



NUS Asia-Pacific Centre for Environment Law Working Paper 21/04

NUS Law Working Paper 2021/022

Singapore: Breaking Circuits and the Norm

Nikhil Dutt Sundaraj

Research Apprentice, APCEL, Faculty of Law

National University of Singapore

&

Jolene Lin

Associate Professor, Director of APCEL, Faculty of Law

National University of Singapore

[Uploaded October 2021]

© Copyright is held by the author(s) of each Asia-Pacific Centre for Environmental Law (APCEL) Working Paper. APCEL Working Papers may not be republished, reprinted, or reproduced in any format (in part or in whole) without the permission of the author(s). The views expressed in this working paper are those of the author(s). They do not necessarily represent or reflect the views of APCEL or of NUS.

“Integrating Climate Change Concerns into Post-COVID Recovery Packages in the European Union, United States and Asia: Reconciliation with the Needs of Industrial Development” (editors: Chien-Te Fan, Anton Ming-Zhi Gao), Kluwer Book Series: Energy and Environmental Law (Forthcoming)

Singapore: Breaking Circuits and the Norm

by Nikhil Dutt Sundaraj* & Jolene Lin⁺

Introduction

This chapter seeks to provide some insights into the economic measures that have been taken in Singapore in response to the Covid-19 pandemic. Thus far, Singapore has not officially announced a post-Covid recovery package. However, we are able to gain a glimpse into how such a package might look like based on the existing measures in place to address some of the adverse economic impacts of the pandemic.

This chapter argues that many of these measures were not planned or implemented with climate or environmental considerations in mind. Nonetheless, there are environmental and sustainability dimensions and implications to these measures which this chapter seeks to explore. This chapter will discuss these measures according to the following typology. The first category of measures refer to those which have had incidental climate mitigation benefits although geared towards entirely different policy aims. The second category refers to measures which indirectly benefit climate change mitigation through similar environmental policy aims e.g. sustainability and biodiversity conservation. The third category includes measures which are directly geared towards mitigating climate change. The final category is made up of measures which have a detrimental effect on climate change.

This chapter is structured as follows. Following this introduction, Part 1 briefly sets out the timeline of events pertaining to the Covid-19 situation in Singapore. Part 2 provides an analysis of the economic measures introduced in response to the pandemic situation in Singapore with a focus on their environmental and climate change implications. Part 3 analyses observations on some of the salient issues which came up during this pandemic and Part 4 concludes with a brief marker on where Singapore is now in its recovery from the pandemic and its climate-related policies.

Part 1: Singapore’s Covid-19 Timeline

Singapore’s first confirmed case was on 23 January 2020.¹ Around the same time, a Multi-Ministry Taskforce was set up to address the pandemic and manage Singapore’s response with the Minister for National Development and the Minister for Health as the co-chairs.²

* Research Apprentice, Asia Pacific Centre for Environmental Law, National University of Singapore (APCEL).

⁺ Associate Professor, Faculty of Law, National University of Singapore; Director, APCEL.

¹ Anon, “Wuhan Virus: Temperature Screening Begins at Woodlands, Tuas and Sea Checkpoints” (CNA January 24, 2020) <<https://www.channelnewsasia.com/news/singapore/wuhan-virus-woodlands-tuas-checkpoint-temperature-screening-12319724>>; accessed February 9, 2021

² Goh T, “Six Months of Covid-19 in Singapore: A Timeline” (The Straits Times July 26, 2020) <<https://www.straitstimes.com/singapore/six-months-of-covid-19-in-singapore-a-timeline>>; accessed February 9, 2021

“Integrating Climate Change Concerns into Post-COVID Recovery Packages in the European Union, United States and Asia: Reconciliation with the Needs of Industrial Development” (editors: Chien-Te Fan, Anton Ming-Zhi Gao), Kluwer Book Series: Energy and Environmental Law (Forthcoming)

Contact tracing teams were set up.³ During the early stages of the pandemic, people were lulled into a false sense of security when no symptoms were found in their contacts within a few days.

Initially, masks were discouraged unless a person was showing symptoms or worked in the healthcare sector. It was revealed months later that the reason for this was concern about a shortage of masks due to hoarding. Activities which put people in close contact with many others still went on.

The problem soon escalated. The foreign worker dormitories which house hundreds of thousands of low-wage, low-skilled workers started to see Covid-19 cases. These workers lived in very cramped conditions with shared facilities and no safe distancing measures in place. Once one person in a dormitory caught the virus, it would rapidly spread to hundreds of others in that dormitory. Furthermore, there was frequent interaction between workers in different dormitories, so it spread from one to another.⁴

At this point, news came in about Wuhan’s lockdown and its early relative success in curbing the virus’ spread.⁵ Singapore maintained for a long time that it would not enter a lockdown, but at the start of April 2020, announced a ‘circuit breaker’ from 7 April 2020.⁶ This comprised a raft of measures which drastically restricted residents’ movements. Without calling it a ‘lockdown’, Singapore had basically entered a lockdown. The main strategies of dealing with the virus post-circuit breaker are testing, tracing, and isolating.

The Singapore government was dealing with the pandemic and economic shock at the same time, which were priorities. As such, the focus was not directly to address problems of climate change per se, but tangential issues which had knock-on effects on climate change. This has led to some interesting political and legal developments and has provided new perspectives on these issues. Some of these will be discussed in Parts 2 and 3 of the chapter.

