia pose a number of challenges including a lack of energy and water efficiency standards, reliance on air conditioning, and inadequate waste management infrastructure. Through this programmatic solution, GGGI aims to primarily green public buildings and affordable housing through improved energy management, building materials, and waste management solutions.

¹ World Bank, "Climate Change Knowledge Portal," <https://climateknowledgeportal.worldbank.org/country/cambodia/vulnerability>.





1. Introduction

Since Cambodia signed the GGGI Establishment Agreement in 2012, GGGI has worked with the RCG to establish its national policy framework and institutional arrangement for the promotion of green growth. The GGGI also undertook analytical work to inform green growth strategies. GGGI opened its first office in 2015, embedded in the General Secretariat for Sustainable Development (GSSD) which has been the Institute's primary government counterpart over the years. After the opening of a country office, GGGI worked with GSSD and national and municipal counterparts to develop sustainable city plans for Phnom Penh and seven secondary cities: Siem Reap, Battambang, Sihanoukville, Kep, Kampong Cham, Bavet, and Suong. These plans look holistically at the requirements for green urban development, addressing clean energy, sanitation, waste management, mobility, green building, manufacturing, and more. GGGI Cambodia then proceeded with advising its counterparts on business models and investment solutions for the implementation of green city projects. By 2020, the program portfolio included projects on waste management, waste-to-energy, decentralized sanitation, clean energy in manufacturing, and the electrification of transport. In addition to the GSSD office, additional project desks were established in Phnom Penh Capital Hall, the Ministry of Public Works and Transport, the Ministry of Industry, Science, Technology and Innovation, the Garment Manufacturers Association of

Cambodia and the Institute of Technology. The CPF 2021-2025 will remain strongly focused on the implementation of these sustainable city plans.

The CPF is a five-year country engagement strategy and program that sets out the priority areas of GGGI's intervention to support the green growth transformation of Cambodia consistent with its national policies, NDCs, SDGs, priorities, and commitments. The objectives of the CPF are derived from the GGGI Strategy 2030 and seek to align GGGI's strategies and goals with the national policies, needs and priorities of Cambodia. Following the adoption of GGGI's Strategy 2030 in 2019, the CPF provides the tool for cascading the strategy to the country level to enable its implementation through Member and partner country programs and projects.

The CPF process serves as a framework for discussion with the RGC, donors, in-country stakeholders including the private sector, civil society and development partners, and in-house GGGI experts, to identify where GGGI can add value in Cambodia over the medium term. The CPF was developed based on in-house analytical work and in-depth consultations with all these stakeholders. The country team undertook a comprehensive stakeholder mapping and ran an electronic survey among government counterparts. The CPF process included consultation

Box 1. About GGGI

GGGI has 39 Members and has operations in over 30 countries where it supports the delivery of NDCs and SDGs.

Founded in 2012, GGGI is a treaty-based international, inter-governmental organization that supports the governments of developing countries to transition to a model of economic growth that is environmentally sustainable, climate-resilient, and socially inclusive.

GGGI has a unique in-country presence and prominent role as a neutral trusted advisor and strategic development partner embedded in Member and partner governments. These advisors are directly engaged with national governments in setting the strategic direction for national development guided by a CPF.

GGGI's operating model maximizes the potential to translate green growth strategies and policies (especially economic policies) into green investment plans, mobilizing green finance commitments needed to bolster support for low-carbon and climate-resilient economic development and strong institutional capacity development.

GGGI's interventions emphasize the delivery of impacts in six Strategic Outcomes (SOs) to support the green growth transformation of Member and partner countries. This will be achieved through program and project interventions in five areas of Global Operational Priorities (GOPs) and 10 programmatic solutions.

Headquartered in Seoul, Republic of Korea, GGGI also has country office representation in over 30 member and partner countries.

meetings with the Government's Technical Working Group on Sustainable Cities as well as donor coordination groups. The team also had extensive bilateral meetings with government counterparts and development agencies on the overall program as well as specific programmatic solutions and projects throughout 2020. Finally, the strategic direction of the CPF was discussed between the Minister of Environment, H.E. Say Samal, and GGGI President & Chair during a meeting in October 2020.

The benefits of the CPF include having a well-developed in-country strategy to improve GGGI's ability to deliver quality, inclusive, and impactful results that will accelerate the green growth transformation of Cambodia. It also allows links to key global agendas on green growth and climate change, fosters Government ownership and commitment, stronger partnership and resource mobilization, and the tracking and reporting of the delivery of SO results.

1.1 CPF Objectives and Purpose

Strategic Alignment

The CPF is designed to make the link between GGGI's Strategy 2030 with national plans and objectives, to determine GGGI's programmatic solutions for a country based on country needs and priorities.

Impactful Programs

A five-year country strategy with a clear set of objectives and with government ownership improves GGGI's ability to deliver quality, inclusive green growth support to its government partners. The CPF serves as a framework for all projects by GGGI in-country that deliver measurable strategic attributed and contributed outcomes.

Government Ownership and Commitment

The CPF is designed to ensure that the government's national development priorities remain at the center of GGGI's interventions. The development process for CPFs relies on both technical analysis and stakeholder consultation. The final endorsement of the CPF by the government demonstrates its political commitment and co-ownership and commits both parties to collaborate and support the joint implementation of the CPF.

Stronger Partnerships and Resource Mobilization

The CPF ensures continuity of results, articulates GGGI's comparative advantage, and demonstrates a clear

and compelling pathway to impact GGGI's partners, all of which is critical for resource mobilization. More practically, the outcomes identified in the CPF can be used to develop funding proposals and/or partnerships. The development of partnerships and alliances is crucial to accelerate the adoption of green growth and transformational impact at scale. During the CPF formulation, GGGI maps out the relevant activities of development partners, avoiding duplication of effort, seeking synergies, and to identify areas of work with strong resource mobilization potential.

Internal integration

In addition to government consultation, CPFs build on in-house discussion and joint analysis between the different divisions. The CPF process brings together country offices and a cross-selection of experts in headquarters, regional and other country offices, to discuss and agree on a common programmatic direction for the next five years and ensure a "ONE GGGI" approach to delivering the CPF.

Link to Key Global Agendas

GGGI's mandate is to support the implementation of the 2015 Paris Climate Change Agreement, and the 2030 Sustainable Development Agenda through green growth. GGGI's Strategy 2030, which is fully aligned with the Paris Agreement, and the UN SDGs has identified key strategic priority areas GGGI can add value and bring about impacts. These agendas are at the core of CPF analytical exercises, priority setting criteria, and results formulation.

1.2 Strategy 2030

GGGI's Strategy 2030 sets the course for GGGI's service delivery, growth, and expansion over the next 10 years from 2021 to 2030. The purpose of Strategy 2030 is to present an ambitious, robust, and clear vision and targets to help accelerate the success of the organization and its mandate to support Members achieve impacts by creating systemic change in the green growth landscape through low-carbon, socially inclusive, and environmentally sustainable economic development.

A primary focus of Strategy 2030 is to achieve scaled up interventions and more impactful results through the six SOs (see Box 2) that support the Member and partner countries NDCs and SDG ambitions. The delivery of these impacts will be achieved through the design and implementation of country-based programs and projects under 10 programmatic solutions (see Box 3).

Box 2. Six Strategic Outcomes

1. GHG emissions reduction
2. Creation of green jobs
3. Increased access to sustainable services, including clean affordable energy, improved sanitation, sustainable waste management, and sustainable public transport
4. Improved air quality
5. Sustained natural capital for the adequate supply of ecosystem services
6. Enhanced adaptation to climate change

Box 3. Programmatic solutions

1. Green Investments
2. Climate Action
3. Climate Resilient Agriculture
4. Sustainable Forests
5. Coastal Resilience
6. Waste Management
7. Sustainable Mobility
8. Green Buildings
9. Solar PV
10. Green Industries

Strategy 2030 will be cascaded down to the country level through the CPF and Country Business Plans. The Country Business Plan is a two-year action plan that outlines Cambodia's country program, projects, and budget for implementation through the biennium Work Program and Budget, beginning with the Work Program and Budget 2021-2022. It is crucial that the CPF is aligned systematically with Strategy 2030 prior to 2021 to ensure that country programs and projects identified in the Country Business Plans and developed and implemented under the Work Program and Budget are in sync with GGGI's new GOPs and programmatic solutions.



