

Submission under the Paris Agreement The Republic of Korea's Update of its First Nationally Determined Contribution

December 30, 2020

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 had domestically formulated and improved specific policies and measures for 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 the COP24 in 2018 in Katowice, Poland and has sought to consider and duly reflect various views of the Parties and stakeholders collected from the facilitative dialogue in the process of updating its NDC. The Republic of Korea hereby communicates its updated NDC that incorporates progress and improvements in its national climate policies in accordance with paragraph 24 of decision 1/CP.21 so as to contribute to the faithful implementation and achievement of the goals of the Paris Agreement.

2. Updated 2030 target

The updated NDC is set at the most ambitious level possible, considering the long-term temperature goal set out in Article 2 of the Paris Agreement. The updated target is to reduce 24.4% from the total national GHG emissions in 2017, which is 709.1 MtCO₂eq, by 2030. This is an absolute emissions reduction target that is more predictable and transparent than the target relative to Business-As-Usual (BAU) emissions projection in the previous first NDC. The updated target also includes an increased share of domestic reduction, which is facilitated through the Republic of Korea's continued mitigation efforts such as the nationwide ban on construction of new coal-fired power plants. In December 2019, *the Enforcement Decree of the Framework Act on Low Carbon, Green Growth* was amended to include the updated target, ensuring the legal basis for mitigation efforts. To lay a more solid foundation for carbon neutrality by 2050, the Korean government will further raise its ambition level for its 2030 national GHG reduction target and communicate further updated NDC at the earliest possible time before 2025.

3. Key updates

The following are the key updates of the Republic of Korea's NDC. First, despite its energy-intensive industry structure and export-driven economy, the Republic of Korea has set the ambitious target of reducing one-fourth of the total national GHG emissions within approximately 10 years from the **base year 2017** in order to contribute to the global efforts to achieve the long-term temperature goal of the Paris Agreement. Second, pursuant to paragraph 4 of Article 4 of the Paris Agreement, the Republic of Korea has **replaced its BAU-based reduction target** with an **economy-wide absolute emissions reduction target**. Third, the Republic of Korea has increased its share of domestic reduction through its continued mitigation efforts such as the ban on construction of new coal-fired power plants. Fourth, the Republic of Korea has provided the information to facilitate clarity, transparency, and understanding of the NDCs, as indicated in Annex I of decision 4/CMA.1, earlier than required. Last but not least, 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 the changing climate. In view of the gravity of the impact of climate change, the Korean government established *the 1st National Climate Change Adaptation Plan* for 2011–2015 in 2010 to reduce potential damage of climate change and the implementation of this 5-year rolling plan has been continuously monitored and evaluated. Also, *the 3rd National Climate Change Adaptation Plan* for 2021–2025 was laid out in 2020. During the course of the policy design, a national climate change risk assessment was conducted in 2019. In July 2020, the 2020 Korea's Climate Change Assessment Report, a comprehensive survey on the impact of climate change and vulnerabilities in such sectors as water management, ecosystem, health, and agriculture and fishery, was published. The assessment and research results served as valuable inputs to mapping out detailed implementation measures to enhance climate resilience across all sectors.

In 2009, the Republic of Korea launched the Korea Adaptation Center for Climate Change, a think tank that provides systematic support for the country's adaptation policy and conducts comprehensive research activities on adaptation. The Center has been working to draw up science-based adaptation measures by developing vulnerability assessment tools and conducting R&D for an extensive analysis of the impact of climate change.

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. To

mainstream adaptation efforts, the Korean government has been providing support for public institutions that own social infrastructure and for climate-vulnerable businesses in their adaptation planning and implementation efforts since 2016.

In April 2019, the Republic of Korea and the UNFCCC secretariat jointly hosted the 1st Global Adaptation Week, the largest event in the world for the discussion on adaptation. The 2nd Global Adaptation Week will be held in the Republic of Korea in 2021. The Republic of Korea has been operating a series of international programs to support developing countries' capacity-building for adaptation and 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 has been implementing the updated NDC in the following institutional arrangements and mechanisms. First, the Republic of Korea legislated on the updated 2030 national GHG reduction target in Article 25 of the amended *Enforcement Decree of the Framework Act on Low Carbon, Green Growth* in December 2019.

