REPUBLIC OF THE PHILIPPINES

BIENNIAL TRANSPARENCY REPORT

PHILIPPINES' BIENNIAL TRANSPARENCY REPORT

Philippines' First Biennial Transparency Report (BTR) to the United Nations Framework Convention on Climate Change (UNFCCC) under the Paris Agreement

Copyright @ 2025

Published by:
Philippine Climate Change Commission

Climate Change Commission:

Secretary Maria Antonia Yulo Loyzaga, Official Representative of the President
Vice Chairperson and Executive Director Robert E.A. Borje
Commissioner Rachel Anne S. Herrera
Commissioner Albert P. Dela Cruz, Sr.

CCC Core Writing Team:

Mr. Jerome E. Ilagan
Engr. Aimee S. Evangelista
EnP. Arnold Grant. S. Belver
Ms. Cressette E. Pidoc
For. Jacinth Paul C. Apostol
For. Kristel Marie D. Valin

Engr. Emmanuel A. Causon
Engr. Dustin S. Ignacio
Mr. Paul Ezekiel M. Losaria
Mr. Justine Angelo M. Lacson
Ms. Alyssa Nicole P. Pogiongko
Ms. Alona R. Arreza

Contributing Agencies:

Department of Agriculture
 Usec. Asis G. Perez
 Dir. Alicia G. Ilaga
 Mr. Jatlie G. Talon

Department of Transportation
 Usec. Timothy R. John Bathan
 Ms. Pamela B. Tadeo
 Ms. Evangeline L. Nova
 Mr. JB Apolonio O. Chavez

Department of Energy
 Undersecretary Felix William B. Fuentebella
 Director Michael O. Sinocruz
 Assistant Director William G. Quinto
 Ms. Hershey T. Dela Cruz
 Ms. Letty G. Abella
 Ms. Angelou B. Austria
 Engr. Clarence H. Andrion
 For. Camille Paulene I. Peria
 Engr. Mary Lorenz P. Barotac-Garcia

Department of Environment and Natural Resources
 Usec. Analiza Rebuelta-Teh
 Asec. Noralene M. Uy
 Dir. Elenida R. Basug
 Mr. Albert A. Magalang
 Ms. Sandee G. Recabar
 Ms. Micah S. De Leon
 For. Jhun B. Barit
 For. Larlyn C. Faith Aggabao
 Ms. Liz C. Silva
 Mr. Rolando O. Abad, Jr.
 Mr. Carl Louie S. Santiago
 For. Yarah V. Garcia
 For. Charles Louie T. Evangelista

National Economic and Development Authority
 Usec. Joseph J. Capuno
 Ms. Lara Gianna V. Hidalgo

Philippine Statistics Authority
 Usec. Claire Dennis S. Mapa
 Ms. Virginia M. Bathan

FOREWORD

The Philippines' first Biennial Transparency Report (BTR) submission demonstrates the country's commitment to global climate action. It affirms our role as an active contributor to global climate initiatives.

As a developing country most vulnerable to climate change, the Philippines places great importance on aligning with international commitments such as the Enhanced Transparency Framework (ETF) under the Paris Agreement. In this BTR, driven by the multilateral process, the Philippines reiterates the need for sustained and stronger support for developing countries to address gaps and challenges in producing transparency reports, as outlined in Decision 19/CMA.1.

Despite contributing minimally to global greenhouse gas (GHG) emissions, the Philippines bears significant economic, ecological, and social costs from climate change. Annual losses and damages will increase unless decisive action is taken. To address these significant challenges, the country completed its first National Adaptation Plan (NAP), and Nationally Determined Contribution Implementation Plan (NDCIP) and its Gender Action Plan (GAP) in 2024, outlining pathways to achieve transformative resilience and low-carbon development. As these plans indicate, the Philippines recognizes adaptation and mitigation co-benefits, fostering cross-sectoral coordination to ensure sustainable and inclusive growth, reflecting national development aspirations, and outlining the principle of common but differentiated responsibilities and respective capabilities (CBDR-RC).

This report was developed through collaborative efforts, reflecting the country's commitment to a data-driven and evidence-based approach to climate governance, enabling informed decision-making to achieve climate goals in pursuit of equity, inclusivity, and climate justice.

This submission lays the groundwork for continuous improvement in reporting with support from the international community. Strengthening the BTR process will drive progress toward achieving its Nationally Determined Contribution (NDC) targets and advancing adaptation and mitigation strategies. This aims to enhance the country's ability to attract international support, including climate finance, technology transfer, and capacity-building.

This first BTR, is a testament to the country's resolve to address the climate crisis with utmost transparency, integrity, and accountability. This Report seeks to foster trust and understanding among country parties as we share our progress in climate action and lessons learned.

(SGD.)
MARIA ANTONIA YULO LOYZAGA
Official Representative of the President to the Climate Change Commission and
Secretary of the Department of Environment and Natural Resources

PREFACE

The Philippines, a country highly vulnerable to climate change, stands at the frontline of global climate action. This BTR underscores our nation's commitment to the climate agenda and a sustainable future. As an archipelagic country with diverse ecosystems and communities, the Philippines faces threats from rising sea levels, extreme weather events, and environmental degradation, all of which put our lives, livelihoods, and future at risk. Despite our minimal contribution to global greenhouse gas (GHG) emissions, the Philippines strives to maximize its resources to reduce and avoid emissions while building resilience and adaptive capacity to safeguard its people and ecosystems.

This inaugural BTR reaffirms the Philippines' commitments under the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement. This Report provides a transparent and comprehensive overview of the nation's progress in implementing climate change mitigation and adaptation measures that enable the transition toward a climate-resilient and climate-smart Philippines.

The Philippines' First BTR includes a national GHG inventory, tracking emissions and removals across key sectors based on the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines. This Report offers insights into the country's NDC, which targets a 75 percent emission reduction and avoidance – comprising 2.71 percent unconditional and 72.29 percent conditional targets – in the Energy, Transport, Agriculture, Waste, and Industrial Processes and Product Use (IPPU) sectors by 2030. The BTR outlines policy advancements, sectoral strategies, and the financial, technological, and capacity-building support necessary to realize these objectives.

The BTR also highlights the country's risks and vulnerabilities exacerbated by climate change, including information on loss and damage, and adaptation priority sectors and strategies. It underscores the need for international cooperation to address gaps in technical capacity, financing, and knowledge systems.

The Philippines emphasizes a whole-of-nation and whole-of-society approach, integrating science-driven policies, grassroots participation, and sustainable development. The Philippines urges Parties for collective action domestically and internationally to deliver and implement more climate actions with tangible results.

This Report stands as a testament to our shared resolve to combat the climate crisis. Together, we move forward to secure a greener, more resilient future for generations to come.

(SGD.)   (SGD.)
RACHEL ANNE S. HERRERA   **ALBERT P. DELA CRUZ, SR.**
Commissioner   Commissioner
Climate Change Commission   Climate Change Commission

(SGD.)
ROBERT E.A. BORJE
Vice Chairperson and Executive Director
Climate Change Commission

ACKNOWLEDGEMENTS

The Philippines' BTR to the UNFCCC under the Paris Agreement was prepared by the Government of the Philippines, led by the Climate Change Commission (CCC).

His Excellency Ferdinand R. Marcos Jr., President of the Republic of the Philippines and Chairperson of the CCC, has underscored his vision of a climate-smart, resilient, and low-carbon economy, highlighting the Philippines' role as a responsible member of the international community. His leadership has made climate considerations central to national policy development, planning, decision-making, and program implementation.

The CCC expresses its appreciation to Secretary Maria Antonia Yulo Loyzaga of the Department of Environment and Natural Resources, the Official Representative of the President to the Commission, for her support for the CCC's initiatives.

The CCC likewise expresses gratitude to the Philippine Government agencies for their commitment and collaboration in advancing the country's climate agenda. This BTR marks a significant step forward. The CCC remains committed to working with all key stakeholders to scale up and enhance climate action for our nation and future generations. The CCC acknowledges the contributing agencies for their participation in data collection and reporting, which were instrumental in the preparation of this Report.

The CCC Writing Team would like to thank Secretary Robert E.A. Borje, Commissioner Rachel Anne S. Herrera, and Commissioner Albert P. Dela Cruz, Sr. for their continuous support and guidance throughout the BTR process.

Appreciation is extended to the Capacity-Building Initiative for Transparency - Global Support Programme (CBIT-GSP) and the Food and Agriculture Organization of the United Nations (FAO) for providing capacity-building support to the Writing Team and contributing agencies, ensuring the successful completion of this endeavor.

Finally, the CCC acknowledges the contributions of technical advisers, including Dr. Faye Abigail T. Cruz, Dr. Monica Ortiz, Dr. Rodel D. Lasco, and Mr. Leandro V. Buendia, whose guidance throughout the BTR process was instrumental in achieving the Report's objectives.

TABLE OF CONTENTS

LIST OF TABLES

<u>LIST OF FIGURES</u>

ABBREVIATIONS

ADB	-	Asian Development Bank
AFOLU	-	Agriculture, Forestry, and Other Land Use
ALU	-	Agriculture And Land Use Greenhouse Gas Inventory
AR5	-	5th Assessment Report
AWITFE	-	Agriculture, Waste, Industrial Processes and Product Use, Transport, Forestry and Other Land Use, And Energy
BAU	-	Business-As-Usual
BARMM	-	Bangsamoro Autonomous Region in Muslim Mindanao
BRT	-	Bus Rapid Transit
BTR	-	Biennial Transparency Report
CALABARZON	-	Cavite, Laguna, Batangas, Rizal, Quezon
CBRT	-	Cebu Bus Rapid Transit
CCAB	-	Climate Change Advisory Board
CCAM	-	Climate Change Adaptation and Mitigation
CCC	-	Climate Change Commission
CCET	-	Climate Change Expenditure Tagging
CDRA	-	Climate And Disaster Risk Assessments
CEA	-	Certified Energy Auditors
CECO	-	Certified Energy Conservation Officers
CEM	-	Certified Energy Managers
CGE	-	Consultative Group of Experts
CH_4	-	Methane
CHED	-	Commission on Higher Education
CIDs	-	Climatic Impact-Drivers
CMA	-	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
CMIP6	-	Coupled Model Intercomparison Project Phase 6
CO_2	-	Carbon Dioxide
CO_2e	-	Carbon Dioxide Equivalent
COP28	-	Twenty-Eighth Session of the Conference of Parties
COP	-	Conference of Parties
CSO	-	Civil Society Organizations
CTF	-	Common Tabular Format
DA	-	Department of Agriculture
DBM	-	Department of Budget and Management
DE	-	Designated Establishments
DENR	-	Department of Environment and Natural Resources
DEPED	-	Department of Education
DFA	-	Department of Foreign Affairs
DILG	-	Department of the Interior and Local Government
DOE	-	Department of Energy
DOF	-	Department of Finance
DOH	-	Department of Health
DOST	-	Department of Science and Technology
DOTr	-	Department of Transportation
DPWH	-	Department of Public Works and Highways
DRR	-	Disaster Risk Reduction
DRRM	-	Disaster Risk Reduction and Management
ECP	-	Energy-Consuming Products
EDSS	-	Energy Database for Sectors System
EEC	-	Energy Efficiency and Conservation
EEE	-	Energy Efficiency Excellence

EMB	-	Environmental Management Bureau
ENSO	-	El Niño-Southern Oscillation
EO	-	Executive Order
ERA5	-	Fifth Generation European Centre for Medium-Range Weather Forecasts Atmospheric Reanalysis
ESCO	-	Energy Service Companies
ETF	-	Enhanced Transparency Framework
EUMB	-	Energy Utilization Management Bureau
FDI	-	Foreign Direct Investment
FMB	-	Forest Management Bureau
FrLD	-	Fund for responding to Loss and Damage
GCF	-	Green Climate Fund
GDP	-	Gross Domestic Product
GEF	-	Global Environment Facility
GEMP	-	Government Energy Management Program
GHG	-	Greenhouse Gas
GWP	-	Global Warming Potential
HFCS	-	Hydrofluorocarbons
IAEECC	-	Inter-Agency Energy Efficiency and Conservation Committee
IBTRACS	-	International Best Track Archive for Climate Stewardship
IPCC	-	Intergovernmental Panel on Climate Change
IPPU	-	Industrial Processes, And Product Use
IRR	-	Implementing Rules and Regulations
ITMOS	-	Internationally Transferable Mitigation Outcomes
KCA	-	Key Category Analyses
LCCAP	-	Local Climate Change Action Plans
LGU	-	Local Government Unit
LULUCF	-	Land Use, Land-Use Change, And Forestry
M&E	-	Monitoring And Evaluation
MEAL	-	Monitoring, Evaluation, Accountability, And Learning
MEPP	-	Minimum Energy Performance for Products
MIMAROPA	-	Mindoro, Marinduque, Romblon, Palawan
mmtCO$_2$e	-	Million Metric Tons of CO$_2$ Equivalent
MPGS	-	Modalities, Procedures and Guidelines
MRT	-	Mass Rail Transit
MRV	-	Measurement, Reporting, And Verification
MSMEs	-	Micro, Small, and Medium Enterprises
MVIS	-	Motor Vehicle Inspection System
MW	-	Megawatt
MWh	-	Mega watts Per Hour
N$_2$O	-	Nitrous Oxide
NAMRIA	-	National Mapping and Resource Information Authority
NASADEM	-	NASA Earth Data
NAP	-	National Adaptation Plan
NC	-	National Communications
NCCAP	-	National Climate Change Action Plan
NCR	-	National Capital Region
NCRMF	-	National Climate Risk Management Framework
NDC	-	Nationally Determined Contribution
NDCIP	-	Nationally Determined Contribution Implementation Plan
NDRRMC	-	National Disaster Risk Reduction & Management Council
NEDA	-	National Economic and Development Authority
NEECP	-	National Energy Efficiency and Conservation Plan
NFSCC	-	National Framework Strategy for Climate Change

NGA	-	National Government Agencies
NGO	-	Non-Governmental Organization
NICCDIES	-	National Integrated Climate Change Database Information and Exchange System
NIR	-	National Inventory Report
NPTE	-	National Panel of Technical Experts
NSC	-	National Steering Committee
ODA	-	Official Development Assistance
ODS	-	Ozone-Depleting Substances
OFW	-	Overseas Filipino Workers
OLU	-	Other Land Use
PAMS	-	Policies And Measures
PAPs	-	Programs, Activities, And Projects
PAR	-	Philippine Area of Responsibility
PCW	-	Philippine Commission on Women
PDO	-	Pacific Decadal Oscillation
PDP	-	Philippine Development Plan
PELP	-	Philippine Energy Labeling Program
PENCAS	-	Philippine Ecosystem and Natural Capital Accounting System
PEP	-	Philippine Energy Plan
PGHGIMRS	-	Philippine Greenhouse Gas Inventory Management and Reporting System
PHILCCA	-	Philippine Climate Change Assessment
PHP	-	Philippine Peso
PIA	-	Philippine Information Agency
PSA	-	Philippine Statistics Authority
PSF	-	People's Survival Fund
PUVMP	-	Public Utility Vehicle Modernization Program
PV	-	Photovoltaic
QA	-	Quality Assurance
QC	-	Quality Control
RA	-	Republic Act
RAC	-	Refrigeration and Air Conditioning
R&D	-	Research and Development
RBMES	-	Result-Based Monitoring and Evaluation System
SDG	-	Sustainable Development Goal
SIR	-	Sectoral Greenhouse Gas Inventory Report
SOCCKSKARGEN	-	South Cotabato, Cotabato, Sultan Kudarat, Sarangani, General Santos
SSP	-	Shared Socioeconomic Pathways
TACCC	-	Transparency, Accuracy, Completeness, Comparability, and Consistency
TESDA	-	Technical Education and Skills Development Authority
UNDP	-	United Nations Development Programme
UNFCCC	-	United Nations Framework Convention on Climate Change
UNICEF	-	United Nations Children's Fund
UNISDR	-	United Nations International Strategy for Disaster Reduction
UPLB	-	University of the Philippines Los Baños
USD	-	United States Dollar
UV	-	Utility Vehicles
WASH	-	Water, Sanitation, and Hygiene

EXECUTIVE SUMMARY

National Circumstances

The Philippines, a low-middle income developing country, is one of the world's most vulnerable nations to the impacts of climate change. Ranked first among 193 countries in the 2024 WorldRiskIndex Report[1] for disaster risk, the country faces complex interactions of multiple exposures and high-intensity natural hazards. Vulnerability stems from direct climate effects and limited adaptive capacity, driven by poverty, lack of knowledge, and insufficient resources. Many Filipino families reside and depend on the natural resources of coastal areas, however, unsustainable exploitation of natural resources, such as seas, forests, and land, worsens the country's susceptibility to climate impacts.

The Philippines' geographical location and topography expose it to geophysical and hydrometeorological hazards. As an archipelago along the Pacific Ring of Fire, the country is prone to frequent seismic activity and volcanic eruptions. Approximately 60 percent of the total land area is hazard-exposed, and around 74 percent of the population lives in areas vulnerable to the adverse effects of these hazards, significantly increasing the potential for loss of life and property.[2]

Data from the Department of Science and Technology (DOST) Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) shows the Philippines faces both rapid and slow-onset climate events such as tropical cyclones, pluvial and fluvial flooding, rain-induced landslides, drought, and sea-level rise. Situated within the Tropical Cyclone Belt, the country experiences an average of 20 tropical cyclones each year, often leading to extreme weather conditions that severely impact communities and infrastructure.

The country also faces significant challenges related to flooding, which is heavily attributed to its high exposure to tropical cyclones and extreme precipitation. On the other hand, drought, intensified by El Niño, threatens biodiversity and critical sectors such as agriculture. Forest fires also occur regularly in the Philippines.[3]

The Philippines is one of 17 megadiverse countries, home to 70-80 percent of the world's biodiversity. However, the changing climate threatens ecosystems and species, especially in critical habitats such as coral reefs and mangroves, stressing the importance of urgent conservation and preservation efforts.

While the Philippines' global GHG contributions are minimal, the economic impact of climate change on the country is substantial. From 2011 to 2021, the country experienced losses and damages amounting to USD 12.1 billion (PHP 673.30 billion) due to tropical cyclones. By 2030, climate impacts could cost 3.2 percent of the country's Gross Domestic Product (GDP), rising

---

[1] Bündnis Entwicklung Hilft / IFHV (2024): WordRiskReport 2024. Berlin: Bündnis Entwicklung Hilft. Retreived at https://reliefweb.int/report/world/worldriskreport-2024-focus-multiple-crises
[2] World Bank Climate Change Knowledge Portal. 2023. Retrieved from: https://climateknowledgeportal.worldbank.org/country/philippines/vulnerability
[3] As reported in the Philippines National Drought Plan (2020). Can be accessed through this link: https://www.unccd.int/sites/default/files/country_profile_documents/1%2520FINAL_NDP_Philippines.pdf

to 5.7 percent by 2040[4] with cost of inaction estimated at USD 25.17 billion (PHP 1.4 trillion) by 2030[5]. Agriculture, a key sector, suffered damages amounting to USD 175.4 million (PHP 9.76 billion) in 2023, highlighting the need for resilience.

Climate change exacerbates socio-economic challenges, leading to increased displacement and the loss of livelihoods for vulnerable sectors. Failure to take action may result in losses and damages to infrastructure, decreased productivity, interruptions to business operations, and community evacuations.

Addressing these risks requires urgent action that is grounded on the best available science and climate analytics. Evidence-based adaptation and mitigation strategies must be in place to ensure the Philippines follows a sustainable, low-carbon path. The country remains committed to climate justice, anchored in the principle of Common but Differentiated Responsibilities and Respective Capabilities (CBDR-RC).

The Philippines' NAP and NDCIP provide key frameworks for science-based, evidence-based adaptation and mitigation, with cross-sectoral coordination mechanisms ensuring synergies in climate actions.

National Inventory Report of Anthropogenic Emissions by Sources and Removals by Sinks of Greenhouse Gas

The 2015 and 2020 National GHG Inventories present the contributions of emissions and removals by sinks across key sectors: energy (including transport), Agriculture, Forestry, and Other Land Use (AFOLU), Industrial Processes and Product Use (IPPU), and waste.

The Philippines estimated total net emissions at 232,988 $GgCO_2e$ in 2015 and 204,325 $GgCO_2e$ in 2020[6], representing 0.46 percent and 0.40 percent of global GHG emissions[7], respectively. The inventories track four greenhouse gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and hydrofluorocarbons (HFCs), using Global Warming Potential (GWP) values for a 100-year period, based on the IPCC Fifth Assessment Report (2013).

Information Necessary to Track Progress Made in Implementing and Achieving Nationally Determined Contributions

In 2010, the Philippines' National Framework Strategy on Climate Change (NFSCC) 2010-2022 was adopted to build the adaptive capacity of communities, enhance the resilience of natural ecosystems to climate change, and optimize mitigation opportunities in support of sustainable development. Adaptation remains the anchor strategy, with mitigation pursued as part of adaptation efforts. The NFSCC underscores the country's commitment to implementing mitigation strategies to curb global emissions.

---

[4] As indicated in the World Bank's Philippines Country Climate and Development Report (CCDR) 2022
[5] Climate Change Commission and the Department of Environment and Natural Resources (2023). National Adaptation Plan (NAP) of the Philippines 2023-2050
[6] These figures come from the Philippine Greenhouse Gas Inventory Management and Reporting System (PGHGIMRS), consolidated by the CCC using the 2006 IPCC Guidelines.
[7] Based on Emissions Database for Global Atmospheric Research (EDGAR) Community GHG Database version 8.0. Retrieved at https://edgar.jrc.ec.europa.eu/dataset_ghg80

PHILIPPINES' BIENNIAL TRANSPARENCY REPORT

The Philippines' Nationally Determined Contribution (NDC), communicated to the UNFCCC in April 2021, aims for a 75 percent reduction in GHG emissions compared to a business-as-usual (BAU) scenario from 2020 to 2030.

This ambitious target is divided into unconditional and conditional commitments, with only 2.71 percent of the reduction being unconditional, and the remaining 72.29 percent contingent on international support.

The implementation of the NDC is guided by the Nationally Determined Contribution Implementation Plan (NDCIP) 2020-2030 and Gender Action Plan (GAP), which outlines gender-responsive and specific policies and measures (PAMs) across key sectors: agriculture, waste management, industry, transportation, and energy. The implementation of the NDC PAMs is estimated to require approximately USD 72 billion (PHP 4 trillion) across these sectors. Each sector has been tasked with developing targeted actions that contribute to the overall emissions reduction goal while enhancing resilience against climate impacts. The NDCIP and GAP emphasize a whole-of-government and whole-of-society approach, ensuring that various stakeholders—including local communities, civil society, the academe, and the private sector—are actively involved in implementing climate actions. This inclusive strategy is crucial for fostering local ownership of climate initiatives and ensuring that these are effectively integrated into national and local development plans.

Information Related to Climate Change Impacts and Adaptation

The Philippines recognizes that a whole-of-nation and whole-of-society approach is necessary to ensure the successful implementation of climate change measures, emphasizing the importance of a science-driven and evidence-based approach to address the impacts of climate change.

To ensure the integration of climate change adaptation and mitigation (CCAM) in the development plans and programs of the country, the CCC was established under Republic Act No. 9729 or Climate Change Act of 2009, as amended, to serve as the lead policy-making body responsible for coordinating, monitoring, and evaluating government initiatives to ensure that climate change adaptation and mitigation efforts are integrated into the country's development plans.

The Philippine government has developed several policy instruments, such as the NFSCC and the National Climate Change Action Plan (NCCAP), that set the direction for the government and other stakeholders in planning and implementing climate change measures and strategies. Aligned with these, the Philippine government adopted the National Adaptation Plan (NAP) 2023-2050, which aims to "steadily reduce climate-related loss and damage and build the country's adaptive capacity towards transformative resilience and sustainable economic development by 2050."

The Philippines' NAP identified four Climatic Impact-Drivers (CIDs) deemed most critical to the Philippines' vulnerability. These are (1) Increased temperature and drought, (2) Sea level rise and extreme sea levels, (3) Extreme precipitation, and (4) Extreme winds and Tropical cyclones.

The Philippine NAP outlines eight sectoral outcomes, including sets of priority outcomes and strategies, to strengthen resilience, reduce climate-related losses and damages, and enhance the adaptive capacity of communities for sustainable socio-economic development. These include: 1) Agriculture and Fisheries and Food Security; 2) Water Resources; 3) Health; 4) Ecosystems and Biodiversity; 5) Cultural Heritage, Population Displacement and Migration; 6) Land Use and Human Settlements; 7) Livelihoods and Industries; and 8) Energy, Transport and Communications.

The Philippine government has identified gaps and barriers that hinder the effective implementation of adaptation strategies. These range from fragmented policies, roles, and coordination to limited access to adaptation finance, lack of technical expertise and resources, gaps in knowledge management and databases, and the absence of a robust Monitoring and Evaluation (M&E) System. It is essential to strengthen governance structures, enhance local capabilities, and secure financial and technical assistance to address these gaps and barriers.

Information on financial, technology development and transfer, and capacity-building support needed and received

The Philippines considers climate finance as resources that have been allocated or may be utilized towards the CCAM requirements of the country and its vulnerable communities as defined under Republic Act No. 10174 (Climate Change Act, as amended). The Philippines recognizes the developments in the climate finance architecture under the UNFCCC process, supporting country-driven, needs-based financing for climate action. The country has also set up systems and processes for tracking and monitoring access at the domestic and international levels.

At the domestic level, the Philippines conducts the Climate Change Expenditure Tagging (CCET) system and administers the People's Survival Fund (PSF). The CCET is used to track domestic resources for publicly funded climate change programs, while the PSF provides long-term financing for adaptation projects for the benefit of local government units and community organizations.

At the international level, the Official Development Assistance (ODA) Report highlights the loans and grants support received for climate change adaptation and mitigation in promoting sustainable social and economic development in the Philippines.

In 2023, 46 programs and projects were tagged under CCAM. Of these, fifteen (15) were supported through loans, and thirty-one (31) through grants. These programs and projects totaled USD 1.96 billion (PHP 109.08 billion), with loans accounting for 88.72 percent and grants for 11.28 percent.
The Philippines' climate efforts are guided by its NDCIP and NAP, which outline policies, measures, and financial requirements for reducing emissions and enhancing resilience.

The NDCIP demands significant resources, with an estimated USD 72 billion (PHP 4 trillion) investment needed for mitigation efforts alone. Despite utilizing multiple and blended financing sources, substantial gaps persist, underscoring the need for urgent international support.

Following the formulation of the NAP and NDCIP in 2024, a survey template on mapping of climate interventions in the Philippines was circulated to development partners. The survey aims to serve as a reference for the Philippine Government in optimizing technical support available or in the pipeline directly supporting NAP and NDCIP focusing on transformative outcomes on the ground through capacity building, technology development, and transfer and finance. Based on the results, an amount of USD 19 billion was tagged for 190 NAP-related projects (91% from loans and 9% from grants). Consequently, an amount of USD 13.55 billion was tagged for 95 NDC-aligned projects (26% from loans and 74% from grants).

While international support has contributed to climate action, the Philippines continues to face data gaps and limited technical capacity, hindering the full implementation of climate plans. Capacity-building is crucial to strengthening institutional and technical expertise, as outlined in the NDCIP and NAP.

Timely and adequate delivery of climate finance, technology transfer, and capacity-building is critical to scaling up action and achieving the country's climate goals while protecting its most vulnerable populations.

Information On Flexibility

The Philippines, under Decision 18/CMA.1 of the Paris Agreement, has utilized flexibility provisions in its reporting under the Enhanced Transparency Framework (ETF) to accommodate its national circumstances and capacities. These provisions allow developing countries to meet transparency requirements while gradually improving their reporting processes. In line with the Modalities, Procedures, and Guidelines (MPGs), the Philippine government has prepared an improvement plan detailing actions, timelines, and dependencies to enhance transparency progressively.

Improvements In Reporting Over Time

Activities and actions were identified to improve the reporting of the National GHG Inventory, Tracking NDC implementation, climate change impacts and adaptation, and FTC Support Needed and Received. The activities and actions were derived from the workshops with sectoral agencies.

INTRODUCTION

The BTR is anchored on the Philippines' principled positions on transparency-related concerns under the Convention and the Paris Agreement, articulating the evidence-based and equity-driven approach to reporting the state of play and future directions on climate actions.

Through this BTR, the Philippines reiterates its call for the timely and adequate provision of support for developing countries to address gaps and challenges in producing the BTR, consistent with Decision 19/CMA.1. emphasizing that Means of Implementation for the ETF should be readily available and accessible to the country. The Report further stresses the need for capacity building and tools to enhance transparency reporting to ensure that the country can effectively participate in global climate processes.

The Philippines recognizes that the knowledge from the Report will feed into an open, transparent, accountable, and party-driven second Global Stocktake in 2028, ensuring substance from a holistic and cross-cutting collection of information from all sources. The Philippines' BTR employed the best available science and data for reporting, culminating in the alignment of the country to the principles of the UNFCCC and the Paris Agreement.

The Report provides an overview of the country's GHG inventories, mitigation and adaptation strategies, and adherence to transparency standards set by the ETF of the Paris Agreement. It also examines implementation strategies and operational challenges, presenting a comprehensive picture of the Philippines' climate action landscape.

Chapter 1 outlines the Philippines' national circumstances, providing information on its geography, climate, and socio-economic profile. This chapter succinctly presents the evidence and rationale for advancing climate justice, consistent with the principle of Common But Differentiated Responsibilities and Respective Capabilities (CBDR-RC).

Chapter 2 presents the Philippines' National GHG Inventories for 2015 and 2020. This chapter offers a detailed account of emissions and removals across four key sectors: Energy (including Transport), AFOLU, IPPU, and Waste. Notably, the forestry sector is highlighted as a major carbon sink.

Chapter 3 examines the Philippine government's efforts to track progress in implementing and achieving its emission reduction targets committed under its NDC. The chapter introduces the NDCIP and NDC GAP, which showcase multi-stakeholder participation and alignment with national development goals and mainstreaming gender in critical sectors.

Chapter 4 discusses the climate risks and vulnerability of the Philippines, including information on losses and damages, as well as the adaptation priority sectors and strategies outlined in the NAP. The chapter also outlines the barriers that hinder the implementation of adaptation actions and the measures to address these barriers.

Chapter **5** reviews the financial, technological, and capacity-building support needed and received by the Philippines to achieve its climate goals under the Paris Agreement. The chapter details the systems and processes to track and monitor domestic and international funded climate adaptation and mitigation measures.

Chapter 6 highlights the flexibility provisions applied by the Philippines in reporting the National GHG Inventory and tracking the NDC PAMs. These measures encompass streamlined methodologies for conducting uncertainty assessments, as well as for quality assurance and quality control of GHG inventories. The chapter also provides insights into the gaps and needs of capacity building to enhance the reporting process on the elements of the BTR.

Chapter 7 outlines the activities and actions that the Philippines will implement to improve for the next reporting cycle of the BTR to ensure continuous progress in transparency and climate action reporting.

CHAPTER 1: NATIONAL CIRCUMSTANCES

National Circumstances

The Philippines, a low-middle income developing country, is one of the world's most vulnerable countries to the impacts of climate change. The 2024 WorldRiskIndex Report[8] ranked the Philippines with the highest disaster risk among 193 nations, exhibiting complex interactions between hazards, exposure, and vulnerability. The Philippines remains highly vulnerable to natural hazards, particularly those linked to weather and climate. This vulnerability stems from the direct impacts of climate change and the country's limited capacity to adapt, exacerbated by poverty, resource constraints, and inadequate environmental management. Furthermore, the country's extensive reliance on coastal and natural resources, coupled with unsustainable exploitation of sea, land, and forests, heightens its susceptibility to the adverse effects of climate change.
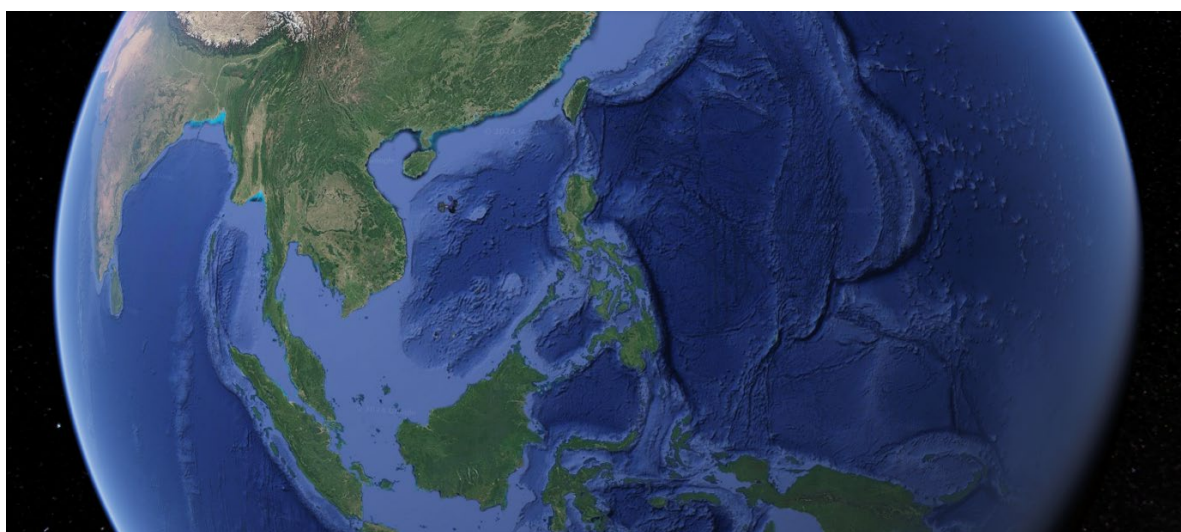
Photo of the map of the Philippines from Google Earth

Geographical Profile

The Philippines is an archipelago of 7,641 islands across three major island groups: Luzon, Visayas, and Mindanao, with a total land area of 298,170 km^2. The country is divided into 18 regions, 82 provinces, 149 cities, and 1,493 municipalities. It has 36,289 km of coastline, bordered by the Pacific Ocean to the east, the West Philippine Sea to the west, the Basha Channel to the north, and the Sulu and Celebes Seas to the south.

