

Assessing Bottom-Up Climate Finance Needs

Methodology

October 2024



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1. INTRODUCTION

While global climate finance has increased over the past decade, reaching an unprecedented level of nearly <u>USD 1.3 trillion per year in 2021/22</u>, much more is needed to keep global temperature rises within 1.5°C and avoid the worst impacts of climate change (CPI, 2023). Since 2021, CPI has strived to support a collective understanding of the climate finance needed to reach net zero carbon emissions by 2050, compiling and standardizing data on climate finance needs to provide the most comprehensive overview of the climate finance gap available to date. Accurately assessing the size of this global climate finance gap can enable decision-makers to mobilize finance effectively, quickly, and to where it is most needed.

This document details the methodology used to produce our bottom-up climate finance needs estimates. Coupled with our wider tracking and analysis of climate finance flows, this will help identify the largest climate finance gaps, track progress against climate targets, and better inform decision-makers and financial institutions on how to increase the speed, scale, and quality of climate finance.

While there is not yet a globally accepted official definition of "climate finance needs", CPI distinguishes between two types of needs:

- Top-down climate finance needs: The estimated climate finance to fund the actions needed across different sectors to keep the average global temperature rise within 1.5°C by the end of this century. These needs are typically derived using predictive models for different sectors. Climate-compatible scenarios developed by different institutions can differ widely in the data, assumptions, model used, and (geographic or sectoral) scope.
- Bottom-up climate finance needs: The climate finance required by countries to reach
 their national climate targets, as stated in official documents such as <u>Nationally</u>
 <u>Determined Contributions (NDCs)</u>. These needs include both the finance required to
 be raised domestically and the financial support required from international (public and
 private) sources.

Existing CPI work on climate finance needs has focused on top-down needs. CPI's assessment of global top-down climate finance needs showed that annual climate finance flows must increase by at least sixfold on current levels, to reach USD 8.5 trillion per year between now and 2030, and over USD 10 trillion per year from 2031 to 2050. However, limited work has been done to date on assessing the scope of bottom-up climate finance needs on a global scale. **Assessing bottom-up needs is critical to understanding countries' climate finance objectives and the required level of international support to reach their mitigation and adaptation goals.**

Top-down and bottom-up needs estimates each shed light on climate finance needs from a different perspective. Top-down needs take a sectoral and technology-based perspective outlining the sectors, technical solutions and actors that would be required (and feasible) to put the world on a climate-compatible pathway and the costs of doing so. On the other hand, bottom-up needs take a country perspective, outlining governments' priorities as well as the domestic and international capital required to achieve national climate goals. Table 1 outlines differences in data coverage and complementarities between top-down and bottom-up needs estimates.

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Table 1: Overview of top-down and bottom-up climate finance needs

	Top-down climate finance needs	Bottom-up climate finance needs
Net zero alignment	The scenarios analyzed outline climate finance required to align to a net-zero pathway. When compared with current climate finance flows, top-down estimates can help to track progress against the objectives of the Paris Agreement, and identify related investment gaps.	NDCs outline measures and finance required to reach each country's specific climate objectives. Globally, the cumulated commitments as per currently submitted NDCs are insufficient to align to a net-zero pathway. As a result, bottom-up needs are materially lower than top-down needs.
Climate uses	Typically, the scenarios analyzed do not explicitly highlight whether the finance needs correspond to mitigation and/or adaptation measures. For this reason, the top-down approach does not analyze the split between mitigation, adaptation, and dual objectives. While the level of granularity varies acrecountries, NDCs typically distinguish be finance required for mitigation, adaptation, and dual cross-cutting (dual objective) measure	
sectoral scope and scope and sectors in the original scenarios with our sectors. In several cases, granularity		While the level of granularity varies across countries, NDCs typically include costed needs by sector. In several cases, granularity is also available at the solution or project level.
Geographical scope and granularity	Scenarios analyzed typically have a global focus and do not provide granularity on the geographical breakdown of finance required.	Costed needs are prevalent in non-Annex I countries' NDCs. As a result, bottom-up data mainly focuses on EMDEs and is available at the country level.
Sources of finance	Scenarios analyzed do not provide any information on the sources of finance that would be able to fund the projected scenarios.	In their NDCs, countries typically specify whether finance will need to be raised domestically (unconditional needs) or internationally (conditional needs). As such, bottom-up estimates can give an indication of the magnitude of the international finance required.

This document details the methodology used to produce our bottom-up climate finance needs estimates ("bottom-up needs" from here on). Alongside our assessment of top-down needs and CPI's wider tracking and analysis of climate finance flows, this analysis can help identify the largest climate finance gaps at the country level, track progress against climate targets, and better inform decision-makers and financial institutions on how to increase the speed, scale, and quality of climate finance. This work can also more accurately inform discussions surrounding the New Collective Quantified Goal on Climate Finance (NCQG) and future NDC updates to improve and align the scoping of needs with the ambition of international support.

2. CPI'S APPROACH TO ESTIMATING BOTTOM-UP CLIMATE FINANCE NEEDS

Bottom-up needs take a country perspective, outlining domestic and international capital required to achieve national climate goals. CPI's bottom-up climate finance needs are derived from the collection and aggregation of climate finance needs as reported by countries in their NDCs. These needs include both the finance required to be raised domestically (unconditional needs) and the financial support required from international (public and private) sources (conditional needs).

Currently there is no standardized methodology for countries to follow when estimating their climate finance needs and no defined structure or mandated topics which must be covered in countries' NDCs. While some countries estimate their climate finance needs using predictive models aligned to a 1.5°C pathway, in most cases, bottom-up needs are derived from a list of costed mitigation and adaptation measures or projects that countries aim to implement. Therefore, the scale and granularity of costed climate finance needs varies widely across countries. Currently, total stated bottom-up needs are insufficient to keep global temperature rises within 1.5°C (UNFCCC, 2023).

CPI's efforts focus on compiling estimates of climate finance needs as presented by countries, for needs that are required from both domestic (unconditional) and international (conditional) sources. Our goal is not to validate the approach and assumptions used by countries in estimating their climate finance needs, but instead to provide a **comprehensive overview of the scope and scale of bottom-up needs estimates to date.** This overview will illustrate how countries currently understand their climate finance needs, including, critically, how much external financial support non-Annex I countries¹ expect they require to meet mitigation and adaptation objectives.

