Singapore: A Green Hub

Young PAP

A Submission to

The Singapore Government

(Position Paper Part II)

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Outline

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

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

3. Climate anxiety has taken the form of public outcries observed around the world. In Singapore, climate anxiety has manifested through events such as the Climate Change Rally held at Hong Lim Park on September 21 2019. Such events demonstrate a growing wave of concern among the youth on the perceived inaction to mitigate climate change and its effects.[viii]

4. The 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.[ix] Additionally, the Government has also announced a comprehensive set of policies to achieve net Zero Waste through the circular economy.[x]

5. YP understands that the Government has made a commitment to achieve a 36 percent reduction in the amount of greenhouse gases emitted per dollar of GDP by 2030 and that this target will be revisited.[xi] YP recommends having this target increased to 50 percent. YP suggests that the matrix calculations should be reconsidered, specifically the denominator of GDP. An absolute measure of actual carbon emissions on a per tonne level benchmarked against the top 5 performing countries should be considered.

Current State: Today's Sustainability Landscape

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

7. Without any viable alternative energy sources, Singapore currently depends on piped and liquified natural gases for 95% of its energy demands.[xiii] While the combustion of natural gases releases significantly less carbon emissions compared to the burning of fossil fuels, the resultant emissions are still relatively high. They should thus still be an area of concern.

8. Approximately 60% of Singapore's carbon emissions are generated from industrial production, with the petrochemical industry standing among its most significant contributors. Activists have appealed for more stringent legislation to push the industry to more accountability to reduce carbon emissions

9. Today, fossil fuels account for about 2% to 3% of the global economy.[xiv] Singapore's maritime industry contributes 7% to its Gross Domestic Product and employs over 170,000 people today.[xv]

10. Singapore will push for the adoption of electric vehicles to reduce carbon emissions from transport.[xvi] However, such technologies are still unavailable for most heavy vehicles. The transport industry (air, land, and sea) is dominated by heavy vehicles with little to no access to alternatives to combustion fuel. YP recognizes that SBS Transit has recently announced the launch of their first 60 electric buses on November 11, 2019.[xvii] Global and regional shipping gives industries more room to explore green options. Alternatives such as electric ships would become more feasible with shorter shipping routes. However, such solutions are not available for the Mass Rapid Transit (MRT) trains, passenger planes, or cargo ships.

11. Singapore must achieve collective growth both in sustainable practices, and economic prosperity to secure a sustainable future. For Singapore to contribute meaningfully to climate change negotiations, it must demonstrate that pursuing a sustainable agenda does not necessarily have to come into conflict with economic viability. Singapore must thus pursue green causes while maintaining its status as a vibrant global city.

12. With this objective in mind, a focus group discussion (FGD) was conducted by the Young PAP (YP) on February 8, 2020, with climate activists and experts from the sustainability sector, to solicit opinions and feedback on Singapore's existing efforts on climate change.

13. During the first FGD, participants outlined five (5) 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
    e. Sustainable Urban Development

14. After the publication of the first working paper, YP conducted two separate FGDs on 13 and 20 September 2020 with representatives from 14 relevant business sectors to seek feedback on the proposals of our first working paper.

15. From engagements with the representatives from the business sectors, three (3) key recommendations were highlighted.

    a. Establish Singapore as a Research and Development (R&D) hub for alternative energy
    b. Professionalise the sustainability industry
    c. Develop an energy usage data sharing framework

Singapore as an R&D Hub for Alternative Energy

16. Historically, economic progress has been closely correlated with energy consumption.[xviii] With limits on carbon emissions, alternate global models are required for economic growth. However, juggling between energy production and carbon emissions is a dual challenge. While renewable energy alternatives are available, the energy generation capacity of renewable energy alone cannot meet Singapore's national demand. Scalable solutions to meet the world's energy needs are necessary.

17. Institutions must look for long term business models to consider sustainability not only from the economic perspective but also the social lens in accordance with the United Nation's (UN) Sustainable Development Goals (SDG). History need not repeat itself; economic progress need not be correlated with higher emissions.

