

Regulations for Periodic Regulatory Goals and Approaches of the Greenhouse Gas Emissions

Announced Date: 2017.03.28

Full text of 12 articles enacted and promulgated on March 28, 2017.

Article 1

This Regulation has been formulated in accordance with Paragraph 1 of Article 11 of the Greenhouse Gas Reduction and Management Act (the Act).

Article 2

Greenhouse gas periodic regulatory goal (periodic regulatory goal) is set on a five-year basis, in which the first phase refers to the period from 2016 to 2020, and so forth in subsequent phases.

Article 3

The following factors shall be taken into account whilst setting up each periodic regulatory goal in line with the long-term national greenhouse gas (GHG) emission reduction goal, pursuant to Paragraph 1 of Article 4 of the Act:

1. Taking fairness and common but differentiated international responsibilities.
2. Cost effectiveness: ensuring that GHG emission reduction goal will be achieved with the lowest cost, and the reasonable economic efficiency and break-even method.
3. Utilizing scientific knowledge and technology relevant to climate change, including domestic applications and feasible technologies for climate change.
4. Circumstances associated with economic and industrial development, including considerations associated with the likely impact on economic and industrial competitiveness.
5. Financial circumstances, including the likely impact on taxes, public revenues and expenditures and government debt financing.
6. Societal circumstances, including the likely effect of the energy costs, lives and properties for special circumstances families, low and middle-income households.
7. Energy policies, including the likely impact on the establishment of energy infrastructure, energy prices and low-carbon energy selection on stable

- energy supply and electricity emission factor.
8. Environmental effect, including the likely impact of the GHG emission reduction actions on environmental quality in varying dimensions.
 9. The implementation status of the imported fossil fuels taxation mechanism.
 10. The United Nations Framework Convention on Climate Change (UNFCCC) and its agreements, or relevant decisions made under international conventions.
 11. Other matters identified by the central competent authority.

Article 4

The periodic regulatory goal of the Greenhouse Gas Reduction Action Plan (Action Plan) shall cover national and sector-based periodic regulatory goals pursuant to Paragraph 1 of Article 9 of the Act. The determination of respective periodic regulatory goals shall be assessed on the basis of implementation within 10 years of each respective stage.

Electricity consumption emissions of the sector-based periodic regulatory goal shall be estimated according to the periodic electricity emission factor goal. The periodic electricity emission goal and the responsibility of the reduction of public utilities shall be defined by the energy sector's periodic regulatory goal. Moreover, the allowance of the indirectly emitted CO₂ provided by the public utilities shall be deducted.

The deviation between the actual electricity emission factor pursuant to the foregoing paragraph and the periodic electricity emission factor goal multiplied by electricity sales volume shall be the responsibility of the energy sector.

Article 5

Whilst the central industry competent authorities of respective sectors, which pursuant to Paragraph 3 of Article 9 of the Act, set up the GHG Emission Control Action Programs for sectors (Action Program), respective industry competent authorities shall be coordinated in line with it.

The determination of sector-based periodic regulatory goal in the Action Program pursuant to the foregoing paragraph shall be based on the attainment of sector-based GHG emission regulatory goal.

Article 6

In order to assess and review the status of the periodic regulatory goals and sector-based GHG emission regulatory goals, the central competent authority shall consult with the central industry competent authorities of respective sectors for setting up national and sector-based assessment indicators which are included in the Action Plan and Action Program respectively.

Article 7

The central competent authority shall consult with the central industry competent authorities to determine the national GHG emission trend projection principles and parameters as well as to project GHG emission trends and scenario analysis by considering the factors listed in Article 3.

In order to determine and amend the periodic regulatory goal of each respective stage, the central industry competent authority of respective sectors shall invite other competent industry authorities to study, discuss and submit GHG reduction scenario, reduction contribution and estimation of the reduction cost of the respective sectors.

Article 8

The central industry competent authorities of the respective sectors shall submit their impact assessment of the periodic regulatory goal and actions in response to economic, energy, environmental, and societal aspects to the central competent authority for compilation and comprehensive evaluation.

Article 9

The central competent authority and the central industry competent authorities of respective sectors shall consult with experts, hold public hearings and provide a written record whilst setting up the periodic regulatory goals and sector-based GHG emission regulatory goals.

For the information regarding the time, location and procedures of public hearings pursuant to the foregoing paragraph, it shall be posted on the internet, as well as in the government gazette, newspapers and other appropriate media for public access.

Citizens or groups may present opinions with their names or titles and addresses in writing or on the internet to the central competent authority or central industry competent authorities before the periodic regulatory goals are submitted to the Executive Yuan for approval.

The references and other relevant information of the foregoing opinions shall be posted on the internet or published in the government gazette and other appropriate media for public access.

Article 10

Whilst compiling the annual execution status reports pursuant to Paragraph 1 of Article 12 of the Act, the central competent authority shall review the previous year's statistics of CO₂ emissions from fuel combustion, followed by inspecting the attainment status of the periodic regulatory goals in the following year in accordance with the detailed statistics of national GHG emissions inventory referred to in Paragraph 2 of Article 13 of the Act.

After the GHG cap-and-trade scheme was enacted, the central competent authority shall compile the foreign emission allowance acquisition information in the status of the periodic goal mentioned in the foregoing paragraph.

The central competent authority shall submit a periodic progress report to the Executive Yuan no later than December 31 of the second year after the end of each respective stage.

Article 11

Amendment of the periodic regulatory goals based on Paragraph 2 of Article 12 of the Act shall be submitted to the Executive Yuan for approval in accordance with Article 6 to Article 9.

Article 12

This Regulation shall enter into effect on the date of promulgation.

二十二、National Climate Change Action Guidelines

National Climate Change Action Guidelines

Announced Date: 2017.02.23

I. Preface

Climate change, caused by greenhouse gas emissions from economic activities, has led to ever-rising average global temperature, impacting both humankind and the ecosystem. Taiwan is no exception; the frequency of extreme rainfalls, typhoons, days with high temperatures and volatility of precipitation in Taiwan are expected to increase significantly in the coming years. This will severely impact numerous areas, including water resources, homeland security, coastal environments, marine resources, food security, public health, and biodiversity.

