CGE

Consultative Group of Experts

The Constituted Body for MRV & ETF

United Nations
Climate Change

Compilation of Examples of Indicators for Adaptation and Mitigation Component of Nationally Determined Contributions

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Introduction

Article 13 of the Paris Agreement provides the core structure of the enhanced transparency framework (ETF), which includes reporting, technical expert review (TER), and facilitative, multilateral consideration of progress (FMCP).

The ETF is implemented on the basis of modalities, procedures and guidelines (MPGs),[1] that apply to all Parties, with flexibility to those developing countries that need it in the light of their capacities.

MPGs provide specific provisions to track progress made in implementing and achieving the NDCs under Article 4 of the Paris Agreement as well as to monitor and evaluate implementation of adaptation actions.

In that context, the indicator(s) selected by Parties to track progress towards the implementation and achievement of its NDC under Article 4 must be relevant to their NDC and may be either qualitative or quantitative.

For each selected indicator, each Party must provide:

i. The information for the reference point(s), level(s), baseline(s), base year(s) or starting point(s), and shall update the information in accordance with any recalculation of the GHG inventory, as appropriate; and
ii. The most recent information for each reporting year during the implementation period of its NDC.

Furthermore, in relation to monitor and evaluate implementation of adaptation actions, each Party should provide information, as appropriate, for assessment of and indicators for:

i. How adaptation increased resilience and reduced impacts;
ii. When adaptation is not sufficient to avert impacts; and
iii. How effective implemented adaptation measures are.

In addition, CMA 7, held in Belem in November 2025, adopted the Belem Adaptation Indicators,[2] and invited Parties to integrate these targets into, and make use of them as appropriate and as relevant in their reporting and planning processes.

Consultative Group of Experts (CGE) is the main channel for the provision of technical assistance and support to developing country Parties in fulfilling their reporting requirements in relation to measurement, reporting, and verification under the Convention and the enhanced transparency framework (ETF) under the Paris Agreement.

This compilation represents an effort by the CGE to assist developing countries in implementing the ETF, with an aim to improve awareness and understanding with regards to the indicators selected by Parties to track progress made in implementing and achieving nationally determined contributions (NDC).

The compilation aims to showcase different examples of indicators reported by Parties in their first BTRs, with a view to serving as a practical reference material especially for those experts involved in preparing and submitting NDCs and BTRs.

It is important to note that this compilation does not capture the full scope of information reported by Parties in their BTRs on indicators and a more comprehensive and detailed information can be found in the respective BTRs and common tabular formats (CTFs) (https://unfccc.int/first-biennial-transparency-reports).

[1] The MPGs are contained in the annex to decision 18/CMA.1. Guidance for operationalizing the MPGs, as well as the corresponding CRTs, CTFs and outlines for reporting, can be found in decision 5/CMA.3 and its annexes. Guidance pertaining to reviews of the information reported pursuant to chap. IV of the annex to decision 18/CMA.1 is available in decision 9/CMA.4.
[2] Available at https://unfccc.int/sites/default/files/resource/cma7_8a_gga_auv.pdf.

Example indicators selected to track progress towards the implementation and achievement of NDCs under Article 4 of the Paris Agreement

ANDORRA

Target and description, including target type, as applicable (Appendix CTF)	55% emission reduction compared to the BAU scenario in 2030 and carbon neutrality in 2050.
Indicator selected to track progress (CTF1)	Annual total net GHG emissions.
Updates in accordance with any recalculation of the GHG inventory, as appropriate (CTF1)	Andorra has partially updated the BAU scenario considering new data available from the First National Forest Inventory of Andorra. This data has also been used in the National GHG inventory, along with other recalculations further explained in the BTR (Annex IV).
Relation to NDC (CTF1)	Andorra's NDC sets a 55% emission reduction compared to the BAU scenario in 2030 and carbon neutrality in 2050.
Definition needed to understand the indicator (CTF2)	Total net GHG emissions correspond to the annual total of emissions and removals reported in CO2 equivalents in the latest GHG inventory of Andorra.
Description of each methodology and/or accounting approach used for indicator (CTF3 row 18, MPGs 74c)	-
Information for the reference point, level, baseline, base year or starting point, as appropriate (CTF1)	BAU scenario, value for 2030: net emissions balance of 449.44 Gg CO2 eq. BAU scenario, value for 2050: net emissions balance of 562.36 Gg CO2 eq.
The most recent information (CTF4)	2021; 230.74 kt CO_2 equivalent
Target year or period; target level (CTF4)	2030; 202.25 kt CO_2 equivalent
Progress made towards the NDC (CTF4)	This indicator is 42.5% below the emission level corresponding to the 'business as usual' scenario in 2021 and 14.1% above the emission level corresponding to the target level in 2030.
Projections of key indicators (CTF10)	-

BHUTAN

Target and description, including target type, as applicable (Appendix CTF)	Bhutan's NDC is an economy-wide target to maintain the carbon neutral status.
Indicator selected to track progress (CTF1)	Net GHG emissions and removals
Updates in accordance with any recalculation of the GHG inventory, as appropriate (CTF1)	Not applicable,
Relation to NDC (CTF1)	Bhutan's NDC is to remain carbon neutral with the estimation of net GHG emissions and removals.
Definition needed to understand the indicator (CTF2)	The overall target is to remain carbon neutral ensuring that the emissions do not exceed the forest sink capacity.
Description of each methodology and/or accounting approach used for indicator (CTF3)	Not applicable. The accounting approach for the indicator does not differ from the accounting approach used to assess the implementation and achievement of the NDC's overall target.
Information for the reference point, level, baseline, base year or starting point, as appropriate (CTF1)	Bhutan's NDC is an economy-wide target to maintain the status as carbon neutral county. It uses 2020 as base year. Multi- year target from 2020-2030 will be used to track progress towards the implementation and achievement of the NDC with the estimation of net GHG emissions and removals.
The most recent information (CTF4)	2021; -7021.05 Gg CO_2 equivalent
Target year or period; target level (CTF4)	2030; -6452.27 Gg CO_2 equivalent; Maintain the carbon neutrality
Progress made towards the NDC (CTF4)	The most recent information for the indicator of net GHG emissions and removals is -6,800.62 CO2 eq in 2022. Bhutan is on track to meeting our NDC of maintaining the carbon neutral status.
Projections of key indicators (CTF10)	

Key indicator	*Unit, as applicable*	*2025*	*2030*
Net GHG emissions and removals	Gg CO_2 eq.	-6,579.49	-6,452.27

