



Ministry of Tourism and Environment
Republic of Maldives

Training Report

Training on Tools & Methodologies for Tracking Mitigation Actions

Consultancy Service for Tracking Mitigation Actions

CBIT Maldives

Capacity Building for Improved Transparency
of Climate Change Mitigation and Adaptation
Actions in the Maldives





Ministry of Tourism and Environment
Republic of Maldives

Training Report

Training on Tools & Methodologies for Tracking Mitigation Actions

Consultancy Service for Tracking Mitigation Actions

CBIT MALDIVES

Capacity Strengthening for Improved Transparency of
Climate Change Mitigation and Adaptation Actions in the
Maldives Project





Ministry of Tourism and Environment

Capacity Strengthening for Improved
Transparency of Climate Change
Mitigation and Adaptation Actions in the
Maldives Project (CBIT Maldives)



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This document was developed under the project “Capacity Strengthening for Improved Transparency of Climate Change Mitigation and Adaptation Actions in the Maldives (CBIT Maldives)”, financed by the Global Environment Facility (GEF).

The project is executed by the Ministry of Tourism and Environment, with implementation support from the United Nations Environment Programme (UN Environment).

December 2025

Consultant:



Riyan Private Limited



Grant Thornton

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Abbreviations

Abbreviation	Full Form
BTR	Biennial Transparency Report
CBIT	Capacity-Building Initiative for Transparency
CO ₂ eq	Carbon Dioxide Equivalent
EPA	Environment Protection Agency
GEF	Global Environment Facility
GHG	Greenhouse Gas
IPCC	Intergovernmental Panel on Climate Change
MACL	Maldives Airports Company Limited
MBS	Maldives Bureau of Statistics
MoTE	Ministry of Tourism and Environment
MoTCA	Ministry of Transport and Civil Aviation
MNU	Maldives National University
MPL	Maldives Ports Limited
MWSC	Male' Water and Sewerage Company
NDC	Nationally Determined Contribution
RE	Renewable Energy
SCADA	Supervisory Control and Data Acquisition
SOE	State-Owned Enterprise
STO	State Trading Organization
STELCO	State Electric Company Limited
UNFCCC	United Nations Framework Convention on Climate Change
URA	Utility Regulatory Authority
WAMCO	Waste Management Corporation Limited
WtE	Waste-to-Energy

Executive Summary

Climate change continues to pose significant risks to the Maldives, and despite contributing minimally to global emissions, the country has committed to ambitious targets, reduce 1.52 million tonnes of CO₂eq in 2035, conditional on receiving adequate support and financial resources, technology, capacity building, and other means of implementation in the context of sustainable development. . The Ministry of Tourism and Environment is currently undertaking the “Capacity Strengthening for Improved Transparency of Climate Change Mitigation and Adaptation Actions in the Maldives (CBIT Maldives)” project, funded by the Global Environment Facility (GEF) and supported by UN Environment Programme. Under the project, a training workshop aimed to strengthen national capacity for tracking and reporting mitigation actions in line with the Enhanced Transparency Framework (ETF) of the Paris Agreement was conducted at Meerumaa Hall on December 8, 2025.

The workshop brought together 16 (9 male, 7 female) participants from key government institutions, state-owned enterprises, and national agencies responsible for providing sectoral data. Participants were introduced to the Maldives' updated NDC targets, sectoral mitigation initiatives, and the finalized indicators and methodologies for monitoring progress in renewable energy, energy efficiency, transport, and waste-to-energy sectors. Technical sessions facilitated by experts from Riyan Pvt Ltd and Grant Thornton Bharat LLP provided step-by-step guidance on applying estimation methodologies, using standardized data-capturing formats, and aligning reporting processes with ETF requirements.

Participants also engaged in practical breakout exercises where they applied the standardized methodologies to real-world scenarios involving renewable energy deployment, energy efficiency improvements, and electric vehicle adoption. These exercises strengthened their understanding of baseline establishment, relevant parameters, calculation of greenhouse gas reductions, and multi-year projection of mitigation outcomes. The collaborative activities highlighted the importance of coordinated data collection, harmonized reporting formats, and consistent application of approved methodologies for national-level tracking.

The workshop concluded with a call for sustained capacity-building efforts to ensure high-quality, transparent, and timely reporting of mitigation actions.

Introduction

The objective of the training workshop was to enhance the understanding and capacity of stakeholders involved in tracking mitigation actions under the NDC. It was specifically targeted to data providers responsible for supplying sectoral information needed to estimate and track mitigation indicators. The workshop introduced participants to the indicators, estimation methodologies, and data reporting formats developed to support consistent and transparent reporting of mitigation actions in key sectors, particularly energy and waste.

The training was conducted under the CBIT Maldives project (Capacity Strengthening for Improved Transparency of Climate Change Mitigation and Adaptation Actions in the Maldives), funded by the Global Environment Facility (GEF) and supported by the UN Environment Programme (UNEP).

A total of 16 participants (09 males and 07 females) attended the workshop. Participants included representatives from the Ministry of Transport and Civil Aviation (MoTCA), Waste Management Cooperation (WAMCO), State Electricity Company (STELCO), Male' Water and Sewerage Company (MWSC), Maldives Airports Company (MACL), Maldives Ports Limited (MPL), President's Office (PO), and the NDC Partnership in country facilitator. Officials from the Climate Change Department, Energy Department, and the Ozone Unit of the Ministry of Tourism and Environment (MoTE) also took part in the training sessions.

