

## Singapore's Intended Nationally Determined Contribution for COP21 Climate Conference in Paris

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### SYNOPSIS

Singapore recently submitted its Intended Nationally Determined Contribution (INDC) to the United Nations Framework Convention on Climate Change (UNFCCC). The 36 per cent emissions intensity target mentioned in the INDC is an unexpected change from Singapore's 2020 target of 7–11 per cent emissions reduction below business as usual (BAU). The two types of targets and the different implementation timeframes present a challenge for attempts to compare their relative ambitiousness. This policy brief examines how Singapore's INDC fulfils the UNFCCC requirements which, apart from mitigation commitments, require that countries explain how they consider their contributions fair and ambitious in light of their respective national circumstances.

### KEY POINTS

- The success of the UN's new climate agreement will largely depend on the ambition of INDCs, which will determine the pace of action taken to tackle climate change after 2020. The emissions reduction target is a key indicator to gauge an INDC's ambition.
- Singapore has changed its target (to be achieved by 2030) from reduction as compared to a BAU in its 2020 Copenhagen pledge, to an emissions intensity reduction target in its INDC, making it essential and challenging to compare the targets for their ambition.
- Singapore's 2030 target will require an intensity reduction of 2.5 per cent annually, as compared to a 1.5 per cent target annual reduction by 2020. However, Singapore has already exhausted mitigation options such as from fuel-switching in its power sector.
- A number of INDCs, including Singapore's, have been analysed as "inadequate" by some commentators. Given that Singapore is an alternative energy disadvantaged country, it faces constraints in terms of the emissions reductions that can be achieved.

### INTRODUCTION

On 3 July 2015, Singapore submitted its Intended Nationally Determined Contribution (INDC) to the UNFCCC, formally putting forward its proposal to reduce its greenhouse gas (GHG) emissions intensity (per unit GDP at 2010 prices) by approximately 36 per cent as compared to 2005 levels by 2030, and to stabilise its emissions with the aim of peaking around 2030.

INDCs are a key element of the ongoing climate negotiations that are expected to conclude in December 2015, culminating in an Agreement that would for the first time unite all countries

in a commitment to legally binding emissions reduction actions for the period 2020–30.

Currently, only 37 industrialised countries are bound to GHG reduction targets under the Kyoto Protocol, with the targets being spread into two commitment periods until 2020. While Canada, Japan and Russia have indicated that they no longer want to be obligated under the protocol beyond its first commitment period (which ended in 2012), all other industrialised countries are committed to meeting their 2020 targets.

Developing countries need only submit targets for 2020 on a voluntary basis, and 57 countries, including Singapore, have done so. These voluntary targets, known as Nationally Appropriate Mitigation Actions (NAMAs), were submitted following the 2009 Copenhagen Climate Summit, and were incorporated into the UNFCCC through the 2010 Cancun Agreement. In its NAMA submitted in 2010, Singapore made an unconditional emissions reduction pledge of 7–11 per cent below BAU levels by 2020, and agreed to further step up the reduction to 16 per cent, should there be a global agreement on climate change where countries adhere to their targets in good faith. Notably, Singapore has chosen to submit its 2030 pledge in a different metric, i.e. emissions intensity per unit of GDP, as compared to its 2020 target.

#### **ANALYSIS**

#### ***INDCs are a key part of the new form of global climate negotiations***

The current climate negotiations under the Ad hoc Working Group on the Durban Platform for Enhanced Action (ADP) are remarkably different from the approach that was followed in the first 20 years of the UNFCCC. While scientific evidence supporting the need to restrict global emissions to a certain level has grown beyond doubt, it has also become clear that the top-down style of imposing mitigation commitments on Parties, as was done in the Kyoto Protocol, will not work if developing countries have to be made a part of the mitigation effort. Thus, the new approach relies on all Parties realising their responsibility and proposing their own set of emissions reduction commitments, which they believe are fair and equitable, and also take into account their national circumstances. Yet, when banded together, these commitments must be ambitious enough to achieve the ultimate objective set in the UNFCCC.

