Submission under the Paris Agreement

The Republic of Korea's Enhanced Update of its First Nationally Determined Contribution

December 23, 2021

1. Background

In accordance with paragraph 2(b) of decision 1/CP.19, the Republic of Korea submitted its Intended Nationally Determined Contribution (INDC) to the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat in June 2015. In the following year, the Republic of Korea introduced the sectoral implementation plan by establishing *the 2030 Basic Roadmap for Achieving the National Greenhouse Gas (GHG) Reduction Target (2030 Roadmap)*. The submitted INDC was registered as the Republic of Korea's Nationally Determined Contribution (NDC), following its ratification of the Paris Agreement on November 3, 2016. And the Republic of Korea has formulated and improved domestic policies and measures specifically for the implementation of the NDC, including the revision of *the 2030 Roadmap* in 2018. The Republic of Korea also actively engaged in the facilitative dialogue held during COP24 in Katowice, Poland in 2018 and has sought to consider and duly reflected various views of the Parties and stakeholders collected from the facilitative dialogue in the process of updating its NDC. In accordance with paragraph 24 of decision 1/CP.21, on December 30, 2020, the Republic of Korea communicated its updated NDC that had replaced its BAU-based reduction target with an economy-wide absolute emissions reduction target so as to contribute to the faithful implementation and achievement of the goals of the Paris Agreement.

To fulfill the long-term temperature goal set in Article 2, paragraph 1 of the Paris Agreement, which is to hold the increase in the global average temperature to well below 2 ℃ above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 ℃ above pre-industrial levels, the Republic of Korea declared to move towards the goal of carbon neutrality by 2050 in December 2020 and has finalized its 2050 carbon-neutrality scenarios as a follow-up measure. In line with the declaration, the Republic of Korea once again communicates the enhanced update of its first NDC.

2. Updated 2030 target

The enhanced update of the first NDC of the Republic of Korea is set at the most ambitious level possible to achieve the goal of carbon neutrality by 2050 despite the country's manufacturing-oriented industry structure.

The updated and enhanced target is to reduce total national GHG emissions by 40% from the 2018 level, which is 727.6 $MtCO_2eq$, by 2030. 40% reduction target is more enhanced because it is below its linear reduction pathways from 2018 to 2050. This indicates the Republic of Korea's enhanced ambition towards the goal of carbon neutrality by 2050.

In September 2021, the Republic of Korea enacted *the Framework Act on Carbon Neutrality and Green Growth for Climate Crisis Response* (or "*the Carbon Neutrality Act*"), enshrining the minimum level of a mid-term national GHG emission reduction target as well as a robust implementation mechanism in law to ensure a faithful implementation of its NDC.

3. Key updates

Below are the key updates of the Republic of Korea's NDC.

The Republic of Korea is significantly enhancing its 2030 target from the previous 24.4% reduction compared to the 2017 level (26.3% reduction from the 2018 level) up to 40% reduction from the 2018 level. In setting the new 2030 target, the entire sectors' mitigation potentials have been analyzed and reflected to the fullest extent possible. The following are key mitigation strategies for achieving the new 2030 target by sector.

- **Power generation**: The Republic Korea is seeking to dramatically phase down coal-fired power generation while ramping up renewable power. Aged coal power plants will be shut down or shift their fuels from coal to Liquefied Natural Gas (LNG). The uptake of solar and wind power will be scaled up as well. The Korean government will also support research and development of improving the efficiency of major renewable energy facilities and make preemptive investment in improving power grids.

- **Industry**: The Republic of Korea is focusing on driving a low-carbon transition in emission-intensive sectors, i.e., steelmaking, petrochemicals, and cement industries. In industrial production processes, electric furnaces are expected to be used to reduce emissions, and bionaphtha will be increasingly used as a feedstock for petrochemical crackers instead of naphtha. In the cement industry, the energy saving rate is set to be improved, and waste synthetic resin will be used for reduced consumption of fossil fuels. Facilities to reduce fluorinated GHG emissions from the semiconductor and display industries will be expanded.

- **Building**: The Republic of Korea is stepping up efforts to promote zero-energy building solutions for newly constructed buildings and encourage the widespread implementation of green remodeling projects on existing buildings. In line with these efforts, the Korean government will strive to improve energy efficiency, including through the distribution of energy-efficient lighting systems and appliances, and actively introduce new and

renewable energy sources, including solar photovoltaic, geothermal and hydrothermal energy.

- **Transportation**: The Republic of Korea has markedly raised its 2030 target on the deployment of zero-emission vehicles such as the ones powered by electricity and hydrogen. In tandem with this, the Korean government is seeking to reduce trips by car, including through the improvement of public transportation services. In the shipping and aviation sectors, emission reduction efforts will be focused on distributing eco-friendly ships and enhancing the operational efficiency of aircraft.

- **Agriculture, livestock farming and fisheries**: The Republic Korea is introducing various options to accelerate low-carbon farming, for instance, improving irrigation techniques in rice paddies and adopting low-input systems for nitrogen fertilizers. As viable mitigation options, enhancing treatment methods for livestock excreta or turning them into energy sources as well as introducing forage that contributes to lower methane emissions are being explored in livestock farming. The Korean government is aiming to adopt highly-efficient facilities to consume less energy in this sector.

