Singapore: A Green Hub

Young PAP

Position Paper

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Contents

Introduction

1. This position paper has been developed by a team of sustainability experts and climate activists from Young PAP (YP), in collaboration with a wide variety of stakeholders, such as Singapore Youth for Climate Action, Fossil-Free Yale-NUS, independent sustainability experts and climate activists and experts, over the course of three months through a series of focus group discussions. We thank the many interested and enthusiastic participants who shared their views at these sessions.

2. Broadly, YP aims to adopt a holistic approach to address climate related challenges in Singapore. Hence, proposals outlined in this paper hinge on the involvement of the whole-of-society which includes the government, community, and industries to minimise the emission of greenhouse gases ("GHG").

Background

3. Climate change has affected lifestyles and livelihoods around the world. Singapore is not immune to the effects of climate change, which include increasingly uncomfortable temperatures[1], rainfall shortage, and biodiversity loss.

4. Climate change also poses several challenges for governments. Changes in the environment will deplete vital resources, such as land for agriculture[2] and reservoirs of clean water. Resource conflicts have already taken place in the Middle East[3], North Africa[4], and Central Asia[5]. Extreme weather conditions have destroyed entire communities, giving rise to waves of environmental refugees[6]. Such forced migration caused by climate change has placed stress on public services in receiving countries, creating opportunities for nationalism, radicalisation and extremism. Rising sea levels from melting polar ice caps also pose an existential threat for maritime states such as Singapore.[7]

5. There have been many calls for action around the world including Greta Thunberg's speech at the United Nations on 23 September 2019.[8] In Singapore, we have had events such as the Climate Change Rally held at Hong Lim Park on 21 September 2019. Such events demonstrate increasing concern among youths on the perceived inaction to mitigate climate change and its effects.[9]

6. The Singapore government takes this issue seriously and has invested in protective measures against the effects of climate change. The government has committed S$100 billion to protect Singapore from rising sea levels.[10] The government has also announced a comprehensive set of policies to achieve net Zero Waste through the circular economy.[11]

7. The Carbon Pledge: the government has made a commitment to achieve a 36% reduction in the amount of greenhouse gases emitted per dollar of Gross Domestic Product ("GDP") by 2030, and this target will be revisited.[12] YP suggests increasing this target to a 50% reduction by 2030 with a view to net zero emissions by 2040. YP believes that the calculations should be revisited, specifically the use of GDP as the denominator. Instead, there should be an absolute measure of actual carbon emissions measured in absolute terms i.e. overall amount of fuel and electricity consumed, transport and process related emissions in metric tonnes against population size *(metric tons per capita).*

8. Additionally, YP calls for the government to benchmark our overall carbon emissions in terms of metric tons per capita against the top five countries with the lowest emission levels *(in terms of metric tons per capita).* The performance benchmark would be relevant to understand Singapore's current performance level and identify areas which require improvements.

Current State of Sustainability in Singapore

9. Singapore is recognised by the United Nations Framework Convention on Climate Change ("UNFCCC") as an "alternative energy-disadvantaged"[13] country due to its unique geographical constraints. Cloud cover and limited land space restrict the amount of energy that can be generated from solar panels. Additionally, the wind speeds in Singapore are insufficient to feasibly harness energy from wind turbines. It also lacks geothermal resources to draw energy from.

10. Without any viable alternative energy sources, Singapore depends on piped and liquefied natural gases to meet 95% of its energy demands.[14] While the combustion of natural gases does release significantly less carbon emissions compared to the

burning of fossil fuels, the resulting emissions are still relatively high and thus still form an area of concern.

11. Approximately 60% of Singapore's carbon emissions are generated from industrial production, with the petrochemical industry being among its biggest contributors. Sustainability experts and climate activists have appealed for more stringent legislation to be imposed on the industry.

12. Today, the maritime industry contributes 7% of Singapore's GDP, and employs over 170,000 people.[15] However, it continues to rely heavily on the transport of fossil fuels.[16] The trading of fossil fuels directly accounts for about 2% to 3% of the global economy.[17]

13. Singapore should aim to achieve growth and positive economic outcomes together with sustainable industrial practices. Our contribution to the climate change movement should be to demonstrate that pursuing a sustainability agenda is compatible with economic viability. Singapore must pursue green causes and continue to be a vibrant global city for all.

