

Hong Kong's contribution to the Paris Agreement goals

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WELCOME TO PARIS WATCH CLIMATE ACTION REPORT 2020

This is the second report assessing Hong Kong's performance against the goals of the Paris Climate Agreement. This new report examines progress on the same five questions we asked in 2018 and continues to seek comparisons with other cities in the East Asia Region.

This section also takes stock of global trends and developments relevant to the implementation of the Paris Agreement.

Immediate actions now needed to achieve long-term decarbonisation pledges

EXECUTIVE SUMMARY

Emissions Reduction

This report is produced a few weeks after China, Japan and Korea have announced clear target dates for achieving net-zero emissions of greenhouse gases. This included a statement by the Hong Kong Chief Executive in her November 2020 policy address that the government would 'strive to achieve carbon neutrality before 2050' and that to this end, a revised plan on climate action would appear in mid-2021.¹

This statement sets a solid foundation upon which Hong Kong can plan a transition to a carbon neutral future. But it is hard to reconcile the carbon neutrality target with a range of infrastructural plans announced in the same speech, such as a third runway for Hong Kong's airport and large scale sea reclamation projects.

Hong Kong, along with mainland China, Korea and Japan must now quickly put in place comprehensive action plans involving all parts of the economy, including milestones and clear targets for the immediate years ahead.

2 Renewable Energy

No additional targets or significant plans for decarbonising Hong Kong's energy sector have been announced since the start of 2016. The introduction of the Feed-in Tariff (FiT) by small-scale producers sent a signal that action is needed, and those who promptly signed up to install solar panels and join the scheme shows that the move was welcome (see box page 34-35). But the **terms of the FiT scheme need to increase in scale and ambition if such a measure is to make a significant contribution to decarbonisation.**

The Council for Sustainable Development's (SDC) Public Engagement report has been criticised by some as an exercise seeking to build support for emissions-free energy imports from the mainland with an emphasis on nuclear power. Whether that is an accurate assessment or not, **what is now critical is the speed with which the government sets out the mix of local and imported emissions-free energy.**



B-Energy Efficiency

Buildings represent the major users of energy in Hong Kong but **Hong Kong has seen no policy improvement on building efficiency since our last report in 2018.** This comes despite criticisms of the piecemeal and ineffective approach to tackling by far Hong Kong's biggest area of energy use. The Council for Sustainable Development report poses many of the right questions about developing a city full of green buildings, but leaves it to government to provide targets and action plans for a comprehensive and effective low-carbon buildings policy.

In the area of transport, announcements on increased electric vehicle charging points, improved diesel emissions standards and small pilot schemes on electric ferries and minibuses appeared in the February 2020 budget. But these individual small steps are not a substitute for an integrated transport development plan that will play its part in the drive towards Hong Kong's carbon neutral target within the next 30 years.



4 Adaptation - Preparing the city for a Changing Climate

Despite a number of worrying reports about the climate vulnerability of Hong Kong and neighbouring areas, **there have been no new initiatives addressing climate adaptation since Hong Kong's last Climate Action Report in early 2017.**

Much official discussion about economic and infrastructural integration with the Greater Bay Area has failed to take full account of warnings that this region is one of the world's areas most vulnerable to human and economic loss from climate change-related flooding.²

The warnings are clear, not only from our meteorological scientists and medical studies, but also from the empirical evidence of hot days and hot nights reported by the Hong Kong Observatory and record-breaking typhoon Mangkhut in 2018.



5. Governance and Finance

The Council for Sustainable Development's public engagement on longterm decarbonisation took 18 months to come up with its findings.

This protracted and devolved process highlighted **the need for a properly empowered climate action body to established at the highest level of government** charged with taking decisive action on climate change.

Green finance initiatives continued through 2019 and 2020 despite the pandemic. The formation of Cross Agency Steering Group on Green and Sustainable Finance by key financial regulation agencies was followed by consultations from the Hong Kong Monetary Authority and the Securities and Futures Commission on climate risk reporting.³



THE PARIS AGREEMENT IN FIVE QUESTIONS

Q1

Is Hong Kong on track towards achieving the Paris Climate Agreement?

Q4

Q2 Are we transitioning to a low carbon economy by developing renewable energy?



3 Are we using energy more efficiently in Hong Kong?

Are we adapting to make Hong Kong a safe and healthy city in the face of global heating?

PARIS2015

COP21-CMP11

5 Are we developing the right governance and financial systems to tackle climate change?

INTRODUCTION

Since the Intergovernmental Panel on Climate Change produced its report Global Warming of 1.5°C in 2018, the scientific consensus has coalesced around the goal of keeping temperature rises below the 1.5°C level. There is also a broad agreement that reducing greenhouse gas emissions to zero by the year 2050 gives us reasonable probability of achieving that 1.5°C target. This report now assesses Hong Kong with reference to compliance with the target of 1.5°C as the target of the Paris Climate Agreement.

Since the first Paris Watch report, a Science-based Target methodology for cities has been developed. Paris Watch researchers have applied these calculations to Hong Kong. On this basis, Hong Kong should be aiming for a target of 2.15 tCO₂e per capita by 2030. Current official targets stand between 3.5 and 3.8 tCO_2e per capita by 2030.



Hong Kong moves towards alignment with Paris Agreement targets

On Friday, 13 November 2020, Hong Kong's Council for Sustainable Development (SDC) issued the "Report on Public Engagement on Long-term Decarbonisation Strategy." ⁴

The headline is the recommendation that Hong Kong needs to set a net-zero emissions target for 2050. The SDC is a government-appointed body whose recommendations are normally agreed as suitable policy before release, so this is likely to become official policy.

This was followed up in the Chief Executive's Policy Address on 25 November, in which Carrie Lam announced that Hong Kong 'will strive to achieve carbon neutrality before 2050.' This will involve updating Hong Kong's Climate Action Plan in the middle of this year "to set out more proactive strategies and measures to reduce carbon emissions." ⁵

Encourag countries

The 2020 announcements from three major East Asian economies of dates by which they aim to reach net-zero greenhouse gas emissions is encouraging news. This helps mitigate the impact of the delay of the COP26 due to COVID-19.

Combining the net-zero announcements from China, Japan and South Korea and those of the EU and the UK means that nations responsible for over 40% of global emissions have now announced clear decarbonisation plans. Once the US President Joe Biden honours his election promise to set a net-zero target for the USA, countries with over 56% of global emissions will have committed to firm dates for net-zero emissions.

It is hoped that China, Japan and South Korea turn their netzero target announcements into formal NDCs and submit these to the UNFCCC well before the November 2021 COP26, in order to encourage other countries to follow suit. It will be important for other big emitters like India, Brazil, Indonesia to join East Asian countries in setting solid, ambitious climate targets.

More importantly, all countries with long-term targets need to set out convincing action plans, financing plans and milestones for achievement of these goals, ensuring steep downward emissions curves between now and 2050.

Encouraging moves from East Asian

A Setback for the Paris Climate Agreement Process

2020 was intended to be the year that nations increased their goals and targets for reducing greenhouse gas emissions. December 2020 is also the fifth anniversary of the Paris Climate Agreement and the point at which the agreement formally comes into force. The COVID-19 pandemic has caused the postponement of the most significant session of the COP climate talks since Paris 2015, and has also given governments a reason for postponing any increase in ambition.

In 2016, C40 Cities said:

"the next 4 years will determine whether or not the world's megacities can deliver their part of the ambition of the Paris Agreement."⁶



Where we should have been in 2020?

Until the recommendations of the Council for Sustainable Development are made real by the government, it is fair to say that Hong Kong has not taken any substantive actions to combat climate change since it set targets to reduce coal-fired electricity generation in January 2016. In the context of this Report, not much has been happening in the policy front in Hong Kong save for the recent announcement of the 2050 carbon net-zero target. Some encouraging policy measures such as the Feed-in Tariff will be analysed in subsequent sections.

Hong Kong Signs up to a Green Recovery

Hong Kong is not only a Steering Committee member of C40 Cities, it is a task force member of the C40 Cities Mayors Agenda for a Green and Just **Recovery** announced in July 2020.⁷

The leaders of some 43 megacities have signed up to this initiative to ensure sustainability lies at the heart of recovery plans. The agenda calls on national and regional governments, banks and financial institutions to join the effort by:

- Agreeing that the only stimulus should be a green stimulus;
- Committing to an equitable and inclusive recovery;
- Protecting and championing mass transit;
- Prioritising and investing in clean energy;
- Investing in resilient cities as the engines of the recovery; and
- Ending all public fossil fuel investments and subsidies.

Like all statements of this kind, the proof of fine sounding intentions will be in concrete actions. A fine intention delayed is a fine intention betrayed.

"Time is running out for combating climate change... Costs of inaction are terrifying[®]?"

A warning contained in the Hong Kong government's 2019 Public Engagement Document on long-term decarbonisation.



Report on Public Engagement on Long-term Decarbonisation Strategy. Hong Kong Council for Sustainable Development. November 2020

"Climate scientists have warned that we have some **10 years left** to thwart climate change before the damages become irreversible."

2020 Environmental Scan

Since the last Climate Action report in 2018, significant environmental and social events have occurred which affect Hong Kong, China and the world's action on climate.

Global events with impact on climate action

Raising the heat

1.

COP26 marking the formal start date of the Paris Climate Agreement was postponed for one year from 2020 to November 2021.

2.

Several countries have delayed formulation of higher ambition emissions reductions which were due for delivery by November 2020.

3.

The COVID-19 pandemic has disrupted progress on policy and investment in renewables.

4.

China reports that it faces higher-thanglobal-average climate impact in terms of sea level rise, temperature rises, droughts and floods.⁹

5.

A number of international leaders are ignoring or questioning climate science in pursuit of populist political agendas.

6.

Impacts of global heating are tangibly disrupting lives, including record heat, ice melt and fires in Russia, California and Australia.





Enriching our green future

1.

Target dates for carbon neutrality were announced by China (2060), Japan (2050) and South Korea (2050). Adding to EU, the UK and Canada, countries over 40% of global emitters now have targets. If the US sets the same target, over 56% of world emissions will be covered.

2.

Achieving zero emissions by 2050 and holding temperatures below 1.5°C are now the widely-accepted climate targets.

3.

33 countries have stated their intention to update their NDC during 2020 (including the European Union), representing 8.3% of global emissions.

4.

103 countries have stated their intention to enhance ambition or action in an NDC by 2020, representing 15.1% of global emissions.

5.

14 countries have submitted a 2020 NDC, representing 3.8% of global emissions.¹⁰

6.

US President Joe Biden has re-entred the USA into the Paris Climate Agreement and has said that setting a carbon neutrality goal is a policy priority.

7.

COVID-19 pandemic has disrupted the fossil fuel industry, raised appreciation of healthier air quality and increased respect for science.

Paris Watch Key Facts: Reducing Emissions

"Is Hong Kong on track towards achieving the Paris Climate Agreement?"

The issue in brief

To assess Hong Kong's contribution to the global target set by Paris Agreement we must determine appropriate targets for emissions reduction for economies with Hong Kong's level of economic and social development. The Paris Agreement principle of "common but differentiated responsibility" acknowledges that countries or regions with high levels of development, which may well have been emitting greenhouse gases for many more years, should make a greater effort than those territories which are still meeting the basic needs of their citizens and still have lower per-capita emissions. The wealthier nations must peak emissions sooner, reduce emissions more sharply, and help the less-developed nations with climate finance, technology and training.

Hong Kong as a city with a GDP per capita of US\$48,714 in 2019¹ certainly belongs to the category of economies bearing a higher responsibility for immediate and far reaching climate action. C40 Cities advocates that a fair share of climate action for cities with a GDP per capita of over US\$15,000 should involve 'steep decline', in which emissions need to be immediately and rapidly reduced.²

This approach matches the Science-based Targets for cities that uses Human Development Index indicators to differentiate responsibility for emissions reduction. The figures for Hong Kong are shown below.

Hong Kong Signals a Target for **Carbon Neutrality**

The Chief Executive's announcement that the city will strive for carbon neutrality before 2050 is a vital marker for Hong Kong. Many would see this as the most profound and challenging commitment in the policy speech.

But there are worrying signs that climate change action fails to assume the necessary policy priority for the target to be achieved. The Government has pledged to develop the action plan by the middle of 2021. The concern comes from the fact that the carbon neutral announcement appeared late in the Policy Address and seemed divorced from a long list of earlier development and infrastructure initiatives which did not include mention of a low carbon approach.

The concerns for the achievement of the long term climate goal of carbon neutrality are presented below:

neutral target

The statement on carbon neutrality appears towards the end of paragraph 126 of the Chief Executive's November 2020 speech, preceded by statements on developing a new runway to build Hong Kong as an aviation hub and a section heading called 'Airport City', expanding automated parking for private vehicles heading for the airport, assisted by new road bridges. Using smart technology to improve private car parking in central areas of the city appears in a section headed 'smart mobility.' Much of the Policy Address is devoted to the issue of housing and construction but the imperative of lowering energy use in building materials, construction techniques, and operational efficiency of buildings is not mentioned in these plans.

This ordering of the report and the lack of linkage between all other development plans and the low carbon target causes concern that climate action still remains a low priority in terms of Hong Kong government policy.

2. We need to commit, not strive

It will be important to pin down the 2050 target. To 'strive' for a target is somewhat different from a firm pledge. Ideally, the target can be written into law, as it is in some countries.

1. All development policies need to line up behind the carbon

3. Zero emissions are not the same as net-zero emissions

Most targets set by nations, regions and companies talk of 'net-zero emissions'. This generally means a combination of absolute emissions reduction combined with carbon removal activities as well as investment in carbon offsets. An important element of any net-zero goal will be clarifying how close to zero emissions we get by ending greenhouse gas emissions, and how much of a gap is then to be filled with carbon removal technologies and carbon offsets. It will be important to examine closely the detail of net-zero targets once these are elaborated. Absolute reductions in GHG emissions, carbon removals and carbon offsets should not be considered of equal value.

Removals and offsets should only account for a small part of the total carbon reduction plan. Unproven carbon removal should not be used to compensate for low ambition on the transition to clean energy combined and sweeping gains in how efficiently we use that energy.³

As the New Climate Institute's report "Navigating the Nuances of Net-Zero Targets" notes:

Claiming net-zero emissions through **offsetting** has a number of limitations and risks under the post-2020 Paris Agreement's global governance framework.

Without a radical transformation of the offsetting market and the types of activities it supports, offsetting cannot be considered an equivalent alternative to an actor's own emission reductions in 2020.

Offsetting may divert attention from the need for deep decarbonisation and the Paris Agreement's ambition ratcheting mechanism. Without stringent safeguards, offsetting projects can set perverse incentives for both developed and developing countries in their efforts to increase domestic ambition.⁴



4. The pathway is as important as the destination

While an overall 2050 target of net-zero emissions is important, a responsible downward trajectory is also vital. The SDC recommendations call for a 'roadmap with critical milestones supported by action plans' to be created in the next one to five years. The pathway between 2020 and net-zero in 2050 is therefore vital along with the 30-year goal. We need steep cuts almost immediately enabling responsible 2025, 2030 and 2040 emissions targets in order not to eat up an unfair share of the global carbon budget on the way to net-zero emissions in 2050.

These intermediate targets will be a very important part of the 'critical milestones' and 'action plans' that the SDC recommends and we hope that a science-based approach is used.



Carbon dioxide removal (CDR) technologies and practices need more support to reach their potential, but uncertainties related to methodologies for calculating their climate impact, as well as the permanence of carbon dioxide storage mean that they should not be considered equivalent to direct greenhouse gas emission reductions and are not suitable for claiming direct neutralization.

Recognising that the outcomes of CDR activities are generally not directly comparable to the real reduction of one's own emissions, actors could set and pursue separate individual targets for each strategy: one target for emission reductions, and another separate target for carbon dioxide removals.⁴

Hong Kong: Targets for a High Emitter with High Level of Wealth

Is Hong Kong on the right track for a fair share on climate action?



