



WWF Singapore
354 Tanglin Road #02-11
Tanglin International Centre
Singapore 247672

Tel: (65) 6730 8100
Fax: (65) 6730 8122
info@wwf.sg
wwf.sg

INPUTS FOR “PUBLIC CONSULTATION ON DEVELOPING SINGAPORE’S LONG-TERM LOW EMISSION STRATEGY”

*Prepared for National Climate Change Secretariat by the World Wide Fund for Nature, Singapore.
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INTRODUCTION

The global consensus on the need for climate action is strong and continues to grow. The impacts of climate change are seen in shrinking water supplies, extreme weather events and bleached coral reefs - events that Singapore is not insulated from. For this very reason, Singapore is getting ready to protect its current and next-generation citizens from global changes that are unprecedented in scale and impact.

Singapore contributes to just 0.11% of global carbon emissions¹. Yet, with 30% of the island vulnerable to over-flooding², and with 90% of food³ and 50% of water⁴ currently being imported, climate change is an issue where Singapore has to punch way above its weight to ensure long-term survival.

The Intergovernmental Panel on Climate Change (IPCC) Special Report on Global Warming of 1.5°C makes clear that 1.5°C is safer than 2°C in terms of climate impacts, and that allowing global temperatures to rise by 2°C above pre-industrial levels will have devastating consequences. Current emissions put the world on track to breach tipping points of 1.5°C that will cause irreversible impacts to people, environments and economies. In the Paris Agreement of 2015, all countries including Singapore agreed to limit the temperature increase to 1.5°C above the pre-industrial levels.

The World Wide Fund for Nature (WWF) strongly urges global governments to increase the ambition of their Nationally Determined Contributions (NDC) in 2020, with actions that are consistent with limiting global warming to below 1.5°C. WWF-Singapore welcomes the openness and transparent approach of National Climate Change Secretariat (NCCS) and the Government of Singapore with the public consultation on Singapore’s Long-Term Low Emission Strategy.

The following paper outlines WWF-Singapore’s science-based recommendations for a zero-carbon climate resilient future. Crucially, these include climate mitigation measures that hinge on the influence of legislation and address the role of industries, financial institutions in driving change at scale, with citizens engaged as responsible consumers.

¹ NCCS, 2016

² Asian School of the Environment and Earth Observatory of Singapore, Nanyang Technological University

³ Agri-Food and Veterinary Authority of Singapore, 2018

⁴ "Finding ways to increase water supply from Johor River", The Straits Times, 17 January 2018

FIVE KEY RECOMMENDATIONS FOR SINGAPORE'S LONG-TERM LOW EMISSION STRATEGY

1. Adopt a Net-Zero Carbon Emission Goal by 2050

A net-zero carbon emission goal needs to be at the heart of Singapore's Long-Term Low Emission Strategy. The IPCC clearly outlines that to meet the Paris Agreement global temperature goal of limiting the increase to 1.5°C above the pre-industrial levels, carbon dioxide (CO₂) emissions need to be reduced to 40-50% by 2030 from 2010 levels, and reach net zero carbon emissions by 2050.

The only way to fulfill the ambition of the Paris Agreement is for all countries to have a goal of "net-zero carbon emission by 2050". Led by France, Norway, Sweden, and the UK, there is a growing list of countries that have laws in place towards this goal. More countries are in the process of doing so. On 23rd September 2019 at the UN Secretary-General's Climate Action Summit, 65 countries committed to cut greenhouse gas emissions to net zero by 2050⁵.

Singapore's current NDC commitment sets the target of reducing emissions intensity by 36% from 2005 levels by 2030. Based on the available science, this is insufficient to meet the goal of the Paris Agreement.

WWF strongly recommends to:

- a) Legislate carbon emissions to peak well before 2030 and adopt legislation to ensure that Singapore will reach "net-zero carbon emissions by 2050".

- b) Update Singapore's current Nationally Determined Contribution (NDC) and resubmit it by 2020 with higher ambition than the initial contribution, and align future NDCs (to be placed in the year 2025 onwards) to the ambition of the Paris Agreement.

