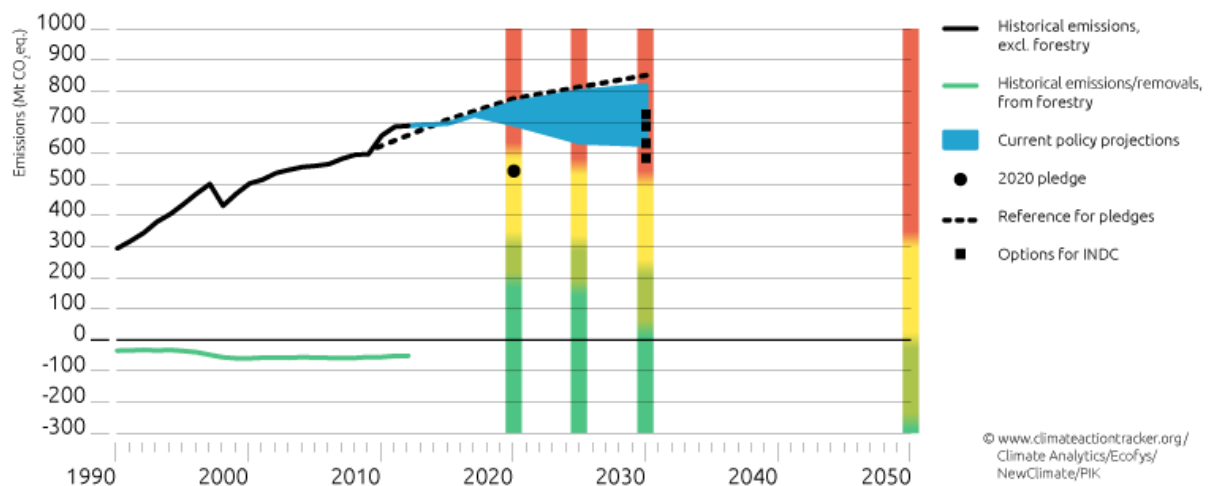


## Rating

Inadequate

## Graph



## Assessment

On 11 June 2015 South Korea announced four options for its Intended Nationally Determined Contribution (INDC), ranging from 14.7% to 31.3% below business-as-usual (BAU) by 2030.

This is equivalent to 98–146% above 1990 emission levels excluding land-use, land-use change and forestry (LULUCF). These proposed options are less ambitious than its 2020 pledge and would allow emissions to increase after 2020. We rate all four options for 2030 “inadequate”.

The “inadequate” rating indicates that the South Korea’s proposed contributions are not in line with interpretations of a “fair” approach to reach a 2°C pathway. This means the options for its INDC are not consistent with holding warming below 2°C unless other countries make much deeper reductions and comparably greater effort: if most other countries followed South Korea’s proposed approach global warming would exceed 3–4°C.

There is a growing implementation gap between South Korea’s 2020 pledge and its climate policies, and its recently-launched Phase 1 emissions trading scheme (ETS) is not stringent enough to address this. After public consultation, South Korea is expected to submit one of the four proposed options as its final INDC by the end of June.

Earlier, South Korea pledged to reduce its emissions by 30% below BAU emissions in 2020 (84% above 1990 emission levels). We rated this pledge “medium”. The “medium” rating for 2020 indicates that South Korea’s climate plans are at the least ambitious end of what would be a fair

contribution. When submitting its final INDC, South Korea might also change its 2020 pledge, which could bring it in the “inadequate” range as well.

In the period 2010–2012, South Korea’s emissions exceeded the BAU projections used as the reference for this pledge. In January 2015 an emissions trading scheme (ETS) was launched. The absolute emissions cap for phase I (2015–2017) of this scheme is not stringent enough to bring South Korea’s emissions on track to meet its 2020 pledge. Depending on the design of the ETS after phase I, the ETS could bring emissions levels on track to meet the least ambitious options proposed for the South Korea’s INDC.

### Pledge and post-2020 contribution

On 11 June 2015 South Korea announced four options for its Intended Nationally Determined Contribution (INDC) (Korea Herald, 2015). These options are 14.7%, 19.2%, 25.7% and 31.3% below a business-as-usual (BAU) of 851 MtCO<sub>2e</sub> by 2030 (equivalent to 98%, 115%, 133% and 146% above 1990 emission levels). Although this is not specifically stated, we assume that the targets and BAU exclude emissions from land-use, land use change and forestry (LULUCF) in line with South Korea’s 2020 pledge. After public consultation, South Korea is expected to submit one of the four proposed options as its final INDC by the end of June.