The attendance sheet of the workshop participants is attached in Appendix 1. The workshop provided a platform for participants to engage in guided exercises and practical demonstrations to enhance their understanding of data requirements and reporting processes.

Opening Ceremony

Opening Remarks

The workshop was inaugurated with remarks from Mr. Amjad Abdulla (Director General, Climate Change Department, Minister of Tourism and Environment). He welcomed all participants to the workshop and provided a brief introduction to the project, emphasizing the importance of establishing a robust framework and following consistent mechanisms in data requirements and reporting processes. He reaffirmed the Maldives' commitment to lowering its GHG footprint and advancing sustainability and encouraged active participation of attendees during the workshop sessions.



The opening remark was followed by group photo and then technical session, as per the agenda attached in Annex 2.

Technical Sessions

Overview of NDC and Mitigation

The session, led by Mr. Mohamed Mareer Husny of Riyan Private Limited, provided an overview of the key elements of the Maldives' Third Nationally Determined Contribution (NDC 3.0), submitted in February 2025, highlighting both mitigation components, with mitigation focused on the energy, waste, energy efficiency, and transport sectors

The Overview of NDC and Mitigation presentation is attached in Appendix 3. With this context established, the session concluded by inviting Mr. Manoj Bansal, Partner at Grant Thornton Bharat LLP to present the formulated indicators for tracking mitigation actions.

Indicators for Tracking Mitigation Actions

The session introduced participants to the foundational elements of the UNFCCC, and detailed the necessity for mitigation actions for the Maldives' climate reporting. The interlinking components of the, Nationally Determined Contributions (NDCs), and Biennial Transparency Reports (BTRs) was detailed, providing clarification on how these mechanisms operate collectively to ensure transparency, accountability, and consistent monitoring of climate actions.

Following this introductory session, Mr. Amit Seth, Associate Director at Grant Thornton Bharat LLP followed with detailed explanation on the methodologies for estimating mitigation indicators and the overview of the finalized data capturing formats.

Methodologies for Estimating Mitigation Indicators

This session provided a detailed explanation of the methodologies used to estimate mitigation indicators across the renewable energy, energy efficiency, transport, and waste-to-energy sectors. Participants were guided through step-by-step approaches for calculating GHG reductions based on different baseline scenarios. Examples were presented for each sector, demonstrating how to apply parameters such as emission factors, specific energy generation rates, appliance efficiency values, fuel consumption patterns, and methane emissions from waste. By comparing baseline and mitigation scenarios, the methodologies allow for consistent and transparent estimation of national GHG reductions associated with each project type.



Overview of the Finalized Data Capturing Formats

The session also introduced the finalized data-capturing formats that will standardize reporting across sectors. Participants were shown the renewable energy forms for documenting electricity generation and installed capacity, the energy efficiency forms for capturing appliance import data and labelling details, and the transport forms for reporting EV and hybrid vehicle imports. Waste-to-energy forms were also presented, outlining the required data on waste quantities, stack emissions, and electricity generation.

Practical Exercise – Breakout Sessions

To reinforce the concepts shared during the technical presentations, participants engaged in two structured breakout exercises designed to simulate real-world reporting scenarios and apply the finalized methodologies.

Task 1 focused on identifying the key parameters required for tracking mitigation actions and understanding which scenarios apply when calculating GHG reductions.

Group 1 worked on a resort case involving diesel generator use, planned renewable energy expansion, the phasing out of old appliances and operation of EVs. Participants identified the need to report parameters such as diesel consumption, RE system capacity, appliance ratings, number of EVs and relevant energy baselines. They also discussed the applicable scenarios, including RE replacing diesel-generated electricity, energy efficiency replacing high-consumption appliances and transport-sector reductions resulting from EV adoption.



Group 2 examined a commercial building shifting to rooftop solar and already implementing energy-efficient appliances. The group outlined reporting needs including annual electricity use, solar capacity, appliance imports and Hakathari ratings. Applicable scenarios discussed included grid electricity displacement by solar power and energy savings from labelled appliances.

Task 2 built on this by asking each group to apply the methodologies and estimate emission reductions year-by-year until 2030.

Group 1 analyzed the resort's phased solar installation, progressive appliance replacement and EV operations, requiring participants to calculate annual RE generation, diesel savings, energy savings from new appliances and avoided emissions from transport.

Group 2 evaluated the building's rooftop solar project, previously completed appliance upgrades and refrigerator replacements. Participants applied the relevant formulas using baseline consumption, energy savings, grid emission factors and default generator efficiencies to estimate annual reductions.


The presentation for Indicators for Tracking Mitigation Actions, Methodologies, and Data Capturing Formats, along with Practical Exercises for Breakout Sessions is included in Annex 4.



Closing Remarks

The project technical coordinator Mr. Mohamed Inaz from MoTE presented the vote of thanks, expressing their sincere appreciation to all participants for taking the time to attend the training workshop and contribute their valuable insights.