2. Country Overview

Over the past two decades, Cambodia has achieved outstanding economic growth and development, making it one of the fastest-growing economies in Southeast Asia. With a population of over 15 million people, Cambodia is classified as a 'least developed country', but it aspires to meet the criteria to graduate from 2027 onwards.²

In 2000, Cambodia was an overall net carbon sink but rapid development and growth in recent years have put a strain on the country's natural resources. Cambodia's geography, reliance on agriculture, and low adaptive capacity makes it one of the most climate-vulnerable countries in the world.³

Table 1. Cambodia at a glance

Indicator Name	Data	Year	Source
Total population (millions)	16.25 ⁴	2019	NIS
Area (sq. km) (thousands)	181	2018	World Bank
Urban population growth (annual %)	39.4	2019	NIS
Urban population (% of total)	23.4	2018	World Bank
GDP per capita, PPP	4360.85	2018	World Bank
World Bank income group classification	Lower middle income	2017	World Bank
Poverty headcount ratio at national poverty lines (% of population)	17.7	2012	World Bank
Unemployment Rate (% of population 15-59 years)	1.2	2019	NIS
Proportion of informal employment in non-agriculture employment (%)	90.6	2012	ILO
Inflation, consumer prices annual %	2.45	2018	World Bank
Net ODA received (% of central government expense)	20.93	2018	World Bank
Human Development Index (Rank)	146	2018	UNDP
Gender Inequality Index (Rank)	114	2018	UNDP
CO2 emissions (metric tons per capita)	0.4	2014	World Bank

² Ministry of Commerce, RGC "The Cambodia Trade Integration Strategy (CTIS) 2019 – 2023," July, 2019.

³ RGC, "Cambodia Industrial Development Plan 2015-2025," 2015.

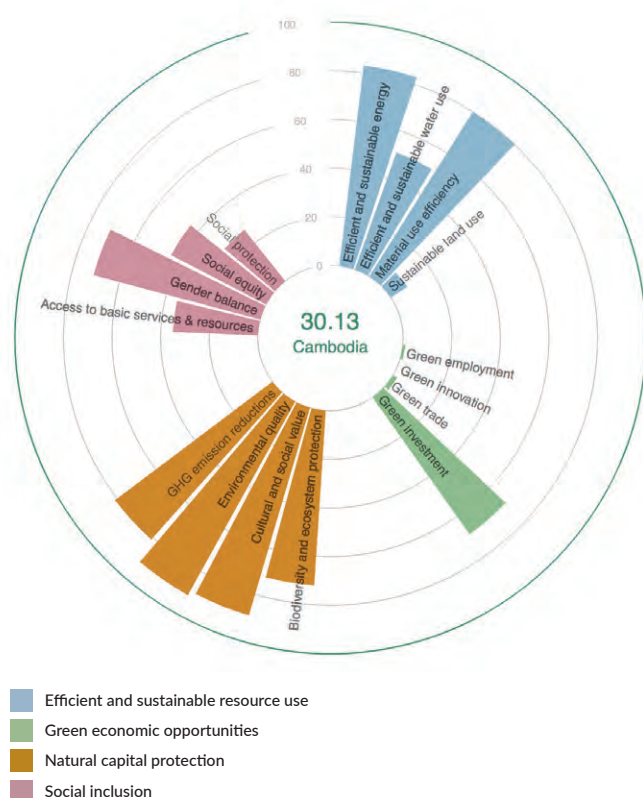
⁴ National Institute of Statistics (NIS), "General Population Census of the Kingdom of Cambodia 2019," 2019.

Forest area (% of land area)	52.85	2016	World Bank
Agricultural land (% of land area)	30.9	2016	World Bank
Agricultural, value added (% of GDP)	22	2018	World Bank
Arable land (% of land area)	21.53	2016	World Bank
Renewable energy consumption (% total final consumption)	64.92	2015	World Bank
Fossil fuel energy consumption (% of total)	30.6	2014	World Bank
Renewable internal freshwater resources per capita (cubic meters)	7896	2014	World Bank
Renewable internal freshwater resources, total (billion cubic meters)	120.6	2014	World Bank
Annual freshwater withdrawals, total (% of internal resources)	1.81	2007	World Bank
Sanitation facilities (% of population with basic access)	59.2	2017	World Bank
Access to safely managed sanitation (% of population)	27	2015	RGC
Environmental Performance Index (Rank)	150	2018	Yale
Global Competitiveness Index (Rank)	110	2018	WEF
Gini coefficient	0.28	2016	World Bank
ND-GAIN Adaptation Index (Rank)	135	2017	ND-GAIN

2.1 Cambodia's Green Growth Index

GGGI's Green Growth Index provides policymakers with a metric to measure the green growth performance of a country. It measures country performance in achieving targets including SDGs, the Paris Climate Agreement, and Aichi Biodiversity Targets for four green growth dimensions – efficient and sustainable resource use, natural capital protection, green economic opportunities, and social inclusion (see Figure 1. The methods used to aggregate the Green Growth Index are shown in Annex A.)

Figure 1. Distance to targets for green growth indicators



Cambodia performs well in efficient and sustainable energy, due to its current high levels of hydropower. However, Cambodia makes limited use of non-hydropower renew-

able energy and shows a trend of increasing fossil fuels in the electricity mix. Cambodia still scores high on natural capital protection – which combines indicators around GHG emissions, biodiversity, environmental quality, and social and cultural value. Green economic indicators highlight untapped opportunities for green investment, green trade, green employment, and green innovation. Regarding social inclusion, scores also remain to be improved.

2.2 Economic Growth

Cambodia's economic growth has been driven primarily by the rapid expansion of exports, namely garment manufacturing, construction, and tourism. Prior to the COVID-19 outbreak, Cambodia had sustained an average of 7.7% annual economic growth since 1994.⁴ Asia Development Bank (ADB)⁵ estimates that economic growth will dramatically slow to 2.3% in 2020 due in part to COVID-19. This impacts, in particular, Cambodia's tourism industry as well as construction and manufacturing through supply chain disruptions and reduced demand.

Market integration with the European Union (EU), the United States, and the People's Republic of China (PRC) contributed to industry growth of an estimated 11.3% in 2019.⁶ The EU market currently accounts for a third of Cambodia's key exports, consisting mostly of low-cost garment production. The PRC has driven tourism and construction industries, making up three-quarters of the foreign direct investment in Cambodia in 2018.⁷ However, industry growth is forecast to slow to 6.5% in 2020 due to a sharp slowdown in the PRC and the partial suspension of the EU Everything But Arms (EBA) trade scheme.⁸

Cambodia's economic growth has also been driven by the country's rich and diverse natural capital. Agriculture (including forestry and fishing) contributed 22% of Cambodia's Gross Domestic Product (GDP) in 2018 and it makes up 32% of the country's employment.⁹ Tourism is another sector that is increasingly dependent on natural resources and environmental sustainability.

⁴ World Bank, "World Bank Database," 2018, <https://data.worldbank.org/country/cambodia>.

⁵ ADB, "Asian Development Outlook 2020: What Drives Innovation in Asia?" 2020, <https://www.adb.org/sites/default/files/publication/575626/ado2020.pdf>.

⁶ Ibid

⁷ World Bank, "Cambodia Economic Update 2019: Investing in Cambodia's Future: Early Childhood Health and Nutrition," 2019, <http://documents.worldbank.org/curated/en/843251556908260855/pdf/Cambodia-Economic-Update-Recent-Economic-Developments-and-Outlook.pdf>.

⁸ ADB, 2020.

⁹ World Bank, 2018.

