FIRST NATIONALLY DETERMINED CONTRIBUTION

(UPDATED)

REPUBLIC OF CUBA

2020-2030

Contents

1. Context of the updated version of the First Nationally Determined Contribution in Cuba

Cuba is highly committed to the global endeavors to combat climate change and its devastating effects.

There is a proven political willingness in the Cuban government that is perceived in its ethical behavior, as well as in the permanent efforts towards the promotion and implementation of national actions to combat climate change and to honor international commitments. Cuba is also committed to the sharing of experiences and good practices with other nations as evidence of cooperation and solidarity advocated by the Cuban revolution.

In this context, the country has achieved important milestones, despite the prevalence of extreme challenges inherited from the condition of being a Small Island Developing State (SIDS) under a sturdy economic, commercial and financial blockade imposed by the United States of America, which has been intensified to record levels in the last few years by the Trump Administration – the latter being the main obstacle to the achievement of major progress when facing climate change and national development.

Following the adoption of the Paris Agreement, the Cuban Government reinforced its national efforts and has built an ambitious framework for actions and mitigation. During the Climate Action Summit, convened by the UN Secretary General in September 2019, Cuba submitted several significant results and projections of public policies to combat climate change, as part of the present initiatives that contribute towards global efforts. On that occasion, the national work was reported in a broader and more ambitious action platform than that formulated in the Nationally Determined Contribution proposal of November 2015.

In the 25th Conference of the Parties (CoP25), held in Madrid in December 2019, the Head of the Cuban delegation stated the determination of the country to update the Nationally Determined Contribution in the year 2020.

The present document is the updated version of the First Nationally Determined Contribution of Cuba, submitted to the United Nations Framework Convention on Climate Change and is in accordance with the Articles 3 and 4 of the Paris Agreement, paragraphs 22 and 24 of the Decision 1 CP21 from 2015.

By stating its increased ambition in this update, Cuba reiterates its position that the content of the Nationally Determined Contribution is established by each country on a voluntary and non-prescriptive basis, and should be viewed in the broader context identified by Article 3 of the Paris Agreement.

The mentioned contributions are to be assessed in the context of the Principle of Common but Differentiated Responsibilities of the Parties of the Convention, meaning the claim of financial resources, the transfer of technology and capacity building, in

accordance with the obligations established in the UN Framework Convention and the Paris Agreement.

2. National circumstances pertinent to this Contribution

2.1 Climate change in the public policies of the country

The new Constitution of the Republic of Cuba, approved by the people's referendum in 2019, explicitly mentions climate change in the context of international relations, and in its Article 16, item f, "promotes the protection and preservation of the environment and confronting climate change, that impends the survival of human species based on the acknowledgment of the common but differentiated responsibilities, the establishment of a fair and equitable international economic order and the eradication of irrational patterns of production and consumption".

The Bases of the Economic and Social National Development Plan up to the year 2030, is the main tool to achieve prosperous development, that is economically and socially sustainable, resilient, and less intensive in carbon emissions.

Confronting climate change has been identified as a priority in the Bases of the Plan. Particularly, the "Strategic Axes: Natural resources and environment" which is declared as one of the three General Objectives: "Strengthening the national capabilities for the adaptation to climate change" and endorses it in its "Specific Objectives"; six of these refer to confronting climate change, and are mentioned below.

