MINISTÈRE DU CADRE DE VIE
ET DU DÉVELOPPEMENT DURABLE
RÉPUBLIQUE DU BÉNIN

NDC PARTNERSHIP
ACCELERATING CLIMATE AND DEVELOPMENT ACTION

DIRECTORATE-GENERAL FOR ENVIRONMENT AND CLIMATE

PROJECT TO SUPPORT THE IMPLEMENTATION OF THE NDC OF BENIN (PROJECT NO. (NP)/ 18. 2105. 7 -001. 09)

BENIN'S UPDATED NATIONALLY DETERMINED CONTRIBUTION UNDER THE PARIS AGREEMENT

(Final document)

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SUMMARY

List of acronyms

AIC	:	Climate-Smart Agriculture
ANCB	:	National Association of Municipalities of Benin
UNFCCC	:	United Nations Framework Convention on Climate Change
CDN	:	Nationally Determined Contribution
CMEICB	:	Commission for Economic Modelling of Climate Impacts and Integration of Change Climate in the General State Budget
CNSC	:	National Committee on Climate Change
COP or CP	:	Conference of the Parties
INDCs	:	Intended Nationally Determined Contributions
DGEC	:	Directorate-General for Environment and Climate
DGRE	:	Directorate-General for Energy Resources
EBT-Adaptation	:	Adaptation Technology Needs Assessment **EBT-Mitigation** : Mitigation Technology Needs Assessment **GHG** : Greenhouse Gases
IPCC	:	Intergovernmental Panel on Climate Change
GTEC	:	Environment and Climate Thematic Group
MCVDD	:	Ministry of Living Environment and Sustainable Development
ODD	:	Sustainable Development Goals
NGO	:	Non-Governmental Organization
PAG	:	Government Action Programme
PANA	:	National Action Programme for Adaptation to Climate Change
GDP	:	Gross domestic product
LDC	:	Least Developed Countries
PNA	:	National Adaptation Plan
PND	:	National Development Plan
PRBA	:	Benin's First Biennial Update Report
PRG	:	Global Warming Power of Greenhouse Gases
TFP	:	Technical and Financial Partners
REED+	:	Reducing Emissions from Deforestation
SBEE	:	Beninese Electric Energy Company
BIA	:	Master Plan for the Development of Municipalities
SNMO	:	National Strategy for the Implementation of the United Nations Framework Convention on Climate Change
TCN	:	Benin's Third National Communication on Climate Change
LULUCF	:	Land Use, Land Use Change and Forestry

List of chemical symbols

CO2	:	Carbon dioxide
CH4	:	Methane
N2O	:	Nitrous Oxide
Nox	:	Nitrogen oxide
CO	:	Carbon monoxide
NMVOCs	:	Non-methane volatile organic compounds
SO2	:	Sulphur dioxide
BC	:	Black Carbon
OC	:	Organic Carbon
PM10	:	PM10 particles
PM2.5	:	PM2.5 particle
NH3	:	Ammonia

List of units

t	:	Ton
E CO2	:	Carbon dioxide equivalent
MW	:	Mega Watt
MWh	:	Megawatt-hour
Mt	:	Mega ton
Mt E-CO_2	:	Mega Ton Carbon Dioxide Equivalent
km²	:	Square Kilometer
ha	:	Hectare

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EXECUTIVE SUMMARY

In accordance with the relevant provisions of decision 1CP/21 adopting the Paris Agreement and paragraph 22 of decision 1CP/21 adopting the Paris Agreement, Benin developed its first Nationally Determined Contribution (NDC) and submitted it to the Convention secretariat in October 2017. The activities foreseen in the NDC, covering the period 2017-2030, are structured into two main components, namely mitigation and adaptation. Following the completion of the NDC inventory of the actions implemented over the period 2017-2019, Benin has embarked on the process of updating this instrument with a view to raising the ambition enshrined in the NDC and providing more clarity and transparency for a better understanding of the instrument on the one hand and for better monitoring of its implementation on the other. In this context, Benin intends to show its firm determination to contribute more to the global effort to reduce greenhouse gases. This document, the elaboration of which benefited from the broad participation of the various stakeholders from public and private structures, local authorities and NGOs, constitutes Benin's updated NDC.

1- NATIONAL CIRCUMSTANCES

The Republic of Benin is located in West Africa between latitudes 6°30' and 12°30' North and longitudes 1° and 3°40' East, with an area of 114,763 km². The population of Benin is estimated at 10,008,749 inhabitants (RGPH4, 2013) with an average annual population growth rate of around 3.52%. Administratively, Benin currently has twelve (12) departments subdivided into 77 Communes. There are two main types of climate in Benin, namely: the sub-equatorial climate characterizing the southern region and the tropical continental climate governing the northern region. On the socio-economic level, Benin experienced an unstable economic situation over the period 1996-2015 marked by a fluctuation in the Gross Domestic Product (GDP) varying globally between 2 and 6%. But thanks to the economic reforms currently being carried out by the public authorities, GDP reached a record 6.8% in 2018 (Source, IMF). However , GDP per capita growth remains low, due to sustained population growth, the poor performance of the policy implemented, thus leaving little room for the achievement of the Sustainable Development Goals (SDGs) by 2030.

Awareness of the issues related to the issue of climate change has led to the development and adoption of several policies, strategies and response programmes by Benin. On the legal level, it should be noted that under climate change, a law regulating climate change in the Republic of Benin was voted by the parliament on June 18, 2018 and promulgated on August 6, 2018. In terms of development priorities and objectives, the Republic of Benin has made commendable efforts, despite the bottlenecks that persist or existing challenges, particularly in terms of infrastructure development, security and governance. However, the level of operationalization of existing strategies is still low to induce a significant evolution towards the realization of their respective visions and that of the National Long-Term Outlook Studies **"**Benin Alafia 2025**".** In terms of climate finance, Benin has created the National Fund for the Environment and Climate (FNEC) accredited by the Green Climate Fund (GCF).

2- MITIGATION

2.1. Current greenhouse gas emissions and business-as-usual projections

Benin's total GHG emissions in 2018 amounted to about 16.94 Mega tonnes of CO2 equivalent (Mt E-CO2), or about 1.5 tonnes of CO2 per capita, excluding the Land Use, Land Use Change and Forestry (LULUCF) sector. These emissions come from the energy (**58.09%),** agriculture (**28.51%),** waste (**5.38%)** and industrial processes (**1.22%)** and other sectors (wildland fire and HFC emissions) for **6.80%.** Taking into account the LULUCF sector, net GHG emissions are **9.62** Mt CO2E.

In terms of projection, if the business-as-usual scenario is maintained, the trend in global emissions (excluding LULUCF) reveals an increase of **71%** over the period 2018-2030, from **16.94** Mt E-CO2 to **29.02** Mt E-CO2 (Figure 1). The total cumulative aggregate GHG emissions without any intervention over the period 2021-2030 is around **241.98** Mt E-CO_2 (excluding LULUCF). They would come **63.62%** from the energy sector and **24.04%** from the agriculture sector, **1.21%** from the PIUP sector, **4.64%** from the waste sector and other sectors (wildland fires and HFC emissions), **6.49%.**

For the coming years, the measures envisaged in the revised NDC in the Energy, Agriculture and Waste sectors (see Tables 5, 6, 7 and 8 below) are likely to contribute to reducing cumulative GHG emissions (excluding LULUCF) by about **48.75** Mt E-CO2 compared to the baseline scenario, i.e. a reduction of around **20.15%** over the period 2021-2030.

2.2. Climate Change Mitigation Goals and Actions

On the basis of existing strategies, plans and programmes, key sectoral objectives and measures for climate change mitigation are identified and reported in tables 3 to 5.

2.3. Strategies, programmes, implementation projects

The implementation of sectoral mitigation activities (agriculture, energy, forestry and waste) under the NDC will build on existing strategies, programmes and projects and future programmes and projects.

3. ADAPTATION

In view of its membership of the group of Least Developed Countries (LDCs), its environmental context and its development objectives, adaptation remains for the Republic of Benin the priority in terms of response to climate change, although it adheres unconditionally to the global effort, oriented towards the mitigation strategy.

3.1. Benin's vulnerability to climate change

The assessment of Benin's vulnerability to climate change on behalf of the updated NDC is based mainly on the results of studies or evaluations conducted in particular in the context of the third national communication on climate change and the Technology Needs Assessment process, and development programmes or projects aimed at adaptation objectives. The current major climate risks that impact livelihoods in particularly vulnerable sectors (Agriculture, Water Resources, Coastline, etc.) include floods, drought, late and violent rains, strong winds, excessive heat and sea level rise. The impacts observed over the last three decades are, among others, the decline in agricultural yields, the disruption of agricultural calendars, the decrease in water levels in drinking water supply dams attributable to the increase in evaporation of the order of 3 to 4% on an annual scale (Houngue et al. 2019), the extension of the low water period (1 to 3 months), the submersion of the banks, etc. In terms of future vulnerability, assessments based on the new Intergovernmental Panel on Climate Change (IPCC) new climate scenarios RCP2.6, RCP4.5 and RCP8.5 (Representative Concentration Pathways) show that annual precipitation projections made at different levels of climate change are

time horizons (2030, 2050) using the CSIRO and CCCMA models, show downward or upward changes depending on the model, but the dominant features remain negative variations (MCVDD, 2019). As regards temperatures (average, minimum and maximum), projections generally show a warming trend by 2030 and 2050. As for the potential impacts, they include the rise in sea level of up to about 0.81m by 2100, with the direct effects of coastal flooding and the intrusion of saline water into rivers and water tables. This could affect human settlements, health, fishing activities (MEHU, 2011). We could also expect a probable decrease in surface water flows by 2050 over the entire Ouémé River basin in a scenario of reduced rainfall in the north of the country and a shift in flood periods in the Beninese portion of the Niger basin, following a significant decrease in rainfall patterns on a scale (MEHU, 2011). In addition, the outlook is for a 21.6% and 28.8% decline in maize yields (75-day SYN variety) by 2030 and 2050 respectively, a decline in cotton yields of around 0.9% in 2030 and 6.3% in 2050, and a prevalence of diseases, including foot-and-mouth disease, peste des petits ruminants, lumpy skin disease and the spread of ticks of the genus Rhipicephalus Boophilus microplus, high rate of fish mortality, and loss of ecological habitats for fish species.

3.2. Climate change adaptation targets

On the basis of existing strategies, plans and programmes, the key sectoral targets for adaptation to climate change are defined for the time horizons 2025 and 2030 and recorded in Table 8.

3.3. Strategies, programmes, implementation projects

The implementation of adaptation activities in the eight (8) sectors considered (agriculture, water resources , forestry, coastline, tourism, energy, health, urban development and infrastructure) under the updated NDC will build on existing strategies, programmes and projects and future programmes and projects.

4. FRAMEWORK FOR GENDER MAINSTREAMING IN NDC IMPLEMENTATION

The integration of the gender aspect in the implementation of the NDC seems extremely important in view of the role played by certain particularly vulnerable social strata, in this case women, in the fight against climate change. In this regard, the integration of the gender aspect in the updated NDC document is envisaged with a view to providing a global overview of the possibilities of taking the gender aspect into account. Thus, it defines the appropriate levels of gender mainstreaming by sector and field of action, accompanied by some recommendations.

5. INSTITUTIONAL FRAMEWORK FOR THE IMPLEMENTATION OF THE NDC

The implementation of Benin's updated Nationally Determined Contribution (NDC) is carried out under the aegis of the Ministry of Living Environment and Sustainable Development (MCVDD) acting as the national focal point of the United Nations Framework Convention on Climate Change. Key players involved include:

- relevant ministries and sectoral institutions;
- local authorities;
- private sector;
- civil society .

The implementing bodies of this instrument are as follows:

- **The Steering Committee**, the supreme decision-making and orientation body. It is made up of designated representatives of the Ministries concerned.

- **The National Coordination Unit** of the NDC is the federating body for all actions. It includes the Director General in charge of Climate Change (DGEC), the

National Coordinator, the Focal Point of the United Nations Framework Convention on Climate Change, the Climate Technology Transfer Focal Point, an Executive Secretary ; two technical assistants to the National Coordinator.

- **Sectoral coordination** of implementation is the responsibility of the ministries, institutions, agencies and other structures covered by the measures/actions identified in the updated NDC. They are made up of the officials in charge of programming and foresight at the level of the ministries, the officials in charge of the monitoring and evaluation of projects, the Climate Change Focal Point of the National Association of Municipalities of Benin, the person in charge of climate change issues at the level of the umbrella organization of civil societies and non-governmental organizations.

- **Municipal coordination,** the body responsible for supervising the NDC at the municipal/local level.

In addition, the implementation of projects and programmes identified in the various sectors covered by the NDC is the responsibility of the ministries, institutions or sectoral entities concerned.

The necessary guidelines and facilities will be given by the MCVDD to support, if necessary, the sectoral structures in the preparation of funding search files or any other initiatives through existing mechanisms. The MCVDD will also ensure responsibility for the MRV (Measurement, Reporting and Verification) system of NDC implementation, institutional capacity building in collaboration with relevant stakeholders.

6. MEANS OF IMPLEMENTATION

The activities planned for the implementation of Benin's updated NDC require financial, technological and capacity-building resources.

With regard to technological resources, emphasis will be placed on endogenous technologies and South-South and North-South transfer, including the necessary know-how. The main needs for technology transfer identified concern the agriculture, water resources, forestry and energy sectors (tables 14 and 15).

Capacity-building will consist of the development of technical skills and the improvement of institutional capacities.

The Republic of Benin, to achieve its greenhouse gas (GHG) mitigation ambitions, will need a global financial envelope of about **8556.81** million US dollars, including **5069.03** million as a contribution from the Beninese Government and the private sector and **3487.77** millionmillion to be mobilized from the international community over the period from 2021 to 2030. The cost of implementing sectoral adaptation programmes and projects is estimated at about **US$1796.13** million, of which the national contribution (unconditional share) is about **US$578.47** million, while the conditional share (international support) corresponds to **US$1217.66** million US dollars. In addition, the financial resources to be mobilized for the implementation of mitigation/adaptation measures for communal projects amount to US$**162.94** million, of which about **US$14.39** million is the national contribution and US$**148.55** million is conditional.
In total, the financial resources to be mobilized for the implementation of mitigation and adaptation actions under Benin's first updated NDC amount to approximately US$**10515.88** million, to be provided by public funds, the private sector and international support. This amount is divided into an unconditional contribution of **about US$**5661.89 million, or **53.8%, and** a conditional contribution of about **US$4853.99** million, or about **46.2%.**

7. CONSTRAINTS TO THE IMPLEMENTATION OF ADAPTATION STRATEGIES AND OPTIONS

The successful implementation of the NDC could be confronted with many constraints , including the effective and timely mobilization of domestic and external resources , the capacity of the public structures concerned to effectively manage large-scale programmes , the effectiveness of the application of regulatory texts, the effective transfer of technologies as well as the completion of research and development work at the national level.

I. NATIONAL CIRCUMSTANCES

The Republic of Benin is located in West Africa between latitudes 6°30' and 12°30' North and longitudes 1° and 3°40' East, with an area of 114,763 km². It is bordered to the south by the Atlantic Ocean , to the west by Togo, to the east by Nigeria, to the northeast by Niger and to the northwest by Burkina Faso. The population of Benin is estimated at 10,008,749 inhabitants (RGPH4, 2013) with an average annual population growth rate of around 3.52%. The average density is 29 inhabitants/km2 with a greater demographic concentration noted in the south of the country. Administratively, Benin currently has twelve (12) departments subdivided into 77 Communes.

In Benin, there are two main types of climate, namely: the sub-equatorial climate characterizing the southern region and the tropical continental climate governing the northern region. Average annual precipitation varies between 700 mm (far north) and 1500 mm (extreme southeast), while air temperatures average around 27.2 °C, with absolute maximums that can exceed 45 °C in the north.

The last two decades have been particularly marked by an increase in climate variability , characterized in particular by a recurrence of extreme weather events (floods in particular), the disruption of seasonal rainfall patterns and an increasingly remarkable reduction in the number of rainfall events. Regarding the air temperature, the deviations from the normal (1981-2010) of the annual averages show values oscillating between -0.7 and
+1.3 °C.

On the socio-economic level, Benin experienced an unstable economic situation over the period 1996-2015 marked by a fluctuation in the Gross Domestic Product (GDP) varying globally between 2 and 6%. But thanks to the economic reforms currently being carried out by the public authorities, GDP reached a record 6.8% in 2018 (Source, IMF). GDP per capita growth remains low, due to sustained population growth, the poor performance of the policy implemented, thus leaving little room for the achievement of the Sustainable Development Goals (SDGs) by 2030.

The governance of climate change at the national level is primarily the responsibility of the Ministry of Living Environment and Sustainable Development (MCVDD), which acts as the National Focal Point of the United Nations Framework Convention on Climate Change (UNFCCC). It coordinates and supervises through the Directorate-General for Environment and Climate (DGEC), the processes for the preparation of national communications on climate change, Nationally Determined Contributions (NDCs) and other documents related to the implementation of the Convention. It works closely with structures under the other ministerial departments concerned and Non-Governmental Organizations (NGOs).

At the political level, one of the instruments of major importance is the National Development Plan 2016-2025, adopted in July 2018. Awareness of the issues related to the issue of climate change has led to the development and adoption of several policies, strategies and response programmes by Benin. These are: the National Strategy for the Implementation of the UNFCCC, the National Action Programme for Adaptation to Climate Change (NAPAs), the National Programme for the Sustainable Management of Natural Resources (PNGDRN), the Strategy for Low-Carbon and Climate-Resilient Development, the National Strategy and Action Plan for the Sustainable Management of Benin's Mangrove Ecosystems and the NDC in particular.

On the legal level, it should be noted that under climate change, a law regulating climate change in the Republic of Benin was voted by the parliament on June 18, 2018 and promulgated on August 6, 2018.

In terms of development priorities and objectives, the Republic of Benin has made commendable efforts, despite the bottlenecks that persist or existing challenges, particularly in terms of infrastructure development, security and governance. However, the level of operationalization of existing strategies is still low to induce a significant evolution towards the realization of their respective visions and that of the National Long-Term Outlook Studies **"**Benin Alafia 2025**".** With regard to climate finance, Benin has created the National Fund for the Environment and Climate (FNEC) accredited by the Green Climate Fund (GCF).

II. MITIGATION

2.1. Current greenhouse gas emissions and business-as-usual projections

The data on greenhouse gas (GHG) emissions are based on the results of estimates made from sectoral data of activities from the NCT updated with the following tools
:

i) the LEAP (Low Emissions Analysis Platform) software for the Energy and Waste sectors and the rice category in the agriculture sector;
ii) EX-ACT (EX-Ante Carbon-balance Tool) software for the agriculture sector (except rice cultivation);

In the forestry sector and other land use, the estimation of gas emissions for the baseline scenario and the assessment of the mitigation scenario were carried out using the Excel spreadsheet using the IPCC guidelines, with the exception of measures for the development of cashew and oil palm plantations, the effects of which were assessed using the Ex-act tool.

❖ **Domestic greenhouse gas (GHG) emissions**

Benin's total GHG emissions in 2018 were about 16.94 Mega tonnes of CO2 equivalent (Mt E-CO_2), or about **1.5 tonnes of CO2 per capita**, excluding the Land Use, Land Use Change and Forestry (LULUCF) sector. These emissions come from the energy (63%), agriculture (28.6%), waste (5.3%) and industrial processes (3.1%) sectors. Taking into account the LULUCF sector, net GHG emissions are 10.6 Mt CO2E.