The country's diverse topography includes alluvial plains, narrow valleys, rolling hills, and high mountain ranges in Luzon and Mindanao, while Visayas have a mountainous interior surrounded by narrow strips of discontinuous flat lowlands on the coastal rims. These geological conditions contribute to the country's geological history, rich biodiversity, and vulnerability to natural disasters.[9]

---

[8] Bündnis Entwicklung Hilft / IFHV (2024): WordRiskReport 2024. Berlin: Bündnis Entwicklung Hilft. Retrieved at https://reliefweb.int/report/world/worldriskreport-2024-focus-multiple-crises

[9] Mendoza, R. J., de Guzman, E. A., & Ramos, T. (2022). Geological and environmental features of the Philippines. Philippine Journal of Earth Sciences, 15(1), 10-24. doi.org/10.1234/pjes.2022.0010

The Philippines is one of the 17 mega-biodiverse countries, hosting 70 to 80 percent of the world's biodiversity and 25,000 species unique to the region, due to its distinctive environment and geographical characteristics. Key ecosystems like tropical forests, coral reefs, mangroves, and grasslands provide vital ecosystem services such as climate regulations, coastal protection, flood protection, and carbon sequestration. However, the country faces persistent environmental challenges.
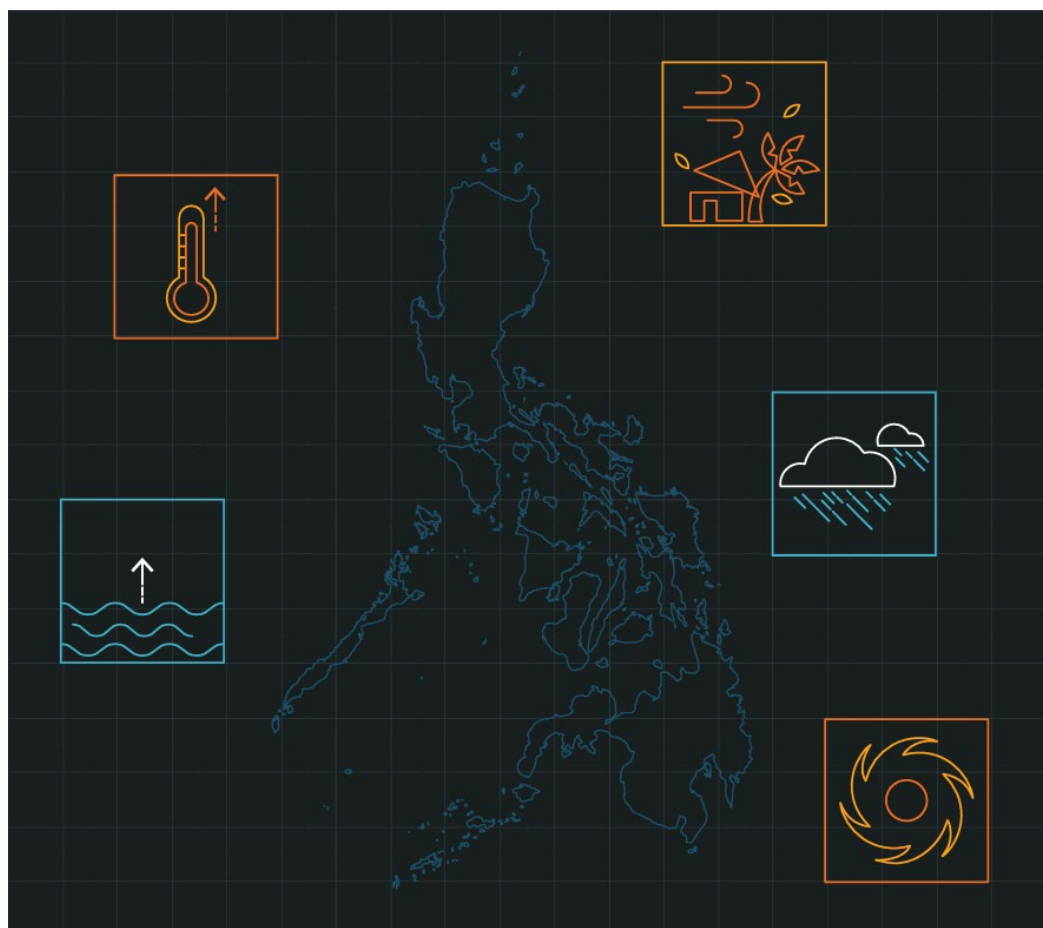
Illustration from PhilCCA 2024 Working Group 1: The Physical Science Basis

The Philippines faces a wide array of geophysical and hydrometeorological hazards due to its unique geographical position and topography. The archipelago's location along the Pacific Ring of Fire further exacerbates its vulnerability, as it experiences frequent seismic activity and volcanic eruptions. Moreover, the country is in a typhoon belt, with an average of 20 tropical cyclones entering its area of responsibility each year, leading to severe weather conditions impacting communities and infrastructure.

Approximately 60 percent of the total land area is classified as hazard-exposed, which includes regions vulnerable to earthquakes, tropical cyclones, flooding, and volcanic eruptions. Additionally, around 74 percent of the population lives in areas susceptible to the adverse effects of these hazards, which significantly increases the potential for loss of life and property.

Climate Profile

The climate of the Philippines is tropical, marked by distinct wet and dry seasons influenced by monsoons. The nation's average temperature hovers around 27°C, with humidity levels averaging 82 percent, driven by the warm trade winds. Though variable across regions, annual rainfall averages 2,348 mm, ranging from 960 mm in southeast Mindanao to over 4,050 mm in central Luzon.

The climate of the Philippines can be categorized into four distinct types based on the Modified Coronas Classification[10]. The western regions of the country experience a Type I climate, characterized by two distinct seasons: a wet season from May to September and a dry season from November to April. During the months of December to February, cooler temperatures are observed, while the period from March to May is typically hot.

In contrast, the eastern regions exhibit a Type II climate, which features a pronounced wet season from November to March and without a defined dry season. The central areas of the Philippines, including Cagayan Valley, Central Visayas, and northwestern Mindanao, are classified as Type III climate zones. This type shares similarities with Type I but presents a less pronounced seasonal cycle. Additionally, certain areas in Eastern Visayas and Mindanao fall under a Type IV climate, where rainfall is more or less evenly distributed throughout the year.

Discussions on the climate impacts, risks, and vulnerabilities, including the climate projections for the Climatic Impact Drivers (CIDs), are discussed in Chapter 4 on Information Related to Climate Change Impacts and Adaptation.

---

[10] Villarin, J. T., Algo, J. L., Cinco, T. A., Cruz, F. T., de Guzman, R. G., Hilario, F. D., Narisma, G. T., Ortiz, A. M., Siringan, F. P., Tibig, L. V. (2016). 2016 Philippine Climate Change Assessment (PhilCCA): The Physical Science Basis. The Oscar M. Lopez Center for Climate Change Adaptation and Disaster Risk Management Foundation Inc. and Climate Change Commission.
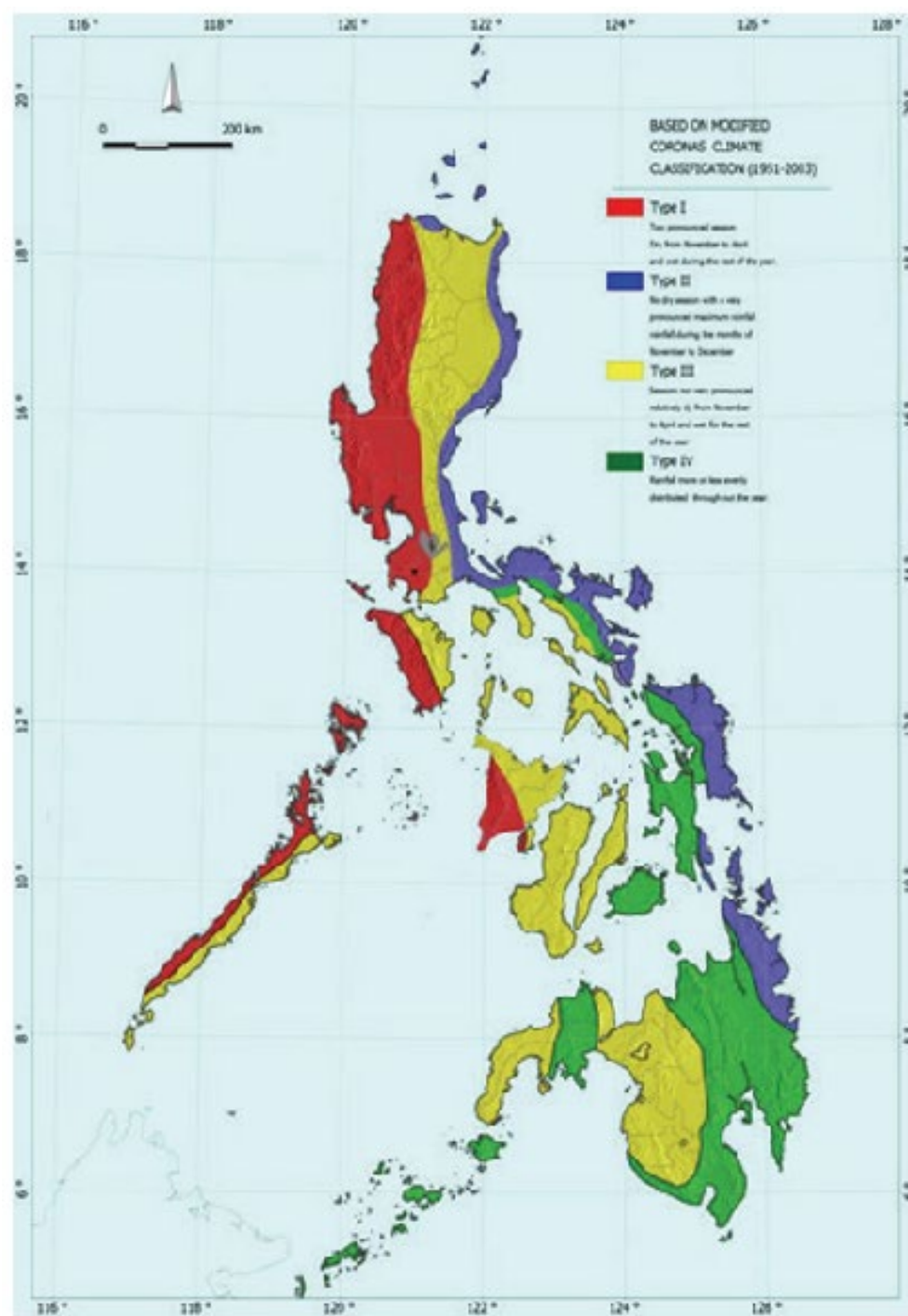
Source: PAGASA, 2011[11]
Figure 1: Modified Coronas Climate Atlas

[11] PAGASA. (2011). Climate Change in the Philippines. Philippine Atmospheric, Geophysical and Astronomical Services Administration.
https://pubfiles.pagasa.dost.gov.ph/climps/climateforum/ClimatechangeinthePhilippines.pdf

Socio-economic Profile

Population

The 2020 Census of Population and Housing (2020 CPH) recorded the Philippines' population at 109.04 million in 2020, reflecting an annual growth rate of 1.63 percent. Projections indicate the population will rise to 142 million by 2045.

Table 1. Population of the Philippines, per region for the year 2020

Region	2020 Population
Philippines	109,035,343*
National Capital Region (NCR)	13,484,462
Cordillera Administrative Region (CAR)	1,797,660
Region I (Ilocos Region)	5,301,139
Region II (Cagayan Valley)	3,685,744
Region III (Central Luzon)	12,422,172
Region IV (CALABARZON)	16,195,042
Region IV (MIMAROPA)	3,228,558
Region V (Bicol Region)	6,082,165
Region VI (Western Visayas)	7,954,723
Region VII (Central Visayas)	8,081,988
Region VIII (Eastern Visayas)	4,547,150
Region IX (Zamboanga Peninsula)	3,875,576
Region X (Northern Mindanao)	5,022,768
Region XI (Davao Region)	5,243,536
Region XII (SOCCSKSARGEN)	4,901,486
Region XIII (Caraga)	2,804,788
Bangsamoro Autonomous Region in Muslim Mindanao (BARMM)	4,404,288
* Note: Population count for the regions does not add up to the national total. The national total includes 2,098 Filipinos in Philippine Embassies, Consulates and Mission Abroad.	

In terms of sex disaggregation, the Philippine population consists of 50.6 percent males and 49.4 percent females, which translates to a sex ratio of 103 males for every 100 females. The demographic profile shows a young population, with 30.7 percent (33.4 million Filipinos) of individuals under the age of 15 and a working-age population representing 64 percent (60.4 million Filipinos). Vulnerabilities to climate impacts are especially pronounced among young and elderly dependents, who account for over 35 percent of the total population. The overall dependency ratio decreased to 57 dependents per 100 working-age individuals in 2020, down from 58 in 2015.

Economy

The country's economy is largely attributed to three key industry sectors: (1) services, accounting for 61.2 percent; (2) industry, contributing 29.8 percent; and (3) agriculture, hunting, forestry, and fishing, which make up 9 percent. The Philippine Statistics Authority (PSA) reported that the country's Gross Domestic Product (GDP) experienced an annual growth of 5.6 percent in the fourth quarter of 2023, resulting in a full-year GDP growth of 5.6 percent, with the GDP reaching $437.17 billion (PHP 24.32 trillion).[12] The Gross National Income (GNI) also saw a year-on-year increase of 11.1 percent in the fourth quarter of 2023, bringing the full-year growth for 2023 to 10.5 percent. Additionally, Net Primary Income (NPI) from the rest of the world surged by 97.7 percent year-on-year in the fourth quarter of 2023 and by 96.6 percent for the entire year of 2023.[13]

In 2023, the industries that contributed most to the annual growth included wholesale and retail trade, as well as the repair of motor vehicles and motorcycles, which grew by 5.5 percent; financial and insurance activities, which increased by 8.9 percent; and construction, which rose by 8.8 percent. Among the major economic sectors, agriculture, forestry, and fishing recorded a growth of 1.2 percent, while the industry sector grew by 3.6 percent, and the services sector expanded by 7.2 percent.

Despite these gains, inflation remains a concern, with the central bank maintaining a 6.25 percent policy rate since March 2023.[14] In response, the government implemented policies to mitigate rising prices, including lowering tariff rates on essential goods. Additionally, remittances from Overseas Filipino Workers (OFWs) continued to support domestic consumption, playing a key role in stabilizing household incomes.

---

[12] Philippine Statistics Authority (2024). Highlights from the 2021-2023 Consolidated Accounts, and Income and Outlay Accounts of the Philippines. https://psa.gov.ph/statistics/ca-and-income-and-outlay-accounts/highlights.
[13] Philippine Statistics Authority (PSA). (2024). Q1 2021 to Q4 2023 National Accounts of the Philippines (NAP). Retrieved from https://psa.gov.ph/system/files/nap/NAP%20Publication%20Q4%202023.pdf
[14] International Trade Administration. (2024). Philippines - Market Overview. Retrieved from https://www.trade.gov/country-commercial-guides/philippines-market-overview

Despite contributing only 9 percent to the GDP, the agriculture sector is a critical pillar of the Philippine economy, employing 23.2 percent of the country's total employment,[15] and playing a vital role in ensuring food security. However, the agriculture sector's vulnerability and the broader economic risks associated with extreme events and disasters are highlighted by the country's high exposure to frequent tropical cyclones. In 2023, the PSA's Compendium of Philippine Environment Statistics (CPES) Component 4[16], a compilation based on the United Nations Framework for the Development of Environment Statistics (FDES), reported that major disasters caused total damages of USD 417.94 million (PHP 23.25 billion). The agriculture sector incurred the second largest share of these damages amounting to USD 175.44 million (PHP 9.76 billion), following infrastructure.[17]

In addition, the climate analytics from the Philippines' NAP indicates that inaction will result in infrastructure damage (up to USD 6.56 billion or PHP 365 billion), productivity losses from extreme heat (up to USD 8.38 billion or PHP466 billion), business interruptions (up to USD 9.47 billion or PHP527 billion), and relocation costs (up to USD 159.98 million or PHP8.9 billion) for communities affected by climate events.

To address this, the government is scaling up efforts under the Philippine Development Plan (PDP) 2023-2028 to enhance resilience through integrated climate action and targeted support for vulnerable sectors, ensuring sustainable development amidst a changing climate.

Guided by Ambisyon Natin 2040 or the long-term vision of the Philippine government for socioeconomic development, the administration of President Ferdinand Romualdez Marcos, Jr. adopted the Philippine Development Plan (PDP) 2023-2028 with specific actions to achieve the 8-point socioeconomic agenda of the national government.

1. Protect purchasing power and mitigate socioeconomic scarring by ensuring food security, reducing transportation and logistics costs, and lowering energy expenses for households.
2. Reduce vulnerability and long-term adverse effects of the COVID-19 pandemic by addressing health concerns, strengthening social protections, and tackling learning losses.
3. Ensure sound macroeconomic fundamentals by enhancing bureaucratic efficiency, implementing robust management practices, and fostering a resilient and innovative financial sector.
4. Create more job opportunities by promoting trade and investments, improving infrastructure, and attaining energy security.
5. Create high-quality jobs by enhancing employability, promoting research and development, fostering innovation, and strengthening the digital economy.
6. Create green jobs by pursuing a green economy and establish livable and sustainable communities.

---

[15] Philippine Statistics Authority (PSA). (2024). 2024 Agriculture and Fisheries Indicators System: Employment and Wages in Agriculture and Fishing. Retrieved from https://psa.gov.ph/system/files/main-publication/AFIS%20Employment%20and%20Wages%20in%20Agri%20and%20Fishing%202019-2023_e-signed.pdf
[16] Philippine Statistics Authority (PSA). Compendium of Philippine Environment Statistics 2014-2023: Component 4: Extreme Events and Disasters, Table 4.13.2. p.4-63. Retrieved from https://library.psa.gov.ph/cgi-bin/koha/opac-retrieve-file.pl?id=3eb2508963f2403294c3bc494464a346
[17] Data Source: Office of the Civil Defense

7. Uphold public order, safety, peace and security.
8. Ensure a fair and competitive environment by strengthening market competition and reducing barriers to entry and entrepreneurship.

Based on the PDP, the Philippines recorded a loss and damage of USD 12.1 billion (PHP 673.3 billion)[18] caused by tropical cyclones alone from 2011-2021. Considering the projected increase in climate impacts, the average estimated loss of the Philippines' GDP by the year 2030 is estimated to be at least 3.2 percent and is anticipated to rise to 5.7 percent by 2040.[19]

To address these, the PDP 2023-2028 highlights priorities for "Accelerating Climate Action and Strengthening Disaster Resilience," which underscore the urgency of climate action to safeguard communities and support sustainable development.

---

[18] As reported in the Philippine Development Plan 2023-2028
[19] As indicated in the World Bank's Philippines Country Climate and Development Report (CCDR) 2022

CHAPTER 2: NATIONAL INVENTORY REPORT OF ANTHROPOGENIC EMISSIONS BY SOURCES AND REMOVALS BY SINKS OF GREENHOUSE GASES

Inventory arrangements and cross-cutting information

Background information on GHG inventories and climate change in the Philippines

As a Party to the UNFCCC, the Philippines submitted two National Communications: the Initial National Communication (INC) in 2000, containing the 1994 national GHG inventory, and the Second National Communication in 2014 containing the 2000 GHG inventory. These reports were prepared by the Department of Environment and Natural Resources (DENR), through its Environmental Management Bureau (EMB), which served as the Secretariat of the Inter-Agency Committee on Climate Change (IACCC) with support from the Global Environment Facility (GEF) through the United Nations Development Programme (UNDP).

The Climate Change Act of 2009, as amended in 2012, mandates the Philippine government, through the CCC, to formulate strategies to mitigate anthropogenic greenhouse gas emissions. A robust GHG inventory is essential for its implementation, which provides data on the quantity and sources of emissions by sector and the removal by sink in the country.

In 2014, Executive Order No. 174 (EO 174) established the Philippine Greenhouse Gas Inventory Management and Reporting System (PGHGIMRS), institutionalizing regular national GHG inventory compilation to support evidence-based policymaking and planning for sustainable development and climate change mitigation. The system is further guided by CCC Commission Resolution No. 2018-003[20], which outlines the essential procedures and processes of national GHG inventory compilation.

The CCC oversees the national GHG inventory process in collaboration with key sectoral agencies, namely: the Department of Agriculture (DA), the DENR, the Department of Energy (DOE), the Department of Transportation (DOTr), and the PSA.

This policy enables regular national GHG inventory reporting by providing the framework to institutionalize capacities, allocate sufficient resources, and guide the GHG inventory compilation process. Through EO 174, the Philippine government operationalized national GHG inventory reporting for 2010, 2015, and 2020.

In the early stages of EO 174, a national GHG Inventory Report for 2010 was completed in 2019 through collaboration among PGHGIMRS agencies demonstrating the Philippines' growing domestic technical and institutional capacity for GHG inventory compilation and commitment to emissions reduction.

---

[20] Document can be accessed here:
https://climate.gov.ph/public/ckfinder/userfiles/files/Resolutions/Resolution%202018-003_%20Resolution%20on%20GHG%20Inventory%20Guidelines.pdf

This BTR provides detailed results from the PGHGIMRS agencies for inventory years 2015 and 2020, summarizing emissions by sector and removals by sink across seven (7) sectors: [1] energy; [2] transport; [3] agriculture; [4] forestry; [5] other land use (OLU); [6] IPPU; and [7] waste.

Such inventories are critical tools for policymakers and form the foundation for formulating climate change mitigation strategies aligned with national development aspirations. The table below provides how the sectors will be discussed in this Report.

Table 2: Detailed Sectoral Reporting Based on the PGHGIMRS

Sectors of the IPCC 2006 Guidelines	Sectors reflected in this Report	Remarks
Energy	Energy	- Transport is a sub-sector of energy according to the 2006 IPCC Guidelines. - EO 174 mandates DOE to serve as the lead agency for energy and DOTr as the lead agency for transport. - Separate reporting for transport will highlight the contributions as a sub-sector.
	Transport	
Agriculture, Forestry, and Other Land Uses (AFOLU)	Agriculture	- EO 174 mandates that the DA and PSA serve as the lead agencies for agriculture and DENR as the lead agency for forestry and other land uses. - Separate reporting for the three sectors will be provided to highlight their respective contributions. - Separate reporting for forestry to highlight its sink function/sequestration of emissions
	Forestry	
	Other Land Uses	
Industrial Processes and Product Use (IPPU)	IPPU	- EO 174 mandates the DENR as the lead agency for IPPU and the Waste sector - Separate reporting for IPPU and the Waste sector will be provided to highlight the contributions of relevant industrial processes and product use, solid waste treatment, and domestic and industrial wastewater treatment as identified in the 2006 IPCC Guidelines.
Waste	Solid Waste	
	Wastewater	

This National Inventory Report (NIR) is based on the submitted Sectoral GHG Inventory Reports (SIRs) from the lead agencies of the PGHGIMRS, assessed and consolidated by the CCC.

National Inventory Arrangements

National entity or national focal point

In 2014, the establishment of the PGHGIMRS formalized the regular preparation of the national GHG inventory reports by providing the framework to institutionalize the reporting and allocation of resources and guide the compilation of greenhouse gas inventory. EO 174 provides the legal basis and institutional arrangement for the conduct of the GHGI. The figure below shows the organizational structure of national GHG Inventory reporting according to EO 174.
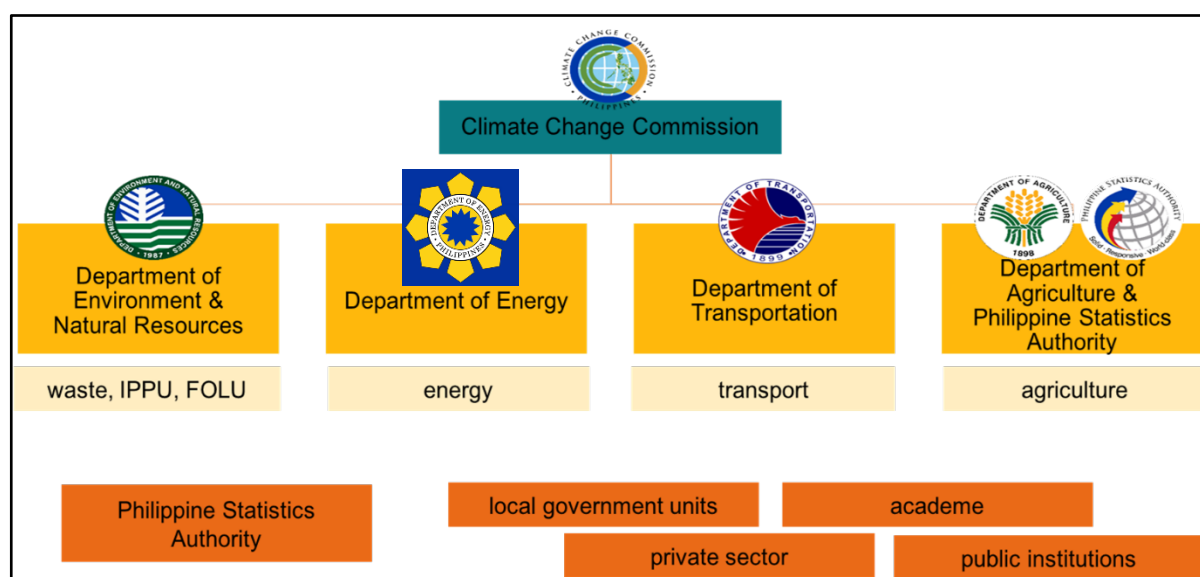
Figure 2: PGHGIMRS Organizational Structure

EO 174 mandated the CCC to serve as the overall lead agency for national GHG inventory reporting. Specifically, the CCC (i) shall provide direction and guidance in the accounting and reporting of GHG emissions; (ii) develop and maintain centralized, comprehensive, and integrated data on GHGs; and (iii) establish a system for archiving, reporting, monitoring, and evaluating GHG inventories in all sectors. The CCC is also tasked with facilitating ongoing capacity-building initiatives in the conduct of GHG inventories to ensure the application of updated methodologies.

Inventory preparation process

EO 174 designates lead agencies based on their mandates and areas of expertise for effective implementation. The DENR leads efforts for the waste, IPPU, and LULUCF sectors. The DOE estimates energy sector emissions, including transport emissions from fuel consumption. The latter is verified by DOTr, per 2006 IPCC Guidelines, considering the transport sector as a sub-sector of the energy sector 21. The PSA is responsible for conducting the agriculture emissions inventory, while the DA handles data collection and identifies policies and measures to reduce emissions from the same sector.

---

[21] Annual Energy Balance Table of DOE is used as main source of data of fuel consumption

Under EO 174, the designated sectoral lead agencies are tasked with conducting, documenting, archiving, and monitoring sector-specific GHG inventories. They are also responsible for reporting these inventories to the CCC in accordance with the established reporting framework. Additionally, these agencies are expected to carry out any other functions necessary to ensure the effective implementation of the policy.

The CCC and the sectoral lead agencies formalized and/or updated their respective GHG inventory teams in preparation for the national and sectoral GHG inventories. **Table 3** lists the latest issuances to support the operationalization of the PGHGIMRS per agency.

Table 3: Latest Issuances and Other Information in the PGHGIMRS Operationalization

Sector	Agency	Latest Supporting Issuances
Overall	Climate Change Commission	CCC Commission Resolution 2018-003: EO 174 IRR CCC Office Order 2024-01-004
Agriculture	Department of Agriculture	DA Special Order No. 683, s.2021
Agriculture	Philippine Statistics Authority	PSA Special Order No. 2024-10NS-80
Energy	Department of Energy	DOE Special Order No. 2024-03-0018
Transport	Department of Transportation	DOTr Department Order No. 2018-001
Waste	Department of Environment and Natural Resources	DENR Special Order No. 2024-67
Industrial Processes and Product Use	Department of Environment and Natural Resources	DENR Special Order No. 2024-67
Land Use, Land-Use Change, and Forestry	Department of Environment and Natural Resources	DENR FMB Special Order No. 2021-55

The PGHGIMRS covers the Agriculture, Waste, Industrial Processes and Product Use, Transport, Forestry and Other Land Use, and Energy (AWITFE) sectors, per the 2006 IPCC Guidelines for National GHG Inventories. While transportation is recognized as a distinct sector, it is reported as a sub-sector within the Energy Sector.

Support institutions such as LGUs, academe, and public/private institutions may assist sectoral and overall lead agencies in GHG inventories, particularly in data collection and analysis to support PGHGIMRS implementation.

Following the modalities, procedures, and guidelines of the ETF, the methodological approach for estimating sectors' emissions and removals is based on the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, hereinafter referred to as the 2006 IPCC Guidelines. The Report presents the contributions of various sectors aligned with the 2006 IPCC Guidelines and EO 174. The PGHGIMRS accounted four (4) greenhouse gases from the

seven sectors in the 2015 and 2020 GHG Inventory, namely, CO_2, CH_4, N_2O, and HFCs, based on the best available data. The 100-year time horizon global warming potential (GWP) values from the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (2014) were used to convert non-CO2 gases.

Archiving of information

The National Integrated Climate Change Database and Information Exchange System (NICCDIES), established under the Climate Change Act and related policies, is an online platform for tracking, monitoring, and publishing climate action and support data. It hosts information on GHG inventories, climate budget tagging, local climate action plans, and international reports.

NICCDIES provides policymakers, academe and research institutions, and the general public access to updated national GHG inventory data. NICCDIES regularly and continuously updates information on GHG inventories developed and submitted.

This portal will also be enhanced in terms of updating data sets and providing interactive features, as applicable, as a means of engaging stakeholders in improving climate information and eventually broadening the space for collaboration. The MOI will thus include measures to enhance the functionality of NICCDIES as an agent for transformative climate action at all levels.

Figure 3: NICCDIES Portal on National GHG Inventory Module

Process For Official Consideration and Approval of Inventory

This section outlines the comprehensive eight-step process undertaken by the Philippines to develop the National GHG Inventory (NGHGI) for 2015 and 2020. This highlights key phases, including inventory planning, data collection, estimation of emissions and removals, data quality management, and the preparation and publication of the Sectoral and National Inventory Reports.

Steps undertaken to prepare the 2015 and 2020 National GHG Inventory

Step 1: Inventory Planning / Development of Improvement Plan

The National GHG Inventory commenced with a planning activity. Planning ensured the applicability of processes to be carried out and the timely submission of requirements. A planning session was conducted before and after each inventory cycle.

Table 4 summarizes the list of planning activities.

As the overall lead agency for EO 174 implementation, the CCC provides direction and guidance in the accounting and reporting of National Inventories, and for developing and maintaining a centralized, comprehensive, and integrated data on GHGs in close coordination with sectoral lead agencies. The CCC facilitated regular coordination meetings to ensure the delivery and quality of inventories developed by the PGHGIMRS.

Table 4: EO 174 Activities Under the Inventory Planning Stage for 2015 and 2020 NGHGI

Activity	Output	Responsible agency	Date Conducted
Conducted a planning session to improve the overall process and preparations for the upcoming inventory cycle.	Overall inventory work plan and preparation instructions	All agencies, led by CCC	26 March 2021
Coordinated with relevant and sector-specific stakeholders to address challenges identified from the outcomes of the planning session.	Sector-specific inventory work plan and preparation instructions	All agencies, facilitated by CCC	April to November 2021
Identified activity data, data sources, appropriate methodologies, and tools to estimate emissions and removals.	Identified data requirements and tools for implementing the 2006 IPCC Guidelines	All agencies, facilitated by CCC	

Step 2: Data Collection and Documentation

The data collection process was imperative in the conduct of GHG inventory and documentation was needed to support emissions and removal estimations, as well as ensure access to data at any time.

Sectoral data collection matrices were developed to support lead agencies in this process.

The 2006 IPCC Guidelines Volume 1 Chapter 2 Approaches to Data Collection is followed. A summary of the activities conducted is provided in **Table 5**.

Table 5: Data Collection and Documentation Activities for 2015 and 2020 NGHGI

Activity	Output	Responsible agency	Date Conducted
Collected and processed emissions and/or removals data.	Emissions and/or Removal data.	All lead sectoral agencies	January 2022 – March 2023
Documented the data gathered and the approach used in the collection.	Documentation of data and approach.	All lead sectoral agencies	January 2022 – March 2023
Quality Control of data gathered.	Matrix of data collected with remarks.	All lead sectoral agencies	January 2022 – March 2023
Capacity-building activities.	Increased technical capacity of GHG Inventory Members.	All sectoral lead agencies, facilitated by CCC	January 2022

A series of capacity-building activities on the 2006 IPCC Guidelines and ETF were conducted to guide agencies on GHG emissions and removals estimation based on IPCC-prescribed methodologies. Information on the activity data and emission factors needed per sector was provided. A data collection matrix, provided by CCC, served as a checklist for gathering sector-specific activity data and emission factors.