2.3 Environmental Sustainability

Cambodia faces some of the highest levels of climate-vulnerability in the world. It is prone to natural disasters such as floods, droughts, and rising sea levels and has a low adaptive capacity.¹⁰ The Ministry of Economy and Finance and the National Council for Sustainable Development (NCSD) estimated that that climate change could reduce Cambodia's GDP by 2.5% by 2030 and by almost 10% by 2050.¹¹

Urbanization in Cambodia offers increased employment opportunities, but it is still in the early stages, with only 23% of the population living in urban areas.¹² However, this is expected to increase rapidly as Cambodia's annual rate of urban growth is one of the highest in the region at 3.25%.¹³ This is predicted to place a strain on infrastructure and services. Cities such as Phnom Penh and Sihanoukville are already experiencing the stress of urban growth with insufficient solid waste management and wastewater treatment, urban flooding, and air pollution.¹⁴

ADB predicts that the country's energy needs will double by 2030.¹⁵ Traditionally high electricity tariffs in the country constrain economic diversification and can make access unaffordable. Domestic electricity generation depends primarily on hydropower (41%) and coal-fired plants (46.7%), with limited sources of non-hydro renewable energy, though there has been growth in utility-scale solar power projects (3.2%).^{16 17}

Urbanization and economic development have driven Cambodia's growth, though this has placed pressure on its natural resources. This pressure arises from the construction of hydropower dams and over-exploitation of forests and mangrove ecosystems. Climate change exacerbates these challenges through sea-level rise and shrinking arable land, threatening clean drinking water supplies and food security.¹⁸

2.4 Poverty Reduction and Social Inclusion

Cambodia has made significant progress in reducing poverty. In 2009, the Millennium Development Goal of halving poverty was achieved, but most of the population who escaped poverty did so by a small margin. Persistent social disparities exist, especially between urban and rural populations. Rural areas of Cambodia are home to about 80% of the population, including the majority of people that live in poverty, and many are dependent on natural resources for food, shelter, and income.¹⁹ According to The World Bank, any negative shock reducing consumption per capita by US\$0.50 would double the poverty rate.²⁰

While government spending on public services such as education and health has increased, it remains largely dependent on aid for service delivery.²¹ Improvements in women's educational attainment and economic participation have narrowed gender gaps in Cambodia, rising several places to 93 out of 144 countries on the World

¹⁰ UNESCO, "Climate Change Vulnerability Mapping for Greater Mekong Sub-Region," October, 2015.

¹¹ RGC, "Cambodia Climate Economic Growth Impact Model," May, 2018.

¹² World Bank, 2018.

¹³ Ibid

¹⁴ World Bank, "Urban Development in Phnom Penh," 2017, <http://documents.worldbank.org/curated/en/286991511862455372/pdf/121692-RE-vised-Phnom-Penh-Urban-report-V8-V-low.pdf>.

¹⁵ ADB, 2020.

¹⁶ EAC, "Salient Features of Power Development in the Kingdom of Cambodia Until December 2020," 2020.

¹⁷ Although hydroelectricity is a renewable source of energy, the construction of large-scale hydroelectric facilities can have significant and unavoidable negative environmental and social impacts. While the nature and severity of such impacts are highly site specific and tend to vary in scale according to the size and type of the project, due to its generally environmentally disruptive impact, it is suggested to count large scale hydropower separate from other renewable energy sources.

¹⁸ RGC, "Cambodia's Nationally Determined Contribution," 2015, <http://www4.unfccc.int/submissions/INDC/Published%20Documents/Cambodia/1/Cambodia's%20INDC%20to%20the%20UNFCCC.pdf>.

¹⁹ UNDP, "Human Development Report Cambodia 2019: Sustaining Natural Resources for all," 2019, http://hdr.undp.org/sites/default/files/nhdr_cambodia.pdf.

²⁰ World Bank, "Cambodia Economic Update 2019: Investing in Cambodia's Future: Early Childhood Health and Nutrition," 2019, <http://documents.worldbank.org/curated/en/843251556908260855/pdf/Cambodia-Economic-Update-Recent-Economic-Developments-and-Outlook.pdf>.

²¹ Ibid

Economic Forum (2018) Global Gender Gap Index. However, gender inequalities and rigid gender norms persist, and women continue to face barriers in society such as a lack of political empowerment.²² To a considerable degree, traditional gender norms that position men as breadwinners and women as homemakers and/or child caretakers still prevail in Cambodia and are at the root of many development challenges. As a result of these norms, women face multiple burdens on their time and energy, and limited mobility and agency. While women are increasingly involved in productive tasks, it is often in low or no wage work, such as family-based agriculture (USAID, 2016).

2.5 National Priorities

In 2019, Cambodia launched the Rectangular Strategy IV, a socio-economic policy agenda that acts as a blueprint to guide national development in four priority areas:

- Human resource development;
- Economic diversification;
- Promotion of private sector development and employment;
- Inclusive and sustainable development.²³

The Rectangular Strategy IV signals a need to strengthen the sustainable management of natural resources, manage urbanization, address climate change, and improve gender equality and social protection.

The National Strategic Development Plan 2019-2023 (NSDP) serves as the roadmap for the effective implementation of the Rectangular Strategy IV. A green growth model for urban development is suggested to address challenges in areas such as transportation, waste management, and energy supply.²⁴

In 2013, the RGC also launched the Cambodian Climate Change Strategic Plan 2014-2023 (CCCSP). This national policy document provides guidance on responding to the high level of climate-vulnerability faced by Cambodia.²⁵

To coordinate effective sustainable development responses, the RGC established the National Council for Sustainable Development (NCSD) in 2015. The NCSD Strategic Framework 2018-2023 identifies the green economy as one of its key objectives and sets goals to improve the sustainability of energy, consumption and production, and cities in Cambodia.

The RGC was one of the first national governments in the world to have established a National Green Growth Roadmap (2010), a National Policy on Green Growth (2013), and a National Green Growth Strategic Plan 2013-2030 to demonstrate its desire for green growth in achieving its development objectives. The National Green Growth Strategic Plan outlines key strategies to improve green growth, including:

- Promoting renewable energy, especially in rural areas;
- Enhancing the efficient use of natural resources and waste management;
- Developing indicators to show green economic growth.²⁶

Cambodia's NDC was submitted to the United Nations Framework Convention on Climate Change in 2015. and in 2020, Cambodia submitted their NDC update. It highlights some of the commitments made by the RGC on an international platform to reduce GHG emissions, implement green growth principles, and improve Cambodia's resilience to climate change. Mitigation actions to lower GHG emissions, conditional upon support from the international community, for 2020-2030 include a focus on reforestation, energy, manufacturing, and transport. Adaptation action focuses on agriculture, health, and infrastructure.

Finally, at the city level, the Phnom Penh Sustainable City Plan and the (draft) Secondary City Strategic Plan for seven secondary cities look holistically at the requirements for green urban development, setting objectives for clean energy, sanitation, waste management, mobility, green building, manufacturing and more.

²² World Economic Forum (WEF), "The Global Gender Gap Report 2018," 2018, http://www3.weforum.org/docs/WEF_GGGR_2018.pdf.