#### ***Choosing Targets***

Different countries at their respective stages of economic development tend to adopt different types of emissions reduction commitments. Developed countries are expected to take up absolute targets wherein their future emissions are expected to be reduced as compared to emissions in a base year. This is because developed countries have historical responsibility to reduce their emissions and

not regress from their previous 2020 targets. On the other hand, developing countries tend to choose between intensity targets (emissions per unit GDP or per capita) and deviations from a BAU scenario. A commitment in the form of a set of policies and measures is generally expected only from Least Developed Countries (LDCs).

For developing countries, choosing between an intensity target and a deviation from BAU can have its own set of implications. While defining a BAU scenario allows a country to experiment with a number of assumptions, the resultant emissions projections can be strongly influenced by the chosen methodology and assumptions. For example, there is constant debate on whether current and future emissions reduction policies should be included in the BAU scenario, as these can overestimate or underestimate the achieved reductions.

On the other hand, intensity targets compel countries to demonstrate a decoupling of their economic growth from increase in emissions. While critics argue that such targets allow countries to increase their absolute emissions, intensity targets ensure that emissions reductions are achieved through actual efficiency improvements, rather than as a result of circumstances such as an economic recession. However, intensity targets can expose countries to higher risks of non-compliance, for example when the economic growth rate is slower than expected and emissions reduce by a lesser margin.

A number of developing countries that have submitted both 2020 pledges and 2030 targets have changed the type of target, likely due to evolved circumstances. Morocco, Ethiopia and the former Yugoslav Republic of Macedonia have graduated from a set of voluntary programmes for 2020 to deviation from BAU targets for 2030. While China's NAMA includes a 40–45 per cent reduction of carbon dioxide emissions intensity by 2020 and a pledge to increase its share of non-fossil fuels in primary energy consumption to around 15 per cent by 2020, its INDC includes an aim to achieve peaking of carbon dioxide emissions around 2030 and a 60–65 per cent reduction of carbon dioxide emissions intensity from 2005 levels in 2030.

### ***Singapore's 2020 Pledge and Post-2020 Intended Contribution***

Singapore's INDC states that its 2030 target translates to an emissions intensity reduction of 2.5 per cent annually from 2020 to 2030. In addition, it also mentions that from 2005 to 2020, Singapore's emissions intensity is already planned to fall by an average of 1.5 per cent annually.

Based on Singapore's 2005 GDP (at 2010 prices) of S\$232.77 billion and 2005 emissions of 40.9 Mt CO<sub>2e</sub>, the annual reduction in emissions intensity of 1.5 per cent by 2020 is found to be almost equivalent to a reduction of 16 per cent in 2020 from the BAU emissions of 77.2 Mt CO<sub>2e</sub>. Our analysis assumes a GDP growth rate of 3 per cent per year from 2015 to 2020 as an average of the GDP growth rates estimated by Singapore's Ministry of Trade and Industry (MTI).

Further, the emissions intensity reduction rate of 2.5 per cent annually from 2021–30, leading to the 36 per cent reduction by 2030, would translate to a peaking and stabilisation of emissions at approximately 65 Mt CO<sub>2e</sub>, given a GDP growth rate of about 2.75 per cent annually. We assume a slightly slower growth for the next decade based on assertions by the Singapore government in its population white paper published in 2012.

### ***Fairness and Ambition***

As of 14 September 2015, approximately 60 per cent of global emissions are covered by 32 submitted INDCs representing 60 Parties. "Climate Action Tracker" (CAT), a climate commitment tracking project by four European research organisations, has assessed 16 of these submissions. They rated eight of these submissions as "inadequate", eight as "medium" and two as "sufficient". No submission has been able to attain the best rating of "role model".

The worst rating of "inadequate" is given to government proposals that are considered by CAT to not be in line with a 2°C pathway under their interpretation of what is "fair". Singapore's INDC has also been given an "inadequate" rating. CAT argues that Singapore could strengthen its reduction target to reflect its high capability. It was stated in a separate article published on 3 July

2015 by London-based news and analysis website, *Responding to Climate Change* (RTCC), that Singapore's INDC "downplays" the role of renewables.

