Intended Nationally Determined Contribution of Viet Nam

I. Introduction

Viet Nam is willing to respond to climate change, which is demonstrated by the range of national policies and concrete greenhouse gas (GHG) mitigation and climate change adaptation measures that have been undertaken throughout the past decade, funded primarily by domestic financial resources. Additionally, Viet Nam supports achieving a legal agreement with the participation of all Parties to the United Nations Framework Convention on Climate Change (UNFCCC) in order to keep the global average atmospheric temperature increase, since pre-industrial times, at below 2^{o}C.

Viet Nam signed the UNFCCC in 1992 and ratified it in 1994; signed the Kyoto Protocol (KP) in 1998 and ratified it in 2002; set up a National Steering Committee to implement the UNFCCC and KP; submitted to the UNFCCC Secretariat its Initial National Communication (2003), the Second National Communication (2010), and the Initial Biennial Update Report (2014), reflecting the latest climate change response efforts and GHG inventories.

In 2008, the Government issued the National Target Programme to Respond to Climate Change (NTP-RCC) in order to assess climate change impacts and develop adaptation and mitigation measures. Climate change was mainstreamed into the National Socio-Economic Development Strategy (2011-2020) and Socio-Economic Development Plan (2011-2015), and policies on disaster risk reduction, coastal zone management, and energy supply and use. Economic sectors and provinces have developed Action Plans to respond to climate change.

In 2011, the National Climate Change Strategy was issued, outlining the objectives for 2011-2015 and 2016-2050, and priority projects to be implemented in the period of 2011-2015. The strategy identifies climate change responses that are vital for the development of the country. Responding to climate change must be associated with sustainable development and a transition towards a low-carbon economy, take advantage of opportunities to increase competitiveness and strengthen the national position, and carry out adaptation and mitigation efforts in parallel.

In 2012, the National Green Growth Strategy was approved, which includes mitigation targets and measures; and regulations on linking with international carbon markets. In 2013, the Law on Natural Disaster Prevention and Control was enacted, aiming to address diverse natural hazards that affect the country, which are primarily climate change related. The 2014 Law on Environment includes a full chapter on climate change. The development and implementation the above-mentioned policies and activities to respond to climate change relies mainly on domestic human and financial resources.

Viet Nam'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, while the conditional contributions are measures that could be implemented if new and additional international financial support, technology transfer and capacity building are received.

Viet Nam's INDC identifies the GHG reduction pathway in the 2021-2030 period. With domestic resources GHG emissions will be reduced by 8% by 2030 compared to the Business as Usual scenario (BAU). The above-mentioned contribution could be increased up to 25% with international support.

The adaptation component describes the climate change adaptation actions that are currently being implemented. It also identifies adaptation gaps in terms of institutional and policy arrangements, financing, human resource capacity and technology and prioritized adaptation measures for the 2021-2030 period. It is estimated that the national budget will be able to meet approximately one third of the financial needs to implement adaptation measures in this period, and will seek international support and private sector investment for the remainder.

Viet Nam's INDC has been developed with the participation and contributions from different line ministries, non-governmental organisations, research institutions, business sector representatives as well as international development partners.

Through this INDC, Viet Nam reaffirms its willingness to respond to climate change and contribute to the objective of the UNFCCC. Viet Nam believes its contribution is fair and ambitious, feasible and achievable. It is committed to continuing to address climate change based on domestic resources and international support.

II. GHG Mitigation Component

2.1. GHG mitigation activities prior to 2020

Viet Nam is one of the first countries to ratify the UNFCCC and the KP and has actively been researching and implementing GHG mitigation measures.

As of June 2015, Viet Nam had 254 Clean Development Mechanism (CDM) projects accredited and registered by the CDM Executive Board (EB). Viet Nam is ranked number four internationally for number of projects, with a total GHG reduction amount of approximately 137.4 million tCO_2e in the credit period. Among the 254 projects, energy projects account for 87.6%, waste treatment for 10.2%, reforestation and afforestation for 0.4% and other projects for 1.8%. To date, more than 12 million Certified Emission Reductions (CERs) credits have been issued by the EB for Viet Nam, which is ranked eleventh in the world.