Appendix 1: Attendance Sheet


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 Ministry of Climate Change, Environment and Energy
 Training Workshop on Tracking Mitigation Actions

Attendance Sheet					
Date: 8th December 2023	Time: 09:00 - 13:00	Venue: Manama	Section: Climate Change Department		
Name	Designation	Organisation	Contact no	Email Address	Signature
1 Fathimath Fizza Yousuf	Director	Utility Regulatory Authority	9474646	fizza.yousuf@ura.gov.mv	
2 Abdulla Shaif	Specialist Engineer	Maldives Ports Limited	7647765	shaif4772@port.mv	
3 Zayan Adam Shareef	Assistant Machine Learning Engineer	Male' Water & Sewerage Company	7780778	zayan.adam@mwsc.com.mv	
4 Hussain Aruban Fawwaz	Manager, Environment Management	Maldives Airports Company Limited	7461129	hussain.aruban@macl.aero	
5 Moosa Ashraf Hashim	Chief Technical Officer	Waste Management Corporation	7581347	ashraf.hashim@wamco.com.mv	
6 Shahuma Abdulla Razzaq	Assistant Director	Ministry of Transport and Civil Aviation	7884842	shahuma.abdulla@transport.gov.mv	
7 Aminath Jeehan	Certification Officer	Ministry of Transport and Civil Aviation	7558189	aminath.jeehan@transport.gov.mv	
8 Gasith Mohamed	Partnerships Specialist	NDC Partnership		gasith.mohamed.5@ndcpartnership.org	
9 Mariyam Ali	Project Engineer	State Electric Company	7900906	150128@stelco.com.mv	
10 Ali Shareef	Presidents Office	Presidents Office			
11 Nashy Rasheed	Presidents Office	Presidents Office			
12 Rizna Rasheed	Assistant Engineer	Ministry of Tourism and Environment	9855323	rizna.rasheed@environment.gov.mv	
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17 Juruath Abdulla Nafiz	Programme Officer	Ministry of Tourism and Environment		juruath.abdulla@environment.gov.mv	
18 Adam Firas	Senior Officer	MACL	779563	adam.firas@macl.aero	
19 Jammat Khatun MD	MD	DAS	779669	xammal@gmail.com	
20 F. Raufa Moosa	PTC	MoTE	7972832	fathimath.raufa@environment.gov.mv	

Appendix 2: Training workshop agenda



Ministry of Tourism and Environment
Republic of Maldives

Training Workshop on Tracking Mitigation Actions

Date: 08th December 2025 | Venue: Meerumaa Hall

Overview and objectives

This training workshop aims to enhance the understanding and capacity of stakeholders involved in tracking mitigation actions under the Maldives' Nationally Determined Contribution (NDC). It is specifically targeted at data providers responsible for supplying sectoral information needed to estimate and track mitigation indicators. The workshop introduces participants to the indicators, estimation methodologies, and data reporting formats developed to support consistent and transparent reporting of mitigation actions in key sectors, particularly energy and waste.

This training is conducted under the CBIT Maldives project (Capacity Strengthening for Improved Transparency of Climate Change Mitigation and Adaptation Actions in the Maldives), funded by the Global Environment Facility (GEF) and supported by the UN Environment Programme (UNEP). The training will be delivered by Riyan Private Limited, in association with Grant Thornton Bharat LLP, and will include presentations, guided sessions, and group exercises to ensure practical learning.

Agenda

09:00 am – 09:10am	Opening Ceremony
09:10 am – 09:20 am	Introduction of participants and Group Photo
09:20 am – 09:40 am	Tea / Coffee break
09:40 am – 10:00 am	Overview of NDC and Mitigation
10:00 am – 10:20 am	Indicators for Tracking Mitigation Actions
10:20 am – 10:40 am	Methodologies for Estimating Mitigation Indicators
10:40 am – 11:00 am	Overview of the finalised data capturing formats - Templates to be used by data providers
11:00 am – 12:00 pm	Practical Exercise – Applying the Methodology
12:00 pm – 01:00 pm	Closing and Lunch

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Participants


1. Climate Change Department, Ministry of Tourism and Environment
2. Energy Department, Ministry of Tourism and Environment
3. Ozone Unit, Ministry of Tourism and Environment
4. Waste and Pollution Control Department, Ministry of Tourism and Environment
5. Ministry of Transport and Civil Aviation
6. Maldives Bureau of Statistics
7. Utility Regulatory Authority (URA)
8. Waste Management Cooperation (WAMCO)
9. State Electricity Company (STELCO)
10. FENKA Corporation
11. Male' Water and Sewerage Company (MWSC)
12. State Trading Organisation (STO)
13. Maldives Industrial Fisheries Company (MIFCO)
14. Maldives Airports Company (MACL)
15. Maldives Ports Limited (MPL)
16. Maldives National University (MNU)
17. NDC Partnership/in country facilitator
18. CBIT Project Team
19. GHG Inventory Expert of BTR Project

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Appendix 3: Presentation of Overview of NDC and Mitigation




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Training on Tools and Methodologies for Tracking of Mitigation Actions


Consultancy Service for Tracking of Mitigation Actions

08 December 2025, Meerumaa, Malé


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Reporting Mechanism under Paris Agreement


- Need to submit every **five** years by **all Parties** to PA
- **Three** NDC submitted since 2015
- NDC Synthesis Reports are prepared by UNFCCC
- NDC has both mitigation and adaptation actions

Nationally Determined Contribution




- Need to submit every two years by **all Parties** (SIDS and LDCs at their own discretion)
- First BTR submitted in **2024**
- BTR Synthesis Reports are prepared by UNFCCC
- BTR prepared based on agreed MPGs


Biennial Transparency Report



- National Adaptation Plans
- Adaptation Communications
- National Communications


Other Reporting Vehicles






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Features of NDC 3.0

- Third NDC in February 2025
- Mitigation and Adaptation actions
- Mitigation sectors:
 - Energy
 - Waste
 - Energy Efficiency
 - Transport