The Science-based target for a city like Hong Kong, with a high score on the Human Development Index (HK comes 7th in the world for HDI out of 189 countries and territories.⁵), emissions stands at 2.03 tonnes per capita by 2030, on the path to net-zero emissions by 2050.⁶

• 2.03 tCO₂ equivalent per capita by 2030 Zero tCO₂ equivalent per capita by 2050

Source: Projections from C40 Cities/ARUP in "Deadline 2020"

• 3.5-3.8 tCO₂ equivalent per capita by 2030 Net zero tCO₂ equivalent per capita 'before 2050' announced by Hong Kong's Chief Executive Carrie Lam in November 2020 as a goal the city will 'strive for' Source: Environment Bureau. 2017. "Hong Kong's Climate Action Plan 2030+"





Asian cities GHG emissions targets 2015-2050

This is an important statement, because it abandons the suggestion that climate action in Hong Kong should be limited due to the size and geography of the territory and therefore the city should be an exception. Instead, the statement acknowledges that more-developed places have extra responsibility to take climate action, which is in line with the UN principle of 'common but differentiated responsibilities.'

"As an advanced economy with well-developed infrastructure, talents and financial resources, Hong Kong should set out a progressive long-term vision for advancing to net-zero carbon emissions by 2050." ⁹

Sources:

- For Tokyo, 2030 targets are under review following recent national announcements on 2050 net-zero targets
- For Hong Kong, the 2050 net-zero target assumes government accepts recommendations of its Council for Sustainable Development issued in November 2020
- Note that Singapore is a major refiner of fuels and petrochemicals, and the emissions used in that process will be accounted for in Singapore whether or not the resulting fuels are used in Singapore or exported.

Hong Kong's Council for Sustainable Development report states:

Engaging the Market for Carbon Reduction

Seoul 🖬

National emissions trading scheme from 2015. Plans announed for a carbon tax

Market-based carbon reduction plans in East Asian cities:10

Guangzhou 📫

Pilot emissions trading scheme (Guangdong Province) from 2013

Singapore 📫

Carbon tax on high emitters introduced in 2019

Toyko

Emissions trading system in Tokyo from 2010

Shenzhen 🖬

Pilot emissions trading scheme from 2013

Hong Kong **P** No current schemes or plans

'**e**

Science-based Targets: Paris-bound or Not?

Companies, governments and cities are increasingly linking their GHG emissions reduction targets to the worldwide effort to address global heating. Science-based targets share out responsibility for cutting carbon on the pathway to achieving the Paris Climate Agreement goals. The target for cities takes some account of fair shares related to the different levels of development in different countries.

The SDC Report on Public Consultation recommends a short term (1-5 year) goal of setting specific science-based targets for energy, buildings, transport and waste as key sectors.¹¹



Sources used in Science-based target calculations for Hong Kong and Singapore:

- Engeco. 2020. Singapore's National Climate Change Strategy: Understanding the Impact on your Business
- Environment Bureau. 2019. Greenhouse Gas Emissions in Hong Kong by Sector. https://www.climateready.gov.hk/files/pdf/2017_GHG_by_sector.pdf
- Pountney C. 2019. Science-based Target Example. (PowerPoint presentation). One Planet City Challenge.
- Prime Minister's Office Singapore. 2020. Speech by SM Teo Chee Hean at the PMO Committee of Supply 2020
- Worldwide fund for Nature (WWF). One Planet City Challenge. Updated Assessment Framework
- United Nations Development Programme. 2018. Human Development Indices and Indicators 2018 Statistical Update. http://hdr.undp.org/sites/default/files/2018 human development statistical update.pdf
- United Nations Development Programme. 2019. Human Development Report 2019 Inequalities in Human Development in the 21st Century. Briefing note for countries on the 2019 Human Development Report. Singapore

Emissions Reduction in East Asia Headlines and Deadlines



Singapore

Singapore submitted a new NDC to the UNFCCC in February 2020. This target peaks greenhouse gas emissions at 65 million tonnes of CO₂e around 2030 working towards halving its emissions to 33 million tonnes by 2050.

In the second half of the century, after 2050, the citystate will work towards achieving net-zero emissions 'as soon as is viable'. As Singapore's population projection is 6.58 million by 2050. This suggests that Singapore would still be emitting $5tCO_2e$ per capita in 2050, a time when several East Asian countries and other major economies aim for net-zero emissions.

Tokyo

Net-zero emissions target by 2050 was announced in December 2019 including 100% decarbonised energy.¹²

Japan submitted a new NDC in 2019 which stated it would continue to aim for its goal set in 2015 of reducing its greenhouse gas emissions by 26% by 2030 from 2013 levels.¹³

However in October Japan's new Prime Minister, Yosihide Suga, pledged to "reduce greenhouse gas emissions in Japan to net-zero by 2050, that is, carbon neutral by 2050."¹⁴

Japan's Renewable Energy Institute has commented that in order to achieve the Prime Minister's new target, the country must strengthen its 2030 GHG emissions reduction goal as well as its target for renewable energy. The organization calculates that the current low 2030 target of a 26% emissions reduction compared to 2013 levels needs to be raised to a 45% emissions reduction from 2010 levels. as called for in the IPCC 1.5°C Special Report. To accomplish this, the target for electricity from renewable energy needs to be raised to around 45%, and all coal-fired power plants need to be phased out by 2030.15



Seoul

The South Korean President declared to the national Assembly on 28 October that the country will go carbon neutral by 2050.¹⁶

The governing Democratic Party of Korea had made a campaign proposal in March 2020 to reduce Korea's emissions to net-zero by 2050.

Stated plans include introduction of a carbon tax, a phase-out of domestic and overseas coal project financing and large-scale investment in renewable energy.

In June 2020, more than 200 South Korean local governments, including Seoul, declared a 'climate emergency' setting the goal of maintaining temperature increase below 1.5°C and calling on the national government to commit to carbon neutrality by 2050 (which it later did).¹⁷

Guangzhou & Shenzhen

China's President Xi Jinping announced to the UN in September that China will target carbon neutrality by 2060 and peak emissions before 2030.18

Both Guangzhou¹⁹ and Shenzhen²⁰ are formulating new five-year strategies for energy development, which will have to accord with the Chinese President's September 2020 announcement that national emissions will peak on or before 2030 and the nation will move to carbon neutrality on or before 2060.

Shanghai

In January 2021, the Municipal Government of China's biggest city announced a target to peak carbon emissions in 2025, five years earlier than the national goal. This is part of Shanghai's response to China's national plan to reach carbon neutrality by 2060.²¹

Paris Watch Key Facts: Renewable Energy

"Are we transitioning to a low carbon economy by developing renewable energy?"



The issue in brief

The transition away from fuels which emit greenhouse gases to emission-free renewable energy lies at the heart of all climate mitigation action. The switch to renewables at an ambitious rate between now and 2050 is the most important step towards stopping global warming and the clearest single indicator as to whether we are on course to net-zero or not. Clean energy is most important for use in power stations. As we generate more electricity from renewable sources, we must convert more of our transport and manufacturing processes to run on that electricity rather than on fossil fuels – coal, oil and gas.

For those activities that do not easily lend themselves to electrification, such as shipping and aviation, the challenge is to develop zero-emission fuels, such as green hydrogen.

Steps One, Two and Three of Hong Kong's Climate Strategy

Hong Kong's climate change strategy hinges on the question of how to generate clean electricity for use in the city. Once we can answer the following questions, all other issues related to climate change strategy will follow.

- a) How much renewable electricity can Hong Kong generate itself?
- b) How much renewable electricity is Hong Kong willing to import, under what arrangement, from where?
- c) Should imported nuclear energy be included as part of the electricity mix?

The Hong Kong Council for Sustainable Development report remains sceptical about local renewable generating capacity, and points towards two solutions. The first involves 'sourcing various types of zero-carbon globally' including green hydrogen. The second suggests that blend of renewable energy and nuclear energy is a viable option.¹

That said, the Council does recommend that the government "review the local RE target based on the progress of Feed-in Tariff Scheme and availability of new technologies." There has to date been no discernible effort by Hong Kong's government to scale up solar farms or to harness onshore or offshore windfarms despite the significant technological advances and cost reductions in recent years. With regard to nuclear energy, opposition has been expressed in Hong Kong against increased import from China Mainland. The lack of a clear direction is delaying the setting of a meaningful target for renewables for 2030 and beyond which it is hoped will end when a concrete plan charting the pathway towards net-zero emissions before 2050 is announced in mid-2021.

Hong Kong's current energy portfolio





於1%

Hong Kong's current proportion of renewable energy



Unclear power used in Hong Kong, generated in the mainland

How dirty is our electricity?

For this year's report we will not include renewables targets for 2030 because these are soon to change. China, Korea, Japan and Hong Kong SAR will be re-setting targets and plans during the next few months to bring them into line with their recently-announced long-term net-zero emissions targets.

Tokyo and Singapore.

Hong Kong's renewable energy growth compared to neighbouring cities



Sources refer to footnotes page 74

* We did not include Shenzhen and Guangzhou in this table as we are unable to disaggregate nuclear and hydroelectric power which are included in renewable energy figures. Using these definitions, Shenzhen's installed energy capacity comprises of coal: 43.76%, gas: 23.39% and 'clean energy': 32.85%.⁶

At national level, China reported that 15.3% of its energy was from renewable or 'non-fossil fuel' sources by the end of 2019, including nuclear power and hydro-electric power.⁷

Sources refer to footnotes page 75

For every kilowatt hour of electricity generated, Hong Kong produces more carbon emissions than China nationally on average, followed by

Carbon Intensity of Electricity Generation

Renewables in East Asia: Headlines & Deadlines



Singapore

Singapore's carbon tax expects to raise 1 billion SGD over five years, which will be used to fund the Productivity Grant (Energy Efficiency) and the Energy Efficiency Fund.²

China

Employment in the renewable energy sector in 2018 provided 4.1 million jobs, more than the fossil fuel extraction industry. China provides 37% of the world's renewable energy jobs.⁷

China's fossil fuel subsidies declined between 2011 and 2015. but showed a 10% annual rise to \$41.9 billion between 2017 and 2018. China ranks third behind only Iran and Saudi Arabia for fossil fuel subsidies.⁸



Seoul and Korea

Seoul has made it obligatory for public institutions to install solar PV systems in cases of renovation or modification of public buildings.³

Korea's Renewable Portfolio Standard requires major electric utilities to increase their renewable and 'new energy' share in the electricity mix to 10% by 2023.⁴

South Korea aims to increase the share of renewables in the electricity mix to 20% by 2030. According to its 2017 Electricity Plan this would require an increase of installed capacity from 11.3 GW in 2017 to 58.5 GW in 2030.

The government revised the Renewable Portfolio Standard by prioritising wind power and incentivising renewable power plants to have a shared profit model with communities.⁵

The draft plan for South Korea's ninth basic energy policy for the years 2020-2034 calls for raising the share of renewable energy out of its electricity generation to 40% by 2034 from the current 15.1%. Drawn up by a working group under the Energy Ministry, the plan also stipulates the closing of all coal-fired power plants whose 30-year operational life cycles expire by 2034.⁶

Hong Kong's Feed-in Tariff (FiT) scheme

The Hong Kong Government launched the Feed-in Tariff (FiT) scheme in 2018 after many years of lobbying by civil society organisations. The initiative aims to encourage private households and businesses in Hong Kong to develop renewable energy.

Under the scheme, the electricity generated by renewable energy systems (currently solar and wind) can be sold to the two power companies (CLP Power Hong Kong and The Hongkong Electric Co.) at a rate higher than the normal electricity tariff rate. A premium of HK\$3 to HK\$5 per unit (kW hour) supplied is paid, depending on total scale. This provides incentives for the private sector and households to install renewable energy (RE) systems. The payback period can be as short as 10 years.

The scheme has been well-received by the Hong Kong community. According to the Environmental Protection Department (EPD), by June 2020, the two power companies have received over 10,000 applications and have approved over 8,600 of these.



EPD figures show that up to the end of February 2020, about 70 renewable energy power systems with a total capacity over **1,100 kW** had been connected to the grid. In the second quarter of 2020, 3,700 solar systems were successfully commissioned and operating.


In September 2020, The Hong Kong University of Science and Technology (HKUST) committed to build the largest solar energy generation project in Hong Kong: an installation of up to 8,000 solar panels, with an estimated generation capacity of 3 million kWh of electricity per year. This is equal to an annual electricity consumption of more than 900 households of 3 persons in Hong Kong.

Yet the scheme has suffered from one major drawback – it does not apply to any renewable installation over 1MW capacity. There have been estimates that if solar farms can be scaled up in public open spaces, disused farmlands, brownfield sites and reservoirs, Hong Kong could meet 20% of its electricity demand. The current government policy has stifled any possibility of scaled-up renewable installations despite criticism from green groups and businesses.



Reference refer to Footnote page 75

Paris Watch Key Facts: Energy Efficiency

"Are we using energy more efficiently in Hong Kong?"

The issue in brief

The challenge of generating sufficient clean energy is made easier if we also use energy more smartly, reducing the energy required to lead our lives.

Efficiency in the way we use energy to manufacture and transport goods, to grow our food, to make our buildings liveable, and operate a comfortable and convenient transport systems is an important part of our journey towards a sustainable future free of climate change. Efficiencies result from improved low-energy technologies and equipment, smart systems and more mindful behaviour on our part as energy users.

The more effectively we use energy, the easier it will become to transition to a world powered entirely by green energy.

86% of HK's emissions come from buildings and transport

Greenhouse Gas Emissions in Hong Kong



- Buildings & transport
- Waste, manufacturing, land use & everything else



Hong Kong Buildings Await a Policy

Hong Kong awaits a coherent buildings efficiency policy. Pledges that the city will strive for carbon neutrality by 2050 will hinge on the creation of an ambitious and all-inclusive building efficiency strategy.

The report from Hong Kong's Council for Sustainable Development¹ raises all the right policy questions surrounding the built environment without, unfortunately, offering clear plans or targets. Subsidies, technical support, along with requirements and regulations are all listed as necessary parts of a policy mix. The need for retrofitting old buildings and raising standards in new buildings are also noted. These issues have all been known for many years, and identified in earlier of government reports on climate change.²

The SDC report notes that low carbon measures include the choice of building materials and construction techniques, the energy efficiency designed into the finished building as well as the day-to-day operation of systems and equipment al bu ul Ci Di th of th of th sy ho Ar or in hip of

within the building once it is occupied. This all adds up to a tacit admission that existing buildings policies have been poor, fragmented and ultimately, ineffective.

Civic Exchange's November 2020 report Decarbonising Hong Kong Buildings recommends that building regulations be tightened and codes improved. It also finds room for improvement of the implementation of regulations such as the frequency of building efficiency audits and systems for ensuring results for buildings that have received incentives for efficiency pledges.³

An effective policy on building efficiency will not only establish comprehensive regulations, but also include ways to steadily escalate standards with higher levels of labelling, exclusive government patronage of top-grade buildings for its activities, incentives for users and occupiers of the most efficient buildings and a drive towards net-zero buildings.

Different needs for different city environments

Singapore: cooling needed all year Tokyo: heating needed in winter; cooling in summer Seoul: heating needed in winter; cooling in summer **Guangzhou:** cooling in summer, neither in winter Shenzhen: cooling in summer, neither in winter Hong Kong: cooling in summer, neither in winter

Commercial building energy efficiency

(energy use of commercial buildings per unit of internal floor areas, TJ/10,000 m²)



(energy use of residential building per living areas of residents, TJ/10,000m²)



10

Sources refer to Footnotes page 75.