14. YP proposes six key areas for improvement in our sustainability landscape:

    a. Financial incentives to support enterprises and reduce energy consumption,

    b. Legislation, regulation, and sector specific reporting,

    c. Driving behavioural change,

    d. Multi-stakeholder cooperation on climate resilience, and

    e. Sustainable urban development.

    f. Managing and using data responsibly

Financial Incentives to Support Enterprises and Reduce Energy Consumption

15. Green Bonds: YP is concerned about funding opportunities for green initiatives, green groups and sustainability-based enterprises today. The Green Bond Grant Scheme[18] by the Monetary Authority of Singapore ("MAS") is commendable, and can be

expanded, with stricter regulations to ensure adherence to the Scheme's definition of Eligible Expenses.

16. Incentivising Small- and Medium-Sized Enterprises ("SMEs"): YP proposes that the Green Bond Grant Scheme be expanded to assist SMEs transition towards more sustainable modes of operations and the provision of green services. With limited resources, it is challenging for SMEs to transition to more sustainable business practices. Thus, funding from Green Bonds will play a significant role in facilitating this transition.

17. Sustainable Sector as Social Enterprises: Sustainability should be recognised and integrated into existing guidelines for the social sector. This would open up the sustainability sector to more opportunities for funding, which in turn provide fiscal options for enterprises and cause-based groups. Sustainability-based enterprises would thus have more opportunities to launch and scale their businesses and contribute meaningfully to the sustainability landscape in Singapore.

18. Incentivising Clean Energy: Regulatory arrangements should be established to incentivise clean energy and penalise carbon emissions. Sector specific metrics should be developed to incentivise and reward cleaner energy production. Concurrently, the same metrics could be used to penalise high-carbon emitting companies and to hold them accountable.

19. Investing in Clean Energy Research: Research on energy alternatives should be a key thrust toward decarbonisation. Today, research on clean energy in Singapore is focused on the conversion, storage and utilisation of solar energy. However, given Singapore's land limitations and high levels of cloud cover, more resources must be put into researching alternative energy generation in addition to solar energy.

Legislation, Regulation, and Sector Specific Reporting

20. Carbon Tax: During the 2017 Budget, the Minister for Finance announced that the Government planned to introduce a carbon tax applied on facilities that emit 25,000 or more tons of carbon dioxide or equivalent ("tCO2e") of GHGs annually. This definition covers the six GHGs that are currently reported to the UNFCCC. The Carbon

Pricing Act was passed by Parliament on 20 March 2018 and came into effect on 1 January 2019.

21. Section 16(1) of the Carbon Pricing Act specifies that the carbon tax is charged on the total amount of reckonable GHG emissions of a taxable facility of a registered person in a reporting period, as set out in an emissions report or the part of an emissions report for the reporting period that is verified under Section 12 of the same Act, i.e. by an accredited external auditor, and approved by the National Environment Agency respectively.

22. Under the Act, any industrial facility that emits direct GHGs equal to or above 25,000 tCO2e annually is required to be registered as a taxable facility and to submit a Monitoring Plan and Emissions Report annually.

23. Taxing carbon emissions is not an approach that is unique to Singapore. There are 46 other jurisdictions besides Singapore, which have also implemented or passed legislation to implement carbon pricing worldwide.[19]

24. The carbon tax in Singapore is currently capped at S$5 per tCO2e in the first instance, from 2019 to 2023. This was implemented with the aim of providing adequate time for industries to transition and implement emissions-reducing projects. The first payments of the carbon tax will be made in 2020, based on actual emissions in the calendar year 2019. A review of the carbon tax will happen by 2023, and an increase to between S$10 and S$15 per tCO2e has been projected.[20]

25. Singapore should consider raising the price of the carbon tax to $100 per tCO2e. To provide a few points of comparison, Finland at present charges about US$70 per tCO2e (S$97.37), while Sweden charges about US$127 per tCO2e (S$176.66).[21]

26. Academic research, however, appears to suggest that carbon taxing is ineffective in Singapore due to the relatively high carbon-income price elasticity, and because the population in Singapore enjoys a relatively high income.[22] Carbon taxation thus does not guarantee the desired level of emissions reduction; conversely, it may even increase the potential for monopolistic firms to pass on the entire tax to consumers.

