

By post and by email at comments@susdev.org.hk

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Council for Sustainable Development
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[Attn: Mr Joe LUK Chun Wai, Public Interaction Manager (Sustainable Development)]

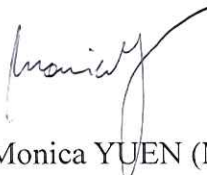
Dear Mr LUK

Public Engagement on Long-term Decarbonisation Strategy

Thank you for inviting the Institution to provide views on the captioned subject. We are pleased to provide herewith our views and suggestions on the subject matters for your consideration.

Thank you for your attention.

Yours sincerely



Monica YUEN (Mrs)
Chief Executive & Secretary
The Hong Kong Institution of Engineers

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MY/ML

Views from the Hong Kong Institution of Engineers on Long-term Decarbonisation Strategy

To combat climate change, there is an imminent need for formulating a long-term decarbonisation strategy. The Hong Kong Institution of Engineers (the HKIE) supports the measures proposed by the Council for Sustainable Development to reduce carbon emissions that suit the geographical, social and economic contexts of Hong Kong.

2. Climate change is affecting every corner of the earth. Hong Kong, similar to other coastal cities, is facing multiple climate-related threats. Last year, Hong Kong experienced the warmest winter solstice on record since 1884. We also experienced severe weather conditions, such as Typhoons Hato and Mangkhut in 2017 and 2018 respectively, as well as the drier weather and heavier rainfalls.

3. In 2015, 196 signatories adopted the Paris Agreement (the Agreement) for combating climate change with ambitious goals for building up a low-carbon, resilient and sustainable future. Under the Agreement, Hong Kong is obliged by 2020 to formulate a long-term decarbonisation strategy up to 2050.

4. As stated in the Consultation Document, the world would need to reduce absolute carbon emissions by between 40% and 70% by 2050 compared with 2010, and to achieve net zero emissions of carbon dioxide and other greenhouse gases (GHGs) before 2100. Hong Kong accounted for 5.7 tonnes carbon emissions per capita in 2016, which was comparable to those of other metropolises worldwide, such as New York City (6.7 tonnes), San Francisco (6.3 tonnes), Amsterdam (5.5 tonnes) and Tokyo (5.1 tonnes). There is a target for Hong Kong to reduce to 4.5 tonnes carbon emissions per capita by 2020 and to about 2 tonnes by 2050.

5. The Administration should make bold moves with bigger steps in formulating long-term and sustainable decarbonisation strategies that suit Hong Kong. It is suggested to refer to the United Nations' Sustainable Development Goals (SDGs) with its sub-objectives on climate action, including strengthening resilience and adaptive capacity to climate-related hazards and natural disasters, integrating climate change measures into national policies strategies and planning, and improving education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning. The HKIE would like to put forth our suggestions in the ensuing paragraphs for the Administration's consideration.

TRANSITION TOWARDS A LOW-CARBON CITY

Low-carbon Electricity Generation

6. Electricity generation and transportation are the two largest carbon emitting sectors in Hong Kong. As noted from the Consultation Document, about 67% of Hong Kong's carbon emissions come from electricity generation. When considering the long-term fuel mix of electricity generation for Hong Kong, the HKIE would regard that "reliability" and then "security and availability" should be the foremost concerns, while "environmental performance and response to climate change" and "affordability" should also be taken into consideration.

7. Coal is the most carbon emitting fuel in existing power generation mix. In the next decade, coal-fired electricity generation will be replaced by natural gas-fired electricity generation which is reliable and available large-scale technology to reduce carbon emission. Nevertheless, the Institution opines that natural gas is still a kind of fossil fuel that emits carbon, and therefore other alternatives to achieve a higher carbon reduction target should be considered.

8. Nuclear energy can be a viable option in supplying zero-carbon electricity to Hong Kong. The Institution considers that the Administration should explore the feasibility on regional cooperation in tapping electricity, especially nuclear power, in Pearl River cities to achieve a higher carbon reduction target beyond 2030.