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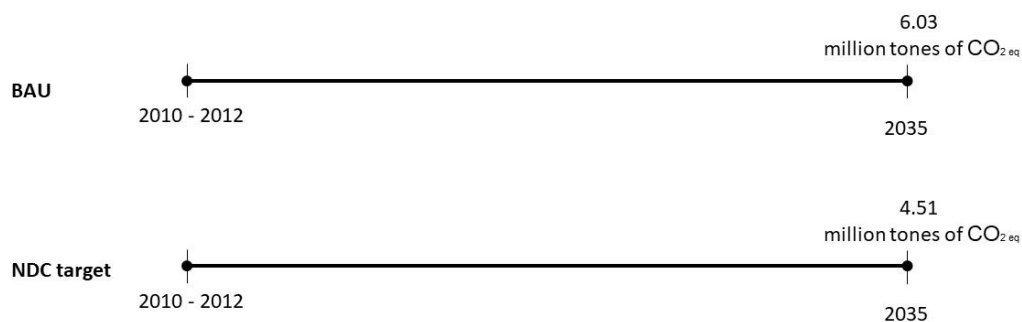
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Mitigation Target



Reduce 1.52 million tonnes of CO₂ eq conditional of receiving finance, technology and capacity building



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Mitigation Actions



Scaling up RE

- 33% of electricity needs from RE



Enhancing EE

- Expand standard labelling programme + Implement mandatory phase
- Enhance and update electricity grid



Waste Management

- Develop and operationalize three RWMS
- Expand composting programmes
- Remediation of the two largest dumpsites + establish IWRMC



Transitioning to More Efficient Transport

- Introduce national vehicle emissions standards
- Expand public transport networks throughout the entire country
- Introduce incentives to promote EV and hybrid vehicles



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Need towards tracking Mitigation Actions (1/3)

33% of electricity needs from RE



Low carbon Fisheries production

LECRd

Dhiffushi Solar Ice Project

Climate Neutrality

POISED

ASPIRE

ASCENT

ASSURE

Resort PV installation

Net Metering

Magey Solar

Clean Energy for Climate Mitigation



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Need towards tracking Mitigation Actions (2/3)

Expand standard labelling programme + Implement mandatory phase



Hakathari Programme

Fahiali Programme



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Need towards tracking Mitigation Actions (3/3)

**Develop and operationalize three RWMS
Expand composting programmes**



Small-Scale Waste-to-Energy Project in Vandhoo

Greater Male Waste-to-Energy Project

Converting Waste to Energy in Addu City



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Thank You



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Appendix 4: Presentation on Tacking Methodologies, Data Capturing Formats and Practical Sessions




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Introduction

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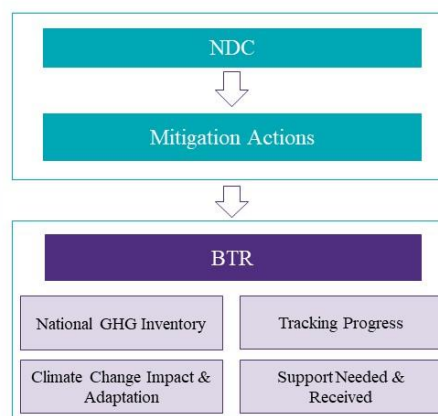
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Introduction to UNFCCC

- **United Nations Framework Convention on Climate Change (UNFCCC)** is the foundational international treaty that provides the framework for global cooperation to limit GHG emissions and adapt to climate impacts
- **Enhanced Transparency Framework (ETF)** to build trust and promote effective implementation by ensuring transparency and accountability and it is linked to the two major pillars NDC and BTR
- ETF tracks progress on the implementation and achievement of Nationally Determined Contributions (NDCs)
- **Biennial Transparency Reports (BTRs)** are the main vehicle through which countries fulfill their ETF obligations



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Objective of the Training

Objectives of the engagement:

- To develop **methodologies** for estimation of mitigation indicators to track the NDC implementation
- To develop **tool** to estimate the GHG emissions reduction from the mitigation actions
- To develop **guidelines** on reporting procedures of GHG estimations from mitigation measures
- To develop **integrated tool** for mitigation actions tracking and reporting

Objectives of the training workshop:

- **Present reporting procedures** for the mitigation actions to track NDC implementation
- **Present final methodologies** for estimation of mitigation indicators to track the NDC implementation
- **Present finalized data capturing formats** for capturing data related to tracking mitigation actions
- **Practice exercise and Power BI dashboard** to be adopted for renewable energy, energy efficiency, waste, transport sectors



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4



Tracking Mitigation Actions (1/2)

Types of projects

Renewable Energy

Energy Efficiency

Waste to Energy

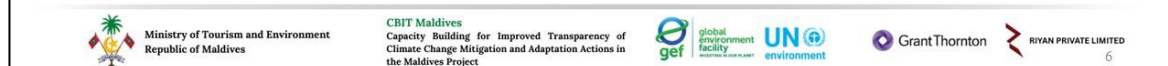
Transport

What need to be reported?

- **All projects aimed at reducing energy intensity, enhancing sustainability, and contributing to emission reductions**, in alignment with the mitigation measures outlined in the Maldives' Nationally Determined Contributions

When and How to Report?

