

RESPONSE TO FEEDBACK ON SINGAPORE'S LONG-TERM LOW EMISSIONS DEVELOPMENT STRATEGY

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The National Climate Change Secretariat (NCCS) conducted a public consultation on Singapore's Long-Term Low Emissions Development Strategy (LEDS) from 16 July to 30 September 2019. About 2,000 responses from the public were received, of which 1,600 were received through the World Wide Fund for Nature (WWF) Singapore and Speak for Climate that had created online forms for the public to submit their feedback. Generally, we received feedback from environmental groups, academics, businesses, and individuals. Prior to the release of this document, several engagement sessions were also organised between August 2019 and January 2020 to facilitate in-depth discussions with stakeholders such as green groups, academics and businesses from various sectors (e.g. transport, infocomm etc.).

2. A summary of the key feedback and our initial responses can be found below. More details on the feedback and our responses can be found in the Annex. This Annex will be updated regularly as the Government continues to study the suggestions and work with stakeholders in developing implementation plans to realise Singapore's LEDS.

Climate Ambition

3. Respondents called for more ambitious climate action given the urgent need to address climate change. Several respondents called for Singapore's climate ambition to be aligned with the recommendations of the Intergovernmental Panel on Climate Change's Special Report on Global Warming of 1.5°C (SR1.5), to peak well before 2030 and to achieve net-zero emissions by 2050. At the same time, other respondents highlighted the various challenges involved in significantly reducing emissions. Several noted that the technologies that will enable transformational shifts to a low carbon future are still in their infancy, while others cited economic competitiveness and employment concerns.

4. The Government is committed to ensuring Singapore transits to a low carbon future, but this will also require greater climate action by everyone, including businesses, community groups, and individuals. We are carefully considering both the calls for climate ambition and the challenges involved in developing and implementing Singapore's LEDS. We agree that, as technologies develop or mature, there will be scope for greater reduction of our emissions.

Energy Use Reduction and Efficiency Improvements

5. For the industry sector, feedback focused on the barriers to energy efficiency improvement, the need for more incentives, and knowledge sharing. Several companies cited high capital cost, low Return-On-Investments, and difficulties in upgrading existing sites as barriers to implementing improvement projects. While some companies said that the Minimum Energy Performance Standards (MEPS) for industrial equipment would be very important to set industry standards, others said that it would affect their competitiveness. Companies also

called for more grants or incentives to encourage greater improvements in energy efficiency, with some suggesting higher support rates for companies that had taken steps to do so. Some companies had decarbonisation plans and in-house expertise to assess and improve energy efficiency. Companies without such in-house capabilities said they hoped to learn more about energy efficiency and energy-saving solutions through online platforms and form stronger partnerships between companies and research institutes.

6. The Government has received similar feedback through its regular consultations with industry players. In 2019, we enhanced grants for industrial companies to adopt energy efficient technologies. To complement this, we will look at ways to improve knowledge sharing with companies on implementing energy efficiency solutions. We will also actively seek partnerships with companies and other industry stakeholders on initiatives to raise industrial energy efficiency. We will continue to help companies overcome the challenges they face in this area, and to achieve an annual improvement of 1 to 2 per cent in industrial energy efficiency.

7. The building sector highlighted similar challenges in improving its energy efficiency. In addition, it faced an issue of split incentives for tenants and landlords in reducing energy consumption – landlords paid for upfront retrofit costs, while tenants enjoyed savings from a lower electricity bill. Several respondents said that some energy-saving practices could be more widely adopted, such as higher air-conditioning temperature settings and motion-sensor lighting. Some suggested a range of enhancements to the Building and Construction Authority (BCA)'s Green Mark scheme, such as higher standards to ensure eco-friendliness, sustainable building design concepts and the incorporation of cooling and solar photovoltaic (PV) technologies into new construction projects.

8. For the household sector, respondents suggested that the MEPS and Mandatory Energy Labelling Scheme (MELS) could be enhanced. They highlighted the need for better understanding of energy labels and the potential cost savings from using energy efficient appliances. Some also suggested using a combination of education and incentives (such as tiered electricity pricing) to encourage energy-saving practices. There was also a suggestion to phase out inefficient appliances.