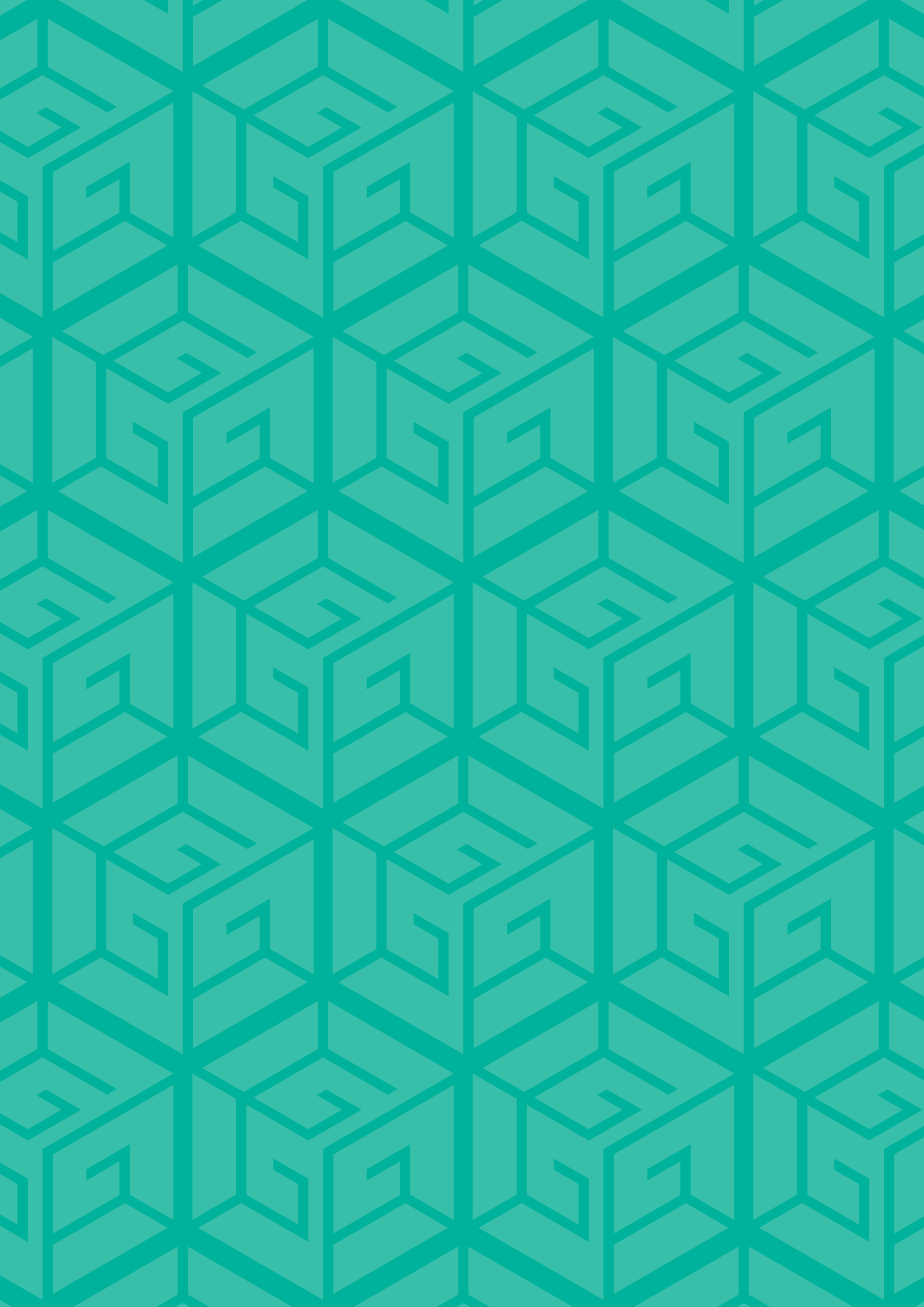
²³ RGC, "Rectangular Strategy - Phase IV," 2018, <http://cnv.org.kh/wp-content/uploads/2012/10/Rectangular-Strategy-Phase-IV-of-the-Royal-Government-of-Cambodia-of-the-Sixth-Legislature-of-the-National-Assembly-2018-2023.pdf>

²⁴ RGC, "National Strategic Development Plan 2019-2023," 2019.

²⁵ RGC, "National Strategic Plan on Green Growth 2013-2020," 2013, <https://policy.asiapacificenergy.org/sites/default/files/National-Strategy-Plan-on-Green-Growth-2013-2030-Cambodia.pdf>.

²⁶ RGC, "National Green Growth Strategic Plan 2013-2030," March, 2013.





3. Programmatic Solutions

3.1 Waste and Wastewater Management

Context

Waste and wastewater management is an ongoing challenge in Cambodia. Rapid urbanization and increasing rates of consumption have led to high levels of waste generation, placing a strain on municipal waste services. In addition, changing waste composition from primarily organic to an increase in non-degradable waste such as plastics, metals, and electronic waste presents the need for additional infrastructure, and management systems. Throughout Cambodia, there are limited waste collection services, treatment plants, recycling, or containment options for solid waste, wastewater, and fecal sludge. Cambodia has no large-scale waste treatment facilities, and landfills and wastewater treatment plants are poorly managed. Waste management is generally outsourced to the private sector, and due to the difficulties in recovering fees from service users, the services provided are poor. A lack of understanding of environmental issues by the public also poses a challenge. This can lead to poor sanitary conditions, particularly impacting poorer parts of the community living over wastewater discharge canals, and around unsanitary landfills.

National Objectives

The National Rectangular Strategy IV and the National Strategic Development Plan 2019–2023 (NSDP) call to strengthen the management of solid waste and wastewater. This is also reflected in the Cambodia Climate Change Strategic Plan 2014 – 2023 (CCCSP), which commits to promoting low-carbon planning and technologies to support sustainable development, including in waste and wastewater management. A target is set in the Cambodian SDGs to provide safely managed sanitation services to 50% of the population by 2030. The SDGs also aim to increase the amount of urban solid waste collected regularly by 11% by 2030.

Barriers

While high-level policies exist, particularly for solid waste, there is a lack of mechanisms for on the ground implementation. For example, there are insufficient master plans, detailed regulations, and budgets to enable efficient action, infrastructure investment and operations and maintenance. Rather, waste management interventions are ad hoc and often rely on financial support by development partners.²⁷ A further barrier is the high investment costs required for efficient waste and wastewater management, despite the possibility to develop sustainable business models.

GGGI's Response

Through value chain assessments, GGGI will identify the best waste-to-resource approach and focus on the development and implementation of viable business models to attract private sector investment, reducing reliance on donors. This includes researching issues and suitable inclusive technologies, supporting cities to design public-private partnerships and cost recovery schemes. The assessments will also include environmental and social safeguards analysis and propose solutions that would generate co-benefits in the waste sector. GGGI will ensure that the business models developed bring improved sanitation specially to underserved communities.

Drawing on GGGI's existing work with secondary cities such as Battambang, Kep, and Siem Reap, GGGI will support municipalities to set up systems for waste collection, recycling, and treatment. This will include institutional arrangements, capacity building of both public and private sector, and community engagement. The country team will also support the government in the development and implementation of regulations to enable the above outputs, such as cost recovery schemes. GGGI will seek to support regulations which protect and sustain the environment as well as the health of the population. The focus will be placed on institutional mechanisms for efficient on the ground implementation, especially at the municipal level.

²⁷ RGC, "National Strategic Development Plan 2019-2023," 2019,

With regard to wastewater management, GGGI will put emphasis on decentralised, affordable, easily manageable solutions, that can realistically be operated and maintained on a city budget.

GGGI's interventions in waste management aim to shift away from landfill-oriented solutions towards circular economies – and ensure inclusive approaches such as involvement of informal workers and waste pickers associations. The targeted outcome is for selected cities to have financially sustainable facilities and systems to collect all waste, increased recycling rates, and functional fee-paying mechanisms. This will lead to improved sanitary conditions and job opportunities for the general population, particularly for poor communities employed in the waste sector

3.2 Green Industries

Context

The industrial sector in Cambodia has shown strong growth resulting in a steady increase of its share in total GDP from about 23% in 2009 to 32% in 2016.²⁸ Cambodia's industrial base is undiversified, dominated by garment production which is driving the country's steep industrial growth and has led to a significant increase in GHG emissions from energy consumption.²⁹ In addition, the use of fuelwood in manufacturing is a significant contributor to deforestation. The garment industry alone burns more than 300,000 tons of wood per year.³⁰ In 2017, the estimated amount of industrial waste disposed to landfill was 145,114 m³, not accounting for waste that would have been illegally dumped or burnt.³¹ The bulk of the waste is textile and wastewater treatment sludge.³² Meanwhile, Cambodia's industry is losing its edge compared to countries like Bangladesh, Myanmar, and Viet Nam, given its high energy costs as well as a recent increase in the minimum wage, lagging infrastructure, productivity, and logistics.³³ The COVID-19 pandemic caused supply chain and demand disruptions which led hundreds of factories to suspend activities or close down in 2020. Investing in resource and energy efficiency in manufacturing offers the

Box 3. Strategic Outcomes

Over the next 5 years, the Waste Management programmatic solution aims to contribute to the following government impact outcomes:

- SO 1: Reduced GHG emissions – GGGI will contribute to the NDC (2020) target of 18% GHG emissions reductions against BAU by 2030 from the waste sector.
- SO 3.2: Improved sanitation – GGGI will contribute to the government SDG target of seeing a 50% proportion of the population using safely managed sanitation services by 2030, up from 32% today.
- SO 3.3: Sustainable waste management – GGGI will contribute to government SDG target of seeing 1.50 million tons of urban solid waste to be regularly collected, with adequate final discharge by 2030, up from 1.35 million ton today.

And the following attributed outcomes:

- SO 3.2: Improved sanitation - 200 000 people have access to improved sanitation.
- SO 3.3: Sustainable Waste Management - 500 000 people have improved access to waste management.

opportunity to boost recovery, reduce production costs, improve competitiveness and reduce negative environmental externalities.³⁴ GGGI's economic modelling projects that a 20% increase in energy efficiency in the garment sector, for example, would lead to an increase of more than 30% in energy productivity by 2030 and US\$ 2 billion of avoided energy costs.