¹ Annex I countries, as referenced in the Paris Agreement, are developed nations and economies in transition committed to reducing greenhouse gas emissions under international climate agreements. These include countries that were OECD members in 1992, plus countries with economies in transition in Central and Eastern Europe (UNFCCC, 2024a). Under the Paris Agreement, non-Annex I Parties are eligible to receive international support (either financial, technological, or capacity-building). Hence, many of them include conditional needs in their NDCs.

3. METHODOLOGICAL STEPS

COLLECTION OF BOTTOM-UP NEEDS DATA

To compile our bottom-up needs data, we reviewed the 168 available NDCs submitted by the UNFCCC Parties that ratified the Paris Agreement.² All NDCs are recorded in a public online NDC registry maintained by the UNFCCC Secretariat (UNFCCC, 2024b).

For each NDC reviewed, we collected, where available, data on stated climate finance needs. Data was collected according to the following principles:

- Prioritizing more recent data: Whenever a country has communicated more than one NDC, we included needs data from the latest NDC available. The assumption is that any new NDC takes precedence over previous ones.
- **Prioritizing more granular data:** Whenever an NDC includes both sectoral aggregate needs and project-level estimated costs, we prioritized the latter to keep the data as granular as possible.
- Including both conditional and unconditional needs: By definition, bottom-up needs
 encompass both finance to be raised domestically and international support required.
 Whenever a country specified that financing was already received or allocated, we
 assumed the funding was already secured (and therefore not needed anymore) and
 excluded the amount.

Appendix II lists all the NDCs reviewed and used for our needs estimates for each country.

DATA EXTRACTION AND STANDARDIZATION

For all the countries listed in Appendix II, we extracted bottom-up needs data, which was available either within the main NDC text, in data tables, or in NDC appendices. Data was available at varying levels of granularity, as depicted in Table 2.

² Out of 198 UNFCCC Parties, the European Union and its 27 member states submitted a joint NDCs. As of 31 August 2024, Iran (Islamic Republic of), Libya and Yemen had not ratified the Paris Agreement and had not submitted NDCs.

Table 2: Levels of data granularity in NDCs³



	5	Number of NDCs		
Level of granularity	Description	Annex I	I Non-Annex I	
No needs quantified The NDC does not quantify any finance needs.		12	47	
Total aggregate needs Only overall climate finance needs are presented, with no thematic or sectoral distinction.		2	8	
Thematic aggregate needs	Needs are costed for mitigation and/or adaptation.	0	31	
Sectoral aggregate needs Needs are costed for different sectors (e.g., for energy or agriculture).		0	9	
Project- or action-level needs	The NDC costs needs at the project or action level.	2	57	

Data was prioritized by the highest level of granularity available, except when granular data was insufficient to capture all described needs. For example, if only a few actions were costed, but total or thematic aggregates were available, the aggregates were included to give a fuller picture of the scope of the bottom-up needs. In this case, the project-level needs would be excluded from analysis to avoid double counting. However, if only partial data is available (e.g., only certain sectors or project needs are costed) we include these needs in the absence of aggregate data.

Original data extracted from the different NDCs varied widely in terms of sector classification, timeframe considered, currency year, and type of value. In order to compare and aggregate the bottom-up needs, we standardized the data along these variables, as described in the sub-sections below.

SECTOR CLASSIFICATION

The sector/technology classification used in NDCs can vary significantly even within the same sector. The sector/technology classification used in the NDCs was also often inconsistent with the taxonomy used by CPI to categorize climate finance flows in our Global Landscape of Climate Finance (GLCF) analyses, making it hard to compare flows and needs data.

In addition, we only included needs for projects or technologies that can be strictly categorized as climate solutions. Various NDCs estimated finance required for measures such as building new fossil fuel power plants, which may be considered essential transition or development finance in some countries.

Once the original data was extracted, we matched each data point with sectors and subsectors in CPI's GLCF taxonomy (see Appendix I), and excluded any technologies that cannot be classified as climate finance from our calculations. This improved how comparable and consistent needs estimates are across CPI climate finance flows.

³ Where the NDC contains multiple levels of granularity (e.g., thematic average for adaptation but project-level for mitigation), the most granular level is counted in Table 3. For a more detailed breakdown at the county-level, see Appendix III.

TIMEFRAME CONSIDERED

Per the Paris Agreement, NDCs should be set and updated every five years after a country submits its initial NDC (UN, 2024). Following the ratification of the Paris Agreement, NDCs were submitted in different years, and according to countries' own methodologies and climate objects. Therefore, they currently include different targets and timeframes (e.g., to 2025, 2030, or beyond).

We do not make any assumptions to extend needs estimates beyond the timeframe presented in the source. The timeframe for each data point is collected as presented in the NDCs and at the most granular level possible. Whenever an NDC includes measures/actions targeting different years (e.g., 2025 and 2030), different timeframes are considered for each measure/action.

Where the timeframe or target year for a specific measure/action is unclear or not specified, the general timeframe of the NDC is used (e.g., the timeframe during which the country has committed to climate objectives, such as GHG reductions). If a number of years/months is given (e.g., 'over the next ten years'), the publication year is used as the start of the timeframe.

CURRENCY YEAR

Most bottom-up needs estimates found were expressed in nominal (current) USD, with different sources being published in different years. Where not stated in the original source, we assumed the currency year in which needs estimates were expressed to be the year of publication. Where bottom-up needs were expressed in currencies other than USD, conversion rates were applied based on the currency year of the source (see Table 3).

Table 3: Exchange rates for currency conversion to USD

Currency	Currency year	Conversion rate to USD
EUR (Euro)	2016	1.1069
EUR (Euro)	2020	1.1382
EUR (Euro)	2021	1.1828
EUR (Euro)	2022	1.0535
CFA (West African franc)	2021	0.001803
MYR (Malaysian ringgit)	2016	0.2415
AUD (Australian dollar)	2022	0.6947
CAD (Canadian dollar)	2021	0.7978
AED (Emirati dirham)	2023	0.2723
BAM (Bosnian convertible mark)	2022	0.5387
COP (Colombian peso)	2020	0.000272
VES (Venezuelan bolivar)	2021	0.0562
XCD (East Caribbean dollar)	2022	0.3702

Source: Exchange Rate Calculator, available <u>here</u>.

To improve consistency and comparability of data, we standardized all investment needs estimates to 2022 USD billon, taking into account the inflation rates shown in Table 4.