Table 6: Series of Capacity-Building Activities Conducted for 2015 and 2020 NGHGI

Activity	Date and Venue	Participants
Certification on 2006 IPCC Guidelines for National GHG Inventories supported by UNFCCC and GHGMI	First round: 2019-2020 Second round: 2021-2022	CCC, DENR, PSA, DOE, DOTr, DA
AFOLU Sector GHG Inventory Training	11-14 January 2022 Virtual	CCC, DA, DA-CRAO, DENR-CCS, DENR-BMB, DENR-FMB, DA-PhilRice, PSA, DA-PCC, DA-FPA, DA-BSWM, DENR-ERDB,
IPPU Sector GHG Inventory Training	17-21 January 2022 Virtual	DENR-CCS, DENR-EMB, DENR-EMB Regional Offices, DENR-MGB, DTI-BOI, Ampleon Philippines, ADCV, Semiconductor and Electronics Industries in the Philippines Foundation, Gruppo EMS Inc., TDK Philippines Corporation, Analog Devices Gen. Trias Inc., Philippine Iron and Steel Institute, Nexperia Philippines Inc.
Waste Sector GHG Inventory Training	25-28 January 2022 Virtual	DENR-CCS, DENR-EMB. DENR-EMB Regional Offices, DENR-MGB, Maynilad Water Services Inc, MMDA, DOH, MWSS, DOST, DPWH, NEXPERIA, Manila Water Company, Manila Water Ventures Philippines, PEZA, NSWMC

Step 3: Emissions and Removals Estimation

The tools and methodologies for estimating GHG emissions are provided in the 2006 IPCC Guidelines. Method choice is indicated in Chapter 4 Methodological Choice and Identification of Key Categories, and Volumes 2, 3, 4, and 5 of the 2006 IPCC Guidelines.

Notably, the 2006 IPCC Guidelines do not impose specific tools or methods but lead the inventory compiler to the most appropriate tool or method to use in the estimation and calculation. These guidelines offer flexibility in tool selection, allowing countries to employ appropriate methods adhering to international standards.

The UNFCCC encourages inventory compilers to use available National GHG Inventory software tools to help implement accurate methodologies for calculating GHG emissions and removals, e.g., the IPCC Inventory Software and the Agriculture and Land Use Greenhouse Gas Inventory Software (ALU Software). Further, exported GHG estimates from these tools can facilitate preparing reporting tables required by the ETF under the Paris Agreement.

For this inventory cycle, sectoral agencies were advised to employ the latest IPCC Inventory Software version (Version 2.69) in estimating GHG emissions and removals. The IPCC prepared supporting references or materials to guide inventory compilers in using the Software. The CCC facilitated capacity-building activities on using the Software to sustain the technical capacities of inventory compilation.

For consistency in estimating and reporting GHGs, lead sectoral agencies were advised to refer to the GWP values of the IPCC Fifth Assessment Report over a 100-year time horizon.

Table 7: Emissions and Removal Estimation Activities

Activity	Output	Responsible person	Frequency/ Time frame
Evaluated the applicability of the 2006 IPCC Guidelines, including the Supplemental Materials and Refinements.	Memorandum on the use of the 2006 IPCC guidelines	CCC, in consultation with lead agencies	Before inventory cycle
Proposed alternative methodologies for the estimation of emissions and removal.	Memorandum on the use of alternate methodologies	All lead sectoral agencies (as needed)	During inventory

Step 4: Data Quality Management

Agencies performed quality control (QC) and quality assurance (QA) of their respective sectoral GHG inventory to ensure the accuracy and completeness of data used and generated. The CCC issued the QA/ QC checklist to guide agencies on their existing quality checks and planned and needed data quality enhancements.

A data quality management system was implemented by all lead agencies throughout the conduct of GHG inventory to ensure that Transparency, Accuracy, Completeness, Comparability, and Consistency (TACCC) are maintained in the reporting of GHG inventories.

This process involves three activities: QA/QC, and uncertainty assessment, where procedures to carry these out are laid out in Volume 1, Chapter 6 Quality Assurance/ Quality Control and Verification, and Volume 1, Chapter 3 Uncertainties of the 2006 IPCC Guidelines. Data quality management was implemented consistently throughout the data collection and GHG estimation processes.

Table 8: Data Quality Management Activities for 2015 and 2020 NGHGI

Activity	Output	Responsible person	Date Conducted
Ensured data quality in accordance with Volume 1 Chapter 6 Quality Assurance/ Quality Control and Verification of the 2006 IPCC Guidelines.	Reviewed/revised GHG Inventory Report	All lead sectoral agencies	January 2022 – March 2023
Ensured data control in accordance with Volume 1 Chapter 6 Quality Assurance/ Quality Control and Verification of the 2006 IPCC Guidelines.	Reviewed/revised GHG Inventory Report	All lead sectoral agencies	January 2022 – March 2023
Assessment and management of uncertainties, including recalculations as necessary, with reference to Volume 1 Chapter 6 Quality Assurance/ Quality Control and Verification of the 2006 IPCC Guidelines.	Reviewed/revised GHG Inventory Report	All lead sectoral agencies	January 2022 – March 2023
Documentation of data quality management activities.	Completed checklist of data quality management activities, including findings and actions taken	CCC as the lead QA All lead sectoral agencies as QA for their sectoral inventories	Every after inventory

Step 5: Sectoral Inventory Report (SIR)

The CCC issued a template for the Sectoral Inventory Reports to be accomplished by the sectoral lead agencies, to be submitted to the CCC. It contained a narrative description of the following:

1. Methodology used;
2. GHG inventory results;
3. Data quality management;
4. Funding and resource requirements used;
5. Archiving and documentation process; and
6. Recommendations for inventory improvement for the next cycle.

Sectoral lead agencies also submitted the Extensible Markup Language (.XML) files, worksheets, and models used to develop their SIRs to the CCC. These files were integrated into the 2006 IPCC software for initial consolidation and review by the CCC, with a spreadsheet program used for final consolidation and analysis of the GHG inventories.

Table 9: Activities related to Sectoral Inventory Report

Report	Responsible Agency	Frequency	Reference
Sectoral GHG Inventory Reports	All lead sectoral agencies	Once every inventory cycle	• Sectoral Reporting Templates • Volume 1 Chapter 8 Reporting Guidance of the 2006 IPCC Guidelines
National GHG Inventory Report	CCC	Once every inventory cycle	• Template developed by CCC, following international guidelines set by the UNFCCC • Volume 1 Chapter 8 Reporting Guidance of the 2006 IPCC Guidelines

Step 6: National Inventory Report (NIR)

Following the receipt of all the SIRs from the EO 174 sectoral lead agencies, the CCC commenced drafting the NIR. Quality assurance was conducted on the data and calculations reflected in the SIRs and the sectoral worksheet files. A complete national inventory was generated aided by the 2006 IPCC software.

The CCC conducted a Key Category Analysis (KCA) to determine source categories per GHG type based on its contribution to the inventory. Identifying key categories in the inventory allows Governments to prioritize resources to improve GHG inventories by moving to a higher level of estimation, reducing uncertainties as well as focusing on sectors for formulating mitigation strategies.

Step 7: NIR Approval and Archiving

Upon completion, the NIR was subjected to the approval process based on guidance from the CCC, in consultation with relevant agencies i.e., DA, DENR, DOE, DOTr, and PSA. Key findings were presented to sectoral agencies for input, and the revised NIR was submitted for CCC management approval. Key findings were presented to sectoral agencies for input, and the revised NIR was submitted for CCC management approval. An archiving system was established to document and store files and reports.

Step 8: Publication of the NIR

Publication and reporting of the NIR was the final step in the inventory cycle. The National Inventory Document was included in the BTR that the Philippines submitted.

Brief Description of Methodologies (including tiers and data sources used)

Pursuant to Decision 18/CMA.1, the methodologies, assumptions, and default factors used in the 2015 and 2020 GHG Inventories followed the 2006 IPCC Guidelines. The 2006 IPCC Guidelines provided internationally agreed methodologies for estimating national inventories of anthropogenic emissions by source and removals by sink of greenhouse gases. The 2006 IPCC Guidelines were developed to assist Parties in fulfilling their reportorial requirements under the UNFCCC for reporting on inventories of anthropogenic GHG emissions not controlled by the Montreal Protocol.

The 2006 IPCC Guidelines generally provide recommendations on estimation methods at three levels of detail, from tier 1 (the default and simplest method) to tier 3 (the most detailed method). For the 2015 and 2020 GHG Inventories, the Tier 1 method was used across the five sectors, while the Tier 2 method was specifically applied to cement production and Ozone-Depleting Substances (ODS) substitutes for Refrigeration and Air Conditioning (RAC) under IPPU.

After data collection and quality checks, activity data and factors were employed in the IPCC Inventory Software (v. 2.930) to facilitate the emissions and removal estimation process. Key categories with significant influence on the country's total inventory were identified using Approach 1 level assessment and trend assessment. In terms of the GWP values used in the inventory, the 100-year time horizon GWP values from the IPCC Fifth Assessment Report were adopted as promulgated by Decision 18/CMA.1.

Brief Description of Key Categories

As defined in the 2006 IPCC Guidelines, "a key category is prioritized within the national inventory system because its estimate has a significant influence on a country's total inventory of greenhouse gases in terms of the absolute level, the trend, or the uncertainty in emissions and removals. Whenever the term key category is used, it includes both source and sink categories."

For the 2015 and 2020 inventories, the approach 1 Quantitative Method was used for the KCA, wherein the aggregation level was based on the suggested aggregation level as stated in Table 4.1 of the 2006 IPCC Guidelines Volume 1.

Table 10 and **Table 11** below shows the results of the KCA using Approach 1 Level Assessment (refer to the Table 4.6.1 from the 2006 IPCC Guidelines Volume 1). This KCA was done using a spreadsheet program (outside IPCC software) due to the RAC subsector of the IPPU sector using the Tier 2A model.

For level assessment, 17 and 18 key categories were identified in 2015 and 2020, respectively. All the key categories identified in 2015 are also present in 2020; however, most of the ranking of each category have differed except for CO_2 removals from Land Converted to Forest Land (Rank 7), Direct N_2O emissions from managed soils (Rank 14), and N_2O and

CH_4 emissions from Manure Management (Ranks 15 and 17, respectively). The key category added for 2020 is the emissions of HFCs in the activity of RAC.

For both inventory years, the activities that most significantly impacted the country's total emissions were land use conversions, forest land sequestration, and emissions from energy industries, and rice cultivation.

Table 10: The 2015 National GHG Inventory Key Categories Analysis including LULUCF (Level Assessment)

Rank	Sector	IPCC Code	Activity	Gas	Percent Contribution	Cumulative Percentage
1	AFOLU	3.B.3.b	Land Converted to Grassland	CO_2	18.33%	18.33%
2	Energy	1.A.1	Energy Industries	CO_2	14.14%	32.47%
3	AFOLU	3.B.1.a	Forest Land Remaining Forest land	CO_2	12.16%	44.63%
4	AFOLU	3.B.2.b	Land Converted to Cropland	CO_2	8.58%	53.21%
5	AFOLU	3.C.7	Rice Cultivation	CH_4	7.28%	60.49%
6	Energy	1.A.3.b	Road Transportation	CO_2	7.22%	67.71%
7	AFOLU	3.B.1.b	Land Converted to Forest Land	CO_2	5.80%	73.51%
8	Energy	1.A.2	Manufacturing Industries and Construction	CO_2	3.64%	77.15%
9	Waste	4.D	Wastewater Treatment and Discharge	CH_4	3.50%	80.65%
10	IPPU	2.A.1	Cement Production	CO_2	3.00%	83.65%
11	Waste	4.A	Solid Waste Disposal	CH_4	2.56%	86.21%
12	AFOLU	3.A.1	Enteric Fermentation	CH_4	2.26%	88.47%
13	Energy	1.A.4	Other Sectors	CO_2	1.95%	90.42%
14	AFOLU	3.C.4	Direct N_2O Emissions from Managed Soils	N_2O	1.77%	92.18%
15	AFOLU	3.A.2	Manure Management	N_2O	1.22%	93.40%
16	Energy	1.A.3.d	Water-borne Navigation	CO_2	0.86%	94.26%
17	AFOLU	3.A.2	Manure Management	CH_4	0.77%	95.04%

Table 11: The 2020 National GHG Inventory Key Categories Analysis including LULUCF (Level Assessment)

Rank	Sector	IPCC Code	Activity	Gas	Percent Contribution	Cumulative Percentage
1	Energy	1.A.1	Energy Industries	CO_2	21.38%	21.38%
2	AFOLU	3.B.1.a	Forest land Remaining Forest Land	CO_2	16.73%	38.11%
3	AFOLU	3.B.3.b	Land Converted to Grassland	CO_2	9.02%	47.13%
4	AFOLU	3.C.7	Rice Cultivation	CH_4	7.78%	54.90%
5	Energy	1.A.3.b	Road Transportation	CO_2	7.41%	62.32%
6	Waste	4.D	Wastewater Treatment and Discharge	CH_4	4.77%	67.09%
7	AFOLU	3.B.1.b	Land Converted to Forest Land	CO_2	3.83%	70.92%
8	Waste	4.A	Solid Waste Disposal	CH_4	3.37%	74.29%
9	IPPU	2.A.1	Cement Production	CO_2	3.31%	77.60%
10	Energy	1.A.4	Other Sectors	CO_2	3.28%	80.88%
11	AFOLU	3.B.2.b	Land Converted to Cropland	CO_2	3.24%	84.12%
12	Energy	1.A.2	Manufacturing Industries and Construction	CO_2	2.96%	87.08%
13	AFOLU	3.A.1	Enteric Fermentation	CH_4	2.40%	89.48%
14	AFOLU	3.C.4	Direct N_2O Emissions from Managed Soils	N_2O	1.98%	91.46%
15	AFOLU	3.A.2	Manure Management	N_2O	1.27%	92.73%
16	IPPU	2.F.1	Refrigeration and Air Conditioning	HFCs	0.89%	93.62%
17	AFOLU	3.A.2	Manure Management	CH_4	0.79%	94.41%
18	Energy	1.A.3.d	Water-borne Navigation	CO_2	0.67%	95.09%

Time Series Consistency and Recalculations

GHG inventories are critical for tracking emissions and removals, providing essential data to monitor progress toward climate goals. However, developing and maintaining these inventories requires strong technical capacity and resources, especially for creating consistent time series datasets and performing recalculations. Time series analysis tracks emissions trends over time, reflecting changes from policies, technologies, or economic shifts. Conversely, recalculations are essential for incorporating new methodologies, enhancing data quality, and aligning with updated IPCC guidelines. Without sufficient capacity-building initiatives and resource allocation, Parties, especially developing nations, face significant challenges in producing reliable and transparent GHG inventories.

In the Philippine context, addressing these challenges requires targeted investments in institutional capacity, technical training, and technology transfer. Capacity-building should focus on data collection and analysis and advanced modeling tools to produce consistent time

series and effective recalculations. Financial and technical resources must be mobilized to establish robust national data archiving, reporting, and quality assurance systems capable of handling recalculation of inventories, integration of sector-specific updates, and accommodation of new data sources. Operating entities of financial mechanisms like the Green Climate Fund (GCF) together with bilateral cooperation and international support are crucial in bridging resource gaps, helping countries meet transparency requirements under the Paris Agreement, and making informed, evidence-based climate action strategies.

General Uncertainty Evaluation, Including Data on the Overall Uncertainty for the Inventory Totals

A high level of uncertainty across all sectors in GHG inventories and emissions projections poses significant challenges to effective climate action and policy formulation. Uncertainty typically arises from incomplete or inconsistent data, limitations in measurement technologies, and methodological assumptions in inventory calculations. For instance, in sectors like agriculture and land use, variability in natural processes and a lack of comprehensive monitoring systems contribute to discrepancies in emissions estimates. Similarly, in energy and industrial sectors, inconsistent reporting frameworks and varying levels of technological adoption can introduce errors. Such uncertainties undermine data reliability, complicating trend analysis, mitigation assessment, or prioritization of interventions.

To address these challenges, countries must adopt a multi-pronged approach focused on improving data quality, enhancing transparency, and refining methodologies. Strengthening institutional frameworks for data collection and harmonizing sectoral reporting standards are critical steps toward minimizing uncertainty. Advanced technologies, such as remote sensing for land-use monitoring or real-time emissions tracking in industrial processes, can provide more accurate data and reduce reliance on estimation. Furthermore, integrating uncertainty analyses into inventory reporting, as the IPCC encourages, allows stakeholders to understand the confidence levels of emissions estimates and adjust their strategies accordingly. Capacity-building and international cooperation are vital in ensuring these practices are adopted, maintaining the credibility and effectiveness of global climate action.

Metrics

This BTR reports on the following greenhouse gases using the GWP values for a 100-year time horizon from the IPCC 5th Assessment Report (AR5).

Table 12: Greenhouse Gas and Respective Global Warming Potential

Greenhouse Gas	AR5 GWP
Carbon Dioxide	1
Methane	28
Nitrous Oxide	265
Hydrofluorocarbons (HFCs)	
Chemical	
R32 (HFC-32)	677
R123	79
R125 (HFC-125)	3,170

Greenhouse Gas	AR5 GWP
R134a (HFC-134a)	1,300
R143a (HFC-143a)*	4,800
Blend	
R404A (44% HFC-125; 4% HFC-134a; 52% HFC-143a)	3,942.80
R407C (23% HFC-32; 25% HFC-125; 52% HFC-134a)	1,624.21
R410A (50% HFC-32; 50% HFC-125)	1,923.5

R143a is included in refrigerant blend only and not used as a single chemical refrigerant

Summary of Flexibility Provisions Applied for the National Inventory Document

Table 13: Summary of Available Flexibilities

Reference in the MPGs[22] (Annex to Decision 18/CMA.1)	Flexibility provision applied
Paragraph 29 Uncertainty assessment	Provide, at a minimum, a qualitative discussion of uncertainty for key categories, using the 2006 IPCC guidelines, where quantitative input data are unavailable to quantitatively estimate uncertainties, and are encouraged to provide a quantitative estimate of uncertainty for all source and sink categories of the GHG inventory
Paragraph 34 QA/QC	Encouraged to elaborate an inventory QA/QC plan in accordance with the IPCC guidelines, including information on the inventory agency responsible for implementing QA/QC.
Paragraph 35 QA/QC	Encouraged to implement and provide information on general inventory QC procedures in accordance with the QA/QC plan and the 2006 IPCC guidelines.
Paragraph 48 Gases	Report at least three gases (CO_2, CH_4, and N_2O) as well as any of the additional four gases (HFCs, PFCs, SF6, and NF3) that are included in the Party's NDC under Article 4 of the Paris Agreement, are covered by activity under Article 6 of the Paris Agreement or have been previously reported.
Paragraph 57 Time series	Report data covering, at a minimum, the reference year/period for its NDC under Article 4 of the Paris Agreement and, in addition, a consistent annual time series from at least 2020 onwards.
Paragraph 58 Reporting year	The latest reporting year shall be no more than three years prior to the submission of the NIR.

2015 and 2020 National GHG Inventories

The 2015 and 2020 national GHG inventories present the contributions of seven (7) key sectors of the country's emissions and removals, namely:

1. Energy;
2. Transport;
3. Agriculture;

---

[22] Modalities, Procedures and Guidelines of the Enhanced Transparency Framework under the Paris Agreement

4. Forestry;
5. Other land use (OLU);
6. Industrial processes and product use (IPPU); and
7. Waste

In accordance with Decision 18/CMA.1, the 2006 IPCC Guidelines for National GHG Inventories were used as the estimation methodology to account for the country's emissions by sources and removals by sinks. Four (4) greenhouse gases were accounted for in the seven key sectors in the 2015 and 2020 GHG Inventories, namely: [1] CO_2; [2] CH_4; [3] N_2O; and [4] HFCs based on the best available science and technology to account for GHGs at the time of inventory.

The GWP values used for these inventories are based on the IPCC Fifth Assessment Report (IPCC, 2013).

To summarize, in 2015, the total GHG emissions (excluding those from LULUCF) of the Philippines were 298,287 gigagrams of carbon dioxide equivalent (GgCO_2e) and net GHG emissions of 232,988 GgCO_2e. On the other hand, the 2020 inventory shows that the total GHG emissions reached 275,680 GgCO_2e and net emissions of 204,325 GgCO_2e.

In 2015, as shown in **Table 14**, the Forestry sector remained a net carbon sink with a carbon sequestration amount of 65,299 GgCO_2e. Taking into consideration emissions from Other Land Uses of 100,967, the FOLU sector is a net emitter.

Table 14: Summary of 2015 National GHG Emissions and Removals Inventory, per sector and per gas (in GgCO₂e; rounded to the nearest whole number)

Year	2015				
Greenhouse Gas	CO$_2$	CH$_4$	N$_2$O	HFCs	Sector Total
Units	GgCO$_2$e				
Energy	71,774	2,555	565	–	**74,894**
Transport	30,722	50	477	–	**31,249**
IPPU	13,032	30	–	2,234	**15,296**
Agriculture	570	37,852	14,281	–	**52,704**
Forestry	-65,299	–	–	–	**-65,299**
Other Land Use	100,967	–	–	–	**100,967**
Waste	2	22,106	1,068	–	**23,176**
Total Emissions	116,100	62,593	16,391	2,234	**–**
Net Emissions	151,769	62,593	16,391	2,234	**–**
Overall Total Emissions					298,287
Overall Net Emissions					232,988

The table presents the GHG emissions in 2015 across different sectors, categorized by the types of gases: CO$_2$, CH$_4$, N$_2$O, and HFCs, with values expressed in GgCO$_2$e. The net emissions total 232,988 GgCO$_2$e after accounting for forestry as a carbon sink.

Among the four (4) GHGs in the 2015 NGHGI, CO$_2$ emissions represented the largest contribution to the atmosphere, accounting for 65.14 percent (151,769 GgCO$_2$e) of the overall net emissions (232,988 GgCO$_2$e). The primary source of CO$_2$ emissions was land use conversion, particularly from Forestlands and Croplands into Grasslands.

This was followed by methane emissions comprising 26.87 percent (62,593 GgCO$_2$e) of the net emissions, which was driven significantly by rice cultivation in the agricultural sector. N$_2$O accounted for 7.04 percent (16,391 GgCO$_2$e) of the net emissions, with the activities in managed agricultural soils and manure management as the largest source. HFCs contributed the least share, at 0.96 percent (2,234 GgCO$_2$e). These emissions originated from the RAC sub-sector within the IPPU sector.

Table 15 shows the overall total GHG emissions of the Philippines of 275,680 GgCO$_2$e and net emissions of 204,325 GgCO$_2$e in 2020. Compared to 2015, the FOLU sector was observed to be a net carbon sink as carbon sequestration (-71,355 GgCO$_2$e) of the sector exceeded the amount of emissions (45,420 GgCO$_2$e) released from the sector.

Table 15: Summary of 2020 National GHG Emissions and Removals Inventory, per sector and per gas (in GgCO$_2$e; rounded in the nearest whole number)

Year	2020				
Greenhouse Gas	CO$_2$	CH$_4$	N$_2$O	HFCs	Sector Total
Units	GgCO$_2$e				
Energy	95,867	3,001	987	–	**99,854**
Transport	28,896	46	490	–	**29,431**
IPPU	13,666	28	–	3,078	**16,772**
Agriculture	765	38,434	14,881	–	**54,080**
Forestry	-71,355	–	–	–	**-71,355**
Other Land Use	45,420	–	–	–	**45,420**
Waste	0	28,646	1,476	–	**30,122**
Total Emissions	139,194	70,150	17,823	3,078	**–**
Net Emissions	113,259	70,150	17,823	3,078	**–**
				Overall Total Emissions	**275,680**
				Overall Net Emissions	**204,325**

In 2020, CO$_2$ remained the largest contributor to overall net emissions, accounting for 55.43 percent (113,259 GgCO$_2$e). Fuel combustion activities in the energy sector accounted for the largest sources of CO$_2$ emissions, highlighting the sector's significant role in the Philippines' emissions profile. Methane emissions comprised the 34.34 percent (70,150 GgCO$_2$e) of the net emissions, with rice cultivation in the agricultural sector as the primary emission source.

N$_2$O emissions represented 8.73 percent (17,823 GgCO$_2$e) of the net emissions, driven largely by activities within managed soils and manure management in the agriculture sector. Lastly, RAC remained as the sole activity emitting HFCs, contributing to 1.51 percent of the net GHG emissions in 2020.

For both 2015 and 2020 NGHGI, the Approach 1 Quantitative Method was used for the KCA. **Table 16** below provides the results of the KCA, listing 17 key categories for the 2015 Inventory and 18 key categories for 2020. All the key categories identified in 2015 are also present in 2020; however, most of the ranking of each category have differed except for CO$_2$ removals from Land Converted to Forest land (Rank 7), Direct N$_2$O emissions from managed soils (Rank 14), N$_2$O and CH$_4$ emissions from Manure Management (Rank 15 and 17 respectively). The key category added for 2020 is HFC emissions in the RAC industry.

Table 16: Comparison of the Key Categories Analysis Result of 2015 and 2020 GHGI

Sector	IPCC Category Code	Activity	Gas	Rank (2015)	Rank (2020)
Energy	1.A.1	Energy Industries	CO_2	2	1
AFOLU	3.B.1.a	Forest land Remaining Forest land	CO_2	3	2
AFOLU	3.B.3.b	Grassland (Land Converted to Grassland)	CO_2	1	3
AFOLU	3.C.7	Rice cultivation	CH_4	5	4
Energy	1.A.3.b	Road Transportation	CO_2	6	5
Waste	4.D	Wastewater Treatment and Discharge	CH_4	9	6
AFOLU	3.B.1.b	Land Converted to Forest land	CO_2	7	7
Waste	4.A	Solid Waste Disposal	CH_4	11	8
IPPU	2.A.1	Cement production	CO_2	10	9
Energy	1.A.4	Other Sectors	CO_2	13	10
AFOLU	3.B.2.b	Cropland (Land Converted to Cropland)	CO_2	4	11
Energy	1.A.2	Manufacturing Industries and Construction	CO_2	8	12
AFOLU	3.A.1	Enteric Fermentation	CH_4	12	13
AFOLU	3.C.4	Direct N2O Emissions from managed soils	N_2O	14	14
AFOLU	3.A.2	Manure Management	N_2O	15	15
IPPU	2.F.1	Refrigeration and Air Conditioning	HFCs	-	16
AFOLU	3.A.2	Manure Management	CH_4	17	17
Energy	1.A.3.d	Water-borne Navigation	CO_2	16	18

CHAPTER 3: INFORMATION NECESSARY TO TRACK PROGRESS MADE IN IMPLEMENTING AND ACHIEVING NATIONALLY DETERMINED CONTRIBUTIONS

Institutional Arrangement for Climate Change Mitigation

In 2014, EO 174 established the PGHGIMRS, with the CCC serving as the lead agency. This initiative resulted in the development of the first National GHG Inventory for the base year 2010, which became the baseline for the Philippines' first NDC submitted in 2021. The implementation of the NDC focuses on sector-specific mitigation actions outlined in the Policies and Measures (PAMs), requiring coordination among national and local governments, international partners, and civil society. The NDC Technical Working Group (TWG), formed in 2016, ensures alignment of NDC efforts with national development plans, with the CCC serving as the secretariat, assessing sector contributions and ensuring compliance with reporting requirements.

CCC = Climate Change Commission, CHED = Commission on Higher Education, CSOs = Civil society organizations, DA = Department of Agriculture, DBM = Department of Budget and Management, DENR = Department of Environment and Natural Resources, DEPED = Department of Education, DFA = Department of Foreign Affairs, DHSUD = Department of Human Settlements and Urban Development, DICT = Department of Information and Communications Technology, DILG = Department of the Interior and Local Government, DOE = Department of Energy, DOF = Department of Finance, DOH = Department of Health, DOLE = Department of Labor and Employment, DOST = Department of Science and Technology, DOT = Department of Tourism, DOTr = Department of Transportation, DPWH = Department of Public Works and Highways, DSWD = Department of Social Welfare and Development, DTI-BOI = Department of Trade and Industry – Board of Investments, FAPs = Foreign-assisted projects, GHG = Greenhouse gas, LGUs = Local government units, NAPC = National Anti-Poverty Commission, NCIP = National Commission on Indigenous Peoples, NCRMF = National Climate Risk Management Framework, NDC = Nationally Determined Contribution, NDC MRV = NDC Measurement, Reporting, and Verification, NEDA = National Economic and Development Authority, NSC = National Security Council, NYC = National Youth Commission, OCD = Office of Civil Defense, OES = Office of the Executive Secretary, OP = Office of the President, SC = Steering Committee, PCO = Presidential Communications Office, PCUP = Presidential Commission for the Urban Poor, PCW = Philippine Commission on Women, PIA = Philippine Information Agency, PSA = Philippine Statistics Authority, TESDA = Technical Education and Skills Development Authority, TNA = Technology Needs Assessments, TWG = Technical Working Group.

Figure 4: Institutional Arrangement for the Nationally Determined Contribution Technical Working Group

Description of Party's Nationally Determined Contribution Under Article 4 of the Paris Agreement

Philippines' Nationally Determined Contribution

The Philippines' NDC, submitted to the UNFCCC in April 2021, represents a significant commitment to climate action despite the country's minor contribution to global GHG emissions (0.49 percent in 2022)[23]. The NDC aims for a 75 percent reduction in GHG emissions compared to a BAU scenario from 2020 to 2030. This ambitious target is divided into unconditional and conditional commitments, with only 2.71% of the reduction being unconditional, while the remaining 72.29 percent depends on international support. The NDC reflects the Philippines' recognition of its vulnerability to climate change and its commitment to sustainable development that aligns with global climate goals, particularly those outlined in the Paris Agreement. The Philippines identified four (4) non-negotiable considerations for the implementation of the Philippines' NDC: (1) Sustainable Industrial Development; (2) Poverty Eradication and Provision of Basic Needs; (3) Securing Social and Climate Justice, and (4) Energy Security.

The NDC implementation is guided by the NDCIP, which outlines specific policies and measures (PAMs) across key sectors: agriculture, waste management, industry, transportation, and energy. The NDCIP emphasizes a whole-of-government and whole-of-society approach, ensuring that various stakeholders—including local communities, civil society, the academe and the private sector—are actively involved in implementing climate actions. This inclusive strategy is crucial for fostering local ownership of climate initiatives and ensuring that these are effectively integrated into national and local development plans.

Financial mechanisms play a vital role in realizing the NDC's objectives. Achieving its targets will require significant investments, which will also be sought through public-private partnerships and international funding sources. By establishing clear governance structures and engaging various stakeholders, including local governments, within a framework for measuring, reporting, and verifying progress on emissions reductions and financial allocations, the Philippines aims to create a conducive environment for green investments to drive economic growth.

Furthermore, the NDC stresses the importance of social equity in climate action, prioritizing meaningful participation from marginalized groups such as women, indigenous peoples and local communities, and persons with disabilities. By promoting gender-responsive strategies and traditional knowledge in climate action efforts, the Philippines aims to ensure inclusive climate policies that build resilience among vulnerable populations disproportionately affected by climate change.

---

[23] Crippa M., Guizzardi D., Pagani F., Banja M., Muntean M., Schaaf E., Becker, W., Monforti-Ferrario F., Quadrelli, R., Risquez Martin, A., Taghavi-Moharamli, P., Grassi, G., Rossi, S., Brandao De Melo, J., Oom, D., Branco, A., San-Miguel, J., Vignati, E., GHG emissions of all world countries – JRC/IEA 2023 Report, EUR xxxx EN, Publications Office of the European Union, Luxembourg, 2023, doi:xxx, JRCxxx.

Table 17: Philippines' Nationally Determined Contribution Under Article 4 of the Paris Agreement

Target(s) and description, including target type(s), as applicable	Philippines' NDC is an economy-wide absolute GHG emissions reduction target of 75 percent, with a 2.71 percent unconditional reduction and 72.29 percent conditional.
Target year(s) or period(s), and whether they are single-year or multi-year target(s), as applicable	Target year: 2030 cumulative
Reference point(s), level(s), baseline(s), or starting point(s), and their respective values(s), as applicable	Base year: 2010 107 mmtCO$_2$e based Starting year: 2020 (projected BAU 75 percent absolute emissions reduction and avoidance from BAU scenario
Timeframes(s) and/or periods for implementation, as applicable	Target period: From 2020 to 2030
Scope and coverage, including, as relevant, sectors, categories, activities, sources and sinks, pools and gases, as applicable	Key sectors: Energy, IPPU, Agriculture, and Waste. GHG covered are CO$_2$, CH$_4$, N$_2$O, and HFCs.
Intention to use cooperative approaches that involve the use of ITMOs under Article 6, towards NDCs under Article 4 of the Paris Agreement, as applicable	Philippines to continue exploring the development and benefits of market and non-market mechanisms under the Article 6 of the Paris Agreement, through bilateral, regional, and multilateral cooperation.
Any updates or clarifications of previously reported information, as applicable	Not applicable

Information Necessary to Track Progress Made in Implementing and Achieving Its NDC Under Article 4

Indicator

The Philippines employs total net GHG emissions and removals as a key metric to monitor the progress in implementing and achieving the NDC. The recent data regarding the indicator is comprehensively outlined in Chapter I.