People in Singapore are not only concerned about the climate; they support action in the form of policy changes. A YouGov survey⁶ has found that 69% of people in Singapore are concerned about the impact of climate change on their homes, families and future⁷. 72% agree to laws and regulations that support the ambition of the Paris Agreement to limit global warming to below 1.5 degrees Celsius⁸.

2. Target the Biggest Contributors of Primary and Secondary Emissions

In its review of measures to reduce carbon emissions, Singapore's policies should accurately reflect the share of contributions by industries. Taking both primary and secondary emissions into account provides a more accurate picture of the top contributors in Singapore.

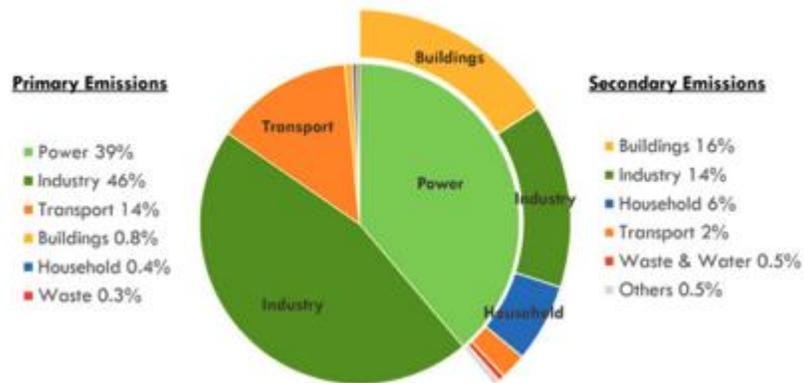
⁵ Climate action Summit 2019 closing press release :https://www.un.org/en/climatechange/assets/pdf/CAS_closing_release.pdf

⁶ WWF commissioned an independent survey by research agency, YouGov, to understand public support for the policy recommendations in this report. 1,105 people responded to the survey from 19-22 September 2019. The results reflect an online representative sample of people in Singapore.

⁷ Q: "How concerned, if at all, are you about the impact of climate change on your home, family and future?"

⁸ Q: "How much do you agree or disagree that Singapore needs laws and regulations that support the ambition of the Paris Agreement to limit global warming to below 1.5 degrees Celsius?"

Figure 1: Singapore's GHG Emissions Profile (2014)



Based on the Figure 1 above of Singapore's GHG Emission Profile, the top contributors of emissions are industries, buildings and transport - with industries taking up the lion's share at 60%. Households contribute just 6% of emissions.

- (i) Industry = 60 % (46 Primary and 14 Secondary emissions)
- (ii) Building = 16.8% (0.8 Primary and 16 Secondary emissions)
- (iii) Transport = 16% (14 Primary and 2 Secondary emissions)
- (iv) Household = 6.4% (0.4 Primary and 6 Secondary emissions)

Singapore's long-term strategy needs to take into account the entire emissions portfolio, with a weighted approach that accurately reflects the contribution of each segment.

a) Recommendations for Industry

(i) Create a Level Playing Field for Clean Energy

A decisive transition to an economy powered by renewables will not happen without policies that level the playing field for renewable energy entrepreneurs. Singapore could encourage investments in more environmentally-friendly technology through incentives and subsidies, or implement a policy measure to only approve the set-up of clean industries locally.

Currently, clean energy industries do not enjoy any subsidies or incentives that fossil fuel-based energy producers receive, even though the industry has also created more jobs in Southeast Asia than anywhere else in the world in the past years.

(ii) Adopt the Science-Based Target Initiative

Singapore should encourage, incentivise or even mandate industries to adopt established, globally recognised emissions reduction targets such as the Science-Based Target Initiative (SBTi) (<https://sciencebasedtargets.org/>) or other emission reduction targets tools. Singapore companies like Singtel, City Developments Limited, and Olam have already set targets on emission reduction under the SBTi, in line with the Paris Agreement.

There is growing support among consumers to recognise businesses aligned to SBTi targets. In the YouGov survey¹⁰, 69% of respondents indicated that they are likely to support products and services from businesses that are committed to be carbon neutral by 2050 or earlier.