Residential building energy efficiency





Transport needs an Integrated Plan

The second most important area for reducing Hong Kong's energy use lies with local transport. To use less energy in transport we can:

- Reduce the number of individual vehicles on the road with the introduction of more convenient and comfortable public transport along with more safe and healthy facilities for cycling and walking
- Make sure that we transition as soon as possible to vehicles that don't emit greenhouse gases. This means electric vehicles and vehicles that use zero-emissions fuels like green hydrogen.

Around the world we are seeing cities setting dates to end the sale, and later the use, of vehicles powered with petrol and diesel. For all cities in countries with net-zero emissions targets, such as Japan, South Korea and China the question is not if, but when.

Hong Kong announced increased electric vehicle charging points, improved diesel emissions standards and small pilot schemes on electric ferries and minibuses in the February 2020 budget. Unfortunately, these individual measures do not amount to a comprehensive plan for decarbonising Hong Kong's transport. What is needed is an integrated transport development plan pointing the way to carbon neutrality well before 2050. Such a plan has to include a timetable to phase out internal combustion engines, limit the use of private vehicles in the city and ensure public transport, ferries and goods delivery can transition to zero carbon.

In a similar manner to its recommendations on buildings, the report from Hong Kong's Council for Sustainable Development lists out a range of policy decisions that are necessary to decarbonise transport, and passes the buck to the government set out actual plans and targets for each of these.

The SDC report is timid on recommending measures to actively discourage private vehicle ownership, perhaps because of the past record of the powerful car-owner's lobby. It suggests the government consider 'restraining automobile ownership' and mentions electronic road pricing only as a pilot, long-term, possible approach in ten years' time. Creating or extending fully traffic-free zones is not discussed.

Acceleration of 'new energy vehicles'

(per 1,000 registered passenger cars)





Charging infrastructure

(number of public chargers per kilometre length of roads managed by the city by the end of year 2019)



Zero-emission vehicles (ZEVs) refer to battery electric vehicles (BEVs) or hydrogen-powered cars, excluding any hybrid power type.

New energy vehicles is a term coined by Ministry of Industry and Information Technology in China, highlighting the new non-conventional technologies in the design of vehicles, which cover also compressed natural gas (CNG) vehicles, and plug-in hybrid vehicles between electric and conventional fuel types (gasoline, diesel, LPG), in addition to the ZEVs.

Sources on transport refer to Footnotes page 75

Energy Efficiency in East Asia: Headlines & Deadlines

Seoul

50% of the city's bus fleet is planned to be electric by 2020. The city will procure only zero emissions buses by 2025, and will run all buses on clean natural gas, electricity or hydrogen by 2027.⁴

South Korea as a whole has a target of 430,000 electric vehicles on the road by 2022.⁵

As part of its Green New Deal, South Korea aims to have 1.13 million electric and 200,000 hydrogen vehicles on the roads by 2025.⁶

Guangzhou

As a production base of car manufacturers, Guangzhou provides policy incentives in purchasing and licensing cars and setting up user charging points, which benefit both the demand and supply sides of new energy vehicles.

Across China, emissions intensity of road transport, represented by average emissions per vehicle, has dropped over 90% from 2000 to 2018 for four major air pollutants: carbon monoxide, hydrocarbon, PM_{10} and nitrogen oxide. The emissions intensity decreased by 71% in Guangdong.⁷





Shenzhen

The city has an all-electric bus fleet with over 16,000 electric buses in operation.⁸

Singapore

Singapore Ministry of Transport announced that all future public bus purchases will be either electric or diesel-hybrid resulting in all public buses running on cleaner energy by 2040.⁹

Tokyo

All buildings are planned to be zero carbon by 2050.¹⁰

Tokyo plans to procure only zero emissions buses by 2025. 50% of cars sold to be zero emission by 2030.¹¹

Paris Watch Key Facts: Adapting to a Changing Climate

"Are we adapting to make Hong Kong a safe and healthy city in the face of global heating?"

The issue in brief

The contribution each separate city makes to reducing greenhouse gases in the atmosphere is of course a small part of the total. But each location that fails to reduce emissions will combine with other laggards to affect the entire planet's attempt to stem climate change. Waiting for others to act first will hurt those who hesitate. Climate mitigation needs international agreement in order to ensure each place plays its part.

When it comes to adaptation – coping with the existing and impending effects of climate change – the picture is different. Each territory can justifiably focus on its own needs, taking measures to protect and prepare communities for the particular impacts of climate change. Each city or region must do what it can to reduce risk and protect people's physical and economic wellbeing.

The Paris Agreement is clear that adaptation should be a big part of climate action. It also makes plain that mutual support between nations and regions is an important part of helping those with greater or lesser challenges and greater or lesser needs.

Climate mitigation and adaptation are of course linked. Carried out in the right way these actions can complement each other. While we create an energyefficient infrastructure, we can also incorporate features that reduce the risk of flooding, heatwaves and other weather extremes. To promote resilience, we can also design safety, shelter and rescue plans into the infrastructure – cooling points, shelters, water supplies.

Some mitigation strategies, such as walkways and cycle lanes roofed over with solar panels, simultaneously contribute to mitigation and adaptation. Many aspects of building design combine more efficient and reliable temperature control with health, safety and emergency preparation provisions. Mitigation and adaptation fit well together in terms of sustainable infrastructure and smart city design.

Preparation for the medical impacts of climate change on the part of health services, administrators and professionals are an important part of the adaptation process.¹ Along with climate readiness, the healthcare sector needs to address its own energy use. In 2017, for example, it was responsible for 4.6% of global greenhouse gas emissions.²

Vulnerable Hong Kong needs a Plan

Despite a number of worrying reports about the vulnerability of Hong Kong as well as a typhoon in 2018 that brought record-breaking high winds to the city, there have been no new announcements regarding climate adaptation since Hong Kong's 2017 Climate Action Plan.

Much official discussion about economic and infrastructural integration with the Greater Bay Area has failed to take much account of warnings in several international studies that the Pearl River Delta region is one of the world's areas most vulnerable to human and economic loss from climate changerelated flooding.³

Measures are overdue for preparation, response and recovery related to periods of heat stress for the groups most vulnerable to heatwaves: the young, the old and outdoor workers. The warnings are clear, not only from our meteorological scientists and medical studies, but also from the empirical evidence of hot days and hot nights reported by the Hong Kong Observatory.

This year's response to COVID-19 only adds to questions about whether the government has put in place leadership, and aligned sufficient resources and planning capacity to prepare a large-scale response to heatwaves and heatrelated diseases.

The Hong Kong government accepts the risk from global heating is known, material, and actionable, as this page from the Public Engagement Document from the Hong Kong Council for Sustainable Development makes clear.⁴







Source:

Negative Impacts. Digital photograph. Environment Bureau. Hong Kong Climate Change Report 2015. Accessed 27 January 2021. https://www.enb.gov.hk/sites/default/files/pdf/ClimateChangeEng.pdf The Hong Kong Environmental Department's Climate Change Report back in 2015 included illustrations of injury and illness resulting from failure to act and adapt to global heating.

The Hong Kong Council for Sustainable Development Report notes starkly: "There was only one day in 2019 with a temperature below 12°C recorded by the Hong Kong Observatory."

In the 1880s, when records began, there were an average of 32 days a year with temperatures below 12°C. Even in the 1960s, the average number of cold days averaged 28 days. In the past decade this has fallen to an average of 16 cold days each year.

At the same time, the number of hot days and hot nights has of course risen. In the 1890s, the number of hot days with temperatures over 33°C averaged under 3. In the past decade hot days have averaged 27 a year. Hot nights (over 28°C) have jumped from an average of less than one per year in the 1890s to 30 a year in the past decade.⁵

Hong Kong: "Hygiene and Health Vector-borne diseases and heat-related diseases caused by climate change have become serious health problems."

The People's Republic of China. Third National Communication on Climate Change. December 2018. (Hong Kong section).¹⁹

Assessing the many interrelated components of disaster reduction and emergency preparedness, some essential components of climate adaptation seem to be weak. This would include:

- **Risk analysis**: information gathering on the correlation of climate events and incidence of diseases and physical disasters
- **Risk reduction**: measures to pre-empt and reduce climate risks. This includes infrastructure design and urban planning
- **Coordination of response**: strong measures, with public support and participation, for concerted government action in times of emergency
- **Recovery**: plans in place for ensuring structural and administrative resilience and swift recovery from climate disasters

Increased heat needs to be addressed in the context of housing conditions, building regulations, transport planning, recreational facilities as well as preventive and responsive health systems in Hong Kong.

Similar questions must be asked about readiness for rising sea levels, particularly the combined impact of rising seas, more severe typhoons, tidal surges and extreme rainfall.

Weather scientists are telling us that weather events which used to be likely once in 100 years are now increasing in probability to a matter of every few years. The Pearl River Delta, on which Hong Kong sits, has been highlighted in a number of recent studies as one of the world's major flood risk zones with massive human and economic consequences.⁶ A study by Chinese University of Hong Kong's Institute of Future Studies has found that consecutive hot nights pose a higher risk to public health than hot days, and bring a 6% higher risk of death for women and 5% more risk of death for the elderly.

A continuous period of five or more very hot days raised the risk of death to about 4%, the study found.⁷

Adaptation and health risk in the region

Heatwave-related mortality rose four times between 1990 and 2019 in China, reaching 26,800 deaths in 2019. The economic cost of this mortality was US\$13.6 billion in 2019.⁸

Heatwave exposure⁹ has risen from 71.8 million person days in 2000 to 2.2 billion person days in 2019, equal to every Chinese citizen aged over 65 facing 13 more heatwave days in 2019 than 2000. Each older person in Yunnan endured 39 more heatwave days in this period, followed by Hong Kong (22 days) and Hainan (18 days).¹⁰

Productivity losses from Chinese workers exposed to heat are estimated at 9.9 hours in 2019, 0.5% of total national work hours. Almost a quarter of these occurred in Guangdong Province. Economic costs of productivity loss is estimated at US\$126 billion (1.14% of China's GDP) in 2017 with the highest proportion shown in Guangdong at 1.65% of GDP.¹¹

In 2017, the incidence rate of dengue fever across China increased 5.7 times compared to that 1990. The transmission potential of malaria will increase 39-140% in south China with an air temperature increase of 1-2°C.¹²

Precipitation Sea Level and Temperature Estimates 2020s to 2080s

	Temp 2020s	Precipitation 2020s	Sea Level rise 2020s	Temp 2050s	Precipitation 2050s	Sea Level Rise 2050s	Temp 2080s	Precipitation 2080s	Sea level rise 2080s
Hong Kong	+1 to 1.9°C	-10 to +12%	+5 to 18 cm	+1.9 to 4.2°C	-12 to +10%	+15 to 60cm	+2.3 to 6.8°C	-13 to +20%	+22 to 123cm
Seoul	+0.6 to 1.1°C	-11 to +9%		+1.1 to 2.2°C	-23 to + 2%		+1.3 to 3.6°C	-38 to +81%	
Shenzhen	+0.5 to 2.3°C	1 to +12%	+5 to 18 cm	+1.4 to 3.9°C	5 to +19%	+15 to 60cm	+1.8 to 5.9°C	7 to +24%	+22 to 123cm
Singapore	+0.9 to 1.8°C	-13 to +7%	+4 to 17 cm	+1.7 to 3.5°C	-17 to + 6%	+15 to 58cm	+2.1 to 5.8°C	-19 to + 8%	+21 to 122cm
Токуо	+0.9 to 1.8°C	-1 to +10%	+3 to 19 cm	+1.7 to 3.7°C	1 to +13%	+13 to 65cm	+2.1 to 5.7°C	2 to +19%	+20 to 129cm



Preciptation -12 to +10%

Source:

Rosenzweig, C., Solecki, W., Romero-Lankao, P., Mehrotra, S., Dhakal, S., & Ali Ibrahim, S. (Eds.). (2018). Climate Change and Cities: Second Assessment Report of the Urban Climate Change Research Network. Annex 2 Climate Projections for ARC3.2 Cities (corrected). Cambridge University Press.

Sea Level Rise +15 to 60cm



Key risk reduction and adaptation strategies for East Asian cities

In this section, we have identified key risks and adapted the key risk-reduction strategies from a variety of local and international sources most relevant to Hong Kong and peer Asian cities.¹³ We have then screened a range of official policies and strategy documents to make a judgement on the degree to which these strategies are effectively in place.

Comparing the effectiveness of adaptation policies between cities is difficult because cities face different physical risks (and therefore need to take different adaptation measures) because of their different geographical settings and climates. Some are hilly, others are flat. Some are coastal and others are inland. Some are in typhoon belts and others are not. Taking these factors into account, we have tried to assess adaptation preparedness in the context of each city.

Green indicates adequate policy coverage is in place which is above average, or reasonably comprehensive

Orange indicates policies and practices cover some areas but are missing in others. Average or mixed or good in some areas and poor in others

Red indicates absence of policies, inadequate coverage of relevant risks or below average content

Climate Hazard -Heatwaves and heat-induced illness ^{16, 17}

Key risk reduction strategies	Heat mapping & thermal imaging	Cooling centres, pools and water parks	Community engagement & education	Health & climate change strategy, including protection of most vulnerable groups	Creation of green spaces & tree planting	Analysis to correlate hot weather periods & incidence of illness	Policies & practices to avoid heat island effect in urban design
Hong Kong		99	13	99			
Guangzhou		46, 47	48	49	50	5	52, 53
Seoul	100	20	38	101	102	103	104
Shenzhen	54	55	56	57, 58, 59	60		61
Singapore	45	45			24		25
Tokyo	27	27		27	27		

Numbers in each cell refer to the information used, which is listed in "References to Climate Hazard Tables" starting on page 76 of this report.