Table 4: Inflation rates for currency conversion

Original currency year	Conversion rate to 2022 USD
2011	1.30
2015	1.24
2016	1.22
2017	1.19
2018	1.17
2019	1.15
2020	1.13
2021	1.08
2022	1.00
2023	0.96
2024	0.94

Source: US Inflation Calculator, available here.

TYPE OF FINANCE

For each need collected, we describe the amount of finance that is (i) unconditional, (ii) conditional or (iii) unspecified, which are defined as follows:

- i. **Unconditional:** Finance needs to be met using domestic resources.
- ii. **Conditional:** Finance needs to be met through international financial support.
- iii. **Unspecified:** Finance needs for which it is unclear or not specified if they are unconditional or conditional.

Where the type of finance required is specified, finance needs may be expressed as a combination of 'unconditional' and 'conditional', or else be described as fully 'unconditional' or fully 'conditional'. Any remaining finance that cannot be classified as 'unconditional' or 'conditional' is considered 'unspecified'.

Information on the type of finance was collected as specified in the NDCs and at the most granular level available. For instance, if the amount of 'unconditional' and 'conditional' finance was specified for each measure/action, this was recorded at the project level. Alternatively, if the NDC specified the unconditional/conditional breakdown at an aggregate level (e.g., "3% of all needs will come from national sources"), the same breakdown was applied to all relevant measures/actions in the NDC. If there is no description of unconditional or conditional needs, all needs are described as 'unspecified'.

Where the document described finance that has already been secured and/or allocated towards climate goals and/or measures in the NDC, this finance is considered separately as 'received finance'. Total needs are calculated as total costs minus finance received.

TYPE OF VALUE

Investment needs in the NDCs are generally expressed as either (i) cumulative needs or (ii) annual needs over a timeframe.

All bottom-up needs data collected were converted to annual needs as follows:

- i. **Cumulative needs:** In these instances, we describe the annual investment as the cumulative needs divided by the number of years, unless otherwise indicated in the NDC.
- ii. **Annual needs:** In these instances, we took the average annual investment for each year as per the NDC.

Whenever an NDC expressed a needs estimate as a range rather than as a single value, we collected data for both the low and high values, and added a mean value into our database.

4. DATA COVERAGE AND GAPS

Since there is no required standardized methodology for countries to determine climate finance needs in their NDCs, granularity and coverage varied widely across the documents reviewed. Quantified needs data within an NDC did not always represent a comprehensive sum of the country's needs. In some cases, only **partially costed** data was available (e.g., only certain sectors or project needs were costed). Within NDCs that fully costed total needs, varying levels of data granularity were available.

Data coverage also varied over climate objective/theme (mitigation or adaptation). While many NDCs quantified needs for both climate objectives, they were sometimes determined at different levels of granularity. Others quantified needs for just one of the two climate objectives. Table 5 below describes the distribution of coverage and granularity by climate objective in the NDCs reviewed.

Table 5: Data coverage by climate objective across NDCs reviewed

Community (Community)		Number of NDCs	
Coverage/Granularity	Both mitigation and adaptation	Mitigation	Adaptation
Fully costed	67	18	4
Partially costed	9	9	2
No costs included	59		

5. DATA AND METHODOLOGY LIMITATIONS

To clarify the global climate finance needs landscape, CPI has developed a novel approach to capturing all existing bottom-up needs estimates in a clear and digestible manner. We make best efforts to ensure a rigorous method to compile and standardize bottom-up needs estimates in an impartial manner, though some limitations remain that affect the effectiveness of our approach and the completeness of results. Our needs estimates should, therefore, be interpreted with the following data and methodology limitations in mind.

DATA LIMITATIONS

As described in Section 4, data coverage across NDCs reviewed varied widely, with less than half of all NDCs reviewed providing comprehensive (fully costed) climate finance needs. Since for many countries, no or limited data was available, this limits our ability to provide a comprehensive assessment of global bottom-up needs.

Where data was available, we sometimes faced the following challenges when trying to include, process, and standardize the data. These challenges, in some cases, limited our ability to use the data for the final calculations.

- Data format. Data was extracted manually from NDCs that are available in text format (either as PDF or Word documents). This is a highly time-consuming process that increases the possibility of mistakes and omissions.
- Data interpretation. NDCs sometimes include miscalculations or unclear wording, which made the interpretation of data difficult. In the cases of miscalculations (e.g., project-level data did not align with aggregate data in the same NDC), CPI privileged the more granular data. Where wording was unclear (e.g., on conditionality of finance) CPI adopted a conservative approach where applicable (e.g., by listing the type of finance as 'unspecified'). In cases where NDCs could be interpreted in different ways, we have validated our interpretation and approach with external partners.
- Data standardization. Different countries define sectors, or even climate finance, differently. Thus, the way needs are categorized may differ greatly from one country's NDC to another's. In many cases, the NDC may provide only a brief description of what is included under each costed need, and there are no accompanying methodology documents that could provide more detail. This may affect our ability to correctly standardize data collected based on CPI's taxonomy (see Section 3).
- Data granularity. Data granularity varies widely across NDCs (see Section 4). Countries may integrate needs for interventions that have limited climate relevance (e.g., fossil fuels, health, education) into their NDCs. For instance, some countries include measures involving a shift from higher-emission fossil fuel sources (e.g., coal) to lower-emission sources (e.g., natural gas). While these measures would result in a reduction of greenhouse gas emissions, they would also lead to a high-carbon infrastructure lock-in. Where data granularity allows, CPI takes a conservative approach and excludes non-climate finance needs from total bottom-up

needs. However, where needs are quantified at a broad and/or not well-defined level, and it is not possible to identify and isolate finance needs for high-carbon activities (e.g., fossil fuels), these activities may be included in total needs estimates.

INTERPRETING THE RESULTS

Our needs estimates compile and standardize data from a wide variety of scenarios. Our goal is to provide a comprehensive understanding of climate finance needs as expressed by countries in their NDCs.

Nevertheless, aggregating bottom-up needs data from different countries brings a number of challenges that should be kept in mind when interpreting our needs estimates.