Under the Copenhagen accord, South Korea agreed to reduce its emissions by 30% below business-as-usual (BAU) emissions in 2020. The target was proposed in November 2009 and submitted to the Copenhagen Accord on 25 January 2010. No conditions were specified for this pledge.

In its Third National Communication (2012), South Korea lowered its BAU projections to 776 MtCO<sub>2e</sub> in 2020 from projections provided earlier of 813 MtCO<sub>2e</sub>.

It notes: “this recalculation does not change the 30% reduction goal rate.” South Korea is the only country that increased the stringency of its pledge (in terms of associated absolute emission target to be achieved) by correcting BAU emissions downwards. However, South Korea may end up weakening its 2020 pledge (Hankyung, 2015).

Under the current BAU projections, the pledge would result in emissions of 543 MtCO<sub>2e</sub> in 2020 excluding land-use, land use change and forestry (LULUCF). This represents an increase of 84% in GHG’s from 1990 emissions levels.

In 2014, the Ministry of Environment published its roadmap for achieving national greenhouse gas reduction targets. This roadmap confirms the BAU projections from the Third National

<b>Convention</b>	
Copenhagen pledge	-30% below BAU by 2020 [84% above 1990 emissions excluding LULUCF]
Conditions	none
<b>Possible INDC</b>	
2030 pledge	-14.7%, -19.2%, -25.7% or -31.3% below BAU [98%, 115%, 133% or 146% above 1990 emissions excluding LULUCF]
Conditions	Not specified.
Coverage	Not specified, most likely excluding LULUCF
<b>National goals</b>	
Long term goal(s)	none

Communication and the emissions reduction pledge, and provides a sectoral breakdown of the emissions reductions.

### Fair share

We rate all four of South Korea's proposed INDC options "inadequate". The "inadequate" rating indicates that the South Korea's proposed contributions are not in line with interpretations of a "fair" approach to reach a 2°C pathway. This means they are not consistent with limiting warming to below 2°C unless other countries make much deeper reductions and comparably greater effort.

We rated South Korea's pledge for 2020 "medium"<sup>1</sup>. The pledge is in line with approaches that focus on responsibility and staged approaches.

### Current policy projections description

South Korea's emissions have more than doubled between 1990 and 2012. Emissions steeply increased in the early 1990s. Growth then continued at a slower pace, and is continuing to slow down. Actual emissions levels in the period 2010-2012 were above the BAU projections from the Third National Communication. Among the OECD members, South Korea is one of the fastest growing emitters. The high export rates from Korea's manufacturing industry play a critical role in Korea's increasing emission levels (Kim et al., 2015).

It is unlikely that South Korea will meet its 2020 pledge with its currently implemented policies. Whether emissions grow or start declining in the coming years depends on the final design and implementation of the emissions trading system (ETS). Current implemented policies are estimated to lead to emissions levels ranging between 643 and 763 MtCO<sub>2e</sub> in 2020 (135% to 160% above 1990 levels) and between 628 and 818 MtCO<sub>2e</sub> in 2030 (113 to 178% above 1990 levels), excluding emissions from land use, land use change and forestry (LULUCF). LULUCF emissions have historically been a sink of between 26 and 41 MtCO<sub>2e</sub> and are projected to remain a sink of 23 MtCO<sub>2e</sub> by 2020 (Republic of Korea, 2012).

South Korea's power demand increased by 162% over the period 1990–2013 and is dominated by coal-fired (45% in 2013) and nuclear generation (26% in 2013) (IEA, 2014). In June 2015 South Korea announced it would cancel four planned new coal-fired power plants with a combined capacity of 3740 MW. At the same time, it announced two new planned nuclear reactors, bringing the total of planned nuclear reactors to 13 (Reuters, 2015). In the 7th Electricity Supply Plan, planned to be finalised by the end of June 2015, South Korea targets the following electricity supply mix by 2029: 18.5% nuclear, 32.2% coal, 24.7% LNG, 4.6% renewable, 5.8% combined heat and power and 4.2% oil and pumped storage. This represents a decrease in coal and an increase in nuclear compared to the previous Electricity Supply Plan.

