



PEOPLE'S REPUBLIC OF CHINA— HONG KONG SPECIAL ADMINISTRATIVE REGION

SELECTED ISSUES

March 2022

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PEOPLE'S REPUBLIC OF CHINA—HONG KONG SPECIAL ADMINISTRATIVE REGION

SELECTED ISSUES

January 26, 2022

Approved By
**Asia and Pacific
Department**

Prepared by a team led by Joong Shik Kang, authored by Phakawa Jeasakul (Resident Representative in Hong Kong SAR).

CONTENTS

CLIMATE CHANGE: ACHIEVING CARBON NEUTRALITY AND PREPARING FOR A LOW-CARBON ECONOMY	2
A. Introduction	2
B. De-Carbonization Efforts	3
C. Adaptation to Climate Change	10
D. Transition Toward a Low-Carbon Economy	13
E. Conclusion	20
References	26
BOXES	
1. A Brief History of Climate Mitigation Efforts	22
2. Green and Sustainable Finance Landscape in Hong Kong SAR	23
FIGURES	
1. Carbon Emissions	4
2. Fuel Mix for Electricity Generation	7
3. Electricity Consumption	8
4. Transportation and Carbon Emissions	10
5. Climate Change Effects	12
6. Climate-Related Financial Risks	16
7. Green Finance Landscape	25
TABLE	
1. Climate Mitigation Targets and Their Progress	5

CLIMATE CHANGE: ACHIEVING CARBON NEUTRALITY AND PREPARING FOR A LOW-CARBON ECONOMY¹

Hong Kong SAR has made significant efforts to address climate change over the last decade, and its progress in achieving net zero carbon emissions is relatively advanced compared with international peers. Following its latest commitment to achieve carbon neutrality before 2050, the government recently issued an updated climate action plan to de-carbonize electricity generation, embrace greater energy saving, adopt green transportation, and enhance waste management. An introduction of additional carbon pricing mechanisms can help support the ongoing efforts of reducing carbon emissions by inducing necessary changes of private sector behavior. Given its exposure to extreme weather events, rising sea levels and other repercussions from climate change, Hong Kong SAR should continue its climate adaptation efforts. Meanwhile, an efficient, resilient green and sustainable finance ecosystem can strengthen Hong Kong SAR's position as a green finance hub and support global efforts to mobilize private sector financing for substantial green investment needs during the transition to a low-carbon economy while safeguarding financial stability against physical and transition climate-related risks.

A. Introduction

1. Climate change presents a major threat to long-term economic prosperity and people's well-being. The Intergovernmental Panel on Climate Change (IPCC), a United Nations body, in its [August 2021 report](#) found that human influence is the main driver for global warming and indicated that a best estimate of equilibrium climate sensitivity is 3°C.² The 26th United Nations Climate Change Conference of the Parties ([COP26](#)) aims to secure global net zero emissions by mid-century and keep global warming at 1.5°C. There are growing concerns that unless there are immediate, rapid and large-scale reduction in greenhouse gas emissions, limiting global warming to close to 1.5°C or even 2°C will be beyond reach. Recent studies suggested the global warming at 2°C would have widespread and severe impacts on people and nature, leading to health problems, more heat-related deaths, serious food and water shortages, and significant economic costs.

2. Hong Kong SAR has adopted a three-pronged strategy to deal with climate change. The climate policy initiatives have focused on mitigating carbon emissions, adapting to climate change, and enhancing resilience to climate-related risks. The mitigation efforts have mainly relied on phasing out coal-fired electricity generation, tightening regulations and facilitating the adoption of green technology (for example, renewable energy and green transportation) to contain and reduce carbon emissions. Meanwhile, the adaptation and resilience efforts have focused on enhancing the resilience of Hong Kong SAR's infrastructure and its society to physical threats posed by climate change such as extreme weather events and rising sea levels. In addition, efforts have been made to

¹ Prepared by Phakawa Jeasakul (Resident Representative in Hong Kong SAR) with input from Hong Xiao (Resident Representative Office).

² The equilibrium climate sensitivity is the technical term of the long-term temperature rise.

promote the development of the green and sustainable finance ecosystem and deal with climate-related financial stability risks.

3. This Selected Issue discusses relevant climate change issues in Hong Kong SAR. Section B reviews Hong Kong SAR's de-carbonization efforts, including the recently announced "Hong Kong's Climate Action Plan 2050", an updated action plan released in October 2021. The section also discusses additional policy options that could help Hong Kong SAR achieve its carbon neutrality objective before 2050. Section C covers Hong Kong SAR's adaption to climate change, with a focus on major challenges and ongoing policy initiatives. Section D discusses key issues pertinent to the transition toward a low-carbon economy, including safeguarding financial stability, developing the green and sustainable finance ecosystem, and mitigating the social impact from higher carbon prices. Section E concludes with a summary of essential actions going forward.

B. De-Carbonization Efforts

Overall Situation

4. Hong Kong SAR's progress in achieving net zero carbon emissions is relatively advanced compared with international peers. Hong Kong SAR's total greenhouse gas emissions have been on a downward trend after reaching its peak in 2014 (Figure 1). Total emissions amounted to 40.1 million metric tons of CO₂-equivalent in 2019, down from 44.6 million metric tons in 2014. Similarly, per-capita emissions have been declining, dropping to 5.3 metric tons in 2019. A preliminary estimate also suggests that per-capita emissions would be about 4.5 metric tons in 2020, as the power plants have phased out coal with natural gas in electricity generation. In comparison with other advanced economies as of 2019, Hong Kong SAR's per-capita carbon emissions were among the lowest, while its carbon intensity was at the average level of international peers. Its relatively low carbon emissions reflect the fact that Hong Kong SAR is a services-oriented economy driven by less carbon-intensive activities. However, consumption-based carbon emissions, which account for emissions embedded in goods and services consumed by Hong Kong SAR residents, estimated to be about 2.5 times of actual emissions in 2018, are still high relative to international peers.³ This feature highlights the importance of Hong Kong SAR to embrace greener lifestyles and strive for greater energy saving to support global efforts of achieving carbon neutrality.

5. Electricity generation is the main source of carbon emissions in Hong Kong SAR. In 2019, electricity generation accounted for 66 percent of total emissions, with buildings being the primary source of electricity consumption. In Hong Kong SAR, the majority of daily personal and business activities are taking place in skyscrapers, resulting in substantial demand for electricity to operate

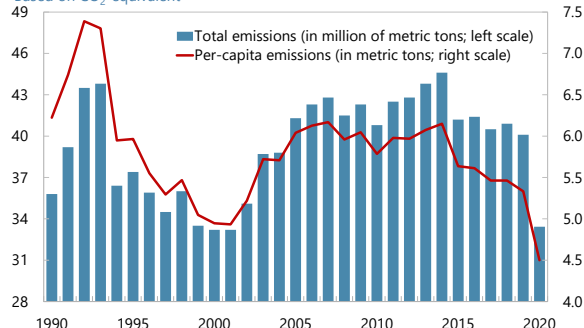
³ There are no international standards on measuring consumption-based carbon emissions. The reported figures are from [Ourworldindata.org](https://ourworldindata.org), which derives the estimates by adjusting domestic carbon emissions for embedded carbon emissions in imports and exports.

Figure 1. Hong Kong SAR: Carbon Emissions

HKSAR's total carbon emissions have been declining after reaching a peak in 2014, ...

HKSAR: Green House Gas Emissions

Based on CO₂-equivalent

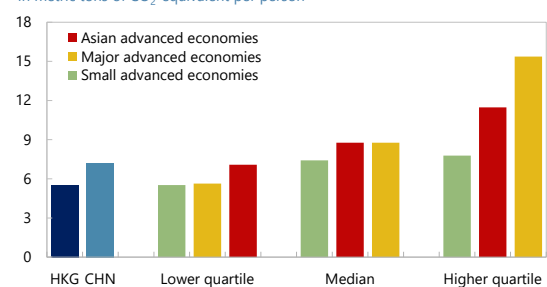


Sources: Hong Kong's Climate Action 2050; Hong Kong SAR's Census and Statistics Department; IMF, World Economic Outlook database; and IMF staff calculations.

While HKSAR's actual per-capita carbon emissions are among the lowest, ...

Actual Carbon Emissions, 2019

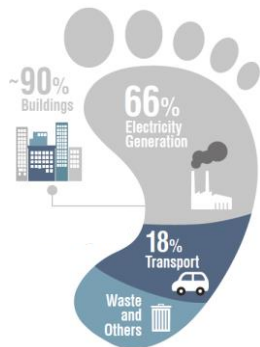
In metric tons of CO₂-equivalent per person



Sources: IMF, World Economic Outlook database; Ourworldindata.org; and IMF staff calculations. Note: Major advanced economies include all G-20 advanced economies. Small advanced economies include Austria, Belgium, Denmark, Finland, Ireland, Luxembourg, New Zealand, Norway, Singapore, Sweden, and Switzerland.

In HKSAR, electricity generation accounts for about two-thirds of carbon emissions, ...

Carbon Footprint, 2019

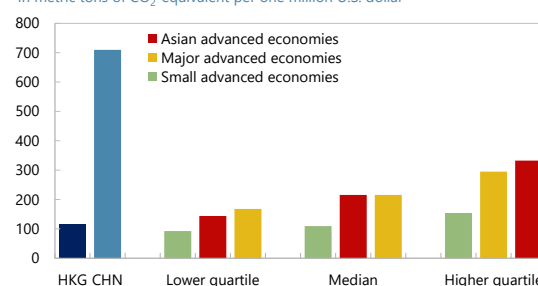


Source: Hong Kong's Climate Action Plan 2050.

... while its carbon intensity is at the average level of advanced economy peers.