- Many countries have not quantified needs within their NDCs, with some establishing action plans with quantified needs in other external documents (e.g., National Adaptation Plans, National Communications, national sector strategies, etc.). While CPI hopes to expand work in the future to cover additional bottom-up needs estimations, the current database covers only NDCs. Therefore results should not be interpreted as total needs for all countries, but instead as the total needs available in NDCs to date.
- As the data collected comes directly from NDCs prepared and submitted by countries, the quality of bottom-up needs estimations is only as good as the quality of the underlying methodologies, assumptions, and approaches used to develop these estimates at the country level. The level of accuracy and refinement of needs estimates varies widely across NDCs and depends, at least in part, on each country's institutional capacity and resources. Therefore results should be interpreted keeping in mind that the quality of needs estimates in NDCs and approaches used can vary widely across countries.
- While the sum of all mitigation targets in the NDCs should align with a 1.5°C pathway, the ambition of current NDCs is insufficient to reach the goals of the Paris Agreement (UNFCCC, 2023). Therefore, results should be interpreted as the current scope of what countries have quantified as climate finance needs and not as the total capital required for a net zero pathway, which is much greater in scale (CPI, 2024).

APPENDIX I: CLIMATE FINANCE TAXONOMY USED IN CPI GLOBAL LANDSCAPE ANALYSES

Sector	Sub-sector	Mitigation or adapdation solution	Additional information and examples
		Biofuel/Biomass-fired	If a project's GHG emissions reductions are demonstrated compared with technically and economically viable alternatives
		Geothermal	
		Hydropower ⁴	If a project's GHG emission reductions are demonstrated compared with technically and economically viable alternatives
		Hydrogen fuel cell	Using green hydrogen only
		Off-grid (renewables only)	Renewables only
		Other marine	Wave, Tidal, etc
		Solar - concentrated solar power	
	Power & Heat Generation	Solar - photovoltaic	Utility-scale and distributed
Energy Systems		Wind - offshore	
		Wind - onshore	
		Carbon capture use and storage in fossil fuel power plants	Incremental costs of CCUS technology only
		Waste-to-energy	E.g., incineration, gasification, pyrolysis and plasma with clear mitigation benefits
		Multiple	Unspecified renewable energy projects or projects that combine multiple energy sources
		Renewable retrofit	Energy efficiency in existing renewable power assets
		Resilient infrastructure and infrastructure for resilience	E.g., reduction in river flows leading to loss of generation from a hydroelectric plant
		District heating	Fueled by renewable energy only
	Power & Heat Transmission & Distribution	Smart grid	
	& Distribution	Mini grids	

⁴ CPI does not count finance for large hydro projects from the private sector, or public sector finance for projects that do not demonstrate mitigation potential.

Sector	Sub-sector	Mitigation or adapdation solution	Additional information and examples
		Power Grid - Retrofit	Retrofits that lead to clear energy efficiency gains
		Power Grid - New	That enable the integration of renewable power capacity
		Resilient infrastructure and infrastructure for Resilience	E.g., undergrounding of power lines
		Biogas	Production of biogas connected to natural gas pipelines
	Fuel Production	Biofuel	Biofuel production
		Hydrogen from renewables	
	Fuel Transmission & Distribution	N/A	E.g., green hydrogen pipelines
	Policy & National Budget Support & Capacity Building	N/A	
	Other/Unspecified	N/A	Other energy projects, including general energy access development with clear mitigation and/or adaptation benefits
		Non-energy and fugitive GHG reduction	E.g., substitutions in industrial processes with associated GHG cuts
	Industrial, Extraction, and	Carbon capture use and storage	Excluding Energy sector – Incremental cost only
	Manufacturing Processes	Energy-use improvements and other GHG cuts	Energy consumption and GHG cuts in industrial processes
Industry		Substitution with hydrogen from renewables	Industrial processes using hydrogen shifting from FF-based Hydrogen to RE-based hydrogen
	Industry Infrastructure & Warehouse	Energy efficiency	Low-consumption warehouses and light industry buildings
		Resilient infrastructure and infrastructure for resilience	E.g., improve the resilience of existing industrial plant/flood protection, etc.
	Policy & National Budget Support & Capacity Building	N/A	
	Other/Unspecified	N/A	
	Solid Waste	Infrastructure and management (including recycling)	
Waste	Policy & National Budget Support & Capacity Building	N/A	
	Other/Unspecified	N/A	
)	Efficient large infrastructure	
	Water Supply & Sanitation	Basic water access	
Wastewater Po	Waste Water Treatment	Infrastructure and management	Greenfield or brownfield projects that reduce methane or nitrous oxide emissions through wastewater, fecal sludge, or septage management
		N/A	
	Policy & National Budget Support & Capacity Building	N/A	Ex. Improved catchment management planning and regulation of water abstraction
	Other/Unspecified	N/A	

Sector	Sub-sector	Mitigation or adapdation solution	Additional information and examples
		Energy efficiency - new construction	
	Building & Infrastructure Construction Work	Energy efficiency – retrofit	
		Resilient infrastructure and infrastructure for resilience	
		Renewable energy-based hvac	
Buildings &	HVAC & Water Heaters	Solar thermal water heaters	
Infrastructure		Energy efficient HVAC	Efficient cooling, etc.
	Appliances & Lighting	Efficient lighting systems (incl. public lighting)	E.g., LEDs
	Policy & National Budget Support & Capacity Building	N/A	E.g., more robust building regulations and improved enforcement
	Other/Unspecified	N/A	
	Private Road Transport	Battery EVs	
	Private Road Transport	EV chargers	
		Modal shift policy support	
	Rail & Public Transport	Energy efficiency retrofits	Fleet Retrofit with clear energy efficiency gains
		New bus, light or heavy rail fleet and related infrastructure	With associated modal shifts from a higher-carbon transport mode. FF-powered rail engines are excluded
	Waterway	Energy efficiency – retrofit	Fleet Retrofit
Transport		New low-carbon fleet and related infrastructure	
Transport	Aviation	Energy efficiency – retrofit	
		Modal shift policy support	
	Policy & National Budget Support & Capacity Building	N/A	
	Transport-oriented Infrastructure and Urban Development	Infrastructure for non-motorized transports	
		Resilient Infrastructure and Infrastructure for Resilience	E.g., Use of revised codes for infrastructure design that consider increased frequency or severity of extreme events
	Other/Unspecified	Modal Shift with Associated GHG Emission Cuts	
	Data Centers	N/A	New highly energy-efficient centers or energy-efficient retrofits
Information and Communications Technology	Telecommunication	N/A	New highly energy-efficient networks or energy-efficient retrofits
	Networks	Resilient Infrastructure and Infrastructure for Resilience	
	Policy & National Budget Support & Capacity Building	N/A	
	Other/Unspecified	N/A	