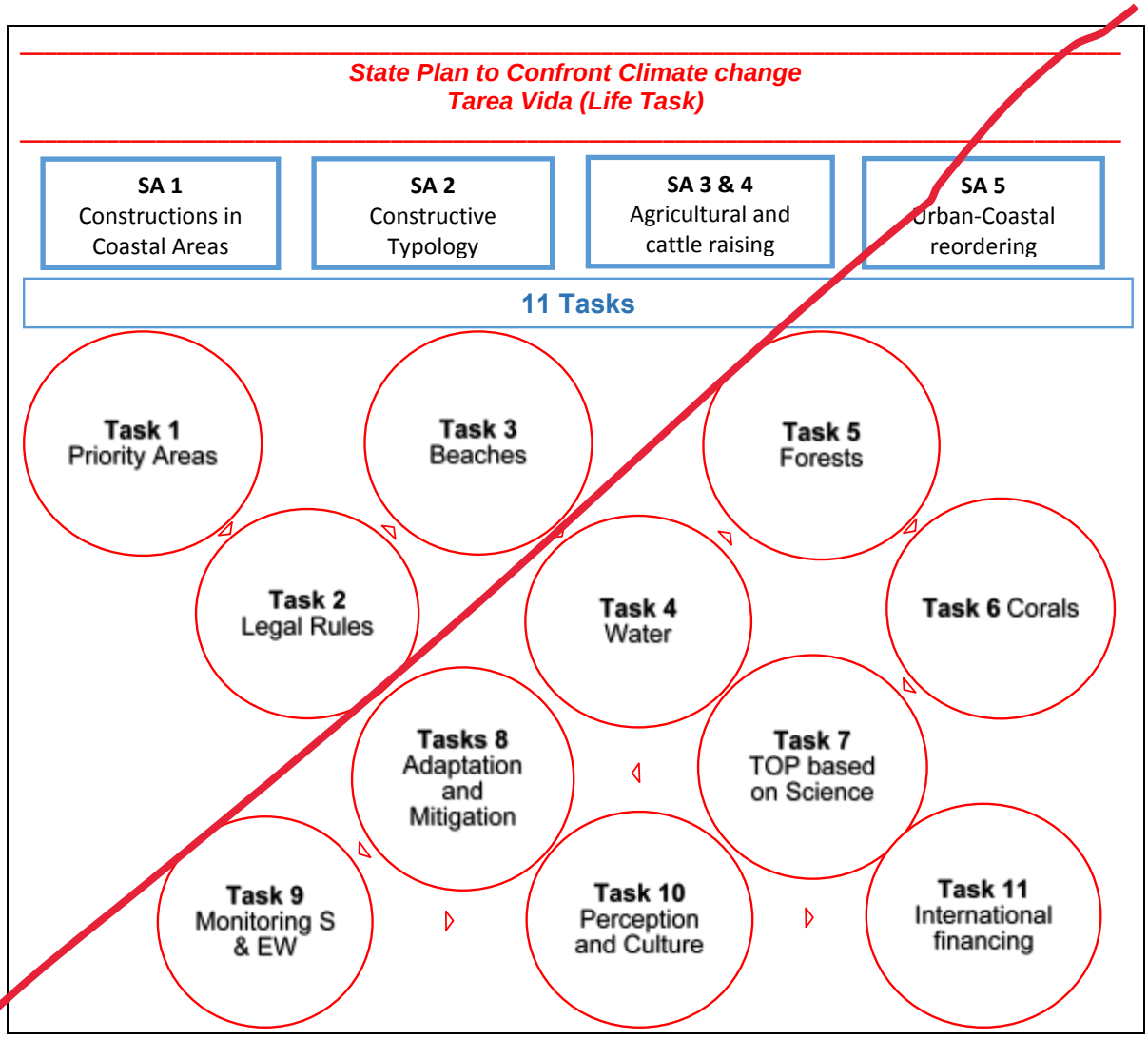
General Objective 3. Reducing the country's vulnerability to the effects of climate change through the gradual implementation of the State Plan to confront it.
Specific Objective 11. Increase energy efficiency and the development of renewable energy sources, which will contribute to, amongst other benefits, the reduction in the generation of greenhouse gases, to mitigate climate change and to promote economic development less intensive in carbon emissions.
Specific Objective 12. Efficiently and effectively implement programs and actions to confront climate change, emphasizing adaptation, the reduction of vulnerability and the introduction of systemic and intersectoral strategies.
Specific Objective 14. Bring to an end degradation of coastal areas and marine ecosystems, taking measures for its restoration and for the sustainable development of fishing practices, tourism and the adaptation to climate change. Reduce coastal vulnerability for settlements threatened by sea level rise.
Specific Objective 15. Implement economic incentives (taxes, tariffs, credits and others) to achieve financial sustainability in the use and preservation of natural and environmental resources, to fight pollution and confront climate change. To make

progress in establishing environmental accounts.
Specific Objective 19. Improve the Civil Defense System to reduce the impact of natural, technological and sanitary disasters, by using science and technology and developing efficient and effective comprehensive risk management, with the dynamic participation of entities, communities, local governments and society as a whole; that enables to minimize damages and reduces coastal vulnerability for the settlements endangered by sea level rise; that enables the best economic assessment of the impact of disasters and the costs of adaptation to climate change effects; and to facilitate rapid and organized recuperation of impacted areas and populations.
Specific Objective 20. Foster international cooperation to confront the effects of climate change, pollution and environmental degradation. Maintain the integration and complementarity in the Latin American and Caribbean region.

The Guidelines of the Economic and Social Policy of the State and the Revolution approved by the People's Power National Assembly in July 2016, tackles the issues related to climate change and state as follows:

> Guideline 107. Accelerate the implementation of the guidelines guides and science, innovation and technology programs, aimed to confront climate change by all entities and agencies, including all sectors and territories prioritizing agriculture, hydraulic resources and health-care. Raise the information provided and capacity building to objectify risk perception in the society.
>
> Guideline 237. The development of the hydraulic program will continue in the long term in order to confront the impact of climate change and materialize the adaptation measures: reuse of water, rainwater harvesting, sea water desalination and the sustainability of all associated services that allows to achieve and exceed the sustainable development goals.

In April 2017, the Cuban Government adopted the State Plan to confront Climate Change, known as "Tarea Vida" (Life Task). The plan comprises of 5 Strategic Actions and 11 tasks.