BRAZIL

Target and description, including target type, as applicable (from NDC or Appendix CTF)	Net emissions limit of 1.32 Gt CO2 eq in 2025 and 1.20 Gt CO2 eq in 2030, consistent with a reduction of 48.4% and 53.1%, respectively, in comparison with 2005, according to the latest GHG inventory data.
Indicators selected to track progress (CTF1)	(i) GHG emissions reduction in 2025; (ii) GHG emissions reduction in 2030; (iii) Total net GHG emissions in 2025; (iv) Total net GHG emissions in 2030.
Updates in accordance with any recalculation of the GHG inventory, as appropriate (CTF1)	Information on emissions in 2005 and reference values may be updated and recalculated as a result of improvements to the methodologies applicable to the inventories.
Relation to NDC (CTF1)	(i) Target for 2025 is consistent with a reduction of 48.4%, in comparison with 2005 (ii) Target for 2030 is consistent with a reduction of 53.1%, in comparison with 2005 (iii) Brazil's NDC target for the year 2025 is a net GHG emission level of 1.32 GtCO2e (GWP AR5) (iv) Brazil's NDC target for the year 2030 is a net GHG emission level of 1.2 GtCO2e (GWP AR5)
Definition needed to understand the indicator (CTF2)	(i) The quantification of the reference indicator is the total net emissions of GHG in the target year of 2025. The target for 2025 is a reduction of 48.4%, in comparison with 2005. (ii) The quantification of the reference indicator is the total net emissions of GHG in the target year of 2030. The target for 2030 is a reduction of 53.1%, in comparison with 2005. (iii) Net emissions limit of 1.32 Gt CO2 eq in 2025. (iv) Net emissions limit of 1.2 Gt CO2 eq in 2030.
Description of each methodology and/or accounting approach used for indicator (CTF3)	Emissions of the gases covered will be calculated based on the 2006 IPCC Guidelines. The methodological level ("Tier") used will depend on the availability of data in the various sectors. An effort will be made to apply at least Tier 2 for the key categories identified. The emissions of the gases covered will be aggregated in terms of global warming potential over a 100-year time horizon (GWP 100), based on the values stipulated in the IPCC's Fifth Assessment Report (AR5), or GWP 100 values from a subsequent IPCC assessment report, as agreed by the CMA. The Brazilian Government will use the latest national greenhouse gas inventory available to measure achievement with the NDC.
Information for the reference point, level, baseline, base year or starting point, as appropriate (CTF1)	The quantification of the reference indicator is the total net emissions of GHG in the reference year of 2005, as reported in Brazil's National Inventory of Anthropogenic Emissions by Sources and Removals by Sinks of Greenhouse Gases not controlled by the Montreal Protocol. According to the latest inventory, net emission levels in 2005 were of 2.56 GtCO2e (GWP AR5).
The most recent information (CTF4)	Total net GHG emissions: 1.82 Gt CO2 eq in 2020 GHG emissions reduction: 28.8 % in 2020
Target year or period; target level (CTF4)	Total net GHG emissions: 1.32 Gt CO2 eq in 2025 and 1.2 Gt CO2 eq in 2030 GHG emissions reduction: 48.8 % in 2025 and 53.1 % in 2030
Progress made towards the NDC (CTF4)	(i-ii) Brazil is progressing towards the NDC target. The total GHG emissions decreased in 2022, compared to the GHG emission level in the NDC base year (2005). In 2020, emissions decreased significantly to 1.82 Gt CO_2 eq, mainly in the LULUCF sector, related to the reduction in deforestation, which was due above all to the adoption of Action Plans for the Prevention and Control of Deforestation and Fires. Despite the increase in national emissions in 2021 (explained in Section 3.1, NIR 2024), Brazil reverted the growth trend in 2022, registering emissions of 2.04 Gt CO_2 eq. (iii-iv) Brazil is progressing on implementation its NDC target in the period 2020–2022 since the indicator selected is below the base-year emissions. In 2022, total GHG emissions are 20.4% below the reference point.
Projections of key indicators (CTF10)	-

CHINA

Target and description, including target type, as applicable (from NDC or Appendix CTF)	To lower CO_2 emissions per unit of GDP by over 65% from the 2005 by 2030, To increase the share of non-fossil fuels in primary energy consumption to around 25%, To have CO_2 emissions peak before 2030, To increase the forest stock volume by 6 billion cubic meters from 2005 levels, and to bring its total installed capacity of wind and solar power to over 1.2 billion kilowatts.
Indicators selected to track progress (CTF1)	1. The carbon intensity indicator 2. Energy related CO_2 emissions per GDP 3. Share of non-fossil fuels 4. Total installed capacity of wind and solar power 5. CO2 emissions from fuel combustion and IPPU 6. Forest stock volume
Updates in accordance with any recalculation of the GHG inventory, as appropriate (CTF1)	NA
Relation to NDC (CTF1)	Directly related.
Definition needed to understand the indicator (CTF2)	1. See Section II&III, Chapter 2, Part VI of BTR 2. To track progress of carbon intensity reduction target. See Chapter 2&3, Part II of BTR 3. To track progress of share of non-fossil fuels target. See Chapter 2&3, Part II of BTR 4. To track progress of total installed capacity of wind and solar power target. See Chapter 2&3, Part II of BTR 5. To track progress of carbon peaking target. See Chapter 2&3, Part II of BTR 6. To track progress of forest stock volume target. See Chapter 2&3, Part II of BTR
Description of each methodology and/or accounting approach used for indicator (CTF3)	See Chapter 2&3, Part II of BTR for each NDC target.
Information for the reference point, level, baseline, base year or starting point, as appropriate (CTF1)	1. The carbon intensity indicator: 100% (2005) 2. Energy related CO_2 emissions per GDP: 100% (2005) 3. Share of non-fossil fuels: NA 4. Total installed capacity of wind and solar power: NA 5. CO2 emissions from fuel combustion and IPPU: NA 6. Forest stock volume: 13 billion cubic meters
The most recent information (CTF4)	1. The carbon intensity indicator: 41.6% 2. Energy related CO_2 emissions per GDP: 49.1% in 2020 3. Share of non-fossil fuels: 15.9% in 2020 4. Total installed capacity of wind and solar power: 534.96 GW 5. CO2 emissions from fuel combustion and IPPU: 11,192,997.49 kt CO_2 equivalent in 2020 6. Forest stock volume: 17.5 billion cubic meters in 2020
Target year or period; target level (CTF4)	1. The carbon intensity indicator: 60% in 2030 2. Energy related CO_2 emissions per GDP: 65% in 2030 3. Share of non-fossil fuels: 25% in 2030 4. Total installed capacity of wind and solar power: 1,200 GW in 2030 5. CO2 emissions from fuel combustion and IPPU: - 6. Forest stock volume: 19 billion cubic meters in 2030
Progress made towards the NDC (CTF4)	1. The carbon intensity indicator: Carbon intensity further decreased in 2021, down 52.5% from 2005 2. Energy related CO_2 emissions per GDP: According to China's latest greenhouse gas inventory, carbon intensity in 2021 decreased by 50.9% from 2005 levels 3. Share of non-fossil fuels: The shares of non-fossil fuels reached for 17.9% 4. Total installed capacity of wind and solar power: By October 2024, total installed capacity of wind and solar power generation was about 1280 GW, achieving the NDC target ahead of schedule 5. CO2 emissions from fuel combustion and IPPU: According to China's latest GHG inventory, CO_2 emissions from fuel combustion and IPPU has not peaked 6. Forest stock volume: The national forest stock volume was 19.493 billion cubic meters, an increase of 6.493 billion cubic meters from 2005 levels, thereby achieving the NDC target ahead of schedule
Projections of key indicators (CTF10)	-

