

Dear NCCS,

Thank you for opening up this channel for consultation with the public on Singapore's climate policy. The climate crisis is undeniably one of the most pressing and existential problems facing present and future generations. I am writing today as a concerned citizen because I am deeply anxious about how the future will be like should we not take drastic actions now to avert the impending climate catastrophe. I am worried about how existing inequalities and injustices will be perpetuated by the climate crisis i.e. marginalised / poor communities being disproportionately affected by the effects of climate change / when humanity becomes so desperate for survival that it makes unethical choices, like going ahead with geo-engineering solutions when they have been purported to exacerbate droughts in Asia, South America and Africa. I am 20 years old this year and this is not the kind of world I wish to inherit. Before I begin to elaborate on my suggestions, I feel compelled to make a few brief points.

Singapore's current climate policies seem to be heavily oriented to adaptationist measures. While the adaptation policies are commendable, I am deeply worried by how this seems to suggest that the government has already committed to a climate catastrophe. I struggle to reconcile with the fact that our current trajectory seeks to increase emissions over the next 10 years, when science has told us that we need to halve our emissions by 45% by 2030 to limit global warming to 1.5 degree celsius. In addition, 95% of our energy grid is natural gas, when science has emphasised that our national grid needs to be at least 70-85% renewable-based by 2050.

According to the SR1.5 report as cited in the public consultation document, "rapid, far-reaching and unprecedented changes in all aspects of society" is required. While it is important that individuals and households do their part, I am bothered by the disproportionate focus on individual and household actions in the questions posed. Climate action, if it's ever going to be effective in achieving significant drawdown of emissions, must target the biggest emitters. On this note that I will move on to respond to specific questions posed in the public consultation document.

A) Improving energy efficiency across sectors

What are the main barriers that are stopping households from adopting more energy-saving practices?

- - Personally, I think the biggest barrier is knowing that my individual actions matter very little in the grand scheme of things.
- - Adding up primary and secondary emissions, households are comparatively inconsequential emitters (6.4%) when looked at alongside industry (60%), buildings (16.8%), and transport (16%), as the data provided from our Greenhouse Gas Emissions Profile reveal.
- - It is difficult to be motivated personally when 60% of emissions produced by industry seems unchallenged my government.
- - Even when I do get motivated to act, I can't help but struggle with the dissonance upon recognising the catastrophic nature of this threat, and sensing the unwillingness of my government to undertake systemic change against it.

How can households in Singapore be incentivised to purchase and use more energy-efficient appliances?

- - I believe that any implemented incentive should promote a switch to a more energy-efficient appliance, rather than the consumption of more appliances. Potential rebound effects must be averted. In addition, a life-cycle approach should be taken to electrical appliances so that the reduction in emissions due to increased efficiency of appliances is not negated by the planned obsolescence of electrical products.
- - Producers must play their part too. Beyond an extended producer responsibility scheme which makes producers responsible for their disposal and recycling, other ways of encouraging them to make products with longer lifespans should be explored, such that the problem is tackled further upstream.
- - I think that it will be great if trade-in programmes that allow people to trade in their old and inefficient products instead of throwing them away become widespread. A trade-in program can also facilitate dismal e-waste recycling rates, which can lead to additional greenhouse gases (HFCs) being emitted in the case of refrigerators and air-conditioners which have refrigerants.
- - There also needs to be a continued phase-out of appliances that rank poorly (i.e. 1-2 energy efficiency ticks) on the Mandatory Energy Labelling Scheme (MLES), removing them from circulation and adding them to the list of products banned under the Mandatory Energy Performance Standards (MEPS) for being too energy-inefficient.

What are some of the more energy-saving practices we can adopt around the home?

- - Barring the use of energy-efficient appliances, I don't think there is much more that households can do, especially if current power consumption (cooling, lighting, et cetera) is fundamental to our way of life.
- - Bearing in mind that our power grid is still largely fossil fuel-based, I am not sure how much effect I will have in reducing my carbon footprint by switching to more energy-efficient appliances.
- - Additionally, rather than consider energy-saving practices that can be adopted around the home, I strongly believe that there should be more emphasis on the discussion of reducing our consumption of luxury goods such as air travel.

B) Encouraging responsible climate action through carbon pricing

Would you be willing to pay more for products from businesses taking actions to be more climate conscious?

- - While personal inconvenience may be inevitable in the short run as we transition into a low-carbon economy, I believe that this has to be mitigated as soon as possible as it does not make sense for consumers to be penalised for being more climate conscious. Prices of products in general must internalise environmental costs and benefits in a way that most impactfully incentivise low-carbon choices.
- - Furthermore, if we are to have a just transition, the temporal rise in cost must be neutralised especially for lower-income Singaporeans through revenue from the carbon tax revenue, which is why it must be sharply increased. While it is praiseworthy that Singapore's carbon tax has no

exemptions for particular industries, the rate is just too low - S\$5/tCO_{2e} from now till 2023 and intentions to increase it to S\$10-15/tCO_{2e} by 2030 is far short of the level needed to drive transformational change, as estimated at US\$40-80 per ton by 2020 and US\$50-100 per ton by 2030.

