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Energy Development in Hong Kong, China

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Distinguished Guests, Ladies and Gentlemen, good morning.

Hong Kong, China's Energy Transition

It is my privilege to have this opportunity to introduce Hong Kong, China's Energy Development. Combating climate change is a global responsibility by every APEC member economies. Hong Kong, China is a highly urbanised city in the APEC with limited land resources and no natural energy reserve. We have to rely on imported fuel for our energy needs. Historically, our energy mix has been heavily reliant on coal, but with the collective effort of the Hong Kong Government, trade, and the general public, we are paving the way in the energy transition together toward carbon neutrality.

Energy underpins our daily life and drives our economic development. Hong Kong, China's long-standing policy is to ensure that energy is supplied safely, reliably, and at reasonable price to meet our demands. At the same time, we have to continuously minimise environmental impact and carbon emissions in the course of energy consumption.

Our economy is predominately pitched at the tertiary industry level, that is the service sector. We have very limited energy-intensive industries. In 2020, electricity generation was the largest contributor to carbon emission, accounting for 60.4 per cent of total emissions, followed by transport for about 19.7 per cent and waste management for around 8.7 per cent. These three major carbon emission sources together account for over 90% of the total emissions, and therefore we focus our decarbonisation works on these three key areas.

We announced the Hong Kong Climate Action Plan 2050 in 2021 to set out the vision of "Zero-carbon Emissions - Liveable City – Sustainable Development" and outline the

strategies and targets for combating climate change and achieving carbon neutrality before 2050.

Net zero electricity generation

Hong Kong, China endeavours to achieve net-zero electricity generation by progressively phasing out fossil fuels, striving to develop renewable energy, exploring new zero-carbon energy sources and regional cooperation. We will cease using coal for electricity generation by 2035 and replace it with natural gas and zero-carbon means.

Floating Storage Regasification Units (FSRU)

Later this year, we will commission our floating storage and regasification unit, or FSRU in short, at the Hong Kong Offshore LNG Terminal to supply natural gas to the power companies. It will be the 4th largest terminal among the 32 offshore terminals now operating globally. FSRU significantly improves the stability of our long-term natural gas supply by diversifying supply sources and opening the doorway to competitive gas supply in the global market.

Renewable Energy

Owing to the limitations of land and natural resources, and the fact that renewable energy is intermittent by nature, we have to come up with many innovative ideas to cope with the challenges. One of the approaches is to widen the adoption of solar energy generation system at government facilities, including reservoirs, restored landfills, government buildings and other suitable facilities. We are also discussing with power companies to invest in offshore wind farms. In addition, we encourage public participation through an enhanced Feed-in Tariff scheme to incentivise connection of private solar systems to the utility grids. We aim to increase the share of renewable energy in the fuel mix for electricity generation from less than 1% at present to 7.5-10% by 2035, and further increase it to 15% before 2050.

Waste to energy

In Hong Kong China, carbon emissions from waste management are mainly generated when municipal waste is decomposed in landfills. To overcome the problem, we build

advanced waste-to-energy facilities to turn waste into electricity. Riding on the success of the two existing facilities, T·PARK and O·PARK1, we continue to construct the second organic resources recovery centre, O·PARK2, and it will be commissioned in 2024 for handling 300 tonnes of food waste per day. Besides, we employed food waste and sewage sludge anaerobic co-digestion at the Tai Po Sewage Treatment Works and the upcoming Sha Tin Sewage Treatment Works. With all these facilities operating together later this year, up to 600 tonnes of food waste could be treated daily. It is estimated that about 150 Terajoule (42 million-Kilowatt hour) of electricity can be exported to the grid per year, sufficient for use by about 12,700 households.

Further to the above, our Integrated Waste Management Facilities (IWMF) Phase 1 in the Shek Kwu Chau is expected to be operational by 2025. The facility will recover heat energy from municipal solid waste incineration to produce about 480 million kilowatt-hour of electricity a year (or 1,725 Terajoule), sufficient for use by about 145,000 households.