- **Waste**: The Republic of Korea's waste management policy focuses on reducing waste generation while increasing recycling. The existing petroleum-based plastics will be replaced by bioplastics, and methane gases emitted from landfills will be recovered for use as an energy source.

- **Carbon sinks (LULUCF)**: The Republic of Korea will maintain and improve its carbon sinks with sustainable forest management, conservation and restoration and increase forestlands by greening urban spaces. Other options include creating new coastal and inland wetlands as well as vegetation in waterfront areas.

The Republic of Korea plans to use voluntary cooperation under Article 6 of the Paris Agreement as a complementary measure to its domestic mitigation efforts including LULUCF to achieve its target.

4. Adaptation

Along with the mitigation efforts mentioned above, the Republic of Korea has been making various efforts to adapt to climate change. In view of the gravity of the impact of climate change, the Korean government established *the 1st National Climate Change Adaptation Plan (NAP)* for 2011–2015 in 2010 to reduce potential damage of climate change and the implementation of this 5-year plan has been continuously monitored and evaluated.

Also, *the 3rd NAP* for 2021-2025 was published in 2020. For *the 3rd NAP*, national climate change risks by sector based on scientific evidence were studied in 2019. In July 2020, the

Republic of Korea published the Climate Change Assessment Report, a comprehensive review of the impact of climate change and vulnerabilities in such sectors as water management, ecosystem, health, and agriculture and fisheries. As a result, *the 3rd NAP* was drawn up to include three key policy pillars: i) improving climate resilience, ii) strengthening monitoring, forecasting and assessment and iii) mainstreaming adaptation in all corners of society.

First, to improve climate resilience, the Korean government will establish and implement measures to manage 84 climate risks in 6 sectors including water management, ecosystems, national land and coastal areas, agriculture and fisheries, health and industry and energy. The measures will be focused on water management that considers future climate risks such as floods and droughts, maintaining the health of ecosystems through ecosystem conservation and recovery, ensuring climate resilience of national land, coastal and social infrastructure, creating an environment that enables sustainable agriculture and fisheries, developing a prevention system against health damages associated with climate change, and improving the adaptive capacity of the industry and energy sector.

Second, to strengthen monitoring, forecasting and assessment, the Korean government will build infrastructure for science-based forecasting and assessment, and improve climate vulnerability and risk assessment tools. The GEO-KOMPSAT-2 (Geostationary - Korea Multi-purpose Satellite-2, or *Cheollian-2*) will be utilized for the collection of diverse information from meteorological, ocean and environmental monitoring. Climate forecast models will be developed to produce the country's detailed climate change scenarios and climate forcings in consideration of the IPCC 6th Assessment Report to be published in 2022. The Republic of Korea will seek ways to connect, advance and utilize these climate impact and vulnerability assessment tools, and build an integrated climate resilience platform for better information sharing with the public.

Third, to mainstream adaptation in policymaking, the Korean government will put in place a right governance, cooperation mechanism and foundation for awareness-raising. Citizens Evaluation Group comprised of actors at all levels – experts, localities, industry, civil society and the youth – is already set up to engage in all processes of establishing, implementing and evaluating adaptation plans. Targeted assistance will be provided for vulnerable groups sensitive to climate impacts and adaptation-related industries will be fostered to ultimately improve climate resilience of society as a whole. The Republic of Korea will submit an adaptation communication and strengthen international cooperation on enhancing action on adaptation and provide capacity-building support for developing countries. Since 2009, the National Climate Change Adaptation Center has been in operation, a think-tank organized for a systematic support for national adaptation policy and comprehensive adaptation research. The Korean government has been focusing on developing science-based adaptation policies including through the development and advancement of the Vulnerability assESsment Tool to

build climate change Adaptation Plan (VESTAP) and the Model of inTegrated Impact and Vulnerability Evaluation of climate change (MOTIVE).

In recognition of the importance of local governments' role in adaptation efforts, the Korean government made adaptation planning a legal obligation of municipal and local governments in 2012 and 2015, respectively. Accordingly, 17 municipal governments and 226 local governments have established and implemented their own adaptation measures every five years. Pursuant to *the Carbon Neutrality Act* enacted in September 2021, public entities in possession and management of climate-vulnerable facilities are required to establish and implement their own adaptation plans. Efforts to develop and distribute climate change adaptation manuals are also underway to ensure businesses are better informed in adapting to climate change.

The Republic of Korea has been operating an international adaptation training program annually since 2010 to support developing countries' effort to build their adaptive capacity. From 2021, the Republic of Korea is working with the UNFCCC Secretariat to jointly operate the Adaptation Academy under the umbrella of the established UNFCCC Climate Action and Support Transparency Training programme until 2025 in an effort to support developing countries' implementation of the Paris Agreement. The Republic of Korea is set to work more closely with the international community to further contribute to an enhanced global adaptation effort.

5. Implementation of the NDC

The Republic of Korea is building up the following institutional arrangements and mechanisms to implement its updated NDC.