❖ **Projections of Greenhouse Gas Emissions under Continued Status Quo**

If the status quo is maintained, the trend in global **annual emissions** (excluding LULUCF) shows an increase rate of about **71%** over the period 2018-2030, from **16.94** Mt E-CO2 to **29.02** Mt E-CO2. Figure 1 shows the annual GHG emission trajectories for the agriculture, energy, waste and industrial process sectors. The total cumulative global GHG emissions without any intervention over the period 2021-2030 is around **241.98** Mt E-CO2 (excluding LULUCF). They would come **63.62%** from the energy sector and **24.04%** from the agriculture sector, **1.21%** from the PIUP sector, **4.64%** from the waste sector and other sectors (wildland fires and HFC emissions), **6.49%.**

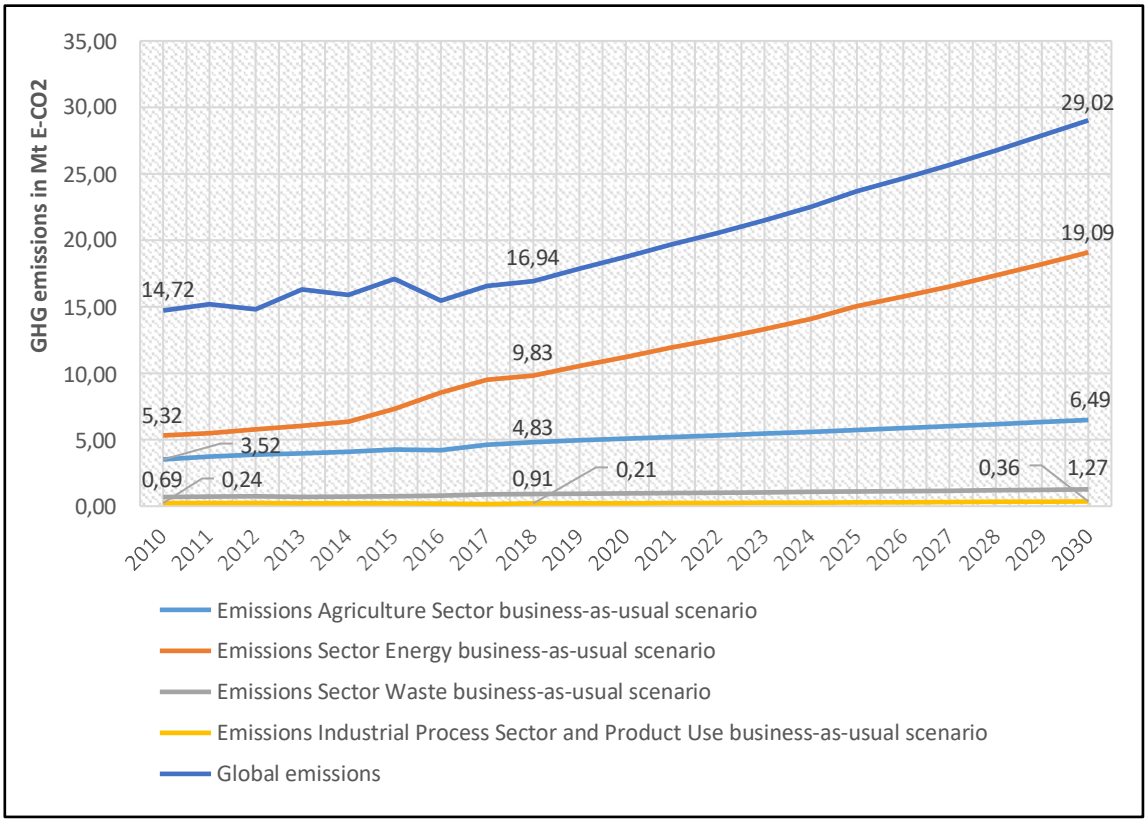

Figure 1: Trend in overall GHG emissions and emissions from the agriculture, energy, waste and Industrial processes, business-as-usual scenario

2.2. Historical emissions of non-GHG SLCPs and air pollutants and business-as-usual projections

Emissions for each pollutant (other than GHGs) individually between 2010 and 2018 are as follows (Table 1). The amount of black carbon emitted into the atmosphere in Benin in 2018 is estimated at 10 thousand tons . The main sources of black carbon emissions are residential combustion, wildland fires and charcoal production, as well as other particulate air pollutants (Figure 2).

Table 1: Total national emissions of SLCP (non-GHG) and air pollutants in Benin between 2010 and 2018 (thousands of tonnes)

Pollutants	2010	2011	2012	2013	2014	2015	2016	2017	2018
Carbon monoxide	3,350	3,422	2,972	3,635	3,170	3,213	1,762	1,626	1,523
Non-methane volatile organic compounds	364.03	373.92	355.74	400.92	384.26	404.34	359.08	368.44	373.65
Nitrogen oxides	179.59	183.98	157.53	195.30	165.28	167.93	81.61	74.08	66.94
PM10 particles	379.78	386.61	327.29	406.80	343.60	344.27	152.21	129.07	112.35
Sulphur dioxide	20.90	21.24	18.95	22.44	19.83	20.55	12.36	12.01	11.15
Ammonia	63.51	66.18	63.36	70.37	67.09	68.31	54.50	56.93	57.88
PM2pt5 particulate matter	257.78	262.37	223.81	276.13	235.87	236.58	110.34	95.81	85.31

Black Carbon	25.17	25.63	22.26	26.99	23.42	23.57	12.51	11.31	10.42
Organic carbon	155.13	157.85	133.45	166.22	140.69	140.93	61.48	52.18	45.32

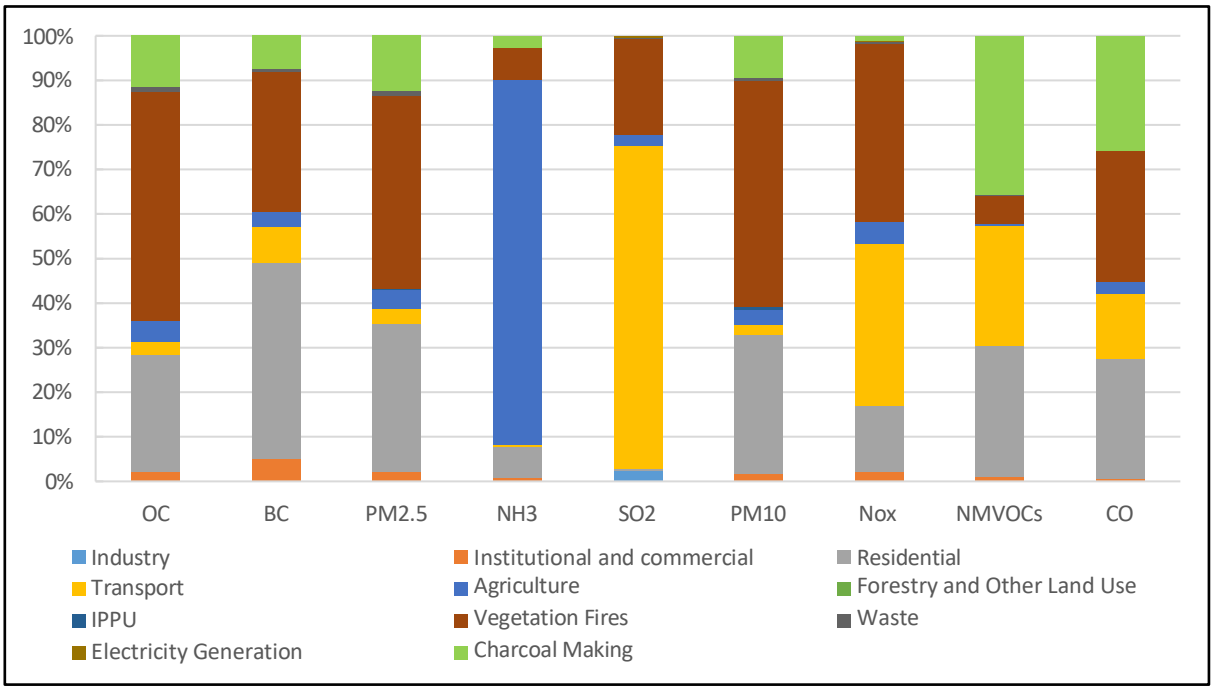

Figure 2: Contribution of different sources to SLCP (non-GHG) and air pollutant emissions in Benin in 2018 (excluding forestry and land use change).

2.3. Nationally determined contribution mitigation actions

The contribution to GHG mitigation contained in the updated NDC is based on actions contained in strategies, programmes and projects for the period 2017 to 2030. This period includes the preparatory phase for the implementation of the NDC (2017 to 2020) and the period for the implementation of the NDC (2021 to 2030, the accounting period for efforts to reduce GHG emissions). Many opportunities for GHG mitigation have been identified in the agriculture, energy and LULUCF sectors to this end.

❖ Nationally determined contribution mitigation actions

The general methodological considerations for the updating of actions and the overall nationally determined contribution to mitigation are presented in table 2.

Table 2: General methodological considerations and overall results for updated mitigation measures

Base year	The base year for the consideration of actions contributing to GHG mitigation is 2018. But the GHG emissions projections are made over the period 2019 to 2030; the emissions trajectory for the scenario without mitigation measures and the scenario with measures being the same for the period 2010 to 2016.
Type of contribution to GHG mitigation and period covered	A GHG mitigation contribution of the updated NDC is based on actions contained in strategies, programmes and projects for the period 2017–2030.This period includes a preparatory and early phase of NDC implementation (2017–2020) and an implementation phase of the NDC (2021–2030).

Options having founded updating the NDC	Commit to further support climate action through more ambitious targets for the same period 2021-2030
GHGs Included in the Contribution	Direct GHGs: Carbon dioxide (CO_2), methane (CH_4), nitrous oxide ($N_{2O)}$, HFCs Other pollutants (SLCP other than GHGs and air pollutants: black carbon, organic carbon, ammonia (NH3), PM2.5, PM10, carbon monoxide (CO), nitrogen oxides (NOx), non-methane volatile organic compounds (NMVOCs).
Sectors/sources covered by gas emission calculations	• Energy ; • Agriculture ; • Industry and Product Use; • Waste ; • LULUCF
Sectors/sources covered by the contribution	• Energy (sources: residential, tertiary, transport and energy industries) • Agriculture (agricultural soils, rice fields, burning of agricultural residues, prescribed burning of savannahs). • LULUCF (forest land including natural forests and plantations: forest and agroforestry plantations).
Geographical coverage	The entire national territory
Scenarios considered for estimating gas emissions	Reference scenario: This scenario does not take into account mitigation policies and measures • Mitigation scenario: This is the scenario that relies on policies and measures that have an implementation period beyond 2021 and that contribute to mitigation GHG emissions or the strengthening of carbon sinks.
Methodology for estimating gas emissions	
Methodology General emissions estimates	For the generation of scenarios in the various sectors and subsectors targeted for the mitigation component, GHG emissions were estimated over the historical period from 2010 to 2016 and projections from 2017 to 2030. Four types of data were used: demographic data, macroeconomic data (GDP), sectoral activity data, emission factors and global warming potentials of the different gases. Demographic and economic data are taken from the statistics and projections of the National Institute of Statistics and Demography (INStaD). Activity data come from official statistical documents and databases of the various sectors concerned. Missing data and data projections required extrapolations and sometimes approximations based on assumptions established and widely shared with stakeholders at the sectoral level . For GHGs, the emission factors used are mostly default values from the 2006 IPCC Guidelines for National GHG Inventories. The CH4 mission factors from enteric fermentation and cattle manure management are specific to Benin. Emission factors for non-GHG and air pollutant SLCPs are taken from the 2006 IPCC Guidelines for National GHG Inventories, Air Pollutant Emission Inventory Guidebook 2019 (EMEP/EEA, 2019) and Andreae and Merlet (2001). Global warming potentials (GWPs) are values provided by the IPCC in its Fourth Assessment Report: 1 for CO2, 25 for CH4 and 298 for N2O.

	Aggregate emissions are assessed from the sum of non-LULUCF sectoral emissions.
Methodological approach for the generation of the reference scenario	The baseline scenario, as noted above, is that GHG emissions occur in the absence of actions adopted from 2017 onwards that could contribute to mitigating GHG emissions or enhancing carbon sinks . Thus, for this scenario, the estimate of emissions over the period 2017 to 2030 is based on projections of sectoral activity data based on historical trends observed over the years 2010 to 2017.
Methodological approach for the generation of the mitigation scenario	The 2019 to 2030 emissions projections for the mitigation scenario take into account 21 measures. In total, by sector, we have: • 03 measures in the agriculture sector (Table 4); • 12 measures comprising a total of 20 actions to be implemented in the energy sector (Table 5); • 05 measures in the LULUCF sector (Table 6); • 01 Measure in the waste sector (Table 7) Of the 21 measures, only 12 are considered in the energy sector for SLCPs (other than GHGs) and air pollutants.
Emission assessment tools for the agriculture, energy, waste and industrial processes sectors	**Agriculture, energy, waste, industrial processes:** For these four sectors, the work on estimating GHG emissions, the LEAP software (Low Emissions Analysis Platform, version 2020) was used to evaluate the baseline scenario. For the assessment of mitigation measures, the tools used are respectively: iii) the LEAP for the Energy and Waste sectors and the rice cultivation category in the agriculture sector; iv) EX-ACT software for agriculture (except rice); In the forestry sector and other land use, the estimation of gas emissions for the baseline scenario and the assessment of the mitigation scenario were carried out using the Excel spreadsheet using the IPCC guidelines, with the exception of measures for the development of cashew and oil palm plantations, the effects of which were assessed using the Ex-act tool.
Aggregation of emissions and emission reductions	Work to aggregate GHG emissions and emission reductions, non-GHG SLCPs and air pollutants for all sectors was completed using the Excel tool
Expected sectoral and overall emission reductions (all targeted sectors) relative to the baseline scenario	**Period from 2017 to 2019:** It appears from the work on the state of play of the implementation of the NDC during the preparatory phase that the mitigation actions undertaken in the agriculture and energy sectors from 2017 to 2019 have made it possible to reduce GHG emissions by **3.8 Mt E-CO2**, i.e. 2.4% already achieved of the target set for 2030 In the forestry sector, actions to restore degraded natural forests and forest plantations resulted in the absorption of **1.155 Mt CO2 E-CO2** over the period indicated above. 2021 to 2030 period: For the coming years, the measures envisaged in the revised NDC in the Energy, Agriculture and Waste sectors are likely to contribute to reducing cumulative GHG emissions (excluding LULUCF) by about 48.75 Mt E CO2 compared to the baseline scenario, i.e. a reduction of 20.15% over the period 2021-2030 (Table 3 and Figure 3). Compared to SLCP (other than GHGs) and air pollutants, 12 measures were considered in the Energy sector and are likely to contribute to reducing black carbon emissions by about 1.8 Mt in 2030 compared to the baseline scenario, a reduction of 14.2 per cent (Table 4)

The implementation of the mitigation actions included in this updated version of Benin's NDC supports the revision of Benin's overall GHG reduction target of one emission reduction

cumulative GHG emissions (excluding forestry) between 2021 and 2030 of 48.75 Mt CO2 E, or 20.15% compared to the cumulative emissions of the baseline scenario (Table 3). Figure 3 shows the GHG emission trajectories in each of the scenarios between 2021 and 2030: the baseline scenario, the unconditional mitigation scenario (based on unconditional measures) and the global mitigation scenario (based on both unconditional and conditional measures). The mitigation measures that are included in each scenario are presented in tables 5, 6, 7 and 8 below. Benin also notes that the implementation of these mitigation measures, in addition to reducing GHGs, would also result in local benefits in relation to air pollution exposure and human health by reducing emissions of short-lived climate pollutants such as black carbon, and other air pollutants harmful to health. Implementing the mitigation measures would reduce black carbon emissions in 2030 by 14% relative to baseline black carbon emissions, as well as significant reductions in other pollutants (Table 4).

Table 3: GHG emissions and emission reductions (excluding forestry) for the business-as-usual and mitigation scenarios (in Mt E-CO2)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Status quo scenario	14,72	15,19	14,81	16,30	15,90	17,09	15,45	16,56	16,94	17,88	18,76
Emissions Unconditional Mitigation Scenario	14,72	15,19	14,81	16,30	15,90	17,09	15,45	16,56	16,94	17,82	18,52
Emissions Global Mitigation Scenario	14,72	15,19	14,81	16,30	15,90	17,09	15,45	16,56	16,94	17,79	18,41
Emission reductions, Unconditional scenario										0,06	0,24
Overall emission reductions										0,09	0,35

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Cumulative 2021-2030
Status quo scenario	19,70	20,56	21,51	22,52	23,70	24,67	25,68	26,76	27,88	29,02	241,98
Emissions Unconditional Mitigation Scenario	19,41	18,42	19,14	19,83	20,62	21,41	22,30	23,22	24,28	25,39	214,03
Emissions Global Mitigation Scenario	19,28	16,55	17,16	17,72	18,33	19,03	19,87	20,72	21,74	22,84	193,23
Emission reductions, Unconditional scenario	0,29	2,14	2,37	2,68	3,08	3,26	3,38	3,53	3,60	3,63	27,95
Overall emission reductions	0,42	4,01	4,35	4,80	5,37	5,64	5,81	6,04	6,13	6,18	48,75

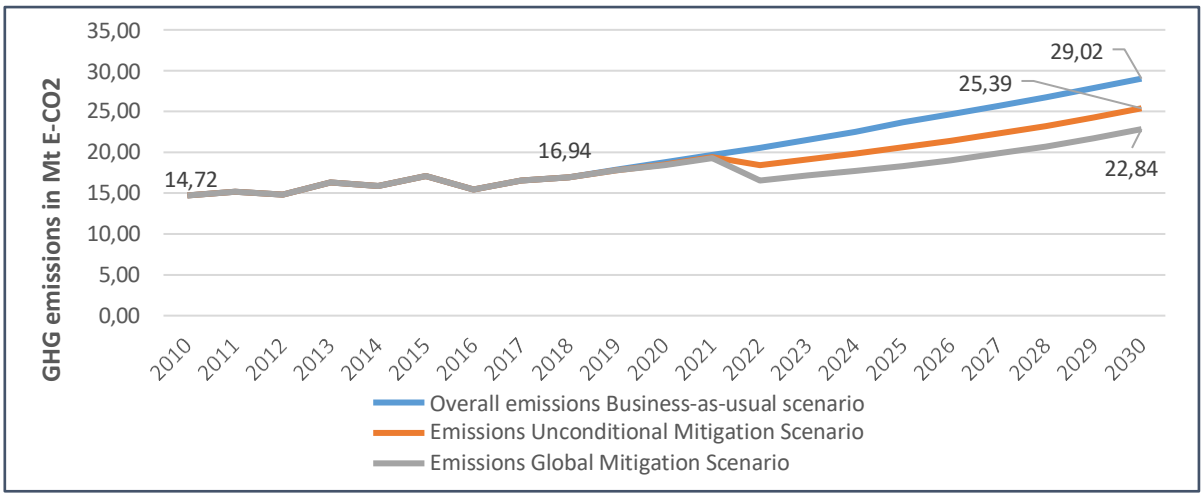

Figure 3: Trend in overall GHG emissions (excluding forestry) under the business-as-usual scenario and in the event of intervention

Table 4: Emissions of SLCP (other than GHGs) and air pollutants in 2030 for baseline and supplementary action scenarios.

Scenario	OC	BC	PM2.5	NH3	SO2	PM10	Nox	NMVOCs	CO
2018	45.3	10.4	85.3	57.9	11.1	112.3	66.9	373.7	1,523
Baseline	53.2	12.7	101.9	76.9	44.8	129.8	83.4	633.2	2,183
Attenuation	48.5	10.9	90.4	75.3	14.0	116.9	78.7	554.1	1,903
Attenuation (% reduction)	-8.9	-14.2	-11.3	-2.1	-68.8	-10.0	-5.7	-12.5	-12.8

The planned sectoral measures and their effects are presented in tables 5, 6, 7 and 8 and illustrated in figures 4, 5 and 6.