²⁸ GGGI, "Green Growth Potential Assessment", 2018.

²⁹ Ibid.

³⁰ Geres, "Sustainable Steam for Cambodian Garment Factories", 2019.

³¹ Cambodian Ministry of Environment, "Draft National Waste Management Strategy and Action Plan," 2018.

³² Accurate data sources for assessing the volumes of industrial waste are scarce, a better understanding of industrial pollution is required to mitigate adverse impacts. GGGI, "Green Growth Potential Assessment", 2018.

³³ Spiess, R, "A sector too big to fail," April 5, 2018, <https://www.phnompenhpost.com/business/sector-too-big-fail>.

³⁴ Spiess, R, "A sector too big to fail," April 5, 2018, <https://www.phnompenhpost.com/business/sector-too-big-fail>

National Objectives

The role of industry and small and medium-sized enterprises (SMEs) as a key driver of growth in Cambodia is emphasized in the Rectangular Strategy, National Strategic Development Plan 2019-2023 (NSDP), and the Industrial Development Policy 2015-2025. SMEs are also at the core of the government's COVID-19 recovery efforts, given the direct impact on livelihoods for the economically vulnerable. To support industrial growth and reduce GHG emissions, the Cambodian Climate Change Strategic Plan 2014-2023 (CCCSP) identifies energy production, energy efficiency, and waste management solutions as key areas for development in the manufacturing industry. The RGC is also developing a Circular Economy Strategy and Action Plan (draft) to provide a roadmap for Cambodia's transition from a linear to a circular economy. The plan primarily focuses on resource use, energy, and waste management.³⁵ This is reflected in the NDC, which recognizes sustainable energy practices as key mitigation actions. The NDC (2020) also commits to halving the deforestation rate by 2030 and identifies promotion of sustainable sourcing of fuelwood in the garment industry as a necessary mitigation action. Further mitigation actions in the garment industry include heat stress adaptation and centralized recycling for industrial waste from the sector. Furthermore, the Cambodian SDGs aim to increase the proportion of renewable energy in the total final energy consumption by 60% by 2030. Sector strategic priorities also include promoting renewable energy and energy diversification for industrial production processes and improving industrial waste management. The Phnom Penh Sustainable City Plan aligns with the same objectives.

Barriers

High-level policy objectives related to industrial resource efficiency have not been widely implemented to date. While a few smaller projects have been implemented with donors' support, there is an absence of a strong government-led, long-term, and comprehensive program on industrial resource productivity. Achieving good industrial productivity requires a program of interventions including technology support both in the factory and service provider ecosystem, promotion of business-mainstreamed environmental management practices, and working to improve access to finance through tailored lending products and innovative business models.

Improving industrial resource efficiency at the SME level is complex and requires a specialized program of support. Interventions often fail because of the need for an intensive engagement approach that emphasizes building trust with business owners and the provision of sub-sector specific solutions. SME resource efficiency interventions must address industry-specific technology adoption barriers and include integrated business strengthening services to strengthen enterprise bankability for access to finance.

Renewable energy, such as solar photovoltaics (PV), offers a way to decarbonize industrial energy demands. However, the renewable energy industry faces financial and regulatory risks. The lack of policy towards the deployment of renewable energy undermines investor confidence and active private sector participation.³⁶

GGGI's Response

GGGI's strategy for greening the industrial sector in Cambodia will focus on activities in four key areas to mobilize finance for cleaner production: 1) Build demand at the factory level through strategic sustainability awareness and optimized project packaging, 2) Create a service ecosystem focused on de-risked project delivery, 3) Strengthen the policy and regulatory environment and government capacity to provide top-down incentives for investments, and 4) Working with the finance sector to build demand for resource efficiency and sustainable energy investments and tailored lending products backed by capital sources. GGGI will explore de-risking mechanisms and carbon credit schemes.

GGGI will broaden support for a green recovery of the manufacturing sector in Cambodia through activities that reduce resource intensity, improve sustainable use of fuelwood, and improve the circularity of materials. GGGI will seek to strengthen engagement with industries to improve material efficiency, enhance on-site waste treatment and separation, and facilitate recycling through connection to markets. Considering the central role of SMEs in COVID-19 economic recovery, GGGI will also intensify the development of support programs that integrate business strengthening services and sector-specific technology adoption activities. The targeted outcome is to increase the productivity and competitiveness of the Cambodian industrial sector while decreasing its environmental footprint.

³⁵ RGC, "[Draft] The Circular Economy Strategy and Action Plan," 2020.

³⁶ GGGI, "Pre-feasibility Study: Improving Access to Finance and Technical Support for Energy Efficiency Investments in Cambodia", 2016.

Since the green industry sector continues to provide proven source of employment (and contributes to poverty alleviation), GGGI will support long term strategies in the sector that create incentives – invest in the necessary education, infrastructure, innovation, and entrepreneurial

Box 4. Strategic Outcomes

Over the next 5 years, the Green Industries programmatic solution aims to contribute to the following government impact outcomes:

- SO 1: Reduced GHG emission – GGGI will contribute to the NDC target of 42% GHG emissions reductions against BAU stemming from the industry sector.
- SO 3.2: Increased access to sustainable energy – GGGI will contribute to the government's SDG target of achieving 5,066.20 Mtoe proportion of renewable energy in the total final energy consumption by 2030, increased from 3,031 Mtoe today.
- SO 3.3: Sustainable waste management – GGGI will contribute to the Government SDG 12 target to substantially reduce waste generation through prevention, reduction, recycling and reuse by 240,000 tons by 2030.
- SO 5: Adequate maintenance of natural capital – GGGI will contribute to the efficient use and sustainable sourcing of fuelwood thus reducing anthropic pressure over remnant natural forests, and supporting attainment of the NDC target of reducing the deforestation rate by 50% by 2030.

And the following attributed outcome:

- SO1: Reduced GHG emissions - GHG emissions from manufacturing decreased by 175,000 tCO₂e against BAU.

skills for most poor and marginalized groups in the country. GGGI will therefore leverage on projects that will act as primary source of income generation, improves living standards for all people and provide technological solutions that are environmentally and socially sound.

3.3 Sustainable Mobility

Context

In Cambodia, the transport sector is the biggest consumer of energy and it is expected to have the largest increase and share of GHG emissions by 2050 at 10,816 GgCO₂eq.³⁷ Strong economic growth and increasing per capita income have led to a rise in private vehicle demand. The rapid expansion in the use of private transport has resulted in increasing traffic volumes in cities, leading to congestion and higher levels of air pollution. Transport infrastructure has not kept up with the growing demand. While feasibility work for some mass transit options for Phnom Penh is underway, public transport systems are generally limited across Cambodian cities. Rapid urbanization has led to urban sprawl and uneven population distribution at the periphery of cities. This pattern of urban growth has led to a reliance on private transport as public buses, where they exist, can only cover the main traffic arteries. Cambodian cities also increasingly lack walkable pathways, contributing to the dependency on private vehicles.

National Objectives

The transport sector plays an important role in Cambodia's national strategies, the National Strategic Development Plan 2019-2023 (NSDP) aims to improve the economy through enhanced transport infrastructure and connectivity while the Cambodia Climate Change Strategic Plan 2014-2023 (CCCSP) includes strategies to promote public transport in major cities and efficient transport technology for climate change mitigation and low-carbon development. These aims are reflected in the Cambodian NDC which identifies several actions to reduce transport emissions, including, increased vehicle inspection, the promotion of integrated public transport systems into main cities and increase use of electric vehicles. Strategies to increase urban mobility are outlined in the Phnom Penh Sustainable City Plan and the Phnom Penh Urban Transport Master Plan 2035, which seeks to increase the use of public transport in the country's capital city to over 30% of the modal share by 2035.³⁸

Barriers

A key barrier to achieving national targets is the lack of public transport infrastructure and effective/inclusive policy and land-use planning. The allocated transport budget is primarily spent on roads and bridges, and challenges include funding road maintenance, implementing effective design, and road safety.³⁹ There is also an inadequate regulatory environment for the uptake of electric vehicles and a lack of capacity to design financial incentives or structure the required public-private partnerships.

GGGI's Response

GGGI will support Cambodia in the transition of its transport sector to sustainable modes by promoting the switch from gasoline to electric vehicles (EV). This will include feasibility assessments for electric busses, regulatory recommendations to accelerate e-mobility transition, the design of financing schemes and bankable projects to attract the necessary public and private investments, as well as capacity building at the national and municipal level.