First, the Republic of Korea is pushing forward policies that accelerate the achievement of its updated 2030 target and 2050 goal in accordance with *the Carbon Neutrality Act*. The Act was enacted in September 2021 with the aim of strengthening both mitigation and adaptation measures and addressing inequality that could arise in the societal transition to carbon neutrality. The Act clearly defines 2050 carbon neutrality as the Republic of Korea's national vision and stipulates the minimum level of its NDC target for 2030. Other key pillars of the Act include: climate impact assessment, climate-responsive budgeting, Emissions Trading Scheme (K-ETS), adaptation measures for the climate crisis, and designation of special areas and establishment of support centers for the just transition. The Act serves as a legislative basis for the economic and social transition that will ultimately enable the Republic of Korea to achieve its NDC.

Second, the public and private sectors have joined forces to implement the NDC with the 2050 Carbon Neutrality Commission at the center. In May 2021, the Republic of Korea has launched the 2050 Carbon Neutrality Commission, the key governance to support its carbon-

neutrality transition. The Commission is co-chaired by the Prime Minister and a representative from the private sector, and its membership is broad from cabinet members to businesses, experts, the youth and civil society from the private sector. The Commission reviews the fundamental direction of carbon-neutrality policies and the framework of national plans and takes stock of the NDC implementation. The Commission also collects opinions of various stakeholders in the society and feeds the collected opinions back into the NDC implementation process.

Third, the Republic of Korea has been developing sectoral strategies to achieve its NDC and the 2050 goal. Policy directions of each sector – energy, industry, transportation, buildings, circular economy, and agriculture, forestry, livestock farming and fisheries – will be coordinated consistently with such sectoral strategies. National plans under the law that include sectoral mitigation and adaptation measures such as *the Basic Plan for Carbon Neutrality and Green Growth* will be either established or revised in line with the NDC and the 2050 goal.

Fourth, the Republic of Korea plans to reduce GHG emissions efficiently based on the market mechanism by utilizing K-ETS, which covers 73.5% of the national GHG emissions. In 2019, *the 3rd Basic Plan for the K-ETS* for 2021–2030 was established, setting out ways of ETS operation for the next decade including effective reduction measures, improved allocation methods, enhanced market functions, and linkage and collaboration with international carbon markets for contributing to achieving the 2030 target. *The 3rd Basic Plan for the K-ETS* specifies that the updated 2030 target should be considered when setting the emissions cap and allocating tradable permits on a 5-year basis, underlining the role of the ETS for the achievement of the NDC. *The Phase 3 Allocation Plan* for 2021-2025, introduced in September 2020, specifies the emissions cap as well as allocation standards and methods by sector and sub-sector, based on the principle of contributing to achieving the NDC. The scope of allocation has been expanded by including the transportation and construction sectors and the coverage rate of the ETS in the national GHG emissions was increased from 70.2% in Phase 2 (2018-2020) to 73.5% in Phase 3.

Fifth, the Korean government will establish annual plans to achieve the NDC by sector and the 2050 Carbon Neutrality Commission will review them and prepare an outcome report for public release. In this review process, targets are tracked closely and additional actions needed to improve performance are identified, which provides valuable inputs to the government's policymaking.

Sixth, the Republic of Korea will continue to be financially supporting carbon-neutrality transition. The Korean government will newly set up the Korea Climate Action Fund in 2022 to effectively tackle the climate crisis and provide funding needed for the shift towards a carbon-neutral society. To accelerate action for this transition, the Republic of Korea has been promoting the Korean Green New Deal since July 2020. In July 2021, the Green New Deal

was realigned to add a new pillar of “laying a foundation for carbon neutrality” to the existing 3 pillars: green transition in cities/spatial planning/living infrastructure, diffusion of low-carbon and distributed energy, and establishment of innovative green industry ecosystems. A total of KRW 61 trillion (approximately USD 51.7 billion) is planned to be invested in the 4 key pillars underpinning this New Deal 2.0. The New Deal 2.0 aims to contribute to the achievement of the NDC and improve sustainability of society.

The Republic of Korea has joined the Global Methane Pledge to become a part of the global efforts to tackle the climate crisis. By joining the Pledge, the Republic of Korea aims to reduce its domestic methane emissions, in order to contribute to the achievement of the goal of the Pledge, which is to reduce global methane emissions by at least 30% from 2020 level by 2030.

(Annex) Information to facilitate clarity, transparency and understanding of the Republic of Korea's nationally determined contribution

1. **Quantifiable information on the reference point** (including, as appropriate, a base year)

	Information	**Information submitted by the Republic of Korea**
(a)	Reference year(s), base year(s), reference period(s) or other starting point(s)	2018
(b)	Quantifiable information on the reference indicators, their values in the reference year(s), base year(s), reference period(s) or other starting point(s), and, as applicable, in the target year	727.6 MtCO2eq (excluding LULUCF)
(c)	For strategies, plans and actions referred to in Article 4, paragraph 6, of the Paris Agreement, or polices and measures as components of nationally determined contributions where paragraph 1(b) above is not applicable, Parties to provide other relevant information	N/A
(d)	Target relative to the reference indicator, expressed numerically, for example in percentage or amount of reduction	40% reduction from total national GHG emissions in 2018
(e)	Information on sources of data used in quantifying the reference point(s)	2020 National GHG Inventory Report of the Republic of Korea (in Korean)
(f)	Information on the circumstances under which the Party may update the values of the reference indicators	If emissions calculation method, activity data, and emissions factor are improved, the values of the reference indicators may be updated.