Table 18: Description of Selected Indicator

Indicator	Description
Net GHG emissions and removals	
Information for the reference point(s), level(s), baselines(s), base year(s) or starting point(s)	Philippines' NDC is an economy-wide cummulative GHG emissions reduction and avoidance of 75 percent on the BAU scenario from 2010 to 2030. Projected cumulative BAU emissions are 3,340.30 mmtCO$_2$e
Updates in accordance with the GHG inventory, if any	Not applicable
Definitions needed to understand indicator	Not applicable
Relation to NDC	Not applicable
Most recent information	Philippines' total GHG emissions in 2020 were 230.26 mmtCO$_2$e total emissions (w/o LULUCF) and 204.325 mmtCO$_2$e net emissions (w/ LULUCF)

Table 19: Methodologies and accounting approaches - consistent with Article 4, paragraphs 13 and 14, of the Paris Agreement and with decision 4/CMA.1

Reporting requirement	Description
For the First NDC under Article 4:a	
Accounting approach used in consistent with Article 4, paragraphs 13-14 of the Paris Agreement	The methodology used to estimate emissions and removals of the 2010 GHG Inventory (NDC base year) is based on the 2006 IPCC Guidelines. The application of the Guidelines will ensure that the Philippines' NDC is grounded on the TACCC principles.
For the second and subsequent NDC under Article 4, and optionally for the first NDC under Article 4:b	

Reporting requirement	Description
Information on how the accounting approach used in consistent with paragraphs 13-17 and annex II of decision 4/CMA.1 (para. 72 of the MPGs)	Not applicable
Explain how the accounting for anthropogenic emissions and removals is in accordance with methodologies and common metrics assessed by the IPCC and in accordance with decision 18/CMA.1 (para. 1(a) of annex II to decision 4/CMA.1)	Not applicable
Explain how consistency has been maintained between any GHG data and estimation methodologies used for accounting and the Party's GHG inventory, pursuant to Article 13, paragraph 7(a), of the Paris Agreement, if applicable (para. 2(b) of annex II to decision 4/CMA.1)	Not applicable
Explain how overestimation or underestimation has been avoided for any projected emissions and removals used for accounting (para. 2(c) of annex II to decision 4/CMA.1)	Not applicable
For each NDC under Article 4	
Accounting for anthropogenic emissions and removals in accordance with methodologies and common metrics assessed by the IPCC and adopted by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement:	
Each methodology and/or accounting approach used to assess the implementation and achievement of the target(s), as applicable (para. 74(a) of the MPGs)	Not applicable
Each methodology and/or accounting approach used for the construction of any baseline, to the extent possible (para. 74(b) of the MPGs)	Not applicable
If the methodology or accounting approach used for the indicator(s) in table 1 differs from those used to assess the implementation and achievement the target, describe each methodology or accounting approach used to generate the information generated for each indicator in table 4 (para. 74(c) of the MPGs)	Not applicable
Any conditions and assumptions relevant to the achievement of the NDC under Article 4, as applicable and available (para. 75(i) of the MPGs)	Not applicable
Key parameters, assumptions, definitions, data sources and models used, as applicable and available (para. 75(a) of the MPGs)	Not applicable
IPCC Guidelines used, as applicable and available (para. 75(b) of the MPGs)	Not applicable

Reporting requirement	Description
Report the metrics used, as applicable and available (para. 75(c) of the MPGs)	Not applicable
For Parties whose NDC cannot be accounted for using methodologies covered by IPCC guidelines, provide information on their own methodology used, including for NDCs, pursuant to Article 4, paragraph 6, of the Paris Agreement, if applicable (para. 1(b) of annex II to decision 4/CMA.1)	Not applicable
Provide information on methodologies used to track progress arising from the implementation of policies and measures, as appropriate (para. 1(d) of annex II to decision 4/CMA.1)	Not applicable
Where applicable to its NDC, any sector-, category- or activity-specific assumptions, methodologies, and approaches consistent with IPCC guidance, taking into account any relevant decision under the Convention, as applicable (para. 75(d) of the MPGs):	
For Parties that address emissions and subsequent removals from natural disturbances on managed lands, provide detailed information on the approach used and how it is consistent with relevant IPCC guidance, as appropriate, or indicate the relevant section of the national GHG inventory report containing that information (para. 1(e) of annex II to decision 4/CMA.1, para. 75(d)(i) of the MPGs)	Not applicable
For Parties that account for emissions and removals from harvested wood products, provide detailed information on which IPCC approach has been used to estimate emissions and removals (para. 1(f) of annex II to decision 4/CMA.1, para. 75(d)(ii) of the MPGs)	Not applicable
How the Party has drawn on existing methods and guidance established under the Convention and its related legal instruments, as appropriate, if applicable (para. 1(c) of annex II to decision 4/CMA.1)	The Philippines adhered to the 2006 IPCC National GHG Inventory Guidelines to establish the baseline emissions for its NDC, ensuring a robust framework for setting its climate ambitions. To foster inclusivity and transparency, the country engaged in multiple multistakeholder consultations, aligning with the principles outlined in decision 1/CP21.
Any methodologies used to account for mitigation benefits of adaptation actions and/or economic diversification plans (para. 75(e) of the MPGs)	None
Describe how double counting of net GHG emission reductions has been avoided, including in accordance with guidance developed related to Article 6 if relevant (para. 76(d) of the MPGs)	Not applicable
Any other methodologies related to the NDC under Article 4 (para. 75(h) of the MPGs)	Not applicable

Reporting requirement	Description
Ensuring methodological consistency, including on baselines, between the communication and implementation of NDCs (para. 12(b) of the decision 4/CMA.1 and para 1 of its annex II):	
Explain how consistency has been maintained in scope and coverage, definitions, data sources, metrics, assumptions and methodological approaches including on baselines, between the communication and implementation of NDCs (para. 2(a) of annex II to decision 4/CMA.1)	The Philippines is set to recalculate the 2010 GHG Inventory by using the 100-year GWP values from AR5. The recalculation will follow the methodologies outlined in the 2006 IPCC Guidelines for National Inventories, ensuring that the inventory reflects accurate emissions data across key sectors such as energy, transport, agriculture, and forestry, in accordance with the MPGs.
Explain how consistency has been maintained between any GHG data and estimation methodologies used for accounting and the Party's GHG inventory, pursuant to Article 13, paragraph 7(a), of the Paris Agreement, if applicable (para. 2(b) of annex II to decision 4/CMA.1) and explain methodological inconsistencies with the Party's most recent NRI, if applicable (para. 76(c) of the MPGs)	In accordance with Decision 18/CMA.1, the methodologies, assumptions, and default factors utilized in the 2015 and 2020 Greenhouse Gas (GHG) Inventories adhered to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. The 2006 IPCC Guidelines generally provide recommendations on estimation methods: a. Tier 1 - default values and basic estimates b. Tier 2 - country-specific data and intermediate methods c. Tier 3 - detailed measurements and modeling Data and factors were processed using the IPCC Inventory Software v.2.691 to estimate emissions and removals. Further, Approach 1 level assessments and trend assessments were utilized to identify all key categories influencing the overall emissions and sinks.
For Parties that apply technical changes to update reference points, reference levels or projections, the changes should reflect either of the following (para. 2(d) of annex II to decision 4/CMA.1):	
Technical changes related to technical corrections to the Party's inventory (para. 2(d)(i) of annex II to decision 4/CMA.1)	Not applicable
Technical changes related to improvements in accuracy that maintain methodological consistency (para. 2(d)(ii) of annex II to decision 4/CMA.1)	Not applicable
Explain how any methodological changes and technical updates made during the implementation of their NDC were transparently reported (para. 2(e) of annex II to decision 4/CMA.1)	Not applicable
Striving to include all categories of anthropogenic emissions or removals in the NDC and, once a source, sink or activity is included, continuing to include it (para. 12 (c) of decision 4/CMA.1 and para. 3 of annex II to decision 4/CMA.1):	

Reporting requirement	Description
Explain how all categories of anthropogenic emissions and removals corresponding to their NDC were accounted for (para. 3(a) of annex II to decision 4/CMA.1)	The accounting framework for anthropogenic emissions and removals in the Philippines aligns with the 2006 IPCC Guidelines, ensuring a standardized approach to emissions reporting. While the forestry sector is not recognized as a contributor to the country's emission reduction targets, it plays a crucial role in implementing adaptation measures
Explain how Party is striving to include all categories of anthropogenic emissions and removals in its NDC, and, once a source, sink or activity is included, continue to include it (para. 3(b) of annex II to decision 4/CMA.1)	Not applicable
Provide an explanation of why any categories of anthropogenic emissions or removals are excluded (para. 12 (c) of decision 4/CMA.1 and para. 4 of annex II to decision 4/CMA.1)	The Philippines prioritizes adaptation as its central strategy for addressing climate change, considering mitigation efforts as complementary benefits. The Philippines plans to implement adaptation measures specifically targeting forestry and coastal and marine ecosystems. Key initiatives will include forest protection, restoration, and reforestation, alongside efforts to secure results-based financing for conservation projects.
Each Party that participates in cooperative approaches that involve the use of ITMOs towards an NDC under Article 4, or authorizes the use of mitigation outcomes for international mitigation purposes other than achievement of its NDC	
Provide information on any methodologies associated with any cooperative approaches that involve the use of ITMOs towards an NDC under Article 4 (para. 75(f) of the MPGs)	Not applicable
Provide information on how each cooperative approach promotes sustainable development, consistent with decisions adopted by the CMA on Article 6 (para. 77(d)(iv) of the MPGs)	Not applicable
Provide information on how each cooperative approach ensures environmental integrity consistent with decisions adopted by the CMA on Article 6 (para. 77(d)(iv) of the MPGs)	Not applicable
Provide information on how each cooperative approach ensures transparency, including in governance, consistent with decisions adopted by the CMA on Article 6 (para. 77(d)(iv) of the MPGs)	Not applicable
Provide information on how each cooperative approach applies robust accounting to ensure, inter alia, the avoidance of double counting, consistent with decisions adopted by the CMA on Article 6 (para. 77(d)(iv) of the MPGs)	Not applicable

Reporting requirement	Description
Any other information consistent with decisions adopted by the CMA on reporting under Article 6 (para. 77(d)(iii) of the MPGs)	Not applicable

Mitigation Policies and Measures, Actions, and Plans including those with Mitigation Co-Benefits resulting from Adaptation and Economic Diversification Plans, related to Implementing and Achieving NDC

Tracking of NDC Progress in the Energy Sector

National Circumstance of Energy Sector

Guided by the Philippine Energy Plan (PEP) 2023–2050, the government seeks to balance the country's energy needs with global climate goals, focusing on inclusive growth, infrastructure modernization, and a shift to clean energy. However, the Philippines face key challenges in energy distribution and rural electrification, with the country's fragmented geography complicating delivery to remote areas and economic growth driving rising energy demand.
The government has outlined key strategies to address these challenges and achieve its energy goals:

1. **Access to Affordable Energy**: Achieving universal electrification is a top priority, with a target of 100 percent household electrification by 2028. Efforts include extending distribution lines, implementing microgrid systems, and leveraging renewable energy solutions under the Microgrid Systems Act of 2022. Furthermore, once the "One Grid Philippines" interconnection project has been completed, it will significantly enhance energy reliability across the nation.
2. **Reliability and Resiliency**: To stabilize the energy supply and transition to cleaner fuels, the Philippines is developing natural gas infrastructure, including liquefied natural gas (LNG) terminals. Complementing this, the Smart and Green Grid Plan integrates renewable energy and bolsters infrastructure against climate impacts.
3. **Clean and Sustainable Energy**: The government has set ambitious renewable energy targets—35 percent of the power generation mix by 2030 and 50 percent by 2040 should be renewables. The plan leverages abundant resources such as wind, solar, hydropower, and geothermal energy while exploring innovative technologies like hydrogen, nuclear energy, and energy storage systems to support the clean energy transition.

4. **Energy Efficiency**: Initiatives under the National Energy Efficiency and Conservation Act promote the adoption of efficient technologies and practices across industries, households, and transportation, ensuring optimal energy use.

The Philippines has made significant strides in advancing energy efficiency, conservation, and renewable energy utilization, which are central to the country's climate mitigation strategy. These efforts contribute to achieving national energy goals and commitments under the Paris Agreement. Key policies and initiatives have supported renewable energy, improved grid emission factors, and reduced greenhouse gas emissions, aligning with national climate goals and driving the transition to a cleaner, more efficient energy sector.

Through the Department of Energy, the country has promoted renewable energy and energy efficiency through the Renewable Energy Act of 2008 (RA 9513) and other programs, which have spurred the growth in capacities and continue to drive future development. namely:

1. Feed-in Tariff (FiT) System provides guaranteed fixed payments per kWh of electricity produced from emerging RE resources, excluding generation for own use, for a period of 20 years.
2. Net-Metering Program allows the end-users to generate electricity from RE-based systems up to 100 kW for their own use and sell their excess to the grid, thereby giving rise to a new type of end-user called "prosumer" (producer and consumer).
3. Renewable Portfolio Standards (RPS) require all mandated participants to source a specified share of their electricity supply from RE.
4. Green Energy Option Program (GEOP) allows end-users to source their power from RE and contract their own RE supply.
5. Green Energy Auction Program (GEAP) promotes the ongoing adoption of RE technologies through a competitive selection process, where developers secure rights to supply specific RE capacities to the electricity market.
6. Renewable Energy Market (REM) serves as the venue for the transparent and fair trading of RE Certificates (RECs), which represent the environmental attributes of electricity generated from RE resources between and among REM participants.
7. Renewable Energy Trust Fund (RETF) is used exclusively to (a) finance the research, development, demonstration, and promotion of the widespread and productive use of RE for power and non-power applications; (b) provide funding to qualified institutions engaged in RE studies, and scholarships and fellowships for energy studies; (c) support the development and operation of new RE resources; and (d) conduct nationwide RE resource and market assessment studies for the power and non-power applications of RE systems; among others.

Apart from the regulatory policies and programs mentioned above, the Renewable Energy (RE) Act provides fiscal and non-fiscal incentives for renewable energy projects, supporting the growth of clean energy sources. Similarly, the Energy Efficiency and Conservation (EEC) Act of 2019 (RA 11285) promotes energy-saving technologies and energy audits and offers incentives for energy-efficient projects, indirectly improving energy use across sectors. The Electric Power Industry Reform Act (EPIRA) of 2001 (RA 9136) has deregulated the energy sector, fostering competition and private sector participation, enhancing energy security, and adopting cleaner technologies.

Programs like the Energy Virtual One-Stop Shop (EVOSS) streamline and/or fast-track the permitting process of energy projects, making it easier to invest in renewable energy and power plant upgrades. Meanwhile, initiatives such as the Philippine Energy Efficiency Project (PEEP) and clean energy financing programs have driven investments in renewable energy and energy efficiency.

On policies like the RE Act, solar, wind, and geothermal energy capacity increased significantly, with solar alone growing from 18 MW in 2010 to over 1,500 MW by 2022.

On the other hand, despite the efforts on the development of renewable energy, the Philippines' reliance on coal has grown from 30 percent to 50 percent of the energy mix between 2010 and 2022, hindering the transition to a low-carbon energy system. Grid infrastructure issues also persist, with the country's power grid struggling to handle intermittent renewable sources like wind and solar. Progress in biofuels and energy storage technologies has been slow, with the Biofuels Act of 2006 facing challenges such as competition with food production and limited domestic capacity.

By 2050, the Philippines aims to achieve energy self-sufficiency of over 50 percent by aggressively expanding renewable energy and diversifying its energy portfolio. Additionally, it seeks to reduce greenhouse gas emissions by 55-66 percent relative to the baseline scenario, meeting the emission reduction targets of the NDC . Furthermore, the plan envisions creating over 1.8 million green jobs through investments in renewable energy, energy efficiency, and emerging technologies.

Energy sector planning in the Philippines is a dynamic, evolving process that balances energy needs with sustainability. Central to this planning is the PEP 2023-2050, which was recently updated reflecting the Department's commitment to its strategic objectives, which include delivering clean and sustainable energy while ensuring energy security.

It includes long-term goals for renewable energy integration, energy efficiency, and reducing GHG emissions, with regular updates to reflect evolving energy demands, technological advancements, and global trends.

Incorporating GHG mitigation into energy planning is aligned with the country's NDC, which focus on reducing emissions from the energy sector. Key initiatives include promoting renewable energy through the RE Act and enhancing energy efficiency through the EEC Act. The Philippines is also exploring carbon pricing mechanisms like carbon taxes or emissions trading systems and supporting carbon offset projects such as reforestation, led by the Department of Finance (DOF) and DENR, respectively.

Technological innovation is central, especially with smart grids and energy storage technologies that improve grid flexibility and support renewable energy integration. Off-grid renewable solutions are being promoted, particularly in rural areas, to reduce carbon footprints and expand energy access. Green financing mechanisms, such as the Renewable Energy Trust Fund, are actively supporting investments in clean energy technologies.

Through a combination of effective policy instruments, the Philippines has made significant advances in promoting renewable energy, improving power plant efficiencies, and integrating

GHG mitigation strategies into its energy planning. To achieve its long-term climate and energy goals, the Philippines must continue to address these challenges, improve infrastructure, and promote further investments in clean energy technologies.

This section presents the energy situation which include the total primary energy supply, the total final energy consumption (by fuel type and by consuming sector) and the total power generation mix. Figure 4 shows the country's primary energy supply from 1990 to 2022. During this period, the country's total primary energy supply (TPES) was dominated by fossil fuels (coal, oil, and natural gas) while in 2022 the contribution of renewable energy (geothermal, hydropower, biomass, solar, wind, and biofuels) was around 33 percent. The country's energy supplies mostly are from domestic resources, except oil product and crude oil that are supplied from import. From 1990 to 2022, the TPES grew at an average rate of 2.76 percent per year from 25.77-million-ton oil equivalent (MTOE) in 1990 to 61.56 MTOE in 2022.
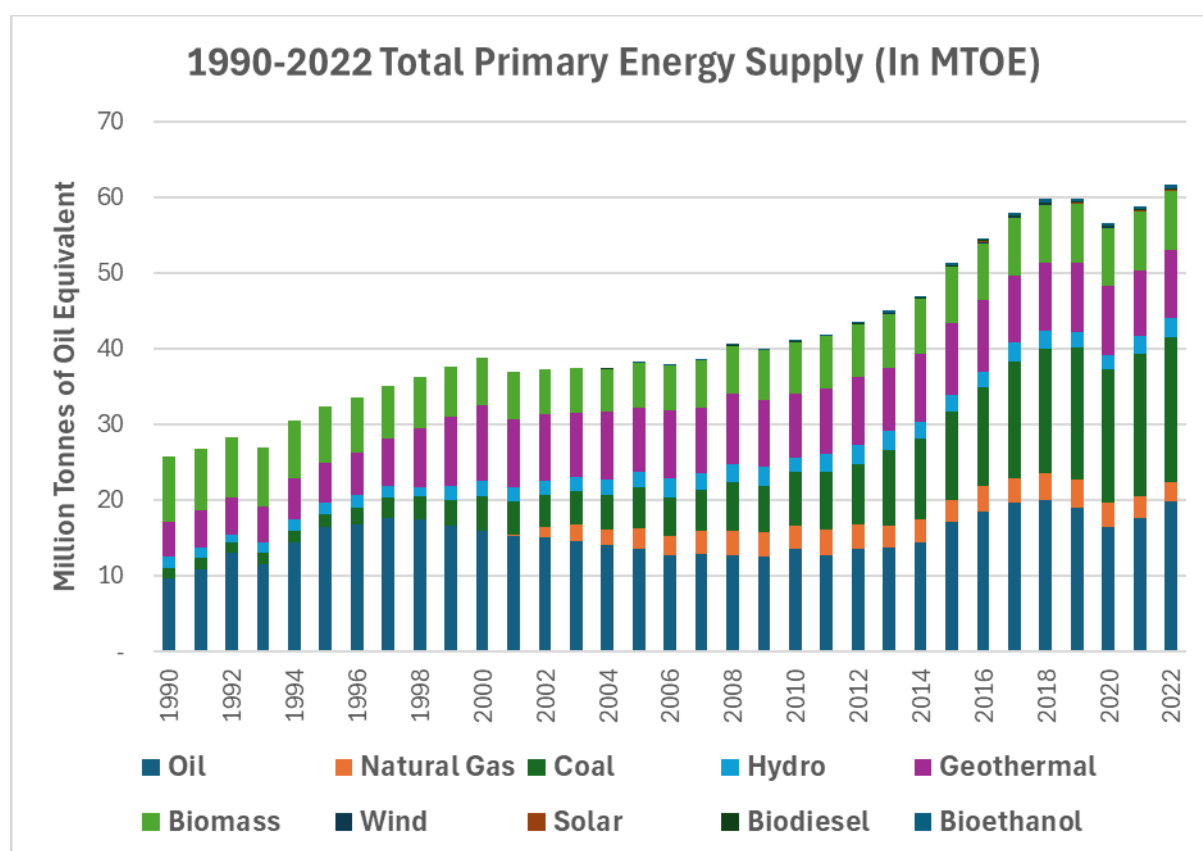
Figure 5: Total Primary Energy Supply in MTOE from 1990 to 2022

Figure 5 below presents the country's total final energy consumption (TFEC) by type of consuming sector from 1990 to 2022.
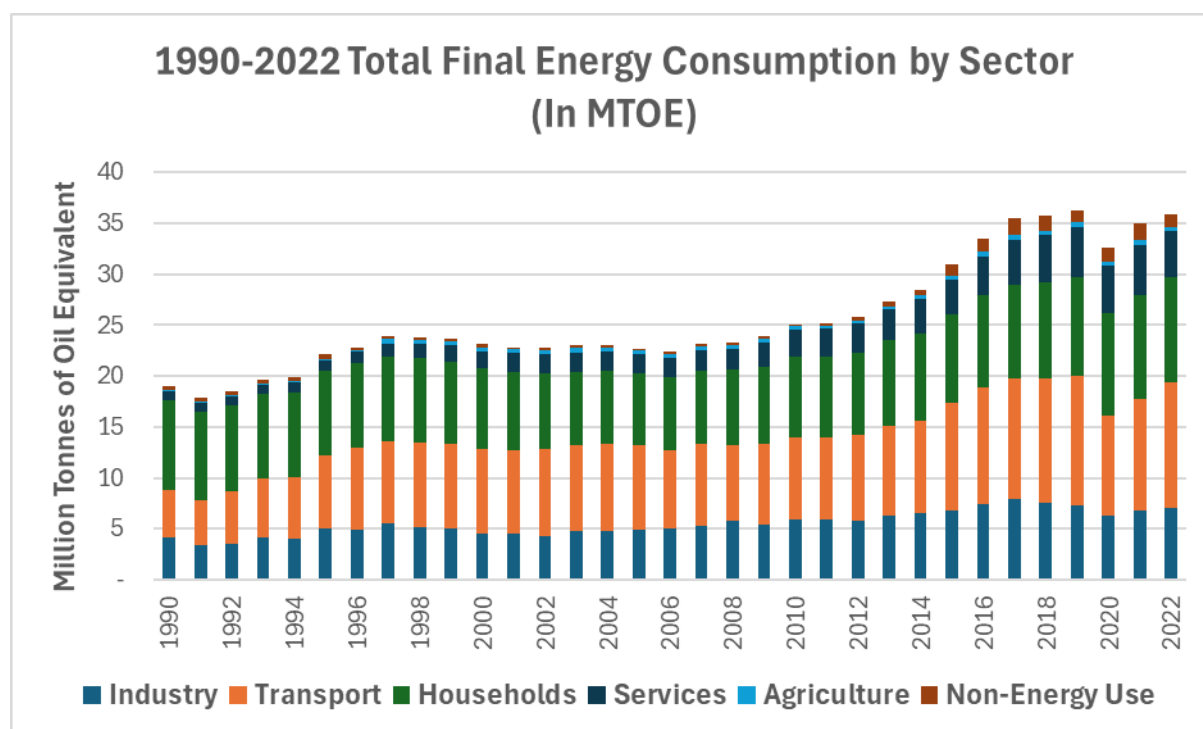
Figure 6: Total Final Energy Consumption by Sector in MTOE from 1990 to 2022

As shown in **Figure 6**, TFEC has six (6) categories according to the type of consuming sector: industry, transportation, households, services, agriculture, and non-energy use. From 1990 to 2022, the country's energy consumption grew from 19.02 MTOE in 1990 to 35.86 MTOE in 2022, or at an average rate of 2 percent per year. In addition, the transport, household, and industrial sectors are the major energy consumers in the country.

In terms of types of fuel, the total final energy consumption is comprised of fossils (oil, coal, natural gas), renewable energy (biomass, biofuel, and biogas), and electricity (generated from both fossil energy and renewable energy). This is shown in the graph below, where oil still dominated energy consumption, particularly in the transport and industrial sectors.
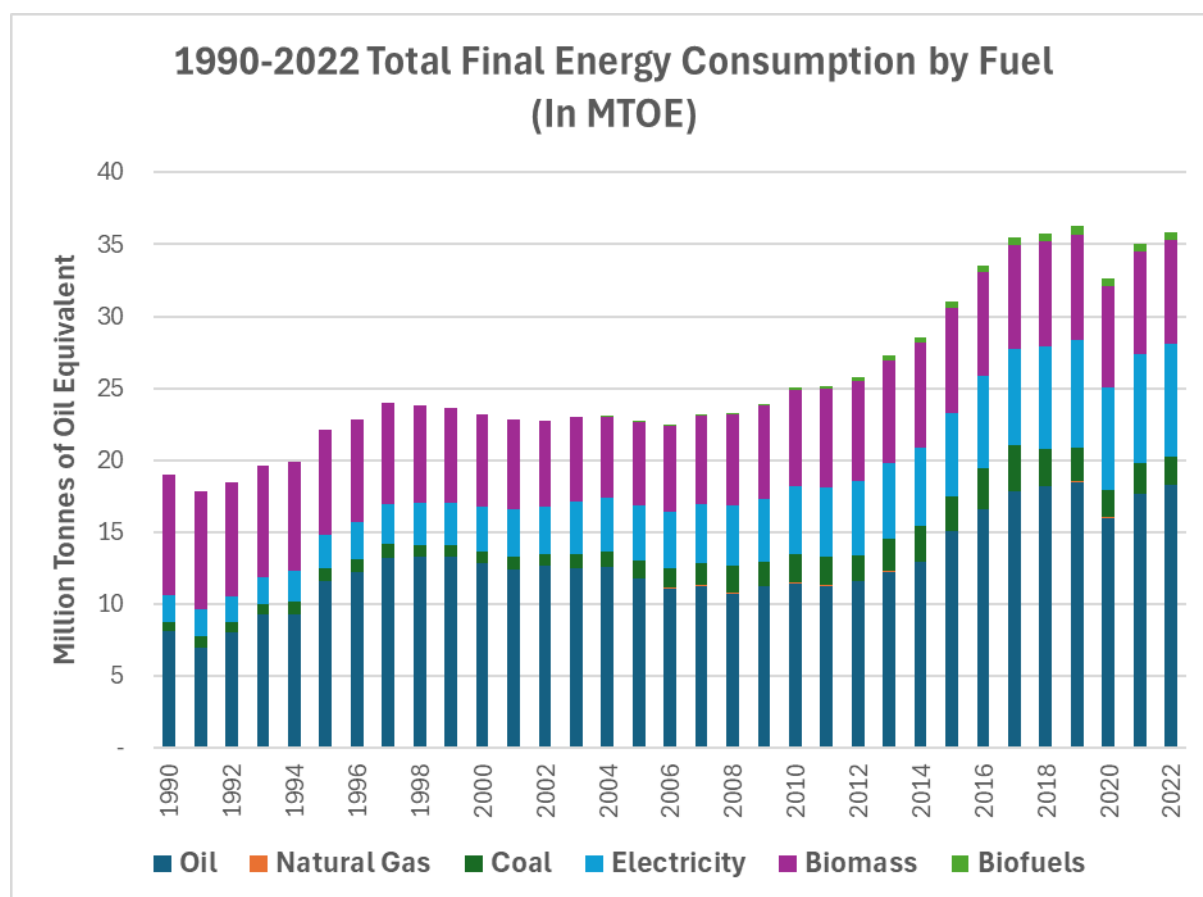
Figure 7: Total Final Energy Consumption by Fuel in MTOE from 1990 to 2022

Electricity is the second most-consumed fuel in 2022, contributing 21.90 percent, while demand levels posted an increase of 4.5 percent to 7.85 MTOE in 2022 from its 1.82 MTOE level in 1990.

Biomass consumption accounted for 20.13 percent (7.22 MTOE), mainly driven by growth in consumption in the food manufacturing industry and service establishments, although these sectors registered minimal growth.

Coal consumption declined by 9.99 percent at 1.95 MTOE (5.43 percent) from the previous year due to reduced usage in the basic metal and chemicals industries, rising coal import prices, and a shift to diesel and electricity as primary fuels for production processes.

Biofuels consumption (biodiesel and bioethanol) grew at 8.70 percent to 0.58 MTOE in 2022 from 0.53 MTOE in 2021, which is mainly attributed to the strict compliance of the blending schedule mandated under the Biofuels Law, coupled with the effective campaign of the government to use cleaner and alternative fuels.
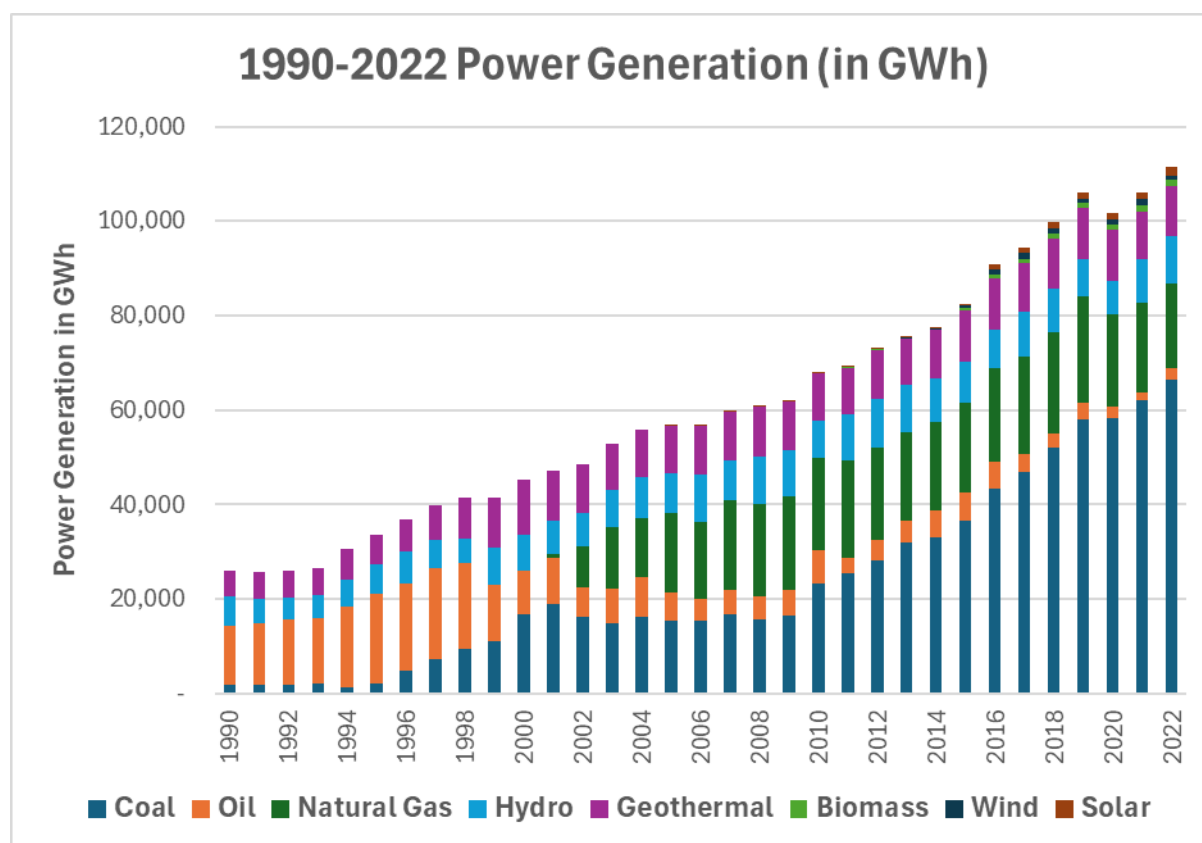
Figure 8: Total Power Generation Mix by Technology Type in GWh from 1990 to 2022

Power generation mainly comes from fossil energy sources, i.e., coal, oil, and natural gas. The above figure shows the 2022 total generation output, which stood at 111,516 GWh, recording a 5.1 percent growth from 2021. Luzon posted the highest electricity consumption at 72.5 percent share or 80,868 GWh while Mindanao, the second highest, accounted for 15,473 GWh or 13.9 percent overall share, and lastly, the Visayas with 15,175 GWh or 13.6 percent share.