Table 5: Measures Considered and Avoided Emissions in the Agriculture Sector

Sub-sectoral objectives	Measures envisaged	Unconditional contribution	Conditional Contribution (Additional)
Promote improved cultivation techniques in crop production.	(1) Implementation of improved cultivation techniques on a area of 5,000,000 ha between 2021 and 2030.	*250,000 ha/year between 2021 and 2030*	*250,000 ha/year between 2021 and 2030*
Promote soil fertility management techniques in crop production.	(2) Implementation of techniques for maintaining soil fertility on an area of 5,000,000 ha between 2021 and 2030.	*250,000 ha between 2021 and 2030*	*250,000 ha between 2021 and 2030*
Promote the facilities hydro-Agricultural.	**(3)** Development and irrigation of rice-growing areas with control of water from 52,000 ha	22,000 ha of rice-growing perimeters developed and irrigated with control of water.	An additional 30,000 ha of rice growing perimeters developed and irrigated with water control.
Reduced emissions in the agricultural sector	**Expected avoided emissions: all the above measures, namely the promotion of** improved cultivation techniques, the maintenance of soil fertility and the development and irrigation of rice perimeter, will make it possible to avoid GHGs to the tune of about **29.9** Mt E-CO2 compared to the business-as-usual scenario, i.e. a cumulative reduction of **51.4%** over the period 2021 to 2030, of which **50%** conditional contribution and **50%** unconditional contribution. Figure 4 below shows the trajectory of emissions in the agriculture sector for each of the scenarios and the levels that could be reached in 2030. The cumulative emissions avoided are distributed as follows: (1) Promotion of improved cultivation techniques and (2) maintenance of soil fertility (**29.7** Mt E-CO2 eq) i.e **. 99.4%** and (3) development of rice growing areas with water control (**0.2** Mt E-CO2) or **0.6%.**		

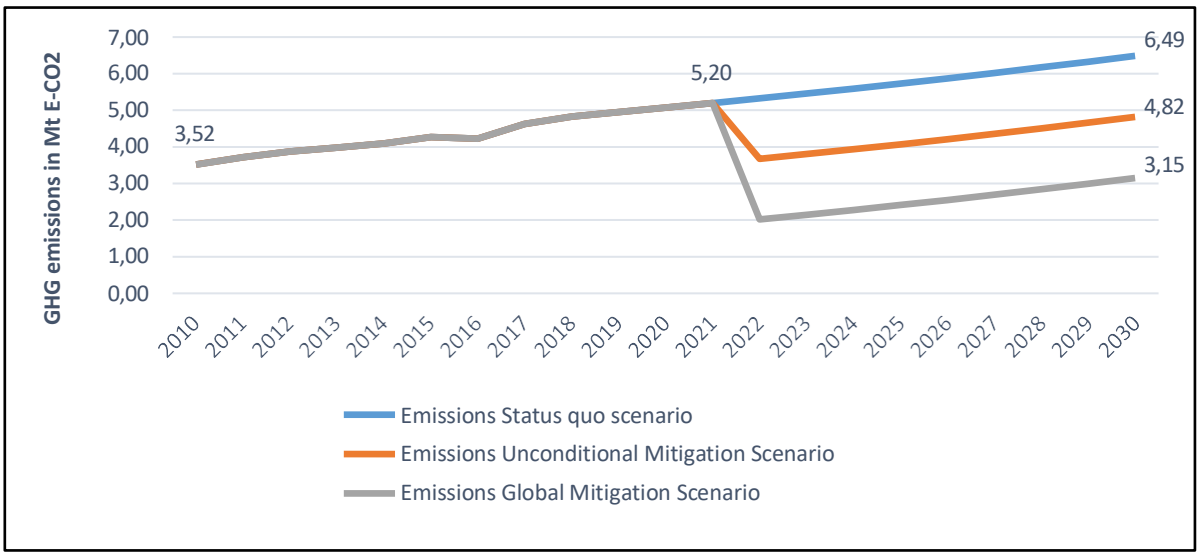

Figure 4: Trend in GHG emissions under the business-as-usual scenario and under intervention in the agriculture sector

Table 6: Measures envisaged and emissions avoided in the energy sector

Objectives under - Sectoral	Measures envisaged	Contribution Unconditional	Contribution Conditional
Expanding production of electrical energy from natural gas and renewable energy sources.	(1) Construction of a floating Liquefied Natural Gas (LRG) regasification terminal in the port of Cotonou (total power of the power plants at power: 500 MW).	60%	40%
	(2) Natural gas operation of installed thermal generation capacity.	36% of the total dual-fuel capacity in 2030 can be operated by natural gas and 64% by oil if the regasification terminal project is not carried out. 100% of the capacity if the regasification unit is Built.	
	(3) Development of renewable energies (construction of hydroelectric power plants; Dogo bis (128 MW and 337 GWh/year); Vossa (60.2 MW and 188.2 GWh/year), and Bétérou (18.8 MW and 57 GWh/year). Installation of solar PV farms with a total capacity of 112 MWp, structuring of a sector biomass fuel 15 MW):	Central hydro (electrical and others, 51.5% of investments) + Solar 87 MW (DEFISSOL, MCA II and others) + Structuring of the 4 MW biomass sector + promotion of biomass-electricity 30% investments.	Hydro power plants (total civil engineering for 48.5% of investments) + Solar 25 MW + Biomass 11 MW + biomass-electricity promotion (70%)
Extending access to Households ele	(4) Electrification of localities by connection to the grid (about 2323 localities between 2021 and 2030).	Electrification of 481 localities	Electrification of 1842 localities (planned for the period 2024-2030)

ctric lighting as a replacement Lighting ke rosene. (Grid connection component)	(5) Promotion of access to domestic lighting and electricity for about 1028000 new households and abandonment of kerosene lighting in the localities that will be	Acquisition of 342,000 household connection kits	Acquisition of **686,000 kits** for connecting households to conventional networks (planned for the period 2024-2030)
Objectives unde r- Sectoral	**Measures envisaged**	**Unconditional contribution**	**Conditional contribution**
	connected to the networks of the Beninese Electric Energy Company (SBEE)		
Pursue an d reinforce the actions fro m Consumption electrical energy efficiency in all sectors.	(6) (Promotion of the use of energy-efficient electric lamps (street lighting)	Rehabilitation of 18777 floor lamps (250W) and replacement so me LED luminaires (100W)	Installation of 30,350 new 100 W street lights **instead of 250 W** between 2021-2030
	(7) Promotion of low-consumption LED lamps in households (3,000,000 lamps in 1,000,000 households (project in preparation for the DGRE)	150,000 lamps	2,850,000 lamps
	(8) Promotion of solar PV street lighting (a total of 53,743 solar street lights , including 23,243 street lights already installed by the end of 2020 and 30,500 new ones street lamps to be installed for a total power **of 4837 KW)**	Installation of 23,393 street lights by the end of 2020 **(2105 KW).** Rehabilitation between 2021 and 2022 8455 floor lamps faulty.	**Installation of 30500 new solar street lights (2732 kW)**
	(9) Solar PV power plants on the roofs of administrative buildings (07 health centers and colleges, 2 sites housing municipal services, 55 administrative buildings)	07 health centres and colleges and 2 sites housing communal services	2 municipal sites 55 administrative buildings of the central administration
	(10) Promotion of the use of energy-efficient electric lamps in public services ~~3~~7,221 LED lamps in the administration	**37,221 LED lamps**	
Promote th e Low technologies consumers of Wood energy	(11) Promotion of the economic use of wood energy by providing access to improved stoves for 809,043 new households.	270.043 new Households	539.000 new Households
Promote Par tial substitution of wood energy consumption by the butane gas	(12) Promotion of access for 275,000 new households to cooking equipment using domestic gas: by subsidizing the cost of acquiring small equipment with a 6 kg tank + burner of up to 30 % or by setting up a mechanism to facilitate access to credit for small civil servants (guarantee fund, partnership framework with financial institutions)	100.000 new Households	175.000 new Households

	(13) Subsidy on the consumption of domestic gas up to at least 30% of the cost of recharging	100.000 new Households	175.000 new Households
Extending household access to electric lighting in Replacement of lighting at	(14) Promotion of the extension of access of households and public services to off-grid electric lighting by individual kits (13,249 households by 2024 and 100,000 new households between 2025-2030).	13,249 households in The horizon 2024 At less 20.000 Other households between 2025 - 2030	80.000 Households between 2025-2030
Objectives under- Sectoral	**Measures envisaged**	**Unconditional contribution**	**Conditional contribution**
kerosene (off-grid electrical system component)	(15) Promotion of Extension of Access some Infrastructure socio-community with off-grid electric lighting (46 health centres and 26 police stations equipped in 2019 for a total capacity of 200 KWc)	46 health centres and 26 police stations	
	16) Development of rural electrification by photovoltaic solar micro-power plants (239 localities + 22 localities)	202 localities including 22 localities of the municipalities' projects	37 rural communities
Continuing and strengthening consumer actions electrical energy efficiency in all sectors.	(17) Promotion of 300,000 efficient refrigerators in households through a subsidized procurement mechanism (DGRE project in preparation with the AfDB)		300,000 efficient refrigerators
Promoting energy efficiency in the transport sector	**(18)** Development of road infrastructure. Projects: North-East Cotonou bypass road; Fishing Route; Highway between Sèmè Kpodji and Porto Novo. Continuation of urban road development in Cotonou, Porto Novo and Parakou and Calavi.	100% (public authorities)	
	(19) Development and implementation of a strategy and action plan for the improvement of mobility in the medium and long term in the greater Cotonou region and Nearby localities	100% (government and private sector)	
	(20) Development of river-lagoon transport (establishment of a lagoon transport service between Calavi and Cotonou and then Cotonou and Porto-Novo	Investment for basic work (dredging from short water, construction of piers)	Private investment in navigation equipment, organization and Transportation Service Management

Reducing emissions in the energy sector	Expected avoided emissions: The implementation of these measures will contribute to reducing cumulative GHG emissions in the sector compared to the business-as-usual scenario of **18.71** Mt E-CO2 over the period 2021 to 2030 compared to the business-as-usual scenario, i.e. a reduction of **12.15%** by 2030, of which **8.4%** is unconditional contribution and **3.75%** conditional contribution. Figure 5 below shows the trajectory of emissions in the energy sector for each of the cases and the levels that could be reached in 2030. The expected contributions by groups of measures are as follows: Extension of access to electric lighting in the residential sector 7.83%; Efficient electricity consumption in the residential sector 13.72%; Sustainable management of wood energy 20.13%; Energy efficiency in the service sector 6.9%; Energy efficiency in the transport sector 11.37%; Electricity generation from natural gas and renewable energies 30.98% and reduction of losses in electricity transmission and distribution 9.06%.

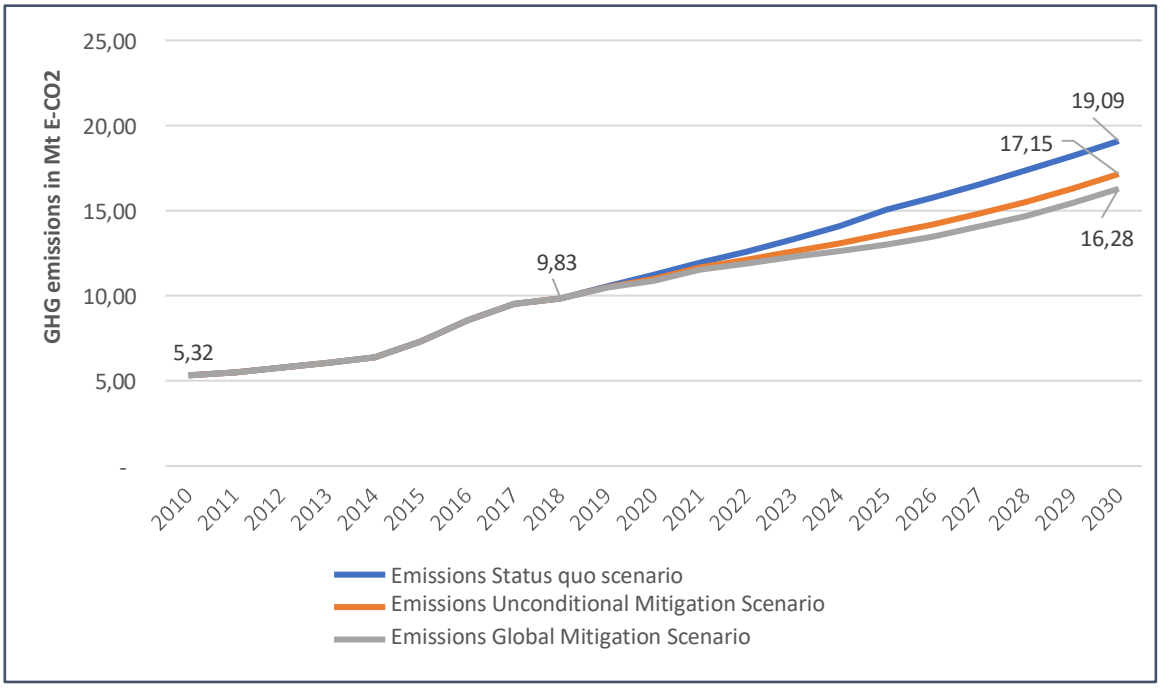

Figure 5: Trend in GHG emissions under the business-as-usual scenario and under intervention in the energy sector .

Table 7: Planned actions and avoided emissions in LULUCF

Sub-sectoral objectives	Measures envisaged	Unconditional contribution	Conditional contribution
Increase the carbon sequestration capacity of the country's forest ecosystems through the implementation of sustainable natural forest management and the strengthening of reforestation/planting efforts	(1) Protection and conservation of existing natural forests and plantations to reduce and maintain the deforestation rate at 35,000 ha/year instead of the current 60,000 ha/year.	Reduction of the deforestation rate by 5,000 ha/ year.	Additional Discount of the rate from deforestation from 20,000 ha/year.
	2) Implementation of a reforestation plan with the objective of creating 15,000 ha of forest plantations per year.	Creation of 5000 ha of forest plantations per year.	Creation of 10,000 ha of forest plantations per year.
Promoting the development of agroforestry as a measure to strengthen carbon absorption capacities	(3) Improvement of the performance of the oil palm sector with the installation of at least 50,000 new hectares	25,000 ha	25,000 ha (planned Come in 2025 and 2030)
	(4) Increase in cashew plantation area by 60,000 ha, including 35,000 ha during the period 2020-2026	35,000 ha	25000 ha (planned for the period 2026-2030)

	(5) Rehabilitation of 100,000 ha of former cashew plantation	100,000 ha	
Sub-sectoral objectives	**Measures envisaged**	**Unconditional contribution**	**Conditional contribution**
Reduction some Emissions/Reinforcement some sinks for LULUCF.	**Avoided emissions/expected removals compared to the business-as-usual scenario** The cumulative reductions in net GHG emissions in the forestry and other land use sector between 2021 and 2030 compared to the baseline scenario are estimated at **40.64 Mt** E-CO2, of which 37.7% is unconditional and **62.3%** is conditional. The cumulative avoided emissions over the period 2021 – 2030 are distributed as follows by measure: Reduction of deforestation by 25,000 ha/year and creation of 150,000 ha of forest plantations **24.53** Mt E-CO2, or **60.3%.** Development of agroforestry (110,000 ha of new oil palm and cashew plantations and rehabilitation of 100,000 ha of old cashew plantations) **16.11** Mt E-CO2, or **39.7%.** The implementation of these measures will also result in an increase in the net CO2 absorption capacity of forest resources by almost 3 times by 2030 compared to the baseline scenario (-3.23 Mt to -9.68 Mt).		

Table 8: Planned Actions and Avoided Emissions in the Waste Sector

Sub-sectoral objectives	**Measures envisaged**	**Unconditional contribution**	**Conditional contribution**
Promoting good environmental management of household waste	Installation of an energy recovery facility for the Ouèssè household waste landfill	100%	
Reducing emissions	The cumulative reduction in GHG emissions expected from this measure between 2021 and 2030 is estimated at 0.136 Mt E-CO2, or 1.2% compared to the scenario without measurement.		

III. AMBITION AND FAIRNESS

The target of reducing cumulative emissions over the period 2021 to 2030 by **20.15%** based on measures is equitable in view of Benin's low contribution to global emissions, its low level of development and its socio-economic fragility. The Republic of Benin is one of the least developed countries in the world whose GHG emissions are estimated at about **16.93** Mt E-CO2 in 2018, or about 1.5 tons of CO2 E-CO2 per capita. Its economic performance remains weak and unstable with a critical financial situation. The average real GDP growth rate (4.7% from 2015 to 2020) is lower than the 7% growth rate, the minimum necessary to fight poverty in the long term. The country depends on the outside world for its supply of commercial energy (petroleum products and electricity).

Benin's commitment is ambitious, given that its reduction targets cover key sectors for its economic development, including the energy and agriculture sectors, and whose emissions cover 91.6% of the country's overall emissions. Benin's aspiration for economic development and population growth would lead to a trend growth in its energy needs. As a result, GHG emissions from the agriculture and energy sectors are expected to increase continuously. One of the major challenges will be the promotion of low-carbon development at both sectoral and local levels.

IV. ADAPTATION

4.1. Benin's vulnerability to climate change

In terms of current vulnerability, the major climate risks impacting livelihoods in the agriculture, water resources, coastal and forestry sectors are drought, flooding, late and heavy rains, strong winds, excessive heat and sea level rise .

The manifestations of the above-mentioned climate risks have led to numerous impacts over the past three decades, namely the decline in agricultural yields, the disruption of agricultural calendars, the lowering of water levels in drinking water supply dams, the extension of the low water period, the submersion of banks, etc.

In terms of future vulnerability, the climate risks to natural and human systems that could be exposed are part of a scenario of persistence or accentuation of the risks currently observed and depend on the sector concerned. The potential impacts, according to climate projections for the 2025, 2050 and 2100 time horizons, range from coastal flooding and saline water intrusions into rivers and water tables to a drop in maize yields in certain agro-ecological zones (ZAE5 in particular) and a shift in flood periods in the Beninese portion of the Niger basin.

4.2. Climate change adaptation targets

On the basis of existing strategies, plans and programmes, the key sectoral targets for adaptation to climate change are defined for the time horizons 2020, 2025 and 2030 and recorded in Table 9.

Table 9: Sectoral targets for climate change adaptation

Sectors	Key adaptation objectives
All sectors	**Horizon 2030** • Master vulnerability assessment tools and decision-making tools for the integration of climate change adaptation into the planning and management instruments of national and regional institutions. • Strengthen the capacity to adapt to climate change in all socio-economic sectors (generation of jobs, income, etc.). • Mobilizing the necessary financial resources for financing adaptation to change Climate.
Agriculture	❖ **Horizon 2025** To improve the performance of Beninese agriculture, to make it capable of ensuring food and nutritional sovereignty in a sustainable manner, contributing to the economic and social development of men and women in Benin and the achievement of the Sustainable Development Goals (SDGs), in particular SDGs 1, 2, 12, and 13.
Water Resources	❖ **Horizon 2030** • Reduce the vulnerability of natural and human systems to water stress, flooding and water quality degradation; • Strengthen knowledge on the climate system and tools for generating climate and hydrological information and predicting climate hazards; • Promote water control and good governance.
Forestry	❖ **Horizon 2030** • Reducing the vulnerability of communities to the degradation of forest ecosystems. • Promote agroforestry. • Develop mangrove ecosystems (forest formations characteristic of the coast).
Sectors	**Key adaptation objectives**

Littoral	❖ **Horizon 2030** • Reduce the vulnerability of human settlements and coastal resources to sea-level rise; • Ensure the continued protection of marine and lagoon ecosystems.
Health	❖ **Horizon 2050** Contribute to the sustainable improvement of the health and well-being of all by reducing vulnerabilities, strengthening adaptive capacities and increasing resilience to climate change
Tourism	❖ **Horizon 2025** Contribute to the reduction of negative territorial and environmental impacts through proposals for more water- and energy-efficient consumption patterns, increase the added value created for communities and the various actors in the sector

V. STRATEGIES, PROGRAMMES, PROJECTS AND INSTITUTIONAL FRAMEWORK

IMPLEMENTATION

5.1. Implementation of sectoral activities

The implementation of sectoral activities under the NDC will build on existing and future strategies, programmes and projects (Tables 10, 11, 12 and 13). Therefore, the relevant sectoral structures are urged to take this into account in the design of future programmes and projects.