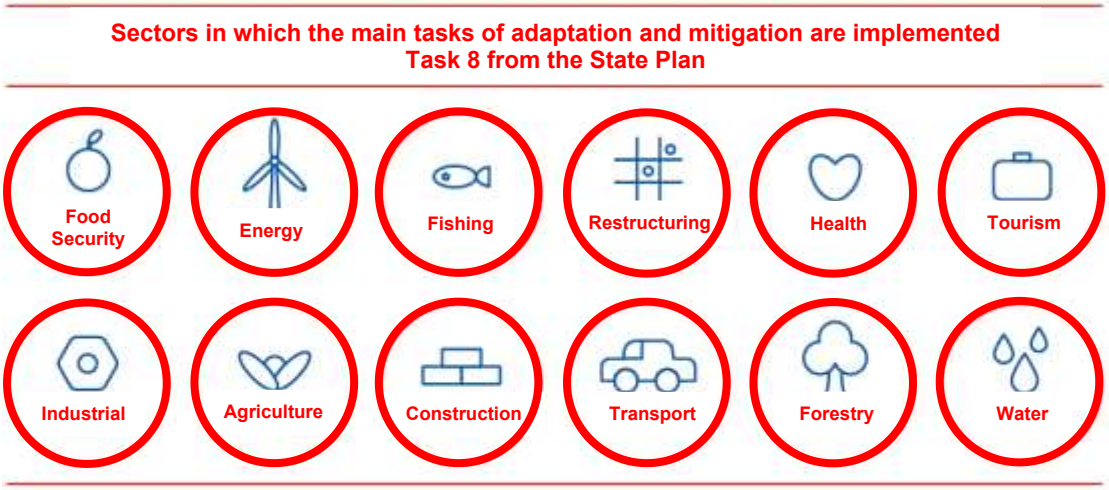
SA –strategic actions TOP –territorial ordering plan S—surveillance EW –early warning

Actions 1, 3 and 5 deal with the vulnerable coastal settlements, and advise to not allow the construction of new buildings in threatened coastal settlements with a prognosis of disappearance due to constant flooding and the most vulnerable ones, as well as reducing the demographic density in the low-lying coastal areas (SA 1); the development of construction concepts in infrastructure, adapted to coastal flooding in low-lying areas (SA 2); and urban restructuring of threatened settlements and infrastructures, starting with lower costs actions like naturally induced solutions (rehabilitation of beaches, reforestation) (SA 5).

A wide range of actions are included in the 11 Tasks of the State Plan. Task 1 states the need to prioritize vulnerable zones, identified in Annex 1 of the State Plan, stating measures for the coastal protection of cities, the relocation of human settlements, the

comprehensive recovery of beaches, mangroves and other protective natural ecosystems, hydraulic works and coastal engineering, amongst others.

The tasks that follow deal with: the legal framework (Task 2), the beaches (Task 3), the availability and efficient use of water (Task 4), reforestation (Task 5), coral reefs (Task 6), territorial and urban planning (Task 7), the strengthening of monitoring, surveillance and early warning systems (Task 9), the increase of risk perception, the knowledge level and the participation of the population (Task 10), the searching of international financing (Task 11). Task 8 is particularly complex, as it indicates the implementation and control of adaptation and mitigation measures to confront climate change, which are derived from sectoral policies of programs, plans and projects linked to 12 prioritized sectors.



2.1.1 Climate profile (vulnerabilities, adaptation).

For Cuba, confronting climate change is a high priority. The Cuban archipelago is very vulnerable to global climate change, given its status of being a small island state located in the tropical area of the planet. Climate change is becoming worse and will continue to worsen, in the future, the environmental issues that the country[1] faces, gradually turning these issues into determining factors for sustainable development.

Today, Cuba's climate is warmer and extreme. Since the middle of the past century, the annual average temperature has increased by 0.9 degree Celsius. During the last decade of the past century and the first ten years of the current century, temperatures have been the warmest ever recorded, according to historical measurements of this

[1] The National Environmental Strategy in force recognizes as an environmental issue: Soil degradation, negative impact on forest cover, pollution, the loss of biological diversity and water scarcity.

parameter. In the past forty years, according to measurements made at various points of the Cuban archipelago, an increase in sea level has been recorded. Furthermore, availability of water has decreased; hence, current results show that there has been a decrease of more than 20% in comparison the year 1990.

It has been observed that there is great variability in cyclonic activity, and currently, it has manifested into a very active season. The rainfall regime is changing and in the last decades, during dry season rainfall has increased and diminished during the wet season. The extension and frequency of draught has significantly increase since 1960, with greater damages in the central region.

A significant reduction of the water potential is estimated at national, regional and local levels. The impact of climate change on water resources will be the most considerable, due to the strategic role of water in the development of the country, particularly in agriculture. The research shows that the exploitable water resources might represent 60% of the existing ones today, increasing the competitiveness between the water availability, the growing human demand and the need to keep a balance in the ecosystems.

Mean sea levels are rising. Future projections estimate increases that will mean a slow reduction of the emerged surface of the country and the progressive salinization of the subterranean coastal aquifers caused by the increase of saline water intrusion and the subsequent advance of the “salt wedge”. The over elevation of sea level rise, due to intense hurricanes and other extreme meteorological events, will still pose a considerable danger due to climate change for the Cuban archipelago – due to coastal flooding and the destruction of human and natural patrimony near the coast.