Coal-fired power plants supplied the bulk of the total power generation at 59.6 percent (66,400 GWh), followed by natural gas at 16.0 percent (17,900 GWh). Generation output from geothermal and hydro was recorded at 9.3 percent (10,400 GWh) and 9.0 percent (10,100 GWh), respectively. On the other hand, the combined shares of solar, wind, and biomass stood at 3.7 percent (4,200 GWh), while at least 2.3 percent (2,500 GWh) came from oil to complete the country's generation mix for 2022.

The country's total installed capacity increased by 5.1 percent from 26,882 MW in 2021 to 28,258 MW in 2022, while the total dependable capacity decreased by 1.10 percent from 23,855 MW in 2021 to 23,598 MW in 2022. Renewable energy projects, which are mostly solar and biomass, led to the expansion of installed capacity.

Coal-fired power plants contributed 44.0 percent, followed by renewable energy with 29.2 percent share, oil-based power plants with 13.6 percent share, and natural gas with 13.2 percent share. In 2022, a total of 1,376 MW of installed capacity was added to the mainly composed of coal (759 MW), solar (213 MW), biomass (122 MW), and geothermal (24 MW) projects. Off-grid areas added a total of 31 MW installed capacity from diesel power plants.

Table 20: *2022* **Total Installed and Dependable Capacity per Technology, Philippines (in MW)**

Fuel Type	Installed		Dependable	
	2022	**2021**	**2022**	**2021**
Coal	**12,428**	**11,669**	**11,504**	**10,913**
Oil Based	**3,834**	**3,847**	**2,860**	**2,650**
Natural Gas	**3,732***	**3,454**	**2,081****	**3,286**
Renewable Energy (RE)	**8,264**	**7,914**	**7151**	**7005**
Geothermal	1,952	1,928	1,763	1,753
Hydro	3,745	3,752	3,444	3,500
Biomass	611	489	382	291
Solar	1,530	1,317	1,150	1,034
Wind	427	427	412	427
Total	**28,258**	**26,882**	**23,598**	**23,855**
BESS	145	10	145	10

NOTE: Includes Off-Grid generators
*2022 installed capacity of natural gas was adjusted based on the nameplate rating of power plants
** 2022 Dependable Capacity for Natural Gas was reduced due to the end of the cooperation period of 1,200 MW Ilajan NGPP in June 2022.

Table 21: Committed and Indicative Capacities, Philippines, as of 31 December 2022 (in MW)

Fuel Type	Installed			Dependable		
	No. of Proponents	**Capacity (MW)**	**% Share**	**No. of Proponents**	**Capacity (MW)**	**% Share**
Coal	**6**	**3,685**	**36.0**	**3**	**1520**	**2.8**
Oil Based	**3**	**42**	**0.4**	**5**	**335**	**0.6**
Natural Gas	**3**	**3,500**	**34,3**	**8**	**9,090**	**16.6**
Renewable Energy (RE)	**53**	**2,983**	**29.2**	**165**	**43,910**	**80.0**
Geothermal	3	74	0.7	4	316	0.6
Hydro	24	270	2.6	52	7,959	14.5
Biomass	7	49	0.5	4	79	0.1
Solar	15	2,317	22.7	71	13,391	24.4
Wind	4	273	2.7	34	22,164	40.4
Total	**65**	**10,210**	**100.00**	**165**	**54,855**	**100.0**
BESS	5	2,080		12	1,781	

As shown in **Table 21**, the total capacity for committed power projects reached 10,210 MW by the end of 2022. About 70.7 percent of the projects will be supplied by coal and natural gas, which will serve as the system's baseload capacity. The remaining 29.6 percent is from renewable energy and oil-based power projects. Meanwhile, indicative power projects stood at 54,855 MW by the end of 2022, the majority of which will come from renewable energy (80 percent), natural gas (16.6 percent), coal (2.8 percent), and oil-based power projects (0.60 percent). In addition, the committed Energy Storage System (ESS) reached 2,080 MW for committed capacity, and 1,781 MW will come from indicative power projects.

National Circumstance of Energy Sector Concerning Energy Efficiency and Conservation

The Philippines, recognizing the pivotal role of energy efficiency and conservation (EEC) in achieving sustainable development, has implemented RA No. 11285 known as the Energy Efficiency and Conservation Act. This foundational policy institutionalizes the efficient use of energy to reduce dependence on imported fuels, decarbonize the energy system, and address inflationary pressures. Despite challenges, the DOE has undertaken significant measures to promote EEC across various sectors, ensuring its alignment with economic, environmental, and social objectives.

RA 11285 provides a robust policy framework for integrating EEC at national and local levels. This collaborative approach includes partnerships with local government units (LGUs) and the private sector. The DOE's initiatives under this act aim to enhance energy security, reduce GHG emissions, and stimulate investments in sustainable energy solutions.

The National Energy Efficiency and Conservation Plan (NEECP) serves as a comprehensive framework for fostering an energy-efficient culture. Short-term goals include capacity building, robust policy guidelines, and financing mechanisms for EEC projects. Medium-term strategies focus on electric vehicle (EV) infrastructure, expanded energy standards, and government project implementation. Long-term aspirations involve institutionalizing Research and Development (R&D), creating a harmonized information database, and establishing a best-practice institute.

The Philippines demonstrates a steadfast commitment to energy efficiency and conservation as a cornerstone of its sustainable development strategy. By institutionalizing EEC practices, fostering public-private partnerships, and mobilizing significant investments, the country is advancing toward a resilient, energy-secure, and environmentally sustainable future.

Nationally Determined Contribution and Achievement Report on Energy Efficiency and Conservation

The energy sector's policies and measures (PAMs) aim to comprehensively address emissions reduction across various sub-sectors, targeting a cumulative reduction of 587 million metric tons of CO_2 equivalent (mmtCO$_2$e) by 2030. Central to these efforts is the energy efficiency and conservation programs—the only unconditional PAM within the sector—which will contribute a reduction of 3.4 mmtCO$_2$e, setting a strong foundation for emissions mitigation.

These sector-specific efforts complement cross-sectoral initiatives, notably transport electrification, which leverage clean energy to advance broader NDC targets. By utilizing sustainable energy sources, these measures enhance the overall effectiveness of emissions reduction strategies, ensuring alignment with the sector's goals. The energy efficiency program, in particular, establishes a benchmark of achieving 5 percent energy savings by 2030, with an estimated reduction of 11.57 mmtCO$_2$e. Promoting efficiency across all sectors, this initiative plays a critical role in reducing energy demand and fostering sustainable energy use.

However, challenges such as emissions growth in secondary sub-sectors persist. Effective policy execution and grid management are essential to address these. The DOE focuses on overcoming these barriers, enhancing policy implementation, and driving sustainable development through strategic collaborations, supporting national and global climate goals.

The EEC Act institutionalized energy efficiency and conservation, enhanced energy use efficiency, and introduced incentives for EEC projects and programs. The DOE leads its implementation, supported by various national government agencies and guided by the law's Implementing Rules and Regulations (IRR).

The implementation of the EEC Act has yielded significant progress in energy efficiency across government and private sectors. Through robust policies, collaborative efforts, and innovative programs, the Philippines is advancing toward a more sustainable energy future, reducing consumption and mitigating environmental impact. Continued engagement and compliance will be critical in achieving the EEC Act's long-term goals.

**Mitigation Measures in the Energy Sector**

The energy sector monitors avoided greenhouse gas (GHG) emissions by assessing the electricity generated from the country's renewable energy (RE) sources. This is calculated using the equivalent amount of fuel required to generate the same electricity, multiplied by coal emission factors for carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). The CH_4 and N_2O emissions are further adjusted using their respective global warming potentials (GWPs) to calculate their CO_2 equivalent, which is then added to the CO_2 emissions. ***Table 22*** provides the actual and projected GHG avoidance from RE generation based on the 2018–2040 NDC projections for the transformation, industry, and other sectors.

Table 22: Energy Sector NDC Assessment of GHG Emissions vis-à-vis' NDC projected Emissions (MTCO$_2$-e)

		Actual*			Projected								Total
		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2020 - 2030
A.	NDC BAU Projected	109.89	116.60	125.48	134.39	143.41	151.50	159.37	167.36	175.46	183.79	192.26	1,659.52
B.	2023-2050 PEP Scenarios												
	REF	99.86	98.97	100.26	99.79	101.51	104.80	108.62	113.61	118.91	121.06	123.26	**1,190.66**
	CES1	99.86	98.97	100.26	99.63	100.12	97.95	96.88	99.16	98.10	106.56	107.77	**1,105.26**
	CES2	99.86	98.97	100.26	99.63	100.12	98.19	94.48	96.84	96.04	99.72	95.27	**1,079.41**
C.	NDC Assessment (Reduction from BAU)												
	REF	10.03	17.63	25.22	34.61	41.90	46.70	50.75	53.75	56.55	62.73	69.00	**468.86**
	CES1	10.03	17.63	25.22	34.76	43.29	53.55	62.50	68.20	77.36	77.23	84.49	**554.26**
	CES2	10.03	17.63	25.22	34.76	43.29	53.30	64.89	70.52	79.42	84.07	96.98	**580.12**
D.	RPS Contribution to Unconditional / RE GHG Avoidance												
	REF	47.46	47.30	49.46	56.00	54.98	57.60	58.70	64.15	67.91	70.03	74.31	**647.90**
	CES1	47.46	47.30	49.46	56.06	59.43	62.62	68.64	71.44	77.90	79.08	84.41	**703.79**
	CES2	47.46	47.30	49.46	56.06	59.43	63.17	70.02	72.86	79.23	82.02	89.03	**716.05**
E.	Total GHG Reduction and Avoidance												
	REF	57.49	64.93	74.68	90.61	96.88	104.30	109.46	117.90	124.46	132.76	143.31	**1,116.76**
	CES1	57.49	64.93	74.68	90.82	102.72	116.17	131.14	139.64	155.25	156.31	168.90	**1,258.05**
	CES2	57.49	64.93	74.68	90.82	102.72	116.48	134.91	143.38	158.65	166.10	186.01	**1,296.16**
E.	NDC BAU less Total GHG Reduction and Avoidance												
	REF	52.40	51.67	50.80	43.79	46.54	47.20	49.92	49.46	51.00	51.03	48.95	**542.76**
	CES1	52.40	51.67	50.80	43.57	40.69	35.33	28.24	27.72	20.21	27.48	23.36	**401.47**
	CES2	52.40	51.67	50.80	43.57	40.69	35.02	24.46	23.99	16.81	17.69	6.24	**363.36**

The DOE underscores the importance of basing energy sector commitments on rigorous technical assessments and evidence. The sector's GHG emission commitments include both conditional and unconditional targets, with the latter reflecting the implementation of government energy efficiency measures.

By accounting for both GHG reductions and avoided emissions, the energy sector contributes significantly to climate change mitigation and adaptation. GHG reductions are quantified based on decreased fossil fuel consumption or replacing a high-emitting fossil fuel with a lower-emitting alternative across the transformation, industry, and other sectors.
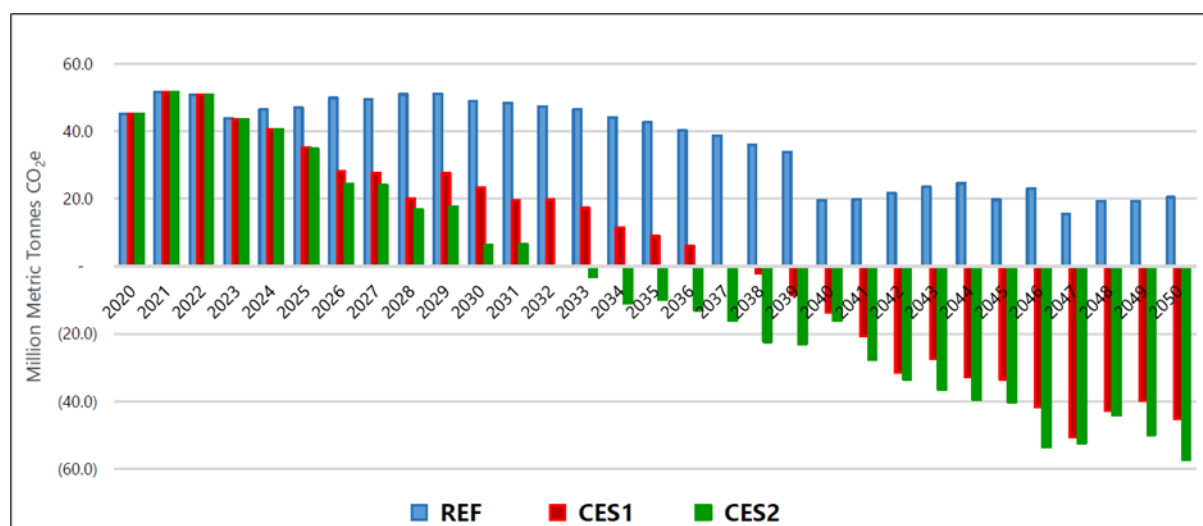
Figure 9: Contribution of GHG Reduction and Avoidance per Scenario to Attain the NDC Targets

Figure *9* illustrates the impact of combined GHG reductions and avoided emissions on the NDC Business-As-Usual (BAU) emissions trajectory. The combined efforts indicate that the energy sector is projected to offset its own emissions as early as 2033 under CES 2 and by 2037 under CES 1. While the REF scenario does not fully achieve this result, it is projected to reduce energy emissions by more than half.

The Philippines' energy sector has implemented a range of mitigation measures targeting GHG emissions reductions while balancing economic growth, energy security, and environmental stewardship. At the forefront of these efforts is the Energy Efficiency and Conservation Program, seeking to achieve 5 percent energy savings by 2030 and 10 percent savings in liquid fuels and electricity by 2040 across critical sectors, including transport, industry, and agriculture. Since its launch in 2019, the program has achieved significant results, with GHG avoidance reaching 9.75 million metric tons of CO_2 equivalent (mmtCO_2e) in 2021 and 11.26 mmtCO_2e in 2022. These outcomes highlight the program's potential as a scalable solution for addressing climate goals, however, achieving the ambitious 5 percent energy savings target by 2030 will require stronger cross-sectoral collaboration, innovative financing, and improved monitoring. Beyond emissions reductions, this initiative enhances energy security, reduces operational costs, and bolsters the nation's competitiveness in the global market.

Complementing this effort is the GEMP, launched in 2023 to reduce the energy footprint of public-sector operations. This program has set a goal of 5 percent energy savings by 2030 and 10 percent savings in oil products and electricity by 2040. By focusing on fuel and electricity savings, GEMP positions the government as a role model in sustainable energy use. While in the early stages, its impact extends beyond emissions reductions, demonstrating the feasibility of sustainability targets in public operations and setting a precedent for private-sector involvement.

Empowering consumers to make informed decisions is the cornerstone of the PELP, introduced in 2020. By requiring energy labels on appliances and equipment, this initiative fosters market demand for energy-efficient products and creates a framework for consumer awareness. PELP has the potential to drive innovation among manufacturers, align local standards with international benchmarks, and cultivate a culture of sustainability at the household level.

A critical legislative pillar of these efforts is the EEC Act, implemented in 2019. This law mandates energy efficiency measures among designated establishments in the commercial, industrial, and transport sectors. By targeting these entities, the program aims to achieve 5 percent energy savings by 2030 and 10 percent savings by 2040. While GHG reductions are still being quantified, the Act has already driven significant energy-saving projects by shifting from voluntary to mandatory compliance to level the playing field, encouraging widespread adoption of energy efficiency practices.

Key themes across these initiatives include the critical role of regulatory frameworks in advancing climate action, emphasizing the importance of climate governance. The inclusivity of these programs—spanning diverse sectors—ensures comprehensive coverage while minimizing emissions leakage to unregulated domains. However, gaps remain in the quantification of GHG reductions, underscoring the need for improved data collection and reporting mechanisms. In addition to addressing climate goals, these programs contribute to energy security, economic resilience, and public awareness, positioning the energy sector as a key driver of sustainable development.

The energy sector's mitigation measures represent a bold step toward achieving the country's climate commitments. To build on this progress, it will be essential to strengthen monitoring and reporting mechanisms, foster public-private partnerships to mobilize resources and technologies, and engage stakeholders to ensure equitable participation. Through sustained effort and adaptive strategies, these initiatives can serve as a blueprint for other sectors, reinforcing the nation's climate leadership.

The Philippines' energy efficiency and conservation programs have demonstrated impressive progress in reducing energy consumption and associated GHG emissions. By focusing on energy savings in government, industry, and the private sector, these initiatives contribute significantly to the country's climate mitigation strategy. As the Philippines moves towards its 2030 and 2040 energy targets, continued investment, innovation, and improved tracking of GHG reductions will be essential to ensure that these programs play a central role in meeting the nation's climate goals and fulfilling its international commitments.

Tracking of NDC Progress in the Transport Sector

National Circumstance of Transport Sector

Transportation is the "backbone" of the economy as it delivers passengers and goods. It is crucial for daily passengers to go to school, work, businesses, and leisure, among others. The logistics of transporting goods for the welfare of the whole community adds more impact to the transport industry. There is an increase in demand for fuel consumption in parallel to the economic activity of the people.

In addition, there are hindrances to vehicle efficiency in the country, considering that jeepneys, the so-called "king of the road," are in the modernization stage. The government is working to have Euro 4 or higher emission vehicle standards and hybrid or electric vehicles for said modernization.

Further, the Philippines has been integrating the GHG mitigation opportunities into transport NDC, including considering public transport improvements to lessen the use of private vehicles, reducing road congestion, and promoting efficient land use and sustainable development.

The transport NDC PAMS is anchored on the Philippine Development Plan (PDP) and the Sustainable Development Goals (SDGs), specifically targeting Goal 11.2, which aims to build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation. The transport NDC PAMS focused on the following: 1) Fuel Efficiency and Improvement Standards, 2) Rail projects, 3) Bus Rapid Transit (BRT) projects, and 4) other projects such as aviation, maritime, and road projects.

For fuel efficiency and improvement standards, there are two (2) projects, the Public Utility Vehicle Modernization Program (PUVMP) - Phase 1 and the Motor Vehicle Inspection System (MVIS)-Phase 1. The target project output of the PUVMP-Phase 1 is to replace all Jeepneys (Diesel PUV) that are at least 15 years old or older with vehicles that are at least Euro-4 compliant and higher, and Fuel economy will improve by 35.71 percent (from typical km/L for Euro0 to 9.5 km/L for Euro4). The continued implementation of the PUVMP – Phase 1 is now called the Public Transportation Modernization Program (PTMP) through DOTr Department Order No. 2023-022 dated 29 December 2023.

In addition, the target output of the MVIS -Phase 1 is 25 percent of passenger cars/ sports utility vehicles, which will improve fuel economy by 2 percent, and 100 percent of utility vehicles (UV) will improve by 5 percent. The PUVMP and MVIS have a cumulative GHG emission mitigation potential (2020-2030) of 3,238.53 Gg CO_2e and 5,081.08 Gg CO_2e, respectively.

The unconditional Rail projects are the Mass Rail Transit (MRT) 3 rehabilitation project, MRT Line 4, and the Cebu Mono-rail project (8,157.56 Gg CO_2e). Moreover, the Cebu Bus Rapid Transit (CBRT) will have a mitigation potential of 768.26 Gg CO_2e. The other projects include vessel modernization, night rating of airports, greenways projects and active transport infrastructures.

At present, there are BRT projects nationwide that will be subject for a Feasibility Study to determine the viability in a particular region which will contribute to lessen the GHG emissions. Railway projects that the DOTr is pursuing are as follows:

- **PNR South Long-Haul Project**

The PNR South Long Haul (SLH) Project is a 560-kilometer standard-gauge railway project with 33 stations that will run from Manila to Albay. The priority section (San Pablo, Laguna to Pagbilao, Quezon), a 52-kilometer railway alignment, is the starter of the construction for the SLH. The priority section has four (4) stations located in San Pablo, Candelaria, Lucena, and Pagbilao and a heavy maintenance depot located along this section. Through the project, the travel time from Manila to Daraga, Albay will be reduced from a range of 10 to 12 hours to 4 to 6 hours.

- **Metro Manila Subway Project**

This 33-kilometer underground railway line shall traverse key financial centers across Metro Manila as well as the country's main international airport. Funded under Japanese ODA, the project will benefit more than 500,000 passengers daily in its opening year.

- **MRT Line 7 Project**

This 24 km-long rail transit system aims to connect dense areas of northeast Metro Manila, consisting of 14 Stations connecting North Avenue, Quezon City to San Jose Del Monte, Bulacan. It shall reduce the travel time from North Ave., Quezon City, to SJDM, Bulacan, from 2-3 hours to 35 minutes and can accommodate 300,000 passengers per day.

- **Mindanao Railway Project**

This Project is an inter-city rail system in the southernmost major island of the Philippines, Mindanao, which covers a distance of 100.2 kilometers and consists of 8 stations connecting Tagum City in Davao del Norte, Davao City, and Digos in Davao Del Sur, Mindanao. It shall reduce the travel time from 3 hrs. to 1 hr. and can accommodate 122,000 passengers per day.

Tracking of NDC Progress in the Industrial Processes and Product Use (IPPU) Sector

The IPPU sector in the Philippines is key to GHG reduction strategies, with industries like cement production and alternatives to ozone-depleting substances. The NDCIP sets a target for an unconditional reduction of 10 mmtCO$_2$e by 2030, with an overall anticipated impact of 59.2 mmtCO$_2$e from implemented PAMs across several subsectors.

To enhance progress, high-impact interventions like clinker substitution in cement manufacturing, low-carbon waste heat recovery, and the shift to low GWP refrigerants have gained traction among major cement producers. Additionally, the transfer of low-carbon waste heat recovery technology and the shift to low GWP refrigerants—supported by incentive systems—are crucial for meeting NDC targets and ensuring domestic accessibility.

While the IPPU sector is expected to function below the projected emissions level of 38.1 mmtCO$_2$e for 2030 due to ongoing efforts by leading cement manufacturers, cumulative emission reductions are estimated to reach around 48 mmtCO$_2$e from 2020 to 2030. To

facilitate this progress, a Regional Data Collection Matrix has been developed to assist in gathering greenhouse gas inventory data necessary for estimating sector emissions. Collaboration among various government agencies, including the DENR and the Department of Public Works and Highways (DPWH), is crucial for promoting low-carbon products effectively.

Capacity-building programs will concentrate on improving measurement, reporting, and verification (MRV) systems to assist DENR track private sector data. Green procurement in government projects is also essential, as the public sector represents a significant portion of cement demand in the Philippines. However, the success of emissions reduction efforts largely depends on decarbonization commitments by leading cement manufacturers. Ongoing monitoring will be necessary to ensure that mitigation actions are implemented consistently throughout the IPPU sector.

Table 23: Summary of implemented PAMs under the IPPU Sector

Mitigation Action	Objective	Type of Instrument	Status
Substitution of clinker in cement production with supplementary cementitious materials (SCMs) such as fly ash, blast-furnace slag, and other pozzolanic materials	Increase the production share of blended cement by 5 percent from the baseline of 65 percent from 2020 to 2025 and additional 10 percent increase by 2026. And 10 percent reduction on the clinker content of blended cement in 2026 from the baseline of 70 percent.	Voluntary	Implemented
Increase use of cullet in glass production	Increase cullet ratio of float/flat glass to 40 percent from baseline of 25 percent by 2020 and increase cullet ratio for container glass to 75 percent from average cullet ratio of 65 percent.	Economic	Implemented
Shift to low-GWP refrigerants in the RAC industry	Phase in of low-GWP Refrigerants in the refrigeration and air conditioning equipment from 2020-2030	Regulatory	Implemented
Installation of Waste Heat Recovery (WHR) Facility in cement plants			Implemented
Alternative fuel and raw materials (i.e., waste and biomass) in cement co- processing		Voluntary	Implemented
Reduction of emissions from iron and steel industry	Introduction of energy efficient/ energy savings technology, process improvement in the iron and steel industry.	Voluntary	Implemented

*Refer to CTF Table 5 for the complete list of PAMs under the IPPU Sector

Tracking of NDC Progress in the Waste Sector

The waste sector in the Philippines plays a crucial role in the country's efforts to mitigate greenhouse gas emissions, with a focus on both solid waste and wastewater management. The NDCIP aims to substantially reduce 15 million metric tons of carbon dioxide equivalent (mmtCO₂e) by 2030, supported by targeted interventions and partnerships across various sectors. Key strategies include enhancing methane capture at landfills and expanding sewage treatment facilities, which are expected to collectively yield a significant reduction in emissions.

This strategy emphasizes PAMs for solid waste and wastewater management. Essential actions include capturing and utilizing methane from sanitary landfills, composting organic wastes, and enhancing septage and sewage treatment facilities in urban areas. The expected outcome of these measures is a remarkable reduction of 65.8 mmtCO₂e by 2030, underscoring the vital role of national government support alongside private sector involvement and aligning policies and actions of local government units in their respective local plans.

Despite having a solid legal framework established by laws like the Ecological Solid Waste Management Act and the Clean Water Act, emissions from the waste sector continue to rise. To address this issue, the plan emphasizes improving MRV systems, and ensuring collaboration among national government bodies, regional offices, LGUs, and private sector partners for efficient data collection and treatment methods. Additionally, capacity-building efforts will aim to enhance data collection, aggregation, and analysis capabilities of climate change focal persons while promoting cooperation across regional offices for timely interventions and data compilation of waste management practices.

Table 24: Summary of implemented PAMs under the Waste Sector

Mitigation Action	Objective	Type of Instrument	Status
Composting of Organic Wastes	By 2030, increased composting rate to 24.3 percent with 3 new large composting facilities to accommodate 1,000 ton/day biodegradable	Regulatory	Implemented
Methane Flaring in Disposal Facilities	By 2030, 30 percent of methane from 86 SLF with capacity under Category 4 will be recovered for flaring.	Voluntary	Implemented
Methane Recovery from Sanitary Landfills for Electricity	By 2030 56 percent of SLF with capacity in Category 4 with methane recovery technology: equivalent to 164,443,339 m3 methane recovery.	Voluntary	Implemented

Mitigation Action	Objective	Type of Instrument	Status
MSW Digestion of Organic Waste with Methane Capture	31 WtE (i.e bio digesters) facilities phased in until 2025 to accommodate 1,000 tons/day biodegradable wastes	Regulatory	Implemented

*Refer to CTF Table 5 for the complete list of PAMs under the Waste Sector

NDC Gender Action Plan 2024-2030[24]

Climate change exacerbates existing gender inequalities, reducing the resilience and adaptive capacity of women, families, and communities, while hindering mitigation and adaptation efforts. Climate-related disasters heighten these disparities, intersecting with other forms of discrimination based on age, ethnicity, disability, religion, sexual orientation, and geography. Women face heightened mortality rates in climate disasters, increased risk of gender-based violence, increased poverty, and amplified unpaid domestic and care burdens.[25] This is due to discriminatory social norms, lack of legal entitlements, unequal access to resources, and limited representation in decision-making. These factors collectively impede women's full participation in addressing climate change challenges.

In 2024, with support from the Asian Development Bank (ADB), the CCC began updating the plan, incorporating new developments and aligning with the UNFCCC and its enhanced Lima Work Program on Gender and its Gender Action Plan 2019. This updated Philippines NDC Gender Action Plan (GAP) 2024–2030, hereinafter referred to as NDC GAP, zeroes in on mainstreaming gender in critical sectors, including agriculture, waste, IPPU, transport, and energy. The proposed gender actions and recommendations were validated through two consultation workshops by the DA, DENR, DOTr, and DOE, and the Philippines Commission on Women (PCW) in April 2024, and are adopted in this updated plan.

The NDC GAP aims to provide strategic actions to ensure gender-responsive PAMs under the NDCIP, focusing on emissions reduction in agriculture, waste, industry, transport, and energy sectors. These PAMs are to be implemented under the supervision of four sector departments: the DA, the DOE, DENR, and the DOTr.

---

[24] Climate Change Commission. Republic of the Philippines NDC Gender Action Plan 2024-2030. 2024. https://climate.gov.ph/files/Final%20NDC%20GAP%202024-2030.pdf
[25] I. Abarquez and N. Parreno. Gender and Climate Change. https://acrobat.adobe.com/id/urn:aaid:sc:AP:237ef765 1ebe-46e9-9849-1dd5fe4f1c66.

CHAPTER 4: INFORMATION RELATED TO CLIMATE CHANGE IMPACTS AND ADAPTATION

Institutional Arrangements and Legal Frameworks

This section will present the Institutional Arrangement and Governance, which describes the roles and responsibilities of relevant government and non-government institutions relative to climate change adaptation in the Philippines. It will also cover the legal framework and regulations on adaptation-related policies and plans. Chapter 1 highlights the discussion on national Circumstances.

Institutional Arrangements and Governance

The Philippines recognizes that a whole-of-nation and whole-of-society approach is necessary to ensure the successful implementation of science-based, evidence-based climate change adaptation measures on the ground. The CCC was established pursuant to Republic Act No. 9729 (RA No. 9729), otherwise known as the Climate Change Act, as the lead policy-making body tasked with coordinating, monitoring, and evaluating government programs and actions on climate change, integrating adaptation and mitigation into national and local development plans.

The President of the Philippines heads the CCC as Chairperson and appoints three (3) Commissioners, one of whom serves as the Vice Chairperson and Executive Director. In 2012, the Climate Change Act was amended by virtue of Republic Act No. 10174 (RA 10174), which established the People Survival Fund (PSF), a special domestic funding mechanism for financing climate adaptation programs aligned with the national strategic framework, with the PSF Board[26] tasked to oversee the strategic direction in the management and use of the fund. The subsection on Legal and Policy Frameworks and Regulations will further discuss the Climate Change Act.

The law stipulates the specific roles of relevant sectors to ensure a collaborative approach to addressing climate change.[27]

- National government agencies (NGAs) are tasked with developing and integrating climate considerations into policies, projects, programs, and activities. NGAs shall assist LGUs, either technical or financial, in developing their local climate action plan. The specific roles and responsibilities of select government entities stipulated in the Climate Change Act are listed in **Table 25Table *25***.
- LGUs, composed of cities and municipalities, are recognized as front-line agencies. They are tasked to formulate, plan, and implement climate actions in their localities based on their risks and vulnerabilities, consistent with the Local Government Code, the National Framework Strategy, and the NCCAP.

---

[26] The PSF Board is composed of the Heads of Agencies for the Department of Finance (DOF), Department of Budget and Management (DBM), National Economic and Development Authority (NEDA), Department of the Interior and Local Government (DILG), Philippine Commission on Women (PCW) and the Vice Chairperson of the CCC. A representative from the academe and scientific community, business sector; and Non-Government Organizations (NGOs) are also selected to be part of the board. The DOF serves as PSF chair and secretariat.

[27] This list was further expanded in the National Adaptation Plan (NAP) of the Philippines 2023-2050.

- Provincial governments shall extend technical assistance, ensure enforcement, and manage information to support LGUs.
- A National Panel of Technical Experts (NPTE) is constituted to provide scientific and technical matters related to climate change. Members of the NPTE are experts in different fields related to climate change[28], including disaster risk reduction and management (DRRM).
- Other relevant stakeholders, including but not limited to non-government organizations, private sectors, civil society organizations, academe, and people's organizations, shall be consulted in developing the climate change plans.

During the development of the Philippine NAP, a National Steering Committee (NSC) was established to provide guidance and strategic direction in NAP implementation, including risk assessments, planning, implementation, monitoring, and evaluation. Following its adoption in 2024, the Philippines shall establish the NAP-NSC's institutional governance structure to define roles, enhance coordination of adaptation measures, and align efforts with national and international goals.