It should be noted that some of the mitigation projects listed in Table 10 have co-benefits with adaptation and vice-versa.

Table 10: Strategies, programmes and projects enabling the preparation and implementation of the NDC for mitigation in the agriculture sector

Strategies, programmes and projects	Actions enabling the preparation and implementation of the NDC
A/ CURRENT OR PLANNED PROGRAMMES AND PROJECTS	
SECTORAL POLICY (PDSA), PROGRAMME AND PROJECT IN THE GOVERNMENT'S PORTFOLIO TO 2025	
Rural Economic Growth Support Programme (PACER) /PADER)	Development of 405 hectares of lowlands for rice production and market gardening.
Agricultural Infrastructure Support Project in the Ouémé Valley (PAIA-VO)	Rehabilitation of hydro-agricultural facilities (i) 1,000 ha of irrigation schemes with total water control, (ii) 3,500 ha of lowlands, including about 2,800 ha of basic development in floodplains and 700 ha of rice-growing lowlands carried out by the company, (iii) 300 ha of market gardens for the wives.
Food Production Support Project in Alibori, Borgou and the Hills (PAPVIRE-ABC)	• Realization of hydro-agricultural developments: rehabilitation of 7 agro-pastoral dams (600,000 m3) and development of 1927 ha of irrigated perimeters. • Development of agricultural value chains and resilience (improvement of farm productivity and technological innovations, strengthening of , stakeholder capacities, development of agricultural value chains).
Programme for the Improvement of Agricultural Productivity of Small Farmers Operators (PAPAPE)	Increasing the productivity of smallholder agricultural production systems in rainfed and irrigated agriculture (extension of management technologies) , Soil Fertility Restoration, Soil Health and Fertility).
Rural Irrigated Perimeter Development Project (PDPIM)	Realization of hydro-agricultural developments: development of 1000 ha of lowlands and 300 ha of small irrigated perimeters, rehabilitation of 200 ha of land degraded agricultural sites, construction of four (04) water reservoirs.

Hydro-Agricultural Development Project for the Lower River Valley Mono (PAHV- MONO)	Completion of development work on a 500-hectare pilot area in the Mono Valley.
Strategies, programmes and projects	**Actions enabling the preparation and implementation of the NDC**
Project "Supporting the transition to climate-smart agriculture and food systems" (CSA)	• Sustainable intensification of productivity and increase of agricultural incomes; • Reduction and/or elimination of GHG emissions; • Creation of an enabling policy and financial environment providing farmers with knowledge and access to resources and services for the transition to sustainable, productive, resilient and economically sustainable production systems. Viable.
Soil Protection and Rehabilitation to Improve Food Security (ProSOL) Project	• Sustainable soil protection and rehabilitation approaches are being implemented on a large scale in Benin • That is to say 30,000 to 50,000 ha of soil are protected or rehabilitated
Project to Support Sustainable Development and Integrated Management of Hydro-Agricultural Perimeters (PAVPHA)	• Contribution to sustainable income improvements, food security and and the employment of young people and young people. wives.
Food Security through Lowland Development and Storage Capacity Building Project in Benin (PSAAB)	• Completion of hydro-agricultural developments of 2300 ha of rice-growing lowlands (2,000 ha) and gardens (300 ha)
National Programme for the Development of the Oil Palm Sector	Improvement of the performance of the oil palm sector with the installation of at least 25,000 new hectares, the improvement of at least 20% of the average yield in 2025
Strategic Plan for the Development of the Agricultural Sector	Improving the productivity and production of crop products in priority agricultural sectors
Strengthening resilience to climate change and improving the food and nutrition security of vulnerable populations	• Agricultural innovations for climate resilience and mitigation (promotion of climate-smart agriculture), extension and support for the implementation of production systems that limit GHG emissions); • Sustainable management of land and aquatic ecosystems.
Low-level development strategy Carbon intensity and climate resiliency	Strengthening the resilience of agricultural communities and value chains
Food Security and Sanitation Project Resilience Building (PROSAR) GIZ	• Improved food situation of people vulnerable to malnutrition, especially women of childbearing age and young children,
Project to strengthen the resilience of vulnerable populations and ecosystems in the Ouémé watershed to climate change through CSA and sustainable management of land and water resources.	• Extension of Agricultural Innovations for Climate Change Resilience and Mitigation (CSA Promotion) • Extension and support for the implementation of production systems limiting GHG emissions • Promoting sustainable management of land and aquatic ecosystems • Development of the Ouémé watersheds
Agricultural Diversification Support Project (PADA)	Contribution to the economic growth of agriculture in Benin through the improvement of the productivity of rural households and the increase in the national supply of quality agri-food products. Strengthen the productive capacities of the project beneficiaries within the rice value chain and promote a sustainable environment capable of supporting the development of the agricultural sector.
Agroecological Transition Support Project in the Cotton Growing Areas of Benin, phase 2	Contribution to poverty alleviation among vulnerable populations; improving food and nutrition security, and strengthening the resilience of family farms to the effects of climate change

Integrated Programme for Adaptation to Climate Change through the Development of Agriculture, River Transport and Tourism in the Niger Valley in Benin (UNDP)	Development of agricultural and pastoral systems (construction of five (05) multi-purpose dams with development of 500 ha of irrigated perimeter downstream, rehabilitation of seven (07) hydro-agricultural dams, development of 200 ha of lowlands with partial water control, development of 500 ha of flood recession perimeters, realization of four (04) flood water spreading weirs for the perimeters flood recession).
Strategies, programmes and projects	**Actions enabling the preparation and implementation of the NDC**
B/ PROGRAMMES TO BE DEVELOPED AND IMPLEMENTED	
Programme to strengthen actions in the departments of Benin in terms of soil fertility management, promotion of improved cultivation techniques and climate-resilient crops (see proposal made for the development of the programme in the annex to the report on the updating of the NDC).	
Programme for the promotion of hydro-agricultural facilities for the cultivation of rice with water control (see proposal made for the development of the programme in the annex to the report on the updating of the NDC).	
C/ PROJECTS INITIATED BY MUNICIPALITIES (PROJECT DOCUMENTS TO BE DRAWN UP FROM THE AVAILABLE SHEETS)	
Municipal Development Plans	
Municipality of Pobè	Development project of 1000 hectares for the production of rice and the cultivation of market garden products in the municipality of Pobè
Municipality of Pobè	Project to create a community dynamic offering greater resilience to the effects of climate change in the Municipality of Pobè
Municipality of Bantè	Project for the restoration of degraded soils in the municipality of Bantè
Municipality of Adja-Ouèrè	Project for the Development of Five Hundred (500) Hectares of Rice-Growing Lowlands in the Commune of Adja-Ouèrè

Table 11: Strategies, programmes and projects enabling the preparation and implementation of the NDC for mitigation in the energy sector

Policies, Strategies, Programs and Projects	Actions enabling the preparation and implementation of the NDC
A/ CURRENT OR PLANNED PROGRAMMES AND PROJECTS	
SECTORAL POLICY, PROGRAMMES AND PROJECTS IN THE STATE PORTFOLIO	
Increase the capacity of Natural gas-fired electricity generation	• Construction of new oil/gas thermal power plants • Construction of a new 143 MW gas-fired thermal power plant
Project "Developing renewable energies and energy efficiency"	• Construction of the Dogo-bis hydroelectric power plant (128 MW and an expected production of 337 GWh/year) • Construction of the Vossa hydroelectric power plant (60.2 MW and an expected output of 188.2 GWh/year) • Construction of the Bétérou hydroelectric power plant (18.8 MW) • Setting up photovoltaic solar farms: Detailed information is provided below • Benin Millennium Challenge Account (MCA II) **Programme for Electricity Production Project** (installation of 4 solar power plants to be connected to the SBEE grid for a total capacity of 50 MW). • DEFISSOL project (Construction and operation of a 25 MW power plant) • Project to build a 25 MWp solar power plant with AFD financing • Structuring of the biomass-fuel sector: use of agricultural waste (potential of 15 MW). The sites: • Development of photovoltaic street lighting • Promoting access to solar PV kits for households in remote areas • Implementation of the UNDP Green New Deal Programme to support Benin in the development of renewable energies and the strengthening of the resilience of the energy mix to climate change.
"Energy consumption control" project	• Implementation of binding standards for reducing energy consumption • Pilot projects for energy saving in administrative buildings ((i) installation of solar PV power plants with storage on the main administrative buildings, (ii) efficient air conditioning and (iii) LED lighting (at least 5 administrative sites) • Public lighting: replacement of energy-consuming bulbs with low-energy consumption lamps (LBC) of the LED type; • Public lighting by solar street light • Energy efficiency in households
Urban and rural electrification projects	• Kandi-Banikoara HVA Line Construction Project • Electricity Grid Extension and Densification Project (PEDER): 44,219 new households expected to be connected • Project for the Restructuring and Extension of the Distribution and Distribution System of the SBEE (PRESREDI): 10,000 new households are expected to be connected • Project for the restructuring and extension of the SBEE networks in the municipality of Abomey-Calavi and the Atlantic Department (PRERA): (i) Densification and extension of urban and peri-urban networks and (ii) electrification of 82 rural localities . • Sustainable and Secure Access to Electricity Project (PADSBEE 2019-2025): Reinforcement and extension of transmission networks and extension of distribution networks over 500 km in several localities (34) Urban and peri-urban • Energy Service Improvement Project (PASE): (i) 8000 LED lamps for public lighting; (ii) supply of equipment for the connection of 75,000 new households. • Special Programme for the Extension and Strengthening of Benin's Electricity Networks (Benin PROSPER2E): Electrification of 1122 localities: 369 urban and peri-urban localities and 753 rural localities. Connection of • PROVES Solar Energy Upgrading Project (8 localities remaining for the grid connection component)

Policies, Strategies, Programs and Projects	Actions enabling the preparation and implementation of the NDC
	• Regional Programme for the Development of Renewable Energy and Energy Efficiency PRODERE 2 under WAEMU funding • RERE FORSUN and PROMER projects • Action Programme for the Electrification of Rural Localities in Benin (PAELRB): (i) electrification of 200 rural localities by connection to the SBEE electricity grid (phases 2 and 3); (ii) connection to the grid of at least 60000 new households. • Renewable Energy and Energy Efficiency Development Project (REREE): (i) installation of solar equipment + AEV system as part of the pilot phase of the Energy and Water for Life program; (ii) installation of solar water heaters in health centres; (iii) carrying out energy audits in 20 public administrations; (iv) promotion of improved cookstoves; (v) installation of low-energy lamps in 400 public establishments in 20 municipalities in Benin. • Rural Electrification Project (PERU): (i) network extension in 76 peri-urban localities in 20 municipalities; (ii) electrification of 100 new localities in 11 of the country's 12 departments; (iii) the connection to the conventional network of at least 41,000 new rural households.
Benin's programme for the Millennium Challenge Account (MCA II)	• Electrical Distribution Project • Off-grid electricity access project.
B/ SECTORAL PROGRAMMES AND PROJECTS TO BE DEVELOPED AND IMPLEMENTED	
Rural Electrification Projects	Action programme for the strengthening of the electrification of rural localities under the NDC (electrification of at least 720 new localities by 2030 (see proposal made for the development of the programme in the annex to the work report of updating the NDC).
Projects to promote low-energy technologies	• Promotion of the economic use of wood energy by providing access to improved stoves for **809,043** new households. • Support for the organisation and development of internal markets for the manufacture and marketing of high-performance cooking equipment (improved cookstoves using wood energy; butane gas cooking equipment).
Programme to continue and strengthen actions to promote energy efficiency	• Establishment of standards, implementation of regulations, support for the organization and development of a market for energy-efficient electrical equipment (lamps, air conditioners, refrigerators, freezers) and other electrical equipment. • Introduction of the obligation to take energy efficiency into account in public orders for electrical equipment and in the construction of public buildings (definition of specific specifications, adoption of interministerial orders, etc.). • Generalization of actions to install automatic lighting and air conditioning cut-off devices in public administration buildings in the event of the absence of office users. • Development of information and awareness campaigns on the benefits of energy savings and the performance of energy equipment with the aim of encouraging behavioural change. • Development/extension of actions to promote public lighting by LEDs or solar street lights. • Implementation of support programmes to improve energy efficiency in the industrial and tertiary sector.
C/ PROJECTS INITIATED BY MUNICIPALITIES (PROJECT DOCUMENTS TO BE DRAWN UP FROM THE AVAILABLE SHEETS)	
Municipal Development Plans	
Municipality of Dassa-Zoumè	Projects to promote climate change mitigation measures at the household level and the promotion of renewable energies and efficient economic stoves and pressure cookers in the commune of Dassa-Zoumé

Policies, Strategies, Programs and Projects	Actions enabling the preparation and implementation of the NDC
	Project for the partial supply of the buildings of the Dassa-Zoumé Town Hall by the solar system (supply of part of the loads of the Town Hall premises by solar PV system on the roof)
Municipality of Pobè	Project for the electrification of 04 localities in the Commune of Pobè (GBANAGO, Onigbolo Village, Otèkotan and Igbo-Ocho) by connection to the existing HVA network offering greater resilience to the effects of climate change (promoting household access to electric lighting)
Municipality of Bantè	Project to electrify the offices of the City Hall with solar energy

Table 12: Strategies, programmes and projects enabling the preparation and implementation of the NDC for mitigation in the forestry sector

Policies, strategies, Programs and Projects	Actions enabling the preparation and implementation of the NDC
A/ CURRENT OR PLANNED PROGRAMMES AND PROJECTS	
(1) SECTORAL POLICY, PROGRAMME AND PROJECT IN THE STATE PORTFOLIO	
Programme for intensive reforestation of the national territory through incentive measures	• Implementation, maintenance and silvicultural monitoring: a total of 20,000 ha of plantations and/or enrichment in classified forests and reforestation perimeters expected • Implementation, maintenance and silvicultural monitoring: a total of 800 ha of private and communal plantations expected • Implementation, maintenance and silvicultural monitoring: a total of 700,000 linear metres of row planting in urban and peri-urban areas is expected • Creation of green spaces in cities: a total of 300 green spaces expected • Implementation of a system for monitoring and protecting forests against bush fires and transhumance
PAGEFCOM 2: Project Support for the Management of Communal Forests, phase 2	• Improvement of forest cover: a total of 600 ha of forest plantations, 20 ha of plantations in schools and 20 ha of cashew plantations are expected. • Promotion of non-timber forest products; • Development of the blue economy in forests; • Support for economic alternatives to forests;
Forests and Riparian Lands Management Program, additional phase	• Financing of alternative income-generating activities; • Protection and monitoring of old plantations; • Management of state-owned plantations.
Strengthening the resilience of the energy sector to the impacts of climate change in Benin (PANA) Energy)	Introduction of sustainable land and forest management practices to strengthen the resilience of wood energy production areas.
Promotion of sustainable biomass electricity production in Benin.	Adoption of best practices in land use, sustainable forest management (sustainable management of forests and land through the restoration of land and forest plantations on 3000 ha, and the establishment of 2000 ha of plantations to provide biomass, improvement of agricultural techniques on more than 9000 ha through the adoption of best land use practices).
Benin Classified Forests Project	Creation of 15,000 ha of wood energy plantations and 7000 ha of teak plantations
Realization of the National Timber Office	• *Reseeding of natural forests* • *Realization of new forest plantations: On average about 500 to 600 ha per year*
Other DGEFC activities contributing to the National Reforestation Campaign	• *Tree planting during the commemoration of the various Days celebrated* • *Other achievements of reforestation and forest plantations at the level of forest inspections*
(2) Low-carbon and climate-resilient development strategy (2016-2025): Strengthening carbon sinks and reducing emissions from deforestation and forest degradation.	
Strengthening carbon sinks and reducing	• Implementation of large-scale afforestation programmes • Implementation of the different components of the REDD+ programme

emissions from deforestation and deforestation forest degradation.	• Development and implementation of sustainable management plans for forest ecosystems
(3) National strategy for the management of wildland fires in Benin	
Improved management of controlled wildland fire management	• Implementation in forest policy (controlled wildland fire management option) • Development of guidelines and plans for the controlled management of appropriate wildland fires. • Regulation of the use of fires in natural areas to be conserved, agricultural areas , grazing areas, forest areas, etc. defined in the Master Plans for the Development of the Municipalities (SDAC) • Development of cross-border and international partnerships to assist in the management of large fires.
(4) Integrated strategies for the promotion of private plantations for the production of wood energy in Benin	
Benin's Space Agenda	
Ensuring sustainable management of forest resources	• Design and implementation of participatory development plans; • Restoration of degraded forest areas; • Establishment of a system for monitoring and protecting forest areas with modern tools; • Promoting the sustainable development of the timber and wood energy sectors • Sustaining conservation and protection initiatives • Design and implementation of a programme for the development of agricultural areas in connection with the preservation of natural areas
B/ SECTORAL PROGRAMMES AND PROJECTS TO BE DEVELOPED AND IMPLEMENTED	
Restoration of degraded forests and establishment of forest plantations	• Large-scale reforestation program with the objective of reaching 15,000 ha of forest plantations per year. • Continuation and intensification of actions to replace wood energy by promoting access to small gas cooking equipment for 275,000 new households butane.
Strengthening of actions in Protection and conservation	Programme for the Strengthening of Actions for the Protection and Conservation of Natural Forests and Plantations (2021-2030).
C/ PROJECTS INITIATED BY MUNICIPALITIES (PROJECT DOCUMENTS TO BE DRAWN UP FROM THE AVAILABLE SHEETS)	
Municipal Development Plans	
Municipality of Pobè	Community Dynamics Project with Greater Resilience to the Effects of Change
Municipality of Bantè	Project to Improve the Management of Forest Resources in the Commune of Bantè
	Project to reduce population pressure on classified forests
Municipality of Bonou	Protection and rehabilitation of ecological reserves (biodiversity) riparian to the Ouémé River
Municipality of Pobè	Project to create a community dynamic offering greater resilience to Effects of change
Communes of Ouèssè, Tchaourou, Savè	Creation of a green belt along the Okpara and Ouémé rivers in the communes of Ouèssè, Tchaourou, Savè on 3000 ha (pilot phase 1000 ha)
Municipality of Dassa-Zoumè	Project for the planting of fast-growing forest species for the production of wood energy

Table 13: Sectoral Strategies for Implementing Adaptation Goals

Sectors	Strategies for implementing adaptation goals
	A/ STRATEGIES AND PROGRAMMES AT SECTORAL LEVEL
All sectors	• National Strategy for the Implementation of the United Nations Framework Convention on Climate Change (SNMO) • National Climate Change Adaptation Plan (NAP) • National Development Plan (under development at the MPD) • Government Action Programme (PAG) • Strategy for Strengthening Human Resources, Learning and Skills Development to Address Climate Change
Agriculture	• Strategic Plan for the Development of the Agricultural Sector (2017-2025) • National Strategy for the Provision of Effective and Efficient Agrometeorological Services for the Benefit of Agricultural Sector Actors • Strategy for training farmers, herders and fishers on technologies adapted to climate change and the use of agro-meteorological information • Communication strategy for strengthening the adaptation capacities of actors to climate change for agricultural production and food security in Benin • National Agricultural Investment Plan and Food and Nutrition Security (2017-2021) • Strategic Plan for the Development of Climate-Smart Agriculture (2018-2022)
Water Resources	• National Action Plan for Integrated Water Resources Management (PANGIRE) • National Strategy for Rural Drinking Water Supply in Benin • National Strategy for Urban Drinking Water Supply in Benin • Master Plan for Water Management and Development in the Ouémé Basin
Forestry	• National Programme for Sustainable Management of Natural Resources • Capacity-building strategy on wildland fire management for better adaptation to climate change • Strategic Plan for the Development of Mangrove Ecosystems • Strategic Plan for the Development of Non-Timber Forest Products
Littoral	• LAW No. 201 8-10 of 2 July 2018 on the protection, development and development of the coastal zone in the Republic of Benin; • Report on the State of the Marine Environment in Benin • Create and make operational the Observatory for Coastal Surveillance and Control of Coastal Risks • Multisectoral plan for adaptation to coastal risks in the face of climate change in Benin
Energy	• Strategic Plan for the Development of the Energy Sector to 2025. • Master Plan for the Development of the Electrical Energy Sub-Sector in Benin (2016-2035). • National Policy for the Development of Renewable Energies in Benin - 2035.
Health	• Cholera containment plan 2017-2021 • National Health Policy (PNS 2018-2030) • National Health Development Plan 2018-2022 • National Community Health Policy - Horizon 2025
Tourism	*National Tourism Policy (PNT 2013-2025)*
Urban planning and infrastructure	Horizon 2025 • Cleaning up the living environment • Mastering urbanization • Reforesting cities or agglomerations • Ensuring the preservation of road assets and improving their management • Developing the national network of roads and tracks
	B/ PROJECTS INITIATED BY THE MUNICIPALITIES