Part 2: The Four Types of Measures

Singapore has implemented several measures during this pandemic. Many of these have had, or could be foreseen to have, an impact on greenhouse gas (GHG) emissions and carbon footprints at an individual and national level. In this chapter, these policies have been grouped into four categories. They are as follows:

A. Measures which have had incidental climate mitigation benefits although geared towards entirely different policy aims

³ Yong M, “Timeline: How the COVID-19 Outbreak Has Evolved in Singapore so Far” (CAN February 3, 2021) <<https://www.channelnewsasia.com/news/singapore/singapore-covid-19-outbreak-evolved-coronavirus-deaths-timeline-12639444>> accessed February 9, 2021

⁴ Yong M, “Timeline: How the COVID-19 Outbreak Has Evolved in Singapore so Far” (CNA February 3, 2021) <<https://www.channelnewsasia.com/news/singapore/singapore-covid-19-outbreak-evolved-coronavirus-deaths-timeline-12639444>> accessed February 9, 2021

⁵ Zhuan Y, “Modelling the Effects of Wuhan’s Lockdown during COVID-19, China” (World Health Organization June 30, 2020) <<https://www.who.int/bulletin/volumes/98/7/20-254045/en>> accessed February 9, 2021

⁶ Anon, “Covid-19: Govt Announces Closures of Non-Essential Workplaces, Schools from April 7 and 8” (TODAYonline April 3, 2020) <<https://www.todayonline.com/singapore/non-essential-businesses-schools-be-shut-april-7-and-8-pm-lee>> accessed February 9, 2021

“Integrating Climate Change Concerns into Post-COVID Recovery Packages in the European Union, United States and Asia: Reconciliation with the Needs of Industrial Development” (editors: Chien-Te Fan, Anton Ming-Zhi Gao), Kluwer Book Series: Energy and Environmental Law (Forthcoming)

B. Measures which indirectly benefit climate change mitigation through similar environmental policy aims e.g. sustainability and biodiversity conservation

C. Measures which are directly geared towards mitigating climate change

D. Measures which have a detrimental effect on climate change

This typology has been adopted because firstly, it is important to distinguish between a measure’s purpose and its effects in keeping with the general reality of law and policymaking. The effects are kept distinct from the purpose because the focus of this chapter is the effect of each measure on GHG emissions while the purposes are manifold. Hence, no matter the purpose of the measure, the bases of comparison for its effects are similar.

Furthermore, the purposes in question are not binary, i.e. it is not a simple yes/no question of ‘does the measure target climate change?’ The question that should be asked is ‘to what extent does the measure target climate change?’ Therefore, there is a tripartite distinction between categories A, B and C. The reason why D does not contain any notion of purpose and merely refers to effect is simply because no government in today’s world enacts legal or other measures with the intention of harming the climate.

Category A

In Singapore, there were a few policies which had entirely different aims than climate mitigation, but contributed in a tangible way to a decline in net total emissions. These policies typically involved slowing down GHG-intensive activities.

One example is the transport sector. During Singapore’s “circuit breaker”, people were allowed to leave their houses for only a few other purposes including the purchase of essential goods and services.⁷ The list of ‘essential’ goods and services did not include many sectors such as law and jobs that tend to be done in an office.⁸ This drastically reduced daily commuter traffic to and from areas which were known for heavier traffic especially during peak hours.⁹ The decline in public transport usage further lowered emissions. Reduced retail and business operations meant that businesses could suspend operation of their physical premises. This meant savings on electricity.

Singapore banned the entry of tourists and short-term travellers into the country on 23 March 2020. During the circuit breaker, only specially chartered flights to bring back overseas Singaporeans and repatriate foreign nationals staying in Singapore were allowed in and out of Changi Airport. The airport shut down two of its terminals to reduce operating costs, which no doubt saved a lot of energy.¹⁰

⁷ COVID-19 (Temporary Measures) (Control Order) Regulations 2020 S.4

⁸ Anon, “What Stores Remain Open, and What Stores Have to Close during the Circuit Breaker Period?” (MCI - Gov.SG April 22, 2020) <<https://www.gov.sg/article/what-stores-remain-open-and-what-stores-have-to-close-during-the-circuit-breaker-period>>; accessed February 10, 2021

⁹ Tan C, “Roads Become More Free-Flowing and Safer but Speeding Cases Surge” (The Straits Times May 14, 2020) <<https://www.straitstimes.com/singapore/transport/roads-become-more-free-flowing-and-safer-but-speeding-cases-surge>>; accessed February 10, 2021

¹⁰ Anon, “Consolidation of Terminal Operations: Singapore Changi Airport” (Consolidation of Terminal Operations | Singapore Changi Airport April 7, 2020) <<https://www.changiairport.com/corporate/media-centre/newsroom/consolidation-of-terminal-operations.html>>; accessed February 10, 2021

“Integrating Climate Change Concerns into Post-COVID Recovery Packages in the European Union, United States and Asia: Reconciliation with the Needs of Industrial Development” (editors: Chien-Te Fan, Anton Ming-Zhi Gao), Kluwer Book Series: Energy and Environmental Law (Forthcoming)

The drastically lower air traffic would also have led to significantly lower aviation emissions. The three main Singaporean carriers - Singapore Airlines, SilkAir and Scoot - slashed their passenger capacity.¹¹ Overall, Singapore’s emissions are 8% to 12% lower in 2020 and 2030 when factoring in the economic impact of the pandemic, including from the circuit breaker and subsequent phased opening of the economy.¹² Transport saw the biggest drop, with a 2.4 billion tonne emissions reduction in 2020.¹³

Category B

GHG emissions are intrinsically tied to other environmental and sustainability issues, including energy security and biodiversity conservation. Singapore’s government has enacted policies to address some of these concerns at different times during the pandemic.

For instance, Singapore is stepping up efforts to grow more food locally.¹⁴ The government wants producers to do this by leveraging new technologies such as vertical farming, hydroponics and lab-grown meat.¹⁵ Local production of food would lower emissions by greatly shortening the supply chain, relying only on land transport within a distance of less than 40 kilometres from producer to distributor owing to Singapore’s small size. Far fewer food miles would be generated compared to imported equivalents.

Singapore's fourth desalination plant, which can produce about 30 million gallons of fresh drinking water per day, began commercial operations in July 2020.¹⁶ It requires less energy and fewer steps to treat compared with regular desalination. This gives it a lower carbon footprint, and also provides a sustainable source of freshwater.

Category C

While the Singapore government’s top priorities were and continue to be very much focused on stemming the virus’ spread and the pandemic’s economic fallout, some consideration has been given to directly addressing climate change during this period.

