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# Intended Nationally Determined Contribution of Democratic People's Republic of Korea

September 2016

## 1. Background

The Democratic People's Republic of Korea (DPR Korea) has always paid a great attention to the environment protection work in constructing the socialist power.

The respected Comrade **Kim Jong Un** said:

“Environmental protection work should be improved so as to protect and increase the country's resources and keep its air, rivers and seas completely free from pollution”

Under the wise guidance of the respected Comrade **Kim Jong Un**, chairman of the State Affairs Commission of DPR Korea, the Republic recently has made much progress in conducting the forest restoration campaign, thus has achieved a great success in establishing the sufficient material and technical foundation for environment protection, afforestation and enclosing-with-park throughout the country. Besides, large or medium and small hydro power stations including the Paektusan Hero Youth Power Station were constructed and much progress has been made in improving the efficiency of electricity generation and consumption, as well as in scaling up the utilization of the renewable energy. All these efforts resulted in the advances towards the protection of air pollution and climate change.

Many scientific and technological advances including the cycling production system in agricultural sector and zero-energy, zero-carbon architecture in construction sector have been achieved so as to accelerate the sustainable development of social and economic sectors.

In addition, DPR Korea has established the legal and policy framework to respond the climate change by supplementing the Law on Environment Protection with the contents

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related to climate change and newly enacting the Law on Environment Impact Assessment.

Especially, in order to contribute to international efforts to address climate change issues, DPR Korea ratified the United Nations Framework Convention on Climate Change (UNFCCC) on 5 December 1994, the Kyoto Protocol on 27 April 2005 and the Paris Agreement on 1 August 2016.

As a non-Annex I Party, DPR Korea prepared the First National Communication and Second National Communication in cooperation with the UNEP and under the coordination of the National Coordinating Committee for Environment, and submitted them to the UNFCCC secretariat respectively in September 2002 and February 2013.

DPR Korea is now making progress towards initiating the enabling activities to prepare the Third National Communication and the First Biennial Update Report under international support.

In 1999, the least-cost GHG abatement strategy was developed under the support of the UNDP/GEF.

Integrating climate change considerations into relevant socio-economic development strategies and plans is considered as one of the important measures to ensure the sustainable development in DPR Korea. Especially in accordance with five-year strategy for national economic development, national energy and climate change issues are simultaneously to be addressed by improving the efficiency of electric power generating facilities and by scaling up the utilization of renewable energy.

Pursuant to decisions 1/CP.19, 1/CP.20 and 1/CP.21 of the Conference of the Parties to the UNFCCC, the Government of the DPR Korea is pleased to prepare its Intended Nationally Determined Contribution (INDC). DPR Korea's INDC includes a mitigation and an adaptation component.

The mitigation component includes both unconditional and conditional contributions. The unconditional contributions are measures that will be implemented using domestic resources. With domestic resources, GHG emissions will be reduced by 8.0% by 2030 compared to the

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Business as Usual scenario (BAU). The conditional contributions are measures that could be implemented if additional international financial support, technology transfer and capacity building are received. The national contribution could be increased up to 40.25% with international support.

The adaptation component describes the adaptation needs raised in terms of institutional arrangement, financing, capacity building and technology transfer by 2030. It also presents the prioritized adaptation measures.