9. As of July 2019, there were four nuclear power stations in Guangdong located at Daya Bay, Ling Ao, Yangjiang and Taishan. There are two more nuclear power stations under early construction or planning at Lufeng and Huizhou Taipingling that comprising of four generating units and providing 4.5 gigawatt (GW) generation capacity. In the long run, the generation capacity for the current pressurised water reactors (PWRs) is expected to level off at 200 GW by 2040 and to be supplemented by the fast neutron reactors (FNRs) which will reach to at least 200 GW by 2050 and 1400 GW by 2100¹. The HKIE opines that it is reasonable to expect a steady supply of new nuclear generating capacity in Guangdong in the following decades to be enough for supplying to Hong Kong.

10. Since the introduction of International Nuclear and Radiological Event Scale (INES) in 1990 to enable prompt communication of safety significant information in case of nuclear accidents, there has been no nuclear event classified at level 2 or above on the INES in the construction and operation of the nuclear power stations in the Mainland², implying that its quality and performance in operating and constructing nuclear facilities were handled properly. Nevertheless, the Administration needs to address the risks affecting the community or the environment due to nuclear power operation and adequately mitigate the risks during design stage, site selection, construction and operation. The Administration should also coordinate with relevant authorities in the Mainland on quantitative assessments and regulatory measures to ensure continuous monitoring of the radioactivity in the nearby environment and operation safety.

11. Apart from importing zero emission nuclear power and renewable energy (RE) from the Mainland, the Institution supports the Administration to take initiative to help exploit locally the resources of RE that minimises the environmental impact of energy use. As most RE is intermittent in nature, more support to stabilise the RE supply, e.g. setting up energy storage facilities, is required. The transition to a low-carbon city requires large investment in installing the infrastructures. The Administration is suggested to subsidise the underprivileged to lessen the burdens of energy cost, and provide incentives, e.g. tax reduction, for those who exercise low-carbon lifestyle. A verified accounting system should also be established to make sure the energy imported from the Mainland is clean with low carbon emission.

12. The development of emerging technologies, including carbon capture and storage (CCS)

¹ World Nuclear Association, Nuclear Power in China (July 2019)

<https://www.world-nuclear.org/information-library/country-profiles/countries-a-f/china-nuclear-power.aspx>

² Ministry of Ecology and Environment of the PRC of China, 中华人民共和国国家核安全局 2018 年报
http://www.mee.gov.cn/hyfs_12801/haqnb/201906/P020190604655977588533.pdf

for fossil fuel plants with free carbon natural gas and fuel cells derived from clean energy sources, should be supported as these are also the keys to the success of reducing carbon emissions and achieving carbon neutral target. The Administration should coordinate with the relevant stakeholders to keep track of the key emerging technologies available in the world and consider if the technologies can be applicable to Hong Kong.

Low-carbon Transport in a Smart City

13. Transportation, which accounted for around 31% of total energy end-use in 2016, is an important component of Hong Kong's economy. The HKIE is pleased to note that the Administration proposes to adopt a multi-pronged approach to reduce carbon emissions from transportation, including the use of railways as backbone, widely use of new energy vehicles, and improvement of the city's mobility and walkability.

14. With a public transport-oriented policy of using railways as backbone, the HKIE is looking forward to the opening of Shatin to Central Link in the coming years and the potential projects such as South Island line (West), Northern Link and North Island line to increase the coverage of the railway network.

15. For the inevitable on-road transportation in Hong Kong, there is a huge potential for wider use of green and innovative technologies through adoption of electric vehicles (EVs), which produce about 30% less carbon emissions on average than their conventional counterparts (tank-to-wheel) on the same mileage travelled. With the increasing potential of low-carbon electricity generation in Hong Kong, electrification of the public and private transportation can achieve reduction in roadside air emissions and immediate public health benefits.

16. The Administration is recommended to formulate clear and progressive targets with policy support and enhance financial incentives for adoption of EVs in Hong Kong. This facilitates the market to introduce new EV models to the city and drive for a wider development of charging infrastructure, which are critical supporting factors to wider adoption of EVs in Hong Kong. However, the HKIE opines that limitations of battery may hinder the development of heavy-duty EVs and therefore suggests the Administration to consider the alternatives, such as application of hydrogen fuel cell technology in heavy duty vehicles.

17. The Institution notes that shipping and aviation sectors are excluded from the Agreement to avoid complication in carbon emissions calculation for transportation of goods. Nevertheless, the Administration is recommended to formulate strategies to reduce carbon emission from air and marine transport, such as studying the feasibility to electrifying ferries and non-road mobile machineries.