One interesting development is the development of stricter Environmental Impact Assessment (EIA) guidelines. It was announced in November 2020 that sweeping changes to Singapore’s EIA framework

¹¹ Daga A, “Singapore Airlines Obtains \$13 Billion Rescue Package amid Coronavirus Shock” (Reuters March 26, 2020) <<https://www.reuters.com/article/us-health-coronavirus-singapore-air-tema-idUSKBN21D3AE>> accessed February 10, 2021

¹² Anon, “Singapore” (Singapore | Climate Action Tracker February 8, 2020) <<https://climateactiontracker.org/countries/singapore/>> accessed February 10, 2021

¹³ Fogarty D, “Carbon Emissions Fell Record 7 per Cent in 2020: Study” (The Straits Times December 11, 2020) <<https://www.straitstimes.com/world/europe/carbon-emissions-fell-record-7-per-cent-in-2020-study>> accessed February 10, 2021

¹⁴ Tan A, “Singapore Boosting Production of Food Locally amid Covid-19” (The Straits Times November 29, 2020) <<https://www.straitstimes.com/singapore/environment/spore-boosting-production-of-food-locally-amid-covid-19>> accessed February 10, 2021

¹⁵ Anon, “Singapore Approves Lab-Grown 'Chicken' Meat” (BBC News December 2, 2020) <<https://www.bbc.com/news/business-55155741>> accessed February 10, 2021

¹⁶ Wong L, “Singapore's Fourth Desalination Plant in Marina East Begins Operations” (The Straits Times July 14, 2020) <<https://www.straitstimes.com/singapore/singapores-fourth-desalination-plant-in-marina-east-commences-operations>> accessed February 10, 2021

“Integrating Climate Change Concerns into Post-COVID Recovery Packages in the European Union, United States and Asia: Reconciliation with the Needs of Industrial Development” (editors: Chien-Te Fan, Anton Ming-Zhi Gao), Kluwer Book Series: Energy and Environmental Law (Forthcoming)

will ensure that Singapore’s development is more sensitive to wildlife and biodiversity. This may not be a direct result of the pandemic but does show a shift in focus to sustainability, which involves reducing GHG emissions. Details on these sweeping changes are not known yet, but the focus on environmental conservation has very much redoubled.¹⁷

The Monetary Authority of Singapore (MAS) announced and published a sustainable finance action plan¹⁸ and a Green and Sustainability-Linked Loan Grant Scheme (GSLs) to support loans of the type.¹⁹ This would encourage sustainable and environmentally-conscious investing and could in turn help breed a new generation of employees and corporate workers who are more environmentally conscious in their corporate decision-making. While not explicitly stated, this would help keep an environmental focus and consciousness in some companies’ recovery efforts post-pandemic.

Furthermore, green concerns seem to be increasingly brought to the fore. Singapore’s Sustainability and Environment Ministry has plans for a green recovery from COVID-19.²⁰ While the details are not apparent yet, this includes reducing emissions, boosting climate resilience, growing green industries like carbon services and climate science, setting up a research office to draw SG masterplan for climate science research. Additionally, job growth in clean energy sectors is being investigated.²¹

Category D

This is arguably the most populated category of measures during the pandemic. With the focus on tackling the pandemic, climate considerations took a back seat. Further, many of these measures involve engaging in GHG-intensive activities.

For instance, Singapore’s Senior Minister of State for Sustainability and the Environment, Amy Khor, announced that the full implementation of Singapore’s Resource Sustainability Act (RSA) will be delayed due to the Covid-19 pandemic, particularly the mandatory packaging reporting requirements.²² This Act is supposed to increase Singapore’s resource conservation and development of a circular economy.²³ Its delay represents a setback in Singapore’s climate mitigation and recycling

¹⁷ Anon, “Development Works in Singapore to Be More Sensitive to Wildlife” (www.singaporelawwatch.sg November 10, 2020) <<https://www.singaporelawwatch.sg/Headlines/Development-works-in-Spore-to-be-more-sensitive-to-wildlife>>; accessed February 10, 2021

¹⁸ Anon, “Sustainable Finance” (Monetary Authority of Singapore November 2, 2020) <<https://www.mas.gov.sg/development/sustainable-finance>>; accessed February 10, 2021

¹⁹ Anon, “MAS Debuts Grant Scheme to Support Green and Sustainability-Linked Loans” (CNA November 24, 2020) <<https://www.channelnewsasia.com/news/singapore/mas-green-sustainability-loan-grant-finance-banks-ocbc-uob-13628212>>; accessed February 10, 2021

²⁰ Lim V, “Sustainability and Environment Ministry Lays out Plans for a Green Recovery from COVID-19: Video” (CAN November 7, 2020) <<https://www.channelnewsasia.com/news/singapore/sustainability-and-environment-ministry-lays-out-plans-for-a-13060316>>; accessed February 10, 2021

²¹ Devi U and Low A, “Clean Energy Pivot Will Yield Green Jobs” (business-times.com.sg November 27, 2020) <<https://www.business-times.com.sg/energy-commodities/clean-energy-pivot-will-yield-green-jobs-but-time-needed-to-fill-them>>; accessed February 10, 2021

²² Allen & Gledhill “Resource Sustainability Act 2019 Partially in Force from 1 January 2020” (Allen & Gledhill January 22, 2020) <<https://www.allenandgledhill.com/sg/publication/articles/13990/resource-sustainability-act-2019-partially-in-force-from-1-january-2020>>; accessed February 10, 2021

²³ Allen & Gledhill (no. 22)

“Integrating Climate Change Concerns into Post-COVID Recovery Packages in the European Union, United States and Asia: Reconciliation with the Needs of Industrial Development” (editors: Chien-Te Fan, Anton Ming-Zhi Gao), Kluwer Book Series: Energy and Environmental Law (Forthcoming)

efforts.²⁴

With most people staying at and working from home, this led to higher domestic electricity consumption despite offices being left generally empty. While some lights and air conditioners may have been switched off in office buildings, more use came from households, which in effect worked against any reductions.²⁵

As the pandemic spread, the Singapore government organised several repatriation efforts for overseas Singaporeans. This involved long flights for a relatively small number of passengers, thus increasing per-capita emissions. Aviation was a hard-hit sector and a proposed ‘Flights to Nowhere’ idea aimed at generating income for Singapore Airlines was scrapped because of an outcry regarding emissions and environmental unfriendliness.²⁶ Furthermore, Singapore’s government pledged to keep its flag carrier airline, Singapore Airlines, afloat in an almost ‘no matter what’ fashion with no green conditions attached to it. SIA has already received a rescue package of S\$19 billion at the time of writing.²⁷

Some high-carbon sectors experienced boosts, especially if they produced goods in high demand due to the pandemic. Manufacturing sector performance, led by electronics and pharmaceuticals production and fiscal stimulus in support of Singapore’s recovery, was strong.²⁸ While this may help emissions if green tech industries are developed, some of Singapore’s most lucrative industries include petrochemical refining and offshore/marine manufacturing, which have a high carbon footprint.²⁹

To boost domestic tourism, each Singaporean has received S\$100 worth of ‘SingapoRediscover’ vouchers, which can be used for numerous activities to support local businesses and tourism. This means more energy usage and thus more emissions, especially from the usage of private vehicles to travel to and from the places with these discounts. Similarly, parking charges in many places were waived in Phase 2. This encouraged personal vehicular usage which leads to carbon emissions. More people used personal vehicles and rideshares where possible for a fear of crowding in public transport during a pandemic.