The Government has issued many policies on energy saving and efficiency, such as the "National Target Programme on Energy Efficiency" (2006), the Law on "Economical and Efficient use of Energy" (2010). The Government has prioritized policies, such as renewable energy development, consistent with Viet Nam's mitigation potential and conditions, in order to contribute to energy security and environmental protection. Policies encouraging energy savings and efficiencies in production and daily life, through the application of energy saving and renewable energy technologies, are also a priority.

Viet Nam has made significant efforts in forest protection, afforestation and reforestation, and is one of the countries participating in Reducing Emissions from Deforestation and Forest Degradation, sustainable management of forests, conservation of forest carbon stocks and enhancement of forest carbon stocks and enhancement of forest carbon stocks (REDD+).

Viet Nam is developing and preparing for the implementation of Nationally Appropriate Mitigation Actions (NAMAs), as well as the registration and implementation of carbon credit projects according to the Verified Carbon Standard (VCS) and the Gold Standard (GS).

Although Viet Nam has exerted great efforts in implementing mitigation actions, it still faces a variety of difficulties and challenges regarding the following issues:

- Establishment of a national GHG inventory system, and Measurement, Reporting and Verification (MRV) system at all levels;
- NAMA development and implementation;
- Application of technologies to reduce GHGs, especially in the agriculture sector;
- Access to national and foreign finance for mitigation activities.

2.2. Contribution to GHG emissions mitigation

Type of contribution	GHG emissions reduction compared to the Business-As-Usual scenario (BAU)
Coverage	The entire economy, including the following sectors: **1. Energy** *a. Fuel combustion:* - Energy industries; - Manufacturing industries and construction; - Transport; - Others: residential, agriculture and commercial services. *b. Fugitive emissions:* - Coal mining; - Natural gas and oil. **2. Agriculture** - Enteric fermentation; - Manure management; - Rice cultivation; - Agriculture soils; - Prescribed burning of savannas; - Field burning of agricultural residues. **3. Land Use, Land Use Change and Forestry (LULUCF)** - Forest land; - Cropland; - Grassland; - Wetlands; - Settlements; - Other land. **4. Waste** - Solid waste landfills; - Industrial wastewater; - Domestic wastewater; - Human waste; - Waste incineration.
Greenhouse gases	Carbon dioxide (CO_2), Methane (CH_4), Nitrous oxide (N_2O), Hydro fluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulfur hexafluoride (SF_6).

Period	From 01/01/2021 to 31/12/2030
Methodologies to estimate GHG emissions and data	- IPCC guidelines; - National statistics, national Socio-Economic Development Plan and sectoral activity data.
Metric applied	GWP 100y values published in IPCC AR4 (2007): • CO_2 = 1 • CH_4 = 25 • N_2O = 298
Business-As-Usual scenario	Viet Nam's BAU scenario for GHG emissions was developed based on the assumption of economic growth in the absence of climate change policies. The BAU starts from 2010 (the latest year of the national GHG inventory) and includes the energy, agriculture, waste and LULUCF sectors. • **GHG emissions in 2010:** 246.8 million tCO_{2e} • **Projections for 2020 and 2030** (not included industrial processes): - 2020: 474.1 million tCO_{2e} - 2030: 787.4 million tCO_{2e}
Unconditional contribution	With domestic resources, by 2030 Viet Nam will reduce GHG emissions by 8% compared to BAU, in which: - Emission intensity per unit of GDP will be reduced by 20% compared to the 2010 levels; - Forest cover will increase to the level of 45%.
Conditional contribution	The above-mentioned 8% contribution could be increased to 25% if international support is received through bilateral and multilateral cooperation, as well as through the implementation of new mechanisms under the Global Climate Agreement, in which emission intensity per unit of GDP will be reduced by 30% compared to 2010 levels.

2.3. Fair and Ambitious

Given the socio-economic conditions of a developing country that is highly affected by climate change, Viet Nam's INDC represents its efforts to contribute to global climate change mitigation to reach the ultimate objective of the UNFCCC, as well as the target of maintaining the global average atmospheric temperature rise to below 2°C by the end of the 21st century.