Overall, it is certain that the climate in Cuba is changing from tropical wet into tropical dry, with average temperatures reaching over 30°C, approximately 1000mm average of rainfall per year, and 70 rainy days which will bring about the displacement of dry landscapes of the eastern region to other parts of the country. Furthermore, wind temperatures could increase by 4.5°C, in consistency with prior modellings performed in Cuba. The highest temperature increase will take place fundamentally in the hottest period of the year, an indication that will be easier to perceive as time passes.

There is a trend towards a decrease in rainfall. The amount of rainfall days will decrease, while heavy and intense rainfall will increase, as well as the intensity and duration of draughts. Therefore, solar radiation will increase as a result of a decrease in the cloud cover.

2.3 Intensification of the economic, commercial and financial blockade and strengthening of the hostility from the United States government towards Cuba.

The economic, commercial and financial blockade imposed for almost 6 decades, by the United States government on Cuba, is the main hurdle for development in the country, as it deleteriously impacts all spheres and sectors of Cuban life and society.

Moreover, it has a negative impact on program policies and actions aimed at confronting climate change and its impact. The blockade is the fundamental barrier for Cuba to access international financial resources, supplies and technologies.

In the past years, after President Donald Trump's administration took office in the White House, an unprecedented strengthening of the blockade and hostility against Cuba has been taking place. The aforementioned affirmation is true given the decision to activate Title III of the Helms-Burton Act. As a result, the economic activities of the country have been severely impacted, particularly those linked to foreign trade operations and foreign investment, given the dissuasive and intimidating effect, coupled with the dread generated by rest of the laws and regulations imposed by the blockade.

The conduct of the present United States government is an affront to the international community, that almost unanimously has condemned the blockade during the past 28 years and has opposed the Helms-Burton Act. The United Nations General Assembly's resolutions have been continuously overlooked, as well as the declarations emerging from the Heads of States and/or Government summits in the European Union, in Latin America and the Caribbean, the African Union (AU), and the Economic Commission for Latin America and the Caribbean (CELAC). Furthermore, the United States government has ignored the statements from the Ministerial Meeting of the Group of 77 plus China, including the call of various political parties, personalities, business persons, inside and outside the United States to end this persecution.

The impact of the mentioned policies, especially of the blockade, has an influence on the Cuban climate agenda, posing serious limitations in the national performance and the capability of the country to achieve more ambitious goals[2].

3. Description of the Cuban Nationally Determined Contribution

3.1 General features of the Cuban Nationally Determined Contribution.

The following table shows the general features of the updated Nationally Determined Contribution.

1. Goals	
1.1. Goals in adaptation	Voluntary.
1.2. Goals in mitigation	Actions and policies type.
2. Period	2020 – 2030

[2] For a detailed assessment of the quantitative impacts of the blockade, please see the corresponding Section of the *Updated First Biennial report on Cuba*.

3. Reference points	In all contributions the base years or reference are specified.
4. Scope and coverage	Sectors: Energy; Agriculture, Forestry and other Land Uses (AFOLU) Gases: CO_2; CH_4; N_2O.
5. Intensification of ambitions	Expressed in: • The current goals are prepared in agreement with those established in the framework of public policies passed after 2015, which considers the basis of the country's projections of development that is resilient and less intensive in carbon emissions. • The update and accuracy of the principal lines of action with regard to adaptation, will continue to be a priority when confronting climate change in the country. • The update and expansion of mitigation goals, in addition to what was expressed in 2015 with regards to renewable energy and energy efficiency, now includes contributions on transportation and forestry. • In the information related to the contributions on mitigation there is more precision (transparency).
6. Other elements.	• There is no Measurement, Report and Verification system in place, in accordance with the Paris Agreement Enhanced Transparency Framework, an objective that is being worked on today, in order to timely report on the progress of this contribution; in virtue of the finally agreed upon rules and in the context of the of flexibilities granted to SIDS. • In the event that a satisfactory covenant is achieved in the negotiations under Article 6 of the Paris Agreement, Cuba intends to use cooperative approaches that involve the use of mitigation results of international transfer in accordance with the mentioned Article.

3.2 Specific approaches pertaining to adaptation

Adaptation is reaffirmed as a priority in the country, due to the negative impact of climate change on the natural and human ecosystems, as well as the low level of greenhouse gas emissions in the country.

The adaptation actions mentioned below, in accordance with public policies, are presented to indicate Cuban priorities according to the country's circumstances and do not indicate whatsoever an international obligation of the country.

Cuba deliberately identifies, in the Annual Economic Plan, the resources devoted to adaptation. In future, these figures will reach the levels allowed by the financial conditions of the country. Nonetheless, in order to response to the growing impacts of climate change higher amounts will be needed.

This area, and others associated to the economic and social development of the country, will require financial resources, technology and capacity building, coming from international cooperation and the compliance of obligations by industrialized countries under the United Nations Framework Convention on Climate Change (UNFCCC), and will require more effective and dynamic management of multilateral funds, particularly the Green Climate Fund.