Part 3: Key Issues

²⁴ Khor A, “Dr. Amy Khor” (Facebook - Amy Khor September 5, 2020)

<<https://www.facebook.com/AmyKhorPage/posts/the-resource-sustainability-act-rsa-was-passed-in-parliament-a-year-ago-last-fri/3711418985535182/>> accessed February 10, 2021

²⁵ Anon, “COVID-19 Circuit Breaker, Hotter Weather Led to Higher Electricity Usage in May: EMA, SP Group” (CNA June 16, 2020) <<https://www.channelnewsasia.com/news/singapore/covid-19-electricity-bill-circuit-breaker-sp-group-ema-12839766>> accessed February 10, 2021

²⁶ Hosie R, “Singapore Airlines Has Cancelled Its Proposed 'Flights to Nowhere' after Criticism from Environmental Campaigners” (Insider October 1, 2020) <<https://www.insider.com/singapore-airlines-drops-flights-to-nowhere-after-environmental-concerns-2020-10>> accessed February 10, 2021

²⁷ Daga A, (no. 11)

²⁸ Subhani O, “Singapore Economy Tipped to Grow 5.5% next Year; Vaccines Could Push Growth Higher” (The Straits Times December 11, 2020) <<https://www.straitstimes.com/business/economy/singapore-economy-tipped-to-grow-55-next-year-vaccines-could-push-growth-higher>> accessed February 10, 2021

²⁹ Hermesauto, “Global Economic Recovery from Pandemic Entering Critical Period, Says MAS Chief” (The Straits Times November 25, 2020) <<https://www.straitstimes.com/business/economy/global-economic-recovery-from-pandemic-entering-critical-period-says-mas-chief>> accessed February 10, 2021

“Integrating Climate Change Concerns into Post-COVID Recovery Packages in the European Union, United States and Asia: Reconciliation with the Needs of Industrial Development” (editors: Chien-Te Fan, Anton Ming-Zhi Gao), Kluwer Book Series: Energy and Environmental Law (Forthcoming)

As explained earlier, the focus of many policies was not directly to address climate change per se, but issues tangential to it. The consideration of and discourse surrounding these issues has led to some interesting political and legal developments.

Resource Conservation

While some may have predicted a decline in Singapore’s resource usage during lockdown, total usage of essentials like water and electricity remained largely unchanged in reality.³⁰ The reason for this negligible difference is that while people no longer turned up in the office for work, they worked from home. Their office-based use was simply ‘transferred’ to their domestic use. This was reflected in rising domestic water and electricity bills during the lockdown.³¹

This has implications for the future engineering and design of office buildings. Many office spaces have centrally controlled air conditioning, lighting and heating. This is an inefficient system as the building’s energy use of energy is likely to far exceed real demand when employees work from home during a pandemic. This also leads to a higher per-capita energy usage for those workers present. Some offices have already begun to ‘green’ their spaces and introduce energy-saving and energy-efficient technologies such as natural lighting and individually adjustable lights and air conditioning.³²

The 2012 Energy Conservation Act (ECA) applies to business activities which are defined as activities that involve the emission of greenhouse gas, the production of energy or the consumption of energy³³; and form a single undertaking or enterprise.³⁴ The Act applies to corporations which have business control over these activities. It mandates conservation and minimum energy efficiency standards and efficient energy management systems, with routine energy efficiency opportunities assessments for corporations, but not consumers. With work from home arrangements in place, these legal standards do not apply as employees are working from their private domiciles. As such, during the circuit breaker period, each employee’s carbon footprint may have increased, but the law (i.e. ECA) cannot apply to limit it, which poses a problem for reducing the nation’s carbon footprint during periods like the circuit breaker.

This realisation has fed into a wider discussion about what offices could look like in the future. According to research by McKinsey, ideas for post-pandemic offices are markedly different from pre-pandemic ideas where open office designs and co-working were the predominant ideas.³⁵ Hybrid systems of working from home and in office mean possibly less office space needed and fewer shared facilities to prevent the spread of pathogens, while the need for big city locations to be close to a physical talent pool is lower. Reports from Singapore have indicated that while the possible impact on coworking spaces is currently unclear, a developing trend pre-pandemic was to relocate some backroom business operations away from the Central Business District (CBD), and downsize those that

³⁰ Anon, “Singapore Household Electricity Consumption up 22% during ‘Circuit-Breaker’” (businesstimes.com.sg June 16, 2020) <<https://www.businesstimes.com.sg/energy-commodities/singapore-household-electricity-consumption-up-22-during-circuit-breaker>>; accessed February 10, 2021

³¹ Anon, (no. 30)

³² Anon, “Green Office Trend on the Rise” (bca.gov.sg August 28, 2013) <https://www.bca.gov.sg/green_mark/pdf/pr28082013_GM.pdf>; accessed February 10, 2021

³³ ECA 2012 [Cap No. 92C, Revised Edition 2014] ss.(3)(a)

³⁴ ECA 2012 [Cap No. 92C, Revised Edition 2014] ss.(3)(b)

³⁵ Boland B and others, “Reimagining the Office and Work Life after COVID-19” (McKinsey & Company December 14, 2020) <<https://www.mckinsey.com/business-functions/organization/our-insights/reimagining-the-office-and-work-life-after-covid-19#>>; accessed February 10, 2021

“Integrating Climate Change Concerns into Post-COVID Recovery Packages in the European Union, United States and Asia: Reconciliation with the Needs of Industrial Development” (editors: Chien-Te Fan, Anton Ming-Zhi Gao), Kluwer Book Series: Energy and Environmental Law (Forthcoming)

remain there.³⁶ However, this was also made possible due to workspaces in newer open office and coworking areas being borderless and more tightly packed – something to be avoided during a pandemic. It could well mean that companies may find it financially sensible to encourage decentralised working, from home if possible, to avoid having large socially distanced office spaces. This would make regulation under the ECA much harder. Any efforts to regulate energy usage at home may necessitate imposition of higher domestic electricity rates. These themselves pose problems as the worker would absorb the higher cost. If working from home is to be the norm, managing one’s carbon footprint would require a collective consciousness on the issue, and individual efforts. However, given Singapore’s history of enacting regulatory laws for important issues, it seems unlikely that this would be left entirely to individual action.