18. There is a need to adopt carbon-free or carbon-efficient sources of energy. However, alternative energy sources in the market are scarce. Today, the dominant source of clean energy is derived from solar power. However, the energy derived from solar power is insufficient to power the national energy demands.

19. Industry players explain that they are limited by the scalability of clean energy solutions. Hence, to meet the carbon zero targets, the Government must invest in R&D efforts to scale alternative energy solutions.

20. YP recommends that Singapore becomes a R&D hub for alternative energy. Hence, YP calls for the Government to direct more national resources towards scientific research for alternative energy. This can be achieved by increasing the talent pool for scientific research and investing in the physical research infrastructure.

21. Institutionalised corporate-university partnerships have been established in this sector to expand the talent pool for alternative energy research. The Government must continue to increase the number of experts researching on the science behind scalable alternative energy solutions. Hosting ASEAN or international level science research competitions could allow Singapore to tap on a larger pool of scientists to accelerate the commercialisation of clean energy solutions.

22. Invest in Clean Energy Research Infrastructure: Supercomputers are being used to accelerate the research for critical issues such as cancer[xix] and COVID-19[xx] . The United States has also deployed supercomputers to improve the efficiency of renewable energy. [xxi]

23. Alternative energy researchers can leverage the use of supercomputers to identify scalable solutions. To achieve this, deeper collaboration between alternative energy scientists, and the National Supercomputing Centre (NSCC)[xxii] is desired. The bridge between the energy and computing could be established by institutionalising partnerships between corporations, universities, and NSCC.

Professionalising the Sustainability Industry

24. Singapore is positioned well to be leading the global carbon documentation and reporting market. The international connectivity of Singapore's seaports[xxiii] allows the highly developed maritime sector to supplement its clients with carbon accounting services across the entire supply chain of a product. The international trust and credibility of Singapore's regulatory standards and the connectivity of our supply chains make Singapore the only country capable of providing end-to-end carbon accounting services to the world.

25. The United Nations Climate Change has called for the harmonisation of greenhouse gas accounting.[xxiv] However, there are several carbon accounting standards adopted by the market today. This includes the Global Reporting Index (GRI)[xxv], Greenhouse Gas Protocol (GHG) [xxvi], and other sector-specific indexes[xxvii]. In the Young PAP's first working paper, YP called for the adoption of the framework proposed by the Taskforce on Climate-related Financial Disclosure (TCFD)[xxviii] for Singapore Exchange (SGX) listed companies.

26. Currently, there is no single global standard for carbon accounting. There is room for Singapore to establish a state-supported set of protocols and accounting standards to document and report the end-to-end carbon emission for all products. The nationalisation of end-to-end carbon reporting standards can potentially create PMET job opportunities for Singaporeans.

27. However, the practice of carbon accounting must be accredited by the Singapore government for practitioners to leverage on Singapore's regulatory credibility. This can be instituted through government-sanctioned training and certification with added subsidies from the SkillsFuture credit to incentivise mid-career PMETs to enter the industry.

28. YP proposes for a taskforce led by the Ministry of Sustainability and Environment (MSE) in collaboration with the Ministry of Trade and Industry (MTI) and the Maritime Port Authorities (MPA) to be established with relevant industry representatives and international organisations to create a nationalised framework for carbon accounting. Protocols, standards, and training curricula for the documentation and reporting of carbon emissions could be co-created with existing international and local regulatory organisations through this taskforce.

Developing an Energy Usage Data Sharing Framework

29. Data sharing is a multi-disciplinary concern which requires enabling technology that facilitates sharing with business. Trust and security are the most cited concerns, although there are operational benefits that can be gained from leveraging large volumes and a variety of data for analytics.

30. Industry representatives have also called for increased access to environmental, technological or operational data. They explained that any enhancement to energy or operational efficiency could reduce carbon emissions and quantifiable results would promote or hasten the adoption of the advancement within the ecosystem.