3.2.1 Priority actions for the adaptation that represent the basis of the national work and the management of international financing

To disallow the construction of new buildings edifications in threatened coastal settlements with a prognosis of disappearance due to severe flooding and the most vulnerable ones, as well as reducing demographic density in the low-lying coastal areas.
The development of construction concepts in infrastructure adapted to coastal flooding in low-lying areas.
Adapting agricultural activities, namely the ones with higher impact on food security of the country, to the changes adapted to the consequences of sea level rise and draught.
Reducing plantation areas close to coasts or areas affected by saline intrusion. Diversifying crops, enhancing soils, introducing and developing plant varieties resistant to the new forecast of temperatures as a result of climate change.
Planning the processes of urban reorganization of threatened settlements and infrastructures within specific terms, in correspondence with the economic conditions of the country. Starting with lower costs measures, such as induced natural solutions (recovery of beaches, reforestation).
Comprehensive conservation, care and recuperation of sandy beaches in the Cuban archipelago, prioritizing the urbanized beaches for touristic use and reducing the vulnerability of the built patrimony.

Guarantying the availability and efficient use of water as a way to face draught, applying water-saving technologies and satisfying the local demands. Increasing the hydraulic infrastructure and its maintenance, as well as implementing actions to measure efficiency and productivity of water.
Using reforestation as the upmost protection of soils and quantity and quality of waters by way of recovering the most affected mangroves. Prioritizing water reservoirs, channels and water regulating lines of the tributary basins of the main bays and coasts of the island platform.
Ending deterioration, rehabilitating and preserving the coral reefs in the archipelago, specifically the ridges around the island platform which protect urbanized beaches for touristic use. Avoiding the over fishing of marine species that favor reefs.
Maintaining and introducing, in planning, the territorial and urban restructuring using the scientific results of the *Macro Project on Risks and Vulnerabilities of the Coastal Zone (2050-2100)*, and introducing results from the *Hazard, Vulnerability and Risks Assessment* in the disasters reduction cycle. Using this information as early warning for decisions-making.
Implementing and controlling adaptation measures derived from the sectoral policies in programs, plans and projects linked to food security, territorial and urban planning, fishery, agriculture, health, tourism, construction, transportation, industry and the comprehensive management of forests. (This is a broad program that includes 12 sectors and the actions to be implemented will be analyzed in conformity with the relevant sectoral programs).
Strengthen the monitoring, surveillance and early warning systems to systematically assess the status and quality of the coastal areas, the water, draught, forests, human and vegetation health.
Prioritize the measures and actions to increase the risk perception and knowledge, as well as the participation of the population in confronting climate change, while fostering a culture that promotes water saving practices.

For any adaptation action considered, the potential mitigation benefits will be assessed.

3.3 Specific approaches on mitigation

Regarding mitigation, the Cuban contribution to the global greenhouse gas (GHG) emissions is minor. In 2016, the last year in which the emissions estimations were performed in Cuba, the gross total emissions structure quantified to 50,213.7 ktCO2eq., while the absorptions appraisals were 27,147.2 ktCO2eq., resulting in 23,066.5 ktCO2eq. of net emissions. Out of the total of the gross amount of GHG, 70.5% emerged from the Energy sector, added to the percentage emerging from the AFOLU sector, amounts to 90.6% of the GHG emissions in the country.

Despite the low impact of emissions, and the priority and the cost that adaptation poses for the country, Cuba has systematically developed and financed mitigation actions associated with energy saving mechanisms; the use of renewable energy sources (RES), and energy efficiency and reforestation, which, in some instances, have played an outstanding role in relation to the international trends.

The National Plan for Economic and Social Development towards 2030 (PNDES 2030) introduces for the first time in the public policies of the country, the concept of development that is less intensive in greenhouse gas emissions. Mitigation is considered in the national policies as an essential dimension in development that contributes to modernization and technological development based on sustainability; as well as augmenting of capacities, the effectiveness and efficiency of processes to diminish the use of fossil fuels–, while moving towards the use of more efficient technology, the better management of wastes and other important elements that transverse into to the economic activity of the country.

3.3.1 Contributions in mitigation

Considering the sectors' contribution to the national inventory of greenhouse gases, agriculture and energy are currently the sectors that are prioritized for emissions reduction. It is in those sectors where all the efforts of the country are focused, to implement mitigation actions that will require financial support in technology transfer and capacity building. A summary of the contributions in mitigation, by sector, that constitute the NDCs is tabulated below:

No.	Contribution	Sector
1.	Increase to 24% of electricity generation based on Renewable Energy Sources (RES) in the Cuban electricity matrix by 2030.	Energy (electricity generation)
2.	Increase of energy efficiency and saving	Energy (Other sectors: commercial/institutional, residential, agriculture)
3.	Less carbon intensive ground transportation	Energy (Combustion, moveable sources, land transportation).
4.	Increase of forest coverage in the country to 33% by 2030	AFOLU (Forestry)
5.	Reduction of greenhouse effect gases emissions in the swine industry in Cuba	AFOLU (Agriculture, Livestock)

In the following 5 tables, each contribution in mitigation will be expressed in detail:

Name of the contribution: Increase to 24% of electricity generation based on the Renewable Energy Sources (RES) in the Cuban electricity matrix by 2030					
Objective	**Follow up Indicator (magnitude).**	**Implementing entity**	**Status**	**Base year/ deadline year**	**Starting value/goal value**
Contribution no GHG emissions Objective: Modifying the electricity generation matrix	*Fraction of energy generated by Renewable Energy Sources in the electricity matrix (%).*	*UNE (Ministry of Energy and Mines-MINEM); AZCUBA*	*Design, partial implementation*	*2014 / 2030*	*4.1% / 24%*
Brief description of the contribution	*In 2014, the electricity generation in the country was 18,393 GWh, 4.1% generated only based on renewable energy sources (sugar cane biomass – 3.4%; wind+solar photovoltaic+water – 0.7%).* *For 2030 the estimate of electricity generation is 29,591 GWh. The contribution intends to generate 24 % in 2030 based on renewable energy sources (sugar cane biomass – 14%; wind+solar photovoltaic+water – 10%). The main actions include the installation of a 2144 MW power capacity connected to the grid up to the year 2030 based on RES.* *Total cost estimated for the implementation of the contribution is USD 7723 million. The financing is to be attained from two sources: long term credits to namely cover the import of technology (for the amount of USD 4713 million) and self-financing (specifically USD 3010millions from the state budget.)*				
Expected results.	*24% of electricity generation based on renewable energy sources by the year 2030.* *It is estimated that the contribution will avoid the emission of 30.6 million $ktCO_2eq.$ into the atmosphere in the period 2014 – 2030.*				
Conditioning for the execution of the contribution.	*Long term credits are required for the amount of USD 4713 million to implement the contribution.*				
Methodologies and/or methods to be used for the follow up	*The data on activity level (generation in MWh) is attained from the complementary statistical system of the Ministry of Energy and Mines (MINEM) considering the registries of annual electricity generation from renewable energy sources. The*				

	emissions factor of the electricity grid is determined following the methodology in the IPCC 2006 Guides, Volume 2, chapter 2, item 2.3 and it is published in the complementary statistical system of MINEM.
Actions required for the adaptation as established in the Paris Agreement	*It is necessary to establish the Measurement, Report and Verification System (MRV) for every measure included in the contribution; based on the methodologies adopted, it is advisable to perform the recalculation of emissions deduction projections, including the estimation of the electrical grid emissions factor.*

Name of the contribution: Increase of energy efficiency and saving					
Objective	**Follow up Indicator (magnitude)**	**Implementing entity**	**Status**	**Base year/ deadline year**	**Goal value***
No GHG emissions contribution Objective: Diminish use of fossil fuels, increase of energy efficiency and saving	*Units*	*ONURE (MINEM); GEGAN (MINAG)*	*Design, partial implementation*	*2014/ 2030*	*Solar heaters: 833,333 U (1,000,000 m^2) Luminaires LED: 15,250,000 U Induction cooker: 2,000,000 U Solar circuit pumps: 5000 U*
Brief description of the contribution.	*For the year 2030 the contribution includes:* • *The installation of 833 333 units of solar heaters (One million of m^2 in the collection area) in the residential and industrial sectors.* • *The installation of 15 million 250 thousand LED lamps in the residential and public sectors.* • *The replacement of 2 million resistances driven electric cookers with induction cookers* • *The installation of 5000 solar pumping systems in*				

	livestock farming. *Likewise, it is foreseen in the qualitative indicators to implement the Energy Management Systems by applying the Cuban standard and the International standard NC ISO 5000 as well as other regulations for the efficient use of energy, contained in Decree Law 345 currently enforced in the country.*
Expected results	*It is estimated that the contribution will avoid the emission of 700 thousand ktCO2eq. into the atmosphere in the period 2014 – 2030.*
Conditioning for the execution of the contribution.	*Long term credits are required to implement the contribution.*
Methodologies and/or methods to be used for the follow up	*The data on activity level (unused energy: the difference of the energy used by the existing devices and the installed devices) is attained from the complementary statistical system of the Ministry of Energy and Mines (MINEM), considering the ONURE registries. The electricity grid emission factor is attained from what published in MINEM complementary statistical system. The grid emission factor (FE_{red}) is determined following the methodology in the IPCC 2006 Guides, Volume 2, chapter 2, item 2.3.*
Actions required for the adaptation as established in the Paris Agreement	*It is necessary to establish the Measurement, Report and Verification System (MRV) for every measure included in the contribution; based on the methodologies adopted, it is advisable to perform recalculations of emissions deduction projections.*

* For all systems, a cero value was considered to start.

Name of the contribution: Less carbon intensive ground transportation					
Objective	**Follow up Indicator (magnitude).**	**Implementing entity**	**Status**	**Base year/ deadline year**	**Starting value/goal value**
No GHG emissions contribution Objective: reduction of fossil fuel use in ground transportation by 50% in	*Percentage of fossil fuel use in ground transportation (%)*	*Ministry of Transport (MITRANS)*	*Design and preparation stage for its implementation*	*2018 / 2030*	*100% / 50%*

2030.					

