

## Early Ambition Makes Reductions 27% Easier

Improved INDCs in 2020 would allow 3.5%/year reduction to limit warming to 2°C, while delay to 2030 requires 4.8%/year improvement

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## Overview

A major issue in Paris is whether the nations of the world will strengthen the pledges they have offered ahead of the talks and agree to a five-year review cycle designed to “update or confirm” their emissions pledges (INDCs). Climate Interactive’s new analysis shows what this could mean.

If countries strengthen their current INDCs so global emissions peak by 2020, the emissions cuts required to limit warming to no more than 2°C become much easier, with the required rate of emissions reductions for the period 2030-2040 falling from 4.8%/year under the current INDCs to 3.5%/year. The sooner emissions peak, the slower they have to fall to limit warming. That drop represents a 27% cut in the required rate of emissions reductions.

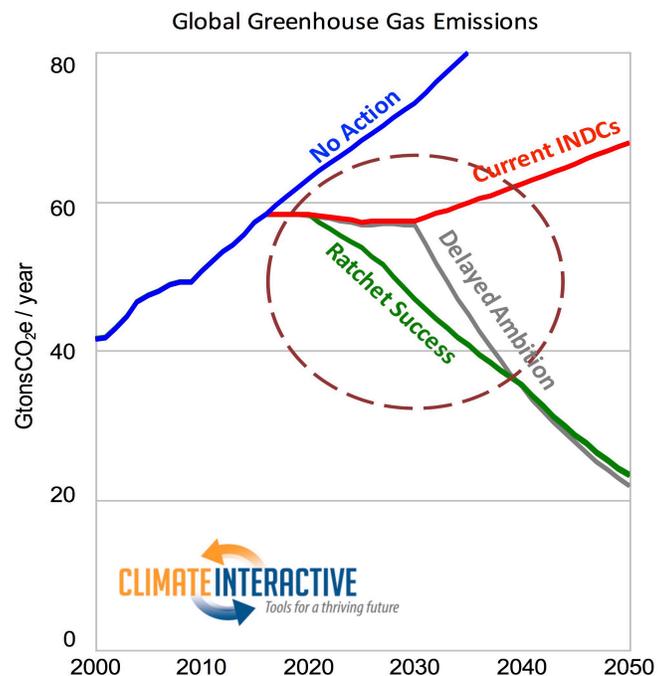


Figure 1: Potential emissions trajectories from 2015-2050

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Professor John Sterman of the MIT Sloan School of Management said, “Given the current pledges, the substantial emissions reductions required to limit warming to 2°C or less don’t begin until after 2030. By then, substantial additional fossil fuel infrastructure would be built, only to become stranded assets after 2030 at great cost to the companies and countries that built and financed them.”

We compared two scenarios that limit warming to no more than 2°C. In the first, denoted **Delayed Ambition**, all current INDCs are fully implemented, with emissions falling after 2030 fast enough to limit warming to no more than 2°C (3.6°F). In the second, denoted the **Ratchet Success** scenario, countries strengthen their INDCs so emissions fall faster between now and 2030, with continued cuts after 2030.

The current pledges delay the increase in ambition required to stay under 2°C, and would require emissions to fall at an average rate of 4.8%/year from 2030-2040, while the **Ratchet Success** Scenario requires an average decline of only 3.5%/year over the same period.

## The Scenarios

Our analysis explores three scenarios, with particular emphasis on the third—Ratchet Success—modeled using the C-ROADS climate policy simulator:

1. **No Action** - Nations continue on a business-as-usual trajectory with continued emissions growth leading to 4.5°C (8.1°F) with a range of uncertainty from 2.6 to 5.9°C (4.8 to 10.6°F) of warming. This scenario aligns with the IPCC’s AR5 RCP8.5 scenario.
2. **Current INDCs** – Emissions follow the INDCs offered as of December 6, 2015, specifically, that all current pledges are fully implemented, but excluding actions that have not been pledged. This would put the world on track for a global temperature increase of 3.5°C (6.3°F) above pre-industrial levels, with a range of uncertainty from 2.1 to 4.7°C (3.7 to 8.4°F). More on this scenario is posted on the [Climate Interactive Scoreboard website](#).
3. **Ratchet Success** – The current INDCs are improved as described in Table 1 below. The result is expected warming of 1.8°C (3.2°F) by 2100, with a range of uncertainty from 0.9 to 2.4°C (1.7 to 4.4°F). More on this scenario is posted on the [Climate Interactive Scoreboard website](#).
4. **Delayed Ambition** – Emissions follow the INDCs as per the **Current INDCs** scenario and then fall at the rate required to limit warming to no more than 2°C. The specifics are in Table 2 below. As in the **Ratchet Success** scenario, the **Delayed Ambition** scenario limits warming to 1.8°C (3.2°F), with a range of uncertainty from 0.9 to 2.4°C (1.7 to 4.4°F).