2. Time frames and/or periods for implementation

	Information	Information submitted by the Republic of Korea
(a)	Time frame and/or period for implementation, including start and end date, consistent with any further relevant decision adopted by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA)	January 1, 2021 – December 31, 2030
(b)	Whether it is a single-year or multi-year target, as applicable	Single-year target The Republic of Korea allocates tradable permits and reduces GHG emissions on a 5-year basis for the 73.5% of its total national GHG emissions by establishing *the 3rd Basic Plan for K-ETS* for 2021-2030, considering the 2030 national GHG reduction target.

3. Scope and coverage

	Information	Information submitted by the Republic of Korea
(a)	General description of the target	The Republic of Korea's updated NDC target is to reduce 40% from the total national GHG emissions in 2018, which is 727.6 MtCO2eq, by 2030. The Republic of Korea plans to use voluntary cooperation under Article 6 of the Paris Agreement as a complementary measure to its domestic mitigation efforts including LULUCF to achieve its target.

(b)	Sectors, gases, categories and pools covered by the nationally determined contribution, including, as applicable, consistent with Intergovernmental Panel on Climate Change (IPCC) guidelines	Sectors: energy, industrial process, agriculture, LULUCF, and waste GHGs: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbon (PFCs), sulfur hexafluoride (SF_6)
(c)	How the Party has taken into consideration paragraph 31(c) and (d) of decision 1/CP.21	GHGs from all sectors are included except NF_3. The NF_3 is not included because of the absence of its activity data. However, once the activity data is collected, it will be compiled in the National GHG Inventory Report.
(d)	Mitigation co-benefits resulting from Parties' adaptation actions and/or economic diversification plans, including description of specific projects, measures and initiatives of Parties' adaptation actions and/or economic diversification plans.	N/A

4. Planning processes

	Information	**Information submitted by the Republic of Korea**
(a)	Information on the planning processes that the Party undertook to prepare its nationally determined contribution and, if available, on the Party's implementation plans, including, as appropriate	

(i)	Domestic institutional arrangements, public participation and engagement with local communities and indigenous peoples, in a gender-responsive manner	**< NDC planning process >** In 2015, the 2030 national GHG reduction target was set to reduce 37% from the 2030 BAU emissions projection level, and the target was communicated as the Republic of Korea's INDC in June 2015. In 2016, the Republic of Korea introduced *the 2030 Basic Roadmap for Achieving the National Greenhouse Gases Reduction Target (2030 Roadmap)*, presenting specific reduction plans for 8 sectors and 30 sub-sectors. The submitted INDC was registered as the Republic of Korea's first Nationally Determined Contribution (NDC), following its ratification of the Paris Agreement on November 3, 2016. Later on, civil society pointed out that *the 2030 Roadmap* should serve to incentivize companies sufficiently to develop their investment plans for emissions reduction. Also, some argued to increase the role of domestic reduction rather than relying on mitigation efforts in overseas countries as suggested in *the 2030 Roadmap*. Based on such inputs, the Korean government revised *the 2030 Roadmap* and added GHG reduction pathways on a 3-year basis to provide a clearer signal of its mitigation policies. Also, the share of the overseas reduction was reduced by increased domestic mitigation efforts. Ahead of communicating an updated NDC in 2020, preparatory consultations commenced in 2019 among relevant ministries including the Ministry of Environment, the Ministry of Trade, Industry and Energy, and the Ministry of Foreign Affairs to

		determine the country's updated GHG reduction target. To ensure the clarity and transparency of the target, the government replaced the previous target with an absolute target which is to reduce 24.4% from 2017 emissions level by 2030. In December 2019, the updated target was legislated through the amendment to *the Enforcement Decree of the Framework Act on Low Carbon, Green Growth*. Following the ensuing review by the Committee on Green Growth and the government, the Republic of Korea finalized and communicated the update of its NDC that includes the 2030 national GHG reduction target. In December 2020, the Republic of Korea declared to move towards the goal of carbon neutrality by 2050. Following this declaration, in April 2021, the government announced its plan to enhance the NDC target once again. A technical working group comprised of experts from national research agencies was set up to review the 2050 carbon-neutrality scenarios and develop ways to better connect the updated NDC with the 2050 scenarios. *The Carbon Neutrality Act*, enacted in September 2021, stipulates the minimum level of the 2030 target should be 35% reduction from 2018 level. Relevant ministries including the Ministry of Environment, the Ministry of Trade, Industry and Energy, the Ministry of Economy and Finance, and the Ministry of Foreign Affairs submitted a draft proposal for 40% reduction from 2018 level by 2030 to the 2050 Carbon Neutrality Commission, in consideration of the provisions and purpose of

		the Carbon Neutrality Act and the need to establish the NDC target consistent with the 2050 goal. Upon receiving the proposal, the 2050 Carbon Neutrality Commission held public hearing sessions with industry, civil society, workers and the youth as well as public online debates and considered and determined the enhanced update of the first NDC in October 2021. On October 27, 2021, the cabinet meeting officially considered and determined the enhanced update of first NDC of the Republic of Korea. **< NDC implementation plan >** The Republic of Korea is building up the following institutional arrangements and mechanisms to implement its updated NDC. First, the Republic of Korea is pushing forward policies that accelerate the achievement of its updated 2030 target and 2050 goal in accordance with *the Carbon Neutrality Act*. The Act was enacted in September 2021 with the aim of strengthening both mitigation and adaptation measures and addressing inequality that could arise in the societal transition to carbon neutrality. The Act clearly defines 2050 carbon neutrality as the Republic of Korea's national vision and stipulates the minimum level of its NDC target for 2030. Other key pillars of the Act include: climate impact assessment, climate-responsive budgeting,