EUROPEAN UNION

Target and description, including target type, as applicable (from NDC or Appendix CTF)	Economy-wide net domestic reduction of at least 55% in greenhouse gas emissions by 2030 compared to 1990. The term 'domestic' means without the use of international credits. Target type: Economy-wide absolute emission reduction.
Indicators selected to track progress (CTF1)	Annual total net GHG emissions.
Updates in accordance with any recalculation of the GHG inventory, as appropriate (CTF1)	This is the first time the reference level is reported, hence there are no updates. The value of the reference level may be updated in the future due to methodological improvements to the EU GHG inventory and to the determination of international aviation and navigation emissions in the NDC scope.
Relation to NDC (CTF1)	The indicator is defined in the same unit and metric as the target of the NDC. Hence it can be used directly for tracking progress in implementing and achieving the NDC target.
Definition needed to understand the indicator (CTF2)	Total net GHG emissions correspond to the annual total of emissions and removals reported in CO2 equivalents in the latest GHG inventory of the EU. The totals comprise all sectors and gases listed in the table entitled 'Reporting format for the description of a Party's nationally determined contribution under Article 4 of the Paris Agreement, including updates.' Indirect CO2 emissions are included from those Member States that report these emissions.
Description of each methodology and/or accounting approach used for indicator (CTF3)	Progress is tracked by comparing annual net emissions with net emissions in the base year. No baseline is constructed.
Information for the reference point, level, baseline, base year or starting point, as appropriate (CTF1)	The reference level is total net GHG emissions of the EU in the base year (1990). The reference level value for the EU is 4 699 405 kt CO2eq.
The most recent information (CTF4)	2022: 3,205,223.00 kt CO_2 equivalent
Target year or period; target level (CTF4)	2030: 2,114,732.00 kt CO_2 equivalent (-55%)
Progress made towards the NDC (CTF4)	The most recent level of the indicator is 31.8 % below the base year level.

Projections of key indicators (CTF10)

Key indicator	*Unit, as applicable*	*2025*	*2030*	*2035*	*2040*	*2045*	*2050*
Annual total net GHG emissions	kt CO_2 eq.	2,845,609.76	2,281,255.58	1,907,145.37	1,668,100.38	1,559,830.05	1,487,856.39

GUYANA

Target and description, including target type, as applicable (from NDC or Appendix CTF)	In the energy sector: Expansion of a renewable energy supply of wind, solar, biomass and hydropower; Reduction of energy consumption and increase of energy efficiency. In the forestry sector: Continuation and improvement of sustainable forest management. These targets are policy-based including measures to reduce the normative "business-as-usual" growth in emissions.
Indicator selected to track progress (CTF1)	1. Energy supply from renewable sources 2. Energy consumption from fossil sources 3. Energy consumption from fossil sources per unit of GDP 4. Percentage of staff dedicated to field monitoring 5. Share of national territory covered by forest 6. Number of staff dedicated to field monitoring
Updates in accordance with any recalculation of the GHG inventory, as appropriate (CTF1)	1. No updates have been made. However, if the energy balance is recalculated the indicator will have to be recalculated as well. 2. No updates have been made. However, if the energy balance is recalculated the indicator will have to be recalculated as well. 3. No updates have been made. However, recalculations in the energy balance or the use of more recent constant prices will require updating the indicator. 4. No updates have been made. However, if external factors such as policy changes or resource limitations affect staff numbers, then the indicator will need to be updated. 5. No updates have been made. However, if Guyana updates the definition of forest or the definition of when an area is deemed deforested, then the indicator will need to be updated. 6. No updates have been made. However, if external factors such as policy changes or resource limitations affect staff numbers, then the indicator will need to be updated.
Relation to NDC (CTF1)	1. Increased energy supply from renewable sources will indicate that Guyana is progressing towards the renewable energy target of the NDC. 2. A decrease of the total energy consumption from fossil sources will indicate that Guyana is progressing towards the target to reduce energy consumption. 3. A decrease in the energy consumption from fossil sources per unit of GDP means that Guyana is progressing towards the energy efficiency target. 4. The indicator measures the percentage of forestry staff actively involved in field monitoring activities related to sustainable forest management out of the total relevant workforce. This includes overseeing compliance with national and international standards and agreements, including legal timber extraction, sustainable practices, and carbon storage potential. 5. Stabilisation or an increase in the forest cover in Guyana indicates that the conditional target for the forestry sector is being achieved. 6. The indicator measures the number of forestry staff actively involved in field monitoring activities related to sustainable forest management. This includes overseeing compliance with national and international standards and agreements, including legal timber extraction, sustainable practices, and carbon storage potential.
Definition needed to understand the indicator (CTF2)	1. Energy supply from renewable sources: Renewable energy sources produce less CO2 compared to fossil fuels, and increasing their proportion in the national energy supply supports climate change mitigation efforts in Guyana. The indicator includes the renewable energy sources specified in the NDC (wind, solar, biomass, hydropower), but Guyana does not restrict itself to only these sources. The indicator is expressed in terajoules (TJ). 2. Energy consumption from fossil sources: Energy consumption from fossil sources refers to the total amount of energy that is derived from fossil sources. This indicator measures the quantity of energy consumed that comes from these non-renewable sources. Higher energy consumption from fossil sources generally leads to higher GHG emissions. The indicator is expressed in terajoules (TJ). 3. Energy consumption from fossil sources per unit of GDP: It measures the amount of energy derived from fossil sources consumed to produce a unit economic output (GDP). This reflects the energy efficiency of an economy in utilising fossil sources. When less fossil sources are used to produce a given amount of economic output this can indicate more efficient use of energy. 4. Percentage of staff dedicated to field monitoring: The indicator measures the percentage of forestry staff actively involved in field monitoring activities related to sustainable forest management out of the total relevant workforce. This includes overseeing compliance with national and international standards and agreements, including legal timber extraction, sustainable practices, and carbon

	storage potential. It assumes that the percentage of staff actively involved in monitoring activities is a reliable proxy for overall forest management effectiveness where an increase in the percentage of staff dedicated to field monitoring directly improves the effectiveness of sustainable forest management practices. 5. Share of national territory covered by forest: Forests absorb carbon dioxide (CO2) from the atmosphere, acting as carbon sinks. By maintaining or increasing the area of forested land, GHG emissions can be reduced, contributing to climate change mitigation efforts. In Guyana, forest is defined as "Land exceeding 1 hectare with trees exceeding 5m in height and 30% crown cover but not classified as agriculture, infrastructure or settlements". An area is deemed deforested once the cover falls and remains below the elected crown cover threshold of 30%, which is guided by the GOFC-GOLD, 2010 definition of "the long-term or permanent conversion of land from forest use to other non-forest uses." 6. Number of staff dedicated to field monitoring: This indicator (number of staff) complements the other indicator to evaluate the overall dedication of Guyana to monitoring of sustainable practices in forest management. It tracks the number of staff assigned specifically to monitor and enforce sustainable forest management practices, which include compliance with national and international standards and agreements, including legal timber extraction, sustainable practices, and carbon storage potential.
Description of each methodology and/or accounting approach used for indicator (CTF3)	Not applicable. Same methodology/accounting approach used to assess the implementation and achievement of the target.
Information for the reference point, level, baseline, base year or starting point, as appropriate (CTF1)	2016
The most recent information (CTF4)	1. Energy supply from renewable sources: 7,864 TJ 2. Energy consumption from fossil sources: 48,391 TJ 3. Energy consumption from fossil sources per unit of GDP: 3.39 TJ/Million USD 4. Percentage of staff dedicated to field monitoring: 50% 5. Share of national territory covered by forest: 82.98% 6. Number of staff dedicated to field monitoring: 194
Target year or period; target level (CTF4)	1. 12,602 TJ in 2025 2. 44,720 TJ in 2025 3. 10.06 TJ/Million USD in 2025 4. 50% in 2025 5. 85.82% in 2025 6. 209 in 2025
Progress made towards the NDC (CTF4)	1. While some capacity was installed during the period, this indicator still shows a decrease in the total energy supply from renewable sources. This decline is largely due to a significant reduction in sugarcane production in the country. Additionally, the lack of available data on energy supply from solar, wind, and hydropower further contributed to the observed downward trend as only data on biomass used is available. 2. This indicator shows an increase in fossil fuel energy consumption between 2016 and 2022, driven primarily by a substantial 221.2% growth in the national GDP. During this period, fossil fuel consumption rose by 8.2%. 3. This indicator reflects a significant decrease in the amount of fossil energy consumed per unit of GDP in Guyana, indicating that the country is on track towards achieving its energy efficiency target. 4. The indicator indicates that the percentage of staff conducting field monitoring for sustainable forest management has been consistent throughout the implementation period of the NDC, indicating that the country is on track towards the continuation and improvement of sustainable forest management. 5. The forest cover level for the year 2022 accounts to 82.98%. However, Guyana continues to maintain low deforestation rates and the carbon market is expected to contribute further to this conditional target. 6. This indicator (number of staff) complements the third indicator to evaluate the overall dedication of Guyana to monitoring of sustainable practices in forest management.
Projections of key indicators (CTF10)	