Climate change is indeed posing a rigorous challenge to the entire planet. Despite the difficult challenge of transforming the energy and industrial structure, Taiwan has reiterated that it will spare no effort to reduce greenhouse gas emissions while complying with the Paris Agreement and the United Nations' Sustainable Development Goals. Pursuant to Article 9, Paragraph 1 of the Greenhouse Gas Reduction and Management Act, promulgated in 2015, the central competent authority, namely the Environmental Protection Administration of the Executive Yuan, has the responsibility to formulate the National Climate Change Action Guidelines (Action Guidelines) and the Greenhouse Gas Reduction Action Plan (Action Plan) as the general guidance for the task of reducing greenhouse gases for the whole nation.

Taiwan endeavors to reduce greenhouse gas emissions, realize environmental justice, establish global partnerships, adopt low carbon lifestyles, and achieve the ultimate goal of sustainable development. It will do so through cooperation between central and local authorities, non-governmental organizations and the general public as well as the development of climate change adaptation and mitigation strategies, which take into account intergenerational equity and the right of minority groups.

II. Prospects and Objectives

1. Prospects

Formulate adaptation strategies; reduce and manage greenhouse gas emissions; construct a green and low carbon homeland that is adaptive to climate risk; ensure sustainable development of the nation.

2. Objectives

- (1) Enhance overarching adaptability; minimize vulnerability; build-up resilience.
- (2) Gradually reduce GHG emissions to 50% of the 2005 emission level by 2050.

III. General Principles

The government shall observe the following principles:

1. Comply with the provisions of the Paris Agreement to enhance greenhouse gas mitigation and gradually phase out the use of hydrofluorocarbons (HFCs) (which have high global-warming potential) pursuant to the Kigali Amendment to the Montreal Protocol.
2. Acknowledge that transparency, environmental co-benefits and cost-effectiveness should be considered in both policy formulation and implementation of mitigation and adaptation issues.
3. Implement a cap-and-trade scheme for greenhouse gases and taxation to put carbon pricing and green finance into practice and enhance economic incentives, reduce greenhouse gas emissions, assist green industrial development, improve national competitiveness, and promote social welfare.
4. Comply with the objective of a nuclear-free homeland, such that expansion in nuclear power will not be adopted as a means of combating climate change.
5. Take mitigation and adaptation strategies into consideration while performing environmental impact assessments.
6. Enhance capacities with regard to basic science, early warning, adaptive response to climate change, and resilience development.

7. Improve energy and resource utilization efficiency, boost resource recycling, and ensure national energy security and sustainable utilization of resources.
8. Establish a communication platform on which to build partnerships between the central and local governments, as well as cooperation between public and private sectors, to practically execute localized adaptation and mitigation measures.
9. Boost international cooperation and authentic participation, based on the principle of reciprocity, to maintain industries' international competitiveness.
10. Increase public awareness and build the capacity to respond to climate change, and proactively assist non-governmental organizations to participate in relevant events.

IV. Adopted Policies

1. Climate Change Adaptation

(1) Enhance disaster risk evaluation and disaster management

- Conduct disaster risk evaluation of climate change; review the vulnerability highlighted by previous extreme climate disasters, assess measures that have been taken, and review their effectiveness in mitigating risks and vulnerabilities.
- Strengthen risk management of climate change; improve early warning and response mechanisms; conduct simulations of scenarios, comprehensive risk evaluation and management, climate risk sharing mechanisms, and develop an adaptation program to respond to extreme weather impacts and enhance resilience.

(2) Raise resilience of infrastructure

- Strengthen the ability of construction, risk assessment and repair of energy and water supply systems.
- Improve adaptability of facilities of transport, communication and information systems against climate change.

(3) Maintain a balance between water supply and demand

- Establish diversified water resource acquisition strategies as well as water conservation and water circulation habits; reasonably allocate water resources for different purposes to ensure sustainable usage of water.
 - Strengthen the flexibility of water resource system against climate change, drastic increase in rainfall, and increased volatility of water levels during wet and dry seasons.
- (4) Assure land use safety and strengthen land consolidation and management mechanisms
- Carry out environmental conservation; perform reasonable land conservation and restoration; strengthen land management mechanisms to assure land use safety.
 - Enhance the resilience of urban and rural areas and improve land use sustainability.
 - Implement river basin management policies, which include integration and harmonization of river basin safety, humans, the environment and ecology.
- (5) Prevent coastal hazards and ensure sustainability of marine resources
- Establish appropriate prevention facilities or mechanisms to mitigate coastal disasters.
 - Protect marine resources and marine wildlife habitats; foster sustainable development of the ecosystem.
 - Strengthen monitoring and an early warning mechanism to respond to coastal hazards and impacts of coastal change.
- (6) Improve adaptability of the energy supply system and industries
- Ensure infrastructure safety and stability of energy supply facilities.
 - Build an environment that reduces climate risks and strengthens adaptive capacities.

- Elevate businesses' ability of risk management and opportunity exploration, to develop climate-resilient products and services.

(7) Secure agricultural production and ensure biodiversity

- Safeguard resources for agricultural production; strengthen the monitoring and early warning system; reinforce government subsidies and insurance system; integrate technology to improve the capacity for stress resistance in agriculture, forestry, fishery and animal husbandry; ensure food security and construct sustainable agriculture that is adaptive to climate risks.
- Refine the management of nature reserves; establish a long-term ecology monitoring system; improve preservation and reasonable application of species and genetic diversity, respectively.

(8) Reinforce the public health and epidemic prevention system and improve health risk management

- Strengthen the capabilities of the public health and epidemic prevention systems for prevention, mitigation, contingency and recovery.
- Improve the ability of health risk monitoring, impact assessment and prevention to protect public health and ensure the rights of minority groups.

2. Climate Change Mitigation

(1) Adjust the energy supply structure and improve energy efficiency

- Adjust the structure of energy supply, increase renewable energy deployment, construct a low carbon energy supply system, and accelerate the expansion of green energy within the energy mix.
- Improve the efficiency of energy generation, usage, transmission and distribution, and promote energy conservation.
- Take environmental quality and regional development into account during energy planning.