Sector	Sub-sector	Mitigation or adapdation solution	Additional information and examples
		Sustainable crops, agro-forestry, livestock production	E.g., investments in crops that are more resilient to climate extremes and change
	Agriculture	Supply chain management (commercialization, primary processing, and storage)	
		Financial services for sustainable production, commercialization, storage, and processing	
Agriculture,	Forestry	Afforestation, Reforestation, Forest Conservation, sustainable management of existing forest, including extraction of non-timber products	
Forestry, Other land uses and Fisheries		Supply chain management (commercialization, primary processing, and storage)	
	Fisheries	Sustainable fish production	
		Supply chain management (commercialization, primary processing, and storage)	
	Food & diet	Food waste and low-carbon diets	
	Policy & National Budget Support & Capacity Building	N/A	
	Unspecified / Multiple	N/A	
	Policy & National Budget Support & Capacity Building	N/A	
Others & Cross- sectoral	Biodiversity, Land & Marine Conservation	N/A	
	Disaster-risk Management	N/A	Ex. Integration of climate change scenarios and climate risk assessments into disaster-risk plans and preparedness
	Other/Unspecified	N/A	

APPENDIX II: LIST OF NDCs REVIEWED

Country	NDC submission	Version ⁵	Submission year	Link
Central Asia and Eastern Europe				
Albania	NDC 1	2	2021	<u>Link</u>
Armenia	NDC 1	2	2021	<u>Link</u>
Azerbaijan	NDC 1	3	2023	<u>Link</u>
Belarus	NDC 1	2	2021	<u>Link</u>
Bosnia and Herzegovina	NDC 1	2	2021	<u>Link</u>
Georgia	NDC 1	2	2021	<u>Link</u>
Kazakhstan	NDC 1	2	2023	<u>Link</u>
Kyrgyzstan	NDC 1	2	2021	<u>Link</u>
Montenegro	NDC 1	2	2021	<u>Link</u>
North Macedonia	NDC 1	2	2020	<u>Link</u>
Republic of Moldova	NDC 1	2	2021	<u>Link</u>
Russian Federation	NDC 1	1	2020	<u>Link</u>
Serbia	NDC 1	2	2022	<u>Link</u>
Tajikistan	NDC 1	2	2021	<u>Link</u>
Türkiye	NDC 1	1	2023	<u>Link</u>
Turkmenistan	NDC 1	2	2023	<u>Link</u>
Ukraine	NDC 1	2	2021	<u>Link</u>
Uzbekistan	NDC 1	2	2021	<u>Link</u>
East Asia and Pacific				
Brunei Darussalam	NDC 1	1	2020	<u>Link</u>
Cambodia	NDC 1	2	2020	<u>Link</u>
China	NDC 1	2	2021	<u>Link</u>
Cook Islands	NDC 1	1	2016	<u>Link</u>
Fiji	NDC 1	2	2020	<u>Link</u>
Indonesia	NDC 1	3	2022	<u>Link</u>
Japan	NDC 1	4	2021	<u>Link</u>
Kiribati	NDC 1	2	2023	<u>Link</u>
Korea, Democratic People's Republic	NDC 1	2	2019	<u>Link</u>
Korea, Republic	NDC 1	3	2021	<u>Link</u>
Lao People's Democratic Republic	NDC 1	2	2021	Link
Malaysia	NDC 1	2	2021	<u>Link</u>

⁵ Version refers to any subsequent revisions of NDC submissions. Revisions may contain minor changes in text, but do constitute a separate submission, with commitments remaining the same.

Country	NDC submission	V ersion ⁵	Submission year	Link
Marshall Islands	NDC 1	3	2020	<u>Link</u>
Micronesia (Federated States of)	NDC 1	2	2022	<u>Link</u>
Mongolia	NDC 1	2	2020	<u>Link</u>
Myanmar	NDC 1	2	2021	<u>Link</u>
Nauru	NDC 1	2	2021	<u>Link</u>
Niue	NDC 1	1	2016	<u>Link</u>
Palau	NDC 1	1	2016	<u>Link</u>
Papua New Guinea	NDC 2	2	2020	<u>Link</u>
Philippines	NDC 1	1	2021	<u>Link</u>
Samoa	NDC 1	2	2021	<u>Link</u>
Singapore	NDC 2	3	2022	<u>Link</u>
Solomon Islands	NDC 1	2	2021	<u>Link</u>
Thailand	NDC 2	3	2022	<u>Link</u>
Timor-Leste	NDC 1	2	2022	<u>Link</u>
Tonga	NDC 1	2	2020	<u>Link</u>
Tuvalu	NDC 1	2	2022	<u>Link</u>
Vanuatu	NDC 1	3	2022	<u>Link</u>
Viet Nam	NDC 1	3	2022	<u>Link</u>
Latin America and Caribbean				
Antigua and Barbuda	NDC 1	2	2021	<u>Link</u>
Argentina	NDC 2	3	2021	<u>Link</u>
Bahamas	NDC 1	2	2022	<u>Link</u>
Barbados	NDC 1	2	2022	<u>Link</u>
Belize	NDC 1	2	2021	<u>Link</u>
Bolivia (Plurinational State of)	NDC 1	2	2022	<u>Link</u>
Brazil	NDC 1	4	2023	<u>Link</u>
Chile	NDC 1	2	2020	<u>Link</u>
Colombia	NDC 1	2	2020	<u>Link</u>
Costa Rica	NDC 1	3	2020	<u>Link</u>
Cuba	NDC 1	2	2020	<u>Link</u>
Dominica	NDC 1	2	2022	<u>Link</u>
Dominican Republic	NDC 1	2	2020	<u>Link</u>
Ecuador	NDC 1	1	2019	<u>Link</u>
El Salvador	NDC 1	3	2021	<u>Link</u>
Grenada	NDC 2	2	2020	<u>Link</u>
Guatemala ⁶	NDC 1	3	2021	<u>Link</u>

⁶ Guatemala's NDC references that needs are estimated in an accompanying document, available <u>here</u>. This document was reviewed and needs estimates were included in the database.