Second, prior to the legislation, the Republic of Korea incorporated the updated target into the 2nd *Basic Plan for Climate Change Response*, the overarching national plan for climate actions established in October 2019. The 2nd *Basic Plan for Climate Change Response* envisions a sustainable and low-carbon green society. Under this vision, the Republic of Korea **aims to limit the national GHG emissions to 536 MtCO₂eq by 2030** and enhance capacity of all sectors to implement the Paris Agreement. To achieve these objectives, the Republic of Korea set out climate mitigation and adaptation measures by sector under its core strategies; transition to a low-carbon society, establishment of a robust adaptation system, and enhancement of a climate change response framework.

Third, the Republic of Korea plans to reduce GHG emissions efficiently based on the market mechanism by utilizing Korea's Emissions Trading Scheme (K-ETS), which covers 73.5% of the national GHG emissions. In December 2019, the 3rd *Basic Plan for the K-ETS* for 2021–2030 was introduced. It set out ways of operations 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 national GHG reduction 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 to 73.5% in Phase 3.

Fourth, from 2020, the Republic of Korea starts operating a government-wide scientific and quantitative system for implementation, which was established in 2019. To ensure transparent implementation of the NDC, the government will analyze and assess the mitigation performance of each ministry every year and release the assessment results to the public.

As an additional countermeasure to accelerate actions for the implementation of the updated NDC, the Republic of Korea has been promoting the Korean Green New Deal since July 2020. The Green New Deal is underpinned by 3 key 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 73.4 trillion will be invested by 2025 and the Green New Deal will facilitate GHG emissions reduction and help sustaining climate-resilient recovery. The next 5 years of implementing the Green New Deal will serve as a lever for achieving the updated NDC including the 2030 national GHG reduction target and green transition toward carbon neutrality.

(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)	2017
(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	709.1 MtCO ₂ eq (excluding LULUCF)
(c)	For strategies, plans and actions referred to in Article 4, paragraph 6, of the Paris Agreement, or policies 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	24.4% reduction from the total national GHG emissions in 2017
(e)	Information on sources of data used in quantifying the reference point(s)	2019 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.
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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	<p>Single-year target</p> <p>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 <i>the 3rd Basic Plan for K-ETS</i> for 2021-2030, considering the 2030 national GHG reduction target.</p>

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 24.4% from the total national GHG emissions in 2017, which is 709.1 MtCO ₂ eq, 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 processes, agriculture, LULUCF, and waste GHGs: carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O), 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. <u>However, once the activity data is collected, it will be compiled in the National GHG Inventory Report.</u>
(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	<p>< NDC planning ></p> <p>The Prime Minister's Secretariat and the Office for Government Policy Coordination led the government-wide initiative for the launch of the Climate Change Task Force in 2015 and had led inter-ministerial coordination for setting a 2030 national GHG reduction target with the Greenhouse Gas Inventory and Research Center of Korea (GIR) which operated a joint working group comprising expert agencies from each sector to conduct technical analysis for setting the target.</p> <p>To collect broader inputs from the private sector in drawing up the target, the Post-2020 Public-Private Joint Commission was formed. The commission consists of representatives from civil society and industries, and it was tasked with reviewing the result of the technical analysis delivered by the joint working group and collecting public opinions through public hearings and parliamentary discussions.</p>

