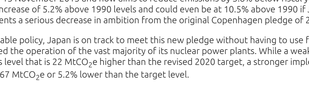
Japan

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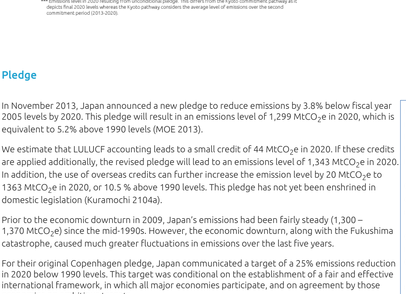
Rating



Assessment

Japan revised its 2020 pledge on 15 November 2013 and now aims to reduce emissions by 3.8% below fiscal year 2005 levels by 2020. The new 2020 pledge is equivalent to an increase of 5.2% above 1990 levels and could even be at 10.5% above 1990 if Japan makes use of forest sinks and overseas credits. This represents a serious decrease in ambition from the original Copenhagen pledge of 25% below 1990.

If it follows through on its renewable policy, Japan is on track to meet this new pledge without having to use forest sinks and overseas credits, and despite the fact it has stopped the operation of the vast majority of its nuclear power plants. While a weaker implementation of renewables policy would lead to an emissions level that is 22 $MtCO_2e$ higher than the revised 2020 target, a stronger implementation of renewables could lead to an emissions level that is 67 $MtCO_2e$ or 5.2% lower than the target level.



Pledge

In November 2013, Japan announced a new pledge to reduce emissions by 3.8% below fiscal year 2005 levels by 2020. This pledge will result in an emissions level of 1,299 $MtCO_2e$ in 2020, which is equivalent to 5.2% above 1990 levels (MOE 2013).

We estimate that LULUCF accounting leads to a small credit of 44 $MtCO_2e$ in 2020. If these credits are applied additionally, the revised pledge will lead to an emissions level of 1,343 $MtCO_2e$ in 2020. In addition, the use of overseas credits can further increase the emission level by 20 $MtCO_2e$ to 1363 $MtCO_2e$ in 2020, or 10.5 % above 1990 levels. This pledge has not yet been enshrined in domestic legislation (Kuramochi 2104a).

Prior to the economic downturn in 2009, Japan's emissions had been fairly steady (1,300 – 1,370 $MtCO_2e$) since the mid-1990s. However, the economic downturn, along with the Fukushima catastrophe, caused much greater fluctuations in emissions over the last five years.

For their original Copenhagen pledge, Japan communicated a target of a 25% emissions reduction in 2020 below 1990 levels. This target was conditional on the establishment of a fair and effective international framework, in which all major economies participate, and on agreement by those economies on ambitious targets.

Revision of the original pledge raises the 2020 target by 356 $MtCO_2e$, and increases the 2020 Emissions Gap (UNEP, 2013) by 3-4%. While the Japanese government claims that this revision is mainly due to the future exclusion of nuclear energy from the energy mix (MOE 2013), our analysis indicates that the revision cannot be fully explained by removing nuclear energy from the energy mix. Instead, it represents a decreased level of ambition (see below and CAT briefing on Japan 2013).

Japan's Kyoto target (2008-2012) was at -6% relative to base year (1990) emission levels.

Kyoto Protocol	
Member of KP CP1 (2008-2012)	yes
Member of KP CP2 (2013-2020)	no
KP CP1 target (below base year)	-6%
KP CP2 target (below base year)	n.a.
Convention	
Current 2020 pledge	**-3.8%**
Reference for current pledge	**FY 2005**
Copenhagen pledge	-25%
Reference for Copenhagen pledge	1990 emissions
Conditions (for higher pledge level)	no range
National goals	
Long term goal(s)	-60 to -80% by 2050 below 2005 emissions

Decreased pledge a necessary response to reduction in contribution from nuclear energy?

The IEA World Energy Outlook's Current policies scenario (IEA, 2013) projects that Japan's nuclear energy would contribute with 220 TWh to Japan's electricity supply. If all nuclear power in this scenario were to be replaced by coal-powered generation, an extra 197 $MtCO_2e$ would be emitted. This is equivalent to 15% of Japan's current emissions. As the policies scenario assumes current economic growth rates and no other mitigation, this value represents the upper end of emissions that can be expected from a total abandonment of nuclear power generation in Japan under current policies.

Even in a worst-case scenario in which nuclear was replaced entirely by coal, the expected increase represents only 55% of the increase in emissions from the original Copenhagen pledge to the new 2020 target. The remaining 45% must therefore represent a change in Japan's political will to reduce emissions.

If the shortfall in supply from nuclear were to be taken up by oil, gas, or renewables, instead of coal, the portion of the revision in Japan's target attributable to national circumstances would be much lower. If replaced by oil, the shut-down of nuclear production would represent 38% of the overall reduction in ambition, 23% in the case of gas, and 0% for a scenario where it is fully replaced by renewables.