31. Data pooling within the industrial sectors will allow businesses to redesign organisational routines and promote greater operational efficiency. This will ultimately reduce wastage, improve efficacy and reduce overall carbon emissions.

32. The proposed data-sharing framework can be divided into two (2) categories; the sectoral data of each Key Industrial Sectors (KIS) and the overall Key Environmental Indicators (KEI).

33. Advantages of data sharing include the enhancement of sectoral efficiency over the entire supply chain, which results in compliance cost reduction for businesses and the

provision of comprehensive information for market efficiency. Both decision-makers and environmental activists see these as critical benefits of data-sharing.

34. Data could be made available to participating stakeholders in different KIS within the industrial ecosystem to improve operational and energy efficiencies. Data shared within the different KIS will be aggregated towards the overall critical environmental indicators for policy decision making.

35. To promote contribution and adoption of the data-sharing framework and to ensure stakeholders' operational security, all data that is pushed into the sharing ecosystem must be anonymised without the possibility of attribution using reverse engineering methods.

36. The availability of such data would allow analysts to identify existing and emerging consumption patterns. This assumes that such availability of data would allow businesses to implement targeted policies to generate maximum gains in their sustainability efforts. Additionally, the availability of data allows analysts to leverage big data for analytics or machine learning.

37. YP recognises the concerns over data privacy and protection for companies to maintain their competitive advantage. YP proposes the adoption of the "Trusted Data Sharing Framework" from Infocomm Media Development Authority (IMDA).[xxix] The purpose of the data-sharing framework is to provide a legal guideline to facilitate rapid data-sharing while alleviating concerns over trust and security.

38. YP will continue our engagement with business and industry stakeholders to study the technical and technological concerns towards the adaptation and operationalisation of the proposed data-sharing framework.

Financial Incentives to Support Enterprises and Reduce Energy Consumption

39. Green Bonds: Participants expressed concern over the sources of funding for many green initiatives, green groups and sustainability-based enterprises today. They commended the Green Bond Grant Scheme by the Monetary Authority of Singapore (MAS) and asked that it be expanded, with stricter regulation to ensure adherence to the Scheme's definition of Eligible Expenses.

40. Incentivising Small and Medium Enterprises (SMEs): From a business perspective, compliance and cost are core priorities. The COVID-19 pandemic has severely impacted businesses,[xxx] and the short- to mid-term survivability is often the utmost concern of their stakeholders. Environmental sustainability is regarded as a secondary goal in the current context.

41. The Government must nudge enterprise in the right direction by developing adequate infrastructure, designing legislation to address concerns, and creating relevance and value for businesses. One of the industry representatives reiterated that continued consumer demand for sustainable solutions will give rise to businesses wanting to supply these solutions.

42. Hence, YP proposes for the Green Bond Grant Scheme to be expanded to help SMEs transition towards more sustainable modes of operation. With their limited resources, it is challenging for SMEs to adopt more sustainable business practices; funding from Green Bonds could play a large role in facilitating this transition.

43. Sustainable Sector as Social Enterprises: Practitioners from the sustainability sector appealed for sustainability to be integrated into existing guidelines for the social sector. This would expose the sustainability sector to a greater diversity of funding, which in turn would bolster fiscal sustainability. This would open more opportunities for sustainability-based enterprises to further their causes.

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

Legislation, Regulation, and Sector-Specific Reporting

45. Carbon Tax: the Government plans to introduce a carbon tax applied on facilities that emit 25,000 or more tons of carbon dioxide or equivalent (tCO2e) of greenhouse gas (GHG) annually. This definition covers the six GHGs that are currently reported to the

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

46. Section 16(1) of the Carbon Pricing Act specified 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.

47. 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.