In 2010, GHG emissions of Viet Nam accounted only for approximately 0.5% of global GHG emissions and GHG emissions per capita were relatively low at 2.84 tonnes of CO_2e. However, Viet Nam is proactively implementing climate change response activities, developing a low-carbon and green economy, strengthening the implementation of potential GHG mitigation measures in the energy, industry, transport, agriculture and waste sectors and enhancing carbon sinks in the LULUCF sector.

National efforts are also reflected in the fact that the Government considers climate change response a crucial issue, as it is the entire country's responsibility to simultaneously implement adaptation and mitigation, as well as use natural resources effectively. A roadmap with methods to implement GHG mitigation measures to achieve Viet Nam's INDC will be issued.

2.4. Policy framework to support the implementation of the goal to mitigate GHG emissions

Legal documents and policies on climate change support to INDC implementation in Viet Nam include:

- Law on Environment (6/2014);
- Law on Economical and Efficient use of Energy (6/2010);
- Resolution No. 24-NQ/TW on "Pro-actively responding to climate change, enhancing natural resource management and environmental protection" (6/2013);
- National Climate Change Strategy (12/2011);
- National Green Growth Strategy (9/2012);
- Decision 1775/QĐ-TTg on "Management of GHG emissions; management of carbon credit trading activities to the world market" (11/2012).

Viet Nam will continue to develop policies that create favourable conditions for investments in mitigation activities.

2.5. Measures to achieve the GHG emissions mitigation targets of the INDC

In order to achieve the above-mentioned mitigation targets, Viet Nam will exert efforts in implementing the following measures:

1) Strengthen the leading role of the State in responding to climate change

- Integration of climate change into development strategies, and development plans;
- Improving and strengthening institutions: (i) Study and formulate policies, mechanisms and legislation on climate change, which are consistent with each development stage of the country and in line with the global climate change agreements and treaties to which Viet Nam is a signatory state; (ii) Develop the national GHG inventory system; (iii) Establish systems for measuring, reporting and verification (MRV) at the national and sectoral levels in order to monitor and supervise GHG emissions activities by sectors, to meet the data requirement for examination and periodic reports as required by the UNFCCC and create favourable conditions for NAMA implementation.

2) Improve effectiveness and efficiency of energy use; reducing energy consumption

- Innovate technologies and apply advanced management and operation procedures for efficient and effective use of energy in production, transmission and consumption, especially in large production facilities where energy consumption is high;
- Apply energy savings and efficiency, and renewable energy applications in the residential sector, trade and services;
- Develop public passenger transport, especially fast modes of transit in large urban centres. Restructure freight towards a reduction in the share of road transport in exchange for an increase in the share of transportation via rail and inland waterways;
- Establish standards on fuel consumption, and develop a roadmap to remove obsolete and energy-consuming technologies in energy production and consumption systems.

3) Change the fuel structure in industry and transportation

- Assure national energy security by developing and exploiting different energy sources, while simultaneously using energy sources effectively;

- Change the energy structure towards a reduced share of fossil fuel, encouraging the exploitation and use of renewable and low GHG emission energy sources;
- Encourage buses and taxis to use compressed natural gas and liquefied petroleum gas (LPG); implement management solutions for fuel quality, emissions standards, and vehicle maintenance;
- Apply market instruments to promote structural change and improve energy efficiency; encourage the use of clean fuels; support the development of renewable energy; implement the roadmap to phase out subsidies for fossil fuels;
- Label energy-saving equipment and issue national standards for the quality of equipment.

4) Promote effective exploitation and increase the proportion of new and renewable energy sources in energy production and consumption

- Develop and implement financial and technical mechanisms and policies to support research and the application of appropriate advanced technologies; exploit and optimize the use of renewable energy sources, both on-grid as well as off grid;
- Develop a renewable energy technology market, domestic industries and local service providers.

5) Reduce GHG emissions through the development of sustainable agriculture; improve effectiveness and competitiveness of agricultural production

- Research and develop solutions to reduce GHG emissions in farming, livestock, fisheries and animal feed and food processing;
- Research and apply production processes and economic technologies that efficiently use seedlings, feed, agricultural materials, soil, water, and other inputs and reduce GHG emissions from agricultural production;
- Widely replicate technologies that treat and reuse by-products and waste from agricultural production to produce animal feed, mushrooms, materials for industries, biogas, and organic fertilizer.