Singapore also has a carbon taxation system established by the Carbon Pricing Act 2018. A carbon tax is charged on the total amount of reckonable GHG emissions of a taxable facility of a registered person in a reporting period. This is to be based on emissions reports sent by registered persons recognised under the Act.³⁷ The amount of payable tax is determined by the National Environment Agency or NEA³⁸ at a rate of S\$5/tCO₂e.³⁹ Carbon credits are also purchasable at a price of S\$5 per credit.⁴⁰ The tax is levied on a registered and taxable facility. This is a two-stage process under S.7 of the Act. Firstly, a facility would have to be registered⁴¹, which entails reporting its emissions regularly⁴², if its emissions cross the first threshold of 2000 tCO₂e.⁴³ If the second threshold is met for at least 1 year of registered operation, then the facility will have to register as a taxable facility.⁴⁴ However, the second threshold is much higher than the first, being 25000 tCO₂e.⁴⁵ The basis for this threshold seems to be a limiting measure for appeals to the High Court; essentially allowing them only when the amount at stake is sufficiently large.⁴⁶ This does not adequately weigh the public (and global) importance of this issue against the potential volume of litigation. It essentially means that only the highest emissions facilities are affected, like power generation facilities, who would hardly feel the pinch anyway as the tax incidence would be passed on to the power companies, who would pass them on to consumers.⁴⁷ While it could be argued that increased power bills at home could push people to reduce their household electricity consumption, it does not achieve any effect on corporate entities whose physical facilities would be using far less power. Effectively, all this would have done is pass the carbon tax burden of doing company work onto each worker. In our present situation, it does not help change corporate culture or office use to become more sustainable. Furthermore, according to a 2018 report by the IPCC, the carbon tax rate levied by Singapore is far too low to even come close to achieving the Paris Agreement maximum target of 1.5°C warming, with Singapore’s tax rate needing to be at least

³⁶ Foo ST, “Commentary: COVID-19 Will Reshape the Singapore Office Property Market Outlook” (CNA January 29, 2021) <<https://www.channelnewsasia.com/news/commentary/coronavirus-covid-19-singapore-office-coworking-property-reits-12745050>>; accessed February 10, 2021

³⁷ Carbon Pricing Act [No. 23 of 2018] ss.11(1) and 11(2)

³⁸ CPA 2018 [No. 23 of 2018] S.21

³⁹ CPA 2018 [No. 23 of 2018] Schedule 2

⁴⁰ CPA 2018 [No. 23 of 2018] Schedule 2

⁴¹ CPA 2018 [No. 23 of 2018] S.7(1)(b)

⁴² CPA 2018 [No. 23 of 2018] S.11(2)(a)

⁴³ CPA 2018 [No. 23 of 2018] Part 1 of Schedule 2

⁴⁴ CPA 2018 [No. 23 of 2018] S.7(1)(c)

⁴⁵ CPA 2018 [No. 23 of 2018] Part 1 of Schedule 2

⁴⁶ Bea E and Lu S, “The Pathway to Paris: A Commentary on the Carbon Pricing (Draft) Bill” (eco-business.com February 8, 2018) <<https://nuselsa.wordpress.com/2018/01/28/the-pathway-to-paris-a-commentary-on-the-carbon-pricing-bill/>>; accessed February 10, 2021

⁴⁷ Anon, “Understanding Carbon Tax in Singapore & Its Impact on Electricity” (iSwitch October 20, 2020) <<https://iswitch.com.sg/carbon-tax-singapore/>>; accessed February 10, 2021

“Integrating Climate Change Concerns into Post-COVID Recovery Packages in the European Union, United States and Asia: Reconciliation with the Needs of Industrial Development” (editors: Chien-Te Fan, Anton Ming-Zhi Gao), Kluwer Book Series: Energy and Environmental Law (Forthcoming)

1,250% higher.⁴⁸

A significant waste-related problem during the lockdown was the increased usage of plastic bags and Styrofoam takeaway containers. A study shows that households in Singapore generated additional 1,334 tonnes of plastic waste during the circuit breaker.⁴⁹ Many businesses in Singapore - from the simple hawker stall to large supermarket chains - use plastic bags for transporting just about anything,⁵⁰ and takeaway food is often presented in styrofoam boxes. The lockdown saw most food stalls reduced to selling only takeaways and deliveries, resulting in far greater usage of plastic and styrofoam than usual. While the usage of plastic bags is widely acknowledged to be convenient and some plastic bags are reused by citizens, the re-use of single-use plastic bags is limited by their relatively brittle nature. As a result, a large percentage of plastics in Singapore end up in landfills or incinerators.⁵¹ Despite the trend in the past few years showing decreases in plastic waste generation, with a 6% reduction from 2018 to 2019, recycling rates also decreased by 2% in the same period.⁵² According to Singapore’s national Environment Agency (NEA), the aim is to reduce the use of Singapore’s primary landfill such that its lifespan extends beyond 2035.⁵³ Statistics for these rates are unavailable for the year 2020, but recycling needs to be the norm if we are to prevent spikes in plastic waste accumulating during periods of high use such as a pandemic and lockdown, especially since it is well known that their incineration releases large volumes of greenhouse gases into the atmosphere and their production using crude oil carries a high carbon footprint.⁵⁴

In contrast to jurisdictions like certain American states⁵⁵ and the European Union⁵⁶, Singapore does not have measures which ban or restrict the usage of plastic bags and other single-use packaging, aside from the Resource Sustainability Act. Section 3(b) of the RSA states that one of its purposes is to “encourage producers of packaging to reduce, re-use or recycle packaging”. The Act has only recently been enacted and it can be argued that social practices take time to evolve. At the time of writing, plastic and Styrofoam remain the most common forms of packaging in Singapore. Excessive packaging