(2) Transform to green business and execute sustainable production and

consumption strategies

- Provide counseling services to transform industries into green and low-carbon enterprises and boost green energy industries to raise the international competitiveness of products.
- Compose comprehensive incentives for greenhouse gas reduction and augment greenhouse gas mitigation measures taken by industries.
- Foster sustainable consumption habits and assist industries to apply sustainable production processes.

(3) Develop green transportation and improve energy efficiency of the transportation system

- Expand public transport systems and strengthen management of transportation demands.
- Construct a green transport network, promote the use of low-carbon transportation, and create a green mode-oriented environment.
- Enhance energy use efficiency of vehicles and transport systems.

(4) Construct sustainable buildings and low-carbon living areas

- Reinforce energy conservation regulations for buildings; improve energy efficiency of buildings; implement carbon reduction measures for both new and existing buildings.
- Implement energy efficiency classification and incentive mechanisms for existing buildings.
- Conduct urban afforestation and consolidate the efforts of local governments and citizens to establish low-carbon living areas.

(5) Boost the development of sustainable agriculture

- Implement eco-friendly agricultural cultivation to stabilize agricultural production; preserve the environment related to agriculture, forestry, fishery and animal husbandry to ensure sustainable development of agriculture.

- Promote low-carbon agriculture; encourage the application of renewable energy for agricultural purposes, and improve agricultural resource recycling.
- Strengthen forest resource management; increase forest resources; raise the net quantity of national carbon sinks to elevate the benefits of forests' carbon sequestration.

(6) Alleviate environmental burdens and build a society that reuses and recycles energy and resources

- Incorporate practical actions of building resilience, greenhouse gas reduction, and environmental co-benefits when conducting environmental impact assessment of government policies and development projects.
- Perform energy and resource recycling to enhance the reuse of regional energy and resources.
- Decrease the greenhouse gas emissions from waste and sewage treatment.

3. Complementary Policies

(1) Mobilize capital from the private sector through the implementation of green finance; foster the development of the green energy industry and boost resilience.

(2) Internalize the external costs incurred by greenhouse gas emissions via the carbon pricing scheme, including green taxation and cap-and trade.

(3) Construct channels for the general public to access relevant climate change information; provide incentives or subsidy measures to trigger behavior change and region-specific low carbon action.

(4) Promote climate change-related environmental education; cultivate professional personnel to respond to climate change issues; enhance the awareness and skills of the general public and convert them into daily low-carbon actions.

V. Future Implementation

In order to reinforce adaptability to climate change, relevant central government agencies shall follow instructions of the Action Guidelines to implement adaptation action plans in various fields. To achieve the national long-term emission reduction goals, the Taiwan government will review the periodic regulatory goals every five years and examine their validity regularly. Through the implementation of the Action Plan, the Greenhouse Gas Emission Control Action Program of the energy, manufacturing, transportation, agriculture, environmental, residential and commercial sectors, along with the Greenhouse Gas Control Implementation Plan of municipality and city authorities, the vertical and horizontal integration of different bodies of the Taiwan government will comprehensively expand the capacity to combat climate change and create the co-benefits of sustainable development of society, the economy and the environment, along with public health protection.

二十三、Greenhouse Gas Reduction Action Plan

Greenhouse Gas Reduction Action Plan

Announced Date: 22 March 2018

I. Preface

The Executive Yuan approved the National Climate Change Action Guidelines (Action Guidelines) on February 23, 2017, as the general guidance for our national policy in greenhouse gas (GHG) mitigation and climate change adaptation. Pursuant to Article 9, Paragraph 1 of the GHG Reduction and Management Act (the Act), the Environmental Protection Administration of the Executive Yuan (EPA) formulated the GHG Reduction Action Plan (the Action Plan) in accordance to the GHG mitigation policy set in the Action Guidelines to achieve the mid-term vision of reducing GHG emissions to 20% below the level of 2005 by 2030, and finally to reach the long-term national GHG reduction goal, set in Article 4 of the Act, of reducing GHG emissions to 50% below the level of 2005 by 2050. The Action Plan is established to launch national cross-agency actions involving central and local governments, public and private partnerships to consolidate the national GHG mitigation policy. The Action Plan will be reviewed once every five years.

II. Prospects and Objectives

Pursuant to Article 11, Paragraph 2 of the the Act, and the Regulations For Periodic Regulatory Goals and Approaches of the GHG Emissions publicized on March 28, 2017, the Taiwan EPA, in consultation with the central industry competent authority, shall set each stage's regulatory goal. The national goal is expressed in terms of net emissions after subtraction of carbon sink from the total GHG emission volume, including 7 GHGs, namely carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydro fluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃). The implementation of periodic regulatory goals will be evaluated according to the national GHG emissions inventory regarding the status of accomplishing the goals.

The national GHG reduction roadmap is set to start with slight reduction at the beginning followed by a rapid drop to achieve our national goal of reducing GHG emissions to 2% below the level of baseline year 2005 by 2020 (i.e. the net GHG emissions shall be 260.717 million tons of carbon dioxide equivalents (MtCO_{2e}). Our further goal is to reach 10% below the baseline year by 2025 and 20% below that by 2030. The GHG reduction responsibility shall be commonly shared between the energy, manufacturing, transportation, residential and commercial, agriculture and environmental sectors (as shown in the figure).