Carbon Intensity, 2019

In metric tons of CO₂-equivalent per one million U.S. dollar

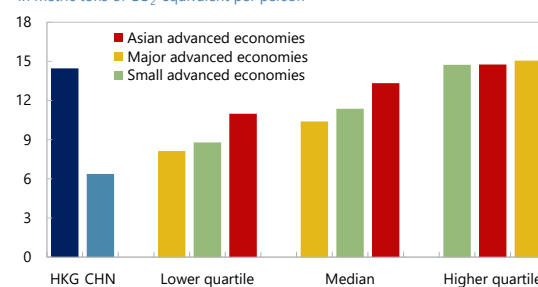


Sources: IMF, World Economic Outlook database; Ourworldindata.org; and IMF staff calculations. Note: Major advanced economies include all G-20 advanced economies. Small advanced economies include Austria, Belgium, Denmark, Finland, Ireland, Luxembourg, New Zealand, Norway, Singapore, Sweden, and Switzerland.

... its consumption-embedded carbon emissions per persons were still relatively high.

Embedded Carbon Emissions in Consumption, 2018

In metric tons of CO₂-equivalent per person

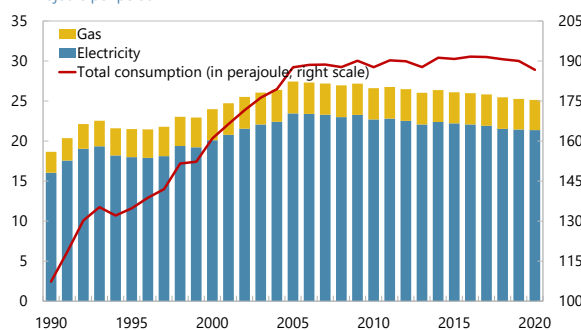


Sources: IMF, World Economic Outlook database; Ourworldindata.org; and IMF staff calculations. Note: Major advanced economies include all G-20 advanced economies. Small advanced economies include Austria, Belgium, Denmark, Finland, Ireland, Luxembourg, New Zealand, Norway, Singapore, Sweden, and Switzerland.

... while per-capita electricity usage has declined moderately over the past decade.

Consumption of Electricity and Gas

In kilojoule per person



Sources: Hong Kong SAR's Census and Statistics Department; IMF, World Economic Outlook database; and IMF staff calculations.

largest source of carbon emissions is transportation, accounting for 18 percent of total emissions. Other emission sources include waste (7 percent, mainly from landfills), other end use of fuel (5 percent), and industrial processes and product use (4 percent). Hong Kong SAR's statistics on inventory of carbon emissions do not capture emissions from international aviation and maritime transportation, which represent important economic activities.⁴

Table 1. Hong Kong SAR: Climate Mitigation Targets and Their Progress			
Announcement		Target (relative to the 2005 level)	Progress (as of 2020)
2010	Chief Executive Policy Address	Reduce carbon intensity by 50-60 percent (from the 2005 level) by 2020	Reduced by 35.4 percent 2019
		Reduce per-capital carbon emissions to 3.6-4.5 metric tons by 2020	4.5 metric tons*
2017	Hong Kong's Climate Action Plan 2030+	Reduce carbon intensity by 65-70 percent (from the 2005 level) by 2030	Reduced by 35.4 percent in 2019
		Reduce total carbon emissions by 20 percent by 2020 and 26-36 percent (from the 2005 level) by 2030	Reduced by 2.9 percent in 2019
		Reduce per-capita carbon emissions to 3.3-3.8 metric tons by 2030	4.5 metric tons*
2020	Chief Executive Policy Address	Achieve carbon neutrality before 2050	...
2021	Chief Executive Policy Address and Hong Kong's Climate Action Plan 2050	Reduce total carbon emissions by 50 percent (from the 2005 level) before 2035	...

Note: * indicates a preliminary estimate.

6. The Hong Kong SAR government has been continually implementing climate mitigation measures in the past few decades. Hong Kong SAR has been participating in international cooperation on climate change, such as under the United Nations Framework Convention on Climate Change as a member of the Chinese delegation (see Box 1 for more detailed discussion about a brief history of climate mitigation efforts). Hong Kong SAR's first climate mitigation target was set in 2010, with a goal to reduce carbon intensity by 50-60 percent from the 2005 level by 2020. In 2017, the government announced a climate action plan "[Hong Kong's Climate Action Plan 2030+](#)", which further advanced its climate mitigation efforts. The action plan envisaged a new carbon intensity reduction target of 65-70 percent from the 2005 level by 2030, which would be equivalent to a reduction of total emissions by 26-36 percent and a reduction of per-capita emissions to 3.3-3.8 metric tons of CO₂-equivalent. The action plan envisaged reducing coal usage in the electricity fuel mix, increasing renewable energy, enhancing energy efficiency in buildings and infrastructure, and promoting green transportation. Despite continual efforts, Hong Kong SAR still

⁴ In line with the IPCC's guideline, international aviation and maritime transportation are not included in the national inventory. Such carbon emissions are reported as memo items in China's national statistics. Hong Kong SAR has participated in global efforts, which are led by the International Civil Aviation Organization and the International Maritime Organization, to reduce carbon emissions in these two sectors.

fell short of one of its previously announced climate mitigation targets (Table 1), pointing to the need for more ambitious and readily implementable action plans to support the global efforts of achieving carbon neutrality.

Mitigation Strategy

7. Hong Kong SAR strives to achieve carbon neutrality before 2050, with the climate action plan being updated in October 2021. Chief Executive Carrie Lam made such a commitment in the [Chief Executive's 2020 Policy Address](#). Subsequently, the government updated the climate action plan "[Hong Kong's Climate Action Plan 2050](#)", which sets a more ambitious intermediate target to reduce total carbon emissions by 50 percent from the 2005 level before 2035. The action plan develops a strategy to tackle major sources of carbon emissions in Hong Kong SAR, namely, electricity generation, transportation and waste. The overall strategy thus builds on four pillars, including: (i) reducing the use of fossil fuel and expediting the use of zero-carbon energy for electricity generation; (ii) promoting energy saving and green buildings; (iii) bolstering green transportation, including the adoption of electric vehicles; and (iv) tackling waste management, including through development of waste-to-energy facilities. These key measures are expected to help reduce carbon emission by about 90 percent; the remaining carbon emissions would be dealt with through the development and application of low-carbon technology.

8. The Hong Kong SAR government has stepped up de-carbonization efforts, backed by a climate budget. In addition to the Steering Committee on Climate Change and Carbon Neutrality chaired by the Chief Executive,⁵ the government recently announced the creation of the Office of Climate Change and Carbon Neutrality to strengthen coordination and promote de-carbonization. The government also plans to allocate about HK\$240 billion in the next 15-20 years to implement mitigation and adaption measures to combat climate change.⁶ Furthermore, as part of the overall strategy to address climate change challenges, the government plans to: (i) promote technology and innovation with a focus on the application of de-carbonization technology for Hong Kong SAR; (ii) advancing capacity building, including the introduction of relevant curricula to tertiary education; and (iii) intensifying public engagement in recognition of the need to promote low-carbon lifestyles for Hong Kong SAR residents.

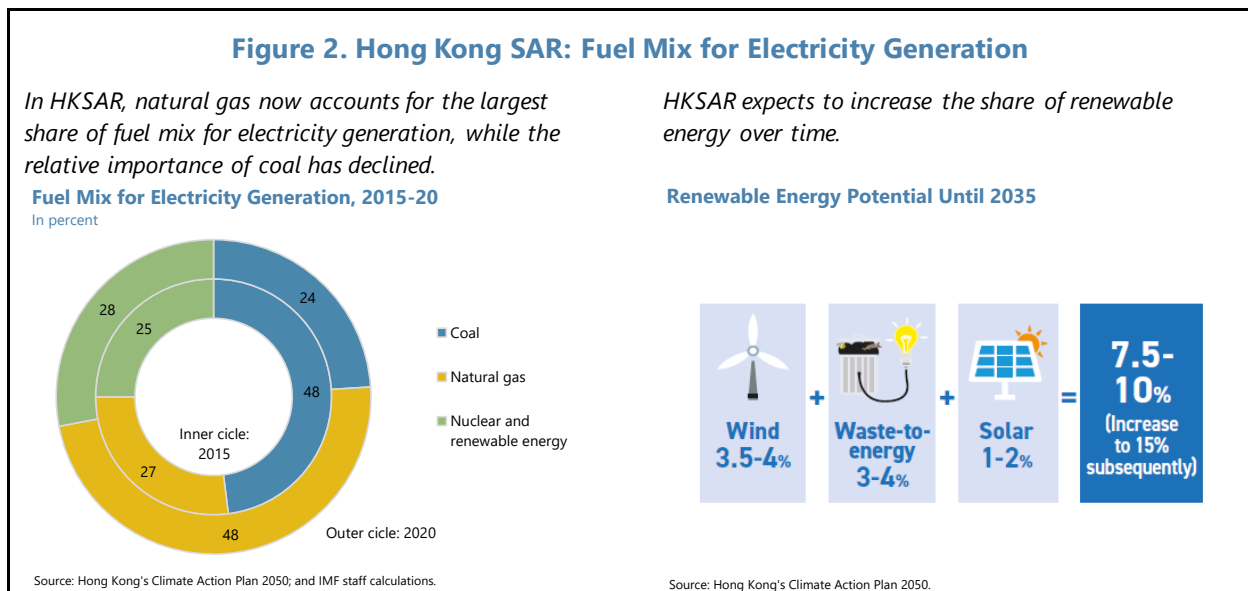
9. A successful adoption of zero-carbon energy is crucial for Hong Kong SAR to achieve carbon neutrality. Coal used to be a major fuel source for electricity generation in Hong Kong SAR, and its usage in the electricity fuel mix has declined sharply to 24 percent in 2020 from 48 percent in 2015 (Figure 2). In 1997, the government took a decision of not allowing the construction of new coal-fired power plants. Natural gas has become a more important fuel source for electricity generation in recent years, with its share in the electricity fuel mix rising to 48 percent in 2020.