6) Manage and develop sustainable forest, enhance carbon sequestration and environmental services; conservation of biodiversity associated with livelihood development and income generation for communities and forest-dependent people

- Review and identify the areas and objects to apply sustainable forest management, afforestation and reforestation, biodiversity conservation, including special priority for regions with large forests that are important for forestry production and livelihoods of local communities people;
- Develop and improve policies to promote sustainable forest management; mechanisms and policies to attract private sector investment for sustainable forest management, afforestation, reforestation, biodiversity conservation and livelihood development;
- Integrate and effectively use domestic and international resources for implementation of programmes and projects related to forest management and development, livelihoods and biodiversity conservation such as REDD+, the policy of payment for forest environmental services (PFES), etc.
- Strengthen and expand international cooperation for investment, technical assistance and capacity building, information and experience sharing on the sustainable forest management and development, biodiversity conservation and livelihood development.

7) Waste management

- Develop waste management planning and enhance waste management capacity; promote reducing, reusing and recycling waste;
- Research and apply advanced waste treatment technologies; deploy modern waste treatment technology in urban and rural areas; strengthen the management and treatment of industrial and household wastewater;
- Utilise landfill gas and solid waste combustion for power generation.

8) Communication and awareness raising

- Promote, educate and raise public awareness of GHG mitigation activities;
- Encourage and provide technical assistance to the people and communities to implement and enlarge production and consumption models, which are economic, safe and climate-friendly;
- Encourage and support communities to develop models of eco-cities, green rural areas, green housing, sort waste at the source through the approach of reducing-reusing-recycling (3R) and improve energy efficiency.

9) Enhance international cooperation

- Enhance cooperation in scientific research, in information exchange on the formulation and implementation of policies and in the basic content of climate change strategies and policies;
- Enlist the support of other countries and international organizations in finance, capacity building and technology in the implementation of climate change strategies and policies;
- Facilitate international cooperation to implement foreign direct investment (FDI) on climate change related projects.

2.6. Monitoring and evaluation

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

III. Adaptation Component

3.1. Climate change impacts

Viet Nam is one of the countries severely affected by climate change and its related disasters. The Mekong Delta is one of the deltas in the world most susceptible and vulnerable to sea level rise. Climate change adaptation is vital for Viet Nam and is regarded by the Government as one of the priority tasks to reduce the vulnerability level.

Over the past 50 years, the average temperature in Viet Nam has increased by approximately 0.5°C and the sea level has risen by about 20cm. Extreme climate events have increased both in frequency and intensity. Climate change has made hazards, especially storms, floods and droughts, more intense.

According to Viet Nam's climate change scenario (2012), by 2100 the annual average temperature in Viet Nam is expected to increase by 2 to 3^{o}C, precipitation will increase in the rainy season and decrease in the dry season and the sea level will rise between 78 and 100cm.

The most vulnerable areas, regions and objects are: agriculture, natural ecosystems, biodiversity, water resources, public health and infrastructure; the Mekong Delta, the Red

River Delta, the Central Coast; the poor, ethnic minorities, the elderly, women, children and people with disabilities.

Viet Nam is facing losses and damages, which are beyond its resilience and capacity, even after thorough application of climate change adaptation measures and mitigation of GHG emissions. Sharing and managing risks of loss and damage must be considered at both the national and international levels.

Over the past 30 years, the average number of dead and missing people due to natural disasters totalled 500 annually; thousands of people were injured and annual economic losses accounted for approximately 1.5% of GDP.

Without implementing climate change adaptation measures, when the sea level rises by 100cm, over 10% of the Red River Delta and Quang Ninh province, more than 2.5% of the area of the central coastal provinces, and over 20% of Ho Chi Minh City will be at risk of being inundated, directly affecting 9% of the population of the Red River Delta and Quang Ninh province, nearly 9% of the population of the central coastal provinces and approximately 7% of the population of Ho Chi Minh City; up to 39% of the Mekong Delta could be submerged, affecting 35% of the population and causing the risk of losing 40.5% of the total rice production in this region.

Adaptation measures to prevent future losses are technically possible, however, many measures to protect against river floods, storm surges, saline water intrusion and drought, are needed to be implemented in the 21st century, which exceed the nation's capacity. The increasing impact of climate change on residential areas, economic zones, and ecosystems will lead to unavoidable losses.