In its INDC, Singapore has in fact elaborated on its national circumstances which explain the limits of its commitment. Singapore has already undertaken early action to switch fuel for power generation from fuel oil to natural gas, which is the least carbon-intensive fossil fuel. Currently, almost 97.5 per cent of Singapore's electricity is generated from natural gas, with the remaining 2.5 per cent coming from waste incineration plants. This fuel switch has led to a significant reduction in Singapore's GHG emissions and improvement in its energy intensity.

However, this mitigation option has now almost been exhausted. As the power generation sector contributes approximately 44.5 per cent of Singapore's total GHG emissions, much more effort is needed to reduce emissions from other sectors to achieve the increased mitigation target. A large portion of the country's emissions are associated with the petroleum refining and trading sector. Unfortunately, as CAT acknowledges as well, the potential for efficiency improvements in this sector are limited since processes are already highly optimised.

On renewables, Singapore has communicated in the submission that there is negligible potential for hydro, wind, tidal and biomass to be exploited here. The only viable option is solar photovoltaics (PV), which can only be pursued at the distributed rooftop scale since there are land constraints for setting up utility scale PV. Additionally, high penetration of solar PV increases stability concerns for the grid because solar PV output is intermittent and non-dispatchable. In the case of Singapore, these impacts are expected to be even more pronounced because the grid is small and isolated.

As a result, Singapore's electricity regulator, the Energy Market Authority (EMA), has determined that the country's power grid can currently accommodate 600MW of PV based on the existing level of frequency balancing services procured in the market. CAT mistakenly mentions this figure as a cap on PV

capacity fixed by the Singapore government. While the EMA has promised to revise this figure upwards as and when there are improvements in PV forecasting accuracy, much higher levels of PV penetration in the grid will be possible in the future with research advancements on multiple fronts, such as demand management, growth of storage technologies, development of a regional interconnected power grid, etc.

### **Adaptation**

At the Lima COP20 in 2014, countries agreed that INDCs could include undertakings in adaptation planning, or in an adaptation component. This reflects the call by many developing countries for their INDCs to include a contribution to adaptation actions, and suggests that INDCs should not solely be about mitigation.

As a low-lying country similar to other members of the Alliance of Small Island States (AOSIS), Singapore is exposed to rising sea levels. A small country without natural resources, Singapore has developed as an open economy that imports the bulk of its food supply, making it sensitive to disruptions in global supply chains. A study by the Centre for Climate Research Singapore (CCRS), established under the Meteorological Service Singapore, projected sea level rises, higher temperatures and more extreme rainfall for Singapore and the surrounding region. As a result, the INDC also highlights the magnitude of current and future adaptation efforts that Singapore needs to undertake.

### **CONCLUSION**

At the upcoming COP21 in Paris from 30 November to 11 December 2015, where Parties will negotiate the form and rules of the post-2020 international climate change agreement, INDCs will be used to gauge the level of seriousness that each brings to the negotiating table. Proposing an INDC that is not ambitious, or even regressive in terms of emissions reduction commitments, will expectedly result in severe criticism of the respective Party. At the same time, they will tend to be careful not to over-promise on a mitigation commitment that is expected to eventually become legally binding.

In all likelihood, the initial contributions by all countries will be inadequate in addressing the enormous problem of climate change. But it is a start. Even if the Paris Agreement turns out to be inadequate, it is better to have a multilateral rules-based agreement than none at all and no scientific way to measure a country's contribution. The submission of an INDC is therefore not a destination; rather it is the beginning of a journey towards a hard negotiated global agreement.

### **WHAT TO LOOK OUT FOR**

- A synthesis report compiled by the UNFCCC Secretariat on the aggregate effect of the INDCs is expected to be released by 1 November 2015. The report will determine the sufficiency of INDCs to limit the temperature increase to 2°C.
- Decisions during the COP21 in Paris on how INDCs will be housed in the Agreement and whether they would be legally binding on countries.
- An ex-post review process to measure, report and verify the progress towards implementation of meeting targets. If agreed upon, Singapore would be subject to the process as well.
- New measures or enhancements to existing schemes in Singapore to accelerate its climate action.

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