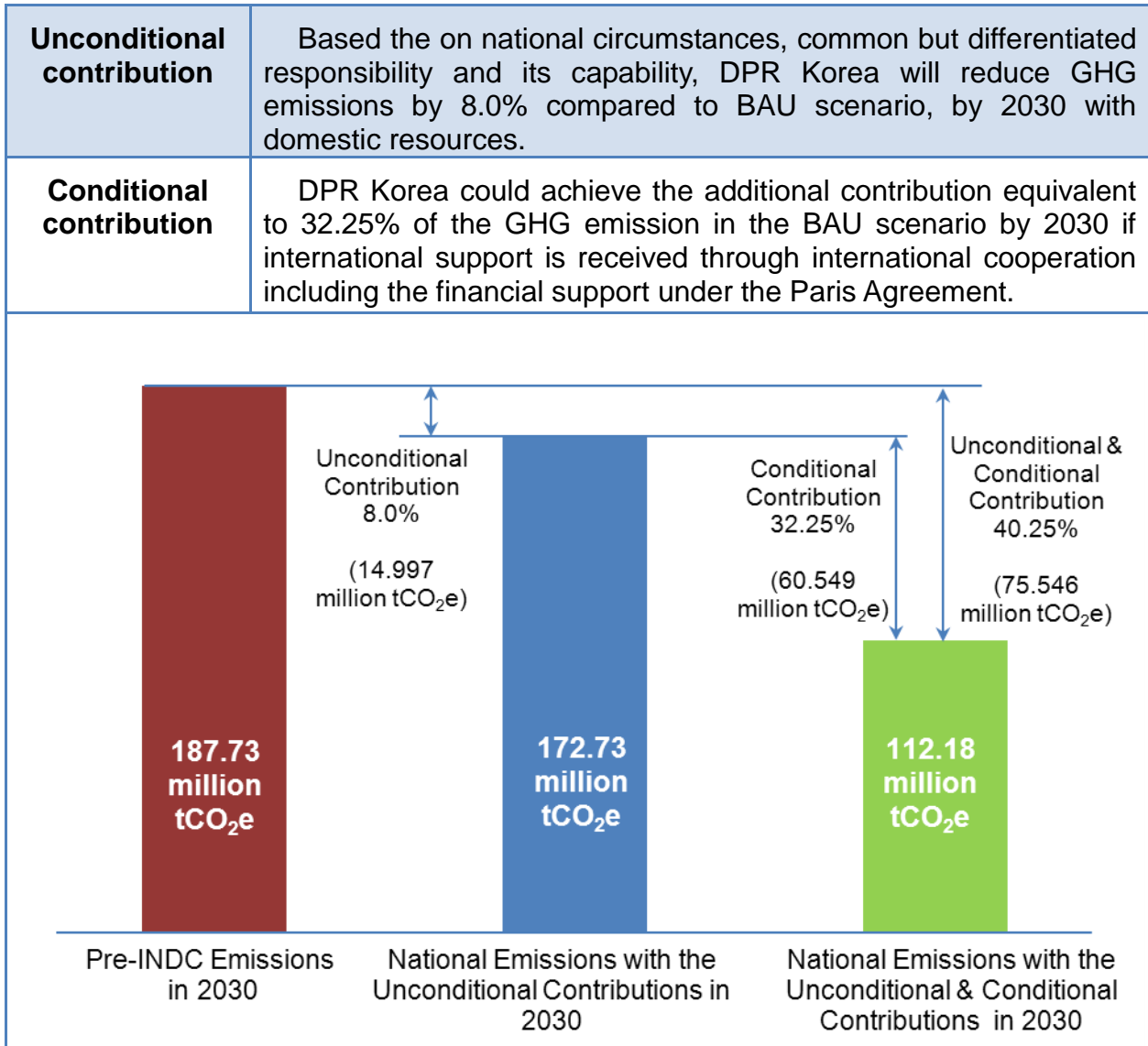
When considering the development priorities and adaptation needs in DPR Korea as one of developing countries, international support for developing countries under the Paris Agreement is required to encourage DPR Korea to scale up his mitigation measures to the level contributable to addressing climate change, an international issue on a global scale.

DPR Korea will continue to make efforts to achieve the contribution beyond the level committed in this report, based on the effective mobilization of domestic resources and international support, and thus will actively contribute to achieving the objectives of the UNFCCC and the Paris Agreement.