Energy Efficiency Enhancement

On the energy transition path, reducing energy demand can lower switching cost to zero-carbon energy, generating financial savings for the public. Buildings account for 90% of the electricity consumption in Hong Kong. The government has introduced energy efficiency enhancement measures to promote green buildings and step up efforts to lead a low-carbon lifestyle so as to reduce total energy consumption, lessen the public's financial burden arising from the foreseeable increase in the use of zero-carbon fuels for electricity generation, and accelerate environmental investment. We have set a goal to reduce the electricity consumption of commercial buildings by 30% to 40%, and residential buildings by 20% to 30% from the 2015 level by 2050, and achieve half of these targets by 2035.

One of the key initiatives is the Buildings Energy Efficiency Ordinance. Since the enforcement of the Ordinance in 2012, we have been continuously examining global development to tighten our requirements on building design, construction, and operation to ensure that they are as energy-efficiency as possible. The Building Energy Code is always kept abreast of the time by being reviewed every three years. In the latest edition of the code, the energy efficiency standards have been elevated by more than 15 per cent as compared with the 2015 edition. By 2035, we anticipate an estimated annual energy

saving of 17,000 to 19,000 Terajoule (4.7 to 5.3 billion kWh) from buildings against 2015, which is equivalent to the consumption of about 1.5M households or 10 to 12% of our total electricity consumption.

In addition, we have implemented the Mandatory Energy Efficiency Labelling Scheme since 2009. It currently covers eight types of electrical appliances, which account for about 50% of the total energy consumption in the residential sector. The energy labelling scheme can save about 930 million-Kilowatt hour of electricity each year and is sufficient for use by about 282,000 households. This September, we will expand the scope of the scheme to include LED lamps, gas cookers and gas instantaneous water heaters. The additional energy saving is estimated to be about 576 Terajoule (equivalent to about 160 million kilowatt hour) per year, or that of 48,000 households. By then, household appliances covered by the energy labelling scheme will account for about 80% of the total energy consumption in the residential sector, a giant leap from the current 50%.

District Cooling Systems are energy-efficient and sustainable infrastructures. They consume 35% and 20% less electricity than traditional air-cooled and individual water-cooled air-conditioning systems respectively. District Cooling Systems can also mitigate the heat island effect, and avoid environmental issues associated with cooling towers. It is also cost-effective by reducing installation and operation costs for building owners, and is highly reliable to ensure continuous cooling.

Riding on the remarkable success of the Kai Tak District Cooling System, we have expanded District Cooling System to New Development Areas to reduce energy consumption and promote environmental sustainability. At the moment, we are constructing new District Cooling Systems at Tung Chung New Town Extension and Kwu Tung North, and we are studying the feasibility of adopting District Cooling Systems in other New Development Areas, including Hung Shui Kiu and Ha Tsuen, New Territories North, and Kau Yi Chau artificial islands, covering a total area of around 3,000 hectares. Our objective is to promote energy efficiency in new development areas through green infrastructure.

Green Transport

Hong Kong has proactively adopted a public transport-oriented policy with railways as the backbone to reduce carbon emission. Electric vehicles and ferries and the

development of new public transport are important steps towards achieving our goal of reducing carbon emission. In promoting the use of electric private cars, we will stop the new registration of fuel-propelled private cars, including hybrid vehicles, by 2035 or earlier. In 2022, 53 per cent of newly registered private cars was electric vehicles, which is double of that in 2021. The number of people taking railways and using electric vehicles has demonstrated the overwhelming public support for our green transport policy.

Zero-carbon Energy

Going forward towards deep carbonisation, we are formulating the development and trials of various zero-carbon energy and technologies, including blue and green hydrogen energy, ammonia nitrogen, carbon capture and storage, carbon-neutral natural gas, and different carbon sinks, etc., to identify the suitable solutions for us in future. As an example, we are exploring the feasibility of producing hydrogen by solar in sewage treatment plants and reservoirs.