		Emissions Trading Scheme (K-ETS), adaptation measures for the climate crisis, and designation of special areas and establishment of support centers for the just transition. The Act serves as a legislative basis for the economic and social transition that will ultimately enable the Republic of Korea to achieve its NDC. Second, the public and private sectors have joined forces to implement the NDC with the 2050 Carbon Neutrality Commission at the center. In May 2021, the Republic of Korea has launched the 2050 Carbon Neutrality Commission, the key governance to support its carbon-neutrality transition. The Commission is co-chaired by the Prime Minister and a representative from the private sector, and its membership is broad from cabinet members to businesses, experts, the youth and civil society from the private sector. The Commission reviews the fundamental direction of carbon-neutrality policies and the framework of national plans and takes stock of the NDC implementation. The Commission also collects opinions of various stakeholders in the society and feeds the collected opinions back into the NDC implementation process. Third, the Republic of Korea has been developing sectoral strategies to achieve its NDC and the 2050 goal. Policy directions of each sector – energy, industry, transportation, buildings, circular economy, and agriculture, forestry, livestock farming and fisheries – will be coordinated consistently with such sectoral strategies. National plans under the law that

		include sectoral mitigation and adaptation measures such as *the Basic Plan for Carbon Neutrality and Green Growth* will be either established or revised in line with the NDC and the 2050 goal. Fourth, the Republic of Korea plans to reduce GHG emissions efficiently based on the market mechanism by utilizing K-ETS, which covers 73.5% of the national GHG emissions. In 2019, *the 3rd Basic Plan for the K-ETS* for 2021–2030 was established, setting out ways of ETS operation for the next decade including effective reduction measures, improved allocation methods, enhanced market functions, and linkage and collaboration with international carbon markets for contributing to achieving the 2030 target. *The 3rd Basic Plan for the K-ETS* specifies that the updated 2030 target should be considered when setting the emissions cap and allocating tradable permits on a 5-year basis, underlining the role of the ETS for the achievement of the NDC. *The Phase 3 Allocation Plan* for 2021-2025, introduced in September 2020, specifies the emissions cap as well as allocation standards and methods by sector and sub-sector, based on the principle of contributing to achieving the NDC. The scope of allocation has been expanded by including the transportation and construction sectors and the coverage rate of the ETS in the national GHG emissions was increased from 70.2% in Phase 2 (2018-2020) to 73.5% in Phase 3. Fifth, the Korean government will establish annual plans to achieve the NDC by sector and the 2050 Carbon Neutrality

		Commission will review them and prepare an outcome report for public release. In this review process, targets are tracked closely and additional actions needed to improve performance are identified, which provides valuable inputs to the government's policymaking. Sixth, the Republic of Korea will continue to be financially supporting carbon-neutrality transition. The Korean government will newly set up the Korea Climate Action Fund in 2022 to effectively tackle the climate crisis and provide funding needed for the shift towards a carbon-neutral society. To accelerate action for this transition, the Republic of Korea has been promoting the Korean Green New Deal since July 2020. In July 2021, the Green New Deal was realigned to add a new pillar of "laying a foundation for carbon neutrality" to the existing 3 pillars: green transition in cities/spatial planning/living infrastructure, diffusion of low-carbon and distributed energy, and establishment of innovative green industry ecosystems. A total of KRW 61 trillion (approximately USD 51.7 billion) is planned to be invested in the 4 key pillars underpinning this New Deal 2.0. The New Deal 2.0 aims to contribute to the achievement of the NDC and improve sustainability of society. The Republic of Korea has joined the Global Methane Pledge to become a part of the global efforts to tackle the climate crisis. By joining the Pledge, the Republic of Korea aims to reduce its domestic methane emissions, in order to contribute to the achievement of the goal of the Pledge, which is to reduce global methane emissions by at least 30% from 2020 level by 2030.

(ii)	Contextual matters, including, inter alia, as appropriate	
a.	National circumstances, such as geography, climate, economy, sustainable development and poverty eradication	In 2019, a total of 63% of the Republic of Korea's territory was estimated to be mountainous areas. And its seasonal characteristics show clear distinctions between four seasons. The population was estimated 51,780,000 in 2020, and its export dependency reached 31.3% in 2020. The percentage of manufacturing to the GDP was 26.1% in 2020. Despite continued population growth and high manufacturing and export dependency, the Republic of Korea ratified the Paris Agreement in November 2016 to cooperate with the international community for climate change response, and declared to move towards the goal of carbon neutrality by 2050 to join global action to tackle climate crisis.
b.	Best practices and experience related to the preparation of the nationally determined contribution	Upon its declaration of carbon neutrality in October 2020, the Republic of Korea launched the 2050 Carbon Neutrality Commission, the key public-private governance for its carbon neutrality transition. The Commission collected views of various stakeholders, which were considered in the process of determining the 2050 carbon-neutrality scenarios and updating the NDC. The enactment of *the Carbon Neutrality Act* in September 2021 added more clarity to NDC target-setting and implementation