## 2. GHG Mitigation Component

### 2.1 Contribution to GHG Emissions Mitigation

<b>Type of contribution</b>	<p><b>GHG emission reduction compared to the Business-As-Usual scenario (BAU)</b></p> <p>BAU scenario approach was adopted, given that DPR Korea has no obligation to reduce its emission regarding a base year under</p>
<b>Period</b>	1 January 2021 – 31 December 2030
<b>Coverage</b>	<ul style="list-style-type: none"> <li>- <b>Sectors covered:</b> all 2006 IPCC sectors <ul style="list-style-type: none"> <li>• Energy</li> <li>• Industrial Processes and Product Use (IPPU)</li> <li>• Agriculture, Forestry and Other Land Use (AFOLU)</li> <li>• Waste</li> </ul> </li> <li>- <b>Geographical coverage:</b> 100 percent geographical coverage</li> <li>- <b>Percentage of national emissions covered, as reflected in the most recent national GHG inventory:</b> 100%</li> </ul>
<b>Greenhouse gases</b>	Carbon Dioxide, Methane, Nitrous Oxide, Hydrofluorocarbons, Perfluorocarbons, Sulfur hexafluoride
<b>Methodologies and tools to estimate GHG emissions and data</b>	<ul style="list-style-type: none"> <li>- 2006 IPCC Guidelines for National Greenhouse Gas Inventories, IPCC Inventory Software</li> <li>- Long-range Energy Alternatives Planning System (LEAP)</li> <li>- Greenhouse gas Abatement Cost Model (GACMO)</li> <li>- Multi-Criteria Assessment (MCA)</li> <li>- IPCC SAR GWP values (Carbon Dioxide; 1, Methane; 21, Nitrous Oxide; 310)</li> </ul>
<b>Planning process</b>	The INDC has been prepared by a participatory and transparent process through stakeholder consultations, taking into consideration the national socio-economic development plans, including the five-year strategy for national economic development
<b>Business-As-Usual scenario (BAU)</b>	<p>DPR Korea’s BAU scenario for GHG emissions was developed based on the assumption of economic growth in the absence of climate change policies.</p> <ul style="list-style-type: none"> <li>- GHG emission projections for 2020: 116.36 million tCO<sub>2</sub>e</li> <li>- GHG emission projections for 2030: 187.73 million tCO<sub>2</sub>e</li> </ul> <p>The BAU scenario projection will be revised to include more accurate information with preparation of the National Communications and Biennial Update.</p>



## 2.2 Fair and Ambitious

DPR Korea's GHG emission is 65 714GgCO<sub>2</sub>e in 2000, which accounts for 0.16% of the World GHG emission in 2000 (40GtCO<sub>2</sub>e). With the GHG emission of 2.9tCO<sub>2</sub>e per capita in 2000, DPR Korea is one of low GHG emitting countries in terms of emissions per capita. GHG emission per capita will be increased to 6.5tCO<sub>2</sub>e in 2030, but it will be still below the world average.

Considering the significance of energy issues in ensuring the sustainable development, DPR Korea continue to give national development priority on the work to keep energy production ahead of economic development. But there are no domestic oil and natural gas resources in DPR Korea. Thus domestic coal accounts now for a comparatively large share

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of energy consumption in energy and industrial sector. This share has a tendency to increase with the activation of the national economy in the near future.

In order to make national contribution to mitigation of climate change fair and ambitious in this development context, DPR Korea attaches the mitigation priorities to the energy and industrial sector in where it is possible to pursue synergy with adaptation to climate change, and thus expects to decrease GHG emission per final energy use and GDP.

DPR Korea's GDP per capita is 462US\$ in 2000. This implies that capability of DPR Korea for mitigation measures with only domestic resource is not sufficient to contribute to responding the climate change, an issue on a global scale.

Especially, international support has a great potential to encourage mitigation measures in DPR Korea, because this INDC expects that conditional contribution takes about 80% of the national GHG emissions mitigation target in 2030.

### **2.3 Legal and Policy Framework to Support the Implementation of National GHG Mitigation Measures**

DPR Korea has strengthened national legal and policy framework for responding climate change in a way of integrating climate change into various laws and mid- or long-term strategies. Measures to achieve the GHG emissions mitigation target during 2021-2030 will be supported by the following relevant laws and policies in the fields of environment protection, energy and forest sector.