Sectors	Strategies for implementing adaptation goals
(PROJECT DOCUMENTS TO BE DRAWN UP FROM THE AVAILABLE SHEETS)	
Municipal Development Plans	
POBE Agriculture	1000 hectares development project for rice production and cultivation of products market gardeners in the municipality of Pobè
BOUKOMBE Agriculture (	Sustainable Agriculture Support for Food and Nutrition Security Project through the promotion of economically promising local sectors.
KANDI Agriculture	Project to support the development of market gardening and strengthen the Resilience of Market Gardeners in the Municipalities of Alibori (PADCMCA)
KARIMAMA Agriculture	Project to Support the Development of Market Gardening Crops and Strengthen the resilience of market gardeners in the commune of Karimama (PADCMCK)
KLOUEKANME Agriculture	Project to improve the resilience of maize, cowpeas, tomatoes and pepper cropping systems in the Commune of Klouékanmè
KARIMAMA Agriculture	Project to Support the Development of Market Gardening Crops and Strengthen the resilience of market gardeners in the commune of Karimama (PADCMCK)
MALANVILLE Agriculture	Construction of three (03) water reservoirs and five (05) fish ponds in the municipality of Malanville
MALANVILLE Agriculture	Strengthening the adaptive capacities of flood victims in the municipality of Malanville
KARIMAMA Agriculture	Strengthening the adaptive capacities of flood victims in the municipality of Karimama
AGBANGNIZOUN Agriculture	Identify and promote food crops that are resilient to climate change and train producers on modern cultivation techniques adapted to the effects of climate change. Climate Change (CFP Project)
SAVE Agriculture	Development and Securing of Agropastoral and Fisheries Areas
OUAKE Agriculture	Strengthening the adaptive and resilience capacities of vegetable producers in the face of the irregularities of the rains in the commune
	Adaptation of Agricultural and Building Systems to Climate Change
OUAKE Agriculture	Strengthening the adaptive and resilience capacities of rice and livestock producers Fish in the face of erratic rainfall
ZAKPOTA Agriculture	Integrated Soil Fertility Management and Change Adaptation Technique Project Climate
ADJA-OUERE Agriculture	Construction of water reservoirs for the benefit of rice producers in Houéli gaba, Dagbla and Massè
GRAND-POPO Urban planning and Infrastructure construction	Project to strengthen the resilience of the municipality to the effects of climate change
OUAKE Urban infrastructure development and Construction	Climate Change Adaptation of Homes Project
PARAKOU Sanitation	Creation of a faecal sludge treatment and solid waste management site

5.2. Framework for Gender Inclusion in the Implementation of the Updated NDC

This Table 14 is integrated into the NDC with a view to providing an overview of the possibilities for taking a gender perspective into account in the implementation of the NDC. Thus, it defines the appropriate levels of gender mainstreaming by sector and field of action, accompanied by some recommendations.

Table 14: Indicators of gender mainstreaming in the implementation of the updated NDC

Sectors	Mitigation measures/ adaptation projects	Level indicated for gender mainstreaming	Gender Inclusion Indicator	Recommendations for the implementation of the updated NDC
Agriculture	Implementation of sustainable land management techniques (improved cultivation techniques, maintenance of rice soil fertility with water control) Sector adaptation projects involving farmers and rural communities	- Targeting potential beneficiaries for agricultural technology extension -Training of farmers - Provision of various supports for the application of sustainable land management techniques -Capacity building for smallholder farmers - Choice of beneficiaries at the level of the various adaptation projects listed - Technological development and agricultural advisory - Access to finance -Soil sustainability management	Rate of women farmers Consideration of agricultural Percentage of women farmers who have benefited from technical and financial support measures	• Ensure, as far as possible, the involvement of women farmers in the implementation of actions to promote sustainable land management techniques • Monitor and evaluate the rate of women's involvement
LULUCF	• Protection and conservation of natural forests and plantations through reforestation. • Development of agroforestry Forest sector adaptation projects involving the improvement of the living conditions of the populations living near the areas	- Beneficiary targeting for private plantations - Training of the project management team - Phase of identification of the beneficiaries of the said programme Training of the project management team - Beneficiary identification phase in the Adaptation projects of forest area stakeholders	-Number of projects and programmes for the Protection and Conservation of Natural Forests and Plantations carried out by women - Rate of women involved in natural forest protection and conservation projects Percentage of women and men targeted for reforestation and having benefited from technical and financial support measures	- Ensure women's support for the protection and conservation of natural forests through programmes and projects developed for this purpose - Regularly monitor the development and implementation of reforestation projects to ensure that the gender aspect is taken into account as far as possible

Sectors	Mitigation measures/ adaptation projects	Level indicated for gender mainstreaming	Gender Inclusion Indicator	Recommendations for the implementation of the updated NDC
	management rational some natural resources.			
ENERGY	• Promotion fro m Economical use of wood energy through access from 809,043 new households with improved stoves at price Subsidized • Promoting access to 275,000 new households with small cooking equipment using domestic gas (6 kg cylinder + burner) by subsidy of the acquisition cost up to 30% or the establishment of a mechanism facilitating access to credit for small civil servants (guarantee fund)	• Targeting households for actions to sell improved cookstoves at subsidized prices • Targeting of households for the distribution of Subsidized Domestic Gas Cooking Equipment	Percentage of women who have benefited from improved stoves at subsidized prices Rate of women who have benefited from subsidized domestic gas cooking equipment	Ensure the availability of equipment in all areas targeted for distribution Ensure that the distribution mechanism in place does not limit women's access to equipment. Ensuring that equipment is well adopted by women
Other sectors (Resources in Water s Coastline, tourism, health;	• Adaptation projects involving the promotion of integrated water resources management • Adaptation projects involving the protection and conservation of coastal areas • Adaptation projects involving so me populations with situations Vulnerable to climate change	Targeting beneficiaries of project activities	Rate of women taken into account in the implementation of projects Rate of women who have benefited from support measures technique an d financial for adapt the climatic constraints	- Gender mainstreaming in all adaptation projects and programmes that fall under the NDC implementation account - Strengthen adaptation project or programme teams to take gender into account in implementation and implementation.

5.3. Institutional framework for the implementation of the updated NDC

The implementation of Benin's updated Nationally Determined Contribution (NDC) is carried out under the aegis of the Ministry of Living Environment and Sustainable Development (MCVDD) acting as the National Focal Point of the United Nations Framework Convention on Climate Change. Key players involved include:

- relevant ministries and sectoral institutions;
- local authorities;
- private sector;
- civil society .

The implementing bodies of this instrument are as follows:

- **The Steering Committee**, the supreme decision-making and orientation body. It is made up of designated

representatives of the Ministries concerned.

- **The National Coordination Unit** of the NDC is the federating body for all actions. It includes the Director General in charge of Climate Change (DGEC), the National Coordinator, the Focal Point of the United Nations Framework Convention on Climate Change, the Focal Point for Climate Technology Transfer, a Executive Secretary; two technical assistants to the National Coordinator.

- **Sectoral coordination** of implementation is the responsibility of the ministries, institutions, agencies and other structures covered by the measures/actions identified in the updated NDC. They are made up of the officials in charge of programming and foresight at the level of the ministries, the officials in charge of the monitoring and evaluation of projects, the Climate Change Focal Point of the National Association of Municipalities of Benin, the person in charge of climate change issues at the level of the umbrella organization of civil societies and non-governmental organizations.

- **Municipal coordination,** the body responsible for supervising the NDC at the municipal/local level.

In addition, the implementation of projects and programmes identified in the various sectors covered by the NDC is the responsibility of the ministries, institutions or sectoral entities concerned.
The necessary guidelines and facilities will be given by the MCVDD to support, if necessary, the sectoral structures in the preparation of funding search files or any other initiatives through existing mechanisms. The MCVDD will also ensure responsibility for the MRV (Measurement, Reporting and Verification) system of NDC implementation, institutional capacity building in collaboration with relevant stakeholders. The organizational structure for the implementation of the updated NDC is shown in Figure 6 below.

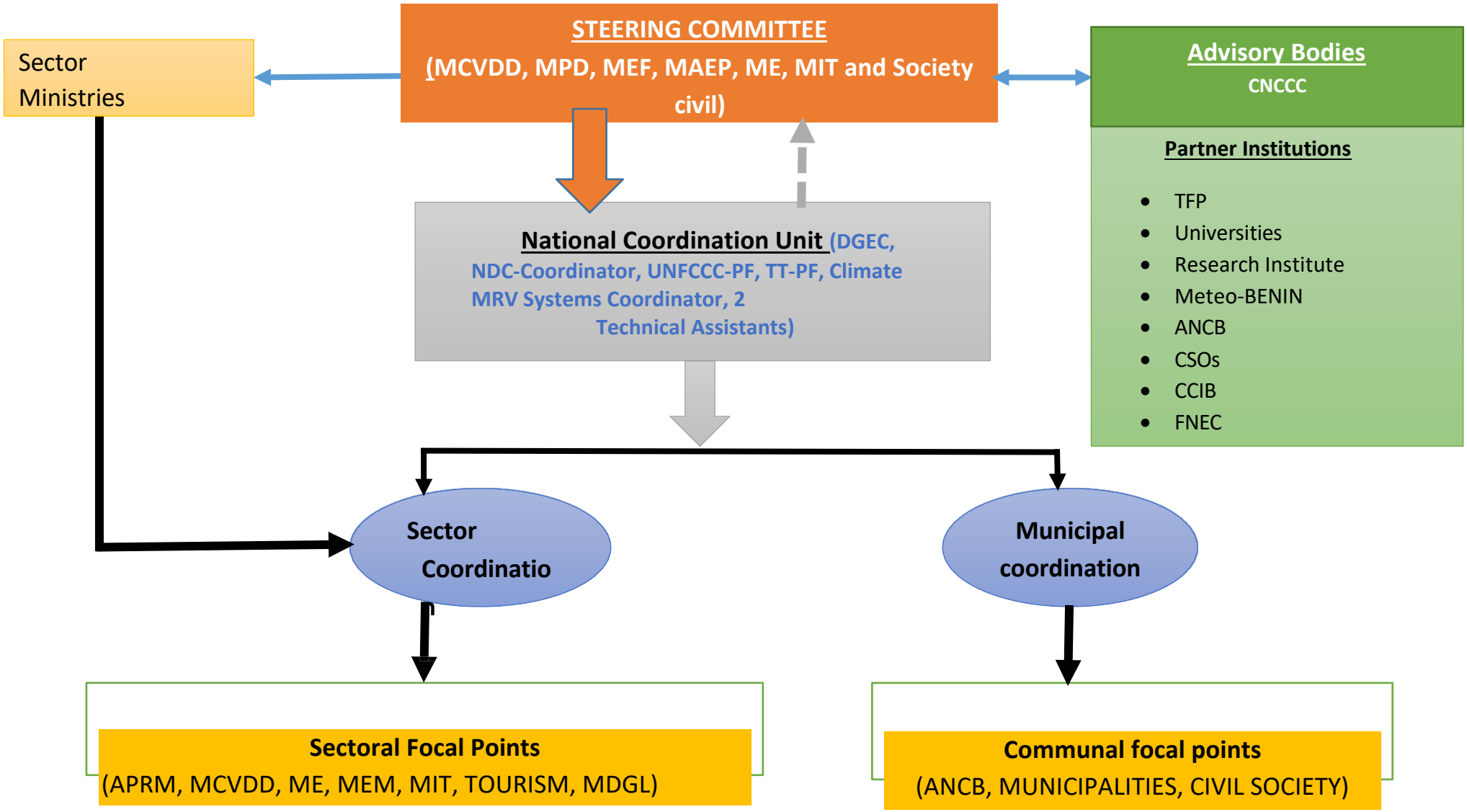

Figure 6: Framework of the *institutional arrangement for the implementation of the NDC*

VI. MEANS OF IMPLEMENTATION

The implementation plan under Benin's updated NDC is presented in Annex 3. The implementation of these activities requires financial, technological and capacity-building resources.

6.1. Technology Transfer Needs

The needs expressed in terms of technology transfer on behalf of the ADAPTATION and Mitigation Component stem mainly from the assessments conducted within the framework of the Third National Communication (MCVDD, 2019) on climate change (October 2019) and the report on priority technologies for adaptation, developed under the Technology Needs Assessment - Technology Action Plan Project (TNA-Adaptation, 2020 & TNA_Atténuation, 2020). They cover the agriculture and water resources sectors for the adaptation component on the one hand and the agriculture, forestry and energy sectors for the mitigation component (see tables 15 and 16)

Table 15: Technology Transfer Needs Adaptation Component

Sector	Priority technologies for adaptation by sector	Objectives	Benefits
Agriculture	Development and popularization of technical itineraries adapted to the new climatic constraints in the agro-ecological zone 5	• Reduce vulnerability or improve resilience to recurrent long dry spells in the area • Sustainably increasing agricultural yields to ensure food and nutrition security • Improving the performance of cropping systems to sustainably combat food insecurity	Fight against food insecurity and, by extension, poverty by creating conditions for improving farmers' incomes and living conditions.
	Mulching	• Reduce water loss through evaporation • Protecting the soil from wind and water erosion • Provide nutrients for crops	Protect the soil from wind and water erosion. • Improve the infiltration of rainwater and irrigation water by maintaining good soil structure. • Keep the soil moist by reducing evaporation. • Nourish and protect soil organisms. Plant mulch is an excellent source of carbon for soil organisms and provides favourable conditions for them to grow. • Block weed growth. • Prevent soil warming. • Provide nutrients for crops. • Increase matter content organic soil.
	Integrated management of agriculture and livestock farming in the agropastoral type	• Ensuring increased agricultural and animal productivity • Ensuring food self-sufficiency for the population • Increasing soil fertility • Improving crop productivity in the long term	Create a framework conducive to the management of bush fires, the conservation of biological diversity (soil microbial fauna), the reduction of the use of agricultural inputs; the increase in the purchasing power of farmers, the consolidation of the social fabric between breeders and farmers.
Sector	**Priority technologies for adaptation by sector**	**Objectives**	**Benefits**

Water Resources	Small watershed management to improve food and nutrition security for vulnerable populations	• Fighting against flooding in the agricultural perimeters of rivers and water bodies • Ensuring the availability of water at agricultural purposes Implementing actions for the sustainable use of water resources	• Conducive to the regeneration of soil fertility • Improvement or stabilization of annual water flows • Optimal management of hydrological risks (low flows, floods, etc.) • Improved management of Water • Diversification of agricultural production
	Integrated management of rice-growing lowlands	• Improving agricultural land productivity and water efficiency in rural communities • Sustainably increase rice production capacity • Promoting the sustainable intensification of rice production systems through the introduction of innovative practices in cropping systems • Contribute to the development of a sustainable system for the production and distribution of quality rice seeds of improved varieties Socially Growing Systems Acceptable and economically viable in the rice perimeters to contribute to the achievement of food security	Advantages linked to the promotion of this technology: hydro-agricultural development for water management; diversification of agricultural activities, rice and fish farming to increase yields and incomes; development of a dynamic process of consultation and participation of local actors organized and mobilized around water management ; development of concerted actions for innovation and innovation. land solutions; increased agricultural production; stormwater management; etc.
	Multi-purpose drilling	• Ensuring the continuous and sustainable availability of drinking water • Continuously ensure the quality of drinking water • Ensuring the supply of drinking water to peri-urban areas • Improving access to rural water services • Ensuring access to drinking water for the entire rural and semi-urban population To reduce the suffering of the population related to the lack of water, especially during the dry season,	The multi-purpose drilling technique has advantages such as: rational water management; reduction of waterborne diseases and reduction of morbidity, mainly infant; reduction of water chore; increase in per capita water availability; development of activities revenue-generating job creation; the improvement of the school enrolment rate, especially for young girls in rural areas.

It should be noted that the technology transfer needs for other sectors may be the subject of future assessments and will be included in future editions.

Table 16: Technology Transfer Needs Mitigation Component

Sector	Priority technologies for adaptation by sector	Objectives	Benefits
Agriculture	Integrated soil fertility management	• Implement fertility maintenance techniques for	Organic-based GIF techniques require less cash flow than the use of mineral fertilizers. They can therefore more easily concern poor households. GIF techniques

Sector	Priority technologies for adaptation by sector	Objectives	Benefits
		5,00,000 ha.au less	are agricultural practices/activities that must be carried out every year/season, etc. Agricultural yields can increase with the implementation of GIF techniques. The increase in yield can range from 50 to 100%. Similarly, this technology will reduce GHG emissions in the agricultural sector.
	Manure production technology and use.	Promoting the technology and use of manure by farmers	This technology will reduce the emission of N2O due to chemical fertilizer in agricultural soils. GHG emissions from pressure on forests for the search for new land will also be reduced.
Forestry	Reforestation from earths Forest	Increase the carbon sequestration capacity of the country's forest ecosystems through the creation of 15,000 ha of forest plantations per year over the period 2021 to 2030.	The soils of the reforested areas will be protected. The plant cover improves the microclimate and therefore the environment. Reduction of forest cover degradation. Enhanced carbon sequestration through rapid reforestation.
	Small equipment butane gas cooking	Promote access to small gas cooking equipment for at least 275,000 new households between 2021 and 2030	Control of the demand for wood energy. Preservation of the forest heritage and its capacity to absorb CO2.
Energy	Efficient refrigerators and air conditioners	Promote the acquisition of 300,000 refrigerators and services sector in households and establishments by 2030 300,000 efficient air conditioners	Contributes to the efficiency of electricity consumption , the control of electricity demand and thus the reduction of GHG emissions.
	Solar street lights PV street lights	Promoting solar energy in street lighting	Solar photovoltaic is a clean energy with no direct GHG emissions.
	Water buses for transport fluvio-lagoon a nd associated infrastructure (piers/landing stage) s) ;	To set up a river-lagoon transport service on the Calavi-Cotonou and Porto Novo – Cotonou routes with the aim of diverting at least 30 % of current road traffic in the same directions. Achieving this target will require the establishment of a fleet of 20 water buses with at least 217 seats each.	Reduction of specific diesel consumption per person per km by about 6 to 7 times compared to small diesel vehicles. As well as a reduction in fuel consumption at sectoral level compared to individual or small group transport . Consequently, a proportional reduction in specific CO2 emissions. Reduced fuel consumption
	Light diesel-electric trains for intercity transport and the rehabilitated Ouidah-Cotonou-Porto Novo rail network	Promote a rapid intercity transport service by light diesel-electric trains on the Ouidah-Pahou-Godomey-Cotonou and Porto Novo-Cotonou routes . Achieving this objective will require the establishment of a transport fleet of at least 4 trains, each consisting of a train of two locomotives and 8 passenger wagons.	A considerable reduction in fuel consumption in the transport sector compared to transport by small four-wheeled vehicle. Consequently a proportional reduction in specific CO2 emissions. Reduction of local air pollution in Cotonou

6.2. Capacity building

Capacity-building will consist of skills development and institutional capacity enhancement (Table 17).

Table 17: Capacity-building needs.