		process as the Act includes provisions on the minimum level of 2030 target and its implementation mechanism. In 2020, the Republic of Korea launched a government-wide assessment process to track the implementation of national GHG reduction target. The Office for Government Policy Coordination / Prime Minister's Secretariat and the Ministry of Environment analyze and assess the mitigation performance of each ministry every year under the principle of transparency, timeliness, responsibility, and open communication and release the assessment results to the public. In this process, relevant ministries implementing GHG polices and collect and submit their GHG reduction data to the Greenhouse Gas Inventory and Research Center of Korea (GIR) which then prepares an assessment report. This assessment process has been functioning well, contributing to the achievement of the updated NDC.
c.	Other contextual aspirations and priorities acknowledged when joining the Paris Agreement	N/A
(b)	Specific information applicable to Parties, including regional economic integration organizations and their member States, that have reached an agreement to act jointly under Article 4, paragraph 2, of the Paris Agreement, including the Parties that agreed to act jointly and the terms of the agreement, in accordance with Article 4, paragraphs 16–18, of the Paris Agreement	N/A

(c)	How the Party's preparation of its nationally determined contribution has been informed by the outcomes of the global stocktake, in accordance with Article 4, paragraph 9, of the Paris Agreement	As the Republic of Korea recognizes the importance of global stocktake as set out in Article 14 of the Paris Agreement, it will fully engage in the 1st GST in 2023 and consider and duly reflect the results from the 1st GST in the preparations of the subsequent NDC. The Republic of Korea participated in the Talanoa Dialogue in 2018 and hosted a domestic Talanoa Dialogue in September of the same year. This domestic event provided an opportunity to collect opinions from governments, private sector, academia, civil society, and the youth. The collected various views have served as a reference to this updated NDC.
(d)	Each Party with a nationally determined contribution under Article 4 of the Paris Agreement that consists of adaptation action and/or economic diversification plans resulting in mitigation co-benefits consistent with Article 4, paragraph 7, of the Paris Agreement to submit information on	
(i)	How the economic and social consequences of response measures have been considered in developing the nationally determined contribution	N/A
(ii)	Specific projects, measures and activities to be implemented to contribute to mitigation co-benefits, including information on adaptation plans that also yield mitigation co-benefits, which may cover, but are not limited to, key sectors, such as energy, resources, water resources, coastal resources, human settlements and urban planning, agriculture and forestry; and economic diversification actions, which may cover, but are not limited to, sectors such as manufacturing and industry, energy	N/A

	and mining, transport and communication, construction, tourism, real estate, agriculture and fisheries	

5. Assumptions and methodological approaches, including those for estimating and accounting for anthropogenic greenhouse gas emissions and, as appropriate, removals

	Information	Information submitted by the Republic of Korea
(a)	Assumptions and methodological approaches used for accounting for anthropogenic greenhouse gas emissions and removals corresponding to the Party's nationally determined contribution, consistent with decision 1/CP.21, paragraph 31, and accounting guidance adopted by the CMA	Currently, the Republic of Korea compiles the national GHG inventory mainly in accordance with decision 24/CP.19 and 1996 IPCC Guidelines. For a few categories, 2000 IPCC Good Practice Guidance (GPG 2000), 2003 IPCC Good Practice Guidance for LULUCF (GPG LULUCF), 2006 IPCC Guidelines are applied.
(b)	Assumptions and methodological approaches used for accounting for the implementation of policies and measures or strategies in the nationally determined contribution	N/A
(c)	If applicable, information on how the Party will take into account existing methods and guidance under the Convention to account for anthropogenic emissions and removals, in accordance with Article 4, paragraph 14, of the Paris Agreement, as appropriate	Under the relevant guidelines of the Paris Agreement (decision 4/CMA.1, decision 18/CMA.1), 2006 IPCC Guidelines, 2013 KP supplementary document and 2013 Wetland supplementary document are being prepared to be applied.
(d)	IPCC methodologies and metrics used for estimating anthropogenic greenhouse gas emissions and removals	The Republic of Korea uses the 1996 IPCC Guidelines to estimate anthropogenic GHG emissions and removals. For some

		sectors, GPG 2000, GPG LULUCF, 2006 IPCC Guidelines are used. Sectors that use GPG 2000 are; i) civil aviation in the energy sector; and ii) landfills, wastewater treatment and waste incineration in waste sector. Sector that used GPG LULUCF is cropland and grassland in LULUCF sector. The 2006 IPCC Guidelines are used for: i) fugitive emissions from natural gas in energy sector; ii) semiconductor manufacture and iii) electrical equipment in industrial process sector; iv) rice cultivation and v) agriculture soils in agricultural sector; vi) forestland and wetland in LULUCF sector; and vii) others in waste sector. The energy sector uses sectoral approach to estimate emissions. For GHG emissions inventory methodologies, Tier 1 is mainly used, while Tier 2 is also used for some areas. Tier 2 is applied to: i) fuel combustion_CO_2 and ii) public electricity and heat generation_CH_4, N_2O in energy sector; iii) semiconductor manufacture in industrial process sector; iv) rice cultivation_CH_4 and v) agricultural soils_ N_2O in agricultural sector; vi) forestland_CO_2 in LULUCF sector; vii) landfill_ CH_4, viii) wastewater treatment_CH_4 and ix) waste incineration_N_2O in waste sector. The CO_2 equivalent emissions are estimated by using the 100-year time horizon GWP values in the IPCC's Second Assessment Report. The government is preparing to apply 2006 IPCC Guidelines and the GWP values in the Fifth Assessment Report by 2024.