(iii) A tax that reflects the true cost of carbon

To encourage emissions reduction from industries, the Singapore government has put forward a carbon tax of S\$5 per tonnes of CO₂ equivalent. This will be reviewed by 2023, with the intention to increase the tax rate between S\$10 and S\$15 per tCO₂e by 2030.

It is WWF-Singapore's view that any future decision making on the carbon tax in Singapore needs to be more ambitious and account for the true cost of carbon. The World Bank Group (2017) has concluded that the explicit carbon-price level consistent with achieving the Paris Temperature Target is at least US\$40 - US\$80 per tCO₂e by 2020, and US\$45 - US\$100 per tCO₂e by 2030. Only at these levels will the world be able to reach the goals of limiting the global temperature increase to 2°C. Even more efforts are needed to further reduce the warming to 1.5°C.

Currently, Singapore's carbon tax rates remain at the lower range compared to other developed countries. The following chart outlines Sweden (US\$131/tCO₂e), Switzerland (US\$86/tCO₂e), Norway (US\$52/tCO₂e), Denmark (US\$26/tCO₂e), France (US\$25/tCO₂e), Slovenia (US\$19/tCO₂e), Iceland (US\$10/tCO₂e) and Japan (US\$3/tCO₂e).

¹⁰ Q: "I will support products and services of businesses that are committed to be carbon neutral by 2050 or earlier."

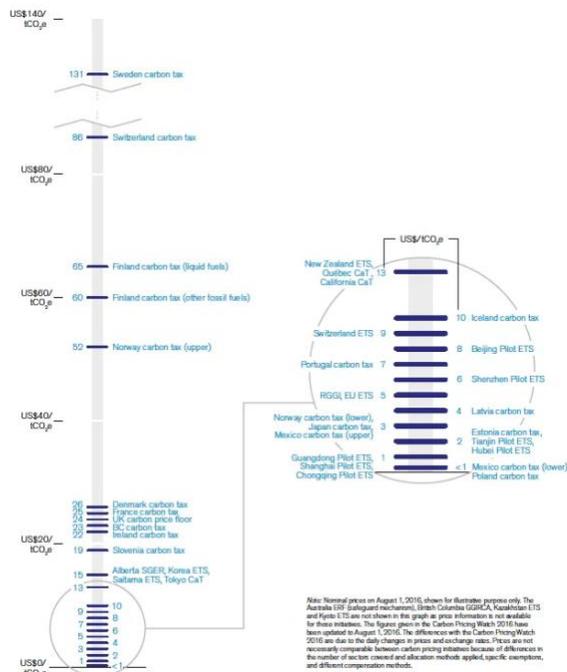


Figure 2: The World Bank (2016) “State and Trends of Carbon Pricing”

b) Recommendations for the Transport Sector

(i) Adopt electric mobility policies

The primary emission from the transport sector contributes to 14% of country emissions. Reducing the huge emissions share from this sector by encouraging electric mobility is a low hanging fruit, while providing an alternative to fossil fuel-driven vehicles.

The Singapore government could adopt a policy of:

- Making vehicle fleet electric powered;
- Provide incentives (i.e., no road tax or other tax incentives) for the import of electric vehicles, and
- Set a time-bound deadline to ensure the usage or sales of only electric powered vehicles (e.g.: by 2035).

c) Recommendations for the Power Sector

Singapore has shifted to natural gas for power generation. However, natural gas is still a fossil fuel that contributes around 39% of primary emissions from the power sector. While Singapore has started deploying solar as an alternative source, most of Singapore’s electricity needs in the near future will continue to rise and may be met by fossil fuels.

(i) Grow access to renewable energy sources

To drastically reduce the share of emissions from the power sector, Singapore needs to shift generating electricity generation from fossil fuel towards renewable sources in the long term.

This can be feasible by:

- I. Deploying more renewable energy (solar, hydrogen, wind) options within Singapore.
- II. Importing electricity generated from renewable energy sources, exploring the ASEAN Power Grid Initiative as an option for important renewable energy from the Southeast Asian region.
- III. Investing into research and development of renewable energy technology and storage mechanisms.