	<p>Through this process, 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 <i>the 2030 Basic Roadmap for Achieving the National Greenhouse Gases Reduction Target (2030 Roadmap)</i>, 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).</p> <p>Later on, civil society pointed out that the <i>2030 Roadmap</i> 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 <i>2030 Roadmap</i>. Based on such inputs, the Korean government revised the <i>2030 Roadmap</i> 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.</p> <p>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</p>
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	<p>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 <i>the Enforcement Decree of the Framework Act on Low Carbon, Green Growth</i>. Following the ensuing review by the Committee on Green Growth and the government, the Republic of Korea finalized the update of its NDC that includes the 2030 national GHG reduction target.</p> <p>< NDC implementation plan ></p> <p>The Republic of Korea has been implementing the updated NDC in the following manner. First, for the implementation of the updated target, the government introduced <i>the 2nd Basic Plan for Climate Change Response</i> in October 2019. <i>The 2nd Basic Plan for Climate Change Response</i> includes key strategies; transition to a low-carbon society, establishment of a robust adaptation system, and enhancement of a climate action framework as well as mitigation measures by sector including transformation, industry, building, transportation, etc. The mitigation measures in the transformation sector (electricity and heating) include a significant reduction of coal power generation (e.g. ban on constructing new coal-fired power plants, additional reduction of existing coal power plants, conversion to eco-friendly fuels such</p>
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		<p>as LNG) as well as the scale-up of renewable energy (to increase the share of renewable energy up to 20% by 2030 and 30-35% by 2040). To improve the energy-intensity, Industry 4.0 technologies such as AI and IoT will be widely used for the sectoral demand side management. The Republic of Korea will further introduce the concept of environment dispatch and rationalize energy price by considering supply costs and also the social costs including external costs. In the industry sector, highly-efficient equipment and factory energy management systems will be diffused at a greater scale. The government will reduce the use of fossil fuels by technology innovation and deployment of new technologies, such as hydrogen reduction steelmaking. In the building sector, existing public buildings will be pursued to be converted into green buildings that are required to meet higher standards in terms of energy performances. With regard to new buildings, including privately-owned buildings, more buildings will be required to be certified as zero-energy buildings that minimize energy consumption, and energy efficiency standard will be strengthened for home appliances and office equipment. In the transportation sector, the Republic of Korea has set the target of deploying 3 million units of electric vehicles and 850,000 hydrogen vehicles by 2030 with a view to scaling up the deployment of zero-emission vehicles. The government is also pursuing a modal shift in freight transport from road to rail and</p>
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	<p>shipping, and expanding eco-friendly ships fueled by LNG. Measures to minimize wastes, such as single-use items in particular, will be implemented. Also, forestation projects will be carried out to increase capacity of carbon sinks in the forest sector.</p> <p>Second, the Korea's Emissions Trading Scheme (K-ETS), which covers 73.5% of the total national GHG emissions, will be more widely promoted to reduce GHG emissions efficiently based on the market-based mitigation mechanism. <i>The 3rd Basic Plan for the K-ETS</i> for 2021–2030 presents effective reduction measures, improved allocation methods, enhanced market functions, and linkage and collaboration with international carbon markets as core strategies of the next decade for the achievement of the 2030 target. According to <i>the 3rd Basic Plan for the K-ETS</i> for 2021–2030, the annual emissions target of the revised <i>2030 Roadmap</i> will be considered when setting the emissions cap for each phase in order to improve coherence between the ETS and the NDC. The auction volume in the K-ETS has been raised from 3% to 10% to enhance the polluter pays principle. To support the industry sector which will bear more burden for GHG reduction, the government will support energy efficiency projects and new mitigation technology development projects. <i>The Phase 3 Allocation Plan</i> for 2021-2025, which was established based on the principles of <i>the 3rd Basic Plan for the K-ETS</i> for 2021-2030, specifies the emissions cap as well as</p>
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	<p>allocation standards and methods by sector and sub-sector. And the emissions cap of the Phase 3 has been determined in consideration of the annual emissions pathways in the <i>2030 Roadmap</i>. 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 (2021-2025). The number of sub-sectors and companies that are covered by the K-ETS has increased from 62 and 589 to 69 and 685, respectively.</p> <p>From 2020, the Republic of Korea starts operating a government-wide scientific and quantitative system for implementation, which was established in 2019, and implementing the reduction target in a transparent manner. The Office for Government Policy Coordination and the Ministry of Environment will 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. Objective and quantitative implementation indicators will be developed for all 8 sectors. The government will assess implementation performance with each indicator and compare the performance with the sectoral emissions targets set out in the revised <i>2030 Roadmap</i> comprehensively. For effective monitoring and assessment, the government plans to estimate provisional GHG emissions and</p>
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		<p>release such information on an annual basis.</p> <p>To add more certainty to the implementation of the updated NDC and to further accelerate mitigation actions and climate-resilient recovery, the Republic of Korea introduced the Green New Deal in July 2020. The Green New Deal is underpinned by 3 key 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 73.4 trillion will be invested by 2025. Under the Green New Deal, the solar and wind power capacity is expected to increase three-fold from the 2019 level by 2025 (from 12.7GW to 42.7GW) and smart meters will be provided for 5 million household units of apartment. For future mobility, the government plans to deploy 1.13 million electric vehicles and 200,000 hydrogen vehicles, and their charging infrastructures (45,000 charging equipment, 450 hydrogen fueling stations, hydrogen production bases, etc.). For the building sector, a total of KRW 20 trillion will be invested in green remodeling of 225,000 public rental homes and 2,000 public buildings (daycare centers, healthcare centers, etc.) used by vulnerable populations, and transformation of 2,890 units of school into green smart school. Also, the government will foster hydrogen-related businesses for the growth of the hydrogen industry. To this end, it will focus on the development of original technologies for hydrogen production, storage, and utilization and create 6 pilot</p>
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		hydrogen-based cities. The next 5 years of implementing the Green New Deal will serve as a lever for achieving the updated NDC including the 2030 national GHG reduction target and green transition toward carbon neutrality.
(ii)	Contextual matters, including, inter alia, as appropriate	
a.	National circumstances, such as geography, climate, economy, sustainable development and poverty eradication	<p>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 51,607,000 in 2018, and its export dependency reached 37.5% in 2017. The percentage of manufacturing to the nominal GDP was 30.4% in 2017.</p> <p>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 has put its efforts to make a transition to a low-carbon society (For more details, please refer to the 4th National Communication of Korea).</p>
b.	Best practices and experience related to the preparation of the nationally determined contribution	The Republic of Korea established a government-wide scientific and quantitative system for implementation to achieve the national GHG reduction target. The Office for Government Policy Coordination and the Ministry of Environment will