The development of hydrogen as fuel has the potential to transform the energy landscape. To keep ourselves abreast of research and development in hydrogen fuel, we have established an inter-departmental working group in 2021 to manage the trials of hydrogen fuel cell electric double-deck buses and heavy vehicles. We will carry out risk assessments on hydrogen refilling stations and vehicles, the arrangement of hydrogen supply, storage and transport, and assess the operational performances of hydrogen fuel cell vehicles in the local environment. Besides, we are reviewing relevant regulations, standards and technical guidelines for a legal framework on the use of hydrogen as fuel. More importantly, we want to attract financial investment in various aspects of using hydrogen as fuel. Last year, our gas utility successfully tested the isolation of hydrogen from its town gas supply. The test aims to jump-start the hydrogen supply through piped means to heavy vehicles. With continued research and development, the challenges of hydrogen fuel can be overcome to pave the way for a low-carbon energy future.

Green Finance

Hong Kong, China is one of the leading international financial centres in the world and is the home to many global financial institutions. The government is committed to promoting financial services to support the development of green and sustainable technologies. Private sector participation is vital to scale up investment in decarbonisation

technologies.

In the past decade, the HK Government has invested over US\$ 6 billion to emission reduction measures. In the coming decades, we will devote about US\$ 30 billion to further enhance our work on climate change mitigation and adaptation. Moreover, we have rolled out the Government Green Bond Programme since 2018. Around US\$10 billion of green bonds have been issued to fund green public works projects. In fact, the total amount of green and sustainable bonds arranged in Hong Kong, China reached US\$31 billion in 2021, accounting for one-third of the Asian green and sustainable bond market.

Incentive is a compelling stimulus to engage the commercial sector in energy efficiency improvements. The government has implemented policies for developers to adopt green building designs, covering tax rebates on energy-efficient or renewable energy installations procurement and concession scheme to allow additional gross floor area upon green building certification.

Regional Collaboration

Regional collaboration is one of our missions to foster innovative energy-efficiency technological development and regional cooperation. We signed the Memorandum of Co-operation on the Retro-Commissioning of buildings with counterparts in China in 2018. We published our technical guidelines on Retro-Commissioning to promote periodic inspection of existing buildings to identify operational improvements. Following the success, we extended the coverage of the Memorandum to building energy saving retrofit in 2022 to accelerate proactive energy-saving measures in existing buildings.

With the aim of translating APEC's policy directions into actions and building capacity with APEC members, we hosted APEC projects to promote Retro-Commissioning in the APEC region and would establish the retro-commissioning hub to offer training courses to our fellow APEC members. Our effort was recognized when our retro-commissioning training programme received the 2022 APEC Energy Smart Communities Initiative Best Practices Awards. We will continue to look for cooperation opportunities with our fellow APEC member economies and organisations.

To empower our community to implement energy-efficient and renewable energy initiatives, we published technical guidelines and best practices booklets covering Building Energy Efficiency, Energy Audit, Retro-Commissioning, Retrofitting, Solar Photovoltaic Systems, Solar Grid Connection, etc. to uplift technical expertise in the professional community and to assist the public in understanding better the technical issues relating to energy efficiency and renewable energy installations. We are delighted to share these guidelines with APEC member economies to foster knowledge transfer of best practices.

Conclusion

Despite these efforts, the pathways to “Reduce Energy Intensity” and attain “Carbon Neutrality” are full of challenges as well as opportunities. With the motto “A” “P” “E” “C”, i.e. “Amalgamate to Protect our Environment Collaboratively”, Hong Kong China eagerly collaborates with APEC members to conquer challenges and seize opportunities for energy efficiency and conservation enhancement. Let us stretch our limits to overcome the impossible to reach our ever-challenging carbon neutrality goals together.

Thank you.