---

[28] Areas of Climate Science/Meteorology, Earth Science/Oceanography, Natural Science, Environment/Ecology/Biodiversity, Energy/Renewable Energy, Economics, Social Science, Health, Law and Policies, Disaster Risk Reduction and Management, Development Planning, Sustainable Development, and other relevant or appropriate fields

Table 25: Roles and Responsibilities of Select Government Entities in the Climate Change Agenda

Relevant government entities	Roles & Responsibilities Overview
Government Agencies	
Climate Change Commission (CCC)	Lead policy-making body of the government tasked to coordinate, monitor, and evaluate programs and action plans of the government to ensure the mainstreaming of climate change into the government plans and programs
Department of Environment and Natural Resources (DENR)	Oversees the establishment and maintenance of a climate change information management system and network, including climate change risks, activities, and investments, in collaboration with other relevant government agencies, institutions, and LGUs
Department of Science and Technology (DOST)	Through PAGASA is tasked to promote, assist, and, where appropriate, undertake scientific and technological research and development, projections, and analysis of future climate scenarios, including activities relative to observation, collection, assessment, and processing of climate-related data such as but not limited to, precipitation, sea-level rise, extreme climate events, rise in temperatures, and records of severe droughts monitored over long periods, in coordination with LGUs in priority/target monitoring sites, for the benefit of agriculture, natural resources, commerce, and industry and in other areas identified to be vital to the country's development.
National Economic and Development Authority (NEDA)	Independent socio-economic planning body responsible for coordinating the national and sub-national development activities, conducting critical analyses of development issues, and offering policy alternatives to decision-makers
Department of Interior and Local Government (DILG)	Facilitates capacity-building programs for LGUs in climate change, including technology provision, in collaboration with the Local Government Academy and NEDA
Department of Budget and Management (DBM)	Undertakes the formulation of the annual national budget that ensures the appropriate prioritization and allocation of funds to support climate change programs and projects in the annual government program.
Department of Finance (DOF)	Coordinates with the Commission on fiscal policies related to climate change matters and monitors and reports measures, including climate finance.
Department of Foreign Affairs (DFA)	Review international agreements related to climate change and make the necessary recommendations for ratification and compliance by the government on matters pertaining thereto
Department of Public Works and Highways (DPWH)	Responsible for planning, designing, constructing, and maintaining national highways, major flood control systems, and other public works.
Philippine Information Agency (PIA)	Disseminates information on climate change, local vulnerabilities and risks, relevant laws and protocols, and adaptation & mitigation measures
Department of Education (DepEd)	Responsible for integrating climate change into the primary and secondary education curricula, subjects, and education materials, including textbooks and primers.
Department of Health (DOH)	Responsible for ensuring all Filipinos' access to essential public health services through providing quality health care and regulating providers of health goods and services.
Inter-agency Committees and Working Groups	
Climate Change Advisory Board (CCAB)	Inter-agency body composed of secretaries from different departments and representatives from selected sectors (e.g., academe, business, NGOs) and is tasked to assist CCC in the formulation of climate adaptation and mitigation policies and give advice on matters related to the mandate of the agencies/offices

Relevant government entities	Roles & Responsibilities Overview
People's Survival Fund Board	The inter-agency body is tasked to guide the management of PSF, including identifying additional funding sources, granting final approval for climate change adaptation proposals, and awarding these grants to qualifying LGUs.
Inter-agency Task Force for Sustainable Finance or the PH Green Force	Tasked to harmonize all government policies concerning green and sustainable projects, establish a cohesive action plan to institutionalize the role of sustainable finance, and develop a pipeline for sustainable investments
National Disaster Risk Reduction & Management Council (NDRRMC)	An inter-agency tasked with responding to natural calamities, with one of its functions being the development of assessment tools for existing and potential hazards and risks arising from climate change in vulnerable areas and ecosystems, in coordination with CCC.
House of Representatives committee on climate change	The lower house of Congress handles policies and programs mitigating the impact of climate change on the environment
Senate committee on environment, natural resources, and climate change	The national legislative branch / upper house of Congress handles policy matters on the environment, natural resources, and climate change

Source: Philippine National Adaptation Plan 2023 - 2050

Legal and Policy Frameworks and Regulations

Recognizing the country's vulnerability to climate change, the Philippines has enacted policies aimed at promoting environmental protection and conservation, promoting sustainable development and mainstreaming climate actions, and increasing the adaptive capacity and resilience at the national and subnational levels to address the impact of climate change.

Most notably, the Climate Change Act of 2009, as amended, was enacted to ensure that climate change considerations are integrated into the government's policies, plans, and programs.
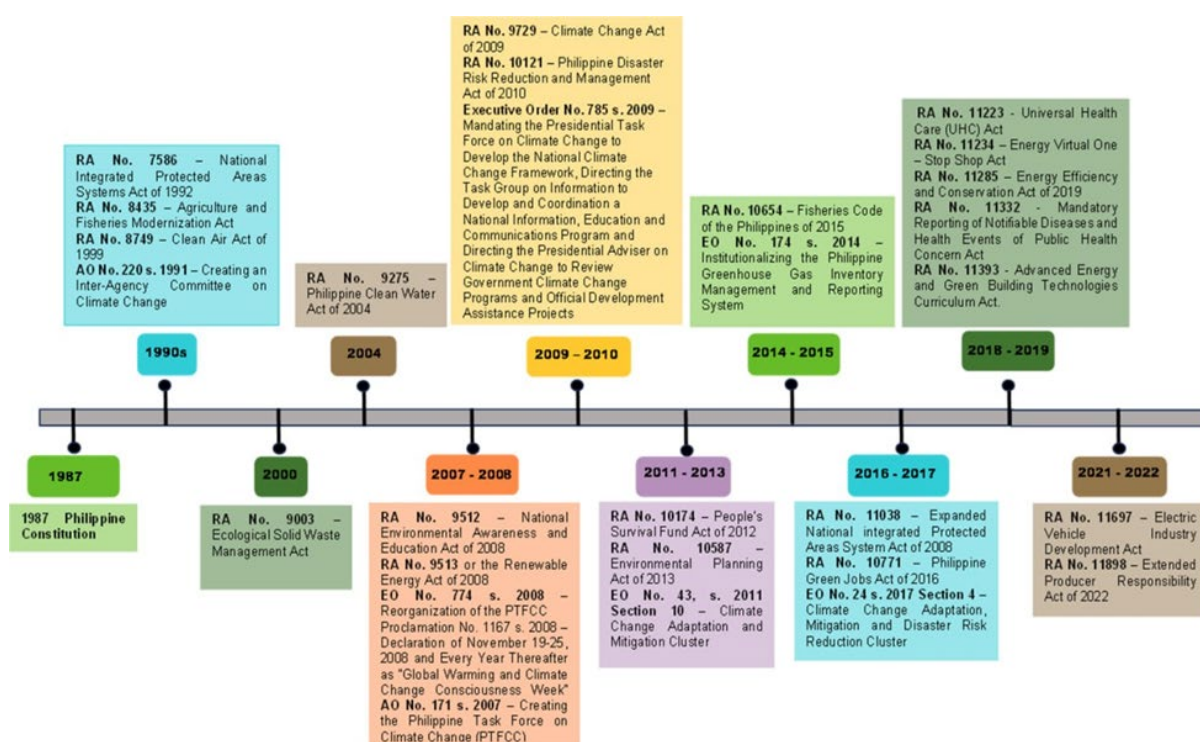
Source: Philippine NAP 2023-2050

Figure 10: Climate Change-Related Laws and Policies in the Philippines (1987 - 2022)

As indicated in Institutional Arrangements and Governance, the CCC is the lead policy-making body tasked with coordinating, monitoring, and evaluating government programs and actions on climate change. The CCC was tasked with developing the NFSCC, a policy framework that emphasizes the Philippines' approach to climate change, and the NCCAP, which outlines the country's agenda for adaptation and mitigation for 2011 to 2028. Both documents served as the basis for designing and implementing climate change measures, with climate change adaptation as the anchor strategy and climate change mitigation as a function of climate change adaptation.

The NCCAP focused on seven (7) thematic priority areas, namely: (1) Food Security, (2) Water Sufficiency, (3) Ecosystem and Environmental Stability, (4) Human Security, (5) Climate-Smart Industries and Services, (6) Sustainable Energy, and (7) Knowledge and Capacity Development. The ultimate goal is "*to build the Adaptive Capacities of women and men in their communities, increase the resilience of vulnerable sectors and ecosystems to climate change, and optimize mitigation opportunities towards gender-responsive and rights-based sustainable development.*"

Under the Climate Change Act, LGUs are tasked with developing their Local Climate Change Action Plans (LCCAP) and outlining their CCAM measures to address their localities' climate risks and vulnerability. As of 2023, 1,484 (87 percent) of 1715 LGUs have developed and submitted their LCCAPs.

The CCET[29] was established in 2015 to track and monitor the public expenditure of national and local government instrumentalities on climate change. The CCET process facilitates (i) informed policy decision-making among oversight agencies by providing timely statistics on resource allocation, (ii) coherence across sectors by strengthening connections between the budget and climate change initiatives, and (iii) government awareness of climate action by illustrating public finance flows dedicated to addressing climate change. To further mainstream the integration of climate change in the country's budgeting process, the Philippines includes a provision in its General Appropriations Act (GAA) for national government instrumentalities and LGUs to tag their budget for CCAM.

Founded on the NCCAP, CCC issued Commission Resolution No. 2019-001[30], adopting the National Climate Risk Management Framework (NCRMF) to ensure the scientific and evidence-based development of the NAP. It aims to undertake risk profiling, assessment, and management needed to increase the adaptive capacity of communities through technology development and transfer and capacity building, grounded on, among others, probabilistic risk assessment to consider future and multiple scenarios on impacts. The PDP 2023-2028 highlights the NCRMF as one of the enabling policies to ramp up climate action and strengthen disaster resilience.

Aligned with the NCCAP and other development plans (i.e PDP), the Philippine NAP 2023-2050, both a document and a process, aims to "steadily reduce climate-related loss and damage and build the country's adaptive capacity towards transformative resilience and sustainable economic development by 2050." The NAP examined the historical perspective on the country's observed climate change and offered insights into future scenarios based on the best available climate science and analytics while identifying socioeconomic consequences and the most impacted geographical areas within the Philippines. Discussion on the eight-priority sector of the NAP is highlighted in the subsection on Adaptation Priority and Barriers and the subsection on Adaptation strategies, policies, plans, goals, and actions to integrate adaptation into national policies and strategies.

---

[29] The CCET was established by virtue of the Department of Budget and Management (DBM) - CCC Joint Memorandum Circular (DBM-CCC JMC) 2015 -01 for the National Level and DBM-CCC- Department of Interior and Local Government (DILG) JMC 2015-01 for the LGUs

[30] Access document here: https://climate.gov.ph/public/ckfinder/userfiles/files/Resolutions/Resolution 2019-001.pdf

The NAP supports other national policies and serves as a foundation for updating the NCCAP (see *Figure 11*). The NAP aims to enhance the strategies outlined in the NFSCC, *Ambisyon Natin* 2040, and PDP 2023-2028. It is envisioned to support the sectoral, sub-national, local, and geographical plans within the Philippines to ensure that adaptation strategies are tailored to the unique needs of each area.
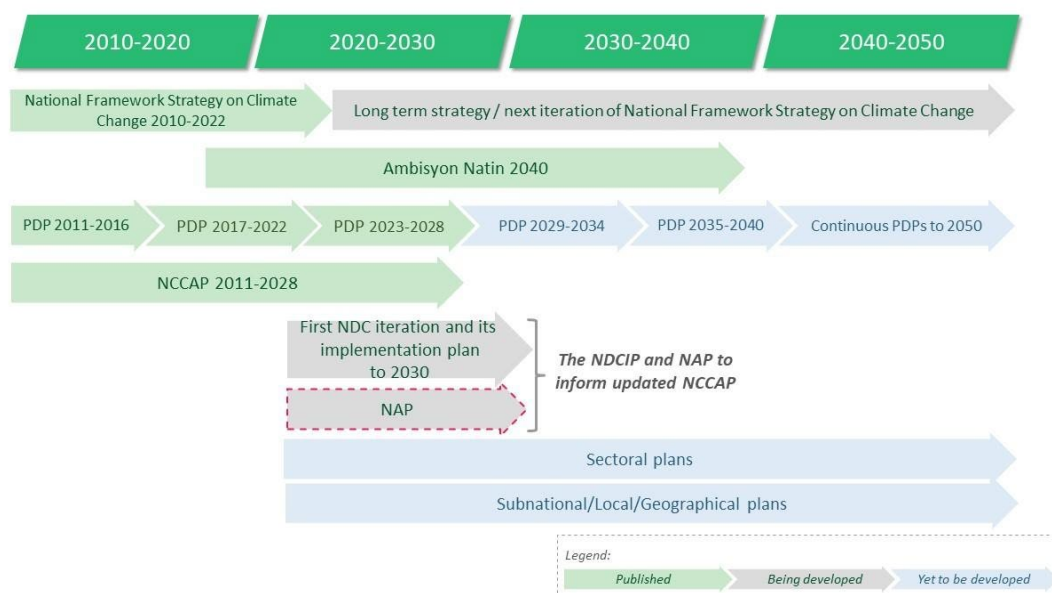
Figure 11: Philippine Climate Change Plans and Frameworks

The NAP was officially adopted pursuant to CCC Resolution No. 2024-003[31]. The resolution instructed all government agencies and instrumentalities to mainstream and integrate the NAP in their respective programs and projects, including in their budget process. The NAP shall guide the types of support to be provided by development partners. The Resolution also tasked the CCC to establish a result-based monitoring and evaluation system (RBMES).

Impacts, Risks, and Vulnerabilities

This section focuses on the Philippines' climate change impacts, risks, and vulnerabilities to climate change. It highlights the four (4) CIDs identified in the Philippine NAP, including the current and projected trends and the observed and projected impacts on the social and economic development of the country. The information reflected in this subsection was culled from findings of the Climate Assessment Chapter 3 of the Philippines' NAP and the 2024 Philippine Climate Change Assessment (PhilCCA) Report.[32]

---

[31] Access document here: https://climate.gov.ph/public/ckfinder/userfiles/files/Resolutions/Commission Resolution No_ 2024-003.pdf

[32] Access document here: https://drive.google.com/file/d/15ndFvl8I47oGySoXoQ9F0zD27LKrqriG/view

Current and Projected Climate Trends and Hazards

The NAP identified four (4) Climatic Impact Drivers (CIDs) - Physical climate system conditions (e.g., means, extremes, events) that affect an element of society or ecosystems. - deemed most critical to the Philippines' vulnerability, taking into account climate trends and extreme events that have affected the nation the most. The following CIDs (**Table 26**) have been identified in consultation with national climate experts (i.e., NPTE and Consultative Group of Experts for the Philippines' NAP development).

Table 26: Description and Importance of the CIDs to the Philippines

Climatic Impact-Driver	Brief Description	Importance in the Philippines
Increased temperature and drought	Increased temperature— episodic high surface air temperature events potentially exacerbated by humidity Drought—an exceptional period of water shortage for existing ecosystems and the human population (due to low rainfall, high temperature, and/or wind)	The Philippines, with substantial outdoor activities, faces the ramifications of increased temperature events and droughts, bearing significant socio-economic consequences. These span from human well-being, labor efficiency, and economic operations. Furthermore, any further temperature escalation pushes people into the hazardous range of the heat index, intensifying the urgency of addressing these challenges.
Sea level rise and extreme sea levels	Sea level rise—chronic and long-term increase of sea levels considering factors such as sterodynamic sea levels, glaciers, land water storage, ice sheets, and subsidence. Extreme sea levels—an acute, temporary, and short-term increase of sea levels such as storm surges, astronomical tides, waves, and swash.	The Philippines has a vast coastline and numerous low-lying areas, making it vulnerable to sea level rise and extreme sea levels, which can result in coastal flooding (flooding driven by episodic high coastal water levels that results from a combination of relative sea level rise, tides, storm surge, and wave setup) and coastal erosion(long term or episodic change in shoreline position caused by relative sea level rise, nearshore currents, waves, and storm surge).
Extreme precipitation	Extreme precipitation - High rates of precipitation resulting in episodic, localized flooding of streams and flat lands Pluvial flooding—inundation of land and urban areas caused by heavy precipitation, where the excess water cannot be efficiently absorbed or drained due to factors such as impervious surfaces and inadequate drainage systems. Fluvial flooding—occurs when rivers and streams exceed their capacity and overflow their banks due to intense or prolonged precipitation.	The Philippines experiences heavy precipitation, especially during the monsoon season. Extreme precipitation events can cause floods and landslides, leading to loss of life, property damage, loss of agriculture production, and disruption of infrastructure.

Climatic Impact-Driver	Brief Description	Importance in the Philippines
Extreme winds and tropical cyclones	Warm-core low-pressure systems are associated with a spiral inflow of mass at the bottom level and a spiral outflow at the top level.	The Philippines is highly vulnerable to tropical cyclones, which can cause significant damage to infrastructure, agriculture, and coastal areas, posing a threat to lives.

Lifted from the National Adaptation Plan (NAP) of the Philippines 2023-2050, pg. 70

Increased Temperature and Drought

The World Meteorological Organization (WMO) reported that 2024 was the warmest year on record, with global temperatures reaching about 1.55 °C (± 0.13 °C) above pre-industrial levels.[33] The compound severe occurrences such as simultaneous heatwaves and droughts have become more commonplace worldwide due to human activities. With observable temperature increases in the first two decades of the twenty-first century, every decade since 1850 has been warmer than before.

The IPCC Sixth Assessment Report discussed that from 2001 to 2020, the global surface temperature was approximately 0.99°C higher than the levels recorded between 1850 and 1900 (range of 0.84°C to 1.10°C). [34] From 2011 to 2020, temperature increased by 1.09°C above the 1850-1900 baseline, with a range of 0.95 to 1.20°C. This overall rise in temperature is primarily attributed to the warming observed from 2003 to 2012, with an increase of 0.19°C (range: 0.16 to 0.22°C). Depending on the emissions scenarios, global temperatures are projected to increase. By 2030, global temperatures are projected to increase between 1.2°C and 1.8°C (SSP2-4.5) and between 1.3°C and 1.9°C (SSP5-8.5) relative to the baseline period of 1850–1900. By 2050, global temperature could increase by 1.6°C to 2.5°C (SSP2-4.5) and 1.9°C to 3.0°C (SSP5-8.5).

In the Philippines, higher-than-normal temperatures have been observed since the 1980s. The country has experienced a 0.1°C increase in temperature per decade, with an overall rise of 0.75°C over the past 69 years (1951-2020).[35]

Climate Analytics shows that by 2030[36], the average temperature across the country is projected to increase by approximately 0.8°C (SSP2-4.5) to 0.9°C (SSP5-8.5), reaching an average temperature of 26.7°C to 26.8°C compared to the 1991–2020 baseline average of 25.8°C. This trend is expected to accelerate, with temperatures increasing by 1.5°C to 1.7°C reaching 27.4°C and 27.6°C by 2050.

---

[33] World Meteorological Organization (2025). WMO confirms 2024 as the warmest year on record at about 1.55°C above pre-industrial level, https://wmo.int/news/media-centre/wmo-confirms-2024-warmest-year-record-about-155degc-above-pre-industrial-level

[34] IPCC, 2021: Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change

[35] The Oscar M. Lopez Center for Climate Change Adaptation and Disaster Risk Management Foundation, Inc. (Oscar M. Lopez Center) and Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA). 2023. State of the 2020 Philippine Climate. January 2023. Available at www.omlopezcenter.org

[36] Boston Consulting Group. (2023). Data Model on Extreme Heat and Droughts [Data model]. Retrieved from CMIP6 (Coupled Model Intercomparison Project Phase 6) database.

Additionally, the heat index is projected to rise significantly compared to the 2010–2020 baseline of 37.0°. By 2030, the heat index is expected to rise by 1.4°C (SSP2-4.5) to 1.9°C (SSP5-8.5) by 2030, reaching 38.4°C to 38.9°C, remaining within the 'Extreme Caution' category. By 2050, the increase is anticipated to accelerate by 3.3°C (SSP2-4.5) to 4.2°C (SSP5-8.5), reaching 40.3°C to 41.2°C and nearing the 'Danger' zone.

The average number of dry days is also projected to slightly increase from a baseline (2010-2020) of 22 days per year to 22 to 24 days from 2030 to 2040 and further to 23 to 25 days in the 2050 to 2060 timeframe.

The average number of unproductive days due to extreme heat - characterized by days with heat index temperatures exceeding 42°C - is expected to rise significantly, from an average of 28 days per year (2010-2020) to between 64 days (SSP2-4.5) and 77 days (SSP5-8.5) by 2030. By 2050, it is projected to reach 133 days (SSP2-4.5) to 168 days (SSP5-8.5).

Sea Level Rise and Extreme Sea Levels

The urgent issues raised by the rise in sea level were highlighted from the analysis of global sea level trends and the unique circumstances of the Philippines. According to the Sixth Assessment Report of the IPCC, the global mean sea level has increased at a rate never seen before since 1900, mainly caused by anthropogenic climate change, the subsequent warming of the oceans, and the melting of ice sheets. From 1901 to 2018, the global mean sea level rose by 0.20 meters (ranging from 0.15 to 0.25), with variations of rates of increase across different periods. Notably, from 2006 to 2018, the sea level rose at an accelerated rate of 3.7 mm per year.

Sea level rise in the Philippines has been significant, with rates of 4.5–7 mm per year recorded from 1993 to 2015. These changes are influenced by climate variability, such as the El Niño Southern Oscillation, and anthropogenic factors. The Philippines is particularly vulnerable to the effects of sea level rise because of its long coastline and large number of coastal cities and islands, particularly in the eastern Visayas and Mindanao. According to the 2024 PhilCCA Report, changes in sea level can be observed across the east Philippine Sea. In the Philippines, a well-above-average annual sea level rise of 14.7 ± 4.39 mm/year was observed using Gravity Recovery and Climate Experiment gravity observations and sea level anomalies from altimetry.

Climate Analytics shows that between 2030 and 2040, some areas in the Philippines may experience sea levels rise by up to 13 mm annually, with the national average projected to be between 5.4 mm (SSP2-4.5) to 6.6 mm (SSP5-8.5) per year. This number is expected to rise by 8.0 (SSP2-4.5) to 8.9 (SSP5-8.5) mm per year by 2050 to 2060. The anticipated rise in absolute sea levels is projected to reach 0.25 meters by 2030 and 0.5 meters by 2050, twice the estimated global average, relative to the 1995 to 2014 period. This rapid increase is especially alarming for communities situated in low-lying coastal areas.

The island of Luzon is expected to experience a faster rate of sea level rise than the rest of the Philippines. Coastal areas along the West Philippine Sea, particularly in NCR, Bulacan, Zambales, and Batangas, are expected to face significant increases in sea levels.

Extreme Precipitation

The IPCC Sixth Assessment Report highlights that global warming is expected to result to more intense and frequent heavy precipitation events globally. The AR6 report indicates that with each increment of global warming, the frequency and intensity of these events will increase. Specifically, extreme daily precipitation is anticipated to intensify by approximately 7% for every 1°C rise in global temperature. At 1.5°C of warming, Asia, including the Philippines, will experience intensified heavy precipitation and increased flood risks. These impacts will become more pronounced at 2°C or greater global warming. As a result, local flooding due to rainfall is expected to rise as heavy precipitation events become more common.

The information provided indicates the noteworthy effects of climate change on precipitation patterns worldwide, including the Philippines. The Climate Risk Country Profile for the Philippines,[37] developed jointly by the World Bank and ADB, states that the country receives an average of 2,348 mm of precipitation annually. However, there is significant geographic variation, as the mean annual rainfall of the Philippines varies from 965 to 4,064 mm annually.

Seasonal variations in precipitation show that from June to September, heavy precipitation is concentrated in the western regions, leading to increased total precipitation. In contrast, heavy rainfall shifts to the eastern regions from October to March, while overall precipitation declines across the country.

Since 2000, tropical cyclone-induced precipitation has significantly increased by 16.9 to 19.3 percent per decade, heightening the risks of flooding and rain-induced landslides. Floods frequently occur during monsoon surges and slow-moving tropical cyclones within the PAR, with La Niña events also affecting the monsoon's severity. A notable example is Super Typhoon Egay (Doksuri) in July 2023, which brought 0.4 to 0.5 meters of rain from its 680-kilometer rainband.

Frequent floods, driven by tropical cyclones and monsoon season, are compounded by land use changes and inadequate infrastructure. The DENR-MGB's Geohazard Mapping identified the country's ten most vulnerable areas, particularly those near rivers, with poor drainage, or in mountainous regions.

Additionally, flooding is also attributed to high exposure to severe tropical cyclones and heavy precipitation. The severity of tropical cyclones has led to increased flood damage, and while climate change contributes to unusual precipitation patterns, the impacts are worsened by clogged sewers and waterways filled with waste.[38]

The climate analytics in the NAP shows that the Philippines will face an increasing risk of increased precipitation and flooding. By 2030, the country is expected to see increased precipitation year-round, particularly from September to November. The number of days with extreme precipitation, defined as days with rainfall exceeding 20mm, is expected to rise from

---

[37] Climate Risk Country Profile: Philippines (2021): The World Bank Group and the Asian Development Bank
[38] Philippines' Second National Communication. https://unfccc.int/sites/default/files/resource/phlnc2.pdf

a historical range of 20-25 days to a future range of 22-27 days by 2050, regardless of whether moderate (SSP2-4.5) or high (SSP5-8.5) emission scenarios are considered.

The eastern Visayas and southeastern Luzon are projected to experience a significant increase in precipitation from December to February, corresponding to the northeast monsoon, in both 2030 and 2050. Conversely, during the March to May dry season, the northern and western regions are expected to experience a noticeable drying trend by 2050. During the June to August period, which aligns with the southeast monsoon, substantial precipitation increases are anticipated in central Luzon, western Visayas, and western Mindanao, while a decline in rainfall is expected in other areas. Between September and November, an upward trend in rainfall is primarily forecasted for the eastern and southwestern regions of the country.

Extreme Winds And Tropical Cyclones

According to the IPCC[39], the frequency of the most intense tropical cyclones (Category 4 to 5) is projected to rise by 1% to 10% with a global temperature increase of 2°C. Furthermore, the average maximum wind speeds of tropical cyclones are expected to increase, and the precipitation rates associated with tropical cyclones could intensify by at least 7% for each degree of warming in sea surface temperatures (SST). These alterations signify an increasing likelihood of stronger winds, more intense rainfall, and heightened storm surges.

In the Philippines, an average of 20.2 tropical cyclones enter the Philippine Area of Responsibility (PAR) each year, with approximately 8.4 making landfall. Like many other parts of the world, the Philippines faces increasing risks from extreme tropical cyclones, defined by wind speeds exceeding 170 km/h.

Research shows that during El Niño, the genesis location of tropical cyclones shifts southeastward (northwestward) during El Niño (La Niña) years, impacting their track, intensity, and lifespan. Additionally, the northern Philippines is affected by more tropical cyclones in La Niña years compared to El Niño years.[40] Variations in sea surface temperature linked with the positive and negative phases of ENSO affect the frequency and intensity of tropical cyclones. Understanding how ENSO, Pacific Decadal Oscillation (PDO), and other large-scale climate variability can affect present and future tropical cyclone activity that is essential for DRRM. Enhancing weather monitoring infrastructure and studying long-term climate variability can therefore improve forecasting and preparedness strategies by scientists and policymakers.

NAP climate analytics show that although the frequency of tropical cyclones entering the PAR will decrease, the severity and destructive potential are expected to pose significant

---

[39] Collins M., M. Sutherland, L. Bouwer, S.-M. Cheong, T. Frölicher, H. Jacot Des Combes, M. Koll Roxy, I. Losada, K. McInnes, B. Ratter, E. Rivera-Arriaga, R.D. Susanto, D. Swingedouw, and L. Tibig, 2019: Extremes, Abrupt Changes and Managing Risk. In: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate [H.-O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, A. Alegría, M. Nicolai, A. Okem, J. Petzold, B. Rama, N.M. Weyer (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 589-655. https://doi.org/10.1017/9781009157964.008.
[40] Climate Change Commission and the Department of Environment and Natural Resources (2023). National Adaptation Plan (NAP) of the Philippines 2023-2050

risks. Spatial analyses reveal that northeastern regions are most affected, underlining the importance of targeted mitigation efforts. Furthermore, the interplay of ENSO phases and tropical cyclone activity underscores the critical need for climate-aware disaster preparedness to mitigate the impacts of these intensified hazards.

While the frequency of tropical cyclones is projected to experience a slight decline—up to 13% by 2050—their intensity is expected to rise markedly. The number of typhoons, characterized by wind speeds between 118 and 184 km/h, is projected to more than double by 2030 and 2050, with an anticipated increase of up to 119%. Additionally, super typhoons, defined as those with wind speeds exceeding 185 km/h, may rise by 24% in 2030 and by 76% in 2050.

By 2030, the frequency of Tropical Cyclones within the PAR is projected to decrease by up to 11 percent (~2 fewer Tropical Cyclones annually) compared to 2010–2020. By 2050, this reduction is estimated to reach 13 percent (~2.5 Tropical Cyclones annually). The number of Tropical Cyclones making landfall will also decrease by up to -52 percent from 7.3 in 2010 to 2020 to about 4.0 (SSP5-8.5) or 3.5 (SSP2-4.5) Tropical Cyclones by 2050.

Despite the decrease in frequency, the number of Tropical Cyclones with windspeeds between 118 and 184 km/h is expected to more than double by 2030 and 2050, up to 119 percent (7.5 (SSP5-8.5) to 7.9 (SSP2-4.5) per year between 2030 and 2040) compared to historical averages (3.6 Tropical Cyclones). Super typhoons[41] are expected to increase by around 24 percent (4.0 (SSP5-8.5) to 4.1 (SSP2-4.5) per year) by 2030-2040 and 76 percent (5.2 (SSP2-4.5) to 5.8 (SSP5-8.5) per year) by 2050-2060 compared to the historical average of 3.3 Super typhoons per year.

The climate analytics also shows that Tropical Cyclones will become more powerful, with average maximum peak wind speeds projected to rise by up to 29 percent (146 km/h per year) by 2030 and by 33 percent (150 km/h per year) by 2030 and 2050 respectively compared to historical average (113 km/h per year).

Observed and Projected Impacts of Climate Change

Over the past decade, the Philippines recorded losses and damages amounting to USD 12.1 billion (PHP 673.30 billion)[42] and is expected to rise under the BAU scenario, potentially accounting for up to 7.6 percent of the country's GDP by 2030 and 13 percent by 2040[43]. The cost of inaction in the 2030 decade is estimated to be $25.17 billion (PHP 1.4 trillion) by 2030, as identified in the National Adaptation Plan 2023-2050.

As contained in the strategic framework, the Philippines NAP aims to "*steadily reduce climate-related loss and damage and build the country's adaptive capacity towards transformative resilience and sustainable economic development by 2050.*"

---

[41] DOST PAGASA define Super Typhoons as Tropical Cyclones with maximum wind speeds exceeding 185 khp or more than 100 knots.
[42] National Economic and Development Authority (2023). Philippine Development Plan (PDP) 2023-2028.
[43] World Bank Group (2021). Philippines Country Climate and Development Report 2022.

Increased Temperature and Drought

The rising temperatures pose significant risks to the country's economy and public health, as shown by the effects over the last few years. In 2020, the United Nations Children's Fund (UNICEF) estimated that 1.1 million children in the Philippines were impacted by frequent high heat occurrences, with 4.5 or more heat waves per year. Furthermore, heatwaves lasting 4.7 days or more affected at least 1.9 million children. By 2050, these figures are predicted to rise, with 33.5 million Filipino children—or 99 percent of all children in the country—expected to endure five or more heatwaves.

Additionally, it is anticipated that 26.3 million children, or 77 percent of the total, will experience prolonged heatwaves,[44] making the Philippines 31st of 163 countries in terms of UNICEF's climate risk index of countries where children are most at risk from climate and environmental factors. The DOH reported at least 118 cases of heat exhaustion in Metro Manila alone in March 2023, with 33 cases coming from Valenzuela City's four high schools.[45]

Additionally, the economy has suffered greatly, particularly during droughts brought on by the interaction of the increased temperature and the effects of large-scale variability like the El Niño-Southern Oscillation (ENSO), which have resulted in significant losses in agriculture and a decline in the country's GDP. One notable example is the 2015-2016 El Niño, which caused agricultural production losses of USD 327 million (PHP 17.78 billion) and national GDP losses totaling USD 3.3 billion (PHP 179 billion).[46]

The climate analytics in the NAP show that the projected increase in temperature threatens public health, livelihoods, and economic stability. Discussion on the projected temperature increase is outlined in the subsection on Current and Projected Climate Trends and Hazards.

The shifts in temperature will severely affect the population. By 2030, around 4 million (SSP2-4.5) to 11 million (SSP5-8.5) people may be exposed to dangerously high heat indices exceeding 42°C. By 2050, this number could escalate to 73 million (SSP2-4.5) to 74 million (SSP5-8.5).

The economic impact is similarly concerning, with heat stress projected to decrease labor productivity, leading to losses of approximately USD 8.36 billion (PHP465 billion) under SSP2-4.5, to USD 8.38 billion (PHP466 billion) under SSP5-8.5 by 2030. Without action, these losses could rise from USD 11.59 billion (PHP645 billion) under SSP2-4.5, to USD 15.64 billion (PHP870 billion) under SSP5-8.5 by 2050.

Impact of Sea Level Rise and Extreme Sea Levels

The Philippines faces significant threats from sea level rise, particularly in coastal flooding.[47] A one-meter rise could impact 7,000 km² across 2,490 barangays, displacing 1.8 million

---

[44]   Climate Change Commission and the Department of Environment and Natural Resources (2023). National Adaptation Plan (NAP) of the Philippines 2023-2050

[45] https://newsinfo.inquirer.net/1752307/doh-records-118-cases-of-heat-exhaustion-in-march

[46]   Baclig, C. E. (2023, March 29). Extreme heat in PH: Health risks, economic impact. https://newsinfo.inquirer.net/1749716/extreme-heat-in-ph-health-risks-economic-impact

[47] Based on the climate analytics model done by the Boston Consulting Group [2023] for the Philippines' NAP

people. A two-meter rise in sea levels would affect 8000 km^2 across 2,730 barangays, impacting an estimated 2.3 million individuals. A three-meter risk would inundate 15,000 km^2, spanning 5,387 barangays with an estimated 3.4 million people affected.

Social-ecological systems and other ecosystem processes are also impacted by sea level rise, which can cause saltwater intrusion, coral reef bleaching, and habitat degradation. The potential for widespread flooding and impacts on millions underscores the urgent need to address rising sea levels. The Philippines will endeavor to protect its coastal communities and conserve natural and economic resources for future generations by implementing efficient adaptation measures.

The climate analytics in the NAP show that if the sea level continues to rise, it can have significant impacts in parts of the Philippines, with some facing permanent displacement and economic losses. By 2030, approximately 154,000 Filipinos could face permanent displacement due to rising sea levels, projected to increase to 423,000 by 2050. This displacement could lead to economic losses of USD 323.56 million (PHP 18 billion) and USD 737 million (PHP 41 billion), respectively, threatening community stability and livelihoods.