48. Taxing carbon emissions is not an approach that has been unique to Singapore. There are about 46 other comparative jurisdictions that have also implemented or passed legislation to implement carbon pricing.[xxxi]

49. The carbon tax in Singapore is currently capped at $5/tCO2e in the first instance, from 2019 to 2023. This has been implemented with the aim of providing adequate time for industries to adjust, 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 $10/tCO2e and $15/tCO2e has been projected.[xxxii]

50. Some FGD participants opined that Singapore should raise the price of the carbon tax to $100/tCO2e, instead of the proposed increments. To provide a comparison with other carbon taxing jurisdictions, Finland at present charges about USD 70/tCO2e (SGD 97.37), while Sweden charges about USD 127/tCO2e (SGD 176.66).[xxxiii]

51. Academic research, however, appears to suggest that carbon taxing may be ineffective in Singapore due to the relatively high carbon-income price elasticity and because the population in Singapore enjoys a relatively high income.[xxxiv] Carbon taxing 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.

52. Hence, YP proposes for the government to conduct a feasibility study of the cap-and-trade (or carbon quota) model as an alternative to the carbon tax model. The cap-and-trade model promotes greater certainty around emissions reduction. It aids governments to achieve pre-determined emissions targets and to apply a falling emissions cap over time.

53. Countries such as Australia, China and the United States have explored some 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.[xxxv]

54. The cap-and-trade model is certainly not without its flaws.[xxxvi] The need to develop regulations to facilitate the trading of emissions permits will likely drive up business compliance costs. The predictability of tax revenue may likewise be affected. During the focus group discussions with business representatives, it was noted that the trading market could be too small in Singapore, and this might require a coordinated ASEAN effort. It is recommended that Singapore's expertise should be leveraged by building an efficient trading platform with neighbouring countries. 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.

55. The 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.[xxxvii] While the SGX reported that 495 listed companies had published their sustainability report on SGXNet as at December 31 2018, areas discussed under material ESG factors were concentrated in occupational health and safety, code of ethics, energy, economic performance, training and education.[xxxviii]

56. YP calls for sustainability reports to adequately provide a picture of trends in sustainable development. Standardisation with a focus on ecological and environmental factors must be implemented. One model which could be adapted from is the framework designed by the Task Force on Climate-related Financial Disclosures (TCFD).[xxxix]

57. Energy Conservation Act 2014: The Energy Conservation Act was last amended in 2019. Participants opined that the Act should be updated within the first half of 2020, to reduce GHG emissions from the production and consumption of energy in Singapore.

58. 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.

59. YP proposes a monitoring system, wherein registered corporations would have to submit their energy management plans to the Energy Market Authority (EMA). These plans would then be tabulated against consumption data supplied by energy suppliers to detect under-reporting.

60. There could also be 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.

61. Participants also noted that the EMA has produced a surplus of energy in Singapore and proposed a national cap for energy production to reduce GHG emissions. Participants hoped that, 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 facilitate public awareness and understanding.

Driving Behavioural Change

62. Total Defence: The YP proposes that the seventh pillar of Total Defence should be added to address climate change. The inclusion of Climate Defence in our Total Defence values would signify and codify the importance of climate change for Singaporeans and galvanise the nation toward sustainability-driven causes.

63. FGD Participants opined that education must be implemented at all stages of life to facilitate long-term behavioural change. They agreed that education on sustainable practices must be continuous, consistent and placed at the forefront. Two key areas of focus were identified for the education system to facilitate behavioural change:

    a. Sustainable Behaviours – avoiding excess consumption and recycling, and

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

64. Embedding Climate Change into Education Curriculum: Participants highlighted the importance of reframing the education curriculum; some were concerned that sustainability education is currently being framed as an addendum to the core curriculum in public schools, rather than being an essential part of students' learning. Participants praised NParks' Biodiversity Week for Schools[xl] initiative and hoped that similar initiatives could be integrated into mainstream education, with lessons on sustainability and the environment conducted during regular class hours.