- Law on Environment Protection, Law on Environment Impact Assessment, Law on Air Pollution Protection
- Law on Wastes Disposal, Law on Sewer
- Law on Energy Management, Law on Coal, Law on Electric Power, Law on Residential Fuel, Law on Medium and Small Power Plant, Law on Crude Oil, Law on Renewable Energy
- Law on Forest, Law on Land, Law on Land Use Planning, Land on Landscape, Law on Nature Reserve
- Law on Science and Technology, Law on City Management
- National Energy Strategy
- Strategy for Agriculture Development
- National Strategy for Science and Technology Development

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## 2.4 Measures to achieve the GHG emissions mitigation targets of the INDC

DPR Korea will exert efforts in implementing the following measures to achieve the target of the INDC.

### 1) Strengthen the national framework on climate change

- Strengthen laws and regulations on climate change
- Formulate and implement the national strategy on climate change
- Integrate climate-change-related objectives into the national economic and social development plans
- Develop the national GHG inventory system
- Establish systems for measuring, reporting and verification at the national and sectoral levels in order to monitor and supervise GHG emissions activities
- Formulate long-term, low GHG emissions development strategy

### 2) Improve energy use efficiency and reduce energy consumption

- Encourage the use of energy efficient appliances in the residential sector
- Conserve firewood in residential sector
- Reduce electric power consumption for irrigation water pumping by effective water resource management plans
- Improve the energy efficiency of technologies and processes in industrial sector
- Establish and improve standards on energy consumption of major technologies and products
- Improve the fuel-economics of the vehicles
- Restrict excessive use of the private transportation by the permitting system of car service by day of the week and a day's interval
- Expand and encourage public transport facilities

### 3) Improve energy efficiency and encourage the use of alternative energy in electric power industry

- Increase electric power generating efficiency in the existing coal-fired power plants
- Construct eco-friendly large, medium and small scale hydro power station, and improve electric power generating efficiency in hydro power stations
- Strengthen the national integrated electric power management system
- Complete the flexible electric power transmission system
- Introduce ultra-high tension transmission technologies

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- Build nuclear power stations

#### **4) Scale up the utilization of renewable energy development**

- Build and scale up the power plants based on renewable energy resources
- Generalize off-grid power generating system based on the renewable energy
- Disseminate the technologies for zero-energy, zero carbon architecture

#### **5) Manage and develop forest in the sustainable manner**

- Modernize nurseries with the object of scientification, industrializing, intensifying, automatizing, mechanizing the production of young trees
- Introduce advanced technologies for afforestation and reforestation
- Introduce and scale up the technologies and methodologies for sustainable forest management including agroforestry

#### **6) Introduce advanced technologies and methodologies for sustainable agricultural development**

- Conduct scientific research for and develop methodologies of GHG emission reduction in agriculture and livestock breeding
- Widely introduce recycling technologies of agricultural residuals for the production of biogas and organic fertilizer

#### **7) Introduce sustainable waste management system**

- Prepare waste management plans
- Promote the reduction and recycling of waste
- Building capacity for waste management and introduce technologies for the advanced waste management
- Introduce methane recovery and destruction technologies from industrial waste

#### **8) Raise public awareness and accelerate participatory process for responding climate change**

- Intensify the all-inclusive mass movement for planting trees such as the period of the spring and autumn general mobilization for land management and the Reforestation Day
- Strengthen activities for energy conservation such as the May and October Electricity Saving Months
- Reinforce afforestation activities of the Youth's Forest and Children's Union Forest



- Strengthen propagation campaign for public awareness and education of climate change mitigation
- Encourage participation in mitigation of climate change

**9) Enhance international cooperation for mitigation of climate change**

- Strengthen international cooperation for preparing and implementing climate policies and strategies
- Reinforce joint research, sci-tech knowledge exchange and demonstration activities among scientific research institutions, within the framework of international technical mechanism, for the purpose of promoting climate-related technology dissemination
- Intensify international cooperation for capacity building and knowledge experience of the experts in the fields of responding climate change

**10) Increase financial support for mitigation measures**

- To further increase budgetary support to mitigation measures
- To actively innovate the application of funds and explore new investment and financing mechanisms for low-carbon development

Particularly, a high priority is attached to the following measures with great mitigation potential in implementing conditional contributions to the mitigation of climate change.