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Climate Hazard -Heat & precipitation related vector-borne diseases^{15,16}

	Testing & vaccination programmes for vector- borne diseases	Community engagement on risk, reduction & treatment	Disease prevention measures (e.g. pest control)	Analysis of growth of vector-borne diseases	Analysis correlating hot weather periods & incidence of diseases
Hong Kong					18
Guangzhou			62, 63		
Seoul	105	38	38	105	101
Shenzhen			62, 63		
Singapore	41		24, 41	24, 41	41
Токуо	28	29	30	30	

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Climate Hazard -Water shortages & drought

	Water shortage plans & contingencies	Community education & preparation for water conservation & rationing	Water risk analysis & monitoring including up-stream supply conditions	Diversification of water supply
Hong Kong	3, 13, 26	13	13	3, 26
Guangzhou	64, 65, 66	67, 68	67, 69	66
Seoul	108	109	110	110
Shenzhen	69, 70, 71	72, 73, 74	70, 75	75
Singapore	22, 24, 37, 43, 44	22, 24, 44	22, 24, 37	22, 26, 37, 44
Токуо	31		31	31

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Climate Hazard -Increased fire risk

	Real time risk monitoring	Hazard resistant infrastructure design	Crisis management including warning and evacuation systems	Community engagement / education	Analysis to correlate hill fires & dry / hot weather patterns	Stress test for electricity, IT and transport systems in events of fire
Hong Kong						
Guangzhou	76		77, 78	79		
Seoul	111, 114	111	38, 111	112	111, 114	113
Shenzhen	76, 80		81, 82, 83	81, 84, 85, 86, 87, 88		

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Climate Hazard -Sea level rise, sea flooding & coastal erosion

	Crisis management, including warning & community-based evacuation systems	Sea level rise modelling and flood mapping (including impact on electricity, IT & transport)	Community engagement/ education & public preparation (including drills)	Flood hazard resistant infrastructure design & construction	Protection of natural sea barriers (e.g. mangrove)	Sea flood defences development & operation
Hong Kong		14	10	39	10	2, 11, 39
Guangzhou	89	90	91	42, 92		
Seoul	114	116	38	177	114	114
Shenzhen	93	94	95, 96	40	97	97, 98
Singapore		21, 24		21	21, 24	21, 24
Tokyo	32	33				

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Climate Hazard -Typhoons, flooding & landslips

	Typhoon warning & evacuation policies including public education and drills	Storm water capture systems & heavy rain drainage	Flood mapping & landslip risk mapping (including electricity supply, IT and transport systems)	Post-typhoon recovery policies & practices	Hazard resistant building and infrastructure construction (high wind, landslips & floods)	Restricted development in risk areas (flood or landslip)
Hong Kong	10	10	13			
Guangzhou	89, 130, 131	90, 132	89	92	130	92, 131, 132
Seoul	20. 28	118	119, 120	121, 122	20	123
Shenzhen	95, 96	94, 133, 134	95, 135	92, 136	137	138
Singapore	n.a.	23	21, 23	n.a.	24	24
Tokyo			32		34	

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Climate Hazard -Reduced biodiversity & damage to ecosystems

	Monitoring & protection of natural habitats & areas of special scientific interest	Biodiversity issues integrated in planning & development policy & practice. e.g. urban forestry, natural species & corridors	Effective control of chemical use, invasive species & GMOs	Effective laws on illegal trade in endangered species & illegal poaching	Laws, enforcement & adequate penalties for illegal destruction of protected land & overfishing	Monitoring of conservation status of endangered species & biodiversity loss through surveys & assessment
Hong Kong	4, 5, 6, 7, 9	5	5	5	8	5
Guangzhou	139	140		141	142	142
Seoul	124	20	125, 128	126	127	124
Shenzhen	143				142	142
Tokyo		35, 36				

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Climate Hazard -Adaptation plans and policies

Adaptation plans and policies	Formulated policies and plans covering aspects listed above with KPIs	Implemented plans, policies with timeline, clear KPIs	Authority (not too concentrated, not too dispersed)	Resourcing: adequate finance	Stakeholder engagement (including advisory bodies)	Monitoring, reporting and evaluation (including communications)	Integration with other city plans
Hong Kong							
Guangzhou	144, 145	145	146				147
Seoul	114	115	114	129	20	115	20, 115
Shenzhen	148	148	149, 150	151			147
Singapore	24	24	24	24		24	24
Tokyo							

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Climate Adaptation in East Asia: Headlines



Centre for Climate Research Singapore (CCRS) undertakes research on effects of climate change on Singapore as the basis for long-term adaptation plans.¹⁴

Prime Minister announced a new Coastal and Flood Protection Fund, S\$100 billion (US\$72 billion) or more that the low-lying island will need over the next 50 to 100 years to adapt to climate change and rising sea levels.

Older buildings and low-lying areas will need coastal defences, to be funded by a S\$5 billion Coastal and Flood Protection fund set aside in the 2020 Budget.¹⁵

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Paris Watch Key Facts: Governing Climate Action

"Are we developing the right governance and financial systems to tackle climate change?"



The issue in brief

Policies and plans for reducing emissions and adapting cities to climate change will only be as good as the governance bodies driving them. If climate action is seen by a government as an issue which comes second to other – often shorter term – economic or political priorities then it may not progress with the necessary urgency or focus.

The Paris Climate Agreement is clear that parties to the agreement need to back up their pledges with several areas of governance: high level decisionmaking power across the entire government; effective institutions doing the job; finance; the right skills; and strong support to science and technology enabling clean energy and efficient energy use.

Hong Kong's Council for Sustainable Development report notes ". . . it is essential to put in place mechanisms and oversight bodies to measure and keep track of Hong Kong's carbon emissions reduction." ¹



Hong Kong Update

The Council for Sustainable Development's (SDC's) public engagement on long-term decarbonisation took 18 months to come up with its findings. Towards the end, the Council's convenor resigned citing frustration in the process and the outcome.²

While the 55 recommendations prepared in the SDC report point to many of the most important aspects of climate action, they say very little in terms of specific targets and deadlines that would pave the way to achieving net-zero emissions in 2050. They largely call on the government to take the next step and devise policies, action plans and timetables.

This unsatisfactory process highlights the need for a fast moving and decisive climate action body to be established at the highest level of government in order that we don't keep preparing statements about what we should do but rather start making action plans about what we are going to do.



In the area of green finance, there has been more to report. Initiatives have continued through 2019 and 2020 despite the pandemic. The formation of Cross Agency Steering Group on Green and Sustainable Finance. The Steering Group was established in May 2020 to include the HK Monetary Authority, Financial Services and Treasury Bureau, Stock Exchange, Securities and Futures Commission, Environment Bureau, and the Insurance Authority. The group aims to accelerate the growth of green finance and coordinate management of climate and environmental risks to the financial sector.³ This was followed by consultations from the Hong Kong Monetary Authority and the Securities and Futures Commission preparing the way for firmer rules on climate risk reporting.

Checklist for Effective Climate Governance

The following tables set out and assess the key initiatives required to ensure effective governance of climate action. The sources are listed at the end of the tables.

1. Political Leadership

Governance Item	Hong Kong	Singapo
Commitment by head of government	Chief Secretary for Administration chairs the Steering Committee on Climate Change. No record of a meeting since 2016	National under the
High-level leadership group	Steering Committee on Climate Change has not met since 2016. No online record of meeting by Council for Sustainable Development (SDC) since June 2019	Inter-Min Senior Mi
Clear decision-making	Chief Executive said in November policy address that the EPD will update the Climate Action Plan	Regular u updated
Effective inter-departmental coordination	Steering Committee on Climate Change includes Secretaries for Transport & Housing, Environment, Development and Home Affairs	IMCCC in Foreign A National
Policy continuity	Policy responsibility passed downwards through 4 groups and sub-committees to undertake public long-term decarbonisation consultation	IMCCC w Secretari
Adequate financial & human resources	Insufficient information	Insufficie
Climate mitigation legislation in place	Hong Kong government stated it has acceded to the Paris Agreement and will follow its reporting timeline	Paris Clin

ore

l Climate Change Secretariat (NCCS). A dedicated unit e Prime Minister's Office. Serves as secretariat to IMCCC

nisterial Committee on Climate Change (IMCCC) headed by linister & Coordinating Minister for National Security

updates and announcements, including submission of NDC to the UNFCCC in February 2020

ncludes Ministers for Sustainability and the Environment, Affairs, Finance, Trade and Industry, Transport, and I Development

vas established in 2007 and the National Climate Change iat (NCCS) was established on 1 July 2010

ent information

nate Agreement ratified in September 2016

2. Policies and Plans

3. Transparency, Accountability, Monitoring and Evaluation

Governance Item	Hong Kong	Singapore
Long-term decarbonisation goals	December 2020 Policy Address set goal of carbon neutrality by 2050	New NDC submitted to UN in March 2020. No date for carbon neutrality
Plans benchmarked against global targets & carbon budgets	Target yes, pathway no	No
Fair shares & concepts of common but differentiated responsibility acknowledged in plans	Responsibility noted in Council for Sustainable Development recommendations to govern- ment	No
Sector specific action plans with targets to achieve goals	No. Planned for mid 2021	Yes
Just transition social issues acknowledged & addressed in plans	Acknowledged in SDC recommendations not yet formally adopted	
Near term plans & targets on track to achieve long term goals	No	No
Plans make effective use of regulations, incentives and standards	Recommended	Yes
Support to developing countries for climate change (finance, technology, training)	No	Yes

Governance Item Accurate measurement of emiss Transparent climate policy revie Evaluations feed learning & poli Stakeholder engagement proces Independent advisory bodies wi roles Climate change issues debated i (business, media, civil society, ad



	Hong Kong	Singapore
sions	Yes	Yes
ew process	Partial	Partial
icy revision	Some stakeholder dialog	Some stakeholder dialog
ess	Yes	Yes
ith defined	Yes	No
in society Icademia)	Yes	Yes

4. Advancing Climate Finance

5. International Cooperation: Membership of City-level Climate Action Organizations & Reporting Initiatives

Finance sector action	Hong Kong	Singapore	
Climate change mitigation objectives are reflected in the national/ regional financial architecture	Cross Agency Steering Group on Green and Sustainable Finance established May 2020	Yes	
Regulatory authorities have a green taxonomy & verification standards for the finance sector	Local certification system (HKQAA)	ASEAN green bond & international standards applied	
Incentives are in place to promote green finance	Yes	Yes	
'Financed emissions' and climate risk disclosure reporting required for investors and lenders	Consultation in progress	Consultation in progress	
Deterrents are in place for lending to carbon-intensive activities	No	No	
All subsidies for the fossil fuel energy sector have ceased	Yes	No	

Sources on Checklist for Effective Governance tables 1-5 refer to Footnotes page 79

	Global Covenant of Mayors for Climate & Energy	C40 Cities member	ICLEI Local Governments for Sustainability (member)	Mayor's Ageda for a Green and just Recovery (C40 Cities)	CDP cities reporting (in CDP database)
Hong Kong	✓	✓	✓	✓	✓
Guangzhou		✓			
Seoul	✓	✓	✓	✓	
Shenzhen		✓	✓		✓
Singapore		✓			✓
Tokyo	✓	✓	✓		✓
Ταipei	✓		✓		✓
Jakarta	✓	 ✓ 	✓		✓
Kuala Lumpur	✓	✓			
Beijing		~			
Bangkok		✓	✓		✓

Climate Goverance & Finance -Headlines



Region

The Greater Bay Area Green Finance Alliance was launched in September 2020 as an intergovernmental initiative involving Guangzhou, Shenzhen, Hong Kong and Macau. The Alliance's aim is to incubate and leverage green investment, promote standards, carry out research and explore cross-border carbon markets.⁴

The Hong Kong – Guangdong Joint Working Group on Environmental Protection and Combating Climate Change (JWGEPCCC) held its first meeting in December 2019. It agreed to work on nature reserve protection, air quality improvement and marine environment management. A newly established 'Special Panel on Combating Climate Change' set up within the Working Group will exchange research and cooperate on retrocommissioning tech for buildings, climate forecasting, carbon reduction incentives, climate and health, sea level rise, drainage and slope safety management.



Hong Kong

Hong Kong government's US\$1 billion green bond was launched in May 2019.

The Cross Agency Steering Group on Green and Sustainable Finance was established in May 2020 to include the Hong Kong Monetary Authority, Financial Services and Treasury Bureau, Stock Exchange, Securities and Futures Commission, Environment Bureau, and the Insurance Authority.

Guangzhou

The China Youth Climate Action Network (CYCAN) is an active NGO, associated with the Climate Action Network. The network runs International Youth Summits and low-carbon campus projects.⁵

CONCLUSION

Hong Kong has now embarked on the journey towards carbon neutrality along with other Asian peer cities and countries. The target of net-zero emissions by 2050 recommended by the Commission for Sustainable Development (SDC) and endorsed by the Chief Executive in her November Policy Address is a vital aspiration which we can all get behind to ensure the creation of credible action plans. This will include action by the government to address the full list of 55 recommendations made by the SDC in the coming months and turn the 2050 goal into a meaningful and realistic plan. A comprehensive climate adaptation plan will need to be integrated into Hong Kong's new climate action plan. The SDC did not cover this aspect of Paris Climate Agreement responsibility.

Hong Kong will need an action plan that combines KPIs, deadlines and interim targets and a budget. With the right mix of policies offering both incentives and penalties, the government must pull in business, the finance sector and civil society to play their part in each step towards achievement of the 2050 goal.

The sooner this process begins, the more realistic and less painful the process of hitting the 2050 target will become, and the sooner business and society can prepare for the economic, technical, educational and social opportunities that will emerge from the transition to a sustainable future.

There is however, a big question mark. Hong Kong must resist the temptation of shifting the full burden of carbon reduction across the border by importing nuclear or renewables en mass without maximizing

the development of its local renewable potential. If the former path is chosen, there would be a danger that while some renewably-generated electricity is sold to Hong Kong, China could fall back in part on fossil fuels for internal demand bringing minimal benefit to China's overall net-zero target.

Despite the distractions of the COVID-19 pandemic, two other events in Hong Kong give some reassurance that climate change has not slipped off the agenda. The first is that a Cross Agency Steering Group on Green and Sustainable Finance was announced in May 2020, involving all the city's financial regulatory bodies.

The second event was Hong Kong's agreement to join the Task Force of the C40 Cities Mayors Agenda for a Green and Just Recovery, launched in July 2020.

Singapore and Japan were among the few countries that submitted new NDCs to the UN in 2020. The targets they contain fall far short of achieving net zero emissions by 2050. Since submitting its NDC, however, Japan has revised targets and the new Prime Minister has announced the country will set a target of net-zero emissions by 2050. Tokyo as a city had earlier announced its own target of net zero emissions by 2050 with a plan to come. We now await a clear national action plan and the important issue of clear 2030 targets to indicate that Tokyo has a responsible and realistic trajectory to zero emissions 20 years after that.

The same will apply to Guangzhou, Shenzhen and Seoul as they align their city plans with national targets for a carbon-neutral future.



THE REGION'S TO DO LIST

Hong Kong

Hong Kong, without further hesitation needs to revise its Climate Action Plan 2030+ to enable carbon neutrality before 2050. Intermediate targets for 2030 and 2040 emissions will stand as important markers for a realistic long-term goal. Hong Kong's Climate Action Plan must extend to cover other aspects of the Paris Climate Agreement including a comprehensive adaptation plan for the city and ways to assist less-advanced nations and regions with finance, technology and capacity building.

Seoul

For Seoul, a bold plan is needed to turn announcement of a national plan for net-zero emissions by 2050 into an action plan for the capital city with a strong downward curve by 2030.

Singapore

Singapore needs to improve on its 2020 Nationally Determined Contribution. A Singapore emitting 5 tonnes of CO₂e per capita as late as 2050 cannot claim to be in line with the Paris Climate Agreement.

Tokyo

Tokyo needs a clear action plan to reach its target of net-zero emissions by 2050, including a significant reduction pathway for 2030.

Guangzhou

Guangzhou is a relatively affluent Chinese city and it needs to be well ahead of the national average to ensure China achieves its target to end carbon emissions by 2060.

Shenzhen

Shenzhen is positioned as one of China's greenest cities. This is all the more reason why this model green city must achieve carbon neutrality well before the national target of 2060.

FIVE QUESTIONS ANSWERED

Is Hong Kong cutting greenhouse gases fast enough?



If Hong Kong quickly embarks on becoming carbon neutral before 2050, meeting the target announced by the Chief Executive, the city will be on track to meet its responsibilities under the Paris Climate Agreement. The trajectory towards 2050 is an important part of this, and a swift decline in emissions will ensure the city does not emit an unfair share of the total global carbon budget.

The critical next step is contained in the very first recommendation from the Council for Sustainable Development's report, which highlights the need "to chart a **roadmap with critical milestones** supported by **action plans** to progressively advance to net zero carbon emissions by 2050." (Emphasis in the original).

Despite the encouraging news emerging in recent weeks, Hong Kong has done nothing substantially new since it announced in January 2016 that it would cut emissions by between 26% and 36% by 2030¹, less than a month after the Paris Agreement was set five years ago. Now we have the opportunity to act, but the goal of carbon neutrality by 2050 will require dramatic changes in the way we live and do business in Hong Kong. We cannot hope for carbon neutrality before 2050 unless climate action is front and centre of all investment, development and infrastructure planning decisions.

Is Hong Kong developing renewable energy?

The city has not altered its targets for renewable energy since those announced in the Climate Action Plan 2030+ in early 2016. Even at that time, they were among the least ambitious of all East Asian cities.

The Council for Sustainable Development's (SDC) Public Engagement Report sets out recommendations addressing the issue of transition to clean electricity generation. The entire public engagement exercise has been criticised by some as a thinly veiled exercise to build the acceptability of emissions-free energy imports from the mainland.