⁴⁸ Masson-Dalmotte V and others, “Summary for Policymakers. In: Global Warming of 1.5°C. An IPCC Special Report on the Impacts of Global Warming of 1.5°C above Pre-Industrial Levels and Related Global Greenhouse Gas Emission Pathways, in the Context of Strengthening the Global Response to the Threat of Climate Change, Sustainable Development, and Efforts to Eradicate Poverty” (2018) 106 IPCC Policy Report 1323

⁴⁹ Elangovan N, “Singapore Households Generated Additional 1,334 Tonnes of Plastic Waste during Circuit Breaker: Study” (TODAYonline June 5, 2020) <<https://www.todayonline.com/singapore/singapore-households-generated-additional-1334-tonnes-plastic-waste-during-circuit-breaker>> accessed February 10, 2021

⁵⁰ Agarwal S, “Commentary: A Case for Making Plastic Bags in Singapore Ugly – or Even Embarrassing” (CNA January 29, 2021) <<https://www.channelnewsasia.com/news/commentary/singapore-plastic-bag-charge-ban-waste-recycle-reuse-pollution-12989408>> accessed February 10, 2021

⁵¹ Liu V, “3 Million Tonnes of Waste Disposed of in Singapore Last Year; Plastic Waste Made up 30%” (The Straits Times April 15, 2020) <<https://www.straitstimes.com/singapore/3-million-tonnes-of-waste-sent-to-semakau-landfill-last-year-plastic-waste-made-up-30>> accessed February 10, 2021

⁵² Anon, “Waste Statistics and Overall Recycling” (National Environment Agency October 16, 2020) <<https://www.nea.gov.sg/our-services/waste-management/waste-statistics-and-overall-recycling>> accessed February 10, 2021

⁵³ Anon, (no. 52)

⁵⁴ Zheng J and Suh S, “Strategies to Reduce the Global Carbon Footprint of Plastics” (2019) 9 Nature Climate Change 374

⁵⁵ Schultz J (State Plastic Bag Legislation February 8, 2021) <<https://www.ncsl.org/research/environment-and-natural-resources/plastic-bag-legislation.aspx>> accessed February 10, 2021

⁵⁶ Anon, “Parliament Seals Ban on Throwaway Plastics by 2021: News: European Parliament” (Parliament seals ban on throwaway plastics by 2021 | News | European Parliament March 27, 2019) <<https://www.europarl.europa.eu/news/en/press-room/20190321IPR32111/parliament-seals-ban-on-throwaway-plastics-by-2021>> accessed February 10, 2021

“Integrating Climate Change Concerns into Post-COVID Recovery Packages in the European Union, United States and Asia: Reconciliation with the Needs of Industrial Development” (editors: Chien-Te Fan, Anton Ming-Zhi Gao), Kluwer Book Series: Energy and Environmental Law (Forthcoming)

is also a problem. Plastics are made from oil and their production generates significant amounts of GHG emissions. Acting to reduce plastic use in Singapore will go a long way to reducing its carbon footprint. Unfortunately, during the pandemic and in its aftermath, plastic usage has increased and is likely to do so as people prefer disposable items in the quest to avoid virus spread. Efforts to reduce them will need to be substantial and require the participation of small businesses and individual consumers to shift towards reusable or biodegradable packaging.

As mentioned earlier, the implementation of the RSA, which is intended to encourage extended producer responsibility in recycling and reducing packaging waste, has been delayed due to the pandemic. Many jurisdictions have witnessed similar delays and roll-back of regulatory measures during this global pandemic.⁵⁷ In the case of the RSA, Singapore is no exception to this global trend which suggests that the attainment of environmental sustainability and climate mitigation remains vulnerable to economic exigencies.

II. Resilient and Greener Sources

Prior to the pandemic, Singapore’s Long-Term Low Emissions Development Strategy (LEDS) sets out the country’s greening and sustainability aims.⁵⁸ The LEDS provides the long-term horizon to Singapore’s enhanced Nationally Determined Contribution (NDC) pursuant to the Paris Agreement, which states Singapore’s commitment to halve its emissions from its peak to 33MtCO₂e by 2050, with a view to achieving net zero emissions as soon as viable in the second half of the century.⁵⁹ The LEDS sets out goals including quadrupling solar power generation by 2025, phasing out internal combustion engine vehicles by 2040, and setting up a US\$2 billion green investments scheme. These have been given renewed importance during the pandemic.

For instance, solar power is being touted as Singapore’s most viable form of renewable energy production. Local firms like Sunseap, and some international firms are lobbying for contracts to set up solar farms and other solar power infrastructure in Singapore. A particularly high-energy facility which is essential for Singaporean businesses is data storage. Singapore hosts over 40 data centres. Due to the consistently high use of IT and online storage systems which may have seen an increase during remote working arrangements from circuit breaker to Phase 2, these data centres have been using a lot of power. Sunseap’s proposal is to build large solar farms on Singapore’s central catchment reservoirs and/or off the north coast where the waters are relatively calm and devoid of large sea traffic. It is estimated that these projects will provide enough power to support those data centres and other operations ancillary to that.⁶⁰ With a more decentralised and online working system in place during global exigencies, these data centres would need the added power supply and this system is a sustainable and low-carbon way to power them and meet the population’s needs.

⁵⁷ Anon, “Global Conservation Rollbacks Tracker” (Conservation International October 13, 2020) <<https://www.conservation.org/projects/global-conservation-rollbacks-tracker>> accessed February 10, 2021

⁵⁸ Anon (Singapore’s Long-Term Low-Emissions Development Strategy April 1, 2020) <<https://www.nccs.gov.sg/media/publications/singapores-long-term-low-emissions-development-strategy>> accessed February 10, 2021

⁵⁹ Anon, (no. 57)

⁶⁰ O’Neill M, “Solar Energy Firm Sunseap Leads Singapore Closer to Its 2040 Clean Energy Goal with a Focus on Photovoltaic Farms, Data Centers, and Creative Solutions to Geographic Challenges” (Business Insider December 8, 2020) <<https://www.businessinsider.com/sunseap-making-worlds-largest-coastal-photovoltaic-farm-in-singapore-2020-12>> accessed February 10, 2021

“Integrating Climate Change Concerns into Post-COVID Recovery Packages in the European Union, United States and Asia: Reconciliation with the Needs of Industrial Development” (editors: Chien-Te Fan, Anton Ming-Zhi Gao), Kluwer Book Series: Energy and Environmental Law (Forthcoming)

The industrial sector is by far the largest consumer of electricity in Singapore.⁶¹ The National Environment Agency (NEA) regulates energy efficiency using minimum energy efficiency standards (MEES) and mandatory energy management practices (MEPS). As Singapore seeks to achieve its decarbonization targets, it can be argued that stricter enforcement than is currently provided for under the Energy Conservation Act (ECA) is required. Currently, ss.33-35 of the ECA provide authorities the power to monitor compliance with MEES. However, not much is provided for by way of enforcing compliance. While this may be a necessary move to ensure that businesses are not adversely affected or dissuaded from operating in Singapore by what they may perceive to be unduly strict standards, it may become a necessity moving forward for these MEES to be more strictly enforced.