Indicator	*Unit*	*2025*	*2030*	*2035*
Energy supply from renewable sources	TJ	NE	NE	NE
Energy consumption from fossil sources	TJ	NE	NE	NE
Energy consumption from fossil sources per unit of GDP	TJ/Million USD	NE	NE	NE
Percentage of staff dedicated to field monitoring	%	NE	NE	NE
Share of national territory covered by forest	%	NE	NE	NE
Number of staff dedicated to field monitoring	Number	NE	NE	NE

Malaysia

Target and description, including target type, as applicable (from NDC or Appendix CTF)	Economy-wide carbon intensity reduction (against GDP) of 45% in 2030 compared to 2005 level.
Indicator selected to track progress (CTF1)	Carbon intensity
Updates in accordance with any recalculation of the GHG inventory, as appropriate (CTF1)	NA
Relation to NDC (CTF1)	Directly related to the NDC.
Definition needed to understand the indicator (CTF2)	The ratio of total GHG emission and removal including LULUCF using net-net approach against GDP at constant 2015 price. Total annual economy wide GHG emission and removals including LULUCF per year measured in Million tons CO2eq., which are quantified and reported in NIR. Annual national GDP in 2015 constant price which are published by Bank Negara Malaysia and Department of Statistic.
Description of each methodology and/or accounting approach used for indicator (CTF3)	NA
Information for the reference point, level, baseline, base year or starting point, as appropriate (CTF1)	Base year: 2005 Values of 2005 GHG emissions and removals which are quantified and reported in NIR and values of 2005 national GDP in constant 2015 constant price.
The most recent information (CTF4)	0.22 kg CO2/RM in 2021
Target year or period; target level (CTF4)	0.19 in 2030
Progress made towards the NDC (CTF4)	Current progress of 2021 carbon intensity level is 37.12% less than 2005 carbon intensity level.
Projections of key indicators (CTF10)	

Key indicator	*Unit, as applicable*	*2025*	*2030*
Carbon intensity	kg CO2/RM	0.20	0.16

Solomon Islands

Target and description, including target type, as applicable (from NDC or Appendix CTF)	• Unconditional Targets: Reduce GHG emissions by 14% by 2025 and 33% by 2030 below 2015 levels, compared to a Business-as-Usual (BaU) scenario. • Conditional Targets (with international support): 27% reduction by 2025 and 45% by 2030 below 2015 BaU levels. • Long-Term Goal: Achieve net-zero emissions by 2050 with adequate international assistance. • Target Type: Economy-wide emissions reduction relative to BaU projections.
Indicator selected to track progress (CTF1)	1. Total National GHG Emissions (Excluding LULUCF) – kt CO_2 eq 2. Renewable Energy Generation – Grid Connected (%) 3. Access to Electricity (% of Population) 4. Energy Efficiency Improvements Across Sectors
Updates in accordance with any recalculation of the GHG inventory, as appropriate (CTF1)	1. The base year emisisons levels are updated to 519.02 kt CO2 eq from 779.73 Gg CO2 eq after recalculations in BTR1. 2. No updates have been made. 3. Base year: 2015 Value: ~69.4% (Urban ~80%, Rural ~20%) 4. No updates have been made.
Relation to NDC (CTF1)	1. Core indicator for tracking progress toward both unconditional and conditional GHG emission reduction targets. 2. Supports mitigation targets by reducing fossil fuel use in the power sector. Contributes to energy sector-specific actions outlined in NDC and LEDS. 3. Indirect indicator of development co-benefits of mitigation. Electrification with renewable energy supports both adaptation and mitigation outcomes. Referenced in NDC energy and development goals. 4. Energy efficiency is a cross-cutting strategy in Solomon Islands' LEDS and NDC, supporting emission reduction without compromising growth. Linked to reduced fossil fuel imports.
Definition needed to understand the indicator (CTF2)	-
Description of each methodology and/or accounting approach used for indicator (CTF3)	NA
Information for the reference point, level, baseline, base year or starting point, as appropriate (CTF1)	1. Total National GHG Emissions (Excluding LULUCF): 519.02 kt CO_2 eq in 2015 2. Renewable Energy Generation – Grid Connected: ~2% in 2015 3. Access to Electricity (% of Population) base year: 2015 4. Energy Efficiency Improvements Across Sectors: 2015
The most recent information (CTF4)	1. 576.83 kt CO2 eq in 2022 2. Not estimated 3. 76% in 2022 4. Not estimated
Target year or period; target level (CTF4)	1. Reduce its emissions by 14% by 2025 below 2015 and by 33% below 2015 by 2030 2. 100% RE in Honiara grid by 2030 3. 100% accessibility by 2050 4. NA
Progress made towards the NDC (CTF4)	1. FX 2. FX 3. Significant progress has been made. 4. NA
Projections of key indicators (CTF10)	Under development.

South Africa

Target and description, including target type, as applicable (from NDC or Appendix CTF)	Limiting total greenhouse gas (GHG) emissions including LULUCF (and excluding emissions from natural disturbances) to a range between 350 Mt CO_2-eq and 420 Mt CO_2-eq by 2030 (Absolute economy-wide target, covering all greenhouse gases and sectors included in the national GHG inventory)
Indicator selected to track progress (CTF1)	1. Total annual national GHG emissions and removals including LULUCF and excluding GHG emissions from natural disturbances 2. Total annual national GHG emissions and removals including LULUCF
Updates in accordance with any recalculation of the GHG inventory, as appropriate (CTF1)	No updates.
Relation to NDC (CTF1)	South Africa's updated first NDC defines its NDC target in Table 3 ("Information to facilitate clarity, transparency and understand of South Africa's updated NDC") as an absolute economy-wide target, consisting of all gases, sectors and sources reported in the most recent national GHG inventory, excluding GHG emissions from natural disturbances. The chosen indicator is therefore completely consistent with how South Africa defines its NDC target in its NDC.
Definition needed to understand the indicator (CTF2)	The term "natural disturbances" is used in the national GHG inventory consistent with the relevant IPCC guidelines used by the inventory. Approaches to natural disturbances are documented in section 6.3.3 of the NID, and data on natural disturbances is provided, with information on sources and data limitations, in Annex VII of the NID.
Description of each methodology and/or accounting approach used for indicator (CTF3)	Not applicable.
Information for the reference point, level, baseline, base year or starting point, as appropriate (CTF1)	Not applicable.
The most recent information (CTF4)	1. Total annual national GHG emissions and removals including LULUCF and excluding GHG emissions from natural disturbances: 394.3 Mega tons CO2 equivalent in 2022 2. Total annual national GHG emissions and removals including LULUCF and excluding GHG emissions from natural disturbances: 394.3 Mega tons CO2 equivalent in 2022
Target year or period; target level (CTF4)	1. 510 Mega tons CO2 equivalent in 2025 2. 420 Mega tons CO2 equivalent in 2030
Progress made towards the NDC (CTF4)	1. South Africa is on track to meet its 2025 NDC target. 2. South Africa is on track to meet its 2030 NDC target.
Projections of key indicators (CTF10)	FX