⁵ The Steering Committee on Climate Change and Carbon Neutrality was created in 2021, with members comprising relevant policy bureaus and departments. Previously, the Steering Committee on Climate Change had been a key coordination platform since its establishment in 2016.

⁶ Over the past decade, the government has allocated over HK\$47 billion to implement various climate-related initiatives.

Furthermore, there is a plan to further improve the thermal efficiency of existing gas-fired power plants from 37 percent currently by installing new generation units with thermal efficiency of 60 percent. The updated climate action plan sets a target to achieve net-zero electricity generation before 2050. Considering safety, reliability, affordability, and environmental performance as the four important factors in developing zero-carbon energy, the government has adopted the following strategy:

- **Phasing out coal-fired electricity generation.** Hong Kong SAR will cease using coal for daily electricity generation by 2035 and will only keep it for providing back-up support.
- **Advancing development of renewable energy.** Currently, renewable energy (from solar and wind) accounts for less than 1 percent in the fuel mix for electricity generation. The government aims to increase the share of renewable energy to 7.5-10 percent by 2035 and to 15 percent afterwards, considering geographical and environmental constraints. Building on the Feed-in Tariff Scheme introduced in 2018,⁷ the government plans to take the lead in installing renewable energy systems at its premises, developing waste-to-energy facilities, and facilitating renewable projects locally and through regional cooperation.
- **Exploring other types of zero-carbon energy.** The government plans to explore different types of zero-carbon energy for electricity generation (for example, green hydrogen energy) with a view to adopting them when the technology becomes relatively mature. The government also plans to enhance regional cooperation to increase the supply of zero-carbon energy.⁸



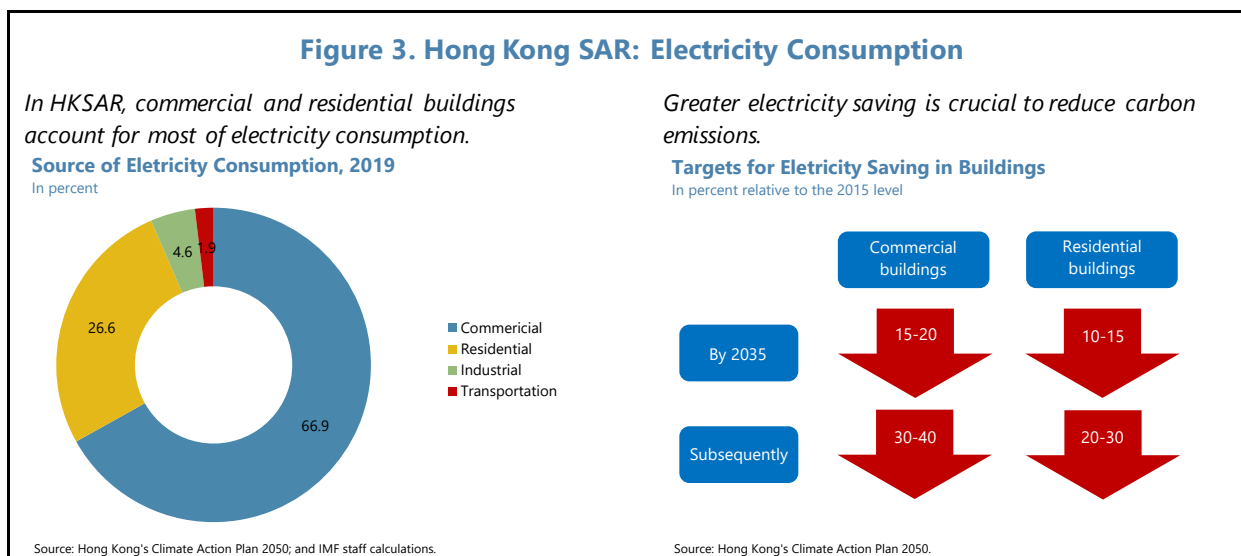
10. Greater energy conservation and improved energy efficiency of buildings would help reduce energy demand and carbon emissions.

Commercial and residential buildings accounted

⁷ The Feed-in Tariff Scheme enables power companies to purchase electricity generated by renewable energy systems of the private sector at a rate higher than the electricity tariff.

⁸ Currently, nuclear energy from Mainland China accounts for about a quarter in Hong Kong SAR's electricity fuel mix.

for 67 and 27 percent of electricity consumption, respectively, pointing to the importance of energy saving in reducing carbon emissions. The updated climate action plan sets ambitious energy saving targets for both commercial and residential buildings, supported by measures to enhance energy efficiency performance of buildings and appliances (Figure 3). The overall strategy relies on: (i) strengthening the regulatory framework, including the building energy efficiency standards, the Mandatory Energy Efficiency Labelling Scheme for appliances, and the regulation of buildings with high energy consumption such as data centers; (ii) encouraging energy efficiency performance through enhancing energy data transparency and using accredited certification schemes; (iii) mandating the implementation of identified energy management opportunities based on energy audits; (iv) promoting the use of energy management technology; and (v) employing more efficient energy infrastructure such as district cooling systems in new development areas.



11. Adopting green transportation would help de-carbonize the transportation sector, which is the second largest source of carbon emissions. Hong Kong SAR's per-capita transport-related carbon emissions are relatively low in comparison with other major cities given its well-developed railway-dominant public transportation system that accounts for about 90 percent of daily passenger trips. Nevertheless, the electrification of vehicles and ferries remains critical to help Hong Kong SAR achieve carbon neutrality. To incentivize the adoption of electric vehicles, the government has provided concessions on the first registration tax to private car owners who replace their old vehicles with electric vehicles, while the first registration tax has been fully waived for electric commercial vehicles.⁹ In 2021, the government announced the target to cease new registration of fuel-propelled and hybrid private cars in 2035 or earlier. The updated climate action plan also envisages (i) developing infrastructure for electric vehicles (for example, charging

⁹ Thanks to the one-for-one replacement scheme for private cars, about one-fifths of newly registered private cars are electric vehicles. As of mid-2021, electric vehicles accounted for about 3 percent of total private cars.

stations),¹⁰ (ii) exploring the use of new-energy public/commercial vehicles and ferries, and (iii) strengthening traffic management measures, including the use of congestion charges.

12. More efficient waste management would help address waste-related carbon emissions.

Waste accounts for about 7 percent of total carbon emissions, and decomposition of waste in landfills contribute to over 90 percent of such emissions. Hence, the government aims to move away from the reliance on landfills for municipal waste disposal by 2035 by developing waste-to-energy facilities, promoting waste reduction (including through waste charges from 2023), boosting recycling efforts, and controlling the use of single-use plastics.

Policy Discussion

13. The updated climate action plan is ambitious but faces challenges and shortfalls. The action plan aims to achieve carbon neutrality for electricity generation, transportation, and waste management—the three main sources of carbon emissions. One key challenge of the action plan is its various components rest on the to-be-developed technology—for example, green hydrogen energy for electricity generation and more reliable, powerful engines for green vehicles that can be safely used in mountainous areas. To mitigate the risk that the emissions reduction strategy may fall short of their targets should expected technology be not available within the timeframe, more proactive actions may be warranted—for example, a priority could be given to explore regional collaboration on developing renewable energy in Mainland China to secure a reliable electricity supply.¹¹ Furthermore, there are many old, poorly maintained buildings in Hong Kong SAR, and the ability to enhance their energy efficiency remains unclear, with multi-folded challenges potentially due to structural conditions, financial resources, and legal complications (particularly, in a case of multiple, divided ownership of a building).¹² On the transportation front, the constant growth of private cars has led to traffic congestion, which in turn results in greater carbon emissions (Figure 4).

14. The government could consider introducing carbon pricing mechanisms to complement ongoing de-carbonization efforts. Hong Kong SAR currently imposes duties on hydrocarbon oil,¹³ which are the only form of carbon taxation. Consideration could be made to adopt more carbon pricing mechanisms to incentivize energy saving, promote green transportation,

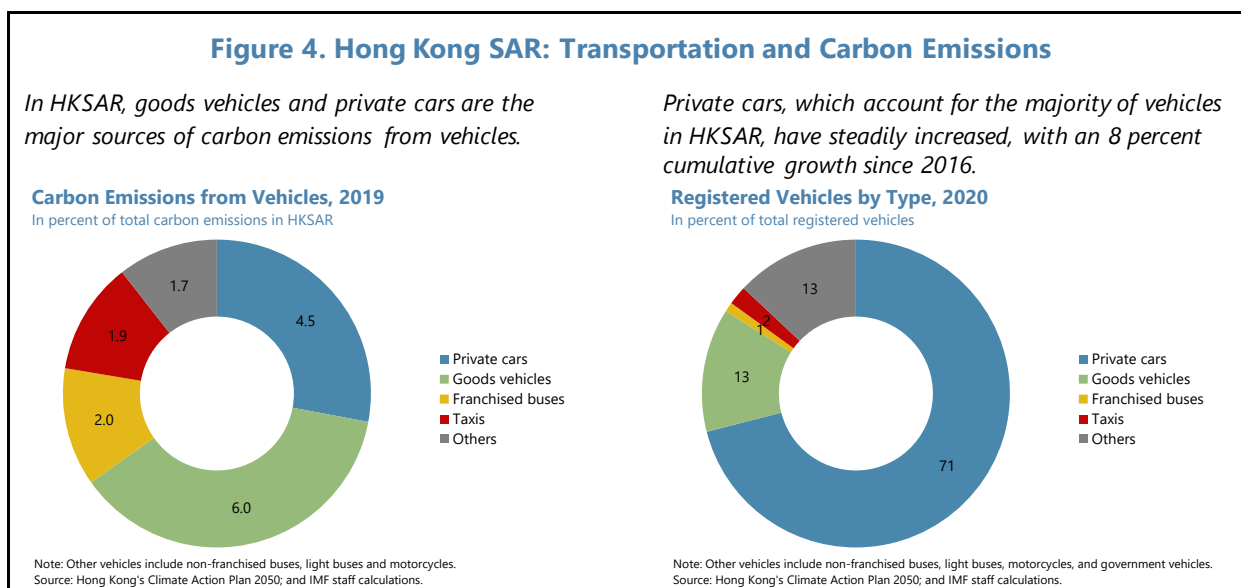
¹⁰ In October 2020, a scheme was launched to subsidize the installation of electric vehicle charging infrastructure in private residential buildings.