One way to enhance enforcement of the ECA is to tie any economic recovery stimulus package to green objectives. For instance, about 30% of the EU’s €750 billion (\$891 billion) stimulus plan and its €1.1 trillion (\$1.3 trillion) 2021-2027 budget will be dedicated to climate-friendly investments.⁶² Among individual EU countries, France and Germany have announced the most green measures.⁶³ Conversely, the Trump Administration’s US\$3 trillion recovery plan did not have any green or sustainability-focused provisions and in fact prioritised bailing out the high-polluting fossil fuel industry.⁶⁴ Singapore’s dependence on energy imports hinders its ability to attach strict greening conditions on power sources during Covid-19 recovery, but a renewed focus on specific applications of green power generation, such as solar power to supply its data centres, are an important step.

Aside from energy, Singapore has over the past two decades developed many new methods and technologies to ensure water sustainability, as the country has highly limited water resources. Water security is also a matter of national security and international politics.⁶⁵ The pandemic has shown that a reliable and clean water supply is an essential tool in fighting a pandemic and maintaining public health. Access to water is also increasingly a hot button issue as clean water sources worldwide get increasingly scarce.⁶⁶ Singapore’s newest desalination plant which opened in the midst of a public park in July 2020 is underground with a large recreational area above ground. It is Singapore's fourth desalination plant, which can produce about 30 million gallons of fresh drinking water per day. In dry weather, the plant draws water from the sea to produce desalinated water. When it rains, the plant will instead use rainwater collected in Marina Reservoir to produce potable water. This requires less

⁶¹ Anon, “Industrial Sector” (National Environment Agency December 11, 2020)

<<https://www.nea.gov.sg/our-services/climate-change-energy-efficiency/energy-efficiency/industrial-sector>> accessed February 10, 2021

⁶² Kurukowska E and Lombrana LM, “EU Approves Biggest Green Stimulus in History With \$572 Billion Plan” (Bloomberg.com July 21, 2020) <<https://www.bloomberg.com/news/articles/2020-07-21/eu-approves-biggest-green-stimulus-in-history-with-572-billion-plan>> accessed February 10, 2021

⁶³ Dagnet Y and Jaeger J, “Not Enough Climate Action in Stimulus Plans” (World Resources Institute September 15, 2020) <<https://www.wri.org/blog/2020/09/coronavirus-green-economic-recovery>> accessed February 10, 2021

⁶⁴ Reuters Staff, “Trump Threatens to Not Sign COVID-19 Bill, Wants Bigger Stimulus Checks” (Reuters December 23, 2020) <<https://www.reuters.com/article/us-health-coronavirus-usa-trump/trump-threatens-to-not-sign-covid-19-bill-want-bigger-stimulus-checks-idUSKBN28X01V>> accessed February 10, 2021

⁶⁵ Long J, “Desecuritizing the Water Issue in Singapore—Malaysia Relations” (2001) 23 Contemporary Southeast Asia 504

⁶⁶ Mekonnen MM and Hoekstra AY, “Four Billion People Facing Severe Water Scarcity” (2016) 2 Science Advances

“Integrating Climate Change Concerns into Post-COVID Recovery Packages in the European Union, United States and Asia: Reconciliation with the Needs of Industrial Development” (editors: Chien-Te Fan, Anton Ming-Zhi Gao), Kluwer Book Series: Energy and Environmental Law (Forthcoming)

energy and fewer steps to treat compared with desalination.⁶⁷ It is therefore a step in the right direction towards more sustainable and lower-emission methods of getting our essential resources.

Empty supermarket shelves early during the pandemic demonstrated the importance of food security which can be compromised during a pandemic due to global supply chain disruptions. As such, Singapore is stepping up efforts to grow more food locally, with the ongoing pandemic highlighting how diversifying food sources may not be enough to ensure a stable supply.⁶⁸ Singapore in 2019 set a goal - dubbed 30X30 - to produce 30 per cent of its own food by 2030, up from less than 10 per cent today.⁶⁹ The government is encouraging farmers to leverage technology such as vertical farming and hydroponics. Greater domestic production and an ability to utilize high-yield agricultural production, especially in times of crisis, will also reduce total and average food miles, lower GHG emissions and enhance Singapore’s food security and resilience.

III. Environmental Impacts of Business Operations

The pandemic has demonstrated that small adjustments in the way we conduct commercial activity can have a profound impact on the environment. The circuit breaker period saw wildlife returning to different parts of Singapore because of a drastic reduction in human and vehicular traffic, with an up to 60% drop according to the Land Transport Authority (from 10 million to 4 million trips per day).⁷⁰ Tangentially, there was also an increase in populations of wild pollinating insect species as various roadside grasses and shrubs could grow and flower instead of being trimmed perpetually by roadside maintenance crews. The Lesser Grass Blue butterfly and the related Pygmy Grass Blue could sometimes even be abundant, with 20 or more individuals thriving amongst small patches wildflowers at a time.⁷¹ This led to wider conversations among members of the public about the impact that commercial activity has on the natural world if even the shortest pause in them can see such a noticeable ‘return of nature’. There has been a growing realisation that what we regard as a ‘human environment’ is still a shared space with local flora and fauna.⁷²

It could be argued that this news coverage of the ‘return of nature’ and the need to remain responsive to climate change has fed a greater awareness during the pandemic and accelerated a consciousness

⁶⁷ Wong L, “Singapore's Fourth Desalination Plant in Marina East Begins Operations” (The Straits Times July 14, 2020) <<https://www.straitstimes.com/singapore/singapores-fourth-desalination-plant-in-marina-east-commences-operations>> accessed February 10, 2021