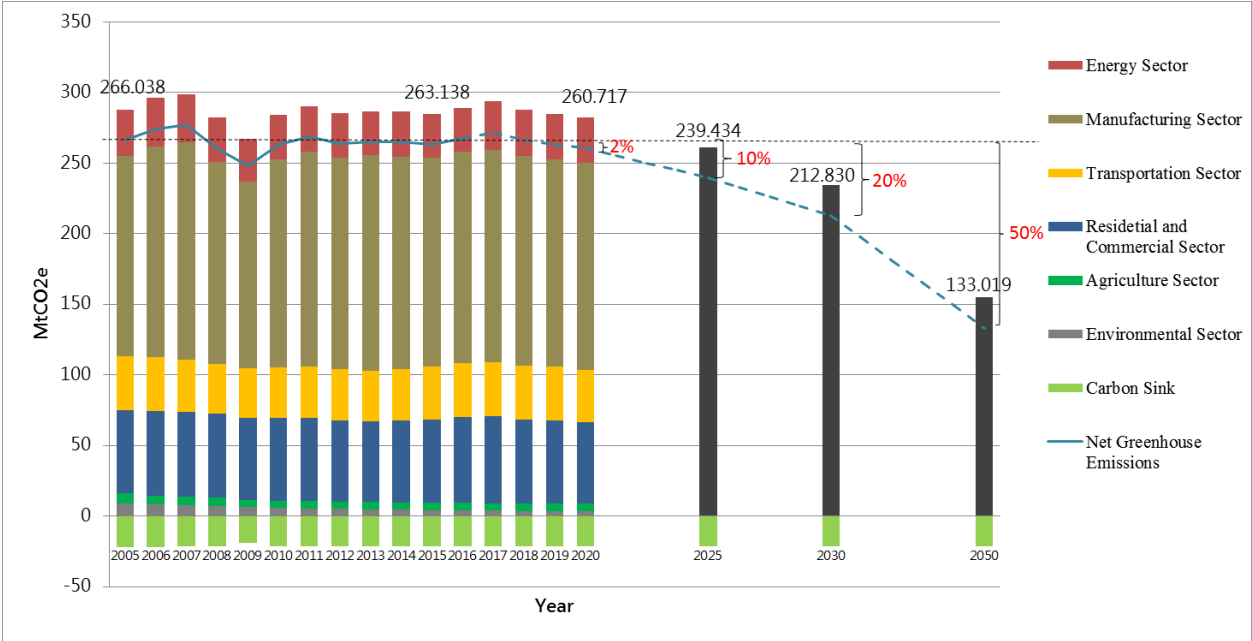


Figure Six Major Sectors of Emissions Status and Short-, Medium-, Long-term Reduction Targets in Taiwan

1. GHG emission at 2020

(1) National net GHG emissions: 2% below the level of 2005 (260.717 MtCO_{2e}).

(2) Sectoral GHG emissions:

- i. Energy Sector: 32.305 MtCO_{2e}
- ii. Manufacturing Sector: 146.544 MtCO_{2e}
- iii. Transportation Sector: 37.211 MtCO_{2e}
- iv. Residential and Commercial Sector: 57.530 MtCO_{2e}
- v. Agriculture Sector: 5.318 MtCO_{2e}
- vi. Environmental Sector: 3.496 MtCO_{2e}

(3) Periodic electricity emission factor goal (the goal for 2020): 0.492 CO₂e/kWh (excluding electricity consumed by electric power generation plants, self-use electric generators and line loss)

2. The first phase periodic regulatory goal

The first phase periodic regulatory goal refers to the regulated total GHG emissions set for the period from 2016 to 2020.

(1) National periodic regulatory goal: 1437.531 MtCO₂e

(2) Sectoral periodic regulatory goal:

- i. Energy Sector: 163.139 MtCO₂e
- ii. Manufacturing Sector: 741.543 MtCO₂e
- iii. Transportation Sector: 189.663MtCO₂e
- iv. Residential and Commercial Sector: 298.845 MtCO₂e
- v. Agriculture Sector: 26.187 MtCO₂e
- vi. Environmental Sector: 18.154 MtCO₂e

(3) Periodic electricity emission factor goal (annual average): 0.517 CO₂e/kWh

III. Responsibilities of Competent Authorities in Charges

Relevant central government agencies shall promote GHG reduction and climate change adaptation through the following actions as assigned:

1. Development of renewable energy and energy technology. [organizer: Ministry of Economic Affairs (MOEA); co-organizer: Ministry of Science and Technology (MOST)]
2. Improvement of energy efficiency and energy conservation. [organizer: MOEA; co-organizer: various central industry competent authorities]
3. Reduction in GHG emissions by industrial sectors. [organizer: MOEA; co-organizer: MOST]
4. Transportation management, development of mass transit systems, and reduction in GHG emissions by other transportation sectors. [organizer: Ministry of Transportation and Communications (MOTC); co-organizer: MOEA]
5. Implementation of low-carbon energy transportation. [organizer: MOTC; co-organizer: MOEA, Environmental Protection Administration, Executive Yuan (EPA)]

6. Reduction and management of GHG emissions from buildings. [organizer: Ministry of the Interior (MOI); co-organizer: MOEA]
7. Waste recycling and reuse. [organizer: EPA; co-organizer: various industry competent authorities]
8. Forest resource management, biodiversity conservation, and strengthening of forests' carbon sequestration. [organizer: Council of Agriculture, Executive Yuan (COA); co-organizer: MOI]
9. Reduction and management of GHG emission from the agriculture and guarantee of food security. [organizer: COA]
10. Green finance and GHG reduction incentive mechanisms. [organizer: National Development Council (NDC); co-organizer: Financial Supervisory Commission (FSC), Ministry of Finance (MOF)]
11. Assessment of impact of GHG reduction on the economy as a whole and planning of response measures. [organizer: NDC; co-organizer: MOEA]
12. Establishment of a GHG cap-and-trade scheme including allocation, auction, allowance sale, trade, and facilitation of international emission reduction cooperation mechanism. [organizer: EPA; co-organizer: MOEA, FSC, Ministry of Foreign Affairs (MOFA)]
13. Research, development and implementation of GHG reduction technologies. [organizer: MOEA; co-organizer: MOST]
14. Study of international GHG conventions and laws and participation in international conferences. [organizer: EPA; co-organizer: various industry competent authorities]
15. Development and implementation of matters connected with climate change adaptation. [organizer: NDC, EPA; co-organizer: various industry competent authorities]
16. Education and advocacy of climate change adaptation and GHG reduction. [organizer: MOE, EPA; co-organizer: various central industry competent authorities]
17. Other climate change adaptation and GHG reduction matters. [organizer: EPA; co-organizer: various industry competent authorities]

Pursuant to Article 9, Paragraph 3 of the Act, the central industry competent authorities charged with the nation's energy, manufacturing, transportation, residential and commercial, and agriculture sectors in determining the GHG Emission Control Action Programs for the sectors are assigned as follows: energy sector (MOEA), manufacturing sector (MOEA and MOST), transportation sector (MOTC), residential and commercial sector (MOI and MOEA), agriculture sector (COA), and environmental sector (EPA).