65. Redefining Growth: Participants also discussed the perceived overemphasis on economic metrics as a means of calculating growth. Some participants felt that such metrics encouraged excessive production and excessive consumption. To shift away from this, YP proposes for Singapore to emphasise on a more holistic metrics, such as the Human Development Index[xli] or the United Nations Environment Inclusive Wealth Index[xlii], as a means to quantify growth.

Multi-Stakeholder Cooperation on Climate Resilience

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

a. Ministry of Education (MOE): Embedding climate change narratives into existing curricula. Participants noted that this should be done in common curricula that apply to all students, and not through optional or elective subjects.

b. Ministry of Social and Family Affairs (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.

c. Ministry of Trade and Industry (MTI): Planning and facilitating transitions in "dirty industries" toward "cleaner" modes of operation, and possibly to new "cleaner" industries altogether. 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 risks of the interim possible economic risks.

d. Ministry of National Development (MND): Introducing waste management systems and green designs in public housing, which incorporate green habits into daily lives. There should be a waste tracking app in every household, similar to energy consumption. A pilot project could be tested out in a specific constituency to measure and identify the current baseline and identify realistic target levels to hit within the next two years.

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

f. Multinational Companies (MNC): 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.

g. Association for South East Asian Nations (ASEAN): Becoming a role model within the region by sharing best practices for sustainability integration across sectors with other ASEAN members. Through such sharing, Singapore can deepen the impacts of its efforts toward emissions reduction.

Sustainable Urban Development

67. Revision of the Green Mark Scheme: Participants called for the Building and Construction Authority (BCA) Green Mark Scheme to be reviewed and updated. Building designs should place greater emphasis on environmental impact 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.[xliii] SDE 4 includes an architecture that allows for room cooling without the use of air conditioning. Participants hoped that such features could be propagated to new buildings. As such, YP calls for the Government to incentivise the design and installation of energy-efficient room cooling systems in all buildings.

68. Representatives from the various business sectors shared that companies with limited leasehold left for their properties have little incentive to adopt sustainable infrastructure as there are little financial incentives to undertake major refurbishment works to make their office spaces more environmentally friendly. Moreover, several technologies required to facilitate the greening of existing or new infrastructure have not been commercialised yet. Admittedly, there are many ideas and technologies on trial; hence the market may be saturated, but there has not been a dominant technology or solution to consolidate the market thus far.

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

70. Mandatory Environment Impact Assessments: YP appeals for mandatory Environment Impact Assessments (EIAs) to be conducted for all government projects,

with each ministry producing an overall EIA for the annual Budget. FGD participants opined that the natural environment has often been compromised in the name of infrastructural development – the Cross-Island MRT Line was raised as a key example of this. While activists recognised that infrastructure is an essential part of Singapore's city life, they also felt strongly that more effort should be put in to protect and conserve Singapore's unique biodiversity.

71. Cooling District for Data Centres: The emerging ICT sector will contribute to high carbon emissions due to the cooling systems required to main a data centre.[xlv] As Singapore aims to become the regional hub for the ICT sector, we must address the challenges of this industry. The Urban Redevelopment Authorities (URA) can consider developing a cooling district to co-locate all heat-emitting infrastructure, such as data centres of the ICT sector. Such a facility can complement existing sectors that require cooling systems as it reduces business costs and aggregate emissions produced from cooling critical infrastructures of exothermic sectors.

72. Protection of Rainforests and Wildlife: Participants noted the Government's efforts to plant new trees to replace ones that are cleared for infrastructural projects and wildlife relocation. However, they felt that this strategy is inefficient because of the time taken for trees to grow a lack of data availability on the impacts on wildlife. This is particularly so in our primary and secondary rainforests. YP thus called for the strengthening of legislation to protect Singapore's primary and secondary rainforests with a gazette defining the species or areas that cannot be removed.

Conclusion – Next Steps

73. This is an updated position paper drafted by YP following engagements with climate change activists, representatives from various businesses and industries.

74. A public consultation session will be conducted to solicit views on the various proposals raised in the position paper.

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