⁶⁸ Kiwatkowski A, “How Singapore Plans to Survive World’s Impending Food Crisis” (Bloomberg.com May 23, 2020) <<https://www.bloomberg.com/news/articles/2020-05-23/how-singapore-plans-to-survive-world-s-impending-food-crisis>> accessed February 10, 2021

⁶⁹ Anon, “30X30 EXPRESS: RAMPING UP LOCAL PRODUCTION TO ENHANCE SINGAPORE’S FOOD SECURITY” (Ministry of the Environment and Water Resources November 9, 2020) <https://www.sfa.gov.sg/docs/default-source/default-document-library/sfa-mewr-joint-media-release_30x30-express.pdf> accessed February 10, 2021

⁷⁰ Tan A, “Commentary: Will COVID-19 Dim Singapore's Love Affair with Cars?” (CNA September 13, 2020) <<https://www.channelnewsasia.com/news/commentary/covid-car-use-ownership-coe-erp-traffic-mrt-bus-bike-transport-13102310>> accessed February 10, 2021

⁷¹ Khew SK (The COVID-19 Effect January 1, 1970) <<https://butterflycircle.blogspot.com/2020/05/the-covid-19-effect.html>> accessed February 10, 2021

⁷² Clarke E, “Commentary: The Truth behind Returning Wildlife Is Less Feel-Good than You Think” (CNA June 6, 2020) <<https://www.channelnewsasia.com/news/commentary/wildlife-sighting-boar-otter-nature-covronavirus-origin-forest-12802398>> accessed February 10, 2021

“Integrating Climate Change Concerns into Post-COVID Recovery Packages in the European Union, United States and Asia: Reconciliation with the Needs of Industrial Development” (editors: Chien-Te Fan, Anton Ming-Zhi Gao), Kluwer Book Series: Energy and Environmental Law (Forthcoming)

about the environmental impacts of our commercial activity. This is also in line with policy developments which have been taking place over the past few years, such as the revamped Environmental Impact Assessment (EIA) framework. In November 2020, it was announced that sweeping changes to Singapore’s EIA framework are coming, and that they will ensure that Singapore’s development is more sensitive to wildlife and biodiversity. This may not be a direct result of the pandemic but does show a shift in focus to sustainability, which involves reducing GHG emissions.⁷³ However, Singapore still has a way to go, as our EIA development is still relatively new compared to other countries. This is despite the fact that these changes had been in the works for at least a couple of years beforehand.

However, they came after numerous cases involving high-profile EIAs which were almost always carried out exclusively by government authorities without the involvement of the general public or NGOs, and about which public opinion seemed to lean towards the side of conservation more than the government had anticipated.⁷⁴ Furthermore, large projects for 2021 and the immediate future are not being planned or funded with any caveats for focusing on sustainability or lower emissions methods of production. Numerous infrastructural projects like the construction of Changi Airport’s Terminal 5 and the expansion of the Integrated Resorts are slated to go ahead at an accelerated pace this year and in years to come, fuelled by state reserves, to make up for the pause experienced during last year’s circuit breaker. Expenditure on these projects for 2021 alone is predicted to be between S\$23 billion and S\$28 billion.⁷⁵ As such, while state bodies seem to be encouraging conservation on one hand, they are fuelling large high-emissions projects like this on the other. While the conversation about the importance of biodiversity and environmental impacts is very much a growing conversation within the public sphere here, direction on the issue has traditionally been quite top-down. As such, any concrete change and shift in focus towards sustainability will have to be reflected in government policy and strict enforcement of the issue in order to see lasting changes in Singapore’s large-scale and higher-polluting business operations, especially while recovering from the pandemic.

Part 4: Conclusion

Due to the economic slowdown, more than S\$50 billion had to be spent on economic recovery, with an additional S\$13 billion to be added this year to the Contingencies Fund during this year’s budget for any unforeseen urgent needs.⁷⁶ While the Paris Agreement has seen renewed global focus since the US re-joined the treaty regime on the first day of President Biden’s administration, Singapore’s efforts as currently known are slated to be insufficient to meet even the lower threshold set in Copenhagen, 2009, of 2°C, let alone the Paris target of 1.5°C.⁷⁷ This is even as optimistic reports have

⁷³ Anon, (no. 17)

⁷⁴ Hesp PA, “The Environmental Impact Assessment Process in Singapore with Particular Respect to Coastal Environments and the Role of NGOs” (1995) 1 *Journal of Coastal Conservation* 135

⁷⁵ GCR Staff, “Deep State Pockets Set to Drive Construction Recovery in Singapore” (*Global Construction Review* January 18, 2021) <<https://www.globalconstructionreview.com/markets/deep-state-pockets-set-drive-construction-recovery/>> accessed February 10, 2021

⁷⁶ Min CH, “Support Measures Set to Taper, but Budget 2021 to Remain Expansionary: Analysts” (*CNA* February 8, 2021) <<https://www.channelnewsasia.com/news/business/budget-2021-expansionary-support-measures-taper-analysts-14103200>> accessed February 10, 2021

⁷⁷ Anon, “Climate Action Tracker Singapore” (Singapore | Climate Action Tracker January 3, 2021) <<https://climateactiontracker.org/countries/singapore/>> accessed February 10, 2021

“Integrating Climate Change Concerns into Post-COVID Recovery Packages in the European Union, United States and Asia: Reconciliation with the Needs of Industrial Development” (editors: Chien-Te Fan, Anton Ming-Zhi Gao), Kluwer Book Series: Energy and Environmental Law (Forthcoming)

come in about Singapore’s progress in quadrupling solar energy production by 2025 and phasing out all internal combustion engine vehicles by 2040.⁷⁸

Sustainable and low-carbon recovery plans would set the global community on the right track after the turbulence caused by Covid-19. The hope is that Singapore would jump on the green bandwagon alongside other countries, turning the pandemic into an opportunity to embrace transformation in its economy and society towards a low-carbon future.

⁷⁸ Chia A, “PM Lee Hsien Loong at the UN Climate Ambition Summit” (Prime Minister's Office Singapore December 13, 2020) <<https://www.pmo.gov.sg/Newsroom/PM-Lee-Hsien-Loong-at-the-UN-Climate-Ambition-Summit>> accessed February 10, 2021