- **When** : During and after implementation of the mitigation measures/actions
- **How** : Use the sector-specific forms provided in this guideline for each mitigation action



Tracking Mitigation Actions (2/2)

Stakeholder	Role
Implementing Entity	Report on data on mitigation actions (Half Yearly)
Ministry of Tourism and Environment	Determine which measure/actions to track, request data, estimate emissions, and compile national reporting

After Data Submission?

- **What** : Submitted data need to be checked for the accuracy and completeness
- **Who** : Ministry of Tourism and Environment will carry out the review and assessment



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Indicators – Renewable Energy

Types of Renewable Energy (RE) projects

Solar PV: Rooftop,
ground mounted, floating

Wind: On-shore,
off-shore

Other RE:
Tidal, Wave, etc.

GHG Emission
Reduction



Quantity of Diesel
Saved



Quantity of Electricity
Generated from RE



Capacity of RE
plant installed

Finalised indicators for reporting interventions related to RE projects

- Annual electricity generation (kWh/year)
- Installed capacity (kWp)



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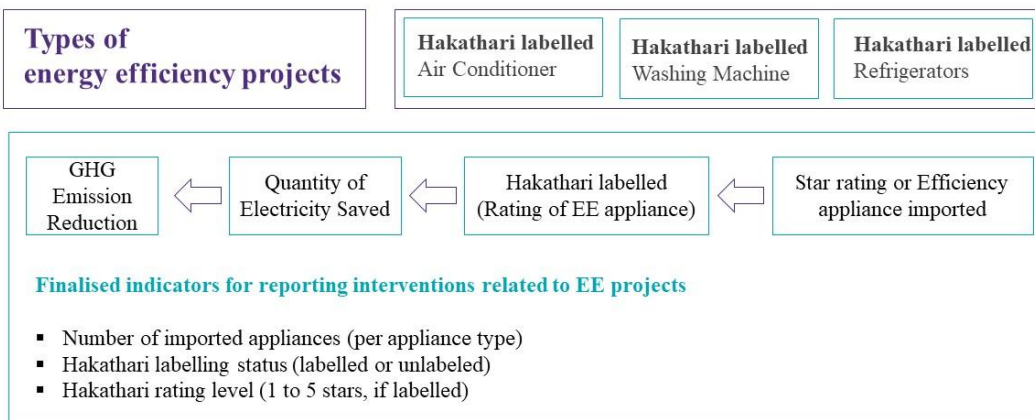


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Indicators – Energy Efficiency



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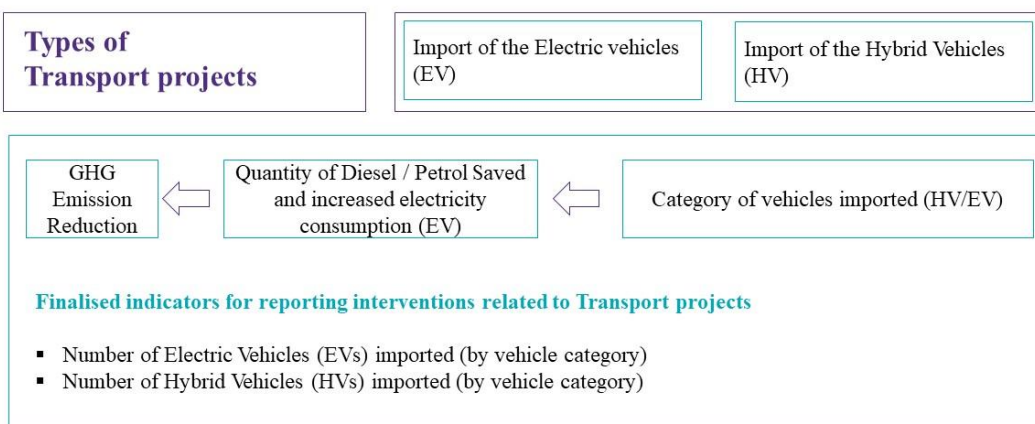
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Indicators – Transport



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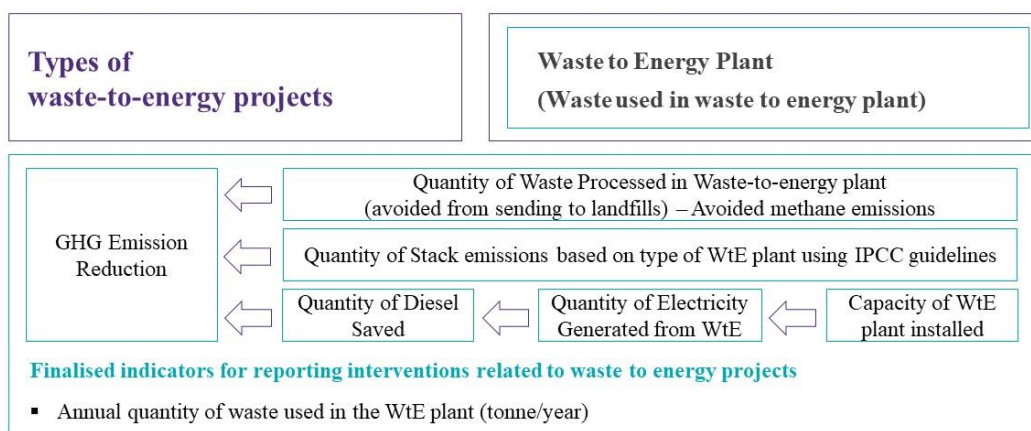
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Indicators – Waste-to-Energy



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Summary of Finalized Indicator