IV. Implementation Strategies

1. Implementation of sectoral reduction strategies

(1) Adjust the energy supply structure and improve energy efficiency

- i. Assessment index for the energy sector: 10,875 MW of renewable energy installation capacity to generate 25.2 billion kWh of electricity in 2020; 27,423 MW of renewable energy installation capacity to generate 54.5 billion kWh of electricity in 2025, with 20% electricity generation from renewable energy.
- ii. Adjust the structure of energy supply, increase renewable energy deployment, construct a low-carbon energy supply system, and accelerate the expansion of green energy within the energy mix.
 - (i) Implement research and application of renewable energy technology to reduce the reliance on fossil fuels.
 - (ii) Expand the use of natural gas in stages to increase the ratio of low-carbon energy supply.
 - (iii) Research and develop or introduce international GHG reduction technology to existing power plants.
 - (iv) Implement to achieve the goal of—lowering periodic electricity emission factor in stages.
 - (v) Develop renewable energy to increase its share in the energy mix; construct a renewable energy-friendly environment and assist the development of low-carbon smart cities with unique local features; encourage the installation of decentralized power facilities to help balance regional supply and accelerate the development of renewable energy.
 - (vi) Develop decentralized electric power storage technology; implement the installation of all varieties of energy storage systems.
 - (vii) Reflect the cost of energy resources on energy pricing to avoid inappropriate subsidies to fossil fuels and internalize the external environmental cost.
 - (viii) Provide economic incentives to bring investments into renewable energy development; implement the renewable energy certification system.

- iii. Improve the efficiency of energy generation, transmission and distribution, usage and promote energy conservation.
 - (i) Implement accelerated retirement of existing power plants and oil refineries; regulate newly built and expanded power plants to adopt best available technology.
 - (ii) Implement a smart grid infrastructure, such as strengthen the power grid structure and management; increase power grid reliability; improve power generation, transmission and distribution efficiency.
 - (iii) Install smart meters for low voltage users and apply time-based electricity pricing in response to supply and demand; encourage the public to change its behavior in using electricity.
 - (iv) Evaluate the establishment of Minimum Energy Performance Standards (MEPS) for energy-consuming equipment to improve energy consumption efficiency.
 - (v) Electricity Retailing Enterprise shall draft up an annual incentive program that encourages and assists the users to save energy.

- iv. Take environmental quality and regional development into account during energy planning.
 - (i) Environmental impact assessment for energy development policy should consider regional and cross regions pollution burden to lower GHG emissions and improve air quality, and consider climate change-related environmental factors.
 - (ii) Energy users of large-scale manufacturing investment projects should publish a statement of energy usage, and conduct environmental impact assessment for the development to comply with local environmental quality standards or assure any of the currently non-compliant environmental quality not to deteriorate further.

- (2) Transform to a green business and execute sustainable production and consumption strategies
 - i. Assessment index for the manufacturing sector: The carbon intensity within the manufacturing sector should be 43% lower in 2020, and 50% lower in 2030 in comparison to the level in 2005.

- ii. Assist industries to transform into green and low-carbon enterprises and boost green energy industries to raise the international competitiveness of products.
 - (i) Gradual upgrade to more stringent emission standards for industrial oil burning boilers and provide subsidy for boiler alteration to use low-carbon fuels.
 - (ii) Implement transformation of energy intensive industries and application of best available technologies; encourage process improvement and retirement of old equipment.
 - (iii) Promote alternative low-carbon fuels for the industrial sector, encourage industrial operators to use clean fuels.
 - (iv) Assist industrial integration of energy resources and waste recycle and reuse, build ecological industrial systems to balance regional energy demand and supply, and raise the effectiveness of overall energy resources utilization.
 - (v) Assist industrial cooperation with research organizations to use green energy and build demonstrative green production line.
- iii. Compose comprehensive incentives for GHG reduction and augment GHG mitigation measures taken by industries.
 - (i) Assess industrial carbon reduction potential and cost effectiveness by taking both industrial carbon reduction and competitiveness into consideration.
 - (ii) Assist industries in building a climate change management mechanism and organization; enhance GHG and energy management; conduct an assessment of internalizing management cost.
 - (iii) Implement technical consultation for industrial carbon reduction to lower GHG emission intensity.
 - (iv) Implement intelligent energy management and assist industries to build energy management systems.
 - (v) Promote GHG offset programs and benchmark reward to build GHG reduction incentives.
- iv. Promote sustainable consumption habits and assist industries to apply sustainable production processes.

- (i) Introduce the product lifecycle concept into environmental designs to build a green consumption-based industrial environment.
 - (ii) Implement low-carbon green supply chain management for industries, disclosure of carbon reduction achievement by the supply chain, disclosure of renewable energy use and carbon intensity change in Corporate Sustainability Reports (CSR).
 - (iii) Assist industries in conducting clean production and implement a green factory certification system.
- (3) Develop green transportation and improve energy efficiency of the transportation system
- i. Assessment index for the transportation sector:
 - (i) Over 7% increase in national public transportation capacity by 2020 compared to 2015, and over 20% increase by 2030 compared to 2015.
 - (ii) Increase the nation's sales of electric motorcycles to 121,000 from 2018 to 2020.
 - (iii) Increase the required average fuel economy target value of the sold vehicles.
 - A. Increase the required average fuel economy target value of the new passenger cars by 30% in 2022 compared to 2014.
 - B. Increase the required average fuel economy target value of the new light-duty trucks by 25% in 2022 compared to 2014.
 - C. Increase the required average fuel economy target value of the new motorcycles within the class of vehicles engine displacement between 100c.c - 150c.c. by 10% in 2022 compared to 2014.
 - ii. Expand public transport systems and strengthen management of transportation demands.
 - (i) Enhance public transportation systems; build incentives and control measures for transferring from private to public transportation, and gradually lower the dependence on private vehicles .
 - (ii) Strengthen low-carbon shuttle transportation systems through cooperation between central and local governments with public and private participation, and increase the public's willingness to use public transportation with the integration of information and

communication technology.