- - Revenue from the tax revenue should also be used to fund additional climate mitigation measures that we desperately need, as well as to support more affected members of society in this transition eg. workers in the petrochemical industries. As mentioned earlier, I find it of prime importance that we manage this transition in a just manner. Therefore, another action that I believe my government must do is to develop a task force on just transition of the workforce. This will be beneficial for the economy too. According to the International Labour Organisation, the transition to a greener economy could generate 24 million jobs in a span of about a decade, with Asia and the Pacific seen to have the highest level of job creation at 14 million, which is more than enough to offset the expected job losses of 6 million in traditional energy sectors. An additional 6 million jobs can also be created by transitioning towards a 'circular economy' (i.e. recycling, repair, rent and remanufacture).
- - If being a climate-conscious business becomes an industry norm, I doubt that I will necessarily have to pay more for the products from these companies. Hence, I think that there needs to be stronger top-down nudges for businesses to take climate action, especially around reducing their emissions.
- - One immediate suggestion I have to the above is to administer carbon pricing through a simple taxation scheme where carbon price is charged based on verified emission values, as opposed to the current framework that requires taxable facilities to be required to buy a certain amount of credits at the beginning of each year, based on an estimate of carbon emissions for the next year. The present practice appears odd to me as it is undeniably difficult to make accurate estimates of the number of carbon credits needed for the year ahead. Hence, there is bound to be over-estimations and left-over unutilised carbon credits. This may lead to facilities with left-over credits to use less energy-efficient technologies so as to finish their remaining credits, which is highly counter-productive to the goal of carbon pricing.

C) Reducing emissions from power generation

How many percent more would you as an individual or company be willing to pay to purchase electricity generated from clean and renewable sources?

- - I do not think that purchasing electricity from clean and renewable sources necessarily means that I will have to pay more. The prices of electricity generated from clean and renewable sources are already increasingly reaching grid parity in ASEAN. Hence, I believe that my government should be an active participant in regional or global efforts to improve grid connection between member nations that will increase Singapore's share of green energy, like the ASEAN Power Grid initiative.

How can Singapore increase our solar power deployment?

- - One way is to look into non-cost factors that hinder solar adoption, such as consumer information, ease of switching suppliers or regulatory barriers that

- prevent people from becoming prosumers of solar photovoltaic systems (PV).
- There should be an enabling regulatory environment for prosumers to sell excess energy back to the grid and generate additional income.
 - - Another way is to also channel more resources to developing the ecosystem for solar energy players.

How can the private sector be encouraged to further accelerate the deployment of solar energy?

- - More monetary incentives need to be introduced to motivate firms to deploy solar energy technology. Imposing costs/penalties for not joining in these schemes will further compel companies to take action.
- - A higher, stricter carbon tax will also directly encourage the private sector to switch to solar energy.
- - An enabling regulatory environment for prosumers of solar PVs, as elaborated above, will encourage private institutions to deploy solar energy too.

D) Deploying emerging low-carbon technologies

What would encourage you to purchase an EV?

- - Nothing really. I generally use public transport, and a vehicle only sparingly. I believe that the only sustainable way to reliably transport 7 million people with minimum environmental impact is through public transportation, not private vehicle ownership.
- - In addition, increasing the number of privately-owned EVs will only reduce our carbon footprint in limited ways, as energy for EVs is will largely come from fossil fuel since fossil fuel dominates our current energy grid.

Regarding questions pertaining to the development and import of hydrogen

- - From what I've read, it appears that whether or not hydrogen as an energy source is considered a green energy depends on how it was derived i.e. whether it was derived using renewable energy or fossil fuel. Hence, I am not sure the relevance of these questions. If anything, these questions further drive the need for a rapid switch to a renewable-based economy.

E) Encouraging collective climate action

What would encourage you to take up active, shared, and public transport for your journeys, especially peak-period journeys?

- - The transportation sector currently accounts for 14% of Singapore's primary greenhouse gas emissions and motorised road vehicles accounted for the bulk (90%) of Final Energy Demand (FED) in the domestic transport sector in 2016. On the other hand, electricity used to power rail network only accounted for 9.6%. More can be done to look at disincentivizing private transport while incentivizing public transport, by understanding the substitution rates between them and weighing factors in choice of transportation (which can include

reliability of public transport, coverage and connectivity of public transport network).