Priority Sectors/Areas	Capacity-building needs
Climate Observation and Monitoring System	Establishment of a reliable climate observation and monitoring system for the entire climate system, including the Earth, Ocean and Atmosphere components.
	Reinforcement of air pollution measurement stations.
	Establishment of capacities for monitoring and forecasting atmospheric fluctuations and changes, early warning systems and assessment of socio-economic and environmental impacts, etc.
Institutional framework	Strengthening of the current structures that operate in the field of protection of the atmosphere, land and oceans.
	Creation or strengthening of structures dealing with adaptation issues.
	Creation or strengthening of structures dealing with mitigation issues.
	Definition of national climate plans and strengthening the integration of climate change into development programmes/strategies
Agriculture	Integration of Climate Change Issues into Agricultural Development Policies, Plans and Programmes .
	Training of rural development actors (managers, technicians, producers, local authorities) on the issue of climate-agriculture relations.
	Support for the adoption of improved sustainable land management technologies
	Use of models in agro-climatology (capacity building in agro-climatic risk modelling, familiarisation with DSSAT, SARRAH software, etc.).
	Popularization of local knowledge in the field of risk management or agro-climatic crises.
	Monitoring and evaluation of agricultural and hydro-agricultural development projects.
	Training of supervisors and producers on the production system of the main food crops integrating integrated fertility and soil moisture conservation techniques
Energy	Promotion and improvement of access to renewable energy sources in order to safeguard forest resources and reduce the vulnerability of populations to the effects of Climate Change.
	Support for the organization and development of high-performance cooking equipment markets (improved stoves, gas cooking equipment).
	Training of public and private actors and users on renewable energy systems.
	Capacity building on energy saving initiatives and measures in different sectors (domestic, industry, services).
	Adoption of labels and standards for efficient lamps and household appliances.
	Implementation of energy performance standards for improved stoves (This action is carried out by the Energy Services Improvement Project (PASE) at the DGRE)
	Establishment of regulations and measures to promote a market for energy-efficient refrigerators using non-CFC hydrocarbons. (DGRE/MCA Benin 2)
	Carrying out a survey on the penetration rates of improved stoves, gas cooking equipment, refrigerators, air conditioners, energy-efficient lamps, and energy consumption in households (country as a whole)
	Carrying out a fuel consumption survey by vehicle category and by use
Water Resources	Strengthening the skills of the decentralised services of the Directorate-General for Water to predict risks and manage hydro-climatic crises.
	Capacity building in the integration of Climate Change issues into water resources management policies.
	Training of technical managers in the field of the vulnerability of water systems to Climate Change and on the methodology for studying the vulnerability of water resources to Climate Change.
	Development of integrated water resources management projects in conditions of Climate Change.

Priority Sectors/Areas	Capacity-building needs
	Hydro-climatic modelling (hydrological functioning of watersheds, hydrogeological functioning of aquifers, saline intrusion processes in wellfields in the coastal zone).
Forestry/ Biodiversity	Establishment of units in charge of Climate Change issues in their relationship with biodiversity.
	Taking into account the issue of Climate Change in the management of biological resources.
	Training of actors (decision-makers, technicians, farmers, local authorities) in the development of integrated projects for the conservation of biological resources in a modified climate situation and in ex situ and in situ conservation methodology.
	Popularization of local knowledge in the management of biological resources.
	Establishment of information and warning systems on the adverse effects of Climate Change on biodiversity
	Valuation of traditional knowledge on the relationship between climate and biodiversity.
	Drafting and dissemination in local languages of laws and regulations relating to biodiversity management.
	Valuation of traditional biodiversity knowledge for the enhancement of carbon sequestration sinks.
Human settlements	Integration of Climate Change issues into policy, strategic, programme and development plans.
	Training and information for stakeholders (decision-makers, health workers, populations, local authorities) on the adverse effects of Climate Change
	Protection of socio-economic systems against coastal environmental degradation and sea-level rise .
	Capacity building, at different levels, to interpret and communicate relevant climate information and advise local communities.
	Strengthening the institutional and technical capacities of the Administration, civil society organizations and communities to assess local risks and vulnerabilities, and formulate plans and climate-sensitive development policies.
	Promotion of practical adaptation solutions to climate variability and future risks of climate change .
	Promoting the strengthening and sharing of knowledge on climate change, through gender-sensitive awareness-raising, risk management and policy-making activities.
Health	Training of actors in the health pyramid on climate change and its impacts on health.
	Establishment of a system for monitoring and reporting on the impact of climate change on health.
Tourism	Strengthening technical expertise in climate change vulnerability and adaptation assessment in the tourism sector
	Establishment of an alert, monitoring and information unit on the impact of climate change in the tourism sector
Communication around the NDCs	Strengthening of the team for the management, monitoring and dissemination of NDC actions/activities Strengthening the capacity for monitoring and evaluation of **adaptation activities in the different sectors.** Media training on the issues, challenges and opportunities of NDCs. Establishment of a framework for periodic consultation to monitor the implementation of the NDC.

6.3. Financing

Domestic resources (public funds and private investment) will be supplemented by external financial support (bilateral or multilateral). The total estimated cost for the implementation of the plans, programmes and projects included under Benin's updated NDC amounts to US$**10515.88** million, of which US$**5661.89** million is an unconditional option and US$**4853.99** million is a conditional option (Annexes 1 and 2). Of this total, the cost of local community projects for the implementation of the updated NDC is estimated globally at **US$162.94** million, with an unconditional share of **US$**14.39 million.

$ **148.55** million in conditional payments (Schedule 3). This estimate is based on the country's current experiences in implementing climate change mitigation and adaptation projects.

In order to measure the progress made in the implementation of these activities, a Measurement, Reporting and Verification (MRV) system will be set up at the MCVDD in conjunction with the other ministries and municipalities involved in the NDC.

6.4 Conditions for successful implementation of the NDC

The successful implementation of the NDC will depend on the following conditions:

- The effective and timely mobilization of domestic resources and the assistance expected from the international community. Difficulties in mobilizing sufficient resources could hamper the implementation of projects.
- The capacity of the public structures concerned to effectively manage large-scale programmes. To prevent any difficulties that may arise from the lack of capacity of these structures, it will be necessary to make a good diagnosis of the staffing needs at the sectoral level for the timely implementation of projects, as part of the development of the institutional capacity-building programme provided for in the NDC.
- The effectiveness of the implementation of regulatory texts and the control of the national market for imported electrical equipment and household appliances and the success of operations to promote energy efficiency.
- The capacity of the agricultural sector to effectively promote improved cultivation techniques on the planned areas.
- The effectiveness of technology transfer as well as the completion of research and development work at the national level.
- Rigorous monitoring of an updated NDC implementation master plan at the level of the coordination team on the one hand and in all relevant sectoral ministries on the other.

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ANNEXES

Annex 1: Summary of Mitigation Actions under Intended Nationally Determined Contributions

Objectives of the proposed measure	Quantified target (by 2030)	Unconditional*	Cost in (US $ million)	Conditional *	Cost in (US$ million)	Total cost in (US$ million)	Institutions responsible for implementation
AGRICULTURE SECTOR							
Promote improved cultivation techniques in crop production.	Implementation of improved cultivation techniques on an area of 5,000,000 ha between 2021 and 2030.	50%	136,5	50%	136,5	273	APRM
Promote soil fertility management techniques in crop production.	Implementation of techniques to maintain soil fertility on an area of 5,000,000 ha between 2021 and 2030.	50%	463,89	50%	463,89	927,78	APRM
Promote hydro-agricultural developments .	Development and irrigation of rice growing areas with water control of 52,000 ha compared to the level reached in 2020	50%	141,82	50%	141,82	283,64	APRM
		50,0%	**742,21**	**50,0%**	**742,21**	**1484,42**	
ENERGY SECTOR							
Expand the production of electrical energy from gas and renewable energy sources.	Construction of a floating Liquefied Natural Gas (Liquefied Natural Gas) regasification terminal in the port of Cotonou (total power of the power plants to be supplied: 500 MW).	Private investment 60%	138	40%	92	230	

Objectives of the proposed measure	Quantified target (by 2030)	Unconditional*	Cost in (US $ million)	Conditional *	Cost in (US$ million)	Total cost in (US$ million)	Institutions responsible for implementation
	Natural gas operation of the installed thermal production capacity .	36% of the total dual-fuel capacity in 2030 can be operated by natural gas and 64% by oil if the regasification terminal project is not carried out. The 100% capacity if the unit of regasification is built.					ME/SBEE
	Develop renewable energies (construction of hydroelectric power plants: Dogo bis (128 MW and 337 GWh/year); Vossa (60.2 MW and 188.2 GWh/year), and Bétérou (18.8 MW and 57 GWh/year). Installation of solar PV farms with a total capacity of 112 MWp (DEFISSOL 25 MW, MCA II 50 MW, 25 MW additional and others), structuring of a 15 MW biomass fuel sector, promotion of sustainable biomass-electricity production)	Central Hydro (electrical and others, 51.5% of investments) + Solar 87 MW (DEFISSOL, MCA II and others) + Structuring of the 4 MW biomass sector + promotion of biomass-electricity 30% investments.	942,00	Hydro power plants (Civil engineering) 48.5% of the investments) + Solar 25 MW + Biomass 11 MW + promotion biomass-Electricity (70%)	846,73	1788,73	ME/SBEE
	Implementation of the UNDP Green New Deal Programme to support Benin in the development of renewable energies and the strengthening of the resilience of Benin's energy mix to climate change			100%	160	160	ME(SBEE)
	Climate and energy issues are integrated into the CDPs (Implementation of the CEMAATERR 2 project) Climate and Energy: Adaptation and Mitigation Measures in Rural Areas)			100%	0,26	0,26	Common

Extending household access to lighting electric to replace kerosene lighting. (Grid connection component)	Electrification of localities by connection to the grid (about 2323 localities between 2021 and 2030)	Electrification of 481 new localities through various projects underway or starting (PRERA, PROVES, PAELRB, PERU). (i.e. 22.63%)	228,14	Electrification of 1842 localities (programs envisaged PROSPER2E and PIERL). (77.36%)	143,39	371,53	ME (SBEE and ABERME)

Objectives of the proposed measure	Quantified target (by 2030)	Unconditional*	Cost in (US $ million)	Conditional *	Cost in (US$ million)	Total cost in (US$ million)	Institutions responsible for implementation
	Restructuring, reinforcement and extension of MV and LV networks and construction of connections in urban and peri-urban areas	Strengthening and Extending networks through various projects in course or starting (PRESDERI, PADSBEE-BADEA/FSD, FORSUN, PADSBEE-VINCI, PEDER, PROMER, RERE, KANDI-BANIKOARA line)	734,93			734,93	ME (SBEE)
	Promotion of access to domestic lighting and electricity for about 1028000 new households and abandonment of kerosene lighting in localities that will be connected to the networks of the Beninese Electric Energy Company (SBEE)	Acquisition of 342,000 household connection kits, i.e. 33% of households	52,85	Acquisition of 686,000 kits for household connections to conventional networks (planned for the period 2024-2030), i.e. 67%	106,02	158,87	ME (SBEE)
Continue and strengthen actions for the efficient consumption of electrical energy in all sectors.	Promotion of the use of energy-efficient electric lamps (street lighting)	Rehabilitation of 18777 conventional street lights (250W) and replacement of the luminaires with LEDs (100W) (i.e. 38.2%)	8,42	Installation of 10,935 new conventional street lamps with LEDs **100 W instead of 250 W** between 2021-2030 (i.e. 61,8%)	5,90	14,32	ME (ABERME)
	Promotion of low-consumption LED lamps in households (3,000,000 lamps in 1,000,000 households (project in preparation for the DGRE)	150,000 lamps (i.e. 5%)	0,75	2,850,000 lamps (95%)	14,22	14,96	ME (DGRE and SBEE)
	Promotion of solar PV street lighting (in total 53,593 solar street lights, including 23,243 street lights already installed by the end of 2020 and 30,500 new street lights to be installed for a total power **of 4837 KW**	Installation of 23,393 street lights by the end of 2020. Rehabilitation between 2021 and 2022 of 8455 streetlights faulty. (i.e. 21.7%)	12,79	30,350 new street lamps Solar. (i.e. 78.3%)	75,42	88,20	ME (ABERME)
	Solar PV power plants on the roofs of administrative buildings (07 health centers and colleges, 2 sites housing municipal services, 55 administrative buildings)	07 health centres and colleges, 2 sites housing communal services	0,24	2 municipal sites 55 administrative buildings of the central administration	1,87	2,11	ME (ABERME)

Objectives of the proposed measure	Quantified target (by 2030)	Unconditional*	Cost in (US $ million)	Conditional *	Cost in (US$ million)	Total cost in (US$ million)	Institutions responsible for implementation
	Promoting the use of energy-efficient electric lamps in public services 37,221 LED lamps in the administration	37,221 lamps (100%)	0,17			0,17	ME (ABERME)
Promoting low-energy technologies energy	Promotion of the economic use of wood energy by providing access to **improved stoves for** 809,043 new households.	**270,043 new households. (i.e . 33.3%)**	0,88	539,000 new households. (i.e . 66.7%)	1,76	2,65	MCVDD (DGEFC) and (DOE (DGRE)
Promoting the partial substitution of wood energy consumption by butane gas	Promotion of access for **275,000 new households** cooking equipment using domestic gas : by subsidizing the cost of acquiring small equipment (6 Kg cylinder + burner up to **33%)**	100,000 new households. (i.e . 36.4%)	1,82	175,000 new households. (i.e . 63.7%)	3,18	5	MCVDD (DGEFC) and (DOE (DGRE)
	Subsidy for domestic gas consumption of 150 CFA francs/kg in the first year and 15% reduction each year to a minimum of 57 CFA francs/kg.	100,000 new households. (i.e . 36.4%)	17,64	175,000 new households. (i.e . 63.6%)	30,86	48,50	MCVDD (DGEFC) and (DOE (DGRE)
Extending household access to lighting as a replacement for kerosene lighting (off-grid electrical system component)	Promotion of the extension of household access and public services to off-grid electric lighting **by individual kits** (**13,249 households by 2024 and 100,000 new households between 2025-2030**).	13,249 households by 2024. And at least 20,000 other households between 2025 and 2030. (i.e. 29.4%)	1,93	80,000 households between 2025-2030. (i.e. 70.6%)	11,64	13,56	ME (ABERME)
	Promotion of the extension of access of socio-community infrastructure to off-grid electric lighting (46 health centres and 26 police stations equipped in 2019 for a total power of 200 KWp)	46 health centres and 26 police stations. (i.e. 100%)	2,36			2,36	ME (ABERME)
	Development of rural electrification by photovoltaic solar micro-power plants (239 localities + 22 localities)	202 localities including the 22 localities of the municipalities' projects. (i.e. 84.5%)	88,79	37 rural localities. (Let it be 16%)	14,67	103,45	ME (ABERME)

Objectives of the proposed measure	Quantified target (by 2030)	Unconditional*	Cost in (US $ million)	Conditional *	Cost in (US$ million)	Total cost in (US$ million)	Institutions responsible for implementation
	Promotion of 300,000 efficient refrigerators and 300,000 air conditioners in households through a subsidized purchase mechanism.			300,000 refrigerators and 300 000 efficient air conditioners (100%)	69,09	69,09	MOE (DGRE)
Promoting energy efficiency in the transport sector	Development of road infrastructure. Projects: · North-East Cotonou bypass road (40km) · Fishing Route Phase II. Highway between Sèmè Kpodji and Porto Novo. Continuation of urban road development in Cotonou, Abomey-Calavi, Porto Novo and Parakou.	100% (public authorities , private partners)	1483,64			1483,64	MIT (DTT)
	Development of river-lagoon transport (establishment of a lagoon transport service between Calavi and Cotonou and then Cotonou and Porto-Novo	Private investment in navigation equipment, the organization and management of the transport service. (i.e. 16%)	17,7	Investment for basic works (dredging of watercourses, construction of piers). (i.e. 84%)	93,03	110,73	MIT DTFL)
	Development and implementation of a strategy and plan for intra- and inter-urban travel in Cotonou, Porto-Novo and Parakou in order to impact the consumption of petroleum products in the transport sector	Strategy and action plan development (100%)	0,93			0,93	MIT and ME (DGRE)
	Improved fuelwood carbonization yield	Support Project for Improving Carbonization for Sustainable Forest Management	0,09				MCVDD (DGEFC)
		Continuation of awareness-raising and training actions on the adoption of improved carbonization technology (2023-2030) with the objective of 50% of coal production by 2030. (50% unconditional)	6,55	50%	6,55	13,09	MCVDD (DGEFC) and DOE (DGRE)
		69,1%	**3740,60**	**30,9%**	**1676,57**	**5417,17**	
FORESTRY SECTOR							

Objectives of the proposed measure	Quantified target (by 2030)	Unconditional*	Cost in (US $ million)	Conditional *	Cost in (US$ million)	Total cost in (US$ million)	Institutions responsible for implementation
Reduce the rate of deforestation to a maximum of 35,000 ha/year instead of the current 60,000 ha/year	Strengthening of actions for the protection and conservation and sustainable management of classified forest resources (establishment of monitoring systems , strengthening of the intervention capacities of the Technical Units for Forest Management, organization and monitoring of conservation series, refilling, improvement and promotion of the rural timber market system, sustainable management of transumance, etc.)	Implementation of the actions planned for the Benin Classified Forests Project (50%)	75,00	Implementation of other similar projects for the protection of classified forests (50%)	75,00	150,00	MCVDD (DGEFC)
	Strengthening of actions for the protection and conservation and sustainable management of the forests of the protected area on at least 2,500,000 ha	Develop and implement projects to support the sustainable management of the natural resources of the protected area (40%)	88,03	Additional projects to support the sustainable management of the natural resources of the protected area (60%)	132,04	220,07	MCVDD (DGEFC) and The municipalities
	Reinforcement of monitoring cations for forest plantations (120,000 ha)	Implement measures to ensure the monitoring of 60,000 ha of former forest plantations (50%) over the period 2023 to 2030	31,74	Implement measures to ensure the monitoring of an additional 60,000 ha of former forest plantations (50%) over the period 2023 to 2030	31,74	63,47	MCVDD (DGEFC) and Common
Increase the carbon sequestration capacity of the country's forest ecosystems through the strengthening of reforestation/planting efforts	Implementation of a reforestation plan with the objective of creating 15,000 ha of forest plantations per year (i.e. 150000 ha by 2030).	To continue the actions in progress (the PRI projects, PAGEFCOM 2, the reforestation by ONAB and the other actions of the National Reforestation Campaigns : On average 5000 ha of forest plantations per year; i.e. 50000 ha by 2030. (33.3%)	274	Creation of 10,000 ha of additional forest plantations per year, i.e. 100,000 ha by 2030. (66,7%)	548	822	MCVDD (DGEFC) and Common

Objectives of the proposed measure	Quantified target (by 2030)	Unconditional*	Cost in (US $ million)	Conditional *	Cost in (US$ million)	Total cost in (US$ million)	Institutions responsible for implementation
Promote alternative activities to logging for the benefit of rural communities (10 to 20% of the costs of new forest reforestation projects)		30%	49,32	70%%	115,08	164,40	MCVDD (DGEFC)
Promote th e development ag roforestry as a strengthening measure absorption capacities carbon	(3) Improve the performance of the oil palm sector with the installation of at least 50,000 new hectares	25,000 ha (50%)	19,09	25,000 ha (planned between 2025 and 2030) (i.e. 50%)	19,09	38,18	APRM
	(4) Increase the cashew tree planting area by 60,000 ha, including 35,000 ha during the period 2020-2026	35,000 ha (58%)	1,75	25000 ha (planned for the period 2026-2030). (Let it be 42%)	1,75	3,49	APRM
	(5) Rehabilitation of 100,000 ha of former cashew plantations.	100,000 ha (100%)	18,45			18,45	APRM
		37,66%	**557,37**	**62,34%**	**922,69**	**1480,06**	
WASTE SECTOR							
Promoting good environmental management of household waste	Installation of an energy recovery facility for the Ouèssè household waste landfill	100%	0,96	0%	0	0,96	MCVDD
	Providing Benin's municipalities with controlled landfills	50%	10,00	50%	10	20	MCVDD and the Communes
		52,3%	**10,96**	**47,7%**	**10**	**20,96**	
INSTITUTIONAL, REGULATORY AND OTHER ACCOMPANYING CAPACITY BUILDING							