(e)	Sector-, category- or activity-specific assumptions, methodologies and approaches consistent with IPCC guidance, as appropriate, including, as applicable	
(i)	Approach to addressing emissions and subsequent removals from natural disturbances on managed lands;	The Republic of Korea will estimate and report the emissions and removals from natural disturbances on managed lands in accordance with IPCC 2013 KP supplement.
(ii)	Approach used to account for emissions and removals from harvested wood products	The Republic of Korea will estimate and report the emissions and removals from harvested wood products using the production approach in accordance with 2006 IPCC Guidelines and IPCC 2013 KP Supplement.
(iii)	Approach used to address the effects of age-class structure in forests	The Republic of Korea continues to practice sustainable forest management, improving forest age structure concentrated on specific age classes, to ensure its forests serve as reliable carbon sinks.
(f)	Other assumptions and methodological approaches used for understanding the nationally determined contribution and, if applicable, estimating corresponding emissions and removals, including	
(i)	How the reference indicators, baseline(s) and/or reference level(s), including, where applicable, sector-, category- or activity-specific reference levels, are constructed, including, for	The reference indicator of the updated NDC is the total national GHG emissions (excluding LULUCF) in 2018 in 2020 National GHG Inventory Report, which was prepared according to the IPCC Guidelines.

	example, key parameters, assumptions, definitions, methodologies, data sources and models used	
(ii)	For Parties with nationally determined contributions that contain non-greenhouse-gas components, information on assumptions and methodological approaches used in relation to those components, as applicable	N/A
(iii)	For climate forcers included in nationally determined contributions not covered by IPCC guidelines, information on how the climate forcers are estimated	N/A
(iv)	Further technical information, as necessary	N/A
(g)	The intention to use voluntary cooperation under Article 6 of the Paris Agreement, if applicable	The Republic of Korea plans to use voluntary cooperation under Article 6 of the Paris Agreement as a supplementary measure to achieve its NDC.

6. How the Party considers that its nationally determined contribution is fair and ambitious in the light of its national circumstances

	Information	**Information submitted by the Republic of Korea**
(a)	How the Party considers that its nationally determined contribution is fair and ambitious in the light of its national circumstances	The Republic of Korea’s manufacturing sector takes up 26.1% of its GDP as of 2020 and its core industries, such as steelmaking, petrochemicals, oil refinery, and cement manufacturing are carbon-intensive industries. The GHG emissions from the top 4 energy-intensive industries accounted

		for 74.8% of the industry sector's total GHG emissions in 2019. Those top 4 energy-intensive industries are also the Republic of Korea's major export industries, which took up 21.2% of the total export amount in 2019. Of the total power mix, coal accounted for approximately 40% as of 2018 and under such circumstances, significant reduction of GHG emissions is a challenging task. The Republic of Korea's GHG emissions level that had been on the continuous rise since the1990s started decreasing after peaking in 2018. The peak has come late when compared to other major economies. The emissions have been declining mainly because the Republic of Korea's active mitigation measures aiming at decoupling economic growth from GHG emissions have begun to take effect. The measures include the ban on construction of new coal-fired power plants and the launch of the K-ETS, the world's largest carbon trading system operated at national level. The K-ETS has been operated since 2015. From 2021 to 2030, the scheme aims to achieve the updated NDC in accordance with *the 3rd Basic Plan for the K-ETS*. To accelerate the momentum gathered so far and contribute to global efforts to tackle climate crisis, the Republic of Korea declared to move towards the goal of carbon neutrality by 2050. To turn what has been declared into reality, the Republic of Korea has set the ambitious level of reduction target, which is to

		cut the total national GHG emissions by 40% from 2018 level by 2030 as a mid-term target. Provided that linear emission reductions are to be made from 2018 to 2050, the emission reduction target for 2030 is calculated to be 37.5%. Therefore, the 40% target is higher than the linear target, which indicates the Republic of Korea's enhanced ambition towards carbon neutrality. To achieve this updated NDC target, the Republic of Korea is seeking to bring about transitions in its economy and society. In line with the 2030 target and the 2050 goal, sectoral strategies will be developed and policy directions of each sector – energy, industry, transportation, buildings, circular economy, and agriculture, forestry, livestock farming and fisheries – will be coordinated accordingly. National plans under the law that include sectoral mitigation and adaptation measures such as *the Basic Plan for Carbon Neutrality and Green Growth*, will be either established or revised in line with the updated NDC and the 2050 goal. The Republic of Korea will scale up dramatic financial investment in achieving the enhanced update of its first NDC. The government will establish the Korea Climate Action Fund for developing carbon-neutrality technologies, foster low-carbon industries, promote circular economy and protect the vulnerable groups, and plans to scale up fiscal investment as well.