As motorcycles made up more than 80% of registered vehicles in Cambodia in 2018, GGGI's initial focus on electric motorcycles can allow for more impactful wins in regulations and investment while building broader EV market confidence and buy-in for clean public transport interventions which are more demanding in terms of time, capital and infrastructure.⁴⁰ To promote sustainable public transport, GGGI will assess the technical, financial, and operational feasibility of electric busses in its partner cities. The country team will then work with international donors and relevant government institutions to facilitate investment in sustainable public transport options. Clean public transport interventions will be spearheaded in the city of Siem Reap. Home to the World Heritage Site of Angkor and a key tourist destination in Cambodia, the city seeks to facilitate the clean mobility of millions of annual tourists as well as workers. As such, GGGI offers vital support to Cambodia's tourism sector in its post-COVID-19 recovery.

Box 5. Strategic Outcomes

Over the next 5 years, the Sustainable Mobility programmatic solution aims to contribute to the following government impact outcomes:

- SO 1: Reduced GHG emissions – GGGI will contribute to the NDC target of 41.7% GHG emissions reductions against BAU by 2030.

And the following attributed outcome:

- S03.4: Sustainable Public Transport – 2 million people have improved access to sustainable transport solutions

Sustainable transport solutions will reduce GHG emissions, improve air quality, stimulate green job creation, and increase access to public transport for the wider population. This sector is recognized as a tool for redistribution of wealth and in favour of the most marginalized communities. As such, GGGI will promote actions mainstream inclusive considerations in urban guidelines and roadmaps that consider inclusivity objectives such as safety, mobility patterns, and affordability of the fares.

3.4 Green Buildings

Context

With an increasing urban population and a construction sector growing at 18.1% during 2014-2019, the share of GHG emissions from buildings is expected to rise rapidly. No standards for energy and water efficiency in buildings currently exist, however, the MoE are developing Green Building Guidelines. Buildings with low energy performance are a drag on improving energy productivity and

³⁷ General Secretariat, National Council for Sustainable Development/Ministry of Environment, RGC, "Cambodia's Second National Communication under the United Nations Framework Convention on Climate Change," 2015.

³⁸ Ministry of Public Works and Transport, RGC, "The project for comprehensive urban transport plan in Phnom Penh capital city (PPUTMP)," December, 2014, <https://openjicareport.jica.go.jp/pdf/12245833.pdf>.

³⁹ ADB, "Cambodia Transport Sector Assessment, Strategy, and Roadmap," September, 2019, <https://www.adb.org/sites/default/files/institutional-document/529231/cambodia-transport-assessment-strategy-road-map.pdf>

⁴⁰ Ibid.

increasingly lock the country into a trajectory for high carbon intensity and a high rate of energy infrastructure investment. Modernization and increasing disposable income are driving the use of electrical and gas appliances in the residential sector. Cooling of buildings also presents a significant challenge. As air temperatures become more extreme, access to air conditioning will be required to maintain basic living conditions. The expansion of air conditioning and refrigeration is closely linked to the impacts of climate change and is a key source of GHG emissions for buildings.

Furthermore, the construction boom in Cambodia is leading to rapidly increasing construction and demolition (C&D) waste, which is treated as a low priority by the construction sector. Through careful planning, design and management, C&D waste can be greatly minimized, reused, or recycled leading to economic benefits. In addition, as part of the building design, basic septic tanks are often installed to meet regulatory requirements without provisions for treating the wastewater properly, and sometimes with poor access for desludgers. In large developments, there is no infrastructure to facilitate the storage of separated recyclable solid waste fractions.

National Objectives

Reducing building energy intensity through building codes, appliance efficiency standards, and awareness is a stated policy in the 2018 Cambodia Draft Energy Efficiency Policy and the Cambodia Basic Energy Plan. The Green Building Guidelines in development by MoE will also provide guidance to create more sustainable buildings. The United Nations Development Programme (UNDP) estimates that energy use can be reduced by at least 20% in residential and commercial buildings by implementing actions identified in the Draft National Energy Efficiency Policy.⁴¹ Cambodia's NDC also includes mitigation actions to reduce GHG emissions from buildings, including increasing climate friendly cooling in public buildings. The NDC (2020) also sets out an action to improve the adaptive capacity of low-income households and vulnerable households through provision of climate-proofed shelters.

Barriers

Currently, there is no minimum compliance standard for building energy or water efficiency in Cambodia. Although the government has signaled interest in introducing a building code, the process is expected to take a number of years.

Decarbonizing energy demands through solar PV generation has the potential to cut building energy use and costs. However, regularly changing regulation creates a lack of clarity on licensing conditions and tariff structures. This creates considerable uncertainty and constitutes a major barrier to investments in renewable energy.⁴²

In sub-decree 113, responsibilities for C&D waste management are outlined, albeit with no implementation nor specific targets for centralized infrastructure for C&D waste recycling. There is also a lack of awareness about energy efficiency and waste management in building design and an absence of data in the building sector. This is a significant barrier to quantifying and prioritizing mitigation activities for the built environment.

GGGI's Response

Building on the existing effort of the RGC to form green building guidelines, GGGI Cambodia will initially focus on public buildings and social housing as entry points for mainstreaming green building standards and building public sector capacity. Greater government control over transactions associated with public buildings and social housing is expected to reduce green building investment risk and support the mobilization of finance. "Greening" can include improved energy management, building materials as well as waste and wastewater solutions. Bioclimatic design strategies can alleviate the challenges of Cambodia's tropical climate and reduce reliance on mechanical cooling appliances.⁴³ Interventions in public buildings and social housing will focus on the promotion of models for building sustainability management, investment planning, green procurement, and elaborate policy pathways to provide

⁴¹ UNDP, "Energy Efficiency: The Key Pillar of Cambodia's Energy Future," 2020, https://www.undp.org/content/dam/cambodia/docs/EE%20Booklet%20V19_Spread.pdf.

⁴² GGGI, "Green Growth Potential Assessment", 2018.

⁴³ Planète Enfants et Développement et al, "Affordable housing in Phnom Penh - Ensuring decent housing opportunities for all (DRAFT)", 2020.

a roadmap for transition from guidelines and best practices to regulations.

Drawing on strong relationships with stakeholders at the municipal level, GGGI plans to expand activities related to promoting green building practices through low-income housing finance. Phnom Penh is actively looking for solutions to expand low-income housing through private sector developers. GGGI Cambodia will continue to develop initiatives that promote the adoption of green building standards through concessional finance programs. As such, GGGI will lower GHG emissions and the environmental footprint of the construction sector while supporting access to affordable housing.