<b>№</b>	<b>Mitigation measures prioritized for conditional contribution</b>
<b>1</b>	To reduce power transmission and distribution losses to 6%
<b>2</b>	To build 2 000MW nuclear power station
<b>3</b>	To install a total of 1 000MW grid connected solar PV systems
<b>4</b>	To build a total of 500MW West Sea off –shore wind farms at the Korean West Sea
<b>5</b>	To build a total of 500MW on-shore wind farms
<b>6</b>	To use energy-efficient air conditioners and heat pumps instead of coal-fired space heating at households and offices
<b>7</b>	To use biogas from livestock manure and domestic sewage instead of coal or firewood for cooking
<b>8</b>	To replace coal use for hot water with solar hot water system at households
<b>9</b>	To replace conventional wood stoves for cooking with efficient wood stoves at rural households

<b>№</b>	<b>Mitigation measures prioritized for conditional contribution</b>
<b>10</b>	To build the rice husk cogeneration plants
<b>11</b>	To building centralized compositing facilities to collect and treat municipal solid waste
<b>12</b>	To replace the old subcritical coal power stations with ultra-supercritical coal power stations
<b>13</b>	To increase additives (blast furnace slag or fly ash) from 15% to 50% in blended cement
<b>14</b>	To build biogas plants treating municipal solid waste
<b>15</b>	To replace conventional coal stoves for cooking with efficient electric cookers at the households
<b>16</b>	To reduce 25% of energy consumption in industry through technical modernization by 2030
<b>17</b>	To replace tunnel brick kilns with vertical shaft brick kilns
<b>18</b>	To introduce the Bus Rapid Transit systems in large cities
<b>19</b>	To scale up agroforestry and sustainable forest management

## 2.5 Monitoring and Evaluation

The monitoring and evaluation of the implementation of the GHG mitigation component to achieve mitigation goals formulated in the INDC will be reflected in the National Communications and Biennial Updated Reports submitted to the UNFCCC.

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### 3. Adaptation Component

Annual mean temperature in DPR Korea rose by 1.9°C over the 20th century. It is over 3 times compared to the rate of global warming. In the late 21st century, annual mean temperature in DPR Korea is expected to rise by 2.8°C to 4.7°C compared to the average (8.2°C, 1971-2000).

Sea level in DPR Korea by 2100 is expected to rise by 0.67m to 0.89m compared to 2000. Thus coastlines in the East and the West Sea may retreat by 67m to 89m and 670m to 890m over 100 years, respectively.

In the late 21st century, water resources (surface water) in DPR Korea are expected to be almost the same as the average (1971-2000) or decrease by 7.9%. In the future, it is expected that severer flood than the present will appear during rainy season, severe drought that the present will appear in spring. In addition, loss in land resources and land degradation will be accelerated by increase of flood, landslide and draught events.

The general goal of adaptation strategy to climate change in DPR Korea is to recover degraded natural eco-environment, improve its function, establish economic, social and environmental structures coping with climate change, and raise up adaptation capacity to negative impacts of climate change into the advanced level.

#### **Especially, the basic direction of the strategy is**

Firstly, to establish the whole social spirit for adaptation to climate change through strengthening public awareness raising and technology transfer, and through supplementing and completing laws, regulations, institutions and management systems related to adaptation to climate change.

Secondly, to carry out adaptation measures to minimize negative impacts to climate change, reflecting them to the national strategy for development of science and technology, energy and agriculture, etc.

Thirdly, to ensure investment for the work to minimize loss of life and property, and build the national capacity for prevention of disastrous events through establishment of the

national real time monitoring system, early warning system and enhancement of corresponding capacity of central and Government bodies to natural disasters such as flood, draught, forest fire, landslide, typhoon, and tidal wave, etc., caused by climate change.

Fourthly, to build research and development capacity related to adaptation to climate change and to train technicians and experts through various opportunities and processes such as university education, training and practice, etc., and to contribute to improvement of people’s living and sustainable development of the country through concentration on research, development and introduction of advanced adaptation technologies and methods.

Fifthly, to establish the system for efficient water resources management, scientific agricultural production and advanced medical care corresponding to negative impacts of climate change.