Organize the NDC Implementation Kick-Off Workshop		100%	0,04	0%	0	0,04	MCVDD

Objectives of the proposed measure	Quantified target (by 2030)	Unconditional*	Cost in (US $ million)	Conditional *	Cost in (US$ million)	Total cost in (US$ million)	Institutions responsible for implementation
Establish the institutional framework for coordinating the implementation of the NDC							MCVDD
Establish an interdepartmental task force to coordinate activities (MCVDD, APRM, MDGL, MIT, MIC, ME, MIC)		100%	0,096			0,096	MCVDD
Support the sectoral ministries involved in the preparation of the programmes provided for in the NDC implementation plan and the files for mobilizing project funding within the framework of the support mechanisms for LDCs.		20%	0,08	80%	0,32	0,4	MCVDD
Develop and implement an Institutional and Regulatory Capacity Building Program for the Climate Change Management sub-sector;		100%	9	0%	0	9	MCVDD
Promote scientific, technical and technological research on climate change adaptation and mitigation ;		20%	8	80%	32	40	MCVDD

Objectives of the proposed measure	Quantified target (by 2030)	Unconditional*	Cost in (US $ million)	Conditional *	Cost in (US$ million)	Total cost in (US$ million)	Institutions responsible for implementation
Ensuring technical assistance and capacity building for financial services : Participation in (i) exchanges of experience at the level of the West African sub-region ; (ii) the meeting of the Coalition of Finance Ministers for Climate Action and (iii) Training on Environmental Tax Policy.		100%	0,15	0%%		0,15	MCVDD
Promote the transfer of technology and know-how in climate change adaptation and mitigation.		0%	0	100%	100	100	MCVDD
Develop a communication plan to inform all categories of stakeholders about the NDC and its benefits for climate action and the development		100%	0,032	0%	0	0,032	MCVDD
Develop a gender-sensitive sectoral implementation plan for the NDC for the living environment and sustainable development sector (environment, urban planning, housing, forestry)		0%		100%	0,134	0,134	MCVDD

To determine Benin's specific emission factors and other emission parameters in the transport sector		0%		100%	3,500	3,500	MCVDD

Objectives of the proposed measure	Quantified target (by 2030)	Unconditional*	Cost in (US $ million)	Conditional *	Cost in (US$ million)	Total cost in (US$ million)	Institutions responsible for implementation
To determine the emission factors and other emission parameters specific to Benin in the waste sector		0%		100%	0,350	0,350	MCVDD
Conducting a survey on the penetration rate of improved cookstoves, gas cooking equipment, refrigerators, air conditioners in and energy consumption.		100%	0,35	0%	0,000	0,350	ME in collaboration with the MCVDD
Carrying out tests to verify the performance of improved cookstoves distributed by different actors in Benin		100%	0,05	0%	0,0	0,050	ME in collaboration with the MCVDD
Carrying out a survey at national level to supplement the available information on the vehicle fleet with data on average annual distances travelled and specific fuel consumption by vehicle category and by use		100%	0,10	0%	0,0	0,100	ME in collaboration with the MCVDD
		11,6	17,90	88,39	136,30	154,20	
TOTAL		**59,2%**	**5069,03**	**40,8%**	**3487,77**	**8556,81**	

Annex 2: Summary of adaptation measures under Benin's Nationally Determined Contributions

No.	Adaptation measures, implementation status and sources	Objectives	Options and Costs					Implementing institutions
			Unconditional		Conditional		Total cost	
			Proportion (%)	Cost (US$ million)	Proportion (%)	Cost (US$ million)	(US$ million)	
Agriculture Sector								
1	Infrastructure Support Project in the Ouémé Valley (PAIA-VO) (2013-2020). *Pilot phase under implementation (*Government Portfolio*)*	To contribute to the food security of the population in plant products and to increase Benin's export volume and earnings. Its specific objective is to develop the production and marketing infrastructure of the low and medium Ouémé Valley for the promotion of growth sectors	8	0,002	92	0,02	0,03	APRM
2	Food Security through Lowland Development and Storage Capacity Building in Benin (PSAAB) Project	Contributing to the food self-sufficiency of the rural poor in Benin, mainly small farmers in the area of intervention	13	2,5	87	16,74	19,24	APRM
3	Food Security through Agricultural Intensification Project in Benin (PSAIA)	To improve the food self-sufficiency and security of the rural poor in Benin, mainly small farmers.	25	1,10	75	3,31	4,41	APRM
4	Support Project for the Development of Agriculture in the Hills (PADAC)	Strengthen the agricultural capacities of the communes and agricultural cooperatives of the Collines department and improve the living conditions of small producers	0	0,00	100	0,52	0,52	APRM
5	Soil Protection and Rehabilitation to Improve Food Security Project (PROSOL)	Sustainable soil protection and rehabilitation approaches are being implemented on a large scale in Benin.	0	0,00	100	38,63	38,63	APRM
6	Agricultural Investment Fund (Fi-Agri) Phase 4	Increase and diversify agricultural production by increasing the use of the developed hydro-agricultural potential of the Atacora and Donga departments to contribute to the implementation of the strategic reference frameworks "Strategic Plan for the Development of the Agricultural Sector 2017-2021 (PSDSA) and National Plan for Agricultural Investment and Food and Nutrition Security (PNIASAN)" in accordance with the protocol of the 2019 Intergovernmental Negotiations	0	0,00	100	11,93	11,93	APRM
7	Green Innovation Centres for the Agri-Food Sector Project (ProCIVA)	Smallholder incomes, job creation and food supply in the target rural areas are improved through innovations in the agri-food sector.	0	0,00	100	11,35	11,35	APRM

No.	Adaptation measures, implementation status and sources	Objectives	Options and Costs					Implementing institutions
			Unconditional		Conditional		Total cost	
			Proportion (%)	Cost (US$ million)	Proportion (%)	Cost (US$ million)	(US$ million)	
8	ProSAR	The food situation of people vulnerable to malnutrition, especially women of childbearing age and young children, has improved	0	0,00	100	10,64	10,64	APRM
9	ProAgri3 and 4	Anchoring the promotion of CVAs in 02 Agricultural Development Poles	0	0,00	100	6,85	6,85	APRM
10	MARKET GARDENING DEVELOPMENT SUPPORT PROJECT (PADMAR)	Sustainably increase the incomes of vegetable farms, while improving their resilience to climate change.	9	4,45	91	44,97	49,42	APRM
11	Food Production Support and Resilience Building Project in the Departments of Alibori, Borgou and PAPVIRE-ABC Hills	Contribute to the improvement of food and nutrition security and poverty reduction.	29	5,32	71	13,01	18,33	APRM
12	Agricultural Development and Market Access Support Project (PADAAM)	Sustainably improve the food and nutrition security and incomes of small-scale producers, especially women and youth.	1	0,52	99	51,31	51,82	APRM
13	Sector Development Support Project Cashew and Agricultural Entrepreneurship (PADEFA-ENA)	Contribute to poverty reduction and the improvement of food and nutrition security in Benin.	9	0,39	91	3,90	4,29	APRM
14	Support Project for the Competitiveness of Agricultural Sectors and Export Diversification (PACOFIDE)	Improving access for producers and SMEs in the agri-food industry to export markets in selected food and beverage chains and thus increase the country's exports of high-value agricultural products beneficiary.	10	17,13	80	137,08	171,35	APRM
15	Rural Irrigated Perimeters Development Project (PDPIM)	Improve food security and reduce rural poverty by developing small-scale irrigated schemes to increase the production and productivity of cereals, vegetables and other food crops.	34	10,20	66	19,80	30,01	APRM
16	Agricultural Diversification Support Project (PADA-FA)	Restore and improve field productivity and post-harvest value addition of targeted value chains (rice, fish, pineapple and cashew nuts) and promote new areas of intervention such as small-scale livestock (poultry, goats and sheep)	10	6,48	90	58,32	64,80	APRM

No.	Adaptation measures, implementation status and sources	Objectives	Options and Costs					Implementing institutions
			Unconditional		Conditional		Total cost	
			Proportion (%)	Cost (US$ million)	Proportion (%)	Cost (US$ million)	(US$ million)	
17	Programme for the Improvement of Agricultural Productivity of Small Farms (PAPAPE)	Increase the productivity of rainfed and irrigated agriculture production systems through, among other things, the promotion of Integrated Soil Fertility Management (IPFS) on farms	8	0,70	92	8,05	8,75	APRM
18	Agroecological Transition Support Project in the Cotton Growing Areas of Benin, phase 2	Sustainable improvement of income from family farms in the cotton-growing areas of Benin.	0	0	100	11,92	11,92	APRM
19	Support Project for the Development of Protein Sectors (PADEFIP)	Contribute to the improvement of producers' incomes and the increase in the availability of affordable proteins in rural areas.	0	0	100	6,86	6,86	APRM
20	Project for the Promotion of Sustainable Aquaculture and the Competitiveness of Fisheries Value Chains		3	0,90	97	29,14	30,04	APRM
21	Agricultural Services Development Project		10	2,01	90	18,13	20,14	APRM
22	Regional Agricultural Market Integration Project		10	6,20	90	55,78	61,98	APRM
23	Support Fund for the Development of Municipalities (FADeC-Agriculture)		100	3,64	0	0	3,64	APRM
24	Project to Support Sustainable Development and Integrated Management of Hydro-Agricultural Perimeters (PAVPHA)	Large-scale promotion of efficient, resilient irrigated agricultural production systems integrated into priority agricultural value chains.	100	10,56	0	0	10,56	APRM
25	Benin Agribusiness Development Project (PDAB)	The overall objective is to promote job creation through the creation of viable agricultural enterprises for young people and women.	100	5,87	0	0	5,87	APRM
26	Rural Economic Growth Support Project (PACER)	SO1: Strengthen the structuring and capacities of agricultural and non-agricultural professional organizations and improve the technical and economic performance of agricultural or non-agricultural MSEs and IGAs ; SO2: Facilitate access to finance for agricultural or non-agricultural MSEs and IGAs ; SO3: Improve access to production and marketing support infrastructure.	56	20,63	44	16,21	36,84	APRM

No.	Adaptation measures, implementation status and sources	Objectives	Options and Costs					Implementing institutions
			Unconditional		Conditional		Total cost	
			Proportion (%)	Cost (US$ million)	Proportion (%)	Cost (US$ million)	(US$ million)	
27	Project for the sedentarization of ruminant herds in Benin (ProSeR)	To contribute to the improvement of animal production and the rational management of farms".	14	8,8956	86	54,64	63,54	APRM
28	Project to support the development of the dairy and Meat and the Promotion of Livestock Enterprises (PRODEFILAV-PEL)	Contributing to the food and nutrition security of and reduce the volume and costs of milk and meat imports.	10	3,51	90	31,57	35,07	APRM
29	PROVAC	Intensify fish production in the target regions through the farmer-to-farmer extension approach and the improvement of fish farming techniques.	70	10,74	30	4,60	15,34	APRM
Water Resources								
30	Integrated Programme for Development and Adaptation to Climate Change in the Niger Basin (PIDACC/BN) - Benin component	Contribute to improving the resilience of Niger River ecosystems and populations through sustainable management of natural resources	8	1,47	92	16,86	18,32	MEM
31	Socio-Economic Infrastructure Development and Food Security Project (PDISSA) (Development of 750 ha of irrigated perimeters in the Niger Basin) Under development	Contributing to sustained growth in the Niger Basin through the fight against poverty, strengthening food security and promoting sustainable development	5	0,41	95	7,75	8,16	MEM
32	Development of multifunctional water infrastructure and sustainable management of water resources (PAG Project 2017-2021)	Promote integrated water resources management at the river basin level and build multifunctional water infrastructure	25	8,23	75	24,68	32,91	MEM
33	OMIKAG Programme-IWRM Component	Ensuring the sustainable and equitable supply of drinking water to rural populations in rural communities	10	0,66	90	5,97	6,64	MEM
34	Programme for universal access to drinking water in rural areas known as the AQUAVI Programme	Increase access to water services and strengthen service delivery modalities in selected areas. Rural areas	10	21,48	90	193,34	214,82	MEM
35	Benin's Water Development and Management Master Plan: Component 1: Project for the construction of 11 small and medium-sized dams in the Ouémé basin	Initiate a process of progressive resource mobilization in water from the Ouémé basin in order to put them at the service of economic and social development of the country.	20	0,04	80	0,17	0,21	MEM
Forestry								

No.	Adaptation measures, implementation status and sources	Objectives	Options and Costs					Implementing institutions
			Unconditional		Conditional		Total cost	
			Proportion (%)	Cost (US$ million)	Proportion (%)	Cost (US$ million)	(US$ million)	
36	PAGEFCOM 2: Communal Forest Management Support Project , Phase 2 (Government Portfolio)	Contribution to the improvement of food and nutrition security and the reduction of poverty of the population, through the development and rational management of natural resources	50	6,27	50	6,27	12,55	MCVDD
37	Integrated Border Management Program (Government Portfolio)	"Strengthen national sovereignty in border areas in order to secure the national territory and create better living conditions for the populations of these areas".	20	2,50	80	9,99	12,48	MCVDD
38	Ecosystem-Based Adaptation Project (Project to Improve Climate Resilience of Rural Communities in Central and Northern Benin)	Ensuring that communities adapt to agricultural livelihoods	30	2,73	70	6,36	9,09	MCVDD
		Littoral sector						
39	Programme for the protection of the coastline against coastal erosion (Cotonou-Siafato, Hilacondji-Bouche du roy, Grand-Popo-Ouidah): Project for the protection of the coastal zone in the face of sea level rise/erosion Coastal	Protecting the Beninese coast from the advancing sea	60	232,04	40	154,69	386,73	MCVDD
40	Sustainable Cities Program	Achieving sustainability and resilience of key centres Benin's urban areas by raising the levels of infrastructure, facilities and services, as well as by protecting and improving local environments	70	54,97	30	23,56	78,52	MCVDD
41	Programme for the Adaptation of Cities to Climate Change in Benin (Government Portfolio)	Increase the capacity of Beninese cities to adapt to climate change , and strengthen the capacities of the various municipal and central actors in charge of sustainable urban development identified at the level of municipalities and ministries	50	35,45	50	35,45	70,89	MCVDD
42	Cotonou Rainwater Sanitation Program (PAPC)	To reduce the vulnerability of the population to floods, to promote the construction of socio-economic infrastructure and to launch the economic and social development of Benin.	30	1,29	70	3,02	4,31	MCVDD
		Healthcare						
43	Reproductive Health Activities Support Programme (PAASR)	Improving the quality and accessibility of maternal and child health services	30	12	70	28	40	MS

No.	Adaptation measures, implementation status and sources	Objectives	Options and Costs					Implementing institutions
			Unconditional		Conditional		Total cost	
			Proportion (%)	Cost (US$ million)	Proportion (%)	Cost (US$ million)	(US$ million)	
44	National Programme for the Construction, Equipment and Functionality of Health Facilities	Reinforcement of infrastructure and equipment in accordance with norms and standards integrating the environmental and climate change dimensions; - the strengthening of the upkeep and maintenance mechanism of health infrastructure and equipment integrating environmental dimensions and climate change	100	535,5	00	00	535,5	MS
45	National Programme for the Rehabilitation and Construction of Hospital Centres (PNRCCH)	Contribute to the improvement of the quality and accessibility of health care and services	100	39,319	00	00	39,319	MS
		Tourism sector						
46	Making Pendjari/W the reference park in West Africa	Enrich and preserve the natural ecosystem through the introduction of new species: Black Rhinoceros, Derby Eland - Promote ecotourism and luxury tourism; - Developing hunting tourism	30	5,11	70	11,93	17,05	MTCA
47	Reinventing the lakeside city of Ganvié	Improving the living conditions of the people of Ganvié - To make Ganvié a showcase for lake tourism, an authentic, atypical and original destination	70	2,39	30	1,02	3,41	MTCA
48	Construction of the Museum of the Epic of the Amazons and the Kings of Danhomé and the rehabilitation of the surrounding palatial site	To promote popular and family tourism around the history of the Amazons and the kings of Abomey and the kingdom of Danhomè To present the history of the kingdom of Danhomè in a lively way To inform and educate the public about the different values of the time Motivate and support scientific research.	70	2,97	30	1,27	4,24	MTCA
49	Construction of a "Toussaint Louverture" Museum , slavery, resistance and memory in Allada (Resized project)	Build a museum dedicated to the memory of slavery, the origins of slaves and resistance; - To help understand the history of slavery in Benin and the region.	70	0,81	30	0,35	1,15	MTCA
50	Construction of the Vodun/Orisha Museum in Porto Novo and rehabilitation of the Adandé and Honmé museums	To offer the world a museum that gives the visitor the intellectual and visual means to better understand Vodun/orisha.	70	1,83	30	0,78	2,61	MTCA

No.	Adaptation measures, implementation status and sources	Objectives	Options and Costs					Implementing institutions
			Unconditional		Conditional		Total cost	
			Proportion (%)	Cost (US$ million)	Proportion (%)	Cost (US$ million)	(US$ million)	
51	Development of the "Vodun/Orisha Convent Route"	To highlight the cultural heritage related to the practice of Vodun / orisha; - To propose elements for reading this heritage; - To make this precious heritage accessible to the general public; - Strengthen intercultural dialogue; - Develop the potential of cultural tourism (generate local, sustainable quality jobs); To rehabilitate Vodun among nationals.	70	0,03	30	0,01	0,04	MTCA
52	Construction of the new palace of the king of Nikki and the arena of the Gaani	To build a new royal palace of Baru Tem in Nikki for the current Emperor and his successors of all dynasties ; - Promoting the cultural values of the Baatonu people - To reveal to the whole world the originality of the traditional and cultural festival "Gaani"	70	0,12	30	0,05	0,18	MTCA
53	Identical reconstruction of the Historic City of Ouidah including PCTT	To make Ouidah the leading destination for memorial tourism in Africa; - Strengthen the tourism potential of Ouidah; - Diversify tourism products in Ouidah.	70	15,72	30	6,74	22,45	MTCA
54	Construction of a Marina near the Gate of No Return in Djègbadji-Ouidah	Create a tourist complex and an immersive show trail " The Boat of the Departure" in Djègbadji; - Create landscaped spaces for meditation.	70	29,84	30	12,79	42,63	MTCA
55	Development of a seaside resort in AVLEKETE	Make the seaside segment a driver of tourism development; - To allow Beninese and foreign tourists to have accessible beaches for bathing; - To develop the district of Avlékété to develop the seaside tourism offer .	70	0,56	30	0,24	0,80	MTCA
56	Development of tourist sites and their access roads	Diversify tourism products throughout the national territory ; - increase the capacity of reception infrastructures at eco-tourism sites ;	50	29,08	50	29,08	58,15	MTCA

No.	Adaptation measures, implementation status and sources	Objectives	Options and Costs					Implementing institutions
			Unconditional		Conditional		Total cost	
			Proportion (%)	Cost (US$ million)	Proportion (%)	Cost (US$ million)	(US$ million)	
		- build piers and landing stages to access lagoon sites						
57	Preservation and enhancement of cultural heritage and natural heritage of a cultural nature	Have a national list of cultural heritage and natural heritage of a cultural nature; - Restore/rehabilitate the cultural heritage of Benin in danger of disappearing; - Promote cultural values of identity (Establishment of the repertoire of living human treasures, Transmission of their knowledge and know-how to the younger generation, etc.)	100	0,73	0	0,00	0,73	MTCA
Total			31,90	578,47	67,15	1217,66	1796,13	

Annex 3: Synthesis of Mitigation and Adaptation Actions under Planned Locally Determined Contributions