Box 6. Strategic Outcomes

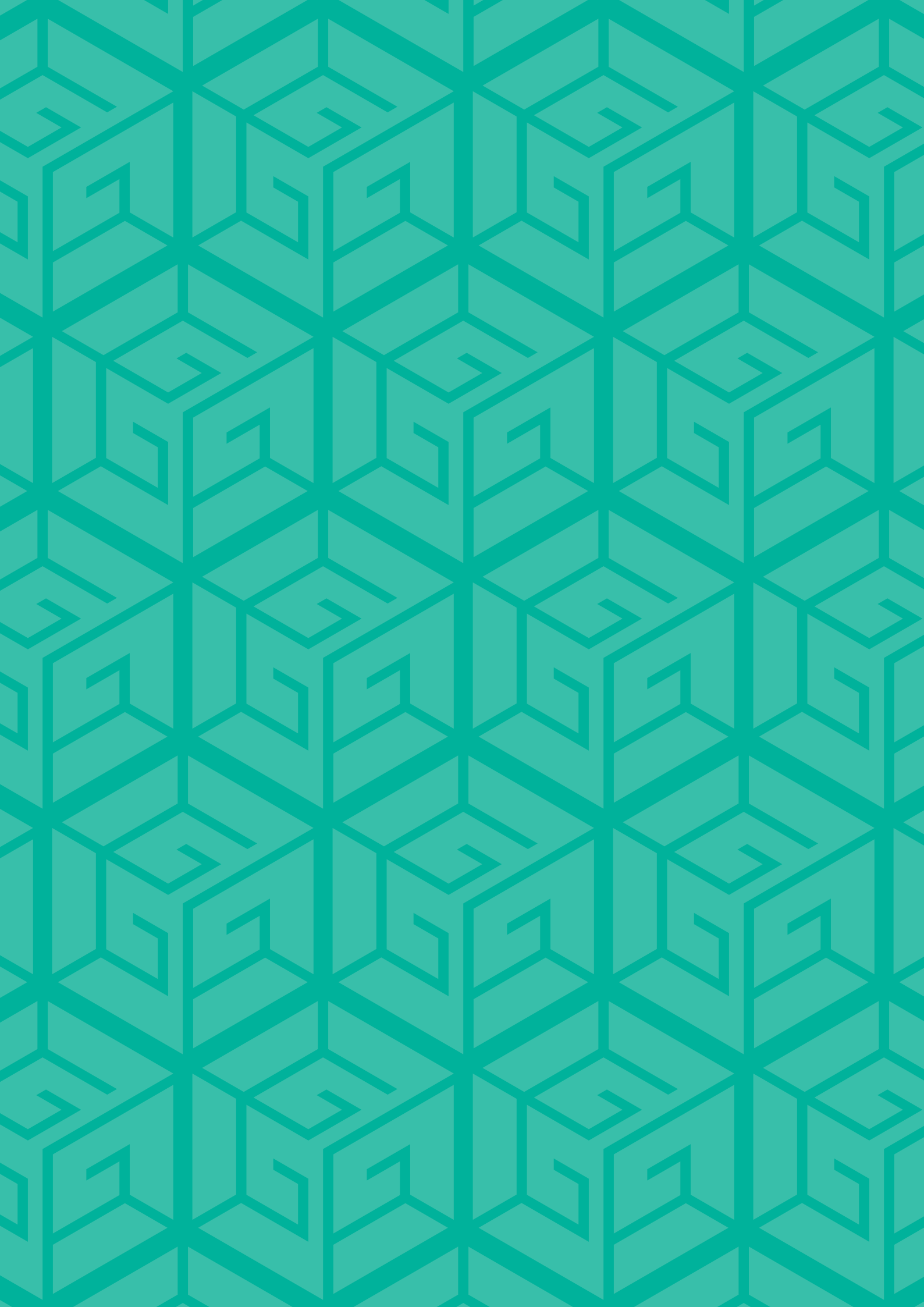
Over the next 5 years, the Green Buildings programmatic solution aims to contribute to the following government impact outcomes:

- SO 1: Reduced GHG emissions – GGGI will contribute to the NDC target of 41.7% GHG emissions reductions against BAU by 2030.

And the following attributed outcome:

- SO 1: Reduced GHG emissions - Reduce GHG emissions from buildings by 43000 tCO₂eq/year against BAU





Annexes

Annex A. Aggregation of Indicators and Dimensions for Green Growth Diagnostic

The Green Growth Index used aggregation methods to find a single holistic value to measure performance. Both linear and geometric methods of aggregation were used to aggregate indicators at the different levels of the Green Growth Index (see Figure 2).

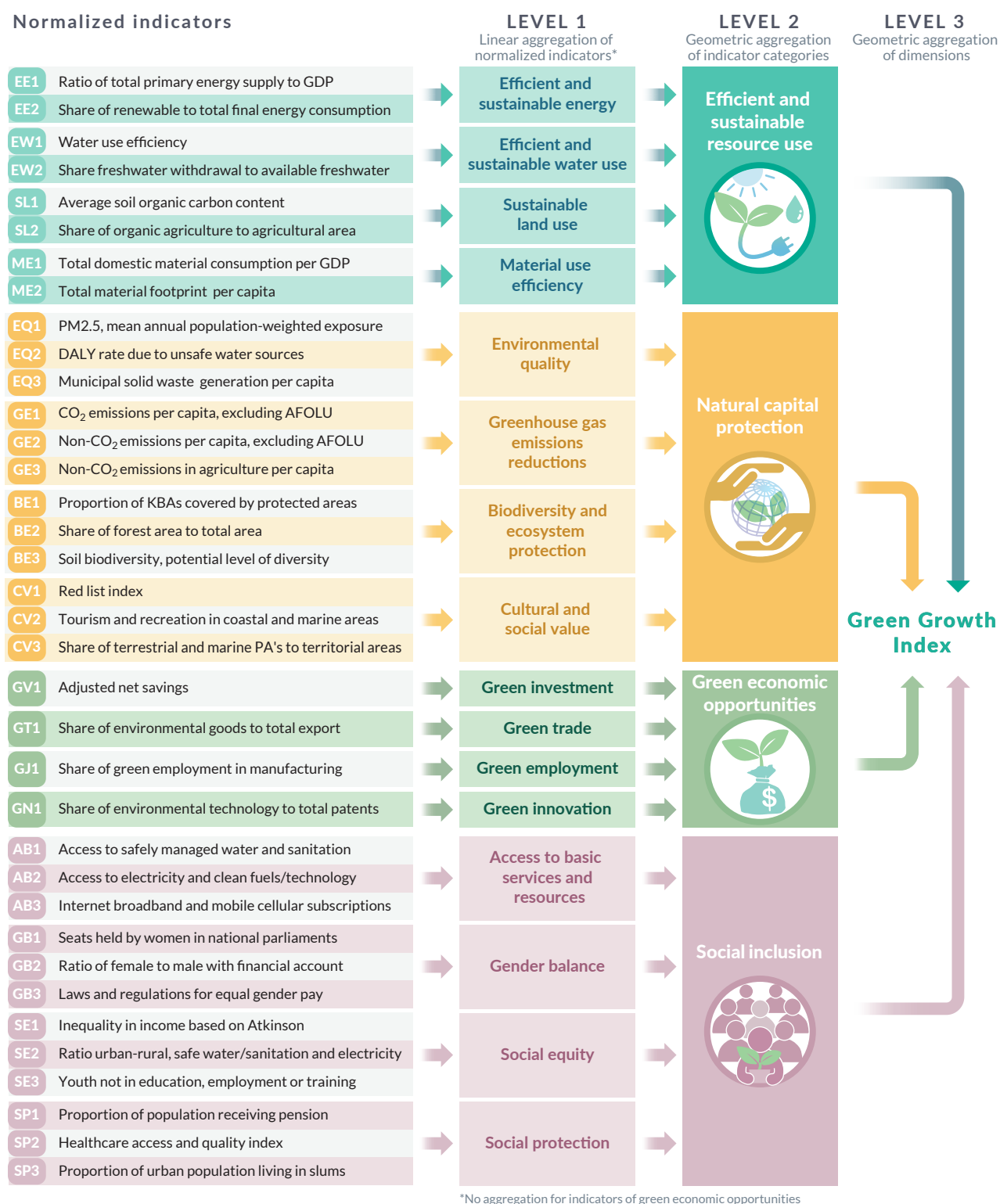
At level 1, the indicators were linearly aggregated into indicator categories using the arithmetic mean. This allows countries with poor performance in one indicator, for instance, due to lack of resources, to be compensated by another indicator in the same indicator category. At level 1 of aggregation, a rule on missing value for a category with more than four indicators was applied: Countries with more than 25% of missing values were dropped. This rule was not applied for the indicators in resource efficiency and green economic opportunities, which have less than three indicators in each category.

At level 2, geometric aggregation was applied to the indicator categories to allow only partial compensability between indicators in each dimension. Similar to level 1, the 25% rule on missing values was applied to dimensions with more than four indicator categories, such as in the case of resource efficiency and green economic opportunities. This rule was not applied for the indicator categories under natural capital protection and social inclusion, which have only three categories each.

At level 3, geometric aggregation was applied to the dimensions, and the 25 percent rule on missing values was not applied. At this level of aggregation, no dimension was allowed to easily substitute for the other dimensions to improve the Green Growth Index. Thus, as the level of aggregation increases, the level of substitutability decreases.



Figure 2. Methods of aggregation at the indicator, indicator category, and dimension levels.