27. As an alternative to carbon taxing, YP proposes the review and adoption of a hybrid cap-and-trade (or carbon quota) along with a carbon tax model in the long term. The cap-and-trade model promotes greater certainty around emissions reduction. This model aids governments to achieve predetermined emissions targets and to apply a falling emissions cap over time.

28. Countries such as Australia, China and the United States have explored various forms of the cap-and-trade model. For example, since 2011, China has been experimenting with cap-and-trade programmes in several pilot cities, including Shanghai and Shenzhen. California also enacted wide-reaching cap-and-trade programmes extending to power plants and other high emitters, such as manufacturers, refineries and other identified polluters.[23]

29. The cap-and-trade model is not without limitations.[24] There is a need to develop regulations to facilitate the trading of emissions permits, and it is likely to drive up business compliance costs. The predictability of tax revenue may likewise be affected. Hence, as an interim measure, YP proposes to bring forward the 2023 timeline to review a carbon tax increase to more than $15 to $20 per tonne and a cap and trade model to be revisited for implementation by 2030.

30. Sustainability Reporting: While the Singapore Exchange ("SGX") requires all listed companies to produce an annual sustainability report, the inconsistency in reporting frameworks makes it difficult to make fair and complete comparisons across companies, sectors and industries.

31. SGX has mandated sustainability reports on environmental, social and governance ("ESG") factors, as set out in Listing Rule 711B on a "comply or explain" basis.[25] While the SGX reported that 495 listed companies had published their sustainability report on SGXNet as of 31 December 2018, areas discussed under material ESG factors were concentrated in occupational health and safety, code of ethics, energy, economic performance, training and education.[26]

32. For sustainability reports to adequately provide a picture of trends in sustainable development, YP believes that standardisation, with a focus on ecological and

environmental factors, must be upheld and prioritised. One model to be studied for adoption or adaptation is the framework designed by the Task Force on Climate-related Financial Disclosures ("TCFD").[27]

33. Data Availability on Carbon Footprint Tracking: Policymaking and regulations surrounding emissions reduction have largely focused on high carbon footprint industries, such as the petrochemical industry. GHG emissions of industries such as the tourism, aviation and maritime sectors are generally excluded from data reporting, and thus present "blind spots" in the race toward emissions reduction. To address these blind spots, YP proposes for the government to implement carbon emissions tracking for all companies with a net revenue above SGD$10 million.

34. To this end, YP calls for increased public access to data on GHG emissions by all commercial sectors in Singapore, to facilitate better-informed policymaking and to raise awareness on these "blind spots". This could be done through a carefully curated and managed data sharing framework for companies with a net revenue above SGD$10 million.

35. Energy Conservation Act 2014: The Energy Conservation Act was last amended in 2019. The Act should be updated within the first half of 2020, to incorporate clauses with the aim of reducing GHG emissions from the production and consumption of energy in Singapore.

36. Under the current Act, Section 27(A)(1) requires a registered corporation to have in place an energy management system and to ensure that the report of the energy management system is submitted to the Director-General of Environmental Protection appointed under the Environmental Protection and Management Act (Cap. 94A). Section 64(1) of the Energy Conservation Act provides for the Director-General to obtain energy consumption data from energy suppliers.

37. YP proposes a monitoring system where all registered corporations would have to submit their energy management plans to the National Climate Change Secretariat ("NCCS"). These plans would then be tabulated against consumption data supplied by energy suppliers to detect under-reporting.

38. YP also proposes an efficient audit framework to utilise and hold accountable the data submitted by the Energy Managers appointed under Section 30(1) read together with Section 28(1) of the Act, to ensure that such energy efficiency improvement plans are well implemented and diligently updated.