¹¹ Given the pivotal role of technological development and adoption, the government set up the Green Tech Fund in 2020, with an initial funding of HK\$200 million, to provide funding support for de-carbonization research and development projects.

¹² To help overcome the lack of sufficient financial resources, subsidy schemes have been set up by the two power companies (under the current scheme of control agreements) to support various types of buildings to undertake energy-saving improvement work.

¹³ The [current duty rates](#) per liter are HK\$6.51 for aircraft spirit, HK\$ 6.06-6.82 for motor spirit, HK\$2.89 for light diesel and ultra-low Sulphur diesel, and zero for Euro V diesel.

and encourage green lifestyles.¹⁴ The planned waste charges, which will be implemented in 2023, are a good example. Additional carbon pricing mechanisms such as a progressive electricity tariff scheme and a progressive mileage-based vehicle taxation scheme could be introduced,¹⁵ and they could be designed to reflect the cost of embedded carbon emissions in line with prevailing global carbon prices. These demand-side measures could help induce changes in people's behavior and businesses' operations, thus reducing carbon emissions embedded in their consumption. In addition, more feebate schemes, similar to the existing one-for-one replacement scheme for private cars, could be implemented to help alter the relative prices of green and carbon-intensive activities in other areas.



C. Adaptation to Climate Change

Challenges Posed by Climate Change

15. Hong Kong SAR is exposed to a variety of risks stemming from climate change. The effects of climate change have already emerged, with Hong Kong SAR experiencing higher temperatures, more frequent extreme weather events, and rising sea levels (Figure 5). With a high concentration of buildings, Hong Kong SAR is subject to a so-called “urban heat island” effect, which makes the urban area significantly warmer than the surrounding areas. High temperatures could in turn put human health under threat and raise energy consumption for cooling. Extreme weather events such as tropical cyclones and rainstorms could become more frequent, and their interaction

¹⁴ Carbon taxes can be a highly effective mitigation tool for the Asia and the Pacific region, especially when supported by complementary measures to compensate those affected by higher energy prices ([IMF Departmental Paper No. 2021/007](#)).

¹⁵ A progressive mileage-based taxation scheme for vehicles could help generate fiscal revenues to offset the prospective decline in duties on hydrocarbon oil.

with rising sea levels could result in higher storm surges.¹⁶ In addition, Hong Kong SAR could encounter extremely wet years or extremely dry years, with the latter potentially putting water resources at significant risk. The global rise in sea levels could also lead to coastal changes all over the world, including in Hong Kong SAR.

16. Hong Kong SAR's financial system has been affected by climate-related physical risks.

Hong Kong SAR is increasingly exposed to extreme weather events, which could create significant property damages and thus potential losses to financial institutions. For example, according to the Hong Kong Federation of Insurers report, total claims incurred by Super Typhoon Mangkhut in September 2018 amounted to HK\$3.1 billion of which about three quarters were related to property damages. Furthermore, using past climate disaster data, the 2021 Financial Sector Assessment Program (FSAP) found that Hong Kong SAR insurers' equity prices have been already adversely affected by physical risks—notably, floods, storms, and landslides.¹⁷ Meanwhile, the effects on Hong Kong SAR banks' equity prices remains limited so far as their profitability has not been much affected. However, banks could be increasingly at risk over time as the value of properties taken as collateral is hit by extreme weather events and/or located in areas vulnerable to seawater inundation.

Adaptation and Resilience Efforts

17. The government has taken steps to deal with physical risks due to climate change, focusing on both adaptation and resilience efforts. The adaption efforts aim to enhance Hong Kong SAR's infrastructure to combat various physical threats posed by climate change, while the resilience efforts aim to improve the readiness of the society to cope with extreme weather conditions.

- ***Combating rising sea levels.*** Hong Kong SAR's coastal and low-lying locations are vulnerable to flood risk due to rising sea levels over time as well as storm surges during inclement weather. The government has carried out investigations of the impact of climate change on these locations and will formulate a long-term strategy for coastal protection.
- ***Combating extreme rainstorms and tropical cyclones.*** Climate change increases rainfall intensity, thus heightening flood risk. The government has adopted a three-pronged flood prevention strategy that features stormwater interception at upstream, flood storage at midstream, and drainage improvement at downstream. The government has also taken steps to ensure that railway and road infrastructure would be resilient to flood risk. Given Hong Kong SAR's mountainous landscape, intense rainstorms increase landslide risk. In response, the government aims to strengthen the slope safety systems to minimize the potential impact of landslides during extreme rainstorms.

¹⁶ For example, Super Typhoon Mangkhut, which hit Hong Kong SAR in September 2018, induced a storm surge that raised water levels by more than two meters.

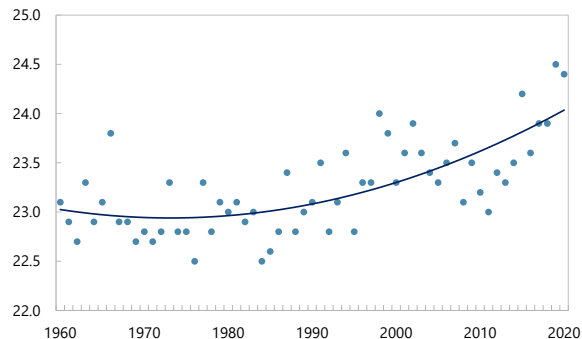
¹⁷ See Financial System Stability Assessment report for Hong Kong SAR (IMF Country Report No. 21/102).

Figure 5. Hong Kong SAR: Climate Change Effects

In HKSAR, the average annual temperature has increased by about 1.5 degrees Celsius since the 1980s.

Average Annual Temperature

In degrees Celsius

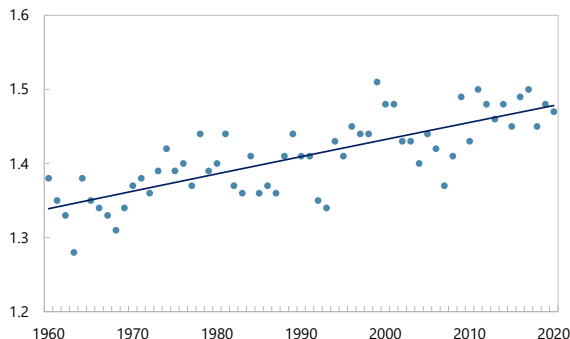


Sources: Hong Kong Observatory; and IMF staff calculations.

The sea level has risen by almost 10 centimeters over the same period.

Average Annual Sea Level

In meters

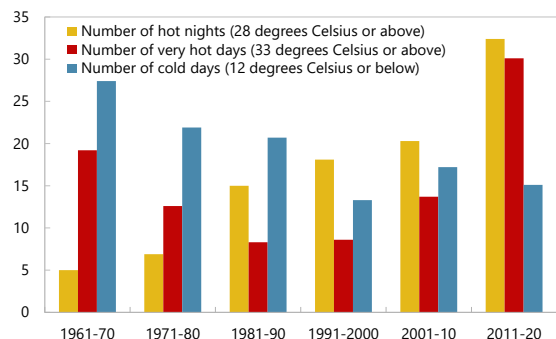


Sources: Hong Kong Observatory; and IMF staff calculations.

Hot nights and very hot days are occurring more frequently, while cold days become less often.

Frequency of Extreme Weather Conditions

In days per year, average over a decade

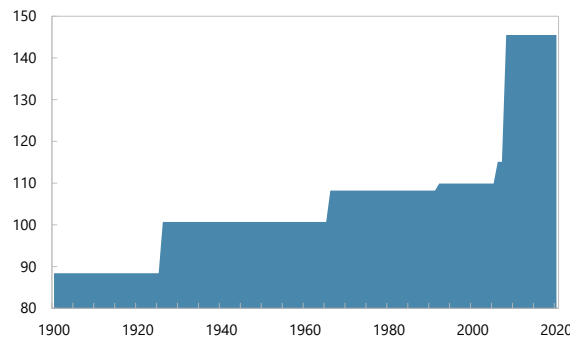


Sources: Hong Kong Observatory; and IMF staff calculations.

It has also taken fewer decades for heavy rainfalls to reach a new record.

Hourly Rainfall Record

In millimeters

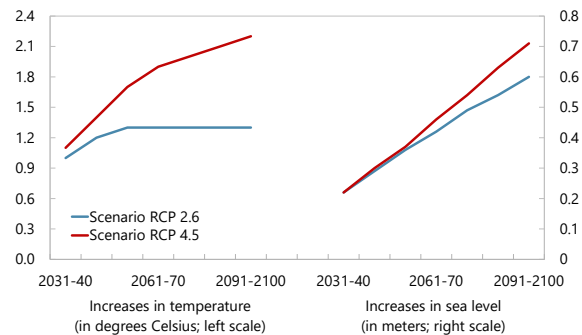


Sources: Hong Kong Observatory; and IMF staff calculations.

As the globe gets warmer, the sea level will continue rising, ...