- - Nonetheless, continuing to expand our MRT rail network should not compromise on biodiversity spaces
- - Public transport does not only have to be active and shared, but can also be fully electric. The LTA has the responsibility to make its fleet more carbon-efficient over time. It should define 'cleaner' as 'fully electric', and set clear step-by-step targets for transitioning to an electric fleet, instead of this vague commitment for 'cleaner by 2040'. An example would be as such: 30% electric-vehicle by 2025, 60% by 2030, 100% by 2035.
- - At the same time, it is increasingly clear that even a rapid switch to electric and other low-carbon vehicles won't be enough to meet the goals of the Paris climate agreement. Thus, I believe that more needs to be done to reduce the demand for transportation altogether. This entails plans like shrinking road spaces and freeing up space for pedestrians to walk or cycle, hence reinforcing low-carbon travel.

What other actions can you as an individual or a member of the community undertake to drive climate action?

- - Broadly speaking, the most significant way to reduce carbon footprint include eating less meat and dairy, reducing the use of private transportation such as cars, switching off the air conditioning and reducing air travel.
- - The above individual actions should also be supported by policies that reflect the costs of these associated products.
- - Specifically, members of the community should commit to the idea of personal de-growth; i.e. a reduction in consumption of material goods beyond essentials. Such a movement will have a considerable impact on global emissions. This can be supported by a change in measures of well-being i.e. moving beyond GDP, taking reference from New Zealand's recent move to Gross National Happiness. The climate crisis has made it clear that the logic of endless growth promoted by GDP is no longer tenable. We need to replace GDP with a more thoughtful indicator - one that accounts for ecological and social impact of economic activity. Hence, I believe that a working group should be commissioned to find out more about the viable routes of transforming our economic model, how that will impact our lives and how maintaining a status quo in our current economic directions will affect citizens of other countries who are disproportionately affected by the climate crisis.
- - Moving forward, changes in our collective societal values will also better prepare us for the realities of a future increasingly destroyed by the climate crisis, in the event that governments and financial institutions choose not to act strongly.

How can we further encourage individuals to reduce, reuse, and recycle?

- - Countries such as Malaysia, China, and Indonesia have introduced regulations on waste imports, meaning that we are less and less able to export our trash. That said, even if exporting trash may ease the problem

locally, it will just create a new set of problems elsewhere, especially if the trash is imported to countries with less stringent controls.

- - I believe that the focus of any genuinely environmentally-concerned government, and populace, should be to emphasise reduction and re-use of goods, not just through showcasing commendable ground up-efforts like Repair Kopitiam, but through providing economic and market-oriented support for repair and maintenance companies.
- - Currently, repair and maintenance programmes are not supported by market forces because cheap manufacture and replacement, as well as re-purchase, serve company bottom lines better.
- - As a result, I think that my government should encourage, through subsidies and grants, the development of repair and maintenance industries. Besides, government-run campaigns have been historically effective. Campaigning against unnecessary consumption, promoting repair & thrift culture instead will greatly shape public perception.
- - Of particular significance is the gap in the disposal and recycling of refrigerants, which can lead to the greater venting of HFCs that is considered to be a greenhouse gas and has been identified as a major source of emissions.
- - Lastly, Intellectual Property (IP) regulations should not unfairly benefit companies by allowing them to keep information on how to repair their products proprietary as this will cause consumers to have no choice but to buy a new product when their existing one is met with issues. As Singapore is looking to further develop its capability as an IP hub, we should ensure that consumers reserve the ability to repair and maintain their own products so that we continue to build on the movement to reduce consumption.

How can we encourage businesses and organisations to take climate action and practice 3Rs within their operations?

- - I believe that businesses must go way beyond the 3Rs simply because we are in a climate crisis. Urgent and systemic actions are necessary. One action I think that businesses and organisations must take is to divest from the fossil fuel industry. Besides, with the advances in clean energy, fossil fuel is likely to become a stranded asset. A recent report found that Blackrock, the world's biggest fund manager, lost \$90 billion over the last decade by ignoring the serious financial risk of investing in fossil fuel companies. Divestment from fossil fuel can be enforced through a stringent implementation of Environment, Social and Governance (ESG) Practices in investing that is facilitated via policies.
- - In addition, I think that my government needs to nudge businesses into being more acutely aware of the financial risks in their operations and investments posed by climate change. After all, it has been reported that the carbon bubble can be as large as \$100 trillion by the end of the century, which can potentially trigger a global financial crisis.
- - The above can be done by mainstreaming the discourse that failing to consider long term investment value drivers in an investment practice is considered a failure of fiduciary duty. Furthermore, firms should be legally obligated for firms to reconsider their investments in fossil fuels, similarly to how there have been investment bans on tobacco and weapons.

