No 1006.3/ 11812

Office of Natural Resources and
Environmental Policy and Planning
60/1 Soi Phibun-Wattana 7, Rama VI Rd.
Samsen-Nai, Phayathai, Bangkok 10400
THAILAND
Tel. / Fax. 0 2265 6690

1 October B.E. 2558 (2015)

Dear Executive Secretary,

Subject: Thailand's Intended Nationally Determined Contribution (INDC)

The Office of Natural Resources and Environmental Policy and Planning (ONEP), in its capacity as Thailand's national focal point to the United Nations Framework Convention on Climate Change, is pleased to communicate Thailand's Intended Nationally Determined Contribution (INDC), as attached.

Please accept the assurances of my highest consideration.

Yours sincerely,

Raweewan Bhumidej
Secretary - General

Ms. Christiana Figueres
Executive Secretary
UNFCCC secretariat
P.O. Box 260124
D-53153 Bonn
Germany

Submission by Thailand
Intended Nationally Determined Contribution and Relevant Information

As a developing country highly vulnerable to the impacts of climate change, Thailand attaches great importance to the global efforts to address this common and pressing challenge. Pursuant to decisions 1/CP.19 and 1/CP.20, Thailand hereby communicates its intended nationally determined contribution (INDC) and the relevant information.

Thailand intends to reduce its greenhouse gas emissions by 20 percent from the projected business-as-usual (BAU) level by 2030.
The level of contribution could increase up to 25 percent, subject to adequate and enhanced access to technology development and transfer, financial resources and capacity building support through a balanced and ambitious global agreement under the United Nations Framework Convention on Climate Change (UNFCCC).

Accompanying information

Baseline:	Business-as-usual projection from reference year 2005 in the absence of major climate change policies (BAU2030: approx. 555 $MtCO_2e$)
Time frame:	2021-2030
Coverage:	Economy-wide (Inclusion of land use, land-use change and forestry will be decided later)
Gases:	Carbon dioxide (CO_2), Methane (CH_4), Nitrous oxide (N_2O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF_6)
Assumptions and methodological approaches:	- Global warming potential on a 100-year timescale in accordance with the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report - National statistics, including sector activity and socio-economic forecasts
Planning processes:	Thailand's INDC was developed through participatory process. Stakeholder consultations were conducted through the establishment of an inter-ministerial working group and steering committee comprising representatives from relevant sectoral agencies, academia and private sector. In addition, three national consultations were held during the technical analysis phase. Thailand's INDC was formulated based on the following plans already approved or in the pipeline for approval by the Cabinet: - National Economic and Social Development Plans - Climate Change Master Plan B.E. 2558–2593 (2015-2050)

	- Power Development Plan B.E. 2558–2579 (2015-2036) - Thailand Smart Grid Development Master Plan B.E. 2558-2579 (2015-2036) - Energy Efficiency Plan B.E. 2558–2579 (2015-2036) - Alternative Energy Development Plan B.E. 2558–2579 (2015-2036) - Environmentally Sustainable Transport System Plan B.E. 2556–2573 (2013-2030) - National Industrial Development Master Plan B.E. 2555–2574 (2012-2031) - Waste Management Roadmap
International market mechanism	Thailand recognizes the important role of market-based mechanisms to enhance the cost effectiveness of mitigation actions, and therefore will continue to explore the potentials of bilateral, regional and international market mechanisms as well as various approaches that can facilitate, expedite and enhance technology development and transfer, capacity building and access to financial resources that support Thailand's efforts towards achieving sustainable, low-carbon and climate-resilient growth, as appropriate.
Review and adjustments	Thailand reserves the right to review and adjust its INDC as necessary upon finalizing the new global agreement under the UNFCCC.

Consideration of fairness and ambition, in light of national circumstances and contribution to the ultimate objective of the Convention (Article 2)

Thailand's national greenhouse gas (GHG) emissions represent only 0.84% of global emissions in 2012. The country's share of cumulative emissions from 1990-2012 is 0.75%. In 2012, per capita GHG emissions is at 5.63 tCO_2e and emissions per GDP (US$ million) is 409.54 tCO_2e, which is lower than world average. In terms of emission profile, the Second National Communication indicates that 67% of total GHG emissions in Thailand in 2000 is from the energy sector. In 2012, CAIT data indicates 73% share is from energy. Consequently, Thailand's mitigation efforts have focused primarily on the energy, including transport sector.