		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 designated to reduce GHG emissions collect and submit their reduction data to the Greenhouse Gas Inventory and Research Center of Korea (GIR) which then prepares an assessment report. This assessment process will be initiated from 2020 and is expected to add more certainty in implementing and achieving the national GHG reduction target.
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 1 st GST in 2023 and consider and duly reflect the results from the 1 st 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	N/A

	economic diversification actions, which may cover, but are not limited to, sectors such as manufacturing and industry, energy and mining, transport and communication, construction, tourism, real estate, agriculture and fisheries	
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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), the Republic of Korea prepares to apply 2006 IPCC Guidelines, 2013 KP supplementary document and 2013 Wetland supplementary document.

(d)	<p>IPCC methodologies and metrics used for estimating anthropogenic greenhouse gas emissions and removals</p>	<p>The Republic of Korea uses the 1996 IPCC Guidelines to estimate anthropogenic GHG emissions and removals. For a few categories, GPG 2000, GPG LULUCF, 2006 IPCC Guidelines are applied. Categories applied by GPG 2000 are i) civil aviation in the energy sector, ii) solid waste disposal on land, and iii) wastewater treatment and waste incineration in waste sector. Categories applied by GPG LULUCF are cropland and grassland in LULUCF sector. The 2006 IPCC Guidelines are applied for i) F-gas emissions from semiconductor manufacturing and electric equipment and fugitive emissions from natural gas, ii) rice cultivation and agricultural soils in agriculture sector, iii) forest land and wetlands in LULUCF sector, and iv) others in the waste sector. The energy sector uses sectoral approach to estimate emissions.</p> <p>For GHG emissions inventory methodologies, Tier 1 is mainly used while Tier 2 is also used for some sub-sectors, such as i) fuel combustion (CO₂), ii) cement production (CO₂) and semiconductor manufacturing (PFCs, HFCs, SF₆), iii) rice cultivation (CH₄) and agricultural soil (N₂O), iv) forest land (CO₂), v) waste incineration (N₂O) and solid waste disposal on land (CH₄), and vi) wastewater treatment (CH₄).</p> <p>The CO₂ 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.</p>
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(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, not confined to a specific age-class, 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 example, key parameters, assumptions, definitions, methodologies, data sources and models used	<u>The reference indicator of the updated NDC is the total national GHG emissions (excluding LULUCF) in 2017 in 2019 National GHG Inventory Report, which was prepared according to the IPCC Guidelines.</u>

(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 has energy-intensive industry structure. Its manufacturing sector takes up 28.4% of the GDP and its core industries, such as steelmaking, petrochemicals, oil refinery, etc., are carbon-intensive industries. The GHG emissions from top 4 energy-intensive industries accounted for 74.8% of the industry sector's total GHG emissions in 2019. Those top 4