9. Energy efficiency improvement and energy reduction will continue to be a key mitigation strategy for the building and household sector. BCA has set a target to green 80 per cent of buildings in Singapore by 2030. The Building Retrofit Energy Efficiency Financing (BREEF) Scheme is in place to help building owners overcome the high upfront cost by having BCA co-share the default risk of these retrofits with financial institutions. For households, energy-saving tips and tools can be found on the Energy Efficient Singapore website.¹

10. The suggestions received will be fed into the Government's regular reviews of existing schemes, and in the development of new policies to increase energy efficiency and reduce energy use and emissions in the building and household sectors. This includes the potential expansion of the MELS and MEPS to cover more appliances, where feasible. As for the phasing out of inefficient appliances, we will continue to do so gradually while keeping the market

¹ <https://www.e2singapore.gov.sg/overview/households/households>.

competitive and ensuring that low-cost options remain available, particularly for low-income households.

Decarbonising the Transport Sector

11. Public transport was cited as the most carbon efficient and eco-friendly means of transportation. Some respondents called for disincentives for private car ownership and road usage, including measures to penalise the use of vehicles with high emission levels. There were suggestions on ways to increase the level of usage of public transportation, including providing more consistent bus schedules, and more affordable concession prices for commuters. There were also suggestions on ways to improve energy efficiency and reduce energy consumption of public transport vehicles, including phasing out older and inefficient vehicles quickly.

12. Many respondents noted that vehicular electrification is a cleaner alternative to Internal Combustion Engine vehicles (ICEs). However, some said that for Electric Vehicles (EVs) to be considered truly “clean”, the electricity used must fully come from renewable sources. Respondents expressed concerns about the scarcity of charging infrastructure, the existing price differential between EVs and ICEs, the long charging period, and the shortcomings of existing battery technology. Incentives such as subsidies and tax rebates, and direct Government action through positive public messaging were some of the key suggestions to increase the uptake of EVs. Companies also requested for clearer policy direction on Singapore’s future EV market.

13. The Government is following up with the suggestions above. We are examining how to better support the greater adoption of cleaner and greener vehicles such as EVs. For public transport, we have committed to put in place cleaner energy bus and taxi fleets by 2040. For private vehicles, we will study ways to incentivise the take-up of cleaner and greener vehicles (including vehicular electrification) with initiatives such as the existing Vehicular Emissions Scheme (VES), and to enhance the charging infrastructure across the country. This includes riding on ongoing research work in energy storage systems (ESS), smart charging solutions and grid management.

14. Meanwhile, the Government will continue to enable and promote more sustainable public, active and shared modes of transport. The strategies in the Land Transport Master Plan 2040, such as wider footpaths, dedicated cycling paths, and improved rail connectivity and reliability, will improve the ease, convenience and safety of public and shared transport. We will engage community groups to help nudge more commuters towards using public transport.

Carbon Pricing

15. Some respondents supported the existing approach of applying a uniform carbon price with no exemptions for covered facilities, to encourage greenhouse gas emissions reductions. Some suggested alternative tax mechanisms, such as having a tiered tax system or having higher carbon tax levels that only apply to emissions generated by covered facilities above a set benchmark level. There were also suggestions for a transition to an emissions trading scheme. While some respondents said that the current carbon tax level was too low, others cautioned that future carbon tax levels would have to be carefully calibrated to ensure that our industries remained internationally competitive. On carbon tax coverage, some respondents

suggested that certain trade-exposed emitters should be exempted, while others suggested that small emitters below the 25 ktCO₂e threshold should be included. Respondents also supported the use of international carbon credits to meet companies' tax liabilities. Some added that credits used should have robust verification mechanisms and meet stringent requirements. The type and amount of credits allowed should be addressed through regulation.