Mitigation Projects to be reported	Renewable Energy Projects	Energy Efficiency Appliances imported	Waste used in Waste-to-energy	Transport - Electric and Hybrid Vehicles
Indicators	<ul style="list-style-type: none"> Annual electricity generation (kWh/year) Installed capacity (kW) 	<ul style="list-style-type: none"> Number of imported appliances (per appliance type) Hakathari labelling status (labelled or unlabeled) Hakathari rating level 	<ul style="list-style-type: none"> Annual quantity of waste used in the WtE plant (tonne/year) 	<ul style="list-style-type: none"> Number of EV imported (by vehicle category) Number of HVs imported (by vehicle category)



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Methodologies for Estimating Mitigation Indicators

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Renewable Energy

Methodology for tracking renewable energy mitigation actions

Indicator: Annual Electricity Generation from Renewable Energy Plant (kWh/year)

Scenario 1: RE is replacing Grid electricity

Step 1: Annual energy generation from RE project (kWh/year) is available

Step 2: Estimated of GHG reduction = RE energy generation (kWh/year) × Grid emission factor

Scenario 2: RE is replacing Diesel Generator electricity, but baseline diesel consumption is not monitored

Step 1: Calculate the SEGR of the Diesel Generator or use 3.9 kWh/L

Step 2: Diesel saved due to renewable energy plant (L) = Annual Electricity Generation from Renewable Energy Plant / SEGR

Step 3: Estimated GHG reduction = Diesel saved (L) × IPCC Default factor for diesel

Renewable Energy

Methodology for tracking renewable energy mitigation actions

Indicator: Installed Capacity of Renewable Energy Plant (kWp)

Scenario 1: RE is replacing Grid electricity

Step 1: Check CUF for RE project (or use default CUF) and calculate annual electricity generation.

Annual electricity generation = RE Plant capacity (kW) × 8760 (hr./year) × CUF

Step 2: Estimated GHG reduction = RE energy generation × Grid emission factor

Scenario 2: RE is replacing Diesel Generator electricity, but baseline diesel consumption is not monitored

Step 1: Check CUF for RE project (or use default CUF) and calculate annual electricity generation. Annual electricity generation = RE Plant capacity (kW) × 8760 (hr./year) × CUF

Step 2: Calculate the SEGR of the Diesel Generator or use 3.9 kWh/L

Step 3: Diesel saved due to Renewable energy plant (L) = Annual Electricity Generation from Renewable Energy Project / SEGR

Step 4: Estimated GHG reduction = Diesel saved (L) × IPCC Default diesel emission factor



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Energy Efficiency

Methodology for tracking energy energy mitigation actions

Indicator: Appliance wise data for the sales respective Hakathari label rating of the appliance

Step 1: Annual energy saving from EE appliance (kWh/year) for each label = Baseline energy consumption – Energy consumption of the EE appliance

Step 2: Calculating the import of the appliance from the custom department (sales / year) for each label and each appliance category

Step 3: Estimated energy saving (kWh/year) = Annual Energy consumption calculated in Step 1 × Number of the import for the same EE appliance

Scenario 1: EE leading to reduction in energy generation – Grid Electricity

Step 4: Estimated GHG reduction = Energy saving per year due to Hakathari appliance's (Energy saving calculated in Step 3) × Grid emission factor



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Step 1: Annual energy saving from EE appliance (kWh/year) for each label = Baseline energy consumption – Energy consumption of the EE appliance

Step 2: Calculating the import of the appliance from the custom department (sales / year) for each label and each appliance category

Step 3: Estimated energy saving (kWh/year) = Annual Energy consumption calculated in Step 1 × Number of the import for the same EE appliance

Scenario 2: EEP leading to reduction in energy generation – Diesel Generator Electricity

Step 4: Calculate the SEGR of the Diesel Generator or use 3.9 kWh/L

Step 5: Diesel saved due to Renewable energy plant (L) = Energy saving per year due to Hakathari appliance's (Energy saving calculated in Step 3) / SEGR

Step 6: Estimated GHG reduction = Diesel saved (L) × IPCC Default diesel emission factor



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Waste

Methodology for tracking energy efficiency mitigation actions

Indicator: Quantity of the waste used in the WtE plant

Step 1: Quantify the waste used in the WtE plant (tonne/year)

Step 2: GHG reduction due to avoided methane emissions from landfill (tonne CO₂/year) (B) = Quantity of waste (tonne/ year) × Methane emission factor (tonne of methane per tonne of waste) × Conversion factor of methane to CO₂

Step 3: GHG reduction generated from waste combustions (tonne CO₂/year) (C) = Quantity of waste (tonne/ year) × Stack emission data taken from IPCC guidelines

Step 4: Energy generation from WtE plant (A) = Data taken from the energy meter installed at plant (reducing the auxiliary energy consumption by the WtE plant)

Scenario 1: Reduction in energy generation – Grid Electricity

Step 5: Use the grid emission factor for the Maldives (CO₂/kWh)

Step 6: Estimated GHG reduction = Grid emission factor × Energy generation (A) + GHG emissions avoided (B) – GHG emissions from stack / combustion of waste (C)



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Waste

Methodology for tracking energy energy mitigation actions

Indicator: Quantity of the waste used in the WtE plant

Step 1: Quantify the waste used in the WtE plant (tonne/year)

Step 2: GHG reduction due to avoided methane emissions from landfill (tonne CO₂/year) (B) = Quantity of waste (tonne/ year) × Methane emission (tonne of methane per tonne of waste) × Conversion factor of methane to CO₂