7**. How the nationally determined contribution contributes towards achieving the objective of the Convention as set out in its Article 2**

		In addition, the Republic of Korea has been pushing forward with its Green New Deal since July 2020, ensuring that it serves as a lever for the societal transition toward carbon neutrality. The Green New Deal is underpinned by 4 key pillars: laying foundation for carbon neutrality, green transition in cities/spatial planning/living infrastructure, diffusion of low-carbon and distributed energy, and establishment of innovative green industry ecosystems. Its total planned investment is estimated to be KRW 61 trillion (approximately USD 51.7 billion) by 2025. The Green New Deal aims to contribute to the achievement of the updated NDC and improve sustainability of the society.
(b)	Fairness considerations, including reflecting on equity	The Republic of Korea declared to move towards the goal of carbon neutrality, and accordingly, enhanced the previous update of its first NDC in an effort to keep the 1.5℃ within reach, indicated by the IPCC Special Report on the Global Warming of 1.5℃. 40% reduction target is more enhanced because it is below its linear reduction pathways from 2018 to 2050. This indicates the Republic of Korea’s enhanced ambition towards the goal of carbon neutrality by 2050. With this enhanced target, the Republic of Korea expects to contribute to limiting the global average temperature increase as set out by the Paris Agreement. The government will take measures to support specific industries, workers and regions potentially at risk of being affected by sudden economic and social structural changes that

		could take place while implementing and achieving the NDC. *The Carbon Neutrality Act* enacted in 2021 requires the government to take support measures for the populations vulnerable to climate change as well as the areas where the number of jobs decreases and economic inequality widens. Also, it stipulates supports for micro-enterprises, unemployment prevention, reemployment support, and opportunities for new industries in the areas at high risk of negative impacts in the process of the transition by designating special areas for the just transition. These institutional arrangements and funding such as the Korea Climate Action Fund will prevent the vulnerable populations from being disproportionately affected in the process of the transition. The government will take various adaptation measures, targeted to the needs of vulnerable populations to climate change, especially the elderly and low-income groups. Insulation programs for residential buildings will be operated for the vulnerable groups: the beneficiaries of basic livelihood subsidies, the elderly living alone, children, and the residents of rooftop houses and basement apartments affected by heat and cold waves. For those densely populated areas with such vulnerable groups, cooling shelters for heatwaves will be installed and green spaces will be created at a smaller scale. A project is also underway to build climate shelter playgrounds for children.
	Information	**Information submitted by the Republic of Korea**

(c)	How the Party has addressed Article 4, paragraph 3, of the Paris Agreement	The Republic of Korea has significantly enhanced the previous update of its first NDC by 2030 from the 24.4% reduction compared to 2017 level to 40% reduction from 2018 level. Accordingly, the GHG emissions level targeted in 2030 is reduced from 536.1 $MtCO_2eq$ to 436.6 $MtCO_2eq$, which is approximately 100 $MtCO_2eq$ reduction.
(d)	How the Party has addressed Article 4, paragraph 4, of the Paris Agreement	The Republic of Korea has set the economy-wide absolute emissions reduction target in its updated NDC. The absolute target provides an enhanced clarity and transparency in terms of target emissions and emissions reduction rates compared to the other target-setting methods, i.e., emissions intensity target or BAU-based reduction target. The update of NDC into the economy-wide absolute emissions reduction target indicates the Republic of Korea's strong commitment to reducing further GHG emissions, especially considering evolving circumstances that can be triggered by changing economic growth rate and industrial structure.
(e)	How the Party has addressed Article 4, paragraph 6, of the Paris Agreement.	N/A

(a)	How the nationally determined contribution contributes towards achieving the objective of the Convention as set out in its Article 2	Article 2 of the UNFCCC sets forth its ultimate objective to achieve stabilization of GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. This objective was later stated more specifically in the Paris Agreement as its goal to hold the increase in the global average temperature to well below 2 ℃ and to pursue efforts to limit the temperature increase to 1.5 ℃ above pre-industrial levels. To achieve this goal, Article 4, paragraph 1 of the Paris Agreement further states that a balance between anthropogenic emissions by sources and removals by sinks of GHGs should be achieved in the second half of this century. The Republic of Korea updated the NDC in consideration of this long-term global goal of the Paris Agreement, and therefore, the Republic of Korea's updated NDC contributes to achieving the ultimate goal of the UNFCCC.
(b)	How the nationally determined contribution contributes towards Article 2, paragraph 1(a), and Article 4, paragraph 1, of the Paris Agreement	The Republic of Korea strives to become carbon-neutral by 2050, which is aligned with the international community's shared goals indicated in Article 2, paragraph 1, and Article 4, paragraph 1 of the Paris Agreement including the target of achieving carbon neutrality in the second half of this century. The Republic of Korea will faithfully carry out the tasks that need to be undertaken to accelerate societal transition to carbon neutrality as suggested by the 2050 carbon-neutrality scenarios finalized in October 2021.

		In in this process, the Republic of Korea will make the best use of the Green New Deal launched in July 2020 to ensure that it serves as a lever for energy transition as well as the shift for a greener economy.