Technology advancements in energy storage might make it feasible in the near future to store renewable electricity on a massive scale like Singapore currently does for Liquefied Natural Gas (LNG).

d) Recommendations for Households and Businesses

Households

Although the emission share of households is significantly smaller compared to the business sector, they could play a role in reducing emissions. Even as affordability remains one of the key factors in a household's consumption choices, Singapore can do more with crucial policy measures or regulation to accelerate the shift among consumers towards low-carbon, energy efficient product choices.

- **Electricity:** Encouraging the switch to solar and clean household electricity providers by making these options as affordable as current fossil fuel-based options. 3 out of 4 (76%) of respondents to the YouGov survey¹¹ are willing to pay for electricity from a renewable or clean energy provider. Of those, 72% are willing to pay more than SGD\$5.00 per month for it. *Refer to Section 2(a)(i) Create a Level Playing Field for Clean Energy.*
- **Energy-efficient appliances:** Adopting regulation that allows only a certain level of energy-efficient appliances to be sold.
- **Carbon footprint labelling:** Empower informed consumer decision-making on low-carbon products by implementing mandatory carbon footprint labelling for all products. 65% of respondents in the YouGov survey¹² indicate that they will choose locally-produced food or household products with a lower carbon footprint.
- **Low carbon food choices:** Implement a Zero GST policy to support local food production and grow the consumption of local food products.
- **Low carbon/carbon neutral products:** Design regulation to support the entry of low-carbon or carbon-neutral products in the market by a certain target year, i.e., 2025.

¹¹ Q: "How much more, if at all, would you be willing to pay for electricity from renewable / clean energy providers per month?"

¹² Q: "I will choose locally-produced food and/or household products with a lower carbon footprint."

Businesses

Measures for businesses could include subsidies or rebates to adopt higher energy-efficient appliances, or taxing companies that do not meet minimum energy-efficient appliances criteria.

In parallel, the government also needs to build capacity within the local workforce that is able to implement energy-efficiency practices at the business or industry level. 56% of respondents to the YouGov survey¹³ want to work for companies with targets to reduce their carbon emission by 2050. Among these, those aged 18-24 (71%) have a higher inclination to do so than the older age groups (ages 25 and above – 54%).

3. Align the Finance Sector to the goals of the Paris Agreement

a) Banks and Asset Owners

The three locally headquartered banks (DBS, OCBC, UOB), as well as asset owners such as local insurance companies (Great Eastern, NTUC) and sovereign wealth funds (GIC, Temasek) could commit to set emissions reductions targets for their financing portfolios through the SBTi to ensure that their lending and investing portfolios are aligned with the Paris Agreement ambition. Around 40 financial institutions around the world have already publicly committed to set such targets when the methodology is finalised. At the very least, in the interim period, these financial institutions can undertake analysis of their portfolios to understand the level of alignment or misalignment with a well under 2°C scenario so as to inform their climate risk management strategies.

WWF has worked with over 40 European asset owners to do a portfolio level study on climate transition risk and is ready to convene a common study for the banking or asset owners in Singapore to explore physical risk scenarios.

b) SGX

The Singapore Exchange could make disclosure under the TCFD (Task Force on Climate-related Financial Disclosure) framework mandatory for all listed companies on a comply or explain basis. [As of June 2019](#), 671 companies with a combined market capitalization of over US\$9.2 trillion support the TCFD, including 374 financial firms responsible for assets of \$118 trillion.

c) Government of Singapore/Monetary Authority of Singapore

The Monetary Authority of Singapore (MAS) could make disclosure under the TCFD framework mandatory for all FIs (Financial Institutions) headquartered in Singapore.

MAS can also create a robust sovereign green bond framework to issue green bonds on behalf of the government of Singapore to finance all climate adaptation needs. WWF has

¹³ Q: "I want to work for companies that have targets to reduce their carbon emissions by 2050 or earlier."

worked successfully with the French government for their [inaugural sovereign green bond](#) and our Climate and Energy practice leader [chairs the independent council](#) set up to [report on the actual impacts](#) of the projects financed with the green bond proceeds. This was the best in class gold standard green bond and we believe that Singapore can be the first sovereign in Asia to issue such a high quality green bond.