One option under consideration by Japan to reach the original Copenhagen pledge was to increase nuclear capacity to 40% of total electricity generation. Assuming the same total electricity demand as in the WEO 2013 current policies scenario (IEA, 2013), Japan could only have achieved a maximum of 8% of emission reduction below 1990 through this approach. If nuclear replaced anything other than coal-powered generation, the reduction would be weaker. The 40% nuclear scenario is insufficient to meet the Copenhagen pledge, and the additional 17% reduction below 1990 would have required energy efficiency improvements, additional changes to the fuel mix or the use of international units. **Our analysis is in agreement with that done by the Japanese Ministry of the Environment in September 2012 that indicated a nuclear-free scenario would lead to a zero to 7% reduction below 1990 levels in 2020.**

Current policy projections

Currently implemented policies will lead to emissions levels of between 1,232 and 1,321 $MtCO_2e$ in 2020 and 1,120 and 1,263 $MtCO_2e$ in 2030, excluding LULUCF. The range for each year depends on the success of the implementation of Japan's renewable strategy. The lower end of the range assumes that Japan will meet its renewable energy targets for electricity generation, as put forward in the 2010 Basic Act on Energy policy. The upper end represents a situation where the currently implemented feed-in tariff will exceed this target. This can be achieved by implementing all currently approved RE capacity until 2020 and by continuing RE growth at a similar rate thereafter.

After the 2011 earthquake, the Japanese government decided to revise its energy policy and committed to reducing its reliance on nuclear energy. In 2013 the government laid out an Innovative Strategy on Energy and Environment that included the goal to phase out nuclear energy.

In 2011, nuclear power plants have stopped operating until they will be able to comply with higher safety standards. (In 2014, the Government announced the new Basic Energy Plan of 2014 (METI 2014) that calls for a reintroduction of nuclear energy. As of August 2014, 19 nuclear power plants with a total capacity of 19 GW have applied for a restart under new more stringent safety standards. These would avert approximately 90 MtCO2 of emissions from coal-fired power plants (Kuramochi 2014b). A little less than the same amount of nuclear energy capacity will then still remain shut down. As of November 2014 only one plant, at Sendai, has been given the go-ahead to open, but has not yet opened.

An important aim of the Basic Energy Plan of 2014 is to diversify the energy mix away from nuclear towards renewable energy. However, the plan does not specify how the Japanese government intends to achieve this. The 2010 Basic Energy plan established renewable targets for electricity generation of: 12.5% in 2020 and 20% in 2030. In 2012, Renewable Energy Act was introduced to support these targets. It institutes a feed-in tariff (FIT) and general funding for distribution networks. As of March 2014 roughly 69 GW (97% of which is PV) have been approved for the FIT. However only 9GW of renewables began operating as of March 2014.

Before the recently initiated transformation of the electricity supply sector, Japan had already introduced effective policies in the area of energy efficiency in transport, industry and buildings. These policies were recently complemented by additional policies in the building sector (Top runner standard for building materials) and a Global Warming Tax. The latter is a low upstream environmental tax at a maximum price of 2.89 US/tCO_2 in 2016 and will likely have only have marginal effects on GHG emissions. Furthermore, the GHG impact of these complex recently introduced policies is difficult to quantify, and has not been quantified by other institution yet (Kuramochi 2014a). We have not attempted to quantify these policies for this update yet either.

Date of pledge: November 2013

Assumptions

Pledge

Targets for 2020 were calculated from fiscal year 2005 according to Japan's Fifth National Communication to the UNFCCC (2010). We calculated Japan's LULUCF accounting quantities in 2020 for afforestation, reforestation and deforestation using the current Kyoto rules. For forest management, Japan's proposed reference level is zero. We also apply a cap on forest management (either 3% of the base year emissions or 15% of the activity whichever is less), since Japan wants to continue using the Kyoto Protocol rules for forest management.

Current policy projections

For the analysis of current policy projections we used the WEO 2013 Current Policy scenario (IEA 2013) which covers energy efficiency policies and their impact on CO_2 emissions. These datasets were combined with non-energy data from US EPA (US EPA 2012) and Edgar (JRC/PBL 2012). The WEO did not cover the shutdown of nuclear energy plants nor the increase of RE capacity triggered by the FIT. Therefore we additionally quantified the development of renewable energy in electricity generation and the likely development of nuclear capacity.

For renewable energy development, we implemented two scenarios, representing the range of possible future development of RE installation. For the higher emissions case we assumed that the RE targets for electricity generation of 12.5% and 20% for 2020 respectively 2030 will be implemented. For the lower emissions scenario we assumed that the currently under the feed-in tariff approved renewable energy capacity will be implemented by 2020 and that a similar growth will be sustained until 2030. For nuclear energy we assumed for both scenarios a restart of the 19 nuclear power plants that applied, assuming that these reactors will be gradually phased out over time, as plants turn older than 40 years.

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