Thailand

Target and description, including target type, as applicable (from NDC or Appendix CTF)	Economy-wide (excluding LULUCF) GHG emission reduction by 30% (Unconditional) to 40% (Conditional), compared to the projected business-as-usual level (at 555 MtCO2eq) by 2030. Target type: Economy-wide emission reduction target
Indicator selected to track progress (CTF1)	Amount of GHG emission reduction
Updates in accordance with any recalculation of the GHG inventory, as appropriate (CTF1)	NA
Relation to NDC (CTF1)	The NDC consists of economy-wide (excluding LULUCF) GHG emission reduction target. Hence, amount of GHG emissions reduction and percentage are the most appropriate indicators for this type of NDC.
Definition needed to understand the indicator (CTF2)	Total economy-wide (excluding LULUCF) GHG emission reduction in the relevant reporting year (ktCO2eq).
Description of each methodology and/or accounting approach used for indicator (CTF3)	NA
Information for the reference point, level, baseline, base year or starting point, as appropriate (CTF1)	Baseline level: The projected emissions in BAU in 2030: 555 MtCO2eq
The most recent information (CTF4)	385,941.14 kt CO2 equivalent in 2022
Target year or period; target level (CTF4)	388,500.00 kt CO2 equivalent in 2030
Progress made towards the NDC (CTF4)	Current progress of 2022 level is 30.46% below the baseline level.
Projections of key indicators (CTF10)	

Key indicator	Unit, as applicable	2022	2025
Amount of GHG emission reduction (Economy wide GHG emissions - WEM scenario)	$ktCO_2eq$	385,941.14	388,500.00

Tunisia

Target and description, including target type, as applicable (from NDC or Appendix CTF)	Carbon intensity target (total net GHG emissions and removals expressed in tons of CO2 equivalent GWP AR4 per unit of GDP expressed in 1000 Tunisian Dinars at constant 2010 prices). • Unconditional target: reduction of 27% of carbon intensity by 2030 compared to 2010 level; • Conditional target: reduction of 45% of carbon intensity by 2030 compared to 2010 level, subject to FTC support received.
Indicator selected to track progress (CTF1)	Carbon intensity (GHG emissions per unit of GDP)
Updates in accordance with any recalculation of the GHG inventory, as appropriate (CTF1)	Due to recalculations of the national GHG inventory, which were carried out after the communication of the NDC, the reference level changed from 0.555 t CO2e/1000 DT 2010 to 0.563 t CO eq/1000 DT 2010 (AR4).
Relation to NDC (CTF1)	The NDC target consists on a reduction, expressed in (%), of Emission (carbon) intensity in 2030, as compared to the carbon intensity level of 2010. Hence, Carbon intensity is the most appropriate indicator reflecting NDC objective and ambitions. The indicator is defined in the same metric and unit as the target of the NDC.
Definition needed to understand the indicator (CTF2)	Ratio between Total GHG emissions and removals (expressed in tons of CO2 equivalent) and GDP (expressed in 1000 Tunisian Dinars at constant 2010 prices). The total GHG emissions and removals correspond to the annual totals reported in CO2 equivalents in the latest national inventory calculated based on AR4 global warming potentials. The GDP corresponds to the Gross domestic product of Tunisia which is the annual measure of the value added created through the production of goods and services in Tunisia during a year expressed in 1000 Tunisian Dinars at constant 2010 prices. The ratio is expressed in tCO2e /1000 Tunisian Dinars at constant 2010 prices.
Description of each methodology and/or accounting approach used for indicator (CTF3)	Not applicable. The methodology/accounting approach is the same as the methodology/accounting approach used to assess the implementation and achievement of the target.
Information for the reference point, level, baseline, base year or starting point, as appropriate (CTF1)	The quantification of the reference indicator is the total net emissions of GHG in the reference year of 2010, as reported in Tunisia's National Inventory of Anthropogenic Emissions by Sources and Removals by Sinks of Greenhouse Gases not controlled by the Montreal Protocol (GWP AR4) divided by the GDP value in the reference year of 2010 (at constant 2010 prices). According to the latest inventory, net emission levels in 2010 were of 35,518 ktCO2e (GWP AR4). According to Tunisia's National Institute of Statistics, GDP level in 2010 was 63,055 million of Tunisian Dinar (at constant 2010 prices). Reference level in the base year (2010) is 0.563 t CO2 e/1000 DT 2010 (AR4).
The most recent information (CTF4)	0.453 t CO2 eq/1000 TND 2010 in 2023
Target year or period; target level (CTF4)	Unconditional: 0.411 CO2 eq/1000 TND 2010 in 2030 Conditional: 0.310 t CO2 eq/1000 TND 2010 in 2030
Progress made towards the NDC (CTF4)	• Unconditional target: Tunisia is progressing towards the unconditional NDC target (reduction of 27% of carbon intensity by 2030 compared to 2010 level). The carbon intensity (GHG emissions per unit of GDP) decreased by 20% in 2023, compared to the carbon intensity (GHG emissions per unit of GDP) level in the NDC base year (2010). • Conditional target: Tunisia is progressing towards the conditional NDC target (reduction of 45% of carbon intensity by 2030 compared to 2010 level, subject to FTC support received). The carbon intensity (GHG emissions per unit of GDP) decreased by 20% in 2023, compared to the carbon intensity (GHG emissions per unit of GDP) level in the NDC base year (2010).
Projections of key indicators (CTF10)	

Key indicator	*Unit*	*2025*	*2030*	*2035*	*2040*
Carbon intensity (GHG emissions per unit of GDP) - WOM	tons of CO2 equivalent/1000 Tunisian Dinars of GDP at constant 2010 prices	0.508	0.441	0.372	0.313
Carbon intensity (GHG emissions per unit of GDP) - WEM	tons of CO2 equivalent/1000 Tunisian Dinars of GDP at constant 2010 prices	0.443	0.320	0.225	0.157
Carbon intensity (GHG emissions per unit of GDP) - WAM	tons of CO2 equivalent/1000 Tunisian Dinars of GDP at constant 2010 prices	0.445	0.304	0.182	0.090