Projected Increases in Temperature and Sea Level

Relative to 1986-2005 level; Based on mean projections

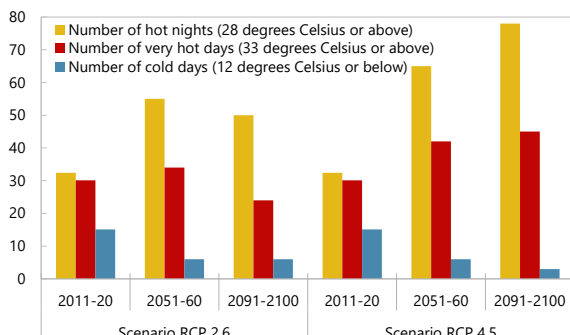


Sources: Hong Kong Observatory; and IMF staff calculations.

... and extreme weather conditions will also become more frequent.

Projected Frequency of Extreme Weather Conditions

In days per year; Based on mean projections



Sources: Hong Kong Observatory; and IMF staff calculations.

Note: The representative concentration pathway (RCP) is a greenhouse gas concentration trajectory. Under the RCP 4.5, the mean temperature rise in Hong Kong SAR by the end of the 21st century will likely be between 1.4 and 3.2 degrees Celsius.

- **Combating extreme droughts and safeguarding water supply.** The government has developed a water management strategy, which adopts a two-pronged approach focusing on containing freshwater demand growth and building the resilience in the freshwater supply. The former focuses on water conservation, water loss management and expansion of the use of lower-grade water for non-potable purposes, while the latter aims to secure diversified water resources to cope with extreme effects of climate change.
- **Combating extreme heat.** The government has promoted green buildings, urban forestry, and a sustainable built environment to alleviate the urban heat island effect. In the anticipation of more extreme temperatures in the future, the government will conduct a review to ensure proper technical requirements for building construction in part due to the prevalence of skyscrapers in Hong Kong SAR.
- **Coping with natural disasters at a higher frequency.** Extreme weather events are expected to become more frequent due to climate change. As a result, the government has developed contingency plans with a view of enhancing Hong Kong SAR's preparedness for, emergency response to and recovery from natural disasters. The government has also developed a weather warning system to help both the public and the government to prepare for taking appropriate preparatory and precautionary measures in the face of extreme weather conditions.

18. Financial institutions are required to step up their efforts to manage climate-related physical risks. In May 2019, the Hong Kong Monetary Authority (HKMA) adopted a three-phased approach to promote green and sustainable banking, part of which aims to mitigate risk of potential physical damages caused by climate change (see Section D below for more detailed discussion of the HKMA's strategy). Such damages may involve credit losses induced by damaged collateral as well as other liabilities arising from being held responsible for the effects of climate change. Furthermore, insurers need to properly account for the impact of climate change, including by ensuring prudent underwriting of insurance products that would be increasingly affected by climate-related natural disasters.

19. The major new development projects present opportunities to build carbon-neutral communities that are resilient to climate change. The government could use the two major development strategic plans—Lantau Tomorrow Vision and Northern Metropolis—to cultivate the right mindset so that the public more proactively join forces in advancing climate mitigation and adaptation efforts. Building carbon-neutral communities with construction well-equipped to face long-term climate change challenges should be a core guiding principle when developing these major development strategic plans, at least because New Territories areas under the Northern Metropolis are low-lying land.

D. Transition Toward a Low-Carbon Economy

20. Climate change presents both challenges and opportunities during the transition toward a low-carbon economy. Given the dominance of services-based activities, Hong Kong SAR does not face an urgent need to diversify away from carbon-intensive activities. However, as an

international financial center, its financial system is financing non-domestic businesses, some of which involve in carbon-intensive activities overseas, including in Mainland China. Hong Kong SAR therefore needs to proactively manage potential stranded assets during the world's transition toward a low-carbon future. At the same time, the social impact of climate change could be substantial as a significant increase in carbon prices would further exacerbate inequality. In terms of opportunities, Hong Kong SAR is well placed to develop into a green and sustainable finance hub that provides a premier financing platform for green enterprises and projects. Furthermore, Hong Kong SAR could step up efforts to promote green innovation with cooperation with neighboring regions.

Safeguarding Financial Stability

21. Climate-related transition risks should be carefully monitored and proactively managed to safeguard financial stability. The Global Financial Stability Report (April 2020) found a temperature pricing anomaly in Hong Kong SAR and some other economies, implying that equity investors in these markets have not paid adequate attention to climate change (Figure 6).^{18,19} A mispricing of climate-related risks would undermine the efficiency of resources allocation and potentially heighten financial stability risks. Furthermore, Hong Kong SAR banks' lending to carbon-intensive sectors is non-negligible, especially for their lending in Mainland China where loans to firms in the utilities, transport and manufacturing sectors account for about a quarter of their total lending activity (see Box 2 for more detailed discussion about the green and sustainable finance landscape in Hong Kong SAR). Climate-related transition risks could materialize during the transition toward a low-carbon economy prompted by changes in climate policy, technological advancement and market sentiment, resulting in some stranded assets. To safeguard financial stability against climate-related risks, the Network for Greening the Financial System (NGFS) recommended central banks and financial supervisory authorities to close the data gaps, enhance risk monitoring and analysis, and integrate climate-related risks into supervision.²⁰

22. Hong Kong SAR sets to adopt mandatory climate-related financial disclosures to enhance transparency for the financial sector. The improvement in the flow of climate-related information would support risk management, facilitate capital allocation, strengthen investor protection, and promote market discipline. Building on the existing requirements of listed companies to provide climate-related disclosures from 2020, the mandatory climate-related disclosures aligned with the Task Force on Climate-related Financial Disclosures (TCFD) recommendations for financial institutions (namely, banks, insurers, asset managers, and pension

¹⁸ Equities with the highest sensitivity to temperature earn lower returns than the others, after controlling for standard risk factors. A firm's temperature sensitivity is defined as the absolute value of the temperature beta, which captures how firms' stock return co-moves with temperature extremes. See Global Financial Stability Report, April 2020, Chapter 5 for more details.

¹⁹ Also see Financial System Stability Assessment report for Hong Kong SAR (IMF Country Report No. 21/102).

²⁰ The NGFS, launched in 2017, is a group of central banks and financial supervisory authorities that are willing to contribute to the enhancement of the financial sector's climate-related risk management and the mobilization of mainstream finance to support the transition toward a sustainable economy.

trustees) will be adopted as soon as practicable but no later than 2025.²¹ Hong Kong SAR authorities are also supporting the efforts by the International Financial Reporting Standards (IFRS) Foundation and the International Sustainability Standards Board (ISSB) to develop sustainability-related disclosure standards, and the Securities and Futures Commission (SFC) will collaborate with relevant local organizations to work on a roadmap to adopt the new standards.^{22,23} The HKMA has already proposed supervisory requirements for banks to develop an appropriate approach to disclosing climate-related information using the TCFD recommendations as the core reference. The SFC has required fund managers that manage collective investment schemes to take climate-related risks into consideration in their investment and risk management processes and make appropriate disclosures (see paragraph 29 for more details). The Insurance Authority also plans to engage with the industry to develop an appropriate approach to integrate climate-related risks into insurers' risk management framework, as well as suitable disclosure requirements.

23. The HKMA has adopted a three-phased approach to promote green and sustainable banking. The HKMA expects banks to step up their efforts to meet the possible challenges arising from climate change, including both physical and transition impacts on their own operations and their clients. In the first phase which started in June 2019, the HKMA developed a common framework to assess the “greenness baseline” of individual banks, and banks conducted a self-assessment under the [Common Assessment Framework on Green and Sustainable Banking](#). In the second phase which started in May 2020, the HKMA has worked on developing the supervisory expectations and requirements on green and sustainable banking, with a public consultation based on a [white paper](#). In the third phase, which is expected to commence in 2022, the HKMA after setting the supervisory expectations will monitor and evaluate banks' progress of managing climate-related risks. Based on the white paper, the HKMA aims to set an appropriate arrangement for governance, strategy, risk management and disclosures. In particular, the board of a bank should be accountable for its climate resilience and responsible for overseeing its climate strategy. Climate considerations should be embedded in the bank's overall strategy from formulation to implementation, while climate-related risks should be identified, measured, monitored, and managed.

²¹ The [TCFD recommendations](#) on climate-related financial disclosures are widely adoptable and applicable to organizations across sectors and jurisdictions. They are designed to solicit decision-useful, forward-looking information that can be included in mainstream financial filings. The TCFD recommendations focus on four thematic areas—governance, strategy, risk management and metrics and targets.

²² The SFC is a member of both the Sustainable Finance Taskforce and the Technical Expert Group at the International Organization of Securities Commissions (IOSCO). Both groups have worked closely with the IFRS Foundation on developing sustainability-related disclosure standards. The Technical Expert Group is tasked to assess whether the future standards developed by the ISSB are fit-for-purpose from the securities regulators' perspective; its assessment will inform the IOSCO Board's decision to endorse the new standards for use across member jurisdictions.

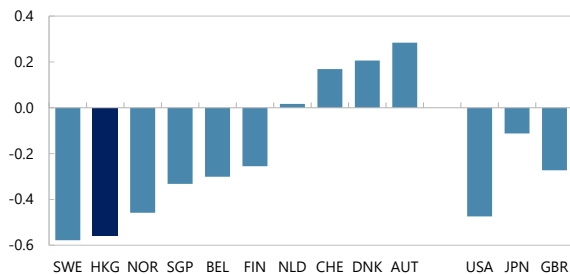
²³ Relevant local organizations include the Hong Kong Exchanges and Clearing Limited (HKEX), the Financial Reporting Council, and the Hong Kong Institute of Certified Public Accountants.

Figure 6. Hong Kong SAR: Climate-Related Financial Risks

There is some evidence of mispricing of climate-related risks in Hong Kong SAR and some other economies.