Country	NDC submission	V ersion ⁵	Submission year	Link
Guyana	NDC 1	1	2016	<u>Link</u>
Haiti	NDC 1	2	2022	<u>Link</u>
Honduras	NDC 1	2	2021	<u>Link</u>
Jamaica	NDC 1	2	2020	<u>Link</u>
Mexico	NDC 1	3	2022	<u>Link</u>
Nicaragua	NDC 1	2	2020	<u>Link</u>
Panama	NDC 1	3	2020	<u>Link</u>
Paraguay	NDC 1	2	2021	<u>Link</u>
Peru	NDC 1	2	2020	<u>Link</u>
Saint Kitts and Nevis	NDC 1	2	2021	<u>Link</u>
Saint Lucia	NDC 1	2	2021	<u>Link</u>
Saint Vincent and the Grenadines	NDC 1	1	2015	<u>Link</u>
Suriname	NDC 2	2	2020	<u>Link</u>
Trinidad and Tobago	NDC 1	1	2018	<u>Link</u>
Uruguay	NDC 2	2	2022	<u>Link</u>
Venezuela (Bolivarian Republic of)	NDC 1	2	2021	<u>Link</u>
Middle East and North Africa				
Algeria	NDC 1	1	2016	<u>Link</u>
Bahrain	NDC 1	2	2021	<u>Link</u>
Egypt	NDC 1	3	2023	<u>Link</u>
Iraq	NDC 1	1	2021	<u>Link</u>
Israel	NDC 1	2	2021	<u>Link</u>
Jordan	NDC 1	2	2021	<u>Link</u>
Kuwait	NDC 1	2	2021	<u>Link</u>
Lebanon	NDC 1	2	2021	<u>Link</u>
Morocco	NDC 1	2	2021	<u>Link</u>
Oman	NDC 2	3	2023	<u>Link</u>
Qatar	NDC 1	2	2021	<u>Link</u>
Saudi Arabia	NDC 1	2	2021	<u>Link</u>
State of Palestine	NDC 1	2	2021	<u>Link</u>
Syrian Arab Republic	NDC 1	1	2018	<u>Link</u>
Tunisia	NDC 1	2	2021	<u>Link</u>
United Arab Emirates	NDC 2	3	2023	<u>Link</u>
Other Oceania				
Australia	NDC 1	4	2022	<u>Link</u>
New Zealand	NDC 1	2	2021	<u>Link</u>
South Asia				
Afghanistan	NDC 1	1	2016	<u>Link</u>

Country	NDC submission	V ersion ⁵	Submission year	Link
Bangladesh	NDC 1	3	2021	<u>Link</u>
Bhutan	NDC 2	2	2021	<u>Link</u>
India	NDC 1	2	2022	<u>Link</u>
Maldives	NDC 1	2	2020	<u>Link</u>
Nepal	NDC 2	2	2020	<u>Link</u>
Pakistan	NDC 1	3	2020	<u>Link</u>
Sri Lanka	NDC 1	3	2021	<u>Link</u>
Sub-Saharan Africa				
Angola	NDC 1	2	2021	<u>Link</u>
Benin	NDC 1	2	2021	<u>Link</u>
Botswana	NDC 1	1	2016	<u>Link</u>
Burkina Faso	NDC 1	2	2021	<u>Link</u>
Burundi	NDC 1	2	2021	<u>Link</u>
Cabo Verde	NDC 1	2	2021	<u>Link</u>
Cameroon	NDC 1	2	2021	<u>Link</u>
Central African Republic	NDC 1	2	2022	<u>Link</u>
Chad	NDC 1	2	2021	<u>Link</u>
Comoros	NDC 1	2	2021	<u>Link</u>
Congo, Republic	NDC 1	2	2022	<u>Link</u>
Côte d'Ivoire	NDC 2	2	2022	<u>Link</u>
Congo, Democratic Republic	NDC 1	2	2021	<u>Link</u>
Djibouti	NDC 1	1	2016	<u>Link</u>
Equatorial Guinea	NDC 1	2	2022	<u>Link</u>
Eritrea	NDC 1	1	2018	<u>Link</u>
Eswatini	NDC 1	2	2021	<u>Link</u>
Ethiopia	NDC 1	2	2021	<u>Link</u>
Gabon	NDC 2	2	2022	<u>Link</u>
Gambia	NDC 2	2	2021	<u>Link</u>
Ghana	NDC 1	2	2021	<u>Link</u>
Guinea	NDC 1	2	2021	<u>Link</u>
Guinea-Bissau	NDC 1	2	2021	<u>Link</u>
Kenya	NDC 1	2	2020	<u>Link</u>
Lesotho	NDC 1	2	2018	<u>Link</u>
Liberia	NDC 1	2	2021	<u>Link</u>
Madagascar	NDC 2	1	2024	<u>Link</u>
Malawi	NDC 1	2	2021	<u>Link</u>
Mali	NDC 1	2	2021	<u>Link</u>
Mauritania	NDC 1	2	2021	<u>Link</u>

Country	NDC submission	V ersion ⁵	Submission year	Link
Mauritius	NDC 1	2	2021	<u>Link</u>
Mozambique	NDC 1	2	2021	<u>Link</u>
Namibia	NDC 1	3	2021	<u>Link</u>
Niger	NDC 1	2	2021	<u>Link</u>
Nigeria	NDC 1	3	2021	<u>Link</u>
Rwanda	NDC 1	2	2020	<u>Link</u>
Sao Tome and Principe	NDC 1	2	2021	<u>Link</u>
Senegal	NDC 1	1	2021	<u>Link</u>
Seychelles	NDC 1	2	2021	<u>Link</u>
Sierra Leone	NDC 1	2	2021	<u>Link</u>
Somalia	NDC 1	2	2021	<u>Link</u>
South Africa	NDC 1	2	2021	<u>Link</u>
South Sudan	NDC 2	2	2021	<u>Link</u>
Sudan	NDC 1	3	2022	<u>Link</u>
Togo	NDC 1	2	2021	<u>Link</u>
Uganda	NDC 1	3	2022	<u>Link</u>
United Republic of Tanzania	NDC 1	2	2021	<u>Link</u>
Zambia	NDC 1	3	2021	<u>Link</u>
Zimbabwe	NDC 1	2	2021	<u>Link</u>
US and Canada				
Canada	NDC 1	3	2021	<u>Link</u>
United States of America	NDC 1	2	2021	<u>Link</u>
Western Europe				
Andorra	NDC 1	3	2022	<u>Link</u>
European Union	NDC 1	3	2023	<u>Link</u>
Iceland	NDC 1	2	2021	<u>Link</u>
Liechtenstein	NDC 1	1	2017	<u>Link</u>
Monaco	NDC 1	2	2020	<u>Link</u>
Norway	NDC 1	3	2022	<u>Link</u>
San Marino	NDC 1	1	2018	<u>Link</u>
Switzerland	NDC 1	3	2021	<u>Link</u>
United Kingdom	NDC 1	3	2022	<u>Link</u>
Vatican City	NDC 1	1	2023	<u>Link</u>