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<sup>1</sup> Due to the inclusion of more effort sharing studies, the "sufficient" and "medium" range for South Korea have changed compared to the assessments in previous years. As a result of this, we changed the rating of this pledge "sufficient" to "medium", even though there has been no change in the pledged emissions level for 2020. Notably, we decreased the lower end of the "sufficient" range as a result of the inclusion of approaches that focus on equal cumulative per capita emissions. The upper end of the "medium" and "sufficient" range is lowered because of economic development in South Korea that we had not included in the studies used in earlier assessments. The increasing GDP level leads to more stringent fair shares in approaches that focus on, for example, capability.

South Korea has successfully implemented its Green Growth Strategy, a comprehensive policy package targeting all policy areas including climate change. One of its key policies is the cap and trade scheme introduced in January 2015.

In 2012, South Korea introduced the Target Management System (TMS), which covered 60% of total emissions. The TMS was a precursor to the emissions trading scheme (ETS) Full implementation of the ETS started in January 2015 and covers all installations in the industrial and power sectors with annual emissions higher than 25 ktCO<sub>2e</sub>. The ETS system does cover both direct and indirect emissions (emissions electricity use). In phase I of the ETS (2015–2017) the absolute emissions cap will decrease from 573 MtCO<sub>2e</sub> in 2015, to 562 MtCO<sub>2e</sub> in 2016 and 551 MtCO<sub>2e</sub> in 2017 (Carbon Market Watch, 2015).

This cap is not stringent enough to bring South Korea's emissions on track for its 2020 pledge and we estimate that this phase of the ETS will not result in additional emission reductions. To meet the 2020 pledge, a much stronger annual decrease of the cap is needed after 2017. The caps for phase II (2018–2020) and phase III (2021–2025) have not been announced. Depending on the design of the ETS after phase I, the ETS could bring emission on track for the least ambitious options proposed for South Korea's INDC.

The Renewable Portfolio Standard (RPS) was introduced in 2012 and is replacing a previous feed-in tariff scheme. The new standard is obliging suppliers to meet annual generation targets from renewable energy. They begin with 2% and increase to 10% in 2022 (Kemco, 2013). South Korea has already started implementing renewable energy technologies but is still dependent on coal, so the reduction effect is low compared to its potential.

For the residential building sector, the government has set up a subsidy program that aims to power one million homes with renewable sources such as geothermal, solar PV, small wind or thermal solar. Fifty percent of the costs for each household will be subsidised. So far, the annual increase rate of the scheme, as well as the supporting modalities, seem to be successful and therefore we assume that the target will be reached.

## Data sources and assumptions

### Pledge

Historical emissions in South Korea were taken from the national inventories submitted to UNFCCC (2015). BAU projections were taken from the Third National Communication (Republic of Korea, 2012). The resulting targeted emissions level is in line with the Roadmap for achieving national greenhouse gas reduction targets (Ministry of Environment, 2014).

### Current policy projections

Current trend projections are based on the International Energy Outlook 2013 Reference case projections for CO<sub>2</sub> emissions from fuel combustion only until 2030 (EIA, 2013) and the US EPA non-CO<sub>2</sub> emission projections until 2030 (USEPA, 2012). The International Energy Outlook 2013 projections are further updated to include the fuel mix from the 7th Electricity Supply Plan, the Renewable Portfolio Standard, the "1 Million Green Homes" Project and the ETS.

The ETS system is assumed to cover from 60% (coverage of TMS system; EDF & IETA, 2014) to 75% (own assumption) of business-as-usual emissions. For phase I (2015-2017) the absolute cap is applied, which is not expected to result in emission savings compared to the International Energy Outlook 2013 Reference case projections (adapted based on the 7th Electricity Supply Plan). Since

no information on the design of phase II and III of the ETS is available yet, the range reflects two possible pathways from 2018 to 2030; 1) The cap remains at the 2017 cap; 2) The cap continues to decrease at the same rate over the period 2008-2025. Overlap between the emission reductions resulting from the Renewable Portfolio Standard and the “1 Million Green Homes” Project and the ETS is assumed to be 25% to 75%.

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### **Climate Analytics**

Climate Analytics is a non-profit organisation based in Berlin, Germany. It has been established to synthesise climate science and policy research that is relevant for international climate policy negotiations. It aims to provide scientific, policy and analytical support for Small Island States (SIDS) and the least developed country group (LDCs) negotiators, as well as non-governmental organisations and other stakeholders in the 'post-2012' negotiations. Furthermore, it assists in building in-house capacity within SIDS and LDCs. Contact: Dr. h.c. Bill Hare, +49 160 908 62463

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