Table 1: Summary of assumptions for the "Ratchet Success" scenario

	(Current INDC)	Improvement for 2030	2030-2050
EU	40% below 1990 levels by 2030	47% below 1990 levels by 2030 (45% below 2005)	80% below 2005 by 2050
U.S.	26% below 2005 levels by 2025	45% below 2005 levels by 2030	80% below 2005 by 2050
Other Developed	3.7% decrease below 2005 emissions by 2030*	45% below 2005 levels by 2030 (or 50% below 1990 levels)	80% below 2005 by 2050
China	Peak CO2 by 2030	Peak by 2025	Reduce 2% per year through 2040 and 4% per year after
Other Developing	10% below BAU by 2030*	Peak by 2027	Reduce 2% per year through 2040 and 4% per year after

\*Level of ambition of the aggregate of individual INDCs within this group.

Table 2: Summary of assumptions for the "Delayed Ambition" scenario

	(Current INDC)		2030-2050
EU	40% below 1990 levels by 2030		80% below 2005 by 2050
U.S.	26% below 2005 levels by 2025		80% below 2005 by 2050
Other Developed	3.7% decrease below 2005 emissions by 2030*		80% below 2005 by 2050
China	Peak CO2 by 2030		Reduce 4.3% per year after
Other Developing	10% below BAU by 2030*		Reduce 4.3% per year after

\*Level of ambition of the aggregate of individual INDCs within this group.

Table 3: Global Annual Reduction Rates

Annual Reduction Rates		2000-2015	2015-2020	2020-2030	2030-2040	2040-2050	2050-2100	2015-2100
Global	INDC Strict	2.1%	0.0%	-0.2%	0.8%	0.9%	0.4%	0.4%
	Ratchet Success	2.1%	-1.3%	-2.2%	-3.5%	-4.2%	-4.2%	-3.5%
	Delayed Ambition	2.1%	0.0%	-0.2%	-4.8%	-4.8%	-4.6%	-3.8%

Table 4: Developed Country and Region Annual Reduction Rates

Annual Reduction Rates		2000-2015	2015-2020	2020-2030	2030-2040	2040-2050	2050-2100	2015-2100
US	INDC Strict	0.3%	-2.1%	-1.8%	0.0%	0.0%	0.0%	-0.4%
	Ratchet Success	0.3%	-4.1%	-4.8%	-5.1%	-5.1%	-5.1%	-4.9%
	Delayed Ambition	0.3%	-2.1%	-1.8%	-6.5%	-6.5%	-6.5%	-5.8%
EU	INDC Strict	-0.2%	-2.8%	-3.0%	0.0%	0.0%	0.0%	-0.5%
	Ratchet Success	-0.2%	-3.7%	-4.4%	-5.1%	-5.1%	-5.1%	-4.8%
	Delayed Ambition	-0.2%	-2.8%	-3.0%	-5.5%	-5.5%	-5.5%	-5.0%
Russia	INDC Strict	1.6%	-1.0%	-1.3%	0.0%	0.0%	0.0%	-0.2%
	Ratchet Success	1.6%	-5.3%	-7.7%	-5.1%	-5.1%	-5.2%	-5.2%
	Delayed Ambition	1.6%	-1.0%	-1.3%	-6.6%	-6.6%	-6.6%	-5.6%
Canada	INDC Strict	0.0%	-2.1%	-2.3%	0.0%	0.0%	0.0%	-0.4%
	Ratchet Success	0.0%	-3.7%	-4.7%	-5.1%	-5.1%	-5.1%	-4.8%
	Delayed Ambition	0.0%	-2.1%	-2.3%	-6.3%	-6.3%	-6.3%	-5.5%
Japan	INDC Strict	0.4%	-2.2%	-2.4%	0.0%	0.0%	0.0%	-0.4%
	Ratchet Success	0.4%	-4.3%	-5.6%	-5.1%	-5.1%	-5.1%	-5.0%
	Delayed Ambition	0.4%	-2.2%	-2.4%	-6.5%	-6.5%	-6.6%	-5.8%
Australia	INDC Strict	1.2%	-3.2%	-3.4%	0.0%	0.0%	0.0%	-0.6%
	Ratchet Success	1.2%	-5.2%	-6.4%	-5.1%	-5.1%	-5.1%	-5.1%
	Delayed Ambition	1.2%	-3.2%	-3.4%	-6.5%	-6.5%	-6.6%	-6.0%
South Korea	INDC Strict	2.5%	-2.1%	-2.7%	0.9%	0.8%	-0.1%	-0.2%
	Ratchet Success	2.5%	-6.3%	-8.9%	-5.1%	-5.1%	-5.2%	-5.3%
	Delayed Ambition	2.5%	-2.1%	-2.7%	-8.2%	-8.2%	-8.2%	-7.1%
Developed nonMEF	INDC Strict	2.1%	0.0%	-0.7%	1.2%	1.2%	0.2%	0.4%
	Ratchet Success	2.1%	-5.4%	-8.7%	-5.1%	-5.1%	-5.2%	-5.2%
	Delayed Ambition	2.1%	0.0%	-0.7%	-7.1%	-7.1%	-7.1%	-5.8%