- (iii) Develop rail transportation; enhance the service capacity for high speed rails, conventional rails and rapid transit networks to provide the convenience of seamless transportation.
- iii. Construct a green transport network, promote the use of low-carbon transportation, and create a green mode-oriented environment.
- (i) Reduce the obstacles to using low-carbon transportation through inspection and amendment of regulations.
 - (ii) Apply an incentive mechanism to foster retirement of private transportation; set priority to retire high polluting vehicles, such as old diesel trucks and two-stroke motorcycles to enhance environment co-benefits.
 - (iii) Implement retirement of old city buses and encourage the use of electric buses, construct low-carbon vehicle battery charging (replacement) facilities with incentive measures; build a quality environment for the use of low-carbon transportation.
 - (iv) Encourage local government to take the lead in compliance with private transportation control measures.
 - (v) Establish air quality control zones—and restrict high polluting vehicles from entering them.
- iv. Enhance transport systems and increase energy use efficiency of vehicles
- (i) Review and amend Fuel Economy Standards and Regulations on Vehicle Inspection and Administration; spur vehicle manufacturers to increase vehicle fuel efficiency.
 - (ii) Continue to set more stringent Fuel Economy Standards; enhance the implementation of regular vehicle inspection; set increasingly stringent average fuel economy standards for vehicle manufacturers and importers.
- (4) Construct sustainable buildings and low-carbon living areas
- i. Assessment index for the residential and commercial sector:
 - (i) Over 10% increase of ENVLOAD value for new buildings by 2020 compared to 2016.

- (ii) Over 5% improvement of EUI for public buildings by 2020 compared to 2015, and 10% improvement by 2025 to achieve designated EUI standards.
 - (iii) Study and consult to establish a building energy databank and develop building energy passport by 2025.
- ii. Reinforce energy conservation regulations for buildings; improve energy efficiency of buildings; implement carbon reduction measures for both new and existing buildings.
- (i) Inspect and amend building regulations to upgrade ENVLOAD design criteria and to set ENVLOAD auditing mechanism.
 - (ii) Expand the implementation of energy saving regulations for designated buildings to consolidate Maximum Energy Performance Standards (MEPS).
 - (iii) Implement the installation of smart meters to introduce energy management systems and to extend energy-saving improvement capacity.
 - (iv) Implement old building energy-saving diagnostic services and training to facilitate the effectiveness of energy-saving improvement.
- iii. Implement energy efficiency classification and incentive mechanisms for existing buildings.
- (i) Implement the improvement to existing certified old public green buildings to maintain the effectiveness of the certification and expand the participation of private buildings.
 - (ii) Set up building energy efficiency evaluation tools, prioritize disclosure of public building energy consumption information; establish a building energy consumption databank with grading system, plan and implement transparency of building energy consumption information and building energy passport system.
 - (iii) Implement the inclusion of building energy consumption information into bank loan assessment criteria, as well as the provision of low interest bank loans for building renovation and low-carbon buildings.
 - (iv) Implement the improvement of heat insulation and renovation of energy efficiency for existing buildings; provide fee exemption incentives to increase the ratio of existing building renovation.

iv. Conduct urban afforestation and consolidate the efforts of local governments and citizens to establish low-carbon living areas.

- (i) Designate new buildings over a certain scale to participate in the design for regional energy integration to build green smart cities.
- (ii) Promote low-carbon buildings and model communities to achieve a higher ratio of buildings using low-carbon energy; increase green coverage in the city, and lower the heat island effect.

(5) Boost the development of sustainable agriculture

i. Increase organic and eco-friendly agricultural cultivation area to 15,000 hectares by 2020, and 22,500 hectares by 2025.

- (i) Assist animal farms with bio-gas utilization (electric generation) to reach 50% of breeding capacity by 2020 (estimated 2.5 million heads), 75% by 2030 (estimated 3.75 million heads).
- (ii) Increase 3,636 hectares of forestry area by 2020 and 7,176 hectares by 2025.

ii. Implement eco-friendly agricultural cultivation to stabilize agricultural production; protect the environment for agriculture, forestry, fishery and animal husbandry to ensure sustainable development of agriculture.

- (i) Implement governmental subsidy and legislation for organic farming to reduce the use of chemical fertilizers and implement eco-friendly agriculture.
- (ii) Carry out reasonable logging of man-made forests; increase recycle and reuse of wood products; develop forestry by sustainable operation.
- (iii) Promote conservation of habitats to assure sustainable development of fishery.
- (iv) Promote sustainable management of animal husbandry to upgrade animal farming industry competitiveness and production efficiency.

iii. Promote low-carbon agriculture; encourage the application of renewable energy for agricultural purposes, and improve agricultural resource recycling.

- (i) Develop special features of local businesses and build an

energy-producing, energy-saving, waste-reducing and emission-reducing circular economy through low interest loans and green financing, integrate photovoltaic bio-gas reutilization (electric generation) for animal farm building to enhance competitiveness for animal farming industry.

- (ii) Improve feed ingredients in animal farms to reduce methane from enteric fermentation and build low-carbon animal agriculture.
 - (iii) Implement low-carbon agriculture through water resources management, agriculture management and soil improvement to upgrade rice and tea farming environment and cultivation techniques, and implement low-carbon agriculture.
- iv. Strengthen forest resource management; increase forest resources; raise the net quantity of national carbon sinks; and elevate the benefits of forests' carbon sequestration.
- (i) Actively implement forestry to increase the effectiveness of carbon sinks.
 - (ii) Implement long-term forestry monitoring to improve resource management and protect natural forest land.
- (6) Alleviate environmental load and build a society that reuses and recycles energy and resources
- i. Assessment index for the environmental sector: Over 60.8% wastewater treated by 2020, over 65.8% by 2025.
 - ii. Incorporate practical actions of building resilience and GHG reduction when conducting environmental impact assessment (EIA) of government policies and development projects.