Brief description of the contribution.	*This contribution foresees the introduction of more than 55 000 electric vehicles and the installation of around 25 thousand recharge stations by 2030.* *The estimated implementation cost for this contribution is USD 1 479 million. Two main financing sources are considered: long term credits to cover the import of technology (for the amount of USD 1261 million) and self-financing (USD 218 million, principally from the State budget.)*
Expected results	*It is estimated that the contribution will avoid the emission of one million ktCO_2eq. annually.*
Conditioning for the execution of the contribution.	*Long term credits are required to implement the contribution.*
Methodologies and/or methods to be used for the follow up	*The data on activity level (use of fossil fuels in ground transportation) is attained from the statistical system in ONEI and the complementary statistical system in MITRANS. The emission factor of vehicles with the use of technology and fuels will be attained following the IPCC 2006 Guides, Volume 3, chapter 3, item 3.2. Likewise, EMISSION FACTORS (FE in Spanish) specific for CO_2 will be used, attained from the quotient mass flow divided by the product of the specific consumption and the power of the analysed vehicle's engine. For this, the volume percentage of the contaminant is correlated, the air present in the process of combustion, as well as the volumetric flow and the molecular weight.*
Actions required for the adaptation as established in the Paris Agreement	*It is necessary to establish the Measurement, Report and Verification System (MRV) for every measure included in the contribution; based on the methodologies adopted, it is advisable to perform recalculations of emissions deduction projections.*

Name of the contribution: Increase of forest coverage in the country to 33% in 2030					
Objective	**Follow up Indicator (magnitude).**	**Implementing entity**	**Status**	**Base year/ deadline year**	**Starting value/goal value**
No GHG contribution Objective: increasing the forest coverage in the country	*Area covered by forests (ha).*	*Forests and Business Group; Attendants of forest heritage (MINAG)*	*Preparation for implementation*	*2019 / 2030*	*3269400 ha / 3434400 ha*
Brief description of the contribution.	*By the end of the year 2018, the forest area in Cuba (susceptible to be covered by forests) was 3 573 400 ha, of which 3 269 400ha were covered by forest and about 304 000ha were to be covered (DFFFS, 2019).* *The contribution intends to increase the forest coverage in 165 thousand hectares in the 2019-2030 period, reaching 33% coverage in the country.* *With national efforts, the forest coverage may reach 80 thousand hectares by 2030 (with a reforestation program equal to the one in the period 2010-2018) and this will be an unconditional contribution. The estimated cost is USD 1960 million, in turn removing an estimated 115,7 million tons of atmospheric CO_2 in that period.* *In the event of additional support, the pace of reforestation can be increased and achieve the proposed 165 000ha by 2030. It is necessary to invest national resources and an additional USD 2291 million in financing which will enable the enlargement of the area covered with artificial forests established between 2019 and 2030, removing 169,9 million tons of atmospheric CO_2 in that period.*				
Expected results	*Increasing forest coverage by 165 000ha in the period 2019-2030.* *Removing 169,9 million tons of atmospheric CO_2 in the period 2019-2030.*				
Conditioning for the execution of the contribution.	*The support of a USD 2291 million in long term credit is required for the implementation of the conditional contribution.*				
Methodologies and/or methods to be used for	*The data on activity level (forest coverage) is attained from the complementary statistical system in the Ministry of Agriculture (MINAG). The carbon retention factor by the forests is calculated in correspondence with 2006 IPCC Guides, Volume*				

the follow up	*4, Chapter 4, Forest Lands.*
Actions required for the adaptation as established in the Paris Agreement	*It is necessary to officially establish the Measurement, Report and Verification System (MRV) for every measure included in the contribution.*

Name of the contribution: Reduction of greenhouse gas emissions in swine industry in Cuba					
Objective	**Follow up Indicator (magnitude).**	**Implementing entity**	**Status**	**Base year/ dead line year**	**Starting value/ goal value**
The objective of this mitigation action is to reduce the GHG emissions in the Cuban swine sector by treating waste waters and using biogas to produce heat and electricity	*Emissions reduction (ktCO2eq.).*	*Livestock Business Group; (MINAG)*	Preparation for the implementation	*2020 / 2030*	*113.7 thousand tCO_2 / year / 538 thousand $ktCO_2eq.$/ year)*
Brief description of the contribution.	*An updated modelling of the Cuban swine industry has been carried out considering the need to process waste waters, based on the growth of number of heads that guarantees the annual increase of 10 000 tons of pork meat until 2030, according to the Livestock Business Group. The implementation of the program leads to an increase in emissions reduction from 113.7 thousand tCO2eq. in 2020 up to 538 thousand tCO2eq. in 2030. Recent analysis and projections have shown that a reduction of more than 900 thousand tCO2e could be reached in 2030, if the entire swine industry is considered.* *The amount of this livestock is estimated to double from 1.1 million to 2.2 million by 2030, located in around 5228 different size units. It is necessary to build and install 18534 bio-digesters of different kinds between 2020 and 2030*				