39. The energy market based in Singapore has produced a surplus of energy in Singapore and thus we propose a national cap for energy production to reduce GHG emissions. To this end, technological tools such as data analytics could be used to better predict energy demands in Singapore, thus informing the energy supply required. An annual report should be published for public access to promote awareness and transparency.

40. Goods Trade: The Singapore port authorities can play a bigger role to regulate the trading of unsustainable products. To this end, YP proposes the imposition of higher tariffs on imported products from unsustainable sources. The proposed approach is to have a tiered tariff rate pegged to actual GHG emission intensity levels.

41. Sustainable Procurement: YP proposes to promote the adoption of Sustainable Procurement by more businesses through subsidised training and certification. Such a measure educates workers in Sustainable Procurement, which they may apply throughout the years of employment and in their private lives.

Driving Behavioural Change

42. Total Defence: The objective of Total Defence is to is to involve every Singaporean to play their part, both individually and collectively, to prepare, prevent, and react to any crisis in Singapore.[28] The inclusion of "Digital Defence" as a sixth pillar on 15 February 2019[29] signifies that Singapore recognises that threats to our national interests are not static and must be updated regularly for the survival of Singapore.

43. During his National Day Rally on 2019, Prime Minister Lee Hsien Loong outlined climate change as an existential threat to Singapore.[30] As such, YP proposes that a seventh pillar of Total Defence should be added to address climate change. The inclusion of Climate Defence as one of the pillars of Total Defence signifies the government's recognition of climate change as a threat to the Singapore way-of-life and codifies the importance of climate change for Singaporeans. YP believes that this

symbolic move would galvanise a whole-of-nation effort towards sustainability-driven causes.

44. Education on sustainable practices and sustainability must be implemented at all stages of life to facilitate long-term behavioural change. This education must be continuous, consistent and placed at the forefront. Two key areas of focus in education were identified as being most important to facilitate behavioural change:

    a. Sustainable behaviours – avoiding excess consumption and recycling; and

    b. Global stewardship – forging a connection with the natural environment.

45. Embedding Climate Change into Education Curriculum: It is important to reframe the education curriculum. It is currently being framed as an addendum to the core curriculum in public schools, rather than being an essential part of students' learning. NParks's Biodiversity Week for Schools[31] initiative is a positive example and we hope that similar initiatives could be integrated into mainstream education, with lessons on sustainability and the environment conducted during regular class hours.

46. Redefining Growth: To steer away from the perceived overemphasis on economic metrics as a means of calculating growth, YP proposes for Singapore to incorporate different forms of holistic metrics, such as the Human Development Index[32] or the United Nations Environment Inclusive Wealth Index[33], as alternatives and more comprehensive means to quantify growth.

Multi-Stakeholder Cooperation on Climate Resilience

47. Engaging Civil Society by Sharing Data: YP appeals for increased public access to data on carbon emissions to enliven the civic space on environmental issues. While some data is currently publicly available, more specific technical data on carbon emissions should be made available for civil society to co-create impact with the government. Such co-creation can only occur through a mutual exchange of research knowledge. More pressingly, there is a lack of public knowledge about the kinds of data available. This poses two areas of concern:

    a. Data cannot be used to inform the work of civil society;

b. Data cannot be used as a means of educating the public.

48. YP thus calls for a platform to be created where data on emissions and climate change can be made available to the public. In addition, YP also calls for this data to be used for purposes of public education.

49. Forms of data requested include carbon emissions sorted by industry, and methodologies used for calculating emissions. Data should be contextualised both in positive and negative terms, to give a clearer picture of the strategies that have worked, those that have failed, areas of improvement and areas for improvement.