APPENDIX III: NDC SCOPE AND COVERAGE LIST

Country	Country classification	Thematic scope (mitigation/ adaptation)	Coverage	Granularity
Central Asia and Eastern Europe				
Belarus	Annex I	None	N/A	N/A
Russian Federation	Annex I	None	N/A	N/A
Türkiye	Annex I	None	N/A	N/A
Ukraine	Annex I	Both	Fully costed	Total only
Albania	non-Annex I	None	N/A	N/A
Armenia	non-Annex I	None	N/A	N/A
Azerbaijan	non-Annex I	None	N/A	N/A
Georgia	non-Annex I	None	N/A	N/A
Montenegro	non-Annex I	None	N/A	N/A
North Macedonia	non-Annex I	None	N/A	N/A
Serbia	non-Annex I	None	N/A	N/A
Uzbekistan	non-Annex I	None	N/A	N/A
Bosnia and Herzegovina	non-Annex I	Mitigation only	Partially costed	Project-level
Kyrgyzstan	non-Annex I	Both	Fully costed	Project-level
Kazakhstan	non-Annex I	Both	Fully costed	Total only
Republic of Moldova	non-Annex I	Both	Fully costed	MI: Thematic, AD: Project-level
Tajikistan	non-Annex I	Both	Fully costed	Sector
Turkmenistan	non-Annex I	Adaptation only	Fully costed	Thematic total
East Asia and Pacific				
Japan	Annex I	None	N/A	N/A
Cambodia	non-Annex I	Both	Fully costed	Project-level
Brunei Darussalam	non-Annex I	None	N/A	N/A
China	non-Annex I	None	N/A	N/A
Cook Islands	non-Annex I	None	N/A	N/A

Country	Country classification	Thematic scope (mitigation/ adaptation)	Coverage	Granularity
Korea, Democratic People's Republic	non-Annex I	None	N/A	N/A
Marshall Islands	non-Annex I	None	N/A	N/A
Philippines	non-Annex I	None	N/A	N/A
Fiji	non-Annex I	Mitigation only	Fully costed	Thematic total
Samoa	non-Annex I	None	N/A	N/A
Singapore	non-Annex I	None	N/A	N/A
Thailand	non-Annex I	None	N/A	N/A
Timor-Leste	non-Annex I	None	N/A	N/A
Indonesia	non-Annex I	Both	Fully costed	Thematic total
Tonga	non-Annex I	None	N/A	N/A
Kiribati	non-Annex I	Mitigation only	Partially costed	Project-level
Korea, Republic	non-Annex I	Mitigation only	Fully costed	Thematic total
Lao People's Democratic Republic	non-Annex I	Mitigation only	Fully costed	Project-level
Malaysia	non-Annex I	Adaptation only	Fully costed	Thematic total
Micronesia (Federated States of)	non-Annex I	Both	Partially costed	Project-level
Mongolia	non-Annex I	Both	Fully costed	Thematic total
Myanmar	non-Annex I	Both	Partially costed	Project-level
Nauru	non-Annex I	Both	Partially costed	Project-level
Niue	non-Annex I	Mitigation only	Partially costed	Project-level
Palau	non-Annex I	Mitigation only	Partially costed	Project-level
Papua New Guinea	non-Annex I	Both	Fully costed	Project-level
Viet Nam	non-Annex I	Both	Fully costed	MI: Sector, AD: Thematic
Solomon Islands	non-Annex I	Adaptation only	Fully costed	Thematic total
Tuvalu	non-Annex I	Mitigation only	Partially costed	Project-level
Vanuatu	non-Annex I	Both	Fully costed	Project-level
Latin America and Caribbean				
Belize	non-Annex I	Both	Fully costed	Project-level
Colombia	non-Annex I	Both	Partially costed	Project-level
Cuba	non-Annex I	Mitigation only	Fully costed	Sector
Dominica	non-Annex I	Both	Partially costed	Project-level
Dominican Republic	non-Annex I	Both	Fully costed	Project-level

Country	Country classification	Thematic scope (mitigation/ adaptation)	Coverage	Granularity
El Salvador	non-Annex I	Both	Partially costed	Project-level
Antigua and Barbuda	non-Annex I	Both	Fully costed	Total only
Grenada	non-Annex I	Mitigation only	Fully costed	Thematic total
Guatemala	non-Annex I	Both	Fully costed	Thematic total
Guyana	non-Annex I	Adaptation only	Fully costed	Thematic total
Haiti	non-Annex I	Both	Fully costed	Project-level
Argentina	non-Annex I	None	N/A	N/A
Barbados	non-Annex I	None	N/A	N/A
Bolivia (Plurinational State of)	non-Annex I	None	N/A	N/A
Bahamas	non-Annex I	Both	Fully costed	Total only
Brazil	non-Annex I	None	N/A	N/A
Chile	non-Annex I	None	N/A	N/A
Costa Rica	non-Annex I	None	N/A	N/A
Ecuador	non-Annex I	None	N/A	N/A
Honduras	non-Annex I	None	N/A	N/A
Jamaica	non-Annex I	None	N/A	N/A
Mexico	non-Annex I	Mitigation only	Fully costed	Thematic total
Panama	non-Annex I	None	N/A	N/A
Paraguay	non-Annex I	None	N/A	N/A
Nicaragua	non-Annex I	Adaptation only	Partially costed	Project-level
Peru	non-Annex I	None	N/A	N/A
Uruguay	non-Annex I	None	N/A	N/A
Saint Kitts and Nevis	non-Annex I	Both	Fully costed	Project-level
Saint Lucia	non-Annex I	Mitigation only	Fully costed	Thematic total
Saint Vincent and the Grenadines	non-Annex I	Adaptation only	Partially costed	Project-level
Suriname	non-Annex I	Both	Partially costed	Project-level
Trinidad and Tobago	non-Annex I	Mitigation only	Fully costed	Thematic total
Venezuela (Bolivarian Republic of)	non-Annex I	Mitigation only	Partially costed	Project-level
Middle East and North Africa				
Egypt	non-Annex I	Both	Fully costed	Project-level
Morocco	non-Annex I	Both	Fully costed	MI: Project-level, AD: Thematic