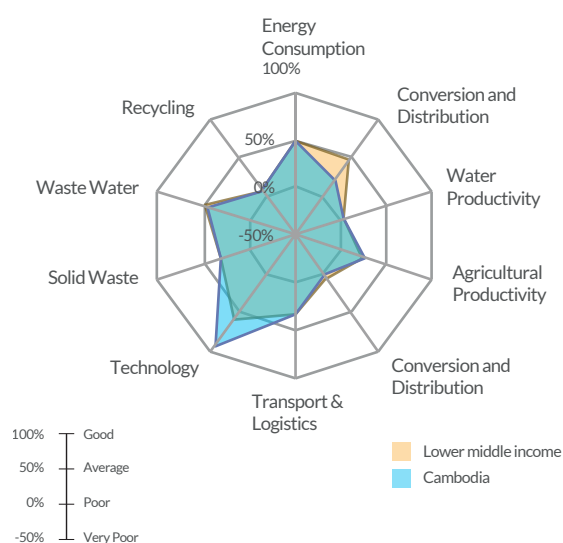


Annex B. Cambodia's Green Growth Performance

In its 2018 “Green Growth Potential Assessment”, GGGI assessed Cambodia's green growth performance compared to Lower Middle-Income Countries (LMICs) and a selected group of peer countries, including Laos, Thailand, and Vietnam. The GGPA draws on a set of more than one hundred comparative indicators covering the economic, environmental, and social dimensions of green growth. Specifically, indicators are grouped into four categories: Resource Efficiency, Natural Assets, Climate Risk and Resilience, and Social Inclusion (see Figures 3 to 6). The blue shaded area represents Cambodia's performance while yellow represents that of LMIC's.

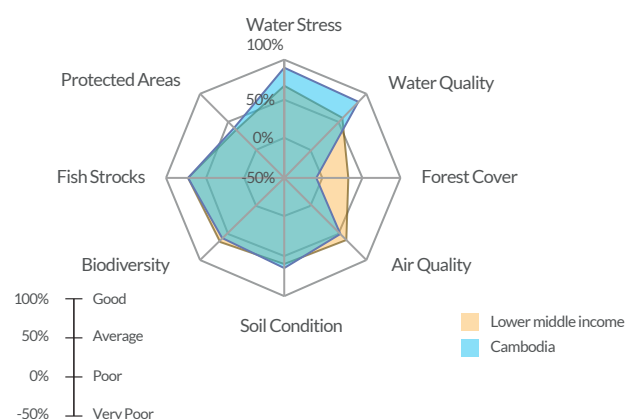
Cambodia scores relatively low for waste management and recycling. In addition, labor productivity received low scores across the region (see Figure 3).

Figure 3. Cambodia's Resource Efficiency



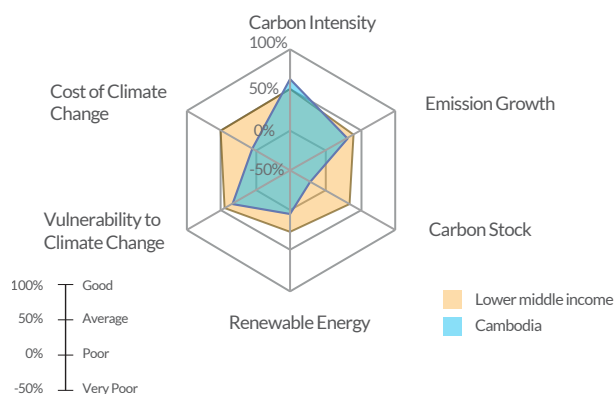
For indicators on natural assets, Cambodia scores lower than its peers on forest cover but performs well in mitigating water stress and water quality. However, the water stress indicator looks at annual use and supply but does not account for water accessibility, which is severely restricted by geography, climate, and water management (see Figure 4).

Figure 4. Cambodia's Natural Assets



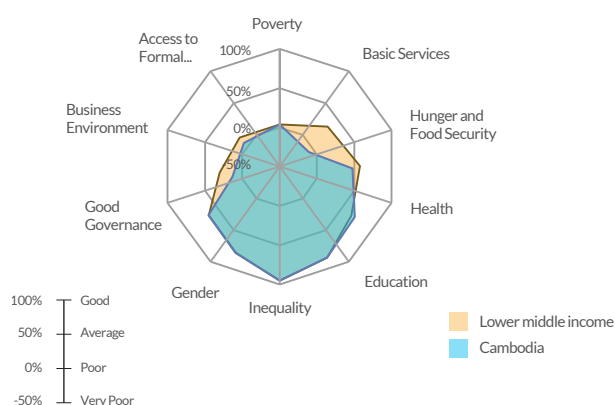
While Cambodia performs well on the carbon intensity of its economy, it faces challenges in its adaptive capacity. It also receives lower scores for renewable energy, which in this analysis, excludes hydropower (see Figure 5).

Figure 5. Cambodia's Climate Risk and Resilience



Cambodia yields poor results in areas including basic services and the business environment, but overall, it performs well on indicators of social inclusion in comparison to other LMICs (see Figure 6).

Figure 6. Cambodia's Social Inclusion



Annex C. Impact Pathway

Programmatic Solutions	Intermediate Outcomes			Strategic Outcomes (Impacts)		Country Goals
	Policy	Financing	Project Development	Attributed Impacts	Contributed Impacts	
Waste Management	Regulations and systems for waste collection, recycling, and treatment adopted	Cost-recovery schemes for waste and wastewater management operational at municipal level	Bankable waste-to-resource projects development, including investment commitment of US\$19M mobilized for an RDF plant in Phnom Penh.	SO 3.2: 200 000 people have access to improved sanitation SO 3.3: 500 000 people have improved access to waste management	SO1: 18% GHG emissions reductions against BAU by 2030 from the waste sector (NDC,2020). SO 3.2: 50% proportion of the population using safely managed sanitation services by 2030 (SDG). SO 3.3: 1.50 million tons of urban solid waste to be regularly collected, with adequate final discharge by 2030 (SDG).	SANITATION SDG: 50% of the population using safely managed sanitation services by 2030. WASTE MANAGEMENT SDG: 1.50 million tons of urban solid waste to be regularly collected, with adequate final discharge, by 2030.
Green Industries	Regulation adopted to promote sustainable energy, resource efficiency and waste management practices in the manufacturing	Establishment of a guarantee scheme to de-risk SME investments in sustainable energy solutions, Establishment of a carbon credit scheme for clean energy in garment manufacturing	Guarantee capitalized at of US\$5M by 2023 leveraging US\$25M in bank loans by 2035. Carbon transactions for US\$19M triggering US\$60M of the energy efficiency investment	SO1: GHG emissions from manufacturing decreased by 175,000 tCO2e against BAU	SO 1: 42% GHG emissions reductions against BAU stemming from the industry sector (NDC, 2020). SO 3.2: 5,066.20 Mtoe proportion of renewable energy in the total final energy consumption by 2030 (SDG). SO 3.3: Reduce waste generation by 240,000 tons by 2030 (SDG). SO 5: contribute to the sustainable use and sourcing of wood fuel thus reducing anthropic pressure over remnant natural forests, and supporting attainment of the NDC target of NDC (2020) target of reducing the deforestation rate by 50% by 2030.	SDG: Reduce waste generation by 240,000 tons by 2030. GHG REDUCTIONS NDC: 41.7% GHG emissions reductions against BAU by 2030. NDC: 42% GHG emissions reductions against BAU stemming from the industry sector. NDC: 18% GHG emissions reductions against BAU by 2030 from the waste sector. RENEWABLE ENERGY SDG: achieve 5,066.20 Mtoe proportion of renewable energy in the total final energy consumption by 2030.
Sustainable Mobility	Policies, regulations, and standards adopted to promote electric vehicles.	Incentive scheme for the transition towards electric vehicles established	US\$20M investment commitment towards electric vehicles committed	SO3.4: 2M people have improved access to sustainable transport solutions	SO 1: 41.7% GHG emissions reductions against BAU by 2030 (NDC, 2020).	NDC: 25% of the energy mix to be renewable (solar, wind, hydro, biomass) by 2030.
Green Buildings	Policies adopted to promote improved energy management, waste management and building materials in government buildings and public housing.	Concessional finance program, established for green public finance and/or green social housing	US\$60M investment commitment for a pipeline of projects identified on energy management, building materials as well as waste and wastewater solutions in public buildings and/or social housing	SO 1: Reduce GHG emissions from buildings by 43000 tCO2eq/year against BAU	SO 1: 41.7% GHG emissions reductions against BAU by 2030 (NDC, 2020).	FOREST COVER NDC: Halve the deforestation rate by 2030.





The Global Green Growth Institute
19F Jeongdong Building 21-15, Jeongdong-gil
Jung-gu, Seoul, Republic of Korea 04518

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