At COP20 in Lima, Thailand pledged our pre-2020 contribution of 7-20% GHG emission reduction by 2020 below business-as-usual (BAU) in the energy and transport sectors. According to a preliminary analysis, Thailand has already achieved 4% of GHG emission reduction from the projected 2020 BAU and is well on track to achieving the 7% target pledged as voluntary domestic efforts by 2020. Our INDC will continue such efforts with ambitious plans in the relevant sectors while considering also our national circumstances and context, including:

❑ **Thailand has taken early actions in the field of energy and has very ambitious plans in the relevant sectors.**

Energy security has long been an issue of concern over the course of Thailand's development. In the past, power generation in Thailand relied heavily on crude oil imports. To remedy this, the Government initiated a shift to natural gas in the power generation sector as early as the 1980s. Such effort has continued throughout the 1990s. And, in 2005 about 72% of electricity in Thailand was generated using natural gas, which is already a cleaner alternative to other types of fossil fuels. These early actions imply that Thailand is left with less available choices and faced with higher marginal cost of further reducing GHG emission in the energy sector.

Despite some limitations due to our early actions, the Ministry of Energy is taking a step forward to balance three key aspects of energy planning for Thailand: security, economy and ecology, also taking into account the need to address climate change. Ambitious targets are defined in the Power Development Plan (PDP), the Alternative Energy Development Plan (AEDP) and the Energy Efficiency Plan (EEP). For example, the PDP sets a target to achieve a 20% share of power generation from renewable sources in 2036. The AEDP aims to achieve a 30% share of renewable energy in the total final energy consumption in 2036. The EEP plans to reduce the country's energy intensity by 30% below the 2010 level in 2036.

The Environmentally Sustainable Transport System Plan also proposes ambitious actions to promote road-to-rail modal shift for both freight and passenger transport, which include extensions of mass rapid transit lines, construction of double-track railways and improvement of bus transit in the Bangkok Metro areas. A vehicle tax scheme based on CO_2 emission was also approved and will become effective beginning 2016. In addition, just last year the Government adopted the Waste Management Roadmap, aiming towards more efficient and sustainable waste management and promotion of power generation from waste-to-energy technologies. The roadmap can contribute tremendous environmental benefits in terms of GHG emission and pollution reduction. Currently, the Ministry of Natural Resources and Environment is also studying the potential to reduce carbon emission in the forest sector through the REDD+ Readiness. We will continue to explore further opportunities and cooperation in this sector.

❑ **Major barriers to successful implementation include high costs and capacity constraints.**

It is important to incorporate concerns that several of the proposed measures and actions in these ambitious plans are subject to very high investment and operating costs, particularly costs of technologies and infrastructures which can become an important barrier to successful implementation of the plans. Some of the key barriers for the energy sector include, for instance, limitation of grid connection due to inadequate capacity of transmission lines, lack of support by financial institutions for energy efficiency and renewable energy investments, lack of domestic technological and technical resources and negative public perception particularly against waste-to-energy and biomass power plants. Several measures require a high level of technical capacity and effective coordination across different sectoral agencies, whereas such technical capacity and effective coordination in a developing country like Thailand is currently lacking. For renewable energy development in particular, the International Energy Agency also cited some of the above-mentioned barriers as common barriers for renewable energy deployment in developing countries. Domestically, Thailand has launched several support mechanisms such as feed-in tariffs, tax incentives and access to investment grants and venture capital to promote renewable energy. However, to achieve ambitious and more rapid renewable energy deployment, incentives have to be created for technology developers to cooperate and