Country	Country classification	Thematic scope (mitigation/ adaptation)	Coverage	Granularity
Jordan	non-Annex I	Both	Fully costed	Project-level
Oman	non-Annex I	Both	Partially costed	Project-level
Algeria	non-Annex I	None	N/A	N/A
Bahrain	non-Annex I	None	N/A	N/A
Iraq	non-Annex I	None	N/A	N/A
Israel	non-Annex I	None	N/A	N/A
Kuwait	non-Annex I	None	N/A	N/A
Lebanon	non-Annex I	None	N/A	N/A
Qatar	non-Annex I	None	N/A	N/A
Saudi Arabia	non-Annex I	None	N/A	N/A
Syrian Arab Republic	non-Annex I	None	N/A	N/A
State of Palestine	non-Annex I	Mitigation only	Fully costed	Project-level
Tunisia	non-Annex I	Both	Fully costed	Project-level
United Arab Emirates	non-Annex I	Mitigation only	Fully costed	Thematic total
Other Oceania				
Australia	Annex I	Both	Partially costed	Project-level
New Zealand	Annex I	None	N/A	N/A
South Asia				
Afghanistan	non-Annex I	Both	Fully costed	Project-level
Bangladesh	non-Annex I	Mitigation only	Fully costed	Project-level
Bhutan	non-Annex I	Mitigation only	Partially costed	Project-level
Nepal	non-Annex I	Mitigation only	Fully costed	Thematic total
Pakistan	non-Annex I	Both	Fully costed	Thematic total
India	non-Annex I	None	N/A	N/A
Maldives	non-Annex I	None	N/A	N/A
Sri Lanka	non-Annex I	None	N/A	N/A
Sub-Saharan Africa		·		
Angola	non-Annex I	Both	Fully costed	Project-level
Benin	non-Annex I	Both	Fully costed	Project-level
Botswana	non-Annex I	Mitigation only	Fully costed	Thematic total

Country	Country classification	Thematic scope (mitigation/ adaptation)	Coverage	Granularity
Burkina Faso	non-Annex I	Both	Fully costed	Project-level
Cabo Verde	non-Annex I	Both	Fully costed	Thematic total
Burundi	non-Annex I	Both	Fully costed	Project-level
Cameroon	non-Annex I	Both	Fully costed	Project-level
Central African Republic	non-Annex I	Both	Fully costed	Sector
Mauritania	non-Annex I	Both	Fully costed	MI: Project-level, AD: Sector
Guinea	non-Annex I	Both	Fully costed	MI: Project-level, AD: Thematic
Congo, Democratic Republic	non-Annex I	Both	Fully costed	Project-level
Congo, Republic	non-Annex I	Both	Fully costed	Project-level
Côte d'Ivoire	non-Annex I	Both	Fully costed	Thematic total
Djibouti	non-Annex I	Both	Fully costed	Thematic total
Equatorial Guinea	non-Annex I	Both	Fully costed	Project-level
Ethiopia	non-Annex I	Both	Fully costed	Thematic total
Gabon	non-Annex I	Mitigation only	Partially costed	Project-level
Gambia	non-Annex I	Both	Fully costed	Project-level
Ghana	non-Annex I	Both	Fully costed	Project-level
Seychelles	non-Annex I	Both	Fully costed	MI: Sector, AD: Project-level
Guinea-Bissau	non-Annex I	Mitigation only	Fully costed	Sector
Kenya	non-Annex I	Both	Fully costed	Thematic total
Lesotho	non-Annex I	Mitigation only	Fully costed	Thematic total
Liberia	non-Annex I	Both	Fully costed	Thematic total
Madagascar	non-Annex I	Both	Fully costed	Thematic total
Malawi	non-Annex I	Both	Fully costed	Project-level
Mali	non-Annex I	Both	Fully costed	Project-level
Chad	non-Annex I	Both	Fully costed	MI: Sector, AD: Thematic
Mauritius	non-Annex I	Both	Fully costed	Thematic total
Eswatini	non-Annex I	Both	Fully costed	Total only
Comoros	non-Annex I	Both	Fully costed	MI: Sector, AD: Thematic
Namibia	non-Annex I	Both	Fully costed	Project-level
Niger	non-Annex I	Both	Fully costed	Thematic total

Country	Country classification	Thematic scope (mitigation/ adaptation)	Coverage	Granularity
Nigeria	non-Annex I	Mitigation only	Fully costed	Thematic total
Rwanda	non-Annex I	Both	Fully costed	Project-level
Sao Tome and Principe	non-Annex I	Mitigation only	Fully costed	Thematic total
Senegal	non-Annex I	Both	Fully costed	Project-level
Mozambique	non-Annex I	Both	Fully costed	Total only
Somalia	non-Annex I	Both	Fully costed	Sector
South Africa	non-Annex I	Both	Fully costed	Thematic total
South Sudan	non-Annex I	Both	Fully costed	Project-level
Sudan	non-Annex I	Both	Fully costed	Project-level
Togo	non-Annex I	Both	Fully costed	Project-level
Uganda	non-Annex I	Both	Fully costed	Thematic total
Sierra Leone	non-Annex I	Both	Fully costed	Total only
United Republic of Tanzania	non-Annex I	Both	Fully costed	Total only
Eritrea	non-Annex I	Both	Fully costed	MI: Thematic, AD: Sector
Zambia	non-Annex I	Both	Fully costed	Total only
Zimbabwe	non-Annex I	Mitigation only	Fully costed	Project-level
United States and Canada				
Canada	Annex I	Mitigation only	Partially costed	Project-level
United States of America	Annex I	None	N/A	N/A
Western Europe				
Monaco	Annex I	Both	Fully costed	Total only
European Union	Annex I	None	N/A	N/A
Iceland	Annex I	None	N/A	N/A
Liechtenstein	Annex I	None	N/A	N/A
Norway	Annex I	None	N/A	N/A
Switzerland	Annex I	None	N/A	N/A
United Kingdom	Annex I	None	N/A	N/A
Andorra	non-Annex I	None	N/A	N/A
San Marino	non-Annex I	None	N/A	N/A
Vatican City	non-Annex I	None	N/A	N/A

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