Abnormal Equity Returns of Firms with the Highest Sensitivity to Temperature

In percent

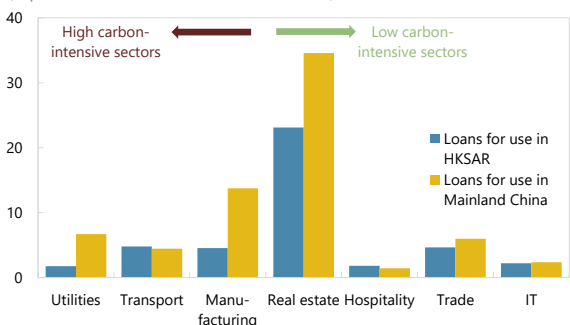


Note: Abnormal equity returns reflect the difference in performance between firms with high temperature sensitivity (top quintile) and all other firms. Estimates are based on 1998-2017 data. Sources: IMF, GFSR, April 2020, Chapter 3; and IMF staff calculations.

Hong Kong SAR banks have non-negligible lending exposures to carbon-intensive sectors, ...

Bank Loans by Sectors, As of End-2021Q3

(In percent of total loans for use in each location)

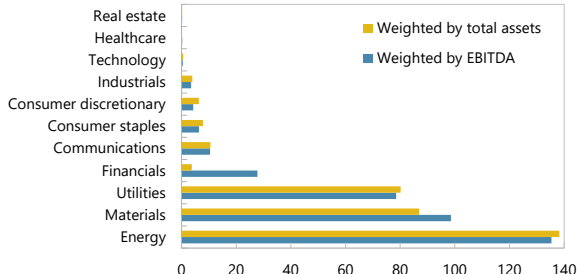


Note: Data on carbon intensity is based on the FSAP analysis; IT=Information technology. Sources: HKMA; IMF, Country Report No. 21/102; and IMF staff calculations.

Among listed firms in Hong Kong SAR (many of which are Mainland Chinese firms), firms in the energy, materials and utilities sectors are the largest carbon emitters.

Hong Kong SAR-Listed Firms: Greenhouse Gas Emissions, 2020

In million metric tons of CO₂-equivalent

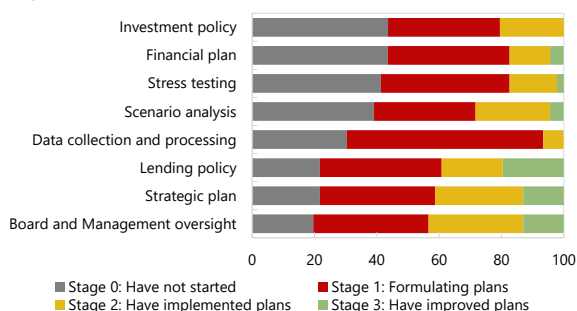


Note: The figure only shows listed firms that report emissions information. EBITDA = Earnings before interest, taxes, depreciation and amortization. Sources: Bloomberg Finance L.P.; and IMF staff calculations.

... while only a small portion of banks have made an advanced progress of dealing with climate-related risks.

Banks' Preparation to Manage Climate-Related Risks Based on HKMA's Survey

(In percent of total)



Sources: HKMA, Quarterly Bulletin (September 2020); and IMF staff calculations.

24. Hong Kong SAR authorities also plan to promote climate-focused scenario analysis. As part of the near-term action points advocated by the Green and Sustainable Finance Cross-Agency Steering Group (Steering Group) (see more details below), the impact of climate change on financial institutions under different pathways will be assessed. Such efforts include a pilot stress testing exercise for banks and insurers and the use of scenario analysis by large asset managers.²⁴ The climate-focused scenario analysis is an integral part of the authorities' action plan to require

²⁴ The HKMA conducted a pilot climate risk stress test for banks in 2021. The exercise included 27 banks that account for about 80 percent of the banking sector's total lending. The results showed that climate risks could potentially cause significant adverse impacts on the banking sector under extreme climate scenarios. Nevertheless, the banking sector would remain resilient given their strong capital buffers. The HKMA also noted that while the exercise has helped banks substantially enhance their capabilities of measuring climate risks, further efforts are required to improve data availability and assessment methodologies.

financial institutions to embed climate considerations into their business processes, as well as to improve risk management, address data gaps, and enhance risk analysis capability.

25. Financial stability issues related to climate change should also be embedded into the authorities' systemic risk oversight. In addition to the efforts to incorporate climate-related risks into microprudential and market conduct oversight, it is important that similar efforts are undertaken by relevant authorities for systemic risk analysis and mitigation. Climate change could amplify existing macro-financial vulnerabilities such as elevated private sector indebtedness, overstretched property prices and substantial exposures to Mainland China, and a macroprudential approach is warranted to properly manage climate-related risks over a long-term horizon.

Developing the Green and Sustainable Finance Ecosystem

26. Hong Kong SAR takes concerted efforts to develop the green and sustainable finance ecosystem. In May 2020, the Steering Group was set up to accelerate the development of green and sustainable finance in Hong Kong SAR and support the government's climate strategies. Co-chaired by the HKMA and the SFC, the Steering Group comprises of the Financial Services and the Treasury Bureau, the Environment Bureau, the Insurance Authority, the Mandatory Provident Fund Schemes Authority, and the Hong Kong Exchanges and Clearing Limited (HKEX).

- ***In December 2020***, the Steering Group launched a strategic plan to strengthen Hong Kong SAR's green and sustainable finance ecosystem. The strategic plan focuses on six areas, including: (i) improving the management of climate-related financial risks; (ii) promoting the flow of climate-related information to facilitate risk management, capital allocation and investor protection; (iii) enhancing capability building for the financial sector and raising public awareness; (iv) encouraging innovation and exploring initiatives to facilitate funding towards green and sustainable causes; (v) capitalizing on opportunities in Mainland China to develop Hong Kong SAR into a green finance center; and (vi) fostering regional and international collaboration.
- ***In July 2021***, the Steering Group announced the next steps to advance the strategic plan, with a focus on making a further progress on climate-related disclosures and sustainability reporting and exploring carbon market opportunities. The Steering Group also launched the Center for Green and Sustainable Finance, which will serve as a cross-sectoral platform to coordinate the efforts of financial regulators, government agencies, industry stakeholders and academia in capacity building and policy development. The Center will also serve as a knowledge repository.
- ***In December 2021***, the Steering Group decided that Hong Kong SAR will develop a local green classification framework, with an aim of aligning with the Common Ground Taxonomy.²⁵ Based on its preliminary assessment of carbon market opportunities, the Steering Group decided to

²⁵ The Common Ground Taxonomy is developed by the Taxonomy Working Group, co-chaired by China and the European Union, at the International Platform on Sustainable Finance. An initial report was released in November 2021 for public consultation.

further explore how Hong Kong SAR may develop into a regional carbon trading center. Furthermore, the Steering Group recommended: (i) developing a common green and sustainable finance qualification framework to enhance capacity building; and (ii) improving green and sustainable finance data.²⁶

27. Hong Kong SAR aims to align with internationally recognized green finance standards, including the Common Ground Taxonomy. Such efforts can help foster the development of Hong Kong SAR's green and sustainable finance ecosystem, which would in turn strengthen its role as a leading financial gateway for Mainland China while staying in sync with the international financial markets. The to-be-developed local green classification framework aligned with the Common Ground Taxonomy, as envisaged by the Steering Committee, aims to facilitate an easy navigation among the Common Ground Taxonomy, as well as Mainland China's and the European Union's taxonomies. The framework will provide a common reference point for the definition of economic activities that are considered environmentally sustainable, taking into account transitional activities and local considerations. In addition, robust verification is typically required by international investors, for both pre-financing and post-financing stages, to ensure that funding is used to finance eligible green assets. Building on its well-developed financial services sector, as well as its envisaged taxonomy, disclosure and reporting frameworks, Hong Kong SAR should strengthen its verification capacity so that it can help mobilize green financing from international investors to fund green investment that support the region's transition toward a low-carbon economy.

28. The authorities have taken various initiatives to develop the green finance market. The government launched the Green Bond Program in 2018 and plans to scale up its issuances up to HK\$200 billion during 2021-25 to help jump start the green bond market development and establish a benchmark yield curve. The HKMA, as the manager of the Exchange Fund, is a signatory of the United Nations Principles for Responsible Investment and has incorporated environmental, social and governance (ESG) factors in its investment process, giving priority to green and ESG investment if their long-term returns are comparable to other investments on a risk-adjusted basis. In addition, the Green and Sustainable Finance Grant Scheme was launched in May 2021 for a period of three years to provide subsidies for eligible green and sustainable bond issuers and loan borrowers to cover expenses on bond issuance and external verification services. A pilot Insurance-linked Securities Grant Scheme was also launched in May 2021 for a period of two years, complementing a new regulatory regime on insurance-linked securities such as catastrophe bonds to promote Hong Kong SAR as a preferred insurance-linked securities domicile.