Uzbekistan

Target and description, including target type, as applicable (from NDC or Appendix CTF)	To reduce specific greenhouse gas emissions per unit of GDP by 35% by 2030 from the level of 2010.
Indicator selected to track progress (CTF1)	1. Reduction of GHG emissions per unit of GDP 2. Share of renewable energy sources in total electricity generation 3. Energy intensity of GDP
Updates in accordance with any recalculation of the GHG inventory, as appropriate (CTF1)	Updates have been made to the calculations: (1) the values of annual GDP expressed in constant international dollars of 2015 were used. Source of information: the WB database for the Republic of Uzbekistan (www.worldbank.org); (2) in 2024 2 GHG inventory recalculations were carried out: 1. Recalculation within NC4, NIR (1990-2021): Indicator value for base year (2010) is 2.83 kg CO2-eq/USD2015 (excluding absorption) 2. Recalculation within NIR, BTR (1990-2022): Indicator value for base year (2010) is 2.85 kg CO2-eq/USD2015 (excluding absorption)
Relation to NDC (CTF1)	1. The NDC goal is to reduce specific greenhouse gas emissions per unit of GDP by 35% by 2030 from the level of 2010 2. Increase the share of renewable energy sources to 25% of total electricity generation by 2030 3. By 2030, reduce the energy intensity of GDP by half compared to 2018
Definition needed to understand the indicator (CTF2)	1. Specific greenhouse gas emissions per unit of GDP (kg CO2-eq/USD) =(GHG emissions)/(GDP value) where: numerator – the annual value of total GHG emissions in CO2 equivalent, and these emissions cover the entire economy. The source of information is the National Inventory of Anthropogenic Emissions Sources and Sinks of Greenhouse Gases in the Republic of Uzbekistan; denominator – the value of annual GDP (expressed in international constant dollars). The calculations use GDP values from the World Bank database for the Republic of Uzbekistan (www.worldbank.org). 2. Statistically observed indicator - SDG indicator (7.2.1.): Data from the National Statistical Agency under the President of the Republic of Uzbekistan is used. 3. Energy intensity of GDP, calculated as the ratio of primary energy consumption to gross domestic product (GDP(PPP)). Statistically observed indicator - SDG indicator (7.3.1.). Data from the National Statistical Agency under the President of the Republic of Uzbekistan is used.
Description of each methodology and/or accounting approach used for indicator (CTF3)	The methodology or calculation approach used for the indicators is no different from the indicators used to assess implementation and goal achievement.
Information for the reference point, level, baseline, base year or starting point, as appropriate (CTF1)	1. Carbon intensity in the base year (2010): 4.28 kg CO2-eq/USD2011 (excluding removals) 2. Share of renewable energy sources in total electricity generation: 10.2% in 2019 3. Energy intensity of GDP: 0.200 toe/thousand USD in 2018
The most recent information (CTF4)	1. 1.69 kg CO2-eq/USD in 2022 corresponding to 40.6% reduction 2. 9.3% in 2022 3. 0.14 toe/thousand USD
Target year or period; target level (CTF4)	1. 35% in 2030 2. 25% in 2030 3. 0.10 toe/thousand USD in 2030
Progress made towards the NDC (CTF4)	1. Uzbekistan has already achieved the target value for the main indicator and fulfilled its obligations in 2022 by 116% 2. Commitment achievement rate is 39% in 2022 3. Commitment achievement rate is 61% in 2022
Projections of key indicators (CTF10)	*Key indicator* / *Unit, as applicable* / *2025* / *2030* Reduction of GHG emissions per unit of GDP / kg CO2-eq/USD / IE[1] / IE[2] Share of renewable energy sources in total electricity generation / % / 25.00 / 25.00 Energy intensity of GDP / toe/thousand USD / 0.12 / 0.09 *[1] Projections of Key Indicator #1 (kg CO2-eq/USD) according to scenarios WM, WAM and WOM for year 2025: WM - 1.48; WAM - 1.44; WOM - 1.60* *[2] Projections of Key Indicator #1 (kg CO2-eq/USD) according to scenarios WM, WAM and WOM for year 2030: WM - 1.18; WAM - 1.10; WOM - 1.42*

Example indicators selected to monitoring and evaluation of adaptation actions and processes

Azerbaijan

The State Statistic Committee of Azerbaijan regularly makes monitoring and activities of all organizations in Azerbaijan and prepare a sectoral report that reflects current state of government programs and roadmaps. The committee has developed specific indicators to track the effectiveness of adaptation actions.

These indicators are tailored to measure resilience in key sectors, including:

- Water Resource Management: Metrics include water use efficiency, water quality indicators, and drought frequency and intensity. Water losses in irrigation and urban water supply is one of the metrics that consider efficiency of the water resources management.
- Agricultural activities: Indicators focus on crop yield variability, irrigation efficiency, and adoption rates of climate-resilient agricultural practices. State Statistical Committee use broad range of indicators that measure effectiveness of agricultural activities. For example, crop yield per hectare, water use per hectare, labor cost for per unit of the production are the main economic indicators of agricultural enterprises and private farms.
- Disaster Risk Reduction: Metrics include response times to extreme weather events, the number of communities with early warning systems, and reductions in flood-affected areas. National Hydrometeorological Service release annual statement on the extreme weather events, heat waves and other weather and climate circumstances.
- Ecosystem Protection and Biodiversity Conservation: Progress is measured through forest cover restoration rates, coastal zone health, and biodiversity indexes in protected areas. Number of wild animals, area of the protected places, state of pollution and many other indicators are used to evaluate state of the ecosystems. Forest fires, extreme hazards in protected areas are also counted and analyzed. NBSAP has a protection plan targeted up 2030, use different indicators to evaluate state of the biodiversity in the country.

Canada

Table below includes an initial set of select indicators to track process on adaptation across Canada. As the National Adaptation Strategy is implemented, the federal government, in partnership with other orders of governments, Indigenous Peoples, and experts will build on this initial set of indicators over time. This could include addition of new metrics and more-representative sources of data as our understanding of the pressures, drivers, and state of adaptation in Canada improves. To view the latest set of indicators in more detail, as well as other aspects of the Monitoring and Evaluation Framework, please visit the main National Adaptation Strategy webpage.