Step 3: GHG reduction generated from waste combustions (tonne CO₂/year) (C) = Quantity of waste (tonne/ year) × Stack emission data taken from IPCC guidelines

Step 4: Energy generation from WtE plant (A) = Data taken from the energy meter installed at plant (reducing the auxiliary energy consumption by the WtE plant)

Scenario 2: Reduction in energy generation – Diesel Generator Electricity

Step 5: Calculate the SEGR of the Diesel Generator or use 3.9 kWh/L

Step 6: Diesel saved (L) due to Energy generation from WtE plant = Energy generation from WtE plant / SEGR

Step 7: Estimate GHG reduction = [Diesel saved (L) × IPCC Default diesel emission factor] (A) + GHG emissions avoided (B) – GHG emissions from stack/combustion of waste (C).



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Transport

Methodology for tracking energy energy mitigation actions

Indicator: Number of the different type of the EV sold

Step 1: Capture the sales of the EV sold under each vehicle type

Step 2: Fuel consumption for each vehicle type (liters/year) = Annual distance travelled (km) × Fuel economy (l/km)

Step 3: Baseline GHG emissions (tonne of CO₂) = Quantity of the fuel used × emission factor as per IPCC

Step 4: Additional annual electricity required for pure EV = Range of the EV / battery capacity (kWh) × Annual distance travelled (km) based upon the vehicle type

Scenario 1: Fuel consumption reduction and increased grid electricity consumption

Step 5: Estimated of GHG reduction = Baseline GHG emissions – Grid emission factor × Additional annual electricity required for pure EV



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Transport

Methodology for tracking energy energy mitigation actions

Indicator: Number of the different type of the EV sold

Scenario 2: Fuel consumption reduction and increased electricity from DG

Step 5: Calculate the SEGR of the Diesel Generator use 3.9 kWh/L

Step 6: Additional Diesel required (L) to generate electricity = Additional annual electricity required for pure EV / SEGR (Step 5)

Step 7: Estimated GHG reduction = Baselines GHG emission from ICE vehicle (calculated in step 3) – Additional diesel required (L) × IPCC Default emission factor for diesel

Scenario 3: Fuel consumption reduction and electricity from dedicated RE

Step 5: Emission from the RE electricity is considered zero

Step 6: Estimated GHG reduction = Baseline GHG emissions



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Methodology for tracking energy energy mitigation actions

Indicator: Number Hybrid Vehicles sold (based upon vehicle types)

Step 1: Capture the sales of the vehicles under each Vehicle Types

Step 2: Annual fuel consumption in baseline scenario (liters/year) = {Annual distance travelled (km) × Fuel economy (l/km)}

Step 3: Annual fuel required in mitigation scenario (liters/year) = {Annual distance travelled (km) × Fuel economy for new HV (l/km)}

Step 4: Annual fuel saving (units/year) = Annual fuel consumption in baseline scenario – Annual fuel required in mitigation scenario

Step 5: Calculate the baseline GHG emissions = Annual fuel Saving (units/year) × emission factor for the fuel (Gasoline / Diesel) as per IPCC



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Overview of the finalized data capturing formats


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Renewable Energy – Forms

Name of Organization / Business / Agency

Type of Organization

☐ Government
☐ SOE
☐ Private Business
☐ Resort

☐ Household
☐ Other: _____

Focal Person Name

Email Address

Phone Number

Name of Organization / Business / Agency


Estimated / Actual Project Cost (USD)

Financing Source(s)




☐ Self-funded
☐ Loan
☐ Grant/Donor
☐ Other



Supporting Documents

☐ Photo of the installation


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Renewable Energy – Forms

Installation Status	<input type="checkbox"/> Operational <input type="checkbox"/> Under Installation <input type="checkbox"/> Planned
Expected or Actual Operational Date	Month _____ Year _____
What motivated or supported you to install this renewable energy system?	<input type="checkbox"/> Required by government regulation <input type="checkbox"/> Part of a business or island development plan <input type="checkbox"/> Company sustainability goal <input type="checkbox"/> Received financial support (e.g., grant, donor, loan, tax benefit) <input type="checkbox"/> Voluntary (cost saving or environmental benefits) <input type="checkbox"/> Other: _____
Type of Renewable Energy	<input type="checkbox"/> Solar <input type="checkbox"/> Wind <input type="checkbox"/> Tidal <input type="checkbox"/> Other: _____
Technology type	Solar: <input type="checkbox"/> Rooftop <input type="checkbox"/> Ground-mounted <input type="checkbox"/> Floating Wind: <input type="checkbox"/> Small-scale <input type="checkbox"/> Large-scale Tidal: <input type="checkbox"/> Stream Generator <input type="checkbox"/> Barrage System Other: _____



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Renewable Energy – Forms

Capacity Installed (kWp or MW)	
Type of Premises	<input type="checkbox"/> Government <input type="checkbox"/> Business <input type="checkbox"/> Resort <input type="checkbox"/> Household <input type="checkbox"/> Other: _____
Connection Type	<input type="checkbox"/> Grid-tied <input type="checkbox"/> Off-grid <input type="checkbox"/> Hybrid
Is battery storage included / planned?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Battery Capacity (if applicable)	_____ kWh
Battery Type (if known)	<input type="checkbox"/> Lead-acid <input type="checkbox"/> Lithium-ion <input type="checkbox"/> Other: _____
Electricity Generated by the System (kWh/month)	



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Energy Efficiency – Forms

Name of Importer

Focal Person Name

Email Address

Phone Number

Reporting Period

Year



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Energy Efficiency – Forms

Air Conditioner (Applicable for units with cooling capacity up to 24,226 BTU/hr.)