29. The SFC has fostered the development of green and sustainable investing. The SFC issued voluntary Principles of Responsible Ownership in March 2016 and outlined a strategic framework for green finance in September 2018. The strategic framework included: (i) setting mandatory environmental and climate-related disclosures for listed companies by 2020; (ii) facilitating the development of green investment products; and (iii) engaging with the asset

²⁶ In response to the former recommendation, the HKMA plans to develop a module on Green and Sustainable Finance under the Enhanced Competency Framework for Banking Practitioners.

management industry to formulate appropriate policies and guidelines on how to incorporate ESG factors into the investment and risk management processes. Major subsequent policy initiatives include:

- **Green and ESG funds.**²⁷ In April 2019, the SFC issued a [circular](#) that set investment and disclosure requirements for green and ESG funds that are SFC-authorized unit trusts and mutual funds. Based on the circular, green or ESG funds must adopt common ESG investment strategies such as screening, thematic, ESG integration and impact investment as their primary investing strategy (that is, at least 70 percent of a fund's net asset value). In December 2019, following the conduct of a [survey](#), the SFC planned to set expectations for fund managers in areas such as governance and oversight, investment management, risk management, and disclosure (see follow-up actions for fund managers below). In June 2021, the SFC updated the [circular](#), which sets higher expectations for disclosures at the offering stage (for example, in areas of investment strategy, asset allocation, reference benchmark, and risks) and disclosures for ESG-related information such as due diligence, monitoring through investment lifecycles, and engagement. The updated circular also provides guidance for climate funds.
- **Fund managers.** In August 2021, the SFC issued a [circular](#) that sets expectations on how fund managers that manage collective investment schemes should take climate-related risks into consideration in their investment and risk management processes and make appropriate disclosures. The circular outlines baseline expectations for all fund managers and prescribes enhanced standards for large fund managers (with assets under management of at least HK\$8 billion), with the focus on four areas encompassing governance, investment management, risk management, and disclosure. Regarding governance, the board of a fund manager is expected to oversee the incorporation of climate-related considerations into its investment and risk management processes. In terms of investment and risk management, the fund manager is expected to identify relevant and material physical and transition climate-related risks, take reasonable steps to assess their impact on the performance of underlying investments, and employ appropriate measures to manage identified risks. Large fund managers are also expected to use scenario analysis for assessing the resilience of investment strategies to climate-related risks. Furthermore, the circular envisages enhanced disclosures at both fund manager and fund levels.
- **Listed issuers.** In December 2019, the HKEX updated the Listing Rules and the ESG Reporting Guide for its listed issuers, imposing certain mandatory disclosure requirements and some "comply or explain" disclosure obligations effective from July 1, 2020.²⁸ In November 2021, the

²⁷ The Global Financial Stability Report (April 2021) highlighted that sustainable investment funds can be an important drive for the transition to a green economy. Nevertheless, an appropriate architecture such as harmonized climate-related disclosures, high-quality and comparable data on climate-related metrics, and globally agreed-upon principles for sustainable finance is essential for fostering the development of sustainable investment funds. All these key elements are envisaged in Hong Kong SAR's strategic plan to strengthen its green and sustainable finance ecosystem.

²⁸ The HKEX first introduced the ESG Reporting Guide in 2012 for the voluntary disclosure of ESG information. The ESG Report Guide was revised in 2016.

HKEX published the Guidance on Climate Disclosures, as well as its analysis of initial public offering (IPO) applicants' corporate governance and ESG practice, to facilitate TCFD-aligned climate-related reporting.

30. The authorities are exploring carbon market opportunities. The Steering Group completed a preliminary feasibility assessment in December 2021 and decided to further explore how Hong Kong SAR may develop into a regional carbon trading center. The next step is to examine carbon market opportunities as part of the Greater Bay Area cooperation and to evaluate the feasibility to develop Hong Kong SAR as an international hub for voluntary trading of carbon credits. In addition, the HKEX has invested in a 7 percent stake in the Guangzhou Futures Exchange (GFE), which was set up in April 2021. The GFE aims to develop emissions-related derivatives products to support Mainland China's national scheme for trading emissions spot contracts (launched in July 2021). In August 2021, the HKEX and the GFE signed a memorandum of understanding for strategic cooperation, including on product development in both onshore and offshore markets to support Mainland China's efforts to achieve carbon neutrality before 2060.

Addressing Other Challenges and Fostering Other Opportunities

31. The social impact of climate change should be recognized and managed. As the world moves toward net zero carbon emissions, carbon prices will likely rise substantially. Given its significant reliance on imported products, Hong Kong SAR residents will likely face higher consumption costs due to higher global carbon prices. For example, if carbon prices were to rise by US\$100 per metric ton of CO₂-equivalent, the consumption cost would increase by about HK\$11,000, which accounts for almost 3 percent of per-capita income.²⁹ The impact of higher global carbon prices will be more pronounced for low-income households, further exacerbating inequality and potentially heightening social risk. Given Hong Kong SAR's relatively limited social safety net, the government should consider providing supportive measures for low-income households to alleviate their burden.

32. Hong Kong SAR should aim to promote innovation to support its efforts to achieve carbon neutrality. Such efforts could yield technological advancement that helps overcome climate mitigation and adaptation challenges. This also presents opportunities for Hong Kong SAR to diversify its services-oriented activities toward a high-end, clean technology sector.

E. Conclusion

33. Hong Kong SAR has made a significant progress to address climate change, but additional efforts are needed to achieve its commitment of carbon neutrality before 2050. Hong Kong SAR has developed an ambitious action plan to reduce carbon emissions over the coming decades. To fulfill the commitment, Hong Kong SAR needs to increase the use of zero-carbon energy for electricity generation, to embrace greater energy saving and green lifestyles, and

²⁹ See Fiscal Monitor, October 2019, Chapter 1, which provided some cross-country estimates for the burden of carbon taxation on households by income groups.

to adopt green transportation. To complement ongoing efforts, the government could consider introducing additional carbon pricing mechanisms to incentivize the change of people's behavior and businesses' operations. In addition, given its exposure to physical threats from climate change, Hong Kong SAR should continue its efforts to enhance the resilience of the jurisdiction's infrastructure and its society to climate change. As Hong Kong SAR will likely be affected by higher global carbon prices over time via imported products, supportive measures for low-income households could be provided to alleviate the burden.

34. The development of green and sustainable finance can support global efforts to mobilize private sector investment for green development and strengthen Hong Kong SAR's competitive advantage. An efficient, resilient green and sustainable ecosystem would enable Hong Kong SAR to play a key role in global efforts to mobilize private sector financing to fund green investment during the transition to a low-carbon economy. Ongoing efforts aim to foster the development of the green and sustainable finance at all fronts, including banking, asset management and market-based financing. Hong Kong SAR authorities aim to adopt internationally recognizable green finance standards, including the Common Ground Taxonomy, TCFD-aligned disclosure requirements, and forthcoming sustainability-related disclosure standards. At the same time, it is important to proactively monitor and manage physical and transition climate-related risks to safeguard financial stability. All these efforts should also help maintain Hong Kong SAR's status as a premier international financial center.

Box 1. A Brief History of Climate Mitigation Efforts¹

At the global level, the United Nations Framework Convention on Climate Change (UNFCCC) provides a platform for international cooperation on climate change. The UNFCCC was adopted in 1992 and entered into force in 1994 following negotiations that started in 1990. The UNFCCC secretariat was also established in 1992 to facilitate climate change negotiations and support the implementation of the original Convention as well as subsequent treaties such as the Kyoto Protocol and the Paris Agreement. Today, the UNFCCC has near universal membership. The UNFCCC's top decision-making body is its Conference of the Parties (COP). The COP meets every year. The latest meeting—the 26th United Nations Climate Change Conference of the Parties (COP26) was held in Glasgow of the United Kingdom in 2021.

The Kyoto Protocol was a first multilateral treaty that featured legally binding emissions reduction targets. Soon after the original Convention was adopted, it became evident that the original emissions reduction provisions were inadequate, leading to new negotiations. These negotiations resulted in the Kyoto Protocol, which was adopted at the COP3 in Kyoto in 1997 and entered into force in 2005. Developed based on the principle of common but differentiated responsibilities, the Kyoto Protocol featured legally binding emissions reduction targets for developed countries on the basis that they are historically responsible for the then current levels of greenhouse gas in the atmosphere. Even though the first commitment during 2008-12 was met, the global emissions increased by [32 percent] during 1990-2010. The second commitment period was agreed in 2012, known as the Doha Amendment to the Kyoto Protocol, to extend the agreement to 2020.

The Paris Agreement aims to limit global warming well below 2°C, preferably to 1.5°C, compared to pre-industrial levels. The Paris Agreement was adopted at the COP21 in Paris in 2015 and entered into force in 2016, effectively replacing the Kyoto Protocol. The Paris Agreement is a landmark in the multilateral climate change cooperation as all nations would contribute under a binding agreement. Still within the limits of common but differentiated responsibilities, the Paris Agreement works on a 5-year cycle of increasingly ambitious climate actions carried out by countries, which are required to submit their action plans known as nationally determined contributions (NDCs).

Hong Kong SAR is participating in the UNFCCC as a member of the Chinese delegation. China is a Party to the UNFCCC, as well as a signatory of the Kyoto Protocol and the Paris Agreement. The central government extended the participation in the UNFCCC to Hong Kong SAR in 2003. In 2009, China made a first climate mitigation pledge to reduce carbon intensity by 40-45 percent from the 2005 level by 2020. Correspondingly, Hong Kong SAR in 2010 set its own target to reduce carbon intensity by 50-60 percent from the 2005 level by 2020. In 2017, Hong Kong SAR adopted a new target to lower carbon intensity by 65-70 percent from the 2005 level by 2030.

Hong Kong SAR made a commitment to achieve carbon neutrality before 2050. The commitment was announced during the Chief Executive's 2020 Policy Address, following Mainland China's pledge to achieve peak carbon emissions before 2030 and carbon neutrality before 2060. In the Chief Executive's 2021 Policy Address, the Hong Kong SAR government set a more ambitious intermediate target to reduce total carbon emissions by 50 percent from the 2005 level before 2035.

¹ Prepared by Phakawa Jeasakul.

Box 2. Green and Sustainable Finance Landscape in Hong Kong SAR^{1,2}

Hong Kong SAR is developing a vibrant green and sustainable finance ecosystem. Hong Kong SAR's financial system is large, sophisticated, and diversified. As of end-2020, banking sector assets amounted to US\$3.3 trillion, or 9.6 times of GDP, while assets under management amounted to US\$4.5 trillion, or 13.0 times of GDP. Regarding the size of capital markets, the stock market capitalization was US\$6.1 trillion, or 17.7 times of GDP, and outstanding debt securities were US\$0.3 trillion, or 0.8 times GDP. In Hong Kong SAR, green and sustainable finance has grown rapidly and already become an integrated part of the financial system, with a fledgling ecosystem encompassing banking, asset management and market-based financing.