18. In addition, the HKIE recommends the Administration to foster a bicycle-friendly environment in new development areas to facilitate widely use of bicycles in local communities. The Administration should also consider installing footbridges linking the business centres and residential buildings to enhance walkability of the districts.

19. Moreover, it is noted that personal electric transportation equipment, such as electric scooter, is banned in Hong Kong. The Administration may reconsider, with reference to experiences of other cities, the application of these innovative transportation technologies in Hong Kong for short-distance commute.

20. Good city planning, which integrates safe cycling and walkability, local public transport, new delivery technologies (such as drones) and car sharing system, will further enhance smart mobility in Hong Kong. By combining smart technologies into the transition of low-carbon transport as the decarbonisation strategy, the HKIE believes that it would further reduce air pollution, noise and accidents and will result in large improvements in the quality of urban living.

Enhancing Building Energy Efficiency

21. In Hong Kong, buildings accounted for about 90% of the city's electricity use and some 60% of total GHG emissions in 2016. The Administration is suggested to extend the scope of Green Building certifications, such as Building Environmental Assessment Method (BEAM) and Leadership in Energy and Environmental Design (LEED), and to provide financial incentive to building owners applying Green Building certifications. Since large portion of electricity consumption (65%) comes from commercial buildings, it is suggested to firstly implement and promote such measures to commercial buildings.

22. Apart from enforcing energy efficiency of new buildings, the Administration should also consider setting up fund in subsidising renovation, retrofitting and refurbishment of existing buildings facilities to improve the energy efficiency of space cooling, lighting, building envelope, and installation of renewable energy devices and other building systems. We also recommend implementing regular carbon audits on existing buildings to monitor the performance of carbon emission.

23. The Institution also suggests the following measures which would assist in enhancing energy efficiency for both new and existing buildings:

- Use LED lamps/ replace old lamps with LED lamps to reduce power consumption on lighting
- Use inverter-driven air conditioners/ replace old air conditioners with inverter-driven ones to save power on cooling
- Use good insulation materials in commercial buildings to save power on cooling
- Use inverter-driven lifts and escalators/ renovate the motors to save power, especially in commercial buildings
- Use more low-carbon, energy efficient building materials
- Encourage sustainable building design

24. In addition, the Administration is suggested to conduct holistic reviews regularly on domestic and commercial use of resources and energy in the buildings, including electricity, gas, oil, water, as well as production of waste. The public could then be aware of their carbon footprints and make wiser choice in adapting a low-carbon lifestyle.

25. To reduce the energy use and carbon emissions coming from the re-construction and to maintain the functionality of the society, the HKIE urges the Administration to strengthen the buildings and infrastructures and increase design standards in order to prevent or minimise the potential damage caused by climate change and extreme weather.

Other Means

26. During the transition phases of decarbonisation strategies in the coming decades, the

nature of jobs will evolve, leading to requirements of new types of skills contributing to reduction of carbon emissions. The Administration should closely review the ongoing strategies and corresponding investment in advancing the skills of our workforce in this economic transformation.

27. We consider that a strategic move to transition to low-carbon city should be supported by general fostering of relevant value and knowledge. Hence, the HKIE considers that enhancement of education in schools and increase of public awareness are crucial in engaging all citizens to reduce carbon footprints in their daily lives. Education should play an important role to ensure that our future generations are well equipped with relevant knowledge and aptitude in protecting our environment. The public should also be educated to help reducing our carbon footprints, like choosing locally grown products where possible and minimising food wastes. Furthermore, providing financial incentives, such as tax reduction for low-carbon lifestyle, is also suggested. Stringent policies on controlling the use of non-green materials, e.g. banning on single-used plastic, may be considered.

28. More audacious carbon reduction targets could be set since it would offer good opportunities for the development of required infrastructures and, even if the aggressive targets cannot be met, the basic level of carbon emissions would be enhanced.

CONCLUSION

29. A host of factors from the society and environment are affecting the effectiveness of decarbonisation but these will not hinder our willingness in protecting our Earth. The development of a low-carbon city underpins the contribution of the global decarbonisation efforts. The continuous public engagement will determine our road ahead in formulating the long-term carbon-free strategies and hence should be encouraged.