Indicator	*Systems*	*Relevance to Adaptation*
Percentage of households with cooling systems	Health and Well-being	As extreme heat events increase, access to reliable cooling systems will help people withstand the worst effects of these events in their own homes.
Percentage of households with park or green space close to home	Health and Well-being, Nature and Biodiversity	In temperate, urbanized regions of Canada, ready access to green spaces promotes physical and mental health and well-being through fitness, recreation, and natural cooling.
Changes in land use, such as from forests to croplands and settlements	Nature and Biodiversity	Natural uses of land, such as forests, reduce the severity of some climate-related impacts.
Percentage of tree canopy cover in urban areas (urban greenness)	Nature and Biodiversity	Trees in cities, where the majority of people in Canada live, reduce the impact of extremes in temperature and precipitation, which are expected to worsen as the climate changes.
Proportion of terrestrial and marine area conserved	Nature and Biodiversity	Conserved areas help to maintain ecosystem services that, in turn, reduce the impacts of climate change on quality of life.
Status of key fish stocks	Nature and Biodiversity, Economy and Workers	As climate change continues to affect the temperature and chemistry of Canada's oceans, sustainable fisheries and continued opportunities to harvest fish hinges on the status of key fish stocks.
Crop data: ratio of harvested acreage to planted acreage	Economy and Workers	As climate change continues to affect Canada's agricultural regions, crop data will contribute to a better understanding of the resilience of crop production systems and the impacts of climate change including extreme weather events (droughts and floods) and increased prevalence of pests and diseases.
Total direct payments to agriculture producers under business risk management programs for protection against income and production losses	Economy and Workers	The provision of support to agricultural producers will help them to recover from losses, including those driven by climate change.
Percentage of natural resource businesses and professionals reporting they have capacity to apply climate change adaptation tools and information for adaptation decision-making	Economy and Workers	Businesses will need to adapt to the realities of a changing climate. Ensuring businesses and professionals have the skills and knowledge to incorporate adaptation tools and information into their operations and decision making will increase the resilience of Canada's economy.
End-to-end transit time of a select grouping of commodities, such as grains, departing from Canada to Asia	Economy and Workers	Adaptation measures can support the resilience and reliability of Canada's supply chain, of which end-to-end transit time is a measure.
Number of long-term drinking water advisories for public systems on reserve*	Infrastructure	Sustainable delivery of drinking water through public systems on reserves will be more resilient to disruptions, including those caused by climate change.
Percentage of public and municipal organizations that factored climate change adaptation into decision-making processes for infrastructure	Infrastructure	Factoring adaptation into decision-making processes for municipal infrastructure assets is a first step in the process of ensuring their resilience to climate change.
Percentage of people in Canada with strong sense of belonging to local community	Foundational	A strong sense of belonging leads to resilience against shocks and disruptions, including those related to climate change.
*Note: * indicates that this represents a structural need in underserved and historically excluded populations, where progress would enhance capacity to adequately prepare for climate change.*		

Guinea Bissau

Guinea-Bissau has implemented a number of adaptation measures in priority sectors such as agriculture, water, coastal areas, biodiversity, health and gender. Interventions were carried out at both community and institutional level, with the aim of reducing climate vulnerability and increasing the resilience of human and ecological systems. In addition to the description of the actions, measurable progress has been made, with emphasis on the following indicators:

- Resilient Agriculture: +1,600 farmers trained in agroecological practices and sustainable use of water; Implementation of 12 solar irrigation systems in arid areas of Oio, Cacheu and Gabú.
- Water Resources Management: Rehabilitation of 23 holes and construction of 10 new community water points.
- Coastal Protection and Ecosystems: Rehabilitation of 981 ha of wetlands and mangroves (Coastal Project); Raising awareness among 54 coastal communities on climate risks and nature-based solutions.
- Education and Gender: Inclusion of climate change issues in the curriculum of 32 basic education pilot schools; Support for 135 women in climate cooperatives with access to microfinance for resilient activities.

Adaptation Progress Indicators:

Sector	*Action Implemented*	*Indicator*	*Value*	*Period*	*Source/Project*
Agriculture	Training of farmers	Number of beneficiaries	1,600	2021–2024	WACA Project, FAO
Water Resources	Infrastructure rehabilitation	Number of water points rehabilitated	23	2022–2025	HRMD / UNDP
Back & Mangroves	Ecological rehabilitation	Restored area (ha)	981 ha	2023–2025	Coastal Project
Education & Gender	Curriculum inclusion and support for women	No. of schools / No. of women supported	32/135	2022–2024	MABAC / local NGOs

Jordan

Jordan's risk assessment indicators were built around three main components: exposure, sensitivity and adaptive capacity.

Exposure indicators capture the degree to which natural and human systems in Jordan are subjected to climate-related hazards, such as increasing temperatures, drought frequency, water scarcity, and extreme weather events. These indicators are particularly relevant in water-limited areas and in socioeconomically vulnerable areas, where the physical impacts of climate change are most acute.

Sensitivity indicators reflect how strongly these sectors—such as agriculture, health, biodiversity, and infrastructure—respond to climate stresses based on their existing conditions and dependencies. Sensitivity is assessed through variables like agricultural yield variability, reliance on rain-fed crops, water demand intensity, and the spatial distribution of population and infrastructure in high-risk zones.

Adaptive capacity indicators, on the other hand, measure the ability of communities and institutions to anticipate, cope with, and recover from climate impacts. In the Jordanian context, this includes institutional readiness, access to financial and technical resources, education levels, public health capacity, and the availability of climate-resilient infrastructure.

Category	*Sample Indicators*
Exposure	• Temperature trends (e.g. increasing maximum temperatures) • Changes in precipitation levels • Frequency of droughts • Number of hot days (e.g. days above certain temperature thresholds) • Intensity of extreme rainfall events or very heavy rainfall days • Evaporation rates • Exposure to climate stimuli such as heatwaves, droughts, shifts in rainy seasons
Sensitivity	• Extent of irrigated vs rain-fed agriculture • Agricultural dependence (crop yields, crop types, livestock) • Water demand versus supply balance • Soil types, land cover and land degradation • Population density in climate hazard-prone areas • Topography, groundwater recharge areas, valleys • Distribution of infrastructure, settlements in exposed zones
Adaptive Capacity	• Institutional readiness (existence of policies, plans, adaptation programs) • Access to financial, technical, and human resources • Education levels and public awareness • Health sector capacity (infrastructure, human health services) • Technology & data availability (climate information and projections, early warning systems) • Social capital / community level capacity • Capacity for integrating adaptation into sectoral development plans

Lebanon

The indicators are designed to measure trends in adaptation efforts and provide insights into the drivers and outcomes of associated actions, ensuring they remain relevant to Lebanon's context and data availability. Headline indicators focus on key adaptation priorities such as resilient agriculture, water management, biodiversity conservation, disaster risk reduction, and climate-resilient health systems; and are presented below:

Sector	*Indicator*	*Unit*
Agriculture	Agricultural production by key crop type	Tonnes
Agriculture	Increase of agricultural productivity of key crop types	%
Agriculture	Percentage of agricultural land using climate-smart practices	%
Agriculture	% increase in total irrigated area under modern irrigation system	%
Forestry	Lebanon's forest cover in Year X	Hectares and %
Forestry	Number of management plans for forest systems	#
Forestry	Hectares of burned lands	Hectares
Water	Difference in emissions from wastewater compared to BAU data	ton CO2eq. and %
Water	GHG emissions trend in wastewater since [2015]	ton CO2eq. and %
Water	Share of population with access to safely managed drinking water	%
Disaster Risk Reduction	Areas dedicated to ecosystem preservation and conservation across Lebanon	Hectares and %
Disaster Risk Reduction	Frequency and severity of coastal flooding events	# / Severity scale
Disaster Risk Reduction	Rate of coastal erosion	cm/year
Health	Number of annual climate-related illnesses (e.g., heatstroke, respiratory problems due to air quality, and water-borne diseases)	#

Lithuania

In Lithuania, the progress and monitoring of climate change adaptation is coordinated by the Ministry of the Environment together with the institutions responsible for the measures. Municipalities are responsible for planning and implementing adaptation measures at the local level. They cooperate with national authorities in the preparation and implementation of specific plans.

The implementation of adaptation measures may be subject to change for the following reasons: the latest scientific data on climate change and its impacts, extreme hydrometeorological events and their consequences requiring urgent action, changes in legislation at the EU and national level, changes in funding sources and conditions, and the needs of local communities. Changes would be made through regular reviews, which would assess the results achieved and identify new priorities and actions. The Lithuanian municipal climate change adaptation plans set out monitoring indicators to assess the effectiveness of the selected measures. The indicators will be monitored at least once a year.