Various initiatives have helped foster the development of the green and sustainable finance ecosystem in Hong Kong SAR. Major ongoing efforts taken by the authorities include enhancing the market transparency through disclosure requirements, adopting forthcoming internationally accepted green finance standards, providing subsidies to support the issuance of green and sustainable debt, scaling up the government green bond program, and supporting capacity building of the financial system to provide green and sustainable finance. Furthermore, a new regulatory regime on insurance-linked securities was introduced in 2021 to promote the market development. Meanwhile, the Hong Kong Exchanges and Clearing Limited (HKEX) has set up Sustainable and Green Exchange (STAGE), a repository of green and sustainable financial products, to support market participants in performing their due diligence, selection and monitoring of green and sustainable investment, and to promote the synergy across asset classes and product types. In addition, the authorities are exploring how Hong Kong SAR may develop into a regional carbon trading center.

The Hong Kong SAR banking sector can facilitate the financing of green and transition investment locally and in the region. As of end-2021Q3, Hong Kong SAR banks' lending to carbon-intensive sectors was non-negligible, especially for their lending in Hong Kong SAR and Mainland China where loans to firms in the utilities, transport and manufacturing sectors account for about 5 percent of banking sector assets, or 48 percent of GDP. As firms in these sectors embark on their climate mitigation efforts, they will need funding to finance their green investment (for example, renewable energy) as well as their transition efforts (for example., transformation of carbon-intensive manufacturing). Supporting the financing of green and transition investment also enables banks to manage their exposure to potential stranded assets, mitigating their climate-related transition risks. Leveraging on their international green and sustainable finance expertise and connectivity to the global financial system, Hong Kong SAR banks can support the clients in undertaking green investment and navigating through the transition to a low-carbon economy.

The Hong Kong SAR asset management sector can help influence corporate responsibility in the Environmental, Social and Governance (ESG) areas. In Hong Kong SAR, the size of green and ESG investment funds has been growing steadily though still remaining small. As of June 2021, there were 25 funds with assets of about US\$10 billion managed in Hong Kong SAR (Figure 7). At the same time, it was reported that 66 funds had been authorized to sell in Hong Kong SAR with assets under management of about US\$100 billion, reflecting Hong Kong SAR's role as an international financial center in channeling capital into green and ESG investment funds though some of which are not managed locally. Beside their role in facilitating the financing of green and ESG investment, asset managers can also help improving corporate responsibility in the ESG areas. According to a [survey](#) conducted by the SFC in 2019, 83 percent of fund managers (660 in total) have considered at least one ESG factor, and 63 percent of them have also practiced responsible ownership, for example through voting and corporate agreement. In addition, 35 percent of surveyed fund managers have systematically integrated ESG factors in their investment and risk management processes.

Box 2. Green and Sustainable Finance Landscape in Hong Kong SAR (concluded)

The issuance of sustainable debt has also grown strongly in recent years, pointing to an important role of market-based financing in green and sustainable finance.

- Cumulative green debt issued and arranged in Hong Kong SAR reached US\$38 billion in 2020 of which about two-thirds was issued by Mainland Chinese entities, highlighting the role of Hong Kong SAR as an important financing platform for Mainland Chinese enterprises. Nevertheless, Hong Kong SAR has also increasingly served a more diversified group of borrowers, including multilateral development banks and Indian bond issuers. By sectors of issuers, real estate firms and financial institutions were the main debt issuers, accounting for 34 and 30 percent of total green debt issued and arranged in Hong Kong SAR, respectively.
- The demand of entities domiciled in Hong Kong SAR for sustainable finance has accelerated sharply in 2021, with the issuance of sustainable debt amounting to \$18.9 billion in the first ten months of 2021, a marked increase from previous years. While green bonds are still the most popular instrument, the sustainable debt instruments have also become more diversified, including sustainability-linked debt that could help boost the provision of transition finance. Since 2009, a total of about US\$50 billion of sustainable debt has been issued, accounting for about 7.5 percent of the total issuance in Asia Pacific.³

¹ Prepared by Phakawa Jeasakul and Hong Xiao.

² *Green finance* refers to financing of eligible green projects. *Sustainable finance* refers to financing of eligible green and/or social projects given their potential overlapping benefits; it is recognized that green projects may have social co-benefits and that social projects may have environmental benefits. There are a number of internationally accepted taxonomies for green finance and social finance. *Sustainability-linked finance* refers to financing of projects with sustainability or Environmental, Social and Governance (ESG) objectives; furthermore, financial and/or structural characteristics of sustainability-linked finance products depend on their pre-defined objectives, while they may not necessarily finance eligible green and social projects according to existing taxonomies. *Transition finance* refers to financing of projects that facilitate a transition towards low-carbon activities, bridging the gap between traditional and green finance.

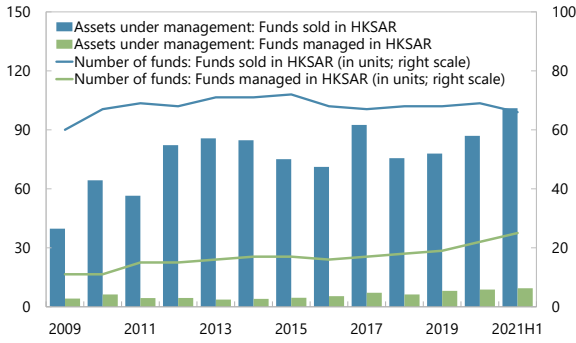
³ A first green bond issued by an entity domiciled in Hong Kong SAR occurred in 2009.

Figure 7. Hong Kong SAR: Green Finance Landscape

Assets under the management of locally managed green and ESG funds have been growing steadily from a low base, while HKSAR investors have access to much more wide-ranging green and ESG funds.

Green and ESG Investment Funds

In billions of HK dollar

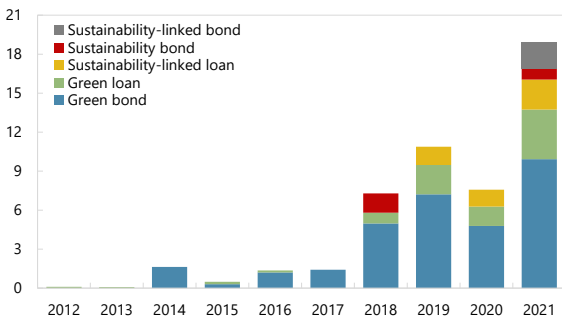


Sources: Bloomberg; SFC; and IMF staff calculations.

Green bond accounts for the largest share of sustainable debt of issuers domiciled in HKSAR.

Sustainable Debt Issuance

(In billions of US dollar; debt of issuers with domicile in HKSAR)

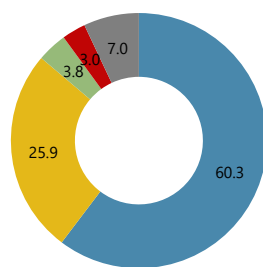


Note: For 2021, data are as of end-October. Sources: BloombergNEF; and IMF staff calculations.

Mainland Chinese issuers led green debt issuance in HKSAR.

Green Debt Arranged and Issued in HKSAR by Location of Issuers, 2020

In percent of total

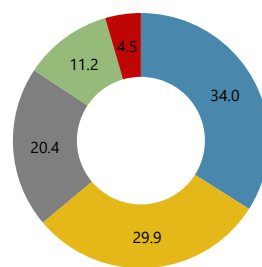


Sources: Climate Bonds Initiative; and IMF staff calculations.

Issuances were dominated by real estate firms and financial institutions.

Green Debt Arranged and Issued in HKSAR by Sector of Issuers, 2020

In percent of total

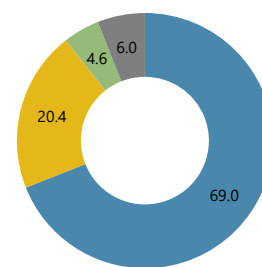


Sources: Climate Bonds Initiative; and IMF staff calculations.

Bonds were predominantly issued in US dollar.

Green Debt Arranged and Issued in HKSAR by Currency, 2020

In percent of total

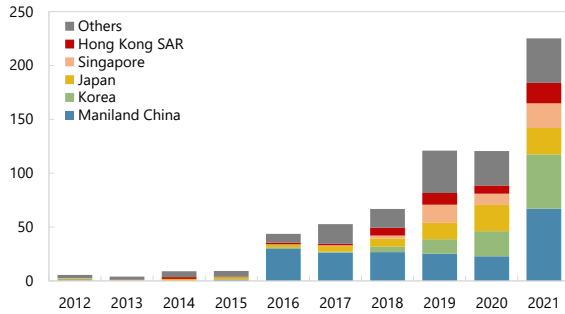


Sources: Climate Bonds Initiative; and IMF staff calculations.

Sustainable debt issuance by entities domiciled in HKSAR, though growing in line with the regional trend, still accounts for a relatively small share of the region's total issuance.

Asia Pacific: Sustainable Debt Issuance

(In billions of US dollar; based on domicile of issuers)

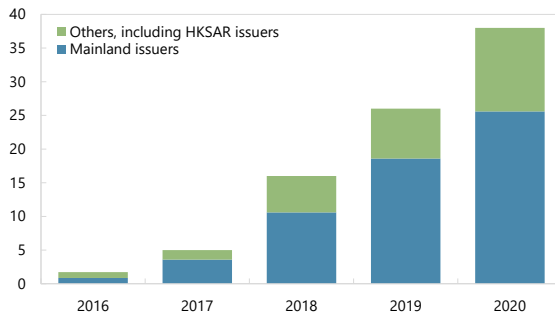


Note: For 2021, data are as of end-October. Sources: BloombergNEF; and IMF staff calculations.

As an international financial center, HKSAR serves as a hub for raising green finance.

Green Debt Arranged and Issued in HKSAR

(In billions of US dollar)



Note: 2020 data include green loans. Sources: Climate Bonds Initiative; and IMF staff estimates.

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