No.	Common	Sector	Measures or Mitigation Options /adaptation of the implementation of the updated NDC at the municipal level	Objectives	Options and Costs				
					Unconditional		Conditional		Total cost (US$ million)
					Proportion (%)	Cost (US$ million)	Proportion (%)	Cost (US$ million)	
1	PARAKOU (mitigation)	Forestry	Implementation of the 2nd communal forest and fodder plot	Establish carbon sinks . Strengthening potential in forage biomass	10	0,002	90	0,02	0,02
2	BANIKOARA (mitigation)	Forestry	Implementation of the 2nd Communal Forest and fodder plot	Establish carbon sinks . Strengthening the potential for forage biomass	10	0,01	90	0,09	0, 1
3	PERERE (mitigation)	Forestry	Establishment of community forests and formation of management committees	Halt deforestation, restore degraded forests and significantly increase afforestation and reforestation at the communal level	10	0,03	90	0,27	0,3
4	Savalou-Bantè-Bassila-Djidja (attenuation)	Forestry	Participatory Management Plan for the Forests of the State and Municipalities Protected Area on 100,000 ha	Development and co-management of the estate's natural forests protected by the State	10	0,018	90	0,162	0,18
5	BANTE (Mitigation)	Agriculture	Projects for the restoration of degraded soils in the municipality of Bantè	Overall, the objective is to contribute to the fight against agricultural land degradation practices	10	0,042	90	0,38	0,42
6	TANGUIETA (Mitigation/Adaptation)	Sanitation	Project to strengthen the mechanism for the management and recovery of household solid waste in the city of Tanguiéta (PRMGVDSM)	To recover Household Solid Waste (MSW) for the sanitation of the living environment, the improvement of the environment and the strengthening of the Resilience to climate change	10	0,036	90	0,33	0,36
7	ADJA-OUERE (mitigation)	Agriculture	Development of five hundred (500) hectares of rice-growing lowlands in the commune of Adja-Ouèrè	Improving rice productivity in the commune of Adja-Ouèrè	10	0,018	90	0,16	0,18
8	DANGBO (Mitigation)	Agriculture	Train growers on soil fertility management methods and promote short-cycle cropping	Increase yields, agricultural production and reduce flood-induced effects	10	0,063	90	0,56	0,63

No.	Common	Sector	Measures or Mitigation Options /adaptation of the implementation of the updated NDC at the municipal level	Objectives	Options and Costs				
					Unconditional		Conditional		Total cost (US$ million)
					Proportion (%)	Cost (US$ million)	Proportion (%)	Cost (US$ million)	
9	POBE (mitigation)	Agroforestry (oil palm)	Project to create a community dynamic offering greater resilience to the effects of climate change in the Municipality of Pobè	Planting 1000 hectares of land with oil palm	10	0,086	90	0,77	0,86
10	HOUEYOGBE (Mitigation)	Agriculture	Restore soil fertility for agricultural purposes and ensure food self-sufficiency in the commune of Houéyogbé.	Project to rehabilitate and restore 20 ha of quarries degraded by gravel mining in the municipality of Houblonnage	10	0,007	90	0,06	0,07
11	NATITINGOU (Mitigation)	Sanitation	Healthy and efficient management of urban waste in the city of Natitingou	Contribute to the sanitation of the living environment of the populations of the city of: Natitingou	10	0,124	90	1,11	1,24
12	AGBANGNIZOUN (Mitigation)	Energy (solar street lighting and electrification services)	Promoting solar energy for street lighting and communal services in rural areas with the support of the diaspora and partners (CDP Project)	Gradual orientation towards renewable energies	10	0,005	90	0,05	0,05
13	DASSA-ZOUME (Mitigation)	Energy (energy efficiency)	Promotion of renewable energies and efficient economic stoves and pressure cookers in the municipality of Dassa-Zoumé	Promoting climate change mitigation measures at the household level	10	0,025	90	0,22	0,25
14	BANTE (mitigation)	Energy	Electrifying the City Hall's offices with solar energy	The aim is to contribute to the improvement of the use of solar energy	10	0,012	90	0,11	0,12
15	DASSA-ZOUME (Mitigation)	Energy	Promote the partial power supply of the buildings of the town hall of Dassa-Zoumé by the solar system	Reducing the City Hall's electricity bill by using renewable energy	10	0,339	90	3,05	3,39

17	POBE (Mitigation)	Energy	Promote electrification of the localities of GBANAGO, Onigbolo Village, Otèkotan and Igbo-Ocho by connection to the existing High Voltage (HV) type A network offering greater resilience to the effects of climate change in the Commune of Pobè	Extend household access to electric lighting instead of kerosene lighting.	10	0,17	90	1,61	1,78

No.	Common	Sector	Measures or Mitigation Options /adaptation of the implementation of the updated NDC at the municipal level	Objectives	Options and Costs				
					Unconditional		Conditional		Total cost (US$ million)
					Proportion (%)	Cost (US$ million)	Proportion (%)	Cost (US$ million)	
18	ZAKPOTA (Mitigation)	Energy	Electrification of 12 rural localities in the commune of Zakpota by connection to the SBEE network	Extend access to electric lighting in 12 rural communities instead of kerosene lighting	10	0,33	90	2,94	3, 27
19		Energy	*Electrification of 22 villages by micro-solar PV power plant*	*Promoting access to clean energy in villages*	10	0,8	90	7,2	8
20	ADJA-OUERE (Mitigation)	Energy (micro-power plants)	Installation of mini-solar power plants in the villages of Houédamè-Djidagba-Logou-Missèbo-Itchagba-Gbadodo and Itchangni in the commune of Adja-Ouèrè (15 villages)	Providing solar energy to households, administrative and socio-community services	10	0,182	90	1,64	1,82
21	OUAKE Attenuation	Energy	Development downstream of the market gardening perimeter of the Komdè dam powered by a solar pumping system	The general objective is to develop a market gardening perimeter downstream of the Komdè dam for sustainable exploitation for the benefit of the market gardening cooperatives of the riverside villages (Akoussitè, Wèkètè and Komdè).	10	0,005	90	0,05	0,05
22	PARAKOU (mitigation)	Forestry (reforestation/ planting)	Intensive reforestation of forests and arteries	Restoring the forest cover of the municipality of Parakou	10	0,001	90	0,09	0,1
23	MALANVILLE (Mitigation)	Forestry (forest plantations)	Development of 03 public spaces in green space in the city of Malanville	Promote public spaces identified with the inhabitants and make sense for them in their daily lives and promote the improvement of local governance for the management of Green spaces in the city 's large roundabouts	10	0,011	90	0,1	0,11

24	MALANVILLE (Mitigation)	Forestry	Creation of 05 Community Forests in the Municipality of Malanville	Contribute to the restoration of forest resources through the installation of community forests in the municipality of Malanville	10	0,007	90	0,06	0,07

No.	Common	Sector	Measures or Mitigation Options /adaptation of the implementation of the updated NDC at the municipal level	Objectives	Options and Costs				
					Unconditional		Conditional		Total cost (US$ million)
					Proportion (%)	Cost (US$ million)	Proportion (%)	Cost (US$ million)	
25	PERERE (mitigation)	Forestry	Establishment of community forests and formation of sustainable land management committees	Halt deforestation, restore degraded forests and significantly increase afforestation and reforestation at the communal level	10	0,031	90	0,28	0,31
26	AGBANGNIZOUN (mitigation)	Forestry	Reforestation of a 100-hectare estate in the district of Tanvè	To constitute a forest resource (heritage) in the commune of Agbangnizoun	10	0,04	90	0,36	0,4
27	BANTE (Mitigation)	Forestry	Improvement of forest resource management in the municipality of Bantè	Promoting forest resource management	10	0,003	90	0,03	0,03
28	BANTE (mitigation)	Forestry	Reduction of population pressure on classified forests	The objective is to contribute to the preservation of the environment	10	0,004	90	0,03	0,04
29	BONOU (mitigation)	Forestry (restoration of areas along the Ouémé River)	Protection and rehabilitation of ecological reserves (biodiversity) riparian to the Ouémé River	The project aims to rehabilitate the ecosystem and biodiversity of the areas bordering the Ouémé River in the Commune of Bonou	10	0,104	90	0,93	1,04
30	DANGBO (mitigation)	Forestry (reforestation of the banks of the Ouémé River , public squares and agroforestry)	Develop along the perimeter of the banks of the Ouémé River, along the main roads and public squares	Reforesting different varieties of species in order to make the municipality green and attractive to tourists	10	0,067	90	0,61	0,67
40	DASSA-ZOUME (mitigation)	Forestry	Reforestation of plantations of fast-growing forest species for the production of wood energy	Reducing the consequences of climate change related to the untimely cutting of trees for the production of wood energy	10	0,02	90	0,17	0,19
41	ADJA-OUERE (Mitigation)	Forestry (plantations of 20 ha of species with	Support for the reduction of the effects of climate change through the planting of twenty (20) hectares of seedlings	Improving the greening of the municipality of Adja-Ouèrè	10	0,005	90	0,05	0,05

No.	Common	Sector	Measures or Mitigation Options /adaptation of the implementation of the updated NDC at the municipal level	Objectives	Options and Costs				
					Unconditional		Conditional		Total cost (US$ million)
					Proportion (%)	Cost (US$ million)	Proportion (%)	Cost (US$ million)	
		Rapid growth)	of a fast-growing species in the commune of Adja-Ouèrè						
42	NATITINGOU (Mitigation)	Forestry	Creation of a green belt along the mountainsides of the Commune of Natitingou	Fighting against the advanced destruction of vegetation cover on mountainsides	10	0,062	90	0,56	0,62
43	ALLADA (Mitigation)	Forestry	Reforestation in the commune of Allada (24 ha)	Planting and maintaining 143,000 seedlings in order to fill the reforestation of fruit species without forgetting the edges of roads to fight against desertification	10	0,008	90	0,07	0,08
44	OUAKE (Mitigation)	Forestry	Intensive reforestation of the municipal territory	Reforest all the degraded areas of the municipality	10	0,01	90	0,09	0,1
45	TOVIKLIN (Mitigation)	Forestry	Promote the reforestation of 05 hectares of plantations in the commune in 7 schools and 7 CEGs in the seven districts of the municipality of TOVIKLIN	- Create wells and reservoirs - Protecting natural resources. - Strengthen early warning and disaster management systems Natural	10	0,004	90	0,04	0,04
				-Strengthen the foundations of agricultural activities					
46	DASSA-ZOUME (mitigation)	Forestry	Improving natural resource management to reduce climate change risks	Managing natural resources in the best possible way	10	0,01	90	0,09	0,1
47	Ouèssè Tchaourou Savè	Forestry	Creation of a green belt along the Okpara and Ouémé rivers in the communes of Ouèssè, Tchaourou, Savè on 3000 ha (pilot phase 1000 ha)	- Restore degraded forest cover. - Increasing carbon sequestration capacity	10	1,25	90	11,23	12,48
48	POBE (Adaptation)	Agriculture	Development project of 1000 hectares for the production of rice and the cultivation of market garden products in the commune of Pobè	Develop 1000 ha for the production of rice and market garden products for the benefit of producers to strengthen their resilience to climatic hazards	10	0,443	90	3,98	4,43

No.	Common	Sector	Measures or Mitigation Options /adaptation of the implementation of the updated NDC at the municipal level	Objectives	Options and Costs				
					Unconditional		Conditional		Total cost (US$ million)
					Proportion (%)	Cost (US$ million)	Proportion (%)	Cost (US$ million)	
49	BOUKOMBE (Adaptation)	Agriculture	Project to support sustainable agriculture for food and nutrition security through the promotion of economically promising local value chains.	Improving the economic power of rural populations through capacity building of producers and processors, nurserymen in the production of shea, locust bean, baobab and moringa integrated into agriculture in its local varieties	10	0,02	90	0,18	0,2
50	GRAND-POPO Adaptation	URBAN PLANNING AND INFRASTRUCTURE CONSTRUCTION	Project to strengthen the resilience of the municipality to the effects of climate change	Strengthening land use planning and sustainable environmental management	10	0,005	90	0,05	0,05
51	KANDI (Adaptation)	Agriculture	Project to support the development of market gardening crops and strengthen the resilience of market gardeners in the Communes of Alibori (PADCMCA)	Sustainably support the improvement of the performance of the municipalities of Alibori in the development of the market gardening sector	10	2, 9	90	26,1	29
52	KARIMAMA (Adaptation)	Agriculture	Project to Support the Development of Market Gardening Crops and Strengthen the Resilience of Market Gardeners in the Commune of Karimama (PADCMCK)	Sustainably supporting Improving the performance of the municipality of Karimama in the development of the market gardening sector	10	6,683	90	60,14	66,83
53	KLOUEKANME (Adaptation)	Agriculture	Project to improve the resilience of maize, cowpeas, tomatoes and pepper cropping systems in the Commune of Klouékanmè	Promoting modern production techniques that are resilient to climate change	10	3	90	27	30

No.	Common	Sector	Measures or Mitigation Options /adaptation of the implementation of the updated NDC at the municipal level	Objectives	Options and Costs				
					Unconditional		Conditional		Total cost (US$ million)
					Proportion (%)	Cost (US$ million)	Proportion (%)	Cost (US$ million)	
54	KARIMAMA (Adaptation)	Agriculture	Project to Support the Development of Market Gardening Crops and Strengthen the Resilience of Market Gardeners in the Commune of Karimama (PADCMCK)	Sustainably support the improvement of the performance of the municipality of Karimama in the development of the market gardening sector	10	0,007	90	0,07	0,07
55	MALANVILLE (Adaptation)	Agriculture	Construction of three (03) water reservoirs and five (05) fish ponds in the municipality of Malanville	Promote fish farming, animal watering and market gardening and improve the productivity of fish farming systems in the municipality of Malanville	10	0,036	90	0,33	0,36
56	MALANVILLE (Adaptation)	Agriculture	Strengthening the adaptive capacities of flood victims in the municipality of Malanville	To ensure the food security of households affected by the floods in the communes of Malanville and Karimama and to increase their capacity to adapt to the climate change.	10	0,01	90	0,09	0,1
57	KARIMAMA (Adaptation)	Agriculture	Strengthening the Adaptive Capacities of Flood Victims in Karimama Commune	To ensure the food security of households affected by the floods in the communes of Malanville and Karimama and to increase their capacity to adapt to climate change	10	0,01	90	0,09	0,1
58	AGBANGNIZOUN (Adaptation)	Agriculture	Identify and promote climate-resilient food crops and train producers on modern and impact-sensitive cropping techniques Climate Change (CFP Project)	Reducing the effects of climate change	10	0,006	90	0,05	0,06

No.	Common	Sector	Measures or Mitigation Options /adaptation of the implementation of the updated NDC at the municipal level	Objectives	Options and Costs				
					Unconditional		Conditional		Total cost (US$ million)
					Proportion (%)	Cost (US$ million)	Proportion (%)	Cost (US$ million)	
59	SAVE (Adaptation)	Agriculture	Development and Securing of Agropastoral and Fisheries Areas	Strengthening farmers' adaptation to CCS by curbing soil degradation	10	0,009	90	0,082	0,09
60	OUAKE (Adaptation)	Agriculture	Strengthening the adaptive and resilience capacities of vegetable producers Faced with the irregularities of the rains in the commune	Developing market gardening perimeters in the municipality	10	0,038	90	0,34	0,38
61		Agriculture	Adaptation of Agricultural and Building Systems to Climate Change	Climate-friendly agriculture and construction	10	0,001	90	0,01	0,01
62	OUAKE (Adaptation)	Urban infrastructure development and Construction	Climate Change Adaptation of Homes Project	Promoting climate-friendly housing	10	0,000446	90	0,00399	0,004436
63	OUAKE (Adaptation)	Agriculture	Strengthening the adaptive and resilience capacities of rice and fish producers to erratic rainfall	Developing lowlands for adaptation and resilience of producers to erratic rainfall	10	0,008	90	0,07	0,08
64	ZAKPOTA (Adaptation)	Agriculture	Integrated Soil Fertility Management and Climate Change Adaptation Technology Project	Improving agricultural production	10	0,022	90	0,2	0,22
65	ADJA-OUERE (Adaptation)	Agriculture	Construction of water reservoirs for the benefit of rice producers in Houéli gaba, Dagbla and Massè	Improving producers' production capacity	10	0,055	90	0,49	0,55
66	PARAKOU	Sanitation	Creation of a faecal sludge treatment and solid waste management site	To provide the city of Parakou with faecal sludge management. Creation of a final landfill for solid waste	10	0,1	90	0,9	1
Total					**10**	**14,39**	**90**	**148,55**	**162,94**

Annex 4: NDC Implementation Plan

Activities	2021- 2025					2026- 2030				
	1	2	3	4	5	6	7	8	9	10
Phase 1: Preparatory phase for the implementation of the NDC										
Establishment of the institutional framework for the implementation of the updated NDC (National, sectoral and communal coordination units and task forces)										
Organization of the NDC Implementation Kick-Off Workshop										
Implementation of the Monitoring/Verification/Evaluation system										
Support to the sectoral ministries involved in the preparation of the programmes provided for in the NDC implementation plan and the files for mobilizing project funding within the framework of the support mechanisms for LDCs.										
Phase 2: Implementation Phase										
I / Implementation of the mitigation component										
• **AGRICULTURE SECTOR**										
ONGOING AND PLANNED PROJECTS (Table **9 in document section A**)										
PROJECTS/PROGRAMMES TO BE DEVELOPED AND IMPLEMENTED (Table **9 in section B**)										
Preparatory phase										
Implementation phase										
PROJECTS INITIATED BY MUNICIPALITIES (Table **9 of document section C**)										
Preparatory phase										
Implementation Phase										
• **ENERGY SECTOR**										
ONGOING OR PLANNED PROJECTS (Table 10 in section A)										
PROGRAMME AND PROJECTS TO BE DEVELOPED AND IMPLEMENTED **(Table 10 in section B)**										
Preparatory phase										
Implementation phase										
PROJECTS INITIATED BY MUNICIPALITIES **(Table 10 of document section C)**										
Preparatory phase										
Implementation phase										
• **WASTE SECTOR**										
Ouèssè landfill energy recovery project										
Projects for the establishment of controlled landfills in municipalities										
• **LULUCF SECTOR**										
ONGOING OR PLANNED PROJECTS (Table **11 in document section A**)										
PROGRAMMES AND PROJECTS TO BE DEVELOPED AND IMPLEMENTED (Table **11 in section B**)										
Preparatory phase										
Implementation phase										

PROJECTS INITIATED BY MUNICIPALITIES (Table **11 of document section C)**										
Preparatory phase										
Implementation phase										
II / Implementation of the adaptation component										
EXISTING SECTORAL STRATEGIES PLANS AND PROGRAMMES										
• Strengthening the climate risk forecasting and early warning system for food security in the areas Vulnerable agroecological										
• Mobilization of surface water for climate change adaptation (small watersheds)										
• Fight against climate-sensitive diseases										
• Protection of the coastal zone from sea-level rise/coastal erosion										
• Strengthening local governance for climate change adaptation financing										
• Capacity building in climate observation										
• Building the resilience of low-lying coastal cities										
• Integration of climate change into sectoral development planning										
• Ensuring the sustainability and resilience of Benin's main urban centres										
• Integration of climate change adaptation into local strategies to reduce the vulnerability of natural systems and human resources in the Beninese portion of the Niger Basin										
• Agriculture Sector Mitigation Measures with Co-Benefit in Adaptation										
• Energy Sector Mitigation Measures with Co-Benefit in Adaptation										
• LULUCF mitigation actions with adaptation co-benefit										
• Support for the integration of climate change adaptation into Communal Development Plans										
PROJECTS INITIATED BY MUNICIPALITIES (Table **12 of document section C**)										
Preparatory phase										
Implementation phase										
III / Implementation of institutional and regulatory capacity-building actions										
Develop and implement an Institutional and Regulatory Capacity Building Programme for the implementation of the NDC										
Develop and implement a communication plan to inform the different categories of actors about the NDC										
Develop and implement a gender mainstreaming strategy										
Promote scientific, technical and technological research in climate change adaptation and mitigation.										
Promote the transfer of technology and know-how in climate change adaptation and mitigation.										
Organize the work of updating the NDC										

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