Additionally, extreme flooding events linked to rising sea levels will exacerbate these issues. By 2030, around 1.7 to 1.9 million Filipinos may be affected, with infrastructure damages estimated at USD 1.43 billion (PHP 80 billion) for both scenarios. By 2050, these damages are anticipated to escalate from USD 1.55 billion (PHP 88 billion) for SSP2-4.5 to USD 1.58 billion (PHP 88 billion) for SSP5-8.5, putting additional strain on resources and hindering national development objectives.

These projections underscore the urgent need for coastal adaptation measures, including enhanced flood defenses, strategic land-use planning, and the development of resilient infrastructure.

Impact of Extreme Precipitation

As of 2010, the World Resources Institute's AQUEDUCT Global Flood Analyzer estimates that 176,000 people in the country experience flooding yearly, with damages up to USD 625 million projected for events up to a 1 in 25-year magnitude. On the other hand, the United Nations International Strategy for Disaster Reduction (UNISDR) reported about USD 500 million cost of damages associated with flooding in the Philippines. Historically, 1.9 million people are estimated to have been impacted by extreme river flooding in the Philippines between 1971 and 2004 (defined as being in the 90th percentile of those affected).[48] Both development activities and climate change are predicted to cause these numbers to rise.

This increased precipitation will escalate the frequency and severity of pluvial and fluvial flooding, which will endanger communities and infrastructure. Pluvial flooding alone is projected to impact 2.3 to 4.8 million (both scenarios) and 2.4 to 5.1 million (SSP2-4.5) to 2.5 to 5.2 million (SSP5-8.5). The Philippines, in the near term (2020-2040) and long term (2040-

---

[48]   Climate Risk Country Profile: Philippines (2021): The World Bank Group and the Asian Development Bank

2060), respectively, may experience estimated economic losses ranging from USD 4.91 to 4.93 billion (PHP 273 and 274 billion) for SSP2-4.5, to USD 5.12 to 5.32 billion (PHP 285 and 296 billion) for SSP5-8.5, annually, highlighting the urgent need for action.

Fluvial flooding, while affecting fewer individuals—approximately 250,000 to 300,000—still poses a serious risk, with economic damages estimated between USD 233.69 million (PHP 13 billion) for both scenarios to USD 269.64 million (PHP 15 billion) for SSP2-4.5 to USD 287.61 million (PHP16 billion) for SSP5-8.5 annually, further straining resources at both national and local levels. Additionally, increased precipitation significantly increases the risk of landslides, threatening the lives of two million Filipinos.[49]

The findings above highlight the urgency of addressing climate change and the need for robust adaptation strategies to cope with the changing precipitation patterns.

Impact of Extreme Wind and Tropical Cyclones

The Philippines has gone through substantial economic and human losses from tropical cyclones. Since 1970, 34,435 people have died, and 75,034 have been injured. These tragic occurrences have highlighted the pressing need for sensible policies to mitigate their impacts and strengthen the nation's resilience.

Over the past 15 years, the Philippines has experienced some of its most severe tropical cyclones, including Typhoons Yolanda, Ulysses, and Egay, which resulted in significant losses and damages, including the loss of lives and critical infrastructure.

A total of 733 casualties, including 112 fatalities, 610 injuries, and 11 missing persons, were caused by seven prominent Tropical Cyclones, namely Ambo, Ofel, Pepito, Quinta, Rolly, Ulysses, and Vicky. Typhoon[50] Ulysses was the deadliest of these, killing fifty-one people. Additionally, the financial ramifications of the 2020 tropical cyclone season were significant. Damage to infrastructure and agriculture totaled USD 891.14 million (PHP 44.22 billion), with infrastructure bearing the majority (63.6 percent) of the total expenses.

By 2030, 1.7 million-5.9 million (SSP2-4.5) to 822,000-5.34 million (SSP5-8.5) Filipinos are expected to experience at least one typhoon or super typhoon within the 2050 decade. The country is projected to experience an estimated infrastructure damage of USD 1.01 billion (PHP 56 billion) for SSP2-4.5 to 1.49 billion (PHP 83 billion) for SSP5-8.5). By 2050, these losses will remain significant at USD 1.31 billion (PHP 73 billion) for SSP2-4.5 to 1.40 billion (PHP 78 billion) for SSP5-8.5.

These trends highlight the urgent necessity for enhanced climate resilience, improved early warning systems, and infrastructure adaptation to alleviate the increasing threats posed by extreme winds and tropical cyclones.

---

[49] Climate Change Commission and the Department of Environment and Natural Resources (2023). National Adaptation Plan (NAP) of the Philippines 2023-2050
[50] DOST PAGASA defines Typhoons as a tropical cyclone with maximum wind speed of 118 to 184 kph or 64-99 knots.

Provincial Categorization Based On Climate Exposure

Based on the current and future trends and impacts of the CIDs in the Philippines, the NAP categorizes provinces based on their projected exposure in the coming decades. The provincial categorization delineates provinces into five distinct categories, determined by their percentile exposure values compared to other provinces in the Philippines. This classification comprehensively evaluates physical, social, and economic dimensions across various CIDs. Provinces are organized into quintiles according to their exposure risks projected for the 2030 decade under the SSP5-8.5 scenario, ensuring a balanced consideration of social, economic, and physical impacts.

Provinces experiencing the highest levels of exposure are confronted with significant risks, attributable to factors such as the absolute population at risk, economic losses as a percentage of GDP, and the total land area affected. This categorization seeks to enhance resource allocation and inform decision-making processes, thereby directing adaptation efforts toward the provinces most in need. It underscores the necessity for localized, downscaled studies to improve future risk assessments and refine adaptation strategies.

The NAP identified the following 18 provinces as `high exposure' areas based on provincial categorization. (**Figure 12**)

High Exposure	Medium-High Exposure	Medium Exposure	Medium-Low Exposure	Low Exposure
Province	Province	Province	Province	Province
Albay	Agusan del Sur	Agusan del Norte	Abra	Apayao
Bulacan	Aklan	Basilan	Aurora	Batanes
Cagayan	Antique	Catanduanes	Benguet	Camiguin
Camarines Norte	Bataan	Cotabato	Biliran	City of Isabela
Camarines Sur	Batangas	Cotabato City	Bukidnon	Davao de Oro
Capiz	Bohol	Laguna	Davao del Norte	Davao Occidental
Cebu	Cavite	Lanao del Norte	Davao del Sur	Davao Oriental
Eastern Samar	Ilocos Sur	Lanao del Sur	Guimaras	Dinagat Islands
Iloilo	Isabela	Negros Oriental	Ilocos Norte	Ifugao
Leyte	La Union	Nueva Ecija	Misamis Occidental	Kalinga
Masbate	Maguindanao	Oriental Mindoro	NCR, City of Manila, First District	Marinduque
Negros Occidental	Misamis Oriental	Rizal	NCR, Fourth District	Mountain Province
Pampanga	Northern Samar	Surigao del Norte	NCR, Third District	NCR, Second District
Pangasinan	Occidental Mindoro	Surigao del Sur	Nueva Vizcaya	Quirino
Quezon	Palawan	Tarlac	Sarangani	Romblon
Samar	Sulu	Zambales	Southern Leyte	Siquijor
Sorsogon	Zamboanga Sibugay	Zamboanga del Norte	Sultan Kudarat	South Cotabato
Zamboanga del Sur			Tawi-Tawi	

Figure 12: Projected Provincial Risk Categorization Between 2030-2040, SP5-8.5
Source: National Adaptation Plan (NAP) of the Philippines 2023-2050

Approaches, Methodologies, and Tools

Guided by the best available science and analytics, the NAP presented a historical perspective on the country's observed climate change and future climate scenarios. The NAP process pursues the NCRMF, which acknowledges the importance of risk profiling, assessment, and management in increasing the adaptive capacity of communities. The NCRMF was complemented by using official data provided by NGAs.

Further, the data were supplemented by the best class data from international sources such as CMIP6[51] ERA5 Reanalysis[52], Fathom Global release 3.0, NASA Earth data (NASADEM)[53], Alaska satellite facility[54], and IBTrACS[55]. From these data, future climate risk projections were arrived at under two scenarios: middle-of-the-road scenario (SSP2-4.5)[56] and Fossil-fueled Development scenario (SSP5-8.5)[57], towards and between 2030 and 2050, applying the following analytics methods. These two (2)-time horizons and scenarios, reflecting the current emission trajectory, offer a balanced perspective by encompassing both moderate and high-emission trajectories, aiding resilience planning against climate change impacts.

This analysis highlights the regions of the Philippines most affected by climate change and its potential socioeconomic effects. The detailed methodology used for the climate analytics is available in the NAP appendices. [58]

Adaptation Priorities and Barriers

This section introduces the eight (8) sectoral outcomes as well as the cross-cutting strategies of the Philippine NAPs as the adaptation priorities for the Philippines. Discussion on the priority outcomes and strategies for each of the sectoral outcomes are reflected in the subsection on Adaptation strategies, policies, plans, goals, and actions.

This section will also present some of the gaps, challenges, and barriers that hinder the effective implementation of adaptation strategies. These range from fragmented policies, roles, and coordination to limited access to adaptation finance, lack of technical expertise and resources, gaps in knowledge management and databases, and the absence of a robust Monitoring and Evaluation (M&E) System.

Domestic priorities and progress towards those priorities

To effectively build resilience, minimize climate-related loss and damage, and enhance adaptive capacity for sustainable socio-economic development, the NAP identified eight key sector outcomes as key pillars for societal well-being and economic resilience. These include:
  1) Agriculture and Fisheries and Food Security;
  2) Water Resources;

---

[51] Coupled Model Intercomparison Project Phase 6 is a climate science project that coordinates the design and distribution of global climate model simulations
[52] Fifth generation European Centre For Medium-Range Weather Forecasts atmospheric reanalysis of the global climate covering the period from January 1940 to present.
[53] Is a global elevation model that uses reprocessed data from the Shuttle Radar Topography Mission (SRTM)
[54] Is a University of Alaska Fairbanks facility that collects, processes, and distributes remote-sensing data for Earth science research
[55] International Best Track Archive for Climate Stewardship (IBTrACS) is a centralized database of tropical cyclone best track data
[56] International Best Track Archive for Climate Stewardship (IBTrACS) is a centralized database of tropical cyclone best track data
[57] Pathway that envisions a future where there is limited global effort to mitigate greenhouse gas emissions.
[58] Access document here: https://www.climate.gov.ph/public/ckfinder/userfiles/files/Knowledge/%5BAppendices%5D%20PH%20NAP%202023-2050-2.pdf

3) Health;
4) Ecosystems and Biodiversity;
5) Cultural Heritage, Population Displacement and Migration;
6) Land Use and Human Settlements;
7) Livelihoods and Industries; and
8) Energy, Transport and Communications.

These sectoral outcomes align with the seven (7) thematic targets under the UAE Framework for Global Climate Resilience.[59]

The NAP prioritizes integrated adaptation actions and emphasizes holistic resilience-building by identifying key enablers, including access to multilateral funding and private capital, as essential for effective implementation. For each sector, the Philippines will implement a set of priority outcomes and strategies to achieve the adaptation themes per sector. These priority outcomes and strategies were identified and prioritized based on the input from sectoral experts and stakeholders to comprehensively address the country's adaptation needs. Prioritization criteria included alignment with existing mandates, hazard coverage, scalability, effectiveness, and urgency. The Philippines recognizes that further downscaling and contextualization of the NAP may reveal additional strategies to achieve these outcomes. While the adaptation priorities are outlined per sector, the Philippines NAP acknowledges the interdependencies of these sectors, necessitating cohesive strategies to manage cross-sector impacts and maximize synergy across sectors. For example, protecting ecosystems and biodiversity sustains ecosystems, supports agriculture and fisheries, and ensures access to water resources, thus ensuring food and water security.

Similarly, resilient infrastructure in energy, transport, and communication improves access to healthcare and facilitates, while sustainable land use reduces vulnerabilities of communities to extreme weather and safeguards human settlements. Disruption in one sector can cause cascading impacts across other sectors.

Across the sectoral outcomes, five (5) cross-cutting strategies were observed.

1. Strengthen infrastructure resilience. All critical infrastructure must be strengthened to withstand the impacts of climate change and its extremes and to ensure the sustainability of the systems crucial for society, such as water supply, energy, transport, and production.
2. Safeguard livelihoods with social protection and regulations. Protect vulnerable populations by providing social protection mechanisms and climate-responsive regulation to support livelihoods.
3. Empower local governments and communities to take adaptation action. Local governments and communities can integrate and implement climate adaptation and resilience measures by providing access to climate information, tools, and capacity-building support.
4. Mainstream integrated adaptation governance. Effectively implementing adaptation measures requires a collective effort among stakeholders, policymakers, and institutions.

---

[59] 2/CMA.5 Global Goal on Adaptation

5. Scale nature-based solutions. Where possible, prioritize scaling and implementing nature-based solutions to enhance climate resilience and protect vulnerable populations, leveraging the co-benefits of ecosystem-based approaches over traditional grey infrastructure to protect biodiversity and avoid maladaptation.

This strategy underscores the importance of aligning investments with risk assessments, sustainable development, and integrating scientific, indigenous, and local knowledge.

The Philippines recognized that adaptation limits, in addition to maladaptation, must be taken into account when implementing localized adaptation strategies to avoid more losses and damages rather than increased resilience. Thus, adaptation measures must be science-based, risk-based, and localized, specific to the national circumstances.

Adaptation challenges, gaps, and barriers

Limited Knowledge on Climate Change Impacts, Vulnerabilities, Adaptive Capacity and Adaptation Options

There are minimal studies and information on how climate will change locally, as can be gleaned from the Philippines Climate Change Assessment Report (PhilCCA) Working Group 1 report (2024). For example, while the temperature rise is evident in all model projections, the direction and magnitude of changes in rainfall patterns are still unclear. There is even much less certainty on how global warming will affect tropical cyclones.

As a result, impact information and vulnerability assessments tend to be generic and, thus, not compelling enough for local action. There is also a sense that changes-induced impacts will occur in the distant horizon beyond the concerns of local politicians seeking to win the next election.

There is also a paucity of data on the adaptive capacity of vulnerable groups and places, especially at the local level. As a result, adaptation options cannot be tailored to fit specific needs.

To address these challenges, it is crucial to invest in localized climate research to enhance the accuracy of impact projections. Strengthening data collection efforts regarding the adaptive capacity of vulnerable communities will facilitate the formulation of targeted adaptation strategies. Furthermore, raising awareness among policymakers and embedding climate action into long-term plans can significantly contribute to fostering continuous and effective responses at the local level.

Fragmented Policies, Roles, and Coordination

One of the most pressing challenges in implementing effective climate change adaptation strategies is the overlapping of policies, fragmented and unclear roles and responsibilities of stakeholders and other government agencies not defined in the Climate Change Act. Although various action and sectoral plans have been developed, the absence of a cohesive approach has resulted in inefficiencies and duplication of efforts among government agencies. This situation is further complicated by the varying levels of understanding and commitment to adaptation strategies across institutions. The lack of dedicated climate

change focal units within several agencies led to challenges in data collection and the reliability of reported climate actions.

To remedy these challenges, it is imperative to streamline policies, define roles and responsibilities, and enhance coordination mechanisms. Additionally, strengthening stakeholder engagement will be essential to promote collaboration and ensure the successful execution of climate change initiatives nationwide.

Access to Adaptation Finance

The Philippines encounters considerable challenges in securing financing for climate change adaptation, primarily due to limited awareness and understanding of available adaptation financing, lack of technical capacity to develop and submit project proposals and project structure, and procedural complexities of the approval process, particularly for local governments and communities.

There is currently no unified framework for evaluating the risks and priorities of climate adaptation projects which complicates the identification of initiatives that genuinely advance climate adaptation objectives. Consequently, decision-making gaps regarding funding and resource allocation may need to be improved, as these gaps may lead to misdirected international funding that could have otherwise supported climate adaptation efforts.

Additionally, insufficient integration of climate-related expenditures into budgeting processes, along with low compliance in budget tagging, hinders accurate tracking of government spending on climate resilience. Crucial investments in climate-resilient projects may be overlooked, resulting in inadequate funding for regions particularly vulnerable to climate threats.

To effectively address these challenges, it is imperative to simplify funding mechanisms for adaptation, enhance the alignment of adaptation projects with adaptation goals and developmental objectives, and fortify systems for monitoring and prioritizing climate-related expenditures. Recognizing the role of blended climate finance sources in scaling the implementation of climate action, the Philippines will work on setting up policies and systems that provide incentives and improve the "bankability" of project proposals, making them more appealing to investors.[60]

Lack of technical expertise in the LGUs

Local governments encounter substantial challenges in developing and implementing effective climate adaptation strategies, primarily due to a lack of technical expertise, inadequate data, and limited resources. Some local governments find it challenging to access funding mechanisms (i.e., PSF) and lack the capacity to prepare climate-responsive project proposals. Additionally, significant budgetary constraints further impede the institutionalization of adaptation strategies and the execution of localized climate action plans.

---

[60] Climate Change Commission and the Department of Environment and Natural Resources (2023). National Adaptation Plan (NAP) of the Philippines 2023-2050

Therefore, it is crucial to enhance the technical and financial capacities of LGUs through capacity-building initiatives to facilitate more robust and sustainable actions to reduce the impacts of climate change at the local level.

Gaps in Knowledge Management and Database

The Philippines' efforts to address the impacts of climate change are significantly impeded by the lack of a centralized knowledge management (KM) system that consolidates and streamlines the country's extensive yet fragmented climate information system. While extensive climate data is available, the absence of harmonization and ease of access hampers effective decision-making and coordination among various stakeholders. Furthermore, the lack of clearly defined metrics and methodologies for evaluating climate risks to avoid maladaptation results in inefficient resource allocation and suboptimal project selection.

Therefore, developing a unified KM system with standardized risk assessment tools is essential for facilitating informed, strategic, and evidence-based climate adaptation planning and implementation.

Absence of a Robust Monitoring and Evaluation (M&E) System

The absence of a robust M&E system and indicators hampers tracking progress, transparency, and accountability among stakeholders both at the National and Local scale. An RBMES was developed to track the progress of the NCCAP implementation using identified outcome indicators. However, the RBMES was not fully realized due to ineffective due to misaligned, outdated, or incomplete data, and challenges in tracking gender responsiveness to climate change measures.

Developing a robust M&E system is crucial for effectively tracking and assessing the implementation of the NAP. For more information, see the discussion in the Subsection on Monitoring and Evaluation of Adaptation Actions and Processes.

Adaptation strategies, policies, plans, goals, and actions to integrate adaptation into national policies and strategies

This subsection outlines the adaptation priorities, outcomes, and strategies that the country will undertake to achieve the adaptation goal, as stipulated in the Philippine NAP. These were identified based on two fundamental approaches: (1) multi-stakeholder consultations with sector representatives to identify the gaps and challenges, and (2) building on the progress of existing initiatives, mechanisms, programs, and policies to access alignment with long-term goals. While formulated in the national context, the NAP was intended to guide regional, provincial, and local stakeholders in selecting the adaptation strategies to implement in their localities.

Priority Sectors in the Philippine NAP

Agriculture & Fisheries & Food Security

The Philippines recognizes the vulnerability of the agriculture, fisheries, and food sectors to the impacts of climate change, leading to reduced agricultural yields, fish stock depletion, and damage to croplands and fishponds, severely impacting food security and the livelihoods of farmers and fisherfolks.

In the Philippines, 75 percent of food is locally produced, making it an essential component of food security. The agriculture and fisheries sector employs a quarter of the workforce, contributing 8.9 percent to the GDP in 2022.[61] However, this sector has historically been the most vulnerable to climate change impacts and will continue to suffer greatly. These cascading impacts, along with high poverty incidence, intensified the vulnerabilities of Filipinos who depend on agriculture, aquaculture, and fisheries for their livelihood, causing poor nutrition, malnutrition, or starvation.

The adaptation theme for Agriculture and Fisheries and Food Security is **Securing Food Supply: Nurture Nature, Sustain Livelihoods.** The Philippines will focus on adaptation strategies to empower farmers, fisherfolks, and communities to enhance productivity and preserve natural resources to ensure sustained production. Key strategies include zoning regulations, land protection policies, financial support systems, capacity-building programs, and access to climate information.

As outlined in the subsection on Adaptation priorities and barriers, the NAP recognizes the interdependence of achieving food security by protecting biodiversity and ecosystems to support agriculture and fisheries. Discussion on the adaptation themes and strategies for Ecosystems and Biodiversity are discussed in the Ecosystems and Biodiversity priority sector.

Examples of Adaptation strategies for Agriculture and Fisheries and Food Security include:[62]
- Diversify and substitute crops, livestock, and aquaculture. Diversification/Rotation of crops, livestock, or aquaculture are evaluated to guarantee local suitability and reduce risks associated with climate change effects on specific species.
- Expand cold storage chains and facilities. Invest in adequate storage infrastructure to reduce post-harvest losses, extend the shelf life of perishable produce, and avoid disruption of supply chains.
- Improve soil health management programs. Enhancing soil testing and implementing appropriate soil improvement strategies to tackle the decline in soil health
- Promote efficient irrigation techniques, including drip irrigation and alternate wetting and drying (AWD), to minimize water loss.
- Develop localized and inclusive early warning systems and information dissemination.
- Improve climate insurance and ensure its inclusiveness. Coverage for severe weather incidents becomes more accessible for farmers and fisherfolk through government support to sustain their operations in the face of climate change.

---

[61] Philippine Statistics Authority (2023). National Accounts of the Philippines (as of April 2023)
[62] Exhaustive list of Adaptation Measures are listed in the Philippine National Adaptation Plan

- Conduct climate risk vulnerability assessments (CRVA) of crop and fishery products and communities to improve planning and monitoring across different levels and scales.

Water Resources

Water resources are vital to economic activity and human survival as they enable industrial production, hydropower generation, fisheries production, and agricultural irrigation. However, the country's water stress level has risen to twice the global average due to the rapidly growing population and inadequate planning and investment in water systems.[63]

The adaptation theme for Water Resources is **Safeguard Water Security: Secure and Sanitary Water for All**. The Philippines will focus on adaptation strategies to support resilient water infrastructure and guarantee access to safe, affordable, and secure water essential for health and sanitation while supplying vital industries with the water necessary to sustain operations. Key strategies include a governance framework with defined roles and responsibilities aligned with a revised Water Code[64] to manage and establish an inventory for future programmatic decisions and to secure adequate government, private, or multilateral funding.

As outlined in the subsection on Adaptation priorities and barriers, the NAP also highlights the interdependence of water security with biodiversity and ecosystems protection, as discussed in the Ecosystems and Biodiversity priority sector.

Examples of Adaptation Strategies for Water Resources include:[65]
- Implement Early Warning Systems for Water Infrastructure. Developing a tool to anticipate potential problems like water shortages, contamination, or infrastructure failure due to climate change before they result in significant impacts.
- Conduct a comprehensive climate risk assessment for water, sanitation, and hygiene (WASH) based on key hazards, exposures, and vulnerabilities affecting the sector.
- Ramp up rainwater harvesting programs as a sustainable water source to maintain consistent water access.
- Install and expand strategic water supply mechanisms for remote areas. Prioritize installing water storage tanks, runoff collection sites, small reservoirs, and cisterns in key areas where traditional water supplies are lacking, particularly in hilly or elevated regions, to secure water access during climate fluctuations.
- Run training programs on water management and conservation techniques. Organize training and educational programs, covering topics from water management for farmers and industries to conservation efforts for households to enhance the resilience of water consumers.
- Enhance integrated watershed management planning and implementation. To bolster watershed resilience, develop integrated management strategies for all watersheds as an overarching framework for comprehensive land-use and sector development strategies at the local government level.

---

[63] National Economic and Development Authority. (2022). Philippine Water Supply and Sanitation Master Plan (PWSSMP). Pasig City, Philippines
[64] Presidential Decree No. 1067, series of 1976: A Decree Instituting a Water Code, thereby Revising and Consolidating the Laws Governing the Ownership, Appropriation, Utilization, Exploitation, Development, Conservation and Protection of Water Resources
[65] Exhaustive list of Adaptation Measures is listed in the Philippine National Adaptation Plan

- Perform profiling of critical water sources. Identify and evaluate all watersheds and river basins to ensure proper monitoring, assessment, and management of surface water resources.

Health

Over 110 million people in the Philippines rely on the healthcare system to prepare for, respond to, and recover from climate-related disasters and diseases. However, climate change exacerbates health inequalities through exposure to extreme weather events, increasing the prevalence of waterborne, vector-borne, and heat-related disorders and damaging health infrastructure.

The adaptation theme for Health is **Climate-Adaptive Healthcare for All: Protecting Health & Well-Being of Filipinos**. The Philippines will focus on adaptation strategies that will enhance primary healthcare access, affordability, and preparedness for climate-related health risks in the Philippines, emphasizing the need for trained health workers, equitable funding, data-driven decision-making, and effective collaboration among health stakeholders. Key strategies include the development of policy support, integrated data management, and access to funding sources to foster integration and capacity building within the health sector.

Examples of Adaptation strategies for Health include:[66]
- Conduct needs assessment of healthcare workers for climate and disaster risk. Identifying training needs and gaps among healthcare workers and developing tailored adaptation measures to ensure delivery of essential medical services.
- Conduct climate and disaster risk and vulnerability assessment of healthcare networks and related infrastructure. Conduct data collection and analysis, identify critical infrastructure, and assess vulnerability to develop tailored adaptation measures to ensure the delivery of essential medical services.
- Strengthen water, sanitation, and hygiene (WASH) protocols and prioritize access to health services in post-disaster and makeshift areas. Enhance and expand concrete actions to improve WASH, while ensuring access to healthcare services, as diseases can spread rapidly in communities affected by disasters and in evacuation centers.
- Accelerate standardization of data collection, especially on climate-sensitive health conditions and diseases, to ensure that information from diverse health facilities and agencies is integrated into a unified information system.
- Integration of health information systems with climate data at national and local levels to clarify the connections between climate and health. This integration will support forecasting, proactive planning, and informed decision-making.
- Develop and fund a transdisciplinary and people-centered climate and health research agenda to ensure that research findings are effectively translated into policy.

Ecosystems and Biodiversity

As one of the 18 mega-biodiverse countries in the world, the Philippines' natural ecosystems protect communities from climate hazards and provide livelihoods across key local industries such as aquaculture, agriculture, fisheries, and tourism. However, global ecosystems are particularly vulnerable to climate change impacts which puts various species in even greater

---

[66] Exhaustive list of Adaptation Measures is listed in the Philippine National Adaptation Plan

danger due to habitat degradation and ecological balance disruption brought on by the intensification of extreme weather occurrences.

The adaptation theme for Ecosystems & Biodiversity is **Safeguard and Nurture Biodiversity: Restore and Sustain Natural Assets**. The Philippines will focus on adaptation strategies that enhance the resilience of ecosystems to strengthen the nation's ability to cope with climate change while maintaining and protecting the benefits from ecosystem services. Key strategies include regular monitoring and accounting programs, along with strong enforcement of protection and management initiatives to ensure effective implementation.

Examples of Adaptation strategies for Ecosystems and Biodiversity include:[67]
- Expand and improve upon ecosystem zoning and mapping. Spatial planning involves designating specific areas for various activities and conservation priorities or actions.
- Implement vulnerability assessment and monitoring programs. Identification of climate change impacts in specific ecosystems and enable the implementation of additional measures.
- Identify, assess, and monitor vulnerable habitats on a regular basis to facilitate prompt safeguards against additional deterioration from both natural and human-induced activities, coupled with active restoration efforts to reduce further losses in the face of climate change.
- Establish collaborative research partnerships among local communities, researchers, and environmental organizations to facilitate access to scientific knowledge, allowing for systematic, evidence-based evaluations to inform decisions at the community level to enhance the resilience of ecosystems.
- Enact legislation to enhance the uses of land, ecosystems, and watersheds. Enacting policies like the National Land Use Act and Sustainable Forest Management Act to facilitate the integration and coordination of land use, ecosystems, and watersheds for social and economic purposes, alongside environmental conservation, enhances the resilience of ecosystems and communities.

Cultural Heritage, Population Displacement & Migration

Extreme climate events and hazards shape the country's migration patterns. According to estimates, between 2020 and 2022, 245 climate disaster events displaced approximately 15 million Filipinos. Moreover, the displacement of indigenous communities from their cultural lands has significant impacts on their identity, livelihoods, spiritual practices, social structures, and traditional knowledge.

The adaptation theme for Cultural Heritage, Population Displacement, & Migration is **Safeguarding Communities & Culture: Durable Solutions for Climate-Induced Mobility.** The Philippines will focus on adaptation strategies to provide displaced populations access to essential resources and psychosocial support, especially during involuntary migrations due to climate events. Proactive measures will also be taken to protect cultural heritage and honor Indigenous peoples' unique connections with their ancestral lands.

---

[67] Exhaustive list of Adaptation Measures are listed in the Philippine National Adaptation Plan

Examples of Adaptation strategies for Cultural Heritage, Population Displacement, and Migration include:[68]

- Provide adequate social facilities and programs in resettlement areas. Organize gender-responsive community events and programs that promote inclusion, safeguard displaced individuals in their new environments, and establish social facilities in resettlement areas.
- Develop incentive mechanisms to encourage climate-resilient shelter design and construction. Upgrade existing and newly built shelters by utilizing sustainable materials and methods sourced locally, positioned in areas at risk of flooding, and equipped with renewable energy sources and systems for rainwater collection.
- Define national policy framework on climate-induced migration to ensure social protection. Establish a national policy and framework to evaluate, assist, and reintegrate climate refugees and other migrants impacted by climate change.
- Strengthen capacities for safe evacuation and disaster response. Improve skills and preparedness of individuals and communities to carry out safe evacuation strategies and respond to emergencies appropriately.
- Assess the vulnerability of cultural heritage sites to climate risks. Conduct comprehensive assessment of cultural heritage sites, including detailed vulnerability maps, to identify high-risk areas and prioritize conservation initiatives.
- Integrate indigenous knowledge into climate risk assessments. Collaborate with Indigenous communities to incorporate traditional knowledge, such as local climate patterns, adaptive strategies, and sustainable resource management, into climate risk assessments.

Land Use and Human Settlements

Land use and human settlements significantly impact the Philippines' development and sustainability; however, climate change directly threatens this sector. Sea level rise is estimated to flood 160 km^2 of land by 2040 permanently, and this could sink around 85,000 residential homes, including informal settlements and coastal villages.

The adaptation theme for Land Use and Human Settlements is **Data-Driven Land Use & Settlements: Conventionalizing Robust, Evidence-Based Planning**. The Philippines will focus on adaptation strategies that strengthen resilience, support vulnerable communities, and promote inclusive governance. Key strategies include the development of reliable local climate data, enabling access to basic services and revitalized housing programs and fostering inclusive and participatory governance frameworks that empower marginalized sectors and ensure cohesive climate action across all administrative levels.

Examples of Adaptation strategies for Land Use and Human Settlements include:[69]

- Ensure access to understandable, open, and shared climate information. Developing a centralized database for information that is accessible and interoperable for settlement planning. This includes policy support to empower LGUs, academic institutions, and other stakeholders to share and access climate data.
- Enhance capacity development efforts and funding for LGUs to develop local climate assessments (e.g., Climate and disaster risk assessment). Capacitate LGUs in the development of Climate and Disaster Risk Assessments (CDRAs) using essential tools and platforms (both digital and non-digital) along with simplified guides that align with national climate action strategies.

---

[68] Exhaustive list of Adaptation Measures are listed in the Philippine National Adaptation Plan
[69] Exhaustive list of Adaptation Measures are listed in the Philippine National Adaptation Plan

- Review and revise existing guidelines to improve standards and incorporate green and resilient technologies. Promote the principles of a green and circular economy within housing initiatives and value chains across all levels while revising relevant guidelines to include gender-sensitive and climate- and disaster-resilient strategies.
- Strengthen inter-LGU collaboration and inclusive participatory planning. Facilitate the exchange of best practices among LGUs.
- Establish formal coordination platforms between local universities and state colleges for climate action. Establish linkages with local universities and state colleges that can offer access to regional data and research and support for land use and urban planning.

Livelihoods and Industries

Building resilience in Filipino livelihoods and key industries is essential for economic and social stability amid rising climate risks. By the 2030s, tropical cyclones and strong winds could affect 6 percent of manufacturing infrastructure.

The adaptation theme for Livelihoods & Industries is **Embrace Resilience: Fortifying Industry for Economic Prosperity**. The Philippines will focus on adaptation strategies to safeguard livelihoods and key industries, ensure worker well-being, and maintain business continuity amid climate risks. Key strategies include conducting thorough risk assessments to identify vulnerabilities in critical infrastructure, revising worker practices and regulations for Micro, Small, and Medium Enterprises (MSMEs), promoting green job opportunities, and implementing measures to protect supply chains to prevent revenue losses.