	<p>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. Under such circumstances, significant reduction of GHG emissions without undermining national economic growth is a challenging task.</p> <p>However, the GHG emissions level that had been on the continuous rise since the 1990s started decreasing from 2018, the year the level is to expected to peak. This is 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 started its operation since 2015. From 2021 to 2030, the scheme aims to achieve the updated NDC in accordance with <i>the 3rd Basic Plan for the K-ETS</i>. The emissions cap in <i>the Phase 3 Allocation Plan</i> was also recently set in accordance with the updated NDC.</p> <p>To accelerate the momentum gathered so far, the Republic of Korea has set the ambitious level of reduction target, which is to cut the total national GHG emissions by one-fourth within approximately 10 years from the base year, 2017.</p> <p>The Republic of Korea plans to significantly scale up R&D investments for core emissions reduction technologies, e.g.,</p>
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		<p>renewable energy, zero emission vehicles and hydrogen technologies, under the recognition that climate change is caused by man-made GHG emissions and therefore, it could be dealt with by human endeavor as well, i.e., the technological development. The government is also pushing ahead with the Korean Green New Deal from 2020 with the planned investment of KRW 73.4 trillion to overcome the climate crisis and economic recession.</p>
(b)	Fairness considerations, including reflecting on equity	<p>The Republic of Korea began its industrialization in the 1970s. Under its drive for economic growth, the Republic of Korea has experienced continued GHG emissions growth since the 1990s. However, with its Energy & GHG Target Management System, K-ETS, and other active mitigation policies starting to take effect, the emissions level is expected to start decreasing from 2019 after 2018, the year the level is expected to peak.</p> <p>Under such circumstances, the Republic of Korea, expecting its emissions level in 2018 to be its peak, has set the ambitious target, which is to cut the total national GHG emissions by one-fourth within approximately 10 years from 2018. This duration of nearly 10 years is much shorter time span than most developed countries have taken to reduce their emissions by one-fourth and therefore, it is our understanding that the Republic of Korea is making a fair contribution to achieving the goals of the Paris Agreement.</p>

		<p>President Moon Jae-in declared in his speech on annual budget at the National Assembly in October 2020 that the Republic of Korea will strive to become carbon-neutral by 2050. Although the Republic of Korea experienced industrialization at a later stage, his speech reaffirmed the Republic of Korea's commitment to striving to achieve the same 2050 goal indicated in <i>the IPCC Special Report on the Global Warming of 1.5 °C</i>. With such long-term goal in mind, the Korean government will seriously consider raising ambition level in its NDC before 2025.</p>
(c)	How the Party has addressed Article 4, paragraph 3 , of the Paris Agreement	<p>The Republic of Korea added GHG reduction pathways on a 3-year basis to the <i>2030 Roadmap</i>, except 2030, the target year. This is to provide clear policy signals so that the indicated pathways could be used as a guidance for setting the emissions caps for the K-ETS. Also, the share of overseas reduction in the <i>2030 Roadmap</i> has been reduced to strengthen domestic mitigation efforts.</p> <p>Building upon such progress, the government updated the existing target to the absolute target, which is to reduce 24.4% from the total national GHG emissions in 2017 by 2030, to increase clarity and transparency of the target. <i>The Enforcement Decree of the Framework Act on Low Carbon, Green Growth</i> was amended to include the updated target, ensuring the legal basis for mitigation efforts.</p>

(d)	How the Party has addressed Article 4, paragraph 4, of the Paris Agreement	<p>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.</p> <p>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.</p> <p>Article 4, paragraph 4 of the Paris Agreement encourages developing countries to move over time towards economy-wide emissions reduction or limitation targets. With this in mind, the Republic of Korea converted the existing BAU-based reduction target, previously communicated in its INDC, into the absolute target, which indicates a meaningful progress.</p>
(e)	How the Party has addressed Article 4, paragraph 6, of the Paris Agreement.	N/A

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

	Information	Information submitted by the Republic of Korea
(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 °C and to pursue efforts to limit the temperature increase to 1.5 °C 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.

		<p>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 transition toward a carbon-neutral society. The Green New Deal is underpinned by 3 key pillars; 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 73.4 trillion by 2025.</p> <p><u>From 2021, the Republic of Korea plans to analyze 2050 carbon neutrality scenarios as well as 2030 emissions reduction potentials for the consideration of raising its ambition level in further updating its 2030 target.</u></p>
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