Sixthly, to encourage the work to effectively cope with negative impacts of climate change so as to draw all social members into, and to actively speed up bilateral and multi-lateral cooperation with international organizations and other countries.

The measures in the following table are prioritized among adaptation measures for a purpose of successful implementation of the adaptation strategy.

Sector	Climate Change Impact	Prioritized Adaptaiton Measures
<b>Cross-cutting</b>	<ul style="list-style-type: none"> <li>• Increase in damages from natural disasters</li> </ul>	<ul style="list-style-type: none"> <li>• Strengthening research capacity for adaptation to climate change</li> <li>• Improvement of climate information service and observation network in DPR Korea</li> <li>• Development of educational curriculum for negative impacts and adaptation options</li> <li>• Capacity building for improving the community-based disaster management system</li> <li>• Establishment of the early warning system in the major basins</li> </ul>

Sector	Climate Change Impact	Prioritized Adaptation Measures
<b>Water resource</b>	<ul style="list-style-type: none"> <li>• Decrease in water availability</li> <li>• Deterioration of water quality</li> <li>• Increase in frequency and intensity of floods, droughts and landslides</li> </ul>	<ul style="list-style-type: none"> <li>• Introduction of technologies for water pollution prevention and efficient water purification</li> <li>• Capacity building for integrated water resources management in the major basins</li> <li>• Establishment of systems for rational distribution and consumption of water resources</li> <li>• Capacity building for management of reservoir and rivers</li> </ul>
<b>Agriculture</b>	<ul style="list-style-type: none"> <li>• Changes in regions suitable for cultivation</li> <li>• Changes in the length of growing season</li> <li>• Decline in crop productivity</li> <li>• Increase in damages from harmful insects</li> </ul>	<ul style="list-style-type: none"> <li>• Promotion of development and dissemination of advanced agricultural technologies coping with climate change</li> <li>• Establishment of integrated and sustainable management system of arable soil</li> <li>• Establishment of integrated system for prevention of harmful insects and weed management</li> </ul>
<b>Coastal zone</b>	<ul style="list-style-type: none"> <li>• Coastal flooding</li> <li>• Retreat of coastline</li> <li>• Salt water intrusion</li> <li>• Increase in damages from flood</li> </ul>	<ul style="list-style-type: none"> <li>• Capacity building for integrated management of coastal zone</li> <li>• Construction of infrastructures such as seawalls and protective facilities in coastal zone</li> <li>• Rearrangement of population and economic activities</li> </ul>
<b>Public health</b>	<ul style="list-style-type: none"> <li>• Increase in incidence of infectious diseases</li> </ul>	<ul style="list-style-type: none"> <li>• Strengthening of hygienic and anti-epidemic work</li> <li>• Strengthening of medical services related to the diseases caused by hot weather</li> <li>• Establishment of database for various infectious diseases and sustainable monitoring system for diseases</li> </ul>

Sector	Climate Change Impact	Prioritized Adaptaiton Measures
<b>Ecosystems</b>	<ul style="list-style-type: none"> <li>• Shift in the structure of biological communities</li> <li>• Changes in the number and range of species</li> <li>• Loss of habitats for species</li> <li>• Increase in damages from forest pests</li> </ul>	<ul style="list-style-type: none"> <li>• Recovery of degraded forest and firewood forest managment in community areas</li> <li>• Control of forest pests outbreaks by climate change and integrated forest pest management</li> <li>• Improvement of ecosystem conservation system in coastal zone of the Korea West Sea</li> <li>• Improvement of management system for existing nature reserves</li> </ul>

DPR Korea will exert efforts in strengthening national financial and technical capacity to make progress in the implementation of these measures, in order to successfully responding the posible negative impacts of the climate change.

However, international support has a great potential to help implementation of adaptation measures in DPR Korea, one of developing countries experiencing now limitation for adaptation to climate change, in terms of financial resource, capacity building and technology transfer. It will also contribute to the mobilizing domestic resources and strengthening the political framework for mitigation of climate change.

The monitoring and evaluation of the implementation of the adaptation component will be reflected in the National Communications and the Biennial Updated Reports submitted to the UNFCCC.