Examples of Adaptation strategies for Livelihoods and Industries include:[70]
- Standardize assessment of climate risks across key industry infrastructure. Offer industry stakeholders a set of tools, including guidelines, requirements, and access to climate impact data, to conduct climate risk assessments along the value chain. Additionally, it provides capacity-building support for MSMEs.
- Broaden the roll-out of incentivization programs to reinforce critical infrastructure at risk. Expand incentive mechanisms to encourage the private sector to prioritize climate de-risking and ensure support for MSMEs.
- Develop sector-specific guidelines for the treatment and handling of workers in relation to climate change. Establish collaborations among government agencies, industry associations, and private companies to assess regulations safeguarding workers from climate-related hazards, including extreme weather safety, and create industry-specific protective guidelines.
- Enhance capacity building and training of climate-resilient skills. Implement training programs to equip workers with skills on climate-resilient practices, including reskilling those from industries affected by climate change.
- Ensure funding and capacity to activate social protection for impacted workers. Implement programs to assist individuals facing job loss or economic challenges due to climate impacts or the shift to a climate-resilient economy.
- Scale awareness programs to educate industries on best-practice adaptation strategies. Inform industries about tailored adaptation strategies to enhance their understanding of climate change impacts.

---

[70] Exhaustive list of Adaptation Measures is listed in the Philippine National Adaptation Plan

Energy, Transport, and Communications

The Energy, Transportation, and Communications sector—consists of crucial systems that empower and interconnect companies, enterprises, and households, facilitating economic activity and growth while providing communities with important services. However, rapid economic and demographic growth and poorly managed initiatives have resulted in overloaded infrastructure systems. Climate change is expected to worsen vulnerabilities in the Energy, Transport, and Communications sectors, affecting infrastructure and service demand across these systems.

The adaptation theme for Energy, Transport, and Communication is **Protect Critical Infrastructure Systems: Secure and Sustain Access and Connectivity**. The Philippines will prioritize adaptation strategies that ensure the resilience and responsiveness of energy, transportation, and communication infrastructure systems to climate change and growing demands. Key strategies include integrating resilience and risk assessments in the whole infrastructure planning and construction processes.

Examples of Adaptation strategies for Energy, Transport, and Communication include:[71]
- Upgrade engineering design codes for critical infrastructure. Revising engineering design codes and standards for critical infrastructure to incorporate risk considerations.
- Regulate and enforce critical infrastructure standards based on land zoning and risk assessment. Enhance building codes and land use regulations, including the National Land Use Act and National Building Code, based on comprehensive risk assessments to ensure that critical infrastructure is strategically sited and designed to withstand climate impacts.
- Incorporate climate risk into the planning of roadways and transportation hubs. Strategically identify efficient road routes and optimal transportation hub locations while considering climate risks and standard considerations.
- Integrate energy infrastructure planning and site selection. Establish new energy infrastructure in optimal locations based on risk assessments in alignment with the Philippine Energy Resiliency Policy and the National Energy Contingency Plan.

Key Enablers for Adaptation Actions

The implementation of NAP's agenda for strengthening climate resilience in the Philippines requires a comprehensive, whole-of-country approach. An implementation framework was developed to ensure effective implementation, guided by international guidelines, adaptation platforms, and national circumstances. The NAP follows a dynamic cycle with three phases—planning, implementation, monitoring, evaluation, accountability, and learning (MEAL)-–supported by key cross-cutting enablers.

---

[71] Exhaustive list of Adaptation Measures are listed in the Philippine National Adaptation Plan

Six cross-cutting enablers were identified that are crucial for the effective planning, implementation, monitoring, evaluation, accountability, and learning of the NAP, namely:

a. **Governance and Institutions** are pivotal in enabling the NAP process. They provide the necessary framework for coordination and co-ownership and ensure national and local priorities are aligned with the NAP for effective, inclusive, and sustained adaptation strategies.
b. **Stakeholder Engagement** ensures that diverse perspectives, knowledge, and experience are integrated into developing adaptation strategies. This will ensure that the adaptation strategies are responsive to the needs of the most vulnerable population.
c. **Skills and Capacity-Building** empower stakeholders with the knowledge and skills to effectively plan, execute, and ensure that adaptation strategies are sustainable and scaled up at all levels.
d. Crucial to NAP implementation is the availability and access to **Data and Knowledge Infrastructure** to support decision-makers in developing informed and science-based policies, plans, and adaptation strategies.
e. Advancing **technology and innovation** is crucial for economic growth, social progress, and addressing climate change impacts. This includes developing tools, policies, and solutions for adaptation.
f. **Adaptation financing** involves deploying strategies to secure, allocate, access, and optimize the use of financial resources for addressing climate impacts. This enabler is important to address issues and opportunities in allocating, accessing, and utilizing each funding source.

Monitoring and Evaluation of Adaptation Actions and Processes

This section will provide information on the Monitoring and Evaluation process in the Philippines. The subsection also outlines the process for the development of the NAP Monitoring, Evaluation, Accountability, and Learning (MEAL) System and the identification of indicators.

Experience in Monitoring and Evaluation of Climate Action

Each government institution has established its own M&E systems to track progress in implementing its sectoral plans and programs. However, the Philippines has yet to establish a robust M&E system specific for tracking and assessing the implementation of adaptation measures in the country. Previously, the Philippines developed an RBMES for the NCCAP, which guided the systematic monitoring, evaluation, and implementation of CCAM initiatives as detailed in the NCCAP from 2011 to 2028.

The RBMES was employed during the development of the first iteration of the NCCAP Monitoring and Evaluation Report FY 2011-2016, published in 2019. The report examined the government's readiness by assessing the effectiveness of enabling policies and their implementation plans and programs. It analyzed the institutional framework and capacity that facilitate or hinder adaptation, evaluated the quality and extent of capacity development, and

reviewed the management of knowledge systems within the government, focusing on their relevance, quality, and timeliness.

Despite the challenging process, the quality and reliability of the data collected did not align entirely with the established indicators, mainly due to missing, outdated, or insufficient data from NGAs.

Development of the NAP Monitoring, Evaluation, Accountability, and Learning (MEAL) system

The Philippines aims to develop a NAP Monitoring, Evaluation, Accountability, and Learning (MEAL) system to ensure timely tracking of outcomes and strategies This will leverage on existing sectoral plans, both international and national, as well as M&E frameworks (i.e., NCCAP RBMES), and informed by the thematic and dimensional targets under the UAE Framework for Global Climate Resilience and the ongoing work under the two-year UAE Belém work programme. Once established, linkages among relevant frameworks will identify critical gaps and guide the selection of suitable indicators/metrics. The CCC will spearhead the NAP MEAL system development in coordination with relevant government instrumentalities.

The MEAL system is crucial for executing the NAP, ensuring adaptation measures are effective, inclusive, and responsive to climate change. This will provide a framework to monitor long-term implementation, enhance accountability among relevant governmental and non-governmental organizations, promote learning, and inform future updates.
Additionally, the MEAL system will ensure the timely execution and reporting of progress regarding adaptation measures, identify specific, measurable, achievable, relevant, time-bound, and gender-responsive indicators, and delineate the roles and responsibilities of key stakeholders.

Development of Indicators

Following the adoption of the Philippine NAP, the country will identify and select indicators drawing from previous M&E exercises, ensuring alignment with national strategies and the ongoing UAE Belém work programme and Framework for Global Climate Resilience. Furthermore, data collection will ensure the involvement of all levels of government and relevant stakeholders for a cohesive MEAL System.

 Progress on the development of the NAP MEAL systems, including the identification and development of indicators, will be reported in the next iteration of the BTR.

Information Related to Averting, Minimizing and Addressing Loss and Damage Associated with Climate Change Impacts

This section discussed the actions taken by the Philippines in averting, minimizing, and addressing climate-related losses and damages.

Actions to Averting, Minimizing, and Addressing Climate-Related Loss and Damage

The Synthesis Report of the Sixth Assessment Report of the IPCC underscores that human-caused climate change is already affecting many weather and climate extremes in every region across the globe, and this has led to widespread adverse impacts and related losses and damages to nature and people. Vulnerable countries that historically contributed the least to climate change are disproportionately affected.

The Philippines has long been actively engaging in the UNFCCC international climate negotiations to advance the country's position on Loss & Damage. The twenty-eighth session of the Conference of Parties (COP28) and fifth session of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA) in 2023 marked a historical milestone with the operationalization of the Fund for responding to Loss and Damage (FrLD) as an as entity entrusted with the operation of the Financial Mechanism of the Convention, which would also serve the Paris Agreement. The FrLD is mandated to assist developing countries particularly vulnerable to the adverse effects of climate change in responding to economic and non-economic losses and damages, including extreme weather events and slow onset events. The Philippines' hosting of the FrLD Board allows the opportunity to focus on the Asia-Pacific region, where many countries struggle with limited resources, hindering the ability to respond to the effects of climate change. Also, during COP 28, The Philippines announced its interest in hosting the FrLD.

At the second meeting of the Board of the Fund held on 09 July 2024, the Board adopted a decision to select the Philippines as the host country of the Board of the Fund. The historic selection of the Philippines as the host of the Board of the Fund for responding to loss and damage due to climate change will further strengthen the country's role in the global climate finance and loss and damage policy landscape. These measures also align with the Philippines' commitments under international agreements such as the Paris Agreement, the Sendai Framework for Disaster Risk Reduction, and the Philippine Development Plan 2023-2028. Further, the Philippines' hosting of the Board shall support the acceleration of developing countries' unhindered access to climate finance, which shall aid in the development and implementation of transformative and science-based strategies and initiatives for climate change adaptation, mitigation, and disaster risk management, towards ensuring sustainable and inclusive growth for all. Hosting the board presents opportunities to develop national and local capacities for climate response, improving institutional mechanisms and collaboration among various stakeholders, including government agencies, civil society, and the private sector.

On 28 August 2024, the Philippines signed into law Republic Act No. 12019 also known as the Loss and Damage Fund Board Act. The law grants juridical personality and legal capacity to the Loss and Damage Fund Board, which will respond to loss and damage due to climate change. Further, the Philippines and the Co-Chairs of the Board of the FrLD signed the Host Country Agreement (HCA) on 12 November 2024 during the COP29 event titled, "From Pledges to Action: Full Operationalization of the Fund for Responding to Loss and Damage," as organized by the COP Presidency. The HCA governs the interaction between the FrLD Board and the Philippine Government, including the granting of privileges and immunities to the Board.

In the national context, the Philippines addresses climate-related losses and damages through its NAP, which outlines adaptation strategies, policies, plans, and actions to integrate adaptation into national policies. Key actions for managing losses and damages include the development of social protection mechanisms, climate insurance schemes for extreme weather events, and vulnerability risk assessments for cultural heritage sites.

The subsection on Observed and Potential Impacts of Climate Change provides details on the recorded losses and damages in the Philippines.

Additionally, the Philippines has established policies to avert, minimize, and address climate-related losses and damages, including:

- Republic Act No. 10121, known as the Philippine Disaster Risk Reduction and Management Act of 2010, was enacted to enhance the capabilities of both national and local governments in executing strategies for disaster preparedness, response, and recovery. Furthermore, the Act established the National Disaster Risk Reduction Management Council (NDRRMC), which comprises representatives from government entities, private sectors, civil society organizations, and various stakeholders. This Council serves as the oversight body responsible for developing policies, plans, and measures related to Disaster Risk Reduction.
- The NCRMF, adopted through Commission Resolution No. 2019-001, underpins the Philippines' climate change adaptation and loss and damage management work, seeking to advance the risk assessment methodology in view of the increasing uncertainty surrounding climate change. The NAP mentioned the NCRMF as a framework and will be subjected to ground-level assessment based on granular information, which will be undertaken subsequently.
- Republic Act No. 11995 (RA 11995) or the Philippine Ecosystem and Natural Capital Accounting System (PENCAS) Act, recognizes the importance of institutionalizing natural capital accounting as part of the strategy for CCAM, taking into consideration the economic value of ecosystem services and the need for sustainable resource management. This aims to serve as the basis for estimating the value of losses and damages concerning BAU and the cost-effectiveness of interventions to reduce loss and damage.

CHAPTER 5: INFORMATION ON FINANCIAL, TECHNOLOGY DEVELOPMENT AND TRANSFER AND CAPACITY BUILDING SUPPORT NEEDED AND RECEIVED

Financing the Philippines' Nationally Determined Contribution

The Philippines' NDCIP, issued in May 2024, outlines the need for significant investments to meet the 75 percent NDC target. Specifically, the implementation of the NDC Policies and Measures (PAMs) is estimated to require approximately USD 72 billion (PHP 4 trillion) for the energy, transport, waste, agriculture, energy sectors. The energy sector has the highest demand, requiring an investment of USD 36.5 billion, followed by the transport sector, with almost USD 33 billion. Meeting this investment requirement will necessitate support from development partners and the private sector to complement publicly mobilized domestic resources. Achieving these goals will depend on the availability of effective financing mechanisms, technology support, and capacity-building initiatives.

Financing the Philippines' National Adaptation Plan

The Philippine government adopted the country's first NAP in May 2024, which aims to reduce vulnerability and build resilience. The NAP estimates the cost of inaction reach USD 25.17 billion (PHP 1.4 trillion) by 2030, or about 8 percent of the 2020 GDP. The economic risks of failing to address climate change threaten both the well-being of the population and the national economy.

To address adaptation financing, the NAP prioritizes creating a national investment and financing plan. This plan will quantify costs, address financial gaps, prioritize interventions, and identify strategies to unlock sustainable financing options for each adaptation priority.

The NAP further emphasizes that, as a developing country disproportionately affected by climate change, the Philippines must blend domestic public funding, international development aid, and private sector investments to sustain its adaptation initiatives. This approach underscores the urgent need to scale up financial resources to protect vulnerable communities and strengthen resilience against climate impacts.

Definition of Climate Finance in the Philippines

Republic Act No. 10174 defines climate finance as resources allocated for climate change adaptation and mitigation in vulnerable communities. Efforts to access, mobilize, and track both domestic and international climate finance operate within this framework.

The Philippines supports country-driven, needs-based financing for climate action, aligning with global developments in climate finance architecture.

Systems and Processes for Tracking and Monitoring Domestic Climate Finance

The CCET is a tool to track, monitor, and report climate change-related Programs, Activities, and Projects (PAPs) of government agencies and local governments funded through domestic resources, such as the General Appropriations Act. This tracking and monitoring system works at both national and subnational levels, fostering alignment between climate policies and budgets and ensuring proper allocation and implementation of climate actions.

The PSF, established under RA 10174, is a special fund within the National Treasury that provides long-term financing for adaptation projects led by local government units and community organizations. These projects aim to enhance the resilience of communities and ecosystems against the impacts of climate change.

Systems and Processes for Tracking and Monitoring International Climate Finance

Under Republic Act No. 8182 (Official Development Assistance Act of 1996) as amended by RA 8555, the National Economic and Development Authority (NEDA) reviews projects financed through ODA, including those for CCAM and Disaster Risk Reduction (DRR). ODA refers to loans and grants promoting sustainable development and the welfare of the Philippines.

The 2023 ODA Portfolio Review Report lists projects on CCAM and DRR, filtered for the Biennial Transparency Report to focus on projects targeting CCAM. However, this report does not provide all the necessary data for the common tabular format, such as project timelines, implementation status, and sector details.

In 2023, 46 programs and projects were tagged under CCAM, with 15 supported by loans and 31 by grants. These programs and projects totaled USD 1.96 billion (PHP 109.08 billion), with loans accounting for 88.72 percent and grants for 11.28 percent.

Projects are categorized as Adaptation (A), Mitigation (M), or both (A/M), reflecting the type of support provided.

Table 27: Summary of Support Received by Loans/Grants

Loans/ Grants	Type of Support	SUM of Domestic Currency (in million PHP)	SUM of USD (in million USD)	Percent share
Grants	A	1,305.96	23.48	1.20
	A/M	416.82	7.49	0.38
	M	10,577.76	190.14	9.70
Grants Sub-Total		**12,300.54**	**221.11**	**11.28**
Loans	A	71,870.74	1,291.93	65.89
	M	24,912.09	447.81	22.84
Loans Sub-Total		**96,782.83**	**1,739.75**	**88.72**
Grand Total		**109,083.37**	**1,960.86**	**100.00**

Significant financing gaps remain for both mitigation and adaptation objectives. Despite access to bilateral and multilateral funding, available resources are underutilized. Rebalancing the loans-to-grants ratio and addressing the country's debt situation must be emphasized.

The NDCIP requires an estimated USD 72 billion (PHP 4.1 trillion) for PAMs, but only USD 637 million (PHP 38.2 billion) has been secured through grants and loans for mitigation programs.

Similarly, adaptation measures in the NAP face similar challenges in securing sufficient and predictable funding. Current climate financing, though drawn from multiple and blended finance sources, remains inadequate to meet the country's climate ambitions.

The NAP and NDCIP outlined priority sectors, cross-cutting strategies, and key investment priorities for adaptation and climate resilience and losses and damages, and greenhouse gas emissions reduction, respectively. Recognizing the importance of international cooperation to scale up transformative climate action, a survey template on mapping climate interventions was circulated to identified development partners. The survey aims to serve as a reference for the Philippine Government in optimizing the technical support available or in the pipeline, directly supporting NAP and NDCIP, and focusing on transformative outcomes on the ground through capacity building, technology development, and transfer and finance. Based on the results of this survey, an amount of USD 19 billion was tagged for 190 NAP-related projects, with 91% from loans and 9% from grants.

The majority of interventions are at the subnational and national levels. Further, environment and natural resources and cross-cutting projects comprise a significant portion of the partner's support. There are few projects related to health, livelihoods, industries, cultural heritage, migration, land use, and human settlements. Consequently, there is an amount of USD 13.55 billion tagged as NDC-aligned projects comprising 26% loans and 74% grants. The majority (87.03%) of these projects are on transport, while other sectors are energy (7.99%), cross-cutting (4.23%), agriculture (0.60%), waste (0.09%), and IPPU (0.07%).

While international support has contributed to advancing climate action, the country continues to face data gaps and limited technical capacity, hindering the full implementation

of climate-related plans. Capacity-building is crucial across all sectors to ensure the effective and sustained delivery of mitigation and adaptation measures. The NDCIP outlines Institutional and Technical Capacity Needs to support sectoral PAMs, aligning with the Paris Agreement's modes of implementation. Similarly, the NAP identifies Skills and Capacity Building as a key cross-cutting enabler essential for its implementation, equipping stakeholders with the necessary knowledge, tools, and networks to drive climate action.

The Philippines recognizes the importance of financial support, technology development and transfer, and capacity-building to enhance climate efforts under the NAP and NDCIP. The timely and adequate delivery of climate finance, as well as the means of implementation for developing countries, remains crucial in scaling up climate action.

CHAPTER 6: INFORMATION ON FLEXIBILITY

Decision 18/CMA.1 outlines the MPGs for implementing the ETF under the Paris Agreement. This decision allows flexibility for developing country Parties based on their capacities. Flexibility provisions ensure that these countries can meet transparency requirements while considering national circumstances, resource limitations, and institutional capacities. This supports progressive improvements in transparency, aligning with the Paris Agreement's principles of equity and ambition.

The Philippines has applied flexibility in reporting under the ETF. The MPGs require countries that utilize flexibility to outline plans for improving transparency in future reports. The Philippines has prepared an improvement plan highlighting key actions, indicative timelines, and dependencies on national circumstances and resource availability. **Table 28** and **Table 29** summarize the applied flexibilities, the corresponding actions for enhancement, and a timeline for achieving these improvements. This ensures a clear trajectory toward meeting the full transparency requirements of the Paris Agreement in the subsequent BTR submissions.

Table 28: List of Flexibilities Applied in Reporting National GHG Inventories

Reporting Component and Flexibility Applied	Data and Information Gaps and Challenges	Action for Improvement	Improvement by
Uncertainty Assessment: Flexibility to provide, at a minimum, a qualitative discussion of uncertainty for key categories, using the IPCC guidelines, both for the latest inventory year and the trend, instead of quantitatively estimating and qualitatively discussing the uncertainty of the emissions and removal estimates for all categories, including inventory totals, for at least the starting year and the latest reporting year of the inventory time series and also estimating the trend uncertainty for these same categories/ inventory totals for the entire time series.	• Limited capacity, resources, expertise, and knowledge in conducting uncertainty analysis.	• Engage in and contribute to capacity-building initiatives focused on uncertainty analysis. • Establish or institutionalize the integration of uncertainty data collection into the compilation process.	Submission of BTR 3 in 2028, contingent on capacity-building activities and resources.
Quality Assurance/Quality Control: Developing countries that need flexibility in light of their capacities are encouraged to elaborate an inventory QA/QC plan in accordance with the IPCC guidelines, including information on the inventory agency responsible for implementing QA/QC; instead of a mandatory requirement to elaborate the QA/QC plan for other Parties.	• No available domestic GHG Inventory expert for the Waste and IPPU sectors to conduct Quality Assurance (QA).	• Explore partnerships with academe and research institutions. • Explore international experts to conduct QA.	Submission of BTR 2 in 2026, contingent on availability of expert/s and resources.
Gases: Flexibility to report at least 3 gases (CO_2, CH_4, and N_2O) as well as any of the additional four gases (HFCs, PFCs, SF_6, and NF_3) that are included in the Party's NDC under Article 4 of the Paris Agreement, are covered by an activity under Article 6 of the Paris Agreement, or have been previously reported; instead of mandatory requirement to report on the basket of 7 gases.	• Limited capacity and resources to collect emission sources of PFC, SF_6, and NF_3 gases.	• Establish and enhance the data collection process in the IPPU sector. • Conduct capacity-building activities for data compilers.	Submission of BTR 3 in 2028, contingent on capacity-building, improvement in the data collection process, and available resources.
Time Series: Flexibility to report data covering, at a minimum, the reference year/period for its NDC and, in addition, a consistent annual time series from at least 2020 onward; instead of the mandatory requirement to report a consistent annual time series starting from 1990.	• Limited capacity and resources to generate annual GHG inventories starting from 1990. • Limited capacity and resources to perform recalculation for the previous GHG inventory years developed.	• Explore possible support for capacity-building activities and technical assistance to conduct recalculation. • Develop capacity to enhance reporting quality, timely, and accurate GHG inventory.	Submission of BTR 3 in 2028, contingent on support provided for technical assistance and available resources.

Table 29: List of flexibilities applied in NDC tracking

Reporting Component and Flexibility Applied	Data and Information Gaps and Challenges	Action for Improvement	Improvement by
GHG Emission Reductions (achieved and expected): Each Party shall provide, to the extent possible, estimates of expected and achieved GHG emission reductions for its actions, policies, and measures in the tabular format; those developing country Parties that need flexibility in the light of their capacities with respect to this provision are instead encouraged to report this information.	• Limited capacity and resources to measure achieved and expected mitigated emissions • The MRV system has yet to be established based on the recently developed NDC Implementation Plan.	• Explore possible support to estimate and monitor mitigation impacts of implemented NDC. • Institutionalize central and sectoral MRV systems to track NDC implementation progress.	Submission of BTR 3 in 2028, contingent on support provided for technical assistance and available resources.
Projections for With Existing Measures, With Additional Measures, and Without Measures: Each Party shall report projections pursuant to paragraphs 93–101 below; those developing country Parties that need flexibility in the light of their capacities are instead encouraged to report these projections. Projections shall begin from the most recent year in the Party's NRI and extend at least 15 years beyond the next year ending in zero or five; those developing country Parties that need flexibility in the light of their capacities with respect to this provision have the flexibility to instead extend their projections at least to the end point of their NDC under Article 4 of the Paris Agreement. Those developing country Parties that need flexibility in the light of their capacities can instead report using a less detailed methodology or coverage	• Limited capacity and resources to provide comprehensive and accurate projections.	• Conduct capacity-building activities to enhance technical capacities to use modeling tools, improve data systems, and technical training to align with the full reporting guidelines. • Explore possible support for technical assistance to project emissions to comply with detailed reporting requirements. • Projections to be included in the 2025 PH NDC submission.	Submission of BTR 2 in 2026, contingent on support provided for technical assistance and available resources.

CHAPTER 7: IMPROVEMENTS IN REPORTING OVER TIME

The following tables outline the activities and actions aimed at improving the reporting of the (a) National GHG Inventory, (b) Tracking NDC implementation Progress, (c) Climate change impacts and adaptation, and (d) FTC Support Needed and Received. The activities and actions were identified through workshops and capacity-building activities with sectoral agencies facilitated by CCC and DENR and supported by CBIT-GSP and UN FAO.

For the National GHG Inventory (**Table 30**), improvements will focus on conducting capacity-building activities, enhancing coordination, and conducting studies to improve data collection and calculate the sectoral GHG.

For Tracking NDC Implementation Progress (**Table 31**), improvements will focus on developing guidelines and policies for reporting and tracking the implementation of NDC PAMs. These include encouraging the participation of more agencies and the private sector in NDC and just transition efforts.

For Climate Change Impacts and Adaptation (**Table 32**), improvements will focus on developing the NAP MEAL/RBMES system, which includes identifying indicators to effectively track the NAP implementation. Additional enhancements will involve activities to localize the NAP, such as establishing a uniform methodology for vulnerability and risk assessments. This will also include capacity-building for local government units (LGUs) to plan and implement locally led adaptation measures and create an enabling policy framework for Nature-Based Solutions (NbS).

For FTC Support Needed and Received (**Table 33**), improvements will focus on enhancing technology transfer and implementation support, identifying sector-specific institutions to facilitate effective activities, conducting capacity-building programs to improve project proposal development, and establishing robust mechanisms for monitoring and reporting on the status of ODA projects.

Support is still required to address challenges in producing the BTR and in using the final versions of reporting tools.

Table 30: Identified Activities and Actions for Improvements on Reporting for the National GHG Inventory

Sector	Activity/Action	Agency/ies Involved
Agriculture	Conduct capacity-building activities for the agriculture sector to enhance expertise on GHG inventories	PSA, DA, CCC
	Generate country-specific emission factors specific to the agriculture sector for recalculation and time series.	DA, CCC, and PSA
	Continue ongoing studies to estimate livestock emissions using the Tier 2 approach.	DA
Transportation	Organize capacity-building programs for the transportation sector to improve data accuracy and reporting.	DOTr, CCC, DOE
Solid Waste	Enhance data collection for open burning, fossil liquid waste, incineration, thermal treatment, and slaughterhouses.	DENR
	Develop appropriate policy instruments in collaboration with DOH to manage hospital and clinical hazardous wastes.	DENR
	Refine characterization and categorization of hospital and clinical hazardous wastes.	DENR
	Establish a rendering facility to manage slaughterhouse waste efficiently.	DENR
	Integrate hazardous solid waste reporting into the existing system of relevant DENR agencies.	DENR
	Promote LGU adoption of updated WACS (Waste Analysis and Characterization Study) guidelines.	DENR
Wastewater	Conduct studies to improve parameters for wastewater generation and influent COD by industry type.	DENR
	Implement capacity-building initiatives to improve data collection for wastewater.	DENR
	Strengthen validation processes for domestic wastewater data.	DENR
IPPU	Strengthen coordination with the private sector to improve reporting of GHG emissions.	DENR
	Establish partnerships with DOE to utilize the Philippine Energy Labelling Program database for the RAC sector.	DENR

	Seek clarification from experts on the operational characteristics of iron and steel furnaces in the Philippines.	DENR
Energy	Support the energy sector in adopting the Tier 2 methodology through training and improved data collection.	DOE, CCC
	Develop emission factors for biomass energy use and liquid fuels.	DOE, CCC
	Enhance capacity to generate data for energy balance tables and energy consumption.	DOE
	Identify facilities involved in energy generation or auto production.	DOE
Land Use, Land-Use Change, and Forestry	Call for support/ assistance from development partners/ other parties in improving the capacities of generating such activity data.	DENR, CCC
	Establish data sharing arrangements and protocols among academe, research organizations, and relevant government agencies, with the support of overarching policy.	DENR
	Prompt release of biennial updated land cover data using the Satellite Land Monitoring System under the National Forest Monitoring System.	DENR
	Further capacity building exercises shall be in place and establishing a pool of experts specifically for LULUCF.	DENR, CCC
	For the forestry sector, the conduct of National Forest Inventory will further strengthen the data/ information integrity in relation to forest datasets. The FMB redesigned the methodology based on the FAO's Forest Resources Assessment while increasing its accuracy and precision of the data generated therein. The Department will commence its National Forest Inventory in 2025.	DENR
Cross-Cutting	Strengthen coordination among stakeholders to improve data collection processes.	Sectoral agencies

Table 31: Identified Activities and Actions for Improvements on Reporting for Tracking NDC Implementation Progress

Category	Activity/Action	Agency/ies Involved
Cross-Cutting	Provide guidelines and templates for tracking NDC progress, harmonized with data collection for the GHG inventory.	CCC, NDC TWG
	Develop policies requiring implementing agencies, such as NGAs and the private sector, to submit information for NDC and GHG reporting.	CCC, NDC TWG, SEC
	Expand the CCET system to include private-sector participants.	CCC and DBM
	Establish an incentive system (not necessarily monetary) to encourage private sector and LGU participation in NDC implementation.	CCC, NDC TWG
	Conduct capacity-building initiatives for mitigation and economic assessment at the project or Policy and Measure (PAM) level.	
	Increase allocation of resources, including workforce and funding, for implementing and monitoring NDC commitments.	
	Provide clarity and guidance on NDC targets to be achieved through Article 6 mechanisms and carbon markets.	CCC, DENR, NDC TWG
Transportation	Include a specific provision for regular reporting of data collection in coordination with the DOTr.	DOTr
Just Transition	Update the Philippine Green Employment Model to align with current and future just transition goals.	DOLE
	Support the identification and estimation of social costs associated with the transition to a low-carbon economy.	
	Develop toolkits for technology deployment and capacity-building for entity-level just transition efforts.	

Table 32: Identified Activities and Actions for Improvements on Reporting for Climate Change Impacts and Adaptation

Category	Activity/Action	Agency/ies Involved
NAP MEAL/ RBMES Development	Establish a robust and operational NAP MEAL/RBMES system.	CCC, NGAs
	Assess indicators from sectoral development plans to create specific indicators for NAP.	
	Develop institutional arrangements to effectively implement the NAP MEAL/RBMES framework.	
Localization	Localize NAP for LGUs to align LCCAP with the NAP.	LGUs, CCC, NGAs, Academe
	Develop a unified methodology for conducting risk and vulnerability assessments for LGUs or the eight sectoral outcomes of NAP.	LGUs, CCC, Academe
PSF Monitoring	Conduct M&E of PSF projects through the DOF, as PSF Board Secretariat.	PSF Board, PSF Secretariat, LGUs
	Increase LGU and NGA capacity for identifying and developing projects eligible for PSF funding.	DOF, CCC, LGUs, NGAs
Capacity Building	Enhance capacity for LCCAP development, implementation, monitoring, and updating.	CCC, LGUs
	Improve capacity of LGUs and NGAs for adaptation project development and sustainability.	NGAs, LGUs
	Improve accessibility and availability of data and information to support adaptation initiatives.	LGUs, NGAs, Academe
	Explore partnerships and collaborations for data management related to adaptation initiatives.	NGAs, Private Sector
Policy Development	Create an enabling policy framework for Nature-Based Solution (NbS) guidelines and criteria.	CCC, NGAs
	Develop mechanisms to identify committed adaptation initiatives and ensure sustainability for NGAs.	CCC, NGAs
	Formulate a policy to engage the private sector and businesses in data collection and reporting of mitigation and adaptation initiatives.	NGAs, Private Sector
Adaptation and Mitigation	Establish a system for monitoring green bonds, blue bonds, and sustainability-linked bonds, with BSP as the main actor.	BSP, NGAs
	Include the role and contribution of the academe in adaptation and mitigation monitoring.	Academe, NGAs
	Conduct assessments of the co-benefits of adaptation and mitigation projects.	NGAs, Private Sector

Table 33: Identified Activities and Actions for Improvements on Reporting for FTC Support Needed and Received

Category	Activity/Action	Key Considerations
Technology Transfer	Explore opportunities to enhance support for technology transfer, development, and implementation.	Focus on NDC-aligned sectors (e.g., agriculture, waste, energy, IPPU, transport, forestry, land use).
	Identify sector-specific support institutions to facilitate the effective implementation of activities and measures.	
Capacity Building	Conduct capacity-building programs for NGAs and LGUs to improve project proposal development.	Include training on tagging climate change adaptation (CCA) and climate change mitigation (CCM) initiatives.
	Ensure alignment of capacity-building activities with sectoral priorities under the NDC.	
Support Prioritization	Prioritize measures and programs to strategically request international and domestic support.	Assess alignment with ODA project requirements and NDC objectives.
	Coordinate with NEDA to ensure consistent tagging of CCA and CCM-related activities.	
	Avoid misclassification as disaster mitigation; ensure NDC Policies and Measures (PAMs) are properly tagged as mitigation (M).	
Monitoring & Reporting	Develop mechanisms to monitor and report on the status (ongoing, completed, etc.) and timeframes of ODA projects.	Include information on whether the projects address NDC sectors and focus on capacity-building, technology transfer, or financing.

Effective delivery of means of implementation, with a focus on strengthening institutional coordination, capacity building, and monitoring mechanisms, is crucial for reinforcing climate action, transparency, and MRV in the Philippines. Enhanced collaboration among NGAs, LGUs, and the private sector will streamline data collection and reporting for the National GHG Inventory and NDC tracking. Institutional arrangements, including the operationalization of frameworks like the NAP MEAL/RBMES system, will ensure efficient monitoring of adaptation and mitigation efforts.

Sector-specific capacity-building programs will equip stakeholders with the tools and expertise for project development, data management, and advanced methodologies. These initiatives will also empower LGUs to localize climate plans, adopt nature-based solutions, and align with national objectives. Furthermore, incentivizing private sector and LGU participation through recognition programs and enabling policies can further promote technology transfer and support sustainable adaptation and mitigation efforts.