	In the period of 2020-2030 the reduction of emissions will be 8 million $ktCO_2eq$. The execution of the program demands the strengthening of national capacities: manufacturing rubber sheets from EPDM rubber base, biogas-based pumps and electrical appliances (heaters, cookers, lamps, etc) *Co-Benefits: The implementation of the measures will contribute to reduce the existence of dumping sites and pollution of hydrographic basins; it will enhance the environmental conditions, diminishing odours, vectors and methane existence in global terms. From an economic standpoint, producers will reduce expenses for energy consumption, having extra income by selling energy and by-products like biological fertilizer. From a social standpoint, working and living conditions will improve, mainly for women, by improving cooking conditions and working conditions.*
Expected results	*Treatment of 100% of waste waters in the Cuban swine sector, reducing 8 million $ktCO_2eq$. in emissions annually in the period of 2020-2030.*
Conditioning for the execution of the contribution.	*The support of long-term credit for the amount of USD 95 million is required to import technology, and likewise USD 10 million are needed to establish the Measurement, Report and Verification System (MRV) for the program, and strengthen capabilities. Self-financing (State funding) is estimated at USD 230 million.*
Methodologies and/or methods to be used for the follow up	*The data on activity level (per head of pigs of waste water treatment area) is attained in the complementary statistical system of MINAG. The baseline emissions are estimated as per the IPCC Guides from 2006, Volume 4, Chapter 10 and the emissions under mitigation actions are estimated following the methodology AMS-III.D Version 19.0.*
Actions required for the adaptation to what established upon the Paris Agreement	*It is necessary to conclude the assessment in order to create a bankable project, including the feasibility analysis, the study of the environmental and social safeguards, the business model and the financial structure. It is also necessary to establish the Measurement, Report and Verification System (MRV) for the action, in correspondence with the MRV System General Basis adopted in the country. The MRV system must be officially established for the measures in the contribution.*

For all the mitigation actions considered, potential co-benefits in adaptation will be evaluated.

4. Cuba's contribution in the international cooperation

Taking into account accrued experiences, Cuba has shared outcomes with other developing nations, especially with other SIDS, by way of bilateral collaboration and actions supported by developed countries and international organizations.

Through international assistance, Cuba created the Capacity Building Center for Disaster Risks Reduction and Adaptation to Climate Change, which has executed several activities and is planning potential projects to continue fostering triangular and South-South cooperation.

Cuba considers that these are national actions that will contribute towards the effective implementation of the Convention and reaffirms the willingness of the country to keep collaborating in capacity development in order to confront the challenges of climate change, as well as in the following areas:

- Technical assistance in preparation of national communications, drafting updated biennial reports and performing inventories on greenhouse gases.
- Development of climate modeling and projections.
- Performance and implementation of Hazard, Vulnerability and Risks studies.
- Assessments on coastal vulnerability and the impact of extreme events and climate change, as part of the environmental impact evaluation of development projects and works.

5. Safeguards

Cuba, in correspondence with the national circumstances, will continue to be committed to the reduction of greenhouse gas emissions, in the context of the application of the Principle of Common but Differentiated Responsibilities and in the scope of its goals for sustainable development, as provided by the Paris Agreement.

The compliance and the perspectives of greater ambitions in the Cuban Contribution will depend on the fulfilment of international obligations established under the Convention.

In preserving its sovereign rights, Cuba has the right to adjust the Contribution:

- In the event of serious impacts due to natural extreme disasters or any other force majeure,
- In the event of inadequate financial support or technology transfer and capacity building, in agreement with the commitments undertaken for developing countries in the Convention and the Paris Agreement,
- As a consequence of the negative impact of the strengthening of the economic, commercial and financial blockade imposed by the United States of America onto Cuba.

GLOSSARY

SA	Strategic Action
AFOLU	Agriculture, Forestry and Other Land Use Sector
AZCUBA	Sugar Business Group, linked to Cuban Sugar Agroindustry
CELAC	Economic Commission for Latin America and the Caribbean (ECLAC)
CH_4	Methane
NDC	Nationally Determined Contribution
CO_2	Carbon Dioxide
DFFFS	Division for Forestry, Wild Flora and Fauna
EPDM	Material made up by Ethylene, Propylene and Diene
FE	Emission Factor
FE_{red}	Electricity Grid Emission Factor
RES	Renewable Energy Sources
GEGAN	Livestock Business Group
GHG	Greenhouse gases
GWh	Giga Watt/hour. Unit of energy
IPCC	Intergovernmental Panel on Climate Change
$ktCO_2eq.$	Kilo/ ton of equivalent carbon dioxide
MRV	Measurement, Report and Verification
MINAG	Ministry of Agriculture
MINEM	Ministry of Energy and Mines
MITRANS	Ministry of Transportation
MW	Mega Watt. Unit of power
N_2O	Nitrous oxide
ONEI	National Office for Statistics and Information
ONURE	National Office to Control the Rational Use of Energy
PNDES 2030	2030 National Plan for Economic and Social Development
UNE	Cuban Electricity Union (State owned electricity company)