4. Food Security link to climate change

Singapore's climate vulnerability does not just result from rising sea levels, but also the global impact on food production systems. Climate change has resulted in extreme weather events, adversely impacted food yields and disrupted global food supply chains¹⁴. Given this impending global scenario, the threats to Singapore's food security cannot be underestimated and must be tackled in a more comprehensive manner.

IPCC (2014) highlighted that the production of major crops (wheat, rice, and maize) will be negatively impacted with a global temperature increase of 2°C or more. With or without adaptation measures, climate change is set to reduce median yields by 0%-2% per decade for the rest of this century. These projected impacts will occur in the context of rising crop demand, projected to increase by about 14% per decade until 2050.

Additionally, Singapore imports more than 90% of our food from more than 180 countries. This is a significant contributor to Singapore's carbon footprint, and needs to be taken into account in a low emissions climate strategy as well.

The government of Singapore has embarked on a remarkable initiative to address food security, with a target of meeting 30% of its nutritional needs by 2030, up from less than 10% currently. This will also reduce the carbon emissions from food imports. Beyond this, Singapore needs to scale up measures to address the link between food security and climate change, and how all stakeholders can contribute to minimising it. Measures include:

- I. Research and development in new technologies on food varieties that can adapt to the changing climate.
- II. Increase important food supplies from countries in the region, ultimately reducing the carbon footprint incurred from food imports.
- III. Increase investments or support for climate adaptation measures in countries that Singapore relies on for food, to ensure minimal disruption to the production and transportation of key supplies.
- IV. Incentives for climate-friendly food industries.
- V. Changing consumer behaviour around food intake to minimise carbon footprint and food waste.

5. Research and Development (R&D) supports a long-term climate resilience strategy

For any long-term sustainability, investment in research and deployment is key. Given the strong capacity in technology, finance, and human resources, it will be vital for Singapore to invest in climate-related R&D for a low-carbon and climate-resilient society in the longer term.

Some of the areas for research and development could be as below but not limited only to:

- a) Alternative renewable energy technology (solar, hydrogen, wind)
- b) Renewable Energy storage technology
- c) Technology innovation for food production and food varieties
- d) Adaptation technology to address heat, flooding and sea-level rise
- e) Carbon Capture and Storage (CCS) technology

Conclusion

Domestically, people in Singapore are increasingly aware of what they purchase, use and the impact of these products on the environment. According to a 2018 YouGov survey, more than 50% of consumers in Singapore support businesses that adopt more sustainable practices. The growth of the renewable energy sector will be supported by a greater willingness among consumers to pay a premium for these options.

In the region, Southeast Asia's transition to renewable energy has already begun. In 2018, 11 million jobs were created globally in the renewable energy sector, a 7% increase over just one year. The greatest growth did not come from primary markets such as China, Brazil, U.S., India or the EU - but from countries like Malaysia, Thailand and Vietnam¹⁵. Singapore wields considerable financial and human resources muscle that, if supported by effective legislation, could launch a swift transition to a low carbon society while positioning the country as a regional leader.

To have a detailed follow up discussion on these recommendations, please contact:

- Kim Stengert, WWF-Singapore (kstengert@wwf.sg)
- Chitra Venkatesh, WWF-Singapore (cvenkatesh@wwf.sg)
- Sandeep Chamling Rai, WWF-Singapore (scrai@wwf.sg)

About WWF-Singapore

WWF is one of the world's largest and most respected independent conservation organisations. Its mission is to stop the degradation of the earth's natural environment and to build a future in which humans live in harmony with nature.

WWF-Singapore is a nationally registered organisation and as one of WWF's international hubs, is part of a global network spanning over 100 countries. It helps protect Singapore's essential needs through the actions of individuals, businesses and governments in the region. To meet key conservation goals, WWF-Singapore addresses issues such as deforestation, haze pollution, food security, sustainable consumption and illegal wildlife trade.

¹⁵ "11 Million People Now Have Jobs In Renewable Energy", Forbes, 17 June 2019 ([Source](#)).