16. The Government will carefully evaluate the suggestions and feedback received on Singapore's carbon tax. The current carbon tax level complements our suite of mitigation measures as outlined in the Climate Action Plan.² Instead of having differentiated carbon prices for different companies and sectors, a simple carbon tax was chosen with no exemptions for covered facilities, to maintain a transparent, fair, and consistent price signal across the economy to incentivise emission reductions. The initial carbon tax level of \$5/tCO₂e is for a transition period of five years to give companies time to adjust to the impact of the tax by implementing energy efficiency measures. The suggestions received further reinforce our view that carbon will become an increasingly constrained resource in future. We have said that the carbon tax level will be raised to between \$10/tCO₂e and \$15/tCO₂e by 2030. We will consider the suggestions received on the future carbon tax level and the carbon pricing mechanism, along with factors such as the prevailing carbon market dynamics, domestic mitigation outcomes, and impact on our economic competitiveness. It is encouraging to note that companies welcome the use of international carbon credits, and we will study the key design features as well as legislative changes and implementation options. We will take into account the feedback concerning the need for any use of international carbon credits to be aligned with international norms and to represent real emission reductions.

Clean Energy

17. Respondents suggested ways to encourage the deployment of solar in Singapore, including potential sites such as facades, MRT infrastructure, walkways, and roads. Several respondents suggested offering incentives and rebates to encourage solar deployment on private and building rooftops. However, respondents acknowledged that the intermittency of sunlight and land constraints were significant challenges to harnessing solar power.

18. The Government will look into these suggestions, as Singapore strives towards the goal of harnessing at least 2 gigawatt-peak (GWp) of solar power by 2030 (which could power an equivalent of 350,000 households a year). We agree with respondents who emphasised the importance of research and development to improve solar panel efficiency and to identify more innovative technologies to harness solar energy.

19. Respondents also suggested that Singapore could consider tapping on other forms of renewable energy, such as geothermal, tidal and wind power, although most agreed that solar energy is Singapore's most viable renewable energy source. Respondents called for Singapore to participate in the initiative to establish an ASEAN grid, and to import solar-generated

² Singapore's Climate Action Plan: Take Action Today, for a Sustainable Future (2016) comprises two publications on Singapore's mitigation and adaptation plans. The first publication, "Take Action Today, for a Carbon-Efficient Singapore", contains information on how Singapore intends to reduce greenhouse gas emissions and increase energy efficiency to meet our 2030 climate pledge. The publications can be downloaded online: <https://www.nccs.gov.sg/media/publications/plans-reports>.

electricity from the region to facilitate a transition to cleaner energy. At the same time, several barriers to energy imports were highlighted, including potential energy losses and interconnection costs.

20. The Government will look into the suggestions, which are broadly aligned to the strategies laid out in Singapore's Energy Story, which includes plans to enable "4 Switches". The "4 Switches" are:

- a. Natural gas – helping power generation companies improve the efficiency of their natural gas-fired power plants;
- b. Solar – working towards achieving a new solar target of at least 2 GWp by 2030 (as mentioned) as we have limited alternative energy options due to low wind speeds, low tidal range, lack of geothermal resources, and lack of large river systems for hydropower, and an energy storage deployment target of 200 megawatt (MW) beyond 2025;
- c. Regional power grids – exploring ways to tap on regional power grids to access energy that is cost-competitive; and
- d. Emerging low carbon alternatives like carbon capture utilisation and storage (CCUS) and hydrogen.

21. There were mixed responses with regard to the willingness to pay a premium for clean energy, with some willing to pay higher prices but not others. Several respondents also expressed concern that the higher costs of producing cleaner energy would increase the financial burden on lower-income households. Some respondents said that the biggest emitters should bear the most responsibility to switch to renewable energy.

Emerging Low Carbon Technologies

22. Hydrogen and CCUS featured prominently amongst proposed low carbon technologies. Suggestions on hydrogen included potential hydrogen applications such as hydrogen compression for storage and transportation, and hydrogen combustion in gas turbines for power and heat or cooling generation. Some respondents felt that hydrogen could be a highly efficient carrier of clean energy, if produced through renewable energy. Respondents however noted the prevailing high costs, safety risks in transportation, and the lack of suitable infrastructure as significant challenges to its widespread adoption. Respondents raised a range of CCUS applications to be explored, such as sequestration and use in synthetic fuels and enhanced oil recovery. Companies cautioned that commercially viable ways to utilise the captured carbon dioxide on a large scale are required. Some respondents noted that many CCUS pathways were still in the early phases of development or necessitated heavy investment and strong incentives to promote commercial uptake.