This was confirmed in public statements from Lam Chiu Ying who resigned as Coordinator SDC before the report was published, and claimed the process was biased towards justifying the import of nuclear power from the mainland.²

Whether this is the case or not, the Long-term Decarbonisation Report from the SDC now provides several policy recommendations, which offer the opportunity to decarbonise the energy sector. The report points to both local and imported solar, wind and nuclear power, along with green hydrogen. What is now critical is whether the government will take action to maximise the production targets of local renewable energy, given the significant technological improvements and cost reductions in solar and offshore windfarms in recent years. It is vital that these recommendations are addressed in Hong Kong's new Climate Action Plan which the Chief Executive expects to be ready in the middle of 2021.


Q3 Is Hong Kong achieving energy efficiency?

We have seen no progress in moves to achieve necessary energy efficiency for Hong Kong's largest sector of energy use: buildings. Policies remain fragmented and piecemeal. Unlike Singapore, there has been no push to raise building efficiency standards while simultaneously providing incentives, subsidies and penalties to drive up adoption of those standards.

The November Council for Sustainable Development report asks many of the right questions on buildings, and this represents a checklist for the government to turn into concrete action: carrots and sticks promoting massive energy efficiency gains in commercial property, residential property, government property, new build and existing stock. The year 2050 now represents a medium term outlook rather than long term, and without a comprehensive building efficiency programme, we will be leaking cool air into the tropical heat well into the second half of the century.

The picture is similar in transport. The government announcements on electric vehicle charging points, diesel emissions standards and pilot schemes do not amount to a comprehensive transport plan contributing to carbon neutrality before 2050. The SDC recommendations ask questions about timetables to phase out internal combustion engines, road pricing and other measures to discourage the use of private vehicles in the city. A new Climate Action Plan must set out a joined-up plan for emissions-free transport.

Is Hong Kong adapting to create a safe and healthy city?

There have been no significant announcements about climate change adaptation for Hong Kong in policy addresses, budgets or officiallycommissioned reports in the past four years. This is despite a number of worrying reports about vulnerability of the city and a typhoon that brought record-breaking high winds to the city. Much official discussion about economic and infrastructural integration with the Greater Bay Area has failed to take full account of the fact that studies suggest this region is one of the world's areas most vulnerable to human and economic loss in the event of flooding.³

Hong Kong is experienced in typhoon response and managing heavy rainfall. Nevertheless, questions remain about the city's capacity to respond in a wellcoordinated way to a major disaster that might result from the accumulated impact of sea level rise, high tide and a super typhoon.

This year's response to COVID-19 raises questions about whether the government has sufficient vision and capacity to prepare for and respond to heatwaves and heat-related diseases. New transmissible diseases arising from hotter average temperatures continue to be a worry, and hopefully we are learning about data gathering, risk management and response from the current pandemic.

Measures are overdue for preparation, reduction, response and recovery related to periods of heat stress for what are widely recognised as the groups most vulnerable to heatwaves: the young, the old, pregnant women and outdoor workers. The warnings are clear, not only from our meteorological scientists, but also from the empirical evidence of hot days and hot nights reported by the Hong Kong Observatory.

Is Hong Kong developing the right governance and finance systems?



No high-level, empowered and dynamic climate change body has been put into place by the Hong Kong government, but the recommendations from the Council achieve some momentum on climate-related finance in Hong Kong. for Sustainable Development make it clear that this is what is needed to turn ideas into plans and policies.

The highest-level government climate group -- the Steering Committee on Climate Change – now needs to rejuvenate or reincarnate in order to take firm control of the climate action agenda.

In the finance sector and among the financial regulatory bodies, there has been positive action when it comes to climate change response. The announcement of the Cross Agency Steering Group on Green and Sustainable Finance in 2020 lined up key players across the sector in the name of heightened action on green finance. The proof of the effectiveness of this steering group will have to be demonstrated in the coming months as the finance sector and its regulators explain what role they plan to play in support of the government's goal of carbon neutrality before 2050.

Hong Kong Government's US\$1 billion Green Bond also signalled a desire to

In the realm of international agreements and cooperation, Hong Kong, in the shape of Environment Secretary KS Wong, stepped up to join the Task Force of the C40 Cities Mayor's "Agenda for a Green and Just Recovery" committing over 40 cities around the world to ensuring economic recovery is sustainable.⁴

The action points for this initiative are well intended. Paris Watch will be looking carefully at Hong Kong's action on each of the six C40 pledges as plans are set for economic recovery from the COVID-19 pandemic.





The 2020 Policy Address announced that "the Government will update the 'Hong Kong's Climate Action Plan' in the middle of next year to set out more proactive strategies and measures to reduce carbon emissions." Although this appeared on page 62 of the policy address, it constitutes the most important task for the territory if it is to live up to its responsibilities under the Paris Agreement.

Climate change action represents the most important task facing the government if it is to secure a safe and prosperous future for the city and its people during this century.

Footnotes

Welcome to Paris Watch Climate Action Report 2020

- Hong Kong Government. 2020. "Striving Ahead With Renewed Perseverance. The Chief Executive's 2020 Policy Address." 1
- See for example: Verisk Maplecroft. 2020. "Environmental Risk Outlook 2020"; China Water Risk. 2020 "Avoiding Atlantis: The 2 CWR APACCT 20 Index"; and China Water Risk. 2020. "20 City Factsheets: At-a-glance coastal threat assessment for 20 APAC cities"
- HK Monetary Authority. 2020. Joint statement on the establishment of the Green and Sustainable Finance Cross-Agency 3 Steering Group. https://www.hkma.gov.hk/eng/news-and-media/press-releases/2020/05/20200505-8/
- Council for Sustainable Development. 2020. Report on Public Engagement on Long-term Decarbonisation Strategy. https:// 4 www.susdev.org.hk/download/report/council_report_e.pdf
- Hong Kong Government. 2020. "Striving Ahead With Renewed Perseverance. The Chief Executive's 2020 Policy Address." 5
- C40 Cities / ARUP. 2016. Deadline 2020: How cities will get the job done 6
- 7 C40 Cities. 2020. Agenda for a Green and Just Recovery. https://www.c40.org/other/agenda-for-a-green-and-just-recovery
- 8 Council for Sustainable Development. 2019. Long Term Decarbonisation Strategy: Public Engagement. HK
- 9 Chinese Meteorological Administration. 2020. Climate Change Blue Book (August 2020)
- 10 Climate Watch 2020 NDC Tracker. https://www.climatewatchdata.org/2020-ndc-tracker, accessed 10 October 2020

Paris Watch Key Facts: Reducing Emissions

- World Bank. https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=HK accessed 20210112 1
- 2 C40 Cities / ARUP. 2016. Deadline 2020: How cities will get the job done.
- 3 New Climate Institute & Data-Driven EnviroLab. 2020. See note i above.
- 4 New Climate Institute & Data-Driven EnviroLab. 2020. Navigating the Nuances of Net-zero Targets. https://newclimate.org/ wp-content/uploads/2020/10/NewClimate NetZeroReport October2020.pdf
- 5 UNDP. 2018. Human Development Indices and Indicators 1028 Statistical Update. http://hdr.undp.org/sites/default/ files/2018 human development statistical update.pdf
- Carbon Care InnoLab. 2019. Setting a Science-based Target for Hong Kong. https://www.ccinnolab.org/uploads/media/CCIL 6 Submission Supplement - Setting a Science-based target for Hong Kong(1).pdf
- CPD. 2019. 2019 City-wide Emissions Reduction Targets. https://data.cdp.net/Emissions/2019-City-wide-Emissions-Reduction-Targets/u9xe-9s5w Accessed 20200901 and Council for Sustainable Development. 2020. Report on Public Engagement on Long-term Decarbonisation Strategy. https://www.susdev.org.hk/download/report/council report e.pdf guoting: IISD. 77 Countries, 100+ Cities Commit to Net Zero Carbon Emissions by 2050 at Climate Summit. https://sdq.iisd.org/news/77-countries-100-cities-commit-to-net-zero-carbon-emissions-by-2050-at-climate-summit/
- New Climate Institute & Data-Driven EnviroLab. 2020. Navigating the Nuances of Net-zero Targets. https://newclimate.org/ 8 wp-content/uploads/2020/10/NewClimate NetZeroReport October2020.pdf
- Council for Sustainable Development. 2020. Report on Public Engagement on Long-term Decarbonisation Strategy. https:// 9 www.susdev.org.hk/download/report/council report e.pdf
- International Carbon Action Partnership (ICAP). 2020. https://icapcarbonaction.com/en/ 10
- Council for Sustainable Development. 2020. Report on Public Engagement on Long-term Decarbonisation Strategy. https:// 11 www.susdev.org.hk/download/report/council_report_e.pdf
- Tokyo Metropolitan Government. 2019. Zero Emission Tokyo Strategy 12
- 13 Climate Home News. 2020. Japan sticks to 2030 climate goal, accused of a 'disappointing' lack of ambition. https://www.climatechangenews.com/2020/03/30/japan-sticks-2030-climate-goals-accused-disappointing-lack-ambition/

P.2

P.16

- Kyodo News. 2020. Gist of Japan PM Suga's 1st policy speech in parliament 14
- Renewable Energy Institute. 2020. Japan's 2050 Carbon Neutral Declaration. 15 https://www.renewable-ei.org/en/activities/reports/20201026.php
- 17 Korea on the right path to carbon neutrality? - China Dialogue
- 18 http://www.xinhuanet.com/english/2020-09/25/c_139396373.htm
- 19 post 4759268.html
- https://www.163.com/dy/article/F9FS02860511HMV0.html
- 21 carbon neutrality plan". https://mp.weixin.gq.com/s/LBKE8ufBBWOphs_uf4UFpA

Paris Watch Key Facts: Renewable Energy

- 1
- 2
- REN21. 2019. Renewables in Cities 2019 3
- 4 Korea New and Renewable Energy Center, 2019.
- 5 g20-climate-performance/g20report2018
- 6 com/view.php?ud=20200525000893
- 7
- Cai W, Zhang C, Suen HP, et al. 2020. Op. cit.

Hong Kong's renewable energy growth compared to neighbouring cities

- 1.
- 2.
- CLP Power. 2020. Renewable Energy Generation Data November 2020 3.
- 4
- 5
- 6. content/2020-08/24/content 23482682.htm
- 7.

https://english.kyodonews.net/news/2020/10/ba1738a5526e-gist-of-japan-pm-sugas-1st-policy-speech-in-parliament.html

16 The Guardian. 2020. South Korea vows to go carbon neutral by 2050 to fight climate emergency. https://www.theguardian. com/world/2020/oct/28/south-korea-vows-to-go-carbon-neutral-by-2050-to-fight-climate-emergency

Kim H. 2020. Is South Korea on the right path to carbon neutrality? China Dialogue Posted online 2 December 2020. Is South

XinhuaNet. 2020. Spotlight: China's pledge to cut CO2 emissions boosts global confidence in climate change.

Guangzhou Government. 2017. Notice of the General Office of the Guangzhou Municipal People's Government on Issuing the 13th Five-Year Plan for Energy Development of Guangzhou (2016-2020). http://www.gz.gov.cn/zwgk/fggw/sfbgtwj/content/

20 Shenzhen. 2020. Shenzhen announced the preparation of "14th Five-Year Plan" and exposed the 15 blueprints.

Carbon Easy, Environmental Circle. 2021. "Strive to peak carbon emissions in 2025! Shanghai takes the lead in announcing the

Council for Sustainable Development. 2020. Report on Public Engagement on Long-term Decarbonisation Climate Action Tracker. https://climateactiontracker.org/countries/singapore/current-policy-projections/

Climate Transparency. 2018. Brown to Green Report: South Korea Country Facts. 2018. http://www.climate-transparency.org/

Nam Kyung-don. "Korea unveils draft plan to foster renewable energy" Korea Herald. 26 May 2020. http://www.koreaherald.

Cai W, Zhang C, Suen HP, et al. 2020. The 2020 China report of the Lancet Countdown on health and climate change. Lancet Public Health 2020; published online Dec 2. https://doi.org/10.1016/S2468-2667(20)30256-5.

Institution for Sustainable Energy Policies. https://www.isep.or.jp/archives/library/category/renewable-energy-100 Seoul Open Data Portal https://data.seoul.go.kr/dataList/10361/S/2/datasetView.do

https://www.clp.com.hk/en/community-and-environment/renewable-schemes/renewable-energy-generation-data

Hong Kong Electric Investments. 2019. Sustainability Report 2019. HKEI - Sustainability Report 2019 (hkelectric.com)

Energy Market Authority. Singapore Energy Statistics 2020. EMA : Singapore Energy Statistics 28RSU.pdf (ema.gov.sq)

SZNews.com 2020. "Shenzhen clean energy construction is the number one in the country". https://www.sznews.com/news/

Hong Kong China News Agency. 2020. "China's installation capacity of hydropower, wind power, photovoltaic power and nuclear power generation under construction rank first in the world." http://www.hkcna.hk/content/2020/1221/869257.shtml

P.31

P.28

Carbon Intensity of Electricity Generation

- 1. CLP Power Sustainability Report 2019.
- 2. Hong Kong Electric Co. Sustainability Report 2019. <u>https://www.hkelectric.com/en/CorporateSocialResponsibility/</u> CorporateSocialResponsibility_CDD/Documents/SR2019E.pdf
- 3. Shenzhen Statistics Yearbook 2019. http://tjj.sz.gov.cn/attachment/0/695/695422/7971762.pdf
- 4. Tokyo Electric Power Co. (TEPCO). <u>https://www.tepco.co.jp/corporateinfo/illustrated/environment/emissions-co2-j.html</u>
- Energy Market Authority EMA | Singapore Energy Statistics Energy Transformation South China: China Southern Power Grid: <u>https://www.csg.cn/shzr/zrbg/202005/P020200531529282368444.pdf</u>

Hong Kong's Feed-in Tariff (FiT) Scheme

- 1 Ta Kung Pao. 2020. '喜見成效「上網電價」計劃明年投產 足供三個太古城用'. Published 15 August 2020. <u>http://www.takungpao.com.hk/news/232109/2020/0815/486664.html?fbclid=lwAR34t3poF-2NTMZE8GGUV7ZFLqHlkicTy2</u> <u>7HzYKXXF6WDqlmOTFv4GXjziY</u> Accessed: 20210107
- 2 Solar Business Hub. 2020. Hong Kong's largest solar energy project to be installed by Widex Technology Development on HKUST campus' Solar Business Hub. Published 15 August 2020. <u>https://solarbusinesshub.com/2020/09/01/hong-kongs-largest-solar-energy-project-to-be-installed-by-widex-technology-</u> development-on-hkust-campus/ Accessed: 20210107
- 3 Mingpao. '氣候逃兵:香港追上特朗普?' by Albert Lai. Published 13 June 2017.

Paris Watch Key Facts: Energy Efficiency

- 1 Council for Sustainable Development. 2020. Report on Public Engagement on Long-term Decarbonisation Strategy. <u>https://www.susdev.org.hk/download/report/council_report_e.pdf</u>
- 2 See, for example: Environment Bureau. 2015. Hong Kong Climate Change Report 2015
- 3 Civic Exchange. 2020. Decarbonising Hong Kong Buildings: Policy recommendations and next steps.
- 4 REN 21. 2019. Renewables in Cities 2019.
- 5 <u>https://climateactiontracker.org/countries/south-korea/</u>
- 6 Climate Home News. 2020. "South Korea formally commits to cutting emissions to net zero by 2050." <u>https://www.climatechangenews.com/2020/10/28/south-korea-formally-commits-cutting-emissions-net-zero-2050/</u>
- 7 REN 21. 2019. Renewables in Cities 2019.
- 8 Cai W, Zhang C, Suen HP, et al. 2020. The 2020 China report of the Lancet Countdown on health and climate change. Lancet Public Health 2020; published online Dec 2. <u>https://doi.org/10.1016/S2468-2667(20)30256-5</u>.
- 9 Energy Studies Institute, NUS. 2020. Singapore's Enhanced 2030 Nationally Determined Contribution and Mid-Century Strategy. ESI Policy Brief 35
- 10 Tokyo Metropolitan Government. 2019. Zero Emission Tokyo
- 11 REN 21. 2019. Renewables in Cities 2019.