share technology knowledge to enable technology transfer on a larger scale. International financial support mechanisms such as technical assistance and technology transfer funds for purchasing intellectual property rights for a free distribution of clean energy technologies would be very valuable to accelerate diffusion of renewable energy technologies for developing countries[1]. Furthermore, efforts are needed to inform the public, through lessons-learned and experience sharing from other countries, as well as showcasing success stories from pilot or demonstration projects, for instance. It is therefore crucial that international cooperation through the UNFCCC focus on these cooperative attempts to unlock the potentials of developing countries in their contributions towards the global solutions to climate change by addressing these important identified barriers, making technological solutions more affordable for developing countries and strengthening the capacity of developing countries to implement these solutions more effectively and more sustainably. Successful implementation of these ambitious mitigation plans in Thailand, in addition to our domestic efforts, will be subject to adequate and predictable access to enhanced means of implementation agreed under the UNFCCC.

Adaptation Efforts

Thailand is a country located in a tropical Southeast Asian peninsula and has 2,420 kilometres of coastline on the Gulf of Thailand and the Andaman Sea. According to the Fifth Assessment Report by the Intergovernmental Panel on Climate Change (IPCC), Southeast Asia is one of the two most vulnerable regions in the world to coastal flooding. In addition, this region is predicted to face with increased annual mean precipitation and extreme precipitation. Geographically therefore, Thailand is a country highly vulnerable to adverse impacts of climate change, and is ranked as the eleventh country most affected by climate-related impacts from 1994–2013.

Thailand is also considered one of the sixteen countries in the "extreme risk" category that are most vulnerable to the future climate change impacts over the next thirty years. Statistically, from 1955 to 2005, Thailand experienced an increase of 0.95°C for mean temperature, 0.86°C for maximum temperature and 1.45°C for minimum temperature. From 1955-2014, number of rain days in Thailand has significantly decreased by 0.99 day per decade while daily rainfall intensity increased. National projections indicate heavier rainfalls are expected in areas with already high precipitation level, such as the southern peninsula, whereas for the arid, inland northeastern region, precipitation level is expected to decline even further. As a result, severe flooding and drought can be expected. Severe flooding in a similar magnitude to the 2011 flood in Thailand could cost as much as US$40 billion to the economy, and led to an estimated 2.5% drop in global industrial production. The economic loss due to the recent drought can be estimated as equivalent to 0.52% of the country’s GDP in 2015, with disproportionate impacts to the agricultural sector, and in particular to subsistent farmers .

Adaptation is therefore top priority in Thailand's national response to climate change. Thailand’s adaptation efforts aim to enhance climate resilience through the guidance of the Philosophy of Sufficiency Economy, bestowed by His Majesty King Bhumibol Adulyadej. Sufficiency Economy stresses the middle path as an overriding principle for appropriate conduct by Thai people at all levels, from family to community to country. “Sufficiency” means moderation, reasonableness, and the need of self-immunity for sufficient protection from impact arising from internal and external changes. To achieve this, the application of knowledge with due consideration and prudence is essential. In particular, great care is needed at every step in the utilization of

[1] IEA (International Energy Agency) (2011), *Renewable Energy. Policy Considerations for Deploying Renewables,* OECD/IEA, Paris.

theories and methodologies for planning and implementation. In addition, a way of life based on patience, perseverance, diligence, wisdom and prudence is indispensable to create balance and be able to cope appropriately with critical challenges, arising from extensive and rapid socioeconomic, environmental, and cultural changes in the world.

Thailand's prioritized adaptation efforts include:

- Promote and strengthen Integrated Water Resources Management (IWRM) practices to achieve water security, effective water resource management to mitigate flood and drought
- Safeguard food security through the guidance of Sufficiency Economy Philosophy e.g. an application of the New Theory in agriculture and land management to promote appropriate resource allocation and economic diversification at the household level and sustainable management of community forests to promote food security at the community level, for instance
- Promote sustainable agriculture and Good Agricultural Practice (GAP)
- Increase capacity to manage climate-related health impacts - including through development of health surveillance and early warning systems, systematic climate risk assessment and effective disease prevention and response measures to climate change related health consequences
- Increase national forest cover to 40% through local community participation, including in particular headwater and mangrove forests to enhance adaptive capacities of related ecosystem
- Safeguard biodiversity and restore ecological integrity in protected areas and important landscapes from the adverse impacts of climate change, with the emphasis on vulnerable ecosystems and red list species
- Develop participatory, integrated marine conservation and coastal rehabilitation plan to protect marine ecosystem and enhance climate proofing infrastructure to strengthen coastal protection against erosion
- Promote nature-based and sustainable tourism while enhancing better understanding on risk and vulnerability of the tourism sector, especially in hotspot areas
- Strengthen disaster risk reduction and reduce population's vulnerability to climate risk and extreme weather events through enhanced awareness, coordination and adaptive capacity of local communities, especially in the disaster risk-prone areas
- Strengthen climate modeling capacity while promoting collaboration among relevant agencies
- Establish effective early warning system and enhance the adaptive capacity of national agencies through multi-hazard risk assessment, systematic observations, integrative research and development of database, model, and technology
- Build regional climate resilience by serving as a knowledge hub to foster regional cooperation and exchange experiences on adaptation

These shortlisted adaptation efforts are essential to build and enhance Thailand's resilience to climate impacts. As guided by the Philosophy of Sufficiency Economy, knowledge building and careful planning is fundamental to the efforts to raise adaptive capacity of stakeholders at different levels. This requires cautious application of local wisdoms in combination with modern knowledge, techniques and technologies. Effective implementation of such adaptation efforts therefore requires substantive and ongoing capacity building of relevant stakeholders to be able to raise the necessary adaptive capacity to respond successfully to climate variability and change. Adequate financial resources and appropriate technology development and transfer are

extremely important and can lead to improved outcomes and increased coping, thus enhancing adaptive capacity under various conditions of climate change. Thailand's Technology Needs Assessment (TNA) report formulated in 2012 has identified three highly impacted sectors in urgent need of adaptation technologies. These are:
(1) Agriculture, in need of forecasting and early warning system technologies, crop improvement technologies, and precision farming technologies
(2) Water Resource Management, in need of networking (via pipes and canals) and management of infrastructures (including zoning), seasonal climate prediction, and sensor web using observation and/or modeling data
(3) Modeling, in need of an integrated national data center, national data transfer/management process and the advanced research, weather research and forecasting (WRF - ARW) model, and an integrated model to address the need of agricultural sector and water resource management sector

During 2009-2011, budget for adaptation actions in Thailand accounted for 68% of the total budget allocated to climate change. As climate change continues, the need for adaptation finance is expected to substantially increase in the future, consequently creating extra burden on an already scarce government fiscal budget of many developing countries including Thailand. To ensure that adaptation actions can be effectively enhanced to address the distress experienced in highly vulnerable developing countries, it will be necessary to secure adequate means of implementation including finance, technology development and transfer and capacity building for adaptation in the new global agreement under the UNFCCC. Adaptation undertakings of developing countries do not provide benefits only at the local and national scales, but also contribute to the resilience of global food production system, enable ecosystem and biodiversity protection, enhance the livelihood particularly of low-income population and contribute to the achievement of the global millennium and sustainable development goals, as well as the objective of the UNFCCC set forth in its Article 2.

Finally, recognizing that long-term and continuous effort is required to address climate change, Thailand has formulated the National Strategic Plan on Climate Change B.E. 2551-2555 (2008-2012) and the Climate Change Master Plan B.E. 2558-2593 (2015-2050), providing a continuous framework for measures and actions in the long-term. The Climate Change Master Plan has laid out a vision to achieve climate-resilient and low-carbon growth in line with sustainable development path by 2050, and has recently been approved by the Cabinet. Relevant agencies in various sectors are now in the process of formulating specific sectoral plans to address climate change, based on this framework plan. Therefore, it is expected that further concrete mitigation and adaptation actions will be proposed in respective sectors.

The information provided in this INDC aims to enhance clarity and understanding, and Thailand is willing to provide additional information to further enhance its clarity. Thailand encourages other Parties with similar or more advanced national circumstances to submit their INDCs as soon as possible. As a developing country, Thailand places great importance on the global efforts in addressing climate change, and will continue to play a constructive role in the UNFCCC process.