Amend EIA-related regulations such as the Development Project EIA Regulations and the Designation of Policy Subject to Strategic EIA to incorporate climate change resilience and GHG mitigation consideration.

- iii. Perform energy and resource recycling to enhance the reuse of regional energy and resources.

- (i) Construct circular production and living to foster waste resources' recycling and reuse.
 - (ii) Implement sustainable material management and life cycle assessment concept to build a circular economy environment with green production, consumption and reuse.
 - (iii) Implement material recycling technologies for recycling of precious metals, diversified reuse of non-organic materials and turning organic wastes into energy towards a circular economy.
- iv. Decrease the GHG emissions from solid waste, wastewater and sewage treatment.
- (i) Implement resource recycling and reuse to reduce the volume of landfill treatment and waste disposal, and increase aerobic digestion treatment capacity for food waste.
 - (ii) Increase national sewage system coverage and treatment ratio; implement bio-gas recycling and reuse for anaerobic sludge treatment processes at all public sewage treatment plants.
 - (iii) Measure GHG emissions from industrial wastewater treatment plants and build local emission factors; implement installation of bio-gas recycling and reuse facilities for anaerobic treatment processes at industrial wastewater treatment plants.

2. Implementation of complementary policies

(1) Implement GHG cap-and-trade system

- i. Assessment index: Establish cap-and-trade regulations by 2020; launch the cap-and-trade system by 2025.
- ii. GHG emission sources and emission baseline management
 - (i) Implement GHG emissions accounting mechanism for the designated GHG emission sources over a certain scale to register verified emission data so as to ascertain GHG emissions from major sources in the nation.
 - (ii) Carry out management of GHG verification and validation institutions to ensure the validity of GHG emissions and reductions data.

iii. GHG reduction and rewarding mechanism

- (i) Implement a domestic offset system for emission sources to extend earlier GHG reduction actions into different sectors.
- (ii) Implement the mechanism to allow emission sources to meet benchmark standards to receive emission allowances; encourage designated emission sources to conduct emission reduction before the implementation of the cap-and-trade system.
- (iii) Encourage voluntary emission reduction from non-designated sources after the implementation of the cap-and-trade system.

iv. Building a GHG cap-and-trade system

- (i) Formulate a GHG allowances allocation mechanism for a cap-and-trade system.
 - A. Establish the goal for cap-and-trade and the methodology to calculate allowances allocation to entities.
 - B. Establish criteria for entities to receive allowances for free and for sale (including auction and sale), as well as the frequency of allocation and the pricing scheme.
- (ii) Formulate a GHG emission trading system
 - A. Consult with the Financial Supervisory Commission to formulate the regulations for the management of an emission allowances registration platform, and the management of emission allowances trading.
 - B. Building a GHG emission trading platform system.
 - C. Clarify emission allowances-related accounting and disclosure processes, conduct propaganda and training programs for the system to strengthen the capability of the entity.
- (iii) Formulate the criteria for validity of foreign allowances and the process for application of validation in reference to the development under international climate conventions and the achievement in domestic GHG reduction to provide supporting regulations for domestic cap-and-trade market flexibility and international linkage. The carbon market price shall be regularly reviewed and published.

(2) Implement green taxation

- i. Assessment index: Develop a green taxation-related economic incentive system in coordination with the national carbon reduction roadmap.
 - ii. Evaluate the feasibility of collecting energy or carbon tax; assess the competition and cooperation between taxes and the mechanism to integrate them; conduct public opinions solicitation and strategic impact assessment to strengthen the publicity of policy goal and complementary measures.
 - iii. Evaluate the feasibility of collecting a carbon fee or GHG management fee through amendment of the GHG Reduction and Management Act.
- (3) Mobilize capital from the private sector through the implementation of green finance; foster the development of the green energy industry by the public sector and boost resilience.
- i. Assessment index: Formulation of green finance related regulations and complementary systems by 2020.
 - ii. Coordinate banks to support the policy and the incentive mechanism implemented by each industry competent authority; provide financing to green energy industry; formulate complementary measures to support the operation of green finance market; encourage banks to adopt the Equator Principles (EPs) to facilitate the development of green energy industry.
 - iii. Develop green bonds and related regulations and complementary measures; encourage insurance companies to invest in domestic green industry and green finance commodity; develop green insurance, build a green energy industry friendly investment environment.
 - iv. Promote green loans and green bonds; implement carbon risk disclosure through the combination of public and private fund investment; integrate energy service companies with energy saving

products and technologies; assist industrial development in upgrading energy efficiency; and assist green energy industry to acquire low interest loans for building a green electricity grid and energy-storage facility.

- v. Strengthen the cultivation of talents in green low-carbon industry financing and construct cross-sector information linkages. Foster financial institutions to promote disclosure of achievement in green financing and promote the concept of green sustainability to public investors to enhance the development of green finance.
 - vi. Encourage banks to develop and promote green credit cards, and encourage investment businesses to issue domestic green funds. Develop domestic green stocks index and green bonds index. Strengthen the information platform to assist investor identification of green investment targets. Encourage credit assessment institutions to provide green credit assessment services to foster in-depth development of green finance commodities and services.
 - vii. Assist financing institutions to build a green consumption system to provide differentiated credit loans or discounts for consumers to purchase low-carbon products. Encourage public participation in green consumption.
- (4) Adapt to the economic impacts from GHG mitigation and implement the research and development of GHG mitigation technologies
- i. Assessment index: Complete the assessment of the economic impacts from GHG mitigation by 2020; complete GHG mitigation technology research pilot study and field application by 2025.
 - ii. Assess economic impact from GHG mitigation in terms of changes to national GDP, consumer price and the workforce.
 - iii. Implement GHG mitigation technology research and development.
 - (i) Carry out research and development of carbon dioxide capture and underground sequestration technology, foster carbon-based material

industry technology development to reduce carbon dioxide emissions from related industries and power plants.