Building efficiency

- 1. Tokyo Metropolitan Government, Bureau of Environment. 2020. Tokyo's Greenhouse Gas Emissions. https://www.kankyo.metro.tokyo.lg.jp/climate/zenpan/emissions_tokyo.html
- 2. Tokyo Metropolitan Government, Bureau of Environment. 2019. Final energy Consumption and Greenhouse Gas emissions in Tokyo (FY2016) <u>https://www.kankyo.metro.tokyo.lg.jp/en/climate/index.files/Tokyo_GHG_2016.pdf</u>

- 3. Japan Building Energy Management Association. 2020. Building energy consumption survey Report (42nd edition) April 2018-March 2019. <u>http://www.bema.or.jp/_src/7197/digest42.pdf?v=1588127609912</u>
- 4. Electrical and Mechanical Services Department, Hong Kong Government. 2020. Hong Kong Energy end-use Data https://www.emsd.gov.hk/filemanager/en/content_762/HKEEUD2020.pdf
- 5. Government Property Agency (Hong Kong). 2019. Government Property Agency Work in 2018 https://www.gpa.gov.hk/english/doc/gpa_annual_report_2018.pdf
- 6. Ng, N. 2018. "Hong Kong's small flats 'to get even smaller', hitting quality of life." South China Morning Post. Published online 17 April 2018. Hong Kong's small flats 'to get even smaller', hitting quality of life | South China Morning Post (scmp.com)
- 7. Guangzhou Bureau of Statistics National Bureau of Statistics. 2019. Guangzhou National Economic and Social Development Statistical Bulletin 2018. <u>http://tjj.gz.gov.cn/gzstats/tjgb_qstjgb/201703/598ddce9f32a458c84c184a344698f1b/files/c86e</u> 2a17a6f84063b1b1c3653cc6f417.doc
- 8. Guangzhou Daily. 2019. "Guangzhou: Per cn/2019/09/19/1268602_m.html
- 9. Tokyo Metropolitan Government. Number of Buildings and Total Floor Space By district, Building Type and Structure (2112-2016). https://www.toukei.metro.tokyo.lg.jp/tnenkan/2015/tn15qa030200.xls
- 10. Energy Market Authority, Singapore Government. Total Final Energy Consumption. <u>https://www.ema.gov.sg/statistic.aspx?sta_sid=20141211NBOOXgSCZ0no</u>
- 11. Data.gov.sg. Available and Vacant commercial Properties Available and Vacant Commercial Properties-Data.gov.sg

Transport

P.31

P.34

P.36

P.39

- 1. International Council on Clean Transportation. 2019. Briefing: Electric Vehicle Capitals: Showing the path to a mainstream market https://theicct.org/sites/default/files/publications/EV_Capitals_2018_20191121.pdf
- 2. International Council on Clean Transportation. 2020. Briefing: Electric Vehicle Capitals: Cities aim for all-electric mobility. https://theicct.org/sites/default/files/publications/ev-capitals-update-sept2020.pdf
- 3. Tokyo Electric Power Company. 2020. CO2 Emissions, emissions per unit and power sold. <u>https://www.tepco.co.jp/</u> <u>corporateinfo/illustrated/environment/emissions-co2-j.html</u>
- 4. Tokyo Metropolitan Government, Bureau of Environment. 2019. Zero Emission Tokyo <u>https://www.kankyo.metro.tokyo.lg.jp/policy_others/zeroemission_tokyo/strategy.files/zero_emission_tokyo_strategy.pdf</u>
- 5. Ministry of Land, Infrastructure and Traffic. 2020. Seoul Vehicle Registration http://stat.molit.go.kr/portal/
- 6. Seoul Metropolitan Government. 2020. Motor Vehicle Registration Status (By Fuel) Statistics <u>http://data.seoul.go.kr/dataList/10860/S/2/datasetView.do</u>
- 7. Data.gov.sg. 2020. Monthly Motor Vehicle Population Statistics by Type of Fuel Used. https://data.gov.sg/dataset/monthly-motor-vehicle-population-by-type-of-fuel-used?view_id=4e96af52-04ea-4d1c-9d43-
- 8. Transport Department, Hong Kong Government. 2020. Registration and Licensing of Vehicles by Fuel Type https://www.td.gov.hk/filemanager/en/content_4976/table44.xls
- 9. China Auto M.S. 2020. The city's new energy vehicles to maintain a total of 210,000 vehicles in Guangzhou in 2019. New smart energy car development announced 全市新能源汽车保有量达 21 万辆,广州市 2019 年新能源智能汽车发展情况公布 _ 汽车总站 网 (chinaautoms.com)
- 10. Shenzhen Government. 2020. Wang Weizhong: Efforts to Build New Infrastructure, Cultivate New Momentum, Fight the Epidemic and Stabilize the Economy <u>https://opendata.sz.gov.cn/article/article/toArticleDetails/1245657311841824768</u>
- 11. Teo, G. 2020. "28,000 charging stations for electric cars is possible but where? Industry players weigh in." Channel News Asia. Published online 11 March 2020. <u>https://www.channelnewsasia.com/news/singapore/electric-vehicles-budget-2020-charging-points-energy-12512194</u>
- 12. Hong Kong Government. 2019. Government Press Releases. Promoting the Use of Electric Vehicles. <u>https://www.info.gov.hk/gia/general/201911/20/P2019112000574.htm?fontSize=1</u>
- 13. Tokyo Statistical Yearbook. 2018. Charged Parking Places by District <u>https://www.toukei.metro.tokyo.lg.jp/tnenkan/2018/</u> <u>tn18q3e004.htm</u>

Guangzhou Daily. 2019. "Guangzhou: Per capita housing area increased 8 times in 40 years." http://news.dichan.sina.com.

P.40

Paris Watch Key Facts: Adapting to a Changing Climate

- Watts, N. et al. 2020. The 2020 Report of the Lancet Countdown on Health and Climate Change: Responding to converging 1 crises. Elsevier Ltd.
- 2 Watts, N. et al. 2020. Op Cit.
- 3 See for example: Verisk Maplecroft. 2020. 'Environmental Risk Outlook 2020'; China Water Risk. 2020 'Avoiding Atlantis: The CWR APACCT 20 Index'; and China Water Risk. 2020. "20 City Factsheets: At-a-glance coastal threat assessment for 20 APAC cities"
- Hong Kong Council for Sustainable Development. 2019. Long-term decarbonisation Strategy: Public Engagement 4
- Hong Kong Observatory Website. https://www.hko.gov.hk/en/cis/statistic/coldday_statistic.htm 5
- 6 See for example:. Nichols, W. and Clisby, R. 2020. China's manufacturing heartland most at risk from rising seas. Environmental Risk Outlook 2020. Verisk Maplecroft. https://www.maplecroft.com/insights/analysis/chinas-manufacturing-heartland-mostat-risk-from-rising-seas/and: Mirando, D. and Tan, D. 2019. Thirsty and Underwater: Rising Risks In Greater Bay Area. China Water Risk https://www.chinawaterrisk.org/resources/analysis-reviews/thirsty-and-underwater-rising-risks-in-greater-bayarea/
- South China Morning Post. 2020. "Hong Kong's hot nights and even hotter days bring higher risk of mortality for women and the 7 elderly, new study finds." 24 August 2020. Hong Kong's hot nights and even hotter days bring higher risk of mortality for women and the elderly, new study finds | South China Morning Post (scmp.com)
- Cai W, Zhang C, Suen HP, et al. 2020. The 2020 China report of the Lancet Countdown on health and climate change. Lancet 8 Public Health 2020; published online Dec 2. https://doi.org/10.1016/S2468-2667(20)30256-5.
- In the Lancet study, a heatwave is assessed as follows: The 92.5th percentile of daily maximum temperature over the warm 9 season (May 1st to Sep 30th) between 1986 and 2005 was computed as reference, and a heatwave event was defined as a period of three or more days where the daily maximum temperature was higher than the reference at a given grid.
- 10 Cai W, Zhang C, Suen HP, et al. 2020. Op. cit.
- 11 Cai W, Zhang C, Suen HP, et al. 2020. Op. cit.
- 12 Cai W, Zhang C, Suen HP, et al. 2020. Op. cit.
- 13 Sources for identifying key risk areas and key risk reduction strategies include: HK University of Science and Technology. 2018. CARe2018 Hong Kong conference: Summary Report and Policy Recommendations and World Wide Fund for Nature (WWF). 2019. One Planet City Challenge: Updated Assessment Framework
- 14 National Climate Change Secretariat. 2020. Charting Singapore's Low-Carbon and Climate Resilient Future
- Channel News Asia. 2020. Explainer: Why adapting to climate change matters https://www.channelnewsasia.com/news/ 15 explainer-climate-change-adaptation-12941668?cid=h3 referral inarticlelinks 24082018 cna

Reference to Climate Hazard tables

- Environment Bureau. 2016. Hong Kong Biodiversity Strategy and Action Plan 2016-2021 1.
- Mirando, D and Tan, D. 2019. No Sense Climate Strategies from DSD to HSBC. Ching Water Risk https://www.chingwaterrisk. 2. org/resources/analysis-reviews/no-sense-climate-strategies-from-dsd-to-hsbc/
- З. von Eiff, David. 2020. Sustainable Infrastructure: Towards a Diversified HK Water Supply. China Water Risk. https://www. chinawaterrisk.org/opinions/sustainable-infrastructure-towards-a-diversified-hk-water-supply/
- Agriculture, Fisheries and Conservation Department. 2017. Hong Kong: the Facts. Country Parks and Conservation https:// 4. www.afcd.gov.hk/english/country/cou_lea/the_facts.html#:~:text=Although%20Hong%20Kong%20is%20one,about%20 three%2Dquarters%20is%20countryside.
- Environment Bureau. 2016. HK Biodiversity Strategy & Action Plan 5.
- WWF Hong Kong. 2020. About Life June 2020. https://d3g9070b7kewus.cloudfront.net/downloads/aboutlife_june2020_eng. 6. pdf
- WWF Hong Kong. 2018. Sea For Future: Conservation Priority Sites for Hong Kong 7.
- WWF Hong Kong. 2018. Transform Hong Kong Into Asia's Most Sustainable City 8.
- WWF Hong Kong. 2016. Inner Deep Bay Unauthorised Development Report 9.
- 10. Drainage Services Department. 2015. Going the Extra Miles

P.44

P.50

- 11. Chan, Faith. 2019. Confronting Storms and Climate Risk in HK. Ching Water Risk
- html
- 13 Environment Bureau. 2017. Hong Kong's Climate Action Plan 2030+
- 14 Change. PDF file. http://acdpr.hkjcdpri.org.hk/pdf/ppt/5Alan Tang.pdf
- 16.
- 17. International Labour Organization, 2019. Working on a Warmer Planet
- 18. Hong Kong. International Journal of Biometeorology (2012) 56:865–872
- 19.
- https://www.nccs.gov.sg/singapores-climate-action/coastal-protection/ 21.
- 22.
- 23.
- 24.
- 25.
- 26.
- Reports from Tokyo Metropolitan Bureau of Environment 27.
- 28. Ministry of Health, Labour and Welfare. Japan
- Tokyo Metropolitan Infection Disease Surveillance Center 29.
- 30. Tokyo Metropolitan Institute of Public Health
- 32. Bureau of Construction, Tokyo
- 33. Japan Meteorological Agency
- 34. Bureau of Urban Development
- 35. tokyo.lg.jp/basic/plan/nature/green biodiversity.html
- 36 kankyo.metro.tokyo.lg.jp/en/greenery/biodiversity.files/all.pdf
- 37. Network/Singapore-Resilience-Strategy-English.pdf
- 39. org/resources/analysis-reviews/no-sense-climate-strategies-from-dsd-to-hsbc/
- security/exclusive-shenzhen-battles-congestion-climate-change/
- security/dr-ng-lee-ching-nea-singapore-dengue-machine-learning/

12. Drainage Service Department website. Flood Prevention https://www.dsd.gov.hk/EN/CoreBusiness/Flood Prevention/index.

Tang, Kai-yan, Alan. (no date) Enhancing Coastal Protection in Hong Kong in Response to Extreme Weather and Climate

15. Nick Watts, Markus Amann, Prof Nigel Arnell, Sonja Ayeb-Karlsson, Kristine Belesova, Prof Maxwell Boykoff et al. The 2019 report of The Lancet Countdown on health and climate change: ensuring that the health of a child born today is not defined by a changing climate. The Lancet, Volume 394, Issue 10211, P1836-1878, November 16, 2019

International Federation of Red Cross and Red Crescent Societies. 2019. Heatwave Guide for Cities. https://www.climatecentre. org/downloads/files/IFRCGeneva/RCCC%20Heatwave%20Guide%202019%20A4%20RR%20ONLINE%20copy.pdf

William B. Goggins, Jean Woo, Suzanne Ho, Emily Y. Y. Chan, P. H. Chau. 2011. Weather, season, and daily stroke admissions in

The People's Republic of China. 2018. Third National Communication on Climate Change: December 2018. http://english.mee. gov.cn/Resources/Reports/201907/P020190702566752327206.pdf Accessed 20200925

20. Seoul Metropolitan Government. 2015. Promise of Seoul: Taking actions against climate change

https://www.nccs.gov.sq/singapores-climate-action/water-resource-management/

https://www.nccs.gov.sg/singapores-climate-action/drainage-and-flood-prevention/

National Climate Change Secretariat. 2020. Charting Singapore's Low-Carbon and Climate Resilient Future.

Government of Singapore. 2020. Budget 2020: Advancing As One Singapore

Zhao Chenlin. 2020. Managing Risks in Transboundary Water Supply: Hong Kong vs Singapore. China Water Risk

31. Nikkei article (2019/04/22); https://style.nikkei.com/article/DGXMZ043355210U9A400C1L83001/

Bureau of Environment, Tokyo Metropolitan Government. New Development of Green Measures https://www.kankyo.metro.

Bureau of Environment, Tokyo Metropolitan Government. 2012. Tokyo Green Plan 2012: City biodiversity strategy https://www.

Centre for Liveable Cities, Singapore. 2018. A Resilient Singapore. https://resilientcitiesnetwork.org/downloadable_resources/

38. Seoul Metropolitan Government. 2019. Resilient Seoul: A strategy for urban resilience 2019.

Mirando, D. and Tan, D. 2019. No-sense Climate Strategies: From DSD to HSBC. China Water Risk https://www.chinawaterrisk.