Brand	Model Number	Cooling Capacity (BTU/hr.)	Hakathari labelled	Hakathari Rating (if labelled)	Quantity Imported
			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5	

Refrigerators (Applicable for units with capacity from 110 liters to 650 liters)

Brand	Model Number	Volume (liters) Without freezer, With freezer, With freezer, With freezer, through- the door ice dispense	Hakathari labelled	Hakathari Rating (if labelled)	Quantity Imported
			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5	

Washing Machine (Applicable for units with capacity up to 14 kg)

Brand	Model Number	Capacity (kg) Front load Top load	Hakathari labelled	Hakathari Rating (if labelled)	Quantity Imported
			<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5	



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Waste – Forms

Name of Organization

Focal Person Name

Email Address

Phone Number

Quantity of waste used in the waste to energy (WtE) plant - tonne per year _____ tonne per year

Does electricity generated from Waste to Energy (WtE) is replacing grid electricity? ☐ Yes ☐ No

Date of Implementation (Month/Year)



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Transport – Reporting Forms

Electric Vehicles (EVs)

Vehicles that are clearly classified as Electric in customs import codes.

Year of reporting

Vehicle Category

Number of Units Imported

Electric Motorcycles

Electric Passenger Cars

Electric Light Commercial Vehicles (LCVs)

Electric Heavy-Duty Vehicles

Electric Urban Buses



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Transport – Forms

Hybrid Vehicles (HVs)

Vehicles that are clearly classified as Hybrid in customs import codes

Vehicle Category

Number of Units Imported

Hybrid Motorcycles

Hybrid Passenger Cars

Hybrid Light Commercial Vehicles (LCVs)

Hybrid Heavy Duty Vehicles

Hybrid Urban Buses



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Practical Exercise Applying the Methodology



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Breakout sessions – Task 1

Group 1

The resort currently uses a diesel generator to produce electricity, with an average monthly fuel consumption of 7,200 liters. To reduce emissions and contribute to the Maldives' NDC commitments, the resort plans to transition to renewable energy and gradually phasing out air conditioners and refrigerators.

Additionally, the resort has been operating 10 electric vehicles (EVs) since 2024.

Task:

What key parameters should be reported to monitor and track progress under these mitigation actions?

What different scenarios are applicable for evaluating these mitigation actions?

Group 2

The ABC Building complex currently uses electricity as its primary energy source, with an average annual consumption of 65,000 kWh. To reduce emissions and contribute to the Maldives' NDC commitments, the building plans to transition to renewable energy by implementing a rooftop solar project.

The building has already replaced old air conditioners with Hakathari-labeled energy-efficient appliances.

Task:

What key parameters should be reported to monitor and track progress under these mitigation actions?

What different scenarios are applicable for evaluating these mitigation actions?



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Breakout sessions – Task 2

Group 1

The resort will implement a 25-kW solar installation in December 2026 and expand solar renewable energy generation by an additional 25 kW each year until 2029.

The resort plans to gradually phase out ten number air conditioners, replacing them with EE Hakathari-labeled units (18,000 Btu/hr., four-star), Eight number EE Hakathari-labeled refrigerators (220 liters, five-star, with freezer) starting January 2026.

The resort has been operating 10 electric vehicles (LCV) since 2024.

Task:

Use the data to estimate the emission reduction during each year till 2030.

Group 2

The building will implement a 10-kW rooftop solar project, which is expected to become operational in 2026.

The building phased out five number old air conditioners and replaced them with EE Hakathari-labeled units (21,000 Btu/hr., five-star) in August 2024.

The building replaced three old refrigerators with five EE Hakathari-labeled refrigerators (190 liters, five-star, without freezer) in April 2023.

Task:

Use the data to estimate the emission reduction during each year till 2030.



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Assumptions

Description	Value	
Capacity Utilization Factor	18%	IRENA
Specific Energy Generation Ration	3.9 kWh/liter of Diesel	STELCO
Diesel Emissions	2.72 kg CO ₂ / liter	IPCCC Conversions
Air conditioner (AC) (CSPF Baseline)	2.9 (Wh/Wh)	Ministry of Environment, Climate Change and Technology
Air conditioner (4 Star)	4 (Wh/Wh)	
Air conditioner (5 Star)	5.1 (Wh/Wh)	
Annual Operating hours for AC	4380 hours /year	
Refrigerator – without freezer (Baseline)	$(368 + 0.892 * \text{Volume}) \times 0.551$ (kWh/year)	
Refrigerator – without freezer (5star)	$(368 + 0.892 \times \text{Vadj tot}) \times 0.239$ (kWh/year)	
Refrigerator – with freezer (Baseline)	$(465 + 1.378 * \text{Volume}) \times 0.553$ (kWh/year)	
Refrigerator – with freezer (5star)	$(465 + 1.378 * \text{Volume}) \times 0.228$ (kWh/year)	
Distance travelled LCV	7300 km/year	
Fuel economy	0.125 liter of Diesel / km	
EV LCV	0.3 kWh/km	Manufacturer data
BTU to kW	3412 BTU /hr = 1 kW	Conversion



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Thank You



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Appendix 5: Photos taken during the workshop