3.2. The need to include an adaptation component in Viet Nam's INDC

The INDC is an official and important channel for conveying information and experience in adaptation, including sharing risks and damages, to the international community. The National Climate Change Strategy has identified that priorities are food security, energy security, water security, poverty reduction, gender equality, social security, public health, livelihood improvements and the protection of natural resources. These goals can only be achieved through enhancing the adaptive capacity of human and socio-economic systems as well as natural systems. Through its INDC, Viet Nam can communicate its current and future climate change response efforts implemented with national resources, and what can be done better with additional international support.

Climate change adaptation will reduce vulnerability and inequality within and among countries. Adaptation benefits go beyond the scope of each locality, community and country. Pro-active climate change adaptation is a contribution of Viet Nam to the global efforts to address climate change. Adaptation to climate change will help Viet Nam increase its resilience to climate change and can sometimes also contribute to GHG emissions mitigation.

The adaptation component of the INDC includes plans developed in accordance with the current situation and projections until 2030 and may be subject to adjustments or supplementations to suit the specific conditions of each period. The implementation of these plans depends on national resources and particularly on international support.

3.3. Climate change adaptation until 2020

Climate change adaptation until 2020 is reflected in the following strategies, programmes and action plans:

- Resolution No. 24-NQ/TW on "Pro-actively responding to climate change, enhancing natural resource management and environmental protection" (2013);

- Law on Natural Disaster Prevention and Control (2013);

- National Climate Change Strategy (2011);

- National Target Programme to Respond to Climate Change (2008, 2012);

- Action plans at the national, ministerial, sectoral and local levels on climate change response and disaster risk prevention and reduction.

Viet Nam has determined that climate change adaptation must be carried out in a focussed manner and respond to urgent, immediate impacts and long-term potential impacts. Climate change adaptation must be linked to sustainable development and the transition towards a low-carbon economy, and to ensure a systematic, joint, interdisciplinary, inter-regional approach, and incorporate gender equality, hunger eradication and poverty reduction.

Numerous climate change adaptation and disaster risk management activities have been carried out on a national scale. However, national investment resources for climate change adaptation are limited. Meanwhile, the expenses for remedying damage caused by potential climate hazards are expected to increase significantly under the impact of climate change, sea level rise and saltwater intrusion. The cost of adaptation is estimated to exceed 3-5% of GDP by 2030. Thus, it is necessary to diversify sources of investment in climate change adaptation from the public and private sectors, and from international support.

Despite great effort and initiative in implementing climate change adaptation activities, the shortage of capacities and resources for climate change adaptation measures are major challenges for Viet Nam.

Policies and institutions: The legal framework for integrating climate change issues into national Socio-Economic Development Plans is still limited; there is still ineffective coordination between line ministries, sectors and localities to address multi-sectoral and inter-regional issues; a lack of incentives to attract domestic and foreign investment and to mobilise the private sector to participate in climate change adaptation.

Capacity: There is a shortage of experts and technical staff who are specialised in climate change and the assessment of the effectiveness of adaptation measures, particularly at the local level; there are significant limitations in communication and awareness-raising on climate change; there are unmet needs in terms of forecasting disasters and early warning capacities, as well as scientific research on climate change and adaptation technology; appropriate climate change adaptation models at the community level need to be summarised comprehensively and replicated; there are limited capacities to select and decide on prioritising resources for the implementation of climate change adaptation activities.

Finance*:* While there are policies, plans and programmes climate change adaptation efforts were designed to collect funding for implementation, State resources can only meet 30% of the adaptation needs.

Technology*:* there is a shortage of advanced technologies for hydrological and meteorological monitoring and forecasting, early warning of natural disasters and hazards, and climate change adaptation.