Chia, Jie Lin. 2018. Exclusive: How Shenzhen Battles Congestion and Climate Change. GovInsider https://govinsider.asia/

41. Rohaidi, N. 2018. How Machine Learning Helps Singapore Swat Dengue. GovInsider. 25 July 2018 https://govinsider.asia/

- 42. Meng Meng, Chan, F, Stead, D. 2018. "Spatial Planning for Climate Adaptation and Flood Risk: Development of the Sponge City Programme in Guangzhou." In Galderisi, A. and Colucci, A. (eds) Smart, Resilient and Transition Cities: Emerging approaches and tools for a climate-sensitive urban development. Elsevier,
- 43. Channel News Asia. 2019. Commentary: Beyond scarcity and security, does Singapore need a new water narrative? https:// www.channelnewsasia.com/news/singapore-water-security-malaysia-conservation-new-narrative-11391186?cid=h3 referral inarticlelinks 24082018 cna
- 44. PUB Singapore's National Water Agency. 2016. Our Water Our Future. https://www.pub.gov.sg/Documents/ PUBOurWaterOurFuture.pdf
- 45. Bloomberg City Lab. 2020. "This is How Singapore Keeps its Cool as the City Heats Up" Singapore Climate Change: Reducing Heat Takes Trees and Technology - Bloomberg
- 46. People's Government of Guangzhou Municipality. 2020. Heat warning signals and response guidelines ("高温预警信号及应对指 引"). http://www.gz.gov.cn/zt/fxbxaqdx/zy/content/post_5765130.html
- 47. Guangzhou Civil Affairs Bureau. 2018. List of addresses and telephone numbers of 24-hour cold and summer temporary shelters in various districts of Guangzhou (" 广州市各区 24 小时防寒避暑临时庇护场所地址和电话一览表 ") http://mzi.gz.gov.cn/dt/mzdt/ content/post 3112117.html
- 48. Guangzhou Meteorological Bureau. 2020. White Paper on Guangzhou Municipal Meteorological Public Service (" 广州市气象公 共服务白皮书 ") http://gd.cma.gov.cn/gzsqxj/zwgk_2386/gggs_2395/202004/P020200422591363541264.pdf
- 49. People's Government of Guangdong Province.2011. Measures for Labor Protection in Hot Weather of Guangdong Province (") 东省高温天气劳动保护办法"). http://www.gd.gov.cn/gkmlpt/content/0/140/post 140318.html#6
- 50. Bureau of Forestry and Landscaping of Guanazhou Municipality, 2020. Guanazhou Urban Green Space System Planning (2010-2020) Revision(" 广州市城市绿地系统规划 (2010-2020) 修编 ") https://www.gz.gov.cn/gzgov/s2884/201711/022426220f3241 c3bd5f55a1257139fd/files/eb751516ffc44243afef1a2f95cdOe2e.pdf
- 51. Provincial Center for Disease Control and Prevention. 2013. For every 1°C rise in Guangzhou, the death rate of elderly increased by 3.7% (" 广州气温每升 1℃ 老人死亡增 3.7%"). http://cdcp.gd.gov.cn/mtbdlist/content/post 1109143.html.
- 52. Guanazhou Climate and Agricultural Meteorological Center, 2019. Guanazhou Heat Island Monitoring Bulletin (" 广州市城市热 岛监测公报 ") <u>http://www.tqyb.com.cn/upload/admin/file/2020-01/%E5%B9%</u>BF%E5%B7%9E%E5%B8%822019%E5%B9% B4%E5%9F%8E%E5%B8%82%E7%83%AD%E5%B2%9B%E7%9B%91%E6%B5%8B%E5%85%AC%E6%8A%A5.pdf
- 53. People's Government of Guangzhou Municipality. 2020. Guangzhou became the first pilot city of the World Bank's "China Sustainable City Cooling Project" ("廣州成爲世界銀行"中國可持續發展城市降溫項目"首個試點城市") http://www.gz.gov.cn/xw/ jrgz/content/post 6550895.html
- 54. Shenzhen Center for Disease Control and Prevention. 2020. High temperature heat wave index, Heat wave index information specification (" 高温热浪指数、热浪指数信息规范 ") http://www.szcdc.net/rdzt/rlzs/
- 55. Civil Affairs Bureau of Shenzhen Municipality. 2019. List of information on indoor emergency shelters in Shenzhen("深圳市室内 应急避难场所信息一览表 ") http://mzi.sz.gov.cn/cn/hdjl/ywzsk/gt/content/post 8280877.html
- 56. Emergency Management Bureau of Shenzhen Municipality.2019. How is high temperature made? ("高温是怎样炼成的?") http:// yjgl.sz.gov.cn/zwgk/xxgkml/qt/ztzl/yjzt/aqyjzsjjcxjhd/yjzs/content/post_3650194.html
- 57. Shenzhen Municipal Human Resources and Social Security Bureau. 2017. Notice on the publication of our province's high temperature allowance standards ("关于公布我省高温津贴标准的通知"). http://hrss.sz.gov.cn/ztfw/gwjt/zcfg/content/ post_7395648.html
- 58. People's Government of Guangdong Province.2011. Measures for Labor Protection in Hot Weather of Guangdong Province (") 东省高温天气劳动保护办法"). http://www.gd.gov.cn/gkmlpt/content/0/140/post 140318.html#6
- 59. Shenzhen Municipal Health Commission. 2020. Shenzhen High Temperature Health Risk Index ("2020 年 6 月 23 日深圳高 温健康风险指数"). http://weather.sz.gov.cn/gixiangfuwu/gihoufuwu/gihouguanceyupinggu/chengshiredaojiance/content/ post 7262131.html
- 60. Shenzhen Urban Management Bureau.2010.Shenzhen City Green Space System Planning ("深圳市城市绿地系统规划"). http:// www.sz.gov.cn/szzt2010/wgkzl/jcgk/jcygk/zdzcjc/201610/P020161020612657061291.pdf
- 61. Meteorological Bureau of Shenzhen Municipality.2020.Shenzhen Heat Island Monitoring Bulletin(" 深圳市 2019 年城市热岛监测 公报"). http://weather.sz.gov.cn/gixiangfuwu/gihoufuwu/gihouguanceyupinggu/chengshiredaojiance/content/post 7262131. html

- html
- 63.
- 64
- http://www.gz.gov.cn/xw/jrgz/content/post 6487491.html
- 67.

- attachment/0/415/415842/6746825.pdf
- 71.
- ("国家节水行动方案") http://jyyscjh.com/nd.jsp?id=184
- ztzl/jcjdzt/jyystl/
- sz.gov.cn/zwfw/bmxx/pshjs/jsjl/
- sz.gov.cn/attachment/0/509/509498/7259229.pdf
- htm
- http://www.tgyb.com.cn/gz/weatherAlarm/otherCity/
- 78. weatherAlarm/guide/
- 80. sz.gov.cn/cn/xxqk/zfxxqj/yjql/yjya 81608/sjyj/content/post 7914732.html
- 81.
- 82 急管理局事故预警"). http://yjql.sz.gov.cn/

62. Health Commission of Guanadona Province.2019.Provincial Health Commission issued health reminders for denaue fever prevention and control ("省卫生健康委发布登革热防控健康提示"). http://wsjkw.gd.gov.cn/zwyw ygxx/content/post 2576876.

Health Commission of Guangdong Province.2020. The Guangdong Provincial Health Commission results of the dengue fever and Zika virus disease vector Aedes density monitoring results in the second half of June 2020 (" 广东省卫生健康委通报 2020 年 6 月下半月全省登革热、寨卡病毒病媒介伊蚊密度监测结果"). http://wsjkw.gd.gov.cn/zwyw ygx/content/post 3042761.html

Guangzhou Water Supply Co., Ltd..2020. Guangzhou Water Supply Industry Service specification (Guangzhou Local Standard DB4401/T 13-2018) ("广州市供水行业服务规范 (广州市地方标准 DB4401/T 13-2018)") https://www.gzwatersupply.com/content /2c9180856f6535ae016fa3eae1281df5/2c918085719b97230171ba96572d1492.html

65. Guangzhou Daily.2020. Promote water saving in the whole society, Guangzhou declares as a national water-saving city (" 推动

66. Guangzhou Daily.2020. Guangzhou: Basically build a water-saving society by 2025 (" 广州: 2025 年基本建成节水型社会")

People's Government of Guangzhou Municipality.2016. Notice of the Guangzhou Municipal People's Government on Issuing the Implementation Plan of the Guangzhou Water Pollution Prevention and Control Action Plan (" 广州市人民政府关于印发广州市水 污染防治行动计划实施方案的通知 ") http://www.gz.gov.cn/gkmlpt/content/4/4435/post_4435826.html#12624

68. Dayoo News.2020. 269 water-saving communities in Guangzhou, rewards for water conversation (" 广州有 269 个节水型小区,节 约用水有奖励") https://news.dayoo.com/guangzhou/202010/10/139995 53597832.htm

69. Shenzhen Water Affairs Bureau.2020. Shenzhen Water Affairs Bureau's 2019 work summary and 2020 work plan ("深圳市水务 局 2019 年工作总结与 2020 年工作计划 ") <u>http://swj.sz.qov.cn/xxqk/zfxxqkml/qhjh/ndqzjhjzj/content/post_7756893.html</u>

70. Shenzhen Water Affairs Bureau.2020. Shenzhen Water Strategy 2035 ("深圳水战略 2035") http://swi.sz.gov.cn/

Shenzhen Water Affairs Bureau.2016. Emergency plan for water sources and water supply emergencies in Shenzhen (" 深圳市水 源和供水突发事件应急预案 ") http://swi.sz.gov.cn/gttgchment/0/351/351877/2922023.pdf

72. National Development and Reform Commission, Ministry of Water Resources, 2020, National Water Conservation Action Plan

73. Shenzhen Water Affairs Bureau.2018.Shenzhen Water Conservation Regulations ("深圳市节约用水条例") http://swi.sz.gov.cn/

74. Shenzhen Water Affairs Bureau.2020. Shenzhen Water Affairs Bureau water saving rewards ("深圳水务局节水奖励") http://swj.

75. Shenzhen Water Affairs Bureau.2020. Shenzhen Water Conservation Plan ("深圳市节约用水规划(2021-2035)") http://swi.

76. Nanfang Daily.2020. Guangdong builds a three-dimensional forest fire prevention and control network of "mountains, ground and air" (" 广东构筑森林火灾 " 山、地、空 " 立体防控网 "). http://news.southcn.com/gd/content/2020-11/01/content_191654788.

77. Guangdong Meteorological Service.2020. Early Warning Signals for Cities in Guangdong Province (" 广东省内城市预警信号 ").

Guangdong Meteorological Service.2020. Early warning and defense guidelines ("预警防御指引"). http://www.tgyb.com.cn/gz/

79. Guangzhou Fire Rescue.2020. Guangzhou City Fire Rescue Winter and Spring Fire Prevention and Control Work News and Media Briefing (" 广州市消防救援支队冬春火灾防控工作新闻媒体通气会"). https://cbgc.scol.com.cn/news/594100

Shenzhen Emergency Management Bureau.2020. Notice of Shenzhen Forest Fire Fighting Headquarters on Printing and Distributing "Shenzhen Forest Fire Emergency Plan (2020 Edition)" ("深圳市森林火灾应急预案(2020 年版)"). http://www.

Shenzhen Emergency Management Bureau.2020. Notice of the Municipal Safety Management Committee on Printing and Distributing the Action Plan for the Safe Development of Shenzhen's Construction of a Pilot Demonstration Zone of Socialism with Chinese Characteristics (2020-2025) ("市安全管理委员会关于印发深圳市建设中国特色社会主义先行示范区安全发展行动方案 (2020-2025年)的通知"). http://www.sz.gov.cn/cn/xxgk/zfxxgj/tzgg/content/post 8231961.html

Shenzhen Emergency Management Bureau.2020. Shenzhen Emergency Management Bureau Accident Early Warning (" 深圳市应

- 83. Shenzhen Emergency Management Bureau.2020. Shenzhen Emergency Management Bureau Emergency shelter (" 深圳市应急管 理局 应急避难场所"). http://yjql.sz.gov.cn/yjql/yjpncs/index.html
- 84. Shenzhen Fire Safety Committee.2018. Shenzhen City's work plan for creating a fire safety community ("深圳市创建消防安全社 区工作方案 "). http://www.szns.gov.cn/xxgk/bmxxgk/gzjj/xxgk/gt/tzgg/201802/P020180213360962930852.pdf
- 85. Shenzhen Education.2020. Province's 2020 elementary and middle school students "forest fire prevention" special education activities (" 全省 2020 年中小学生 " 森林防火 " 专题教育活动 ") http://szeb.sz.gov.cn/ydmh/xxgkw/yjgl/content/post 7253893. html
- 86. Party Working Committee of Meisha Street.2020. Xiaomeisha Community, Meisha Street, Yantian District, will carry out fire prevention and control community education (" 盐田区梅沙街道小梅沙社区开展今冬明春火灾防控宣传活动 ") http://www.yantian. gov.cn/cn/zjyt/jjyt/xgxx/content/post 8339328.html
- 87. Department of Emergency Management of Guangdong Province.2020. Shenzhen 2020 "Forest Fire Prevention Publicity Month" and "Forest Fire Prevention Open Day" (" 深圳市 2020 年 " 森林防火宣传月 " 暨 " 森林消防公众开放日 " 活动举行 ") http:// yjql.qd.qov.cn/xw/dsqzdt/content/post 3084814.html
- 88. Shenzhen Emergency Management Bureau.2020. Shenzhen successfully held the 2020 forest fire emergency drill ("深圳市成功 举办 2020 年森林火灾应急演练"). http://www.sz.gov.cn/cn/xxgk/zfxxgj/bmdt/content/post 8345183.html
- 89. Guangzhou Emergency Management Bureau.2019. General emergency plan for emergencies in Guangzhou (" 广州市突发事件总 体应急预案 "). http://yjglj.gz.gov.cn/zwgk/zcwj/qtwj/content/post_6437752.html
- 90. Guangzhou Land Resources and Planning Commission.2017. Special Planning of Guangzhou Sponge City (2016-2030) (" 广州市 海绵城市专项规划(2016 – 2030)") http://ghzyj.gz.gov.cn/gzlpc/ywpd_cxgh_tzgg/201707/43c933ee3aed4b42b2b3a422752 dcdfd/files/f5381be7638e466f93bc429e9adcd6e7.pdf
- 91. Guangzhou Water Affairs Bureau.2020. Guangzhou Water Affairs Bureau launches a joint operation exercise for exceeding standard floods in the Liuxi River Basin in 2020 (" 广州市水务局开展 2020 年流溪河流域超标准洪水联合调度演练 ") http://swj. gz.gov.cn/gkmlpt/content/6/6453/post 6453757.html?jump=false#1045
- 92. Department of Emergency Management of Guangdong Province.2020. Regulations of Guangdong Province on Flood Prevention, Drought Prevention and Wind Prevention (" 广东省防汛防旱防风条例") http://www.zc.gov.cn/zx/ztjj/yjgl/yjya/ content/post 5796415.html
- 93. Shenzhen Water Affairs Bureau.2020. Shenzhen flood prevention plan in 2019 ("2019 年深圳市防汛预案") http://swi.sz.gov.cn/ xxgk/zfxxgkml/yjgl/content/post 2921322.html
- 94. Shenzhen Municipal Planning and Natural Resources Bureau.2017. Special Planning and Implementation Plan for Shenzhen Sponge City Construction ("深圳市海绵城市建设专项规划及实施方案") http://www.sz.gov.cn/cn/xxgk/zfxxgj/ghjh/csgh/zxgh/ content/post 1317061.html
- 95. Shenzhen News.2020. Luohu District's 2020 Three-prevention Real Forces Pulling Comprehensive Emergency Drill (" 全方位提升 防汛救灾能力 罗湖举行三防应急演练 "). http://www.sznews.com/news/content/2020-08/14/content 23452676.htm
- 96. General Office of Shenzhen Municipal People's Government.2020. Luohu Holds 2020 Three-Prevention Real Force Pulling Comprehensive Emergency Drill (" 唱响 " 强军战歌 " 锤炼 " 作战 " 精兵 罗湖举行 2020 三防实兵拉动综合应急演练 ") http://www. sz.gov.cn/szzt2010/ygfk2020/szzxd/content/post 8001746.html
- 97. Shenzhen Water Affairs Bureau.2014. Shenzhen flood control plan revision and river improvement plan Revision report of flood control plan (2014 ~ 2020) ("深圳市防洪潮规划修编及河道整治规划 防洪潮规划修编报告(2014 ~ 2020)") http://swi.sz.gov.cn/ attachment/0/704/704978/8100259.pdf
- 98. Planning and Natural Resources Bureau of Shenzhen Municipality. 2018. Shenzhen Marine Environmental Protection Plan (2018-2035) (" 深圳市海洋环境保护规划(2018-2035 年)") https://pnr.sz.gov.cn/ywzy/ghzs/201810/P020181023652970817265.pdf
- 99. Home Affairs Department, Hong Kong Government. Emergency Relief Services. Home Affairs Department Public Services -Emergency Relief Services (had.gov.hk)
- 100. Korean e Country Index, S.Korea Government. 2020. "Temperature Trend" http://www.index.go.kr/potal/main/ EachDtlPageDetail.do?idx_cd=1400
- 101. National Assembly Budget Office, S.Korea Government. 2020. "Structural Changes of the Korean Economy and Response Strategy IV" http://nabo.go.kr
- 101. Korea Environment Institute (KEI). 2020 "2020 Heat Wave Influence Report" https://www.kei.re.kr/
- 102. Seoul Metropolitan Government. 2020. "Thirty Million Three Planting Project" https://news.seoul.go.kr/env/square/tree planting project
- 103. Korea Meteorological Administration, S.Korea Government. "Citizen Manual for Heat Wave" https://www.weather.go.kr/ weather/warning/safetyguide_heat.jsp