50. Multi-Stakeholder Partnership on Climate Change: A multi-stakeholder task force could be launched to foster greater consideration for sustainability in decision-making within government, businesses, and society. Such stakeholders could include:

    a. Prime Minister Office ("PMO"): Mandating a "green representative" for every public agency to coordinate inter- and intra-agency green practices;

    b. Ministry of Environment and Water Resource ("MEWR"): Introducing a "Green Rating" for consumer products to educate the public on environmentally conscious choices;

    c. Ministry of Communications and Information ("MCI"): Translating data on emissions and climate change into readily accessible media for public distribution in schools, print media, social media and other platforms.

    d. Ministry of Transport ("MOT"): Supporting the transition of the local public transport operator's heavy vehicle fleet from combustion engines into hybrid or electric engines to meet the 2040 deadline set during Budget 2020[34];

    e. Ministry of Education ("MOE"): Embedding climate change narratives into existing curricula. Education on climate change should not be done as a separate subject which would probably be an elective or non-examinable. Instead, such narratives should be integrated into mandatory subjects for Primary, Secondary, and Tertiary education while catering to the relevance for each student;

f. Ministry of Social and Family Development ("MSF"): Educating the social sector on groups particularly vulnerable to the effects of climate change, and helping them to adapt, or providing them with tools to mitigate such effects;

g. Ministry of Trade and Industry ("MTI"): Planning and facilitating transitions in "dirty industries" toward "cleaner" modes of operation, and possibly creating new "cleaner" industries. MTI could also develop its plans for industrial transformation together with sustainability experts to assess potential environmental and ecological impacts. YP proposes to review an industry transition plan in addition to the Industry Transformation Maps to better manage the possible interim economic risks;

h. Ministry of National Development ("MND"): Introducing waste management systems and green designs in public housing, which incorporate green habits into peoples' everyday lives. A waste tracking application could be developed to help individual households better manage their waste output, with functions similar to such trackers for energy consumption. Pilot projects could be carried out in select constituencies to measure and identify baselines, as well as to identify realistic target levels to be hit within the next two years;

i. Ministry of Community, Culture, and Youth ("MCCY"): Building climate resilience within communities and fostering community readiness for climate crises; mobilising local groups championing sustainability initiatives through networks such as the People's Association ("PA");

j. Multinational Companies ("MNCs"): Developing and testing new technologies and processes that can be propagated across industries to aid companies' transition toward more sustainable modes of operation. This would have to take place under a framework of cooperation with the government - outcomes from such cooperation could be exported beyond Singapore, to facilitate sustainable development across the world;

k. Association for Southeast Asian Nations ("ASEAN"): YP appeals for the government to champion the creation of an ASEAN platform to share best practices for sustainability integration across sectors among ASEAN members.

Sustainable Urban Development

51. Revision of the Green Mark Scheme: The Building and Construction Authority ("BCA") YP proposes for the Green Mark Scheme to include means of transportation of raw materials and/or finished products as a mandatory criterion.

52. Building designs should take the environmental impact of buildings into account more seriously, with a greater focus on reducing energy consumption and increasing energy production where possible. The National University of Singapore's School of Design and Environment Block Four ("SDE 4") is a good example of a building with net-zero energy consumption,[35] incorporating architecture that cools rooms without the need for air conditioning. Such features could be propagated to new buildings. YP calls for the government to incentivise the design and installation of energy efficient room cooling systems in all buildings. In addition, YP proposes for consumption evaluation to be monitored by a different government agency such as either NEA or EMA.

53. Emissions per Household in Town Council Management Report: The Ministry of National Development ("MND") could update the requirements for Town Council Management Reports ("TCMR")[36], such that assessments on non-industrial carbon emissions per household must be reported. This would encourage townships to plan for and construct developments with sustainability in mind.

54. Standardised Annual Emissions Report in Private Estate Management: The Ministry of Development ("MND") to mandate private residential estate managements to produce an annual emissions per household report aligned to the TCMR. This aims inculcate sustainability to residents of both public and private estates.

55. Mandatory Environment Impact Assessments: YP appeals for a standardised mandatory Environment Impact Assessments ("EIAs") to be conducted for all government projects, with each ministry producing an overall compliance certificate report for the annual Budget. YP recommends that this assessment is managed by

the National Climate Change Secretariat (NCCS). The natural environment has often been compromised in the name of infrastructural development – the Cross-Island MRT Line was raised as an example of this. While activists recognised that infrastructure is an essential part of Singapore's city life, YP feels strongly that more effort should be put in to protect and conserve Singapore's unique biodiversity.