The list of possible monitoring indicators to improve the effectiveness of the measures selected in the Climate Change Adaptation Plan are presented in the table below:

Indicator	*Possible Data Source*
1. Number of people visiting healthcare institutions (cases per 100,000 inhabitants) with diagnosed conditions directly or indirectly related to extreme meteorological events (e.g., heatwaves) or air pollution. This also includes deaths related to such causes, such as cardiovascular and respiratory diseases, trauma caused by extreme events, diseases from heat or cold exposure, or neglect.	Healthcare institutions, Ministry of Health, Health Information Centre, Hygiene Institute
2. Financial losses due to the impact of extreme climate events (in Euros)	Municipalities
3. Number of fires related to extreme climate events (drought, storms)	Fire and Rescue Department under the Ministry of Interior
4. Number of infrastructure objects affected during storms	Municipalities
5. Number of trees fallen during storms	Municipalities
6. Areas of cities flooded due to insufficient surface water collection infrastructure	Municipalities and companies managing water supply networks
7. Number of hydro-technical structure accidents caused by extreme meteorological events	Municipalities
8. Damage to transportation infrastructure caused by flooding or other extreme climate events	Municipalities
9. Ecological status of surface water bodies	Lithuanian Environmental Protection Agency
10. Exceedances of air pollution limit values per year	Municipalities
11. Number of air or water pollution incidents caused by extreme meteorological events	Municipalities
12. Forest or woodland damaged by pests in urban areas (hectares per year)	State Forest Service

Republic of Korea

The Enhanced 3rd NCCAP (June 2023) incorporates monitoring and evaluation frameworks from its planning phase through established performance metrics. The Plan includes two sets of indicators, i.e., 18 policy indicators to assess implementation progress, and 15 public-oriented indicators to measure adaptation outcomes.

Policy Objectives	*Indicator Names*	
	Policy Indicators	*Public Oriented Indicators*
Strengthening Climate Change Monitoring and Forecasting Systems	Climate Change Situation Map	-
	Establishment of GHG Ground Observation Network	-
Promoting Climate Change Adaptation Information and Technological Development	Development of a Standard Classification System for Adaptation Information	-
Enhancing Water Resource Management for Flood and Drought Preparedness	Expansion of Flood Forecasting Locations (units)	Expansion of Small-Scale Rain Radar Systems (units)
	National Drought vulnerability Map Service	Designation of Priority Areas for Sewerage Management (units)
	-	Users of National Drought Information Service (persons/year)
	-	Provision of Drought Meteorological Forecasts
Preventing Forest Disasters, Including Wildfires and Landslides	Advanced Wildfire Prediction System	Advanced landslide early warning system
	Precision of Landslide Hazard Map	Establishment of Mountain Meteorological Observation Network (units)
Strengthening Public Health Measures for Extreme Temperature Events (Heatwaves and Cold Waves)	Development of Methodology for Estimating Climate-Related Disease Burden	-
Enhancing Disaster Resilience of Housing, Urban Areas, and Infrastructure	Support for Relocation of Households in Non-Standard Residences to Public and Private Rental Housing (households)	-
	Green Remodeling of Public Rental Housing Units (units)	-
Developing Climate-Resilient Ports and Marine Spaces	Reinforcement of External Port and Fishing Port Facilities (units)	-
Fostering Sustainable Agricultural and Fisheries Practices	Expansion of Crop Disaster Insurance Coverage	Development of Climate-Resilient Crop Varieties (varieties)
	Expansion of Real-Time Sea Temperature Observation Network (units)	Provision of Farm-Specific Early Warning System Information (sub-national governments)
Maintaining Ecosystem Stability and Biodiversity	Designation of National Protected areas km2	Database of Species Experiencing and Likely to Experience Mass Proliferation Events
	Urban Ecological Corridor Restoration Projects (projects)	Eco-Friendly Pest Control Guidelines
Strengthening National Protection for Climate Vulnerable Populations	Standard Model for Adaptation Infrastructure (units)	Survey and Guidelines for Climate Vulnerable Populations
	-	Support for Adaptation Infrastructure Development (sub-national governments)
Enhancing Response Capabilities for Climate-Related Disasters	Publication of Korea Climate Change Assessment Report	Selection Plan for Climate Risk Priority Management Areas
Implementing Inclusive Adaptation Governance with Public Participation	Operation of Adaptation Research Institution Consultation Network	Operation of Adaptation Academy (cumulative/persons)
	-	Operation of Regional Expert and Resident Support Groups for Sub-National Government Adaptation Plans (sub-national governments)

Rwanda

Key vulnerabilities to climate impacts were assessed in detail in the Third National Communication (2018) and in the subsequent Climate Change Vulnerability Assessment and Index Report 2019. Updates on the significant negative impacts on growth and development in key vulnerable sectors including agriculture, water, health and energy are discussed in the Climate Change Vulnerability Assessment and Index report of 2019. The 37 indicators are listed below:

Exposure Indicators:

1. Projected change in population growth to 2032
2. Annual frequency of warm days (above 30 oC) per year
3. Current mean annual temperature; annual change in temperature
4. Change in agricultural production
5. Annual precipitation run-off rate
6. Annual groundwater recharge
7. Change in # of deaths from diarrhea diseases and malnutrition
8. Change of malaria hazard
9. Change in % of national forest cover
10. Change of hydropower generation capacity

Sensitivity indicators:

1. Age dependency ratio
2. Total urbanized population
3. Effectiveness of Rwanda's social safety net / social protection system
4. Annual loss due to damage caused by hazards, particularly weather-related
5. Rural population as % of the total population
6. Freshwater withdrawal rate
7. Dependency on external resources for health services
8. Proportion of urban population living in slum areas
9. Change in size (ha or km2) of natural habitats or critical ecosystems
10. Level of dependency on imported fuel

Adaptive Capacity Indicators:

1. Level of education attained by women
2. Strength of government capacity and coordination to mainstream climate change
3. Access to improved climate-related early warning info/systems – for extreme weather
4. Percentage of the area of Rwanda covered by the Rwanda Meteorology Agency
5. Extent of use of climate info products and services in decision-making in climate-sensitive sectors
6. Extent of fertilizer use
7. Level of severe child malnutrition
8. Change in future water demand
9. Capacity of dams and lakes to store water
10. Access to reliable drinking water

National Indicators:

1. Change in access to healthcare facilities
2. Access to improved sanitation facilities
3. Proportion of land area protected to maintain biodiversity and natural ecosystems
4. Engagement in international environmental conventions
5. Quality of trade and transport infrastructure
6. Length of paved roads
7. Proportion of the population with access to electricity for lighting

Zambia

To ensure transparency, accountability and continuous improvement in adaptation planning and implementation, Zambia is developing and operationalizing systems to monitor and evaluate both adaptation and mitigation actions. These systems are critical for tracking progress towards building climate resilience and meet the country's commitments under its NDC.

The adaptation indicators are listed as follows:

- Water security of all Zambians is promoted and protected, via gender-responsive and climate-smart water infrastructure;
- Strengthened climate resilience of Agricultural production and productivity;
- Enhanced early warning systems;
- Adoption of improved livestock management practices that enhance livelihoods;
- Increased resilience of the health sector to climate change;
- Catchment areas restored.

CGE
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