- contents.es?mid=a30336000000
- 108. National Drought Information Portal. S.Korea Government. http://www.drought.go.kr/
- table=5000&wr id=154&page=12
- Indicators for Estimation of Damage in Disaster Areas'
- enu=edu

- www.me.go.kr/home/web/policy_data/read.do?menuId=10262&seq=6656
- 118. Water Resources Management Information System (WAMIS), S.Koreg Government. http://www.wamis.go.kr/

- Damage on Underground Roads" https://opengov.seoul.go.kr/sanction/11599415
- opengov.seoul.go.kr/budget/17090915
- jsp?id=95083225
- eng/content/view.do?menuKey=691&contentKey=114
- seg=407094&rowIdx=435
- rehome/news/news_view.jsp?bbs_sno=121&page_count=16&1=1&bbs_man_sno=3

- com/pages/articles/257675
- tzgg/content/post 6469304.html

104. The Seoul Institute. "Measures to improve the ability to respond to heat waves in Seoul" 105. Korea Center for Disease Control & Prevention Portal https://www.kdca.go.kr/index.es?sid=a2 https://www.kdca.go.kr/

109. Seoul Energy Dream Center. Seoul Metropolitan Government. 2016. https://www.seouledc.or.kr/bbs/board.php?bo

110. National Drought Information Portal, Water Environment Information System. S.Korea Government http://water.nier.go.kr/ 111. Korea Research Institute for Human Settlements (KRIHS). 2020. "A Study on the Utilization of Satellite Images and Land

112. Korean Fire Protection Association (KFPA). "Fire Prevention Training Material" https://www.kfpa.or.kr/?menucode=30400&tm

113. National Law Information Center. S.Korea Government. 2020. "Electricity Safety Management Act" http://www.law.go.kr/%EB <u>%B2%95%EB%A0%B9/%EC%A0%84%EA%B8%B0%EC%95%88%EC%A0%84%EA%B4%80%EB%A6%AC%EB%B2%95</u>

114. Korea Meteorological Administration (KMA). 2020. "Korean Climate Change Assessment Report 2020"

115. Ministry of Environment. S.Korea Government. 2020. "The Third National Climate Change Adaptation Plan 2021- 2025" http://

116. Korea Hydrographic and Oceanographic Agency. S.Korea Government. 2020. "National Sea Level Rise Modelling Statistics" http://www.khoa.go.kr/user/bbs/detailBbsList.do?bbsMasterSeg=BOARD_MST_000000003&bbsSeg=BBS_0000006161

119. KBS News. 2020. "Flood Map - Public disclosure" https://tamsak.kbs.co.kr/floodriskmap/index.html

120. KBS News. 2020. "Natural Disaster Reduction Association Plan" http://news.kbs.co.kr/news/view.do?ncd=5061120

121. Seoul Information Communication Plaza. Seoul Metropolitan Government. 2013. "Report on Measures to Prevent Flood

122. Seoul Information Communication Plaza, Seoul Metropolitan Government, 2019. "2040 Plan for Sewage Maintenance" https://

123. Ministry of Land, Infrastructure and Transport. S.Korea Government. 2019. "Integrated Management Plan for 2020-2040 Land & Environment Plan including 5 Integrated Management Strategies" http://www.molit.go.kr/USR/NEWS/m 71/dtl.

124. CBD-CHM Korea. S.Korea Government. "National Biodiversity Strategy and Biodiversity Statistics" http://www.cbd-chm.go.kr/

125. Ministry of Environment. S.Korea Government. 2018. "Prohibition action on invasive species of South Korea" https:// moleg.go.kr/lawinfo/nwLwAnInfo.mo;jsessionid=ClavtPSSyHYOXwW8XwymsVlH.mo_usr20?mid=a1010602000&cs_

126. National Institute of Biological Resources (NIBR). S.Korea Government. 2013. https://species.nibr.go.kr/endangeredspecies/

127. Ministry of Environment, S.Korea Government. 2019. "Natural Environment Conservation Act" https://www.law.go.kr/%EB%B2 %95%EB%A0%B9/%EC%9E%90%EC%97%B0%ED%99%98%EA%B2%BD%EB%B3%B4%EC%A0%84%EB%B2%95

128. Ministry of Environment, S. Korea Government. 2020. "Hazardous Chemical Management Act" https://www.law.go.kr/%EB%B2 %95%EB%A0%B9/%ED%99%94%ED%95%99%EB%AC%BC%EC%A7%88%EA%B4%80%EB%A6%AC%EB%B2%95

129. Ministry of Environment, S. Korea Government, 2019. "Budget for Climate Adaptation Measures 2019" https://www.pressian.

130. Guangzhou Municipal Housing and Urban-Rural Development Bureau. 2020. Notice of the Guangzhou Municipal Bureau of Housing and Urban-Rural Development on earnestly doing a good job in the prevention of severe weather such as typhoons in the flood season (" 广州市住房和城乡建设局关于认真做好汛期台风等灾害性天气防御工作的通知") http://zfcj.gz.gov.cn/zjyw/zlag/

131. People's Government of Guanazhou Municipal.2019. Provisions of Guanazhou City on Prevention of Meteorological Disasters(" 广州市气象灾害防御规定 "). http://www.gz.gov.cn/zwgk/fggw/zfgz/content/post 4757126.html

132. People's Government of Guangzhou Municipal.2016. Notice of the General Office of the Guangzhou Municipal People's Government on Issuing the Emergency Plan for Flood Prevention, Drought, Wind, and Freezing in Guanazhou (" 广州市人民政府办 公厅关于印发广州市防汛防旱防风防冻应急预案的通知"). http://www.gz.gov.cn/zwgk/fggw/sfbgtwj/content/post_4758600.html

- 133. People's Government of Shenzhen Municipal. 2019. Measures for the Management of Water Conservation in Construction Projects (" 深圳市建设项目用水节水管理办法 ") http://www.gd.gov.cn/zwgk/wjk/zcfgk/content/post 2532246.html
- 134. People's Government of Shenzhen Municipal.2019. Measures for the Management of Water Conservation and Water Conservation in Construction Projects ("深圳市建设项目用水节水管理办法"). http://www.qd.gov.cn/zwqk/wjk/zcfqk/content/ post 2532246.html
- 135. PENG Jian , WEI Hai , WU Wenhuan , LIU Yanxu , WANG Yanglin.2018. Risk assessment of urban rainstorm and flood disaster based on land use change scenarios (" 基于土地利用变化情景的城市暴雨洪涝灾害风险评估 ") http://www.ecologica.cn/stxb/ch/ html/2018/11/stxb201708271546.htm
- 136. Meteorological Bureau of Shenzhen Municipality.2019. Shenzhen Typhoon Prevention Plan in 2019 ("2019 年深圳市防台风预案") http://weather.sz.gov.cn/szsqxjwzgkml/szsqxjwzgkml/qt/yjgl/content/post_5614372.html
- 137. Water Authority of Shenzhen Municipality.2014. Shenzhen flood control plan revision and river improvement plan Revision report of flood control plan (2014~2020) ("深圳市防洪潮规划修编及河道整治规划 防洪潮规划修编报告(2014~2020)") http://swj.sz.gov.cn/attachment/0/704/704978/8100259.pdf
- 138. Shenzhen Municipal Planning and Land Resources Commission.2016. Key Points and Review Rules of Shenzhen Sponge City Planning ("深圳市海绵城市规划要点和审查细则") http://www.sz.gov.cn/cn/xxgk/zfxxgj/tzgg/201703/ P020170314410812720232.pdf
- 139. Guangzhou Ecological Environment Bureau.2019. Introduction to Guangzhou Ecological Environment Bureau (" 广州市生态环境 局简介") http://sthij.gz.gov.cn/wzdh/gywm/content/post 2814147.html
- 140. People's Government of Guangzhou Municipal.2016. Notice of the Guangzhou Municipal People's Government on Issuing the Outline of the Ecological Civilization Construction Plan of Guangzhou (2016-2020) (" 广州市人民政府关于印发广州市生态文明建 设规划纲要(2016-2020年)的通知") http://www.gz.gov.cn/zwgk/fggw/szfwj/content/post_4757501.html
- 141. China (Guangdong) Pilot Free Trade Zone.2016. Announcement of the Office of Import and Export Administration of Endangered Species of the People's Republic of China ("中华人民共和国濒危物种进出口管理办公室公告") http://ftz.gd.gov.cn/ myl/content/post 918942.html#zhuyao
- 142. People's Government of Guangdong Province.2017. Notice of the People's Government of Guangdong Province on Issuing the Comprehensive Development Plan for the Coastal Economic Belt of Guangdong Province (2017-2030) (" 广东省人民政府关于印 发广东省沿海经济带综合发展规划(2017-2030年)的通知") http://www.gd.gov.cn/gkmlpt/content/0/146/post 146463.html#7
- 143. Ecological Environment Bureau of Shenzhen Municipal.2020. Ecological Environment Bureau of Shenzhen Municipal (" 深圳市生 态环境局") http://meeb.sz.gov.cn/xxgk/jgzn/jggk/
- 144. Ecological Environment Bureau of Shenzhen Municipal.2020. Division of Climate Change ("应对气候变化处") http://sthjj.gz.gov. cn/zwgk/jgszyzn/cs/content/post 2808316.html
- 145. People's Government of Guangzhou Municipal.2017. The 13th Five-Year Plan for Energy Conservation and Carbon Reduction("节能降碳第十三个五年规划") http://www.cnemission.com/article/news/ssdt/201705/20170500001278.shtml
- 146. Guangzhou Municipal Development and Reform Commission.2020. Guangzhou Municipal Development and Reform Commission (" 广州市发展和改革委员会 ") http://fgw.gz.gov.cn/
- 147. The State Council, The People's Republic of China.2019. Outline of Guangdong-Hong Kong-Macao Greater Bay Area Development Plan (" 粤港澳大湾区发展规划纲要") http://www.gov.cn/zhengce/2019-02/18/content_5366593.htm#1
- 148. Development and Reform Commission of Shenzhen Municipality.2017. Shenzhen's 13th Five-Year Plan for Climate Change(" 深 圳市应对气候变化"十三五"规划"). http://fgw.sz.gov.cn/zwgk/ghjh/zxgh/content/post_4561189.html
- 149. Development and Reform Commission of Shenzhen Municipality.2020. Development and Reform Commission of Shenzhen Municipality ("深圳市发展和改革委员会") http://fqw.qz.gov.cn/
- 150. Development and Reform Commission of Shenzhen Municipality.2020. The Shenzhen Municipal Development and Reform Commission held the second meeting of the Shenzhen Global Environment Facility Project Leading Group and the project kickoff meeting of the "Shenzhen Bainikeng Regional Sustainable Development Planning and Construction Management Research Based on the TOD Concept"("深圳市发展改革委召开深圳市全球环境基金项目领导小组第二次会议暨"基于 TOD 理念的深圳白坭坑区 域可持续发展规划建设管理研究"项目启动会") http://fgw.sz.gov.cn/gkmlpt/content/8/8241/post_8241133.html#2658
- 151. Shenzhen Municipal Ecological Environment Bureau.2020. Shenzhen Municipal Ecological Environment Special Fund Management Measures ("深圳市生态环境局深圳市财政局关于印发《深圳市生态环境专项资金管理办法》的通知") http://meeb.sz.gov. cn/xxgk/zcfg/zcfg/hblgfxwj/content/post 7964474.html

Paris Watch Key Facts: Governing Climate Action

- Council for Sustainable Development. 2020. Report on Public Engagement on Long-term Decarbonisation
- Low, Zoe. 2020. "Top Adviser Quits Hong Kong Climate Change Support Group." Posted online 12 October 2020. 2
- https://www.scmp.com/news/hong-kong/health-environment/article/3105037/top-adviser-guits-hong-kong-climate-change 3 HK Monetary Authority. 2020. Joint statement on the establishment of the Green and Sustainable Finance Cross-Agency Steering Group. https://www.hkma.gov.hk/eng/news-and-media/press-releases/2020/05/20200505-8/
- https://www.hkgreenfinance.org/greater-bay-grea-green-finance-allignce-officially-launched-today/ 4
- Asian Development Bank. 2018. 50 Climate Solutions for PRC Cities 5

Checklist for Effective Climate Goveance, Table 1-4

- Climate Analytics.
- 2. Engeco. 2020. Singapore's National Climate Change Strategy: Understanding the impact on your business.
- 3. Hong Kong Monetary Authority. 2020. White Paper on Green and Sustainable Banking
- Hong Kong University of Science and Technology. 2018. CARe2018 Hong Kong conference: Summary Report and Policy 4. Recommendations
- 5. National Climate Change Secretariat. 2020. Charting Singapore's Low-Carbon and Climate Resilient Future.
- 6. Securities and Futures Commission. 2020. Consultation Paper on the Management and Disclosure of Climate-related Risks by Fund Managers
- 7. World Resources Institute. 2014. Greenhouse Gas Protocol. Policy and Action Standard. (Adapted from Intergovernmental Panel on Climate Change. 2007. AR4 Assessment Report 4 (2007))
- UNFCCC. 2020. Singapore's Update of its First Nationally Determined Contribution (NDC) and Accompanying Information. 8. https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Singapore%20First/Singapore%27s%20Update%20of%20 1st%20NDC.pdf

Checklist for Effective Climate Goveance, Table 5

- ICLEI Local governments for Climate Action. 2020. https://iclei.org/en/members-search.html Accessed 20201910 C40 Cities. https://www.c40.org/cities Accessed 20201910 C40 Cities. 2020. Mayors Agenda for the Green and Just Recovery. https://www.c40.org/other/agenda-for-a-green-and-just-
- 1. 2.
- 3. recovery Accessed 20201910
- 4. 20201910
- 5. Global Covenant of Mayors. 2020. https://www.globalcovenantofmayors.org/our-cities/ accessed 20201019

Conclusion

- Environment Bureau. 2016. Hong Kong's Climate Action Plan 2030+ 1
- 2
- https://www.scmp.com/news/hong-kong/health-environment/article/3105037/top-adviser-guits-hong-kong-climate-change See for example: Verisk Maplecroft. 2020. 'Environmental Risk Outlook 2020'; China Water Risk. 2020 'Avoiding Atlantis: The 3 CWR APACCT 20 Index'; and China Water Risk. 2020. "20 City Factsheets: At-a-glance coastal threat assessment for 20 APAC cities"
- 4 https://www.c40.org/other/agenda-for-a-green-and-just-recovery

1. Climate Action Tracker. 2019. Climate Governance: Assessing governments' ability and readiness to transform their countries into zero emissions societies. CAT Climate Governance Series. Methodology Note September 2019. New Climate Institute &

CDP. 2019. 2019 City Wide emissions. https://data.cdp.net/Emissions/2019-City-wide-Emissions/542d-zyj8 Accessed

Low, Zoe. 2020. "Top Adviser Quits Hong Kong Climate Change Support Group." Posted online 12 October 2020.

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