56. Electric and Hybrid Vehicles: Transport is one of the largest emitters of GHG and we recommend further research on electric and hybrid vehicles to reduce the GHG produced from private transport (including heavy vehicles). Additionally, the automobile industry has observed a significant shift away from internal combustion engines and is expected to replace such engines with electric engines by 2050.[37] YP calls for the accelerated installation of public charging points for electric vehicles to facilitate the adoption of electric vehicles ("EVs"). Additionally, to incentivise the adoption of hybrid cars till 2030 prior to the complete transition to EVs in 2040.

57. Extended Producer's Responsibility for Electric Vehicle Batteries: YP activists shared that legislation should be in place to mandate the responsible disposal of batteries of EVs. Hence, YP appeals for the government should mandate an extended producer responsibility ("EPR") for EV manufacturers.

58. Protection of Rainforests and Wildlife: The strategy to plant new trees to replace ones that are cleared for infrastructural projects and wildlife relocation is to be commended. But this is inefficient because of the time taken for trees to grow, as well as the lack of data availability on the impacts of such practices on wildlife. Thus, YP calls for the strengthening of legislation to protect Singapore's primary and secondary rainforests with a gazette defining the species and/or areas that cannot be removed. YP also proposes for the government to consider the construction of more eco-friendly bridges over expressways for example, like Eco-Link@BKE for the safe passage of our wildlife over busy traffic areas.

Managing and Using Data Responsibly

59. Engaging Civil Society by Sharing Data: We appeal for increased public access to data on carbon emissions to enliven the civic space on environmental issues. While

some data is currently publicly available, more specific technical data on carbon emissions should be made available for civil society to co-create impact with the government. Such co-creation can only occur through a mutual exchange of research knowledge.

60. There is also a lack of public knowledge about the kinds of data available. YP calls for a platform to be created where data on emissions and climate change can be made available to the public. This could be included as a section on the National Climate Change Secretariat ("NCCS") website.

61. Types of data required and methods of data collection are also important factors for consideration. To this end, YP has two suggestions. First, sector-specific data on emissions should be collected and published. Second, there should be transparency in the methodologies and calculations used to derive the data reported, particularly for data on emissions amounts, and for data submitted by private organizations. These methodologies and calculations should be visibly represented on the platform described above.

62. Using Data for Public Education: YP also calls for data to be used for purposes of public education. Recognising that raw data or data in the form of pure numbers may be difficult to digest for laypeople, YP hopes that data can be interpreted and translated by public agencies into easily consumable infographics or other media for public consumption. Such media could be disseminated in schools, print media, and social media, among others.

Conclusion – Next Steps

63. These releases will take the form of a Position Paper. The Position Paper will comprise three main sections. Firstly, it will provide suggested guiding principles and metrics to define and scope the success of Singapore's commitment to mitigating climate change and its effects. Secondly, the Position Paper will propose frameworks and mechanisms to implement the policy recommendations made in this Paper. Thirdly, the Position Paper will suggest approaches that can be taken to ameliorate the risks or concerns associated with the proposed transformations and transitions.

64. Singapore is in a strong position to be a leading nation in addressing the effects of climate change, and we are committed towards this vision. This Position Paper focuses on a few key areas to make this a reality. First, we look to financial incentives and instruments to broaden opportunities to make the sustainability sector viable. Second, by expanding current regulatory reporting frameworks and legislative tools, we develop a robust legal landscape that matches up to global standards while retaining our competitive advantages. Third, we look into driving behavioural change through the various national education channels by making sustainability one of the nation's priorities. Fourth, we aim to promote the vision of climate resilience through multi-stakeholder cooperation, recognising the roles in which all sectors at various institutional levels must play for a whole-of-society shift. Last but not least, being a city-state, by reinforcing our commitment towards sustainable urban development, we ensure not only a future for Singaporeans today, but for our future generations, and the flora and fauna that make up Singapore.

65. Sustained engagement will be conducted with sustainability experts, climate activists, and industry representatives as YP continues to refine its position. The inputs and comments received from participants at the FGD, as well as those that will be received following the release of this Paper from YP's subsequent engagements, will inform the content of YP's following releases.

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