- (ii) Develop alternative sources for petroleum fuels and bio-material technology to assist industrial development of bio-products in compliance to green regulations.
 - (iii) Develop hydrogen energy and fuel-cell electricity generation and energy storage technologies to enhance energy supply reliability and stability.
- (5) Construct channels for the general public to access relevant climate change information; provide incentives or subsidy measures to trigger behavior change and region-specific low-carbon action.
- i. Assessment index: Maintain a smooth channel for the transmission of climate change-related information to an accumulation of more than 2 million people through the internet by 2020. Each competent authority shall complete the formulation of rules for reward or subsidy to encourage GHG research and consolidate its implementation by 2025.
 - ii. Construct channels for the general public to access relevant climate change information.
 - (i) Establish a climate change information platform to provide climate change information, literature, training materials and research results.
 - (ii) Use different broadcast media to raise the effectiveness of campaigns.
 - (iii) Regularly investigate and assess national GHG emissions by using graphs to disclose emission information on websites to foster public awareness of the nation's status on GHG emission.
 - iii. provide incentives or subsidy measures.
 - (i) Reward the development of low-carbon products and disclose product carbon foot print information; implement the mechanism to prioritize low-carbon products in government procurement.
 - (ii) Each level of government agencies shall prioritize the implementation of institutionalized rewarding or subsidy measures to encourage outstanding performance on GHG-related research, management and implementation.
 - (iii) The distribution and ratio of GHG management fund for subsidy

programs shall consider the performance of local governments' promotion action.

- iv. Connect central, local and public organizations to consolidate local low carbon action.
 - (i) Reinforce central and local government cooperation to build cost-effective reduction strategies for the implementation of local GHG reduction action.
 - (ii) Connect and integrate existing strategies to bring about a low-carbon sustainable homeland.
- (6) Promote climate change-related environmental education; cultivate professional personnel to respond to climate change issues; enhance the awareness and skills of the general public and convert them into daily low-carbon actions.
 - i. Assessment index: Complete the national survey and evaluation of public awareness on climate change by 2020, complete the establishment of central and local climate change agencies and manpower.
 - ii. Combine the capacity of local governments and the general public in promotion of climate-change environmental education.
 - (i) Promote climate-change environmental education to consolidate carbon reduction actions through public and private partnership in community transformation and on-the-job education.
 - (ii) Combine broadcast media into all varieties of climate-change environmental education outreach activities to foster delivery of professional climate change knowledge and actions to allow the participation of the general public.
 - (iii) Subsidize NGOs to promote climate-change education.
 - iii. Cultivate professional personnel to respond to climate change issues through the education system; enhance the awareness, skills, and action of the general public.
 - iv. Establish low-carbon product labeling and service system in combination with an incentive mechanism to enhance the public's

willingness to purchase or use low-carbon products and services as a daily habit in sustainable consumption.

(7) Review to amend GHG related regulations

- i. Assessment index: Complete the review for each sector's regulations by 2020; complete the removal of regulatory barriers and the integration of relevant control and rewarding tools by 2025.
- ii. Review GHG-related control and promotional regulations for each sector to identify barriers to the implementation of such regulations.
- iii. Review the competition and cooperation relationship between relevant regulations to remove barriers in the system and integrate the control and promotional tools to broaden the scope of GHG reduction actions.

(8) Strengthen the climate change mitigation financing mechanism

- i. Assessment index: Complete the review of all available climate change mitigation-related funds by 2020, complete the implementation report on the integration and review of energy and GHG reduction-related funds.
- ii. Review and amend regulations regarding the sources, applications and the amount of funds established in accordance to the Energy Management Act, Petroleum Management Act, and Air Pollution Control Act to ensure their contribution of capital into climate-change mitigation issues.
- iii. Evaluate the feasibility of amendment to include additional incomes into the GHG Management Fund in the Act; review the purpose of the Fund and evaluate the ratios and distribution methods of subsidies pursuant to the Act.

V. Expected Benefits

The action plan will establish relevant regulatory systems and complementary measures related to GHG reduction management through the guidance of periodic regulatory goals, cross-sector integration and implementation, central and local government cooperation, as well as industry and general public participation, to consolidate each specific reduction action, accelerate low-carbon transformation and trigger public behavior change, achieve long-term GHG reduction goals, and fulfill national sustainability development in our society, economy and environment by actions.

1. Sustainability in society: Strengthen the public's participation to gather opinions and expectations from all levels of society through open public communication to build a fair living environment for our society, ensure cross generational balance, implement environmental justice, and fulfill our common responsibility in protecting the global environment.
2. Sustainability in economy: Implement the green finance and carbon pricing scheme, foster green industrial development and increase international competitiveness, create regional job opportunities, and motivate innovative technology development.
3. Sustainability in environment: Carry out GHG reduction to enhance environmental quality and public health, create a healthy living environment, maintain and protect environmental resources to build a low-carbon sustainable homeland.

VI. Implementation and Evaluation

The GHG Reduction Action Plan will be implemented through the GHG Reduction Action Program determined by the central industry competent authorities charged with the nation's energy, manufacturing, transportation, residential and commercial, agriculture and environmental sectors and the GHG Control Implementation Plan developed by special municipality, county and city competent authorities. The GHG Control Implementation Plan shall be submitted

for approval to the central competent authority in consultation with the central industry competent authorities within one year after the approval of the aforementioned action plan and action program.

Each plan shall be reviewed once every five years. The cost needed for implementation of the plan shall be covered by the budget of each level of government agency. If necessary, a special unit can be formed to implement the reduction. Regular reports regarding the implementation of the plan shall be submitted online to the platform established by the Environmental Protection Administration. The Environmental Protection Administration shall report the results of implementation regarding periodic regulatory goals to the Executive Yuan before December 31 in every year by compiling the reports submitted before September 31 by competent authorities for the sectors. Any sector that fails to achieve the periodic regulatory goal shall submit improvement plan to the Executive Yuan for approval within six months after the approval of the final result report.