Table 5: Developing Country and Region Annual Reduction Rates

Annual Reduction Rates		2000-2015	2015-2020	2020-2030	2030-2040	2040-2050	2050-2100	2015-2100
China	INDC Strict	6.8%	1.3%	0.8%	0.3%	0.4%	0.2%	0.4%
	Ratchet Success	6.8%	0.1%	-1.1%	-3.2%	-4.0%	-4.0%	-3.1%
	Delayed Ambition	6.8%	1.1%	0.6%	-4.3%	-4.3%	-4.3%	-3.3%
India	INDC Strict	3.6%	0.9%	0.6%	1.6%	1.6%	0.6%	0.9%
	Ratchet Success	3.6%	0.1%	-0.6%	-3.0%	-4.0%	-4.0%	-3.0%
	Delayed Ambition	3.6%	0.9%	0.6%	-4.3%	-4.3%	-4.3%	-3.4%
Indonesia	INDC Strict	1.7%	-1.6%	-1.8%	0.4%	0.5%	0.0%	-0.2%
	Ratchet Success	1.7%	-2.1%	-2.6%	-3.4%	-4.0%	-4.0%	-3.5%
	Delayed Ambition	1.7%	-1.6%	-1.8%	-4.3%	-4.3%	-4.3%	-3.8%
Mexico	INDC Strict	1.0%	0.1%	-0.1%	-4.3%	-4.3%	0.0%	-1.0%
	Ratchet Success	1.0%	-0.7%	-1.3%	-4.0%	-4.0%	-4.0%	-3.4%
	Delayed Ambition	1.0%	0.1%	-0.1%	-4.3%	-4.3%	-4.3%	-3.5%
Brazil	INDC Strict	-0.5%	-2.1%	-1.8%	0.0%	0.0%	0.0%	-0.4%
	Ratchet Success	-0.5%	-2.8%	-3.0%	-3.0%	-4.0%	-4.0%	-3.6%
	Delayed Ambition	-0.5%	-2.1%	-1.8%	-4.3%	-4.3%	-4.3%	-3.9%
South Africa	INDC Strict	0.5%	0.9%	0.4%	-0.9%	-1.0%	-1.0%	-0.7%
	Ratchet Success	0.5%	0.3%	-0.6%	-3.0%	-4.0%	-4.0%	-3.0%
	Delayed Ambition	0.5%	0.9%	0.4%	-3.4%	-4.3%	-4.3%	-3.2%
Developing nonMEF	INDC Strict	1.7%	1.3%	1.1%	2.0%	1.9%	0.7%	1.1%
	Ratchet Success	1.7%	0.5%	0.0%	-3.0%	-4.0%	-4.0%	-3.0%
	Delayed Ambition	1.7%	1.3%	1.1%	-4.3%	-4.3%	-4.3%	-3.3%