3.4. Climate change adaptation in the period 2021 – 2030

Viet Nam aims to minimize the loss of life and property due to climate change. The climate change adaptation priority actions for the period 2021-2030 include:

1) Respond pro-actively to disasters and improve climate monitoring

- Modernise the hydro-meteorological observatory and forecasting system to ensure the timely forecasting and early warning of weather events. Develop the assessment and

monitoring system on climate change and sea level rise;

- Produce Socio-Economic Development Plans based on climate change scenarios, with a focus on key sectors and regions;
- Implement disaster prevention plans and measures, protect peoples' lives, and ensure national defence and security;
- Consolidate and develop prioritised and urgent disaster prevention projects; strengthen the capacity of search and rescue forces;
- Develop infrastructure and make plans for residential areas; relocate and resettle households and communities from areas affected frequently by, storm surges, floods, riverbank and shoreline erosion, or areas at risk of flash floods and landslides;
- Allocate and mobilise resources for community-based climate change adaptation and disaster management; raise awareness and build capacities for climate change adaptation and disaster risk management.

2) Ensure social security

- Review, adjust and develop livelihoods and production processes that are appropriate under climate change conditions and are linked to poverty reduction and social justice;
- Develop mechanisms, policies, and strengthen the insurance system, and share climate and disaster risks;
- Improve regulations and technical standards for infrastructure, public facilities and housing, that are appropriate under climate change conditions;
- Implement ecosystem-based adaptation through the development of ecosystem services and biodiversity conservation, with a focus on the preservation of genetic resources, species at risk of extinction, and important ecosystems;
- Implement community-based adaptation, including using indigenous knowledge, prioritizing the most vulnerable communities;
- Implement integrated water resources management in river basin systems; ensure reservoir safety; strengthen international cooperation in addressing transboundary water issues; ensure water security;
- Ensure food security through protecting, sustainably maintaining and managing agricultural land; restructuring of crops and livestock; create new climate change resilient varieties; complete the disease control and prevention system;
- Implement sustainable forest management; improve the quality of poor natural forests; implement afforestation and reforestation measures, focusing on large timber plantations; prevent forest deforestation and degradation;
- Protect, restore, plant and improve the quality of coastal forests, including mangroves, especially in coastal estuaries and the Mekong and Red River deltas.

3) Responding to sea level rise and urban inundation

- Implement integrated coastal zone management;
- Use sea level rise scenarios in urban and land use planning for infrastructure, industrial parks, coastal and island resettlement areas;
- Implement anti-inundation measures for large coastal cities; construct climate change resilient urban infrastructure; strengthen and build new large urban drainage infrastructure;

- Consolidate, upgrade and complete crucial sea and river dykes;
- Control saline water intrusion in the most severely affected areas.

3.5. The need for capacity building, technology transfer and finance for climate change adaptation

Viet Nam has attempted to implement climate change adaptation measures but does not have sufficient capacities to meet the demands, so there is a need for international assistance as well as cooperation with other developing countries:

- Strengthen the capacity to adapt to climate change at national and local level.
- Technology transfer: (i) technology for real-time forecasting, early warning, and sharing information system on real-time hydro-meteorological monitoring; (ii) tools to assess climate change impacts, vulnerability, exposure and climate change adaptation measures; (iii) technology for the sustainable use of water resources, prevention of water pollution, and urban water supply; (iv) technology to prevent erosion and protect the coastline and riverbanks; and (v) technology for sustainable agriculture, forestry and aquaculture production; biotechnology to develop new varieties that are more resilient to climate change.
- Finance for climate change adaptation, mainly for maintenance of existing infrastructure and building important projects aimed at prevention of natural disasters, and social-economic development in the context of climate change. Viet Nam encourages and creates favourable conditions for private sector investment in climate change adaptation activities.

3.6. Monitoring and evaluation

Climate change adaptation activities until 2030 will be evaluated based on the following key indicators:

- At least 90% of Socio-Economic Development Plans have integrated disaster risk management and climate change adaptation;
- The average national poverty rate is lowered 2%/year; in poor districts and communes it is lowered by 4%/year;
- 100% of piers and boat storm shelters are constructed, and 100% of offshore fishing boats and ships have sufficient communication equipment;
- Forest coverage increases to 45%; the area of protection forest in coastal areas is increased to 380,000 hectares, including 20,000 to 50,000ha of additional mangrove planting;
- At least 90% of city-dwellers and 80% of rural inhabitants have access to clean water; 100% of the population has access to health care services.

The monitoring and evaluation of the implementation of the adaptation component will be reflected in Viet Nam’s "National Communications" and “Biennial Updated Reports” submitted to the UNFCCC.