- - Lastly, I think that there needs to also be a top-down mandate to get all banks in Singapore to cease funding in new coal power plants and withdraw from existing deals. The International Energy Agency has already warned that to limit temperature rises to 2 degree celsius, let alone the 1.5C as scientists recommend, either all new energy projects would have to be low carbon or existing infrastructure would need to be cleaned up. It is on this basis that I believe that we simply cannot allow our institutions to continue financing fossil fuel projects.

What are the challenges individuals face in taking climate action in their daily lives?

- - I believe that the biggest challenge is the seeming insignificance of taking individual and day-to-day climate action relative to the immense power that stakeholders such as governments and companies have to make widespread change in society.
- - As such, I think that my government must look into drawing down the financial, political and physical systems that support the global fossil fuel industry, which has clearly hindered climate action for a long time. This is the only way it can assure the people of Singapore that it is seriously committed to the mitigation that will protect our way of life, and persuade them to take climate action.

F) Tapping on green growth opportunities

How can Singapore be a global leader in green growth? What are the key components required to build a green growth ecosystem in Singapore?

- - Singapore must first divest from the sunset carbon-intensive industries (i.e. fossil fuels) before reinvesting in green growth sectors.
- - Furthermore, state institutions must be aligned under a whole-of-government approach to tackling this issue, rather than working individually and ineffectually, as efforts by one ministry may be negated by what is planned by another.
- - Singapore must incorporate climate priorities into the decisions of all ministries. This entails for instance, a compulsory climate risk assessment to be conducted for projects that will incur environmental impact.
- - My government must also re-consider the recently announced expansion of Jurong Island. This action will commit Singapore to more carbon-intensive infrastructure, creating more stranded assets that will ultimately be abandoned in the green transition.

How can the Government help to upskill workers to prepare them for a green economy?

- - While 6 million jobs in the Asia-Pacific could be lost in traditional energy sector, the green energy sector has been estimated to be able to produce 14 million jobs. Countries that have a highly skilled labour force, such as Singapore, are well-placed to take advantage of this knowledge-based sector.

- - A just transition for all towards an environmentally sustainable economy needs to be well managed and will require a great degree of administrative focus.
- - Using carbon tax revenue, I believe that my government should encourage workers in current petrochemical industries to transition to the green energy sector, for example by offsetting (to a large extent) the cost of re-skilling, with the aid of existing infrastructure such as SkillsFuture.

Which existing green growth sectors (e.g. clean energy, waste, water) have potential for greater growth? How can this potential be harnessed?

- - Waste has zero potential for green growth. This is because greater waste follows greater consumption and production of unnecessary goods and services, such as single-use plastics or fast fashion clothing, products which are or soon to be banned in many countries.
- - Clean energy has tremendous potential for growth. As the untenability of further extraction of fossil fuel reserves further increases, and the costs of extraction and pollution continue to outgrow their inherent value, countries that have the technological and knowledge capabilities to support the world's pivot to clean energy will be economically secure for the foreseeable future.

What other green growth opportunities and industries should Singapore be looking at?

- - Of particular note is the agricultural industry, specifically the sectors of agri-business and agri-tech. Food-producing deltas of the world are gradually flooded by rising sea-levels, areas of high population density, such as cities, are going to see skyrocketing prices for imported food.
- - As a result, many cities will be looking into becoming more self-sustaining when it comes to food production. Countries that have developed technological and knowledge expertise in this area will greatly benefit from this desire for greater sustainability. Therefore, agriculture is a high-skill industry that presents opportunity for Singaporeans.
- - Moreover, Singapore is specifically at risk due to its high level of imports for food, and thus promoting home-grown food production is not only a matter of economic opportunity but of food security.
- - Existing ideas of adaptation through the construction of seawalls should also proactively protect our shorelines, i.e. not alter existing shoreline habitats such as seagrass beds and mangroves as to conserve precious biodiversity. These habitats are also often possible efficient sites for carbon sequestration. Examples from other countries include replanting mangroves to reduce damage to dikes, private property (done in Vietnam), and ECOConcrete which can allow ocean life to thrive on seawalls.

Once again, I would like to thank NCCS for holding this public consultation. I acknowledge that some of the recommendations laid out here are beyond the current thinking in government, but I believe they reflect the transformative change we need to avoid a climate breakdown. I've also gone ahead to attach the detailed calls to action put out by organisers of the Climate Rally for your perusal - I find them to be wonderfully crafted as they are evidence-based and aligned to the science-

based targets as laid out in the IPCC. I sincerely hope that these suggestions will be given due consideration.

*“Until you start focusing on **what needs to be done** rather than what is politically possible, there is no hope. We can’t solve **a crisis** without treating it as a crisis. We need to keep the fossil fuels in the ground, and we need to focus on equity.” - Greta Thunberg*

Sincerely,
Min Jie