23. The Government has commissioned studies on hydrogen and CCUS, in order to inform the development of long-term hydrogen and CCUS implementation strategies for Singapore. Feedback from the various stakeholder engagement exercises (organised as part of the studies) will be taken into account when government agencies review the findings from these studies. We also encourage companies to work closely with us to further develop both pre-commercial and deployment-ready technologies and business models that will enable the large-scale

adoption of hydrogen and CCUS. We will also examine suggestions on other emerging technologies that could potentially reduce our emissions significantly, apart from hydrogen and CCUS.

Green Growth

24. Green finance, research and development and technological solutions were cited by respondents as being key enablers for green growth. Some felt that it was reasonable to trade off some economic growth for environmental protection. Respondents felt that the Government could take the leading role in the transition to a green economy by providing grants and technical experts to firms. A common concern raised was the need to reskill workers in emissions-intensive industries to work in clean energy industries.

25. The Government will study the suggestions received to enable green growth in Singapore. We have taken early action to promote the integration of green priorities into financial practices, and are working on a comprehensive, long-term strategy to make green finance a defining feature of Singapore's role as an international financial centre. For instance, the Monetary Authority of Singapore (MAS) will be issuing environmental risk management guidelines to set out its supervisory expectations on governance, risk management and disclosures across the banking, insurance and asset management sectors. We agree that technological innovation will play a significant role in addressing Singapore's climate change and energy challenges, while contributing to the economy. Singapore's commitment to research, innovation, and enterprise (RIE) in the sustainability domain started as early as 2006, when clean energy was identified as a strategic area of research to create new industries and enable high growth. Since then, initiatives focusing on solar PVs, green buildings, green data centres and waste-to-energy have been launched. We will consider and study suggestions on other initiatives that would expand our green economy and provide future job opportunities for our people. We will also continue to work with industry and institutes of higher learning to ensure that our workers and students have the necessary skills and qualifications to tap on the opportunities of a green economy.

Collective Climate Action

26. Many respondents highlighted the need for collective climate action, including ways businesses can encourage collective climate action, the need to switch to climate-friendly diets, and further reducing waste and plastics use. There were also suggestions on how businesses could set an example for collective climate action, including using sustainable products in food and beverage services and adopting sustainable manufacturing practices. Other respondents called for policies to encourage a behavioural shift towards plant-based diets. The need to reduce the consumption of disposable plastics was emphasised, with respondents suggesting both penalty-based and incentive-based policies such as a plastic bag tax, "pay with plastic" events and a reward point system for using reusable bags. Suggestions to reduce waste included the installation of anaerobic digesters – equipment that break down organic matter such as food waste to produce usable products such as fertilisers – in schools, and local food branding to encourage the purchase of "ugly" produce.

27. Several respondents commented that a lack of understanding of how to adopt greener lifestyle practices hindered climate action. As such, respondents said a variety of campaigns and engagements would help educate individuals about climate change and eco-friendly practices. Others felt that school curricula and programmes should place more emphasis on climate change and related initiatives like environmental protection and reducing waste. To promote greater dialogue and engagement, some suggested regular meetings to consult the public on policy initiatives.

28. A whole-of-nation effort is needed to achieve our carbon reduction goals. More can be done with the public and with private sector companies, and the Government is committed to working with all stakeholders towards greater awareness and action. Through nation-wide campaigns and other outreach programmes, Singapore is taking a long-term, holistic approach to tackling excessive consumption by building a national consciousness to care for the environment. We will also continue to introduce policies to encourage sustainable production and consumption.

Conclusion

29. The work of protecting our environment and improving our resilience has become more urgent than ever before. Climate change is already affecting Singapore and the rest of the world. Singapore can turn vulnerabilities into opportunities – just as it did with water – by thinking long-term, innovating boldly, and exporting new sustainability solutions to other countries that face the same challenges.

30. Everyone needs to play their part and work together as one people, to overcome the existential challenge that climate change poses, which can threaten our way of life. The Government will continue to encourage collective climate action, and work closely with businesses and citizens to co-create solutions to build a resilient and sustainable Singapore for the future.

31. NCCS wishes to thank all individuals, businesses, organisations and councils for their feedback. Members of the public who wish to make their feedback submitted during the 2019 consultation exercise publicly available may do so via the following web link: <http://bit.ly/ledsform>.