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Panel on Environmental Affairs

Meeting on 24 June 2024

Background brief on Strategy of Hydrogen Development in Hong Kong

Purpose

This paper provides background information on the Strategy of Hydrogen Development in Hong Kong (“the Development Strategy”), and a brief account of the major views and concerns expressed by Members when related issues were discussed by relevant committees of the Legislative Council (“LegCo”) in recent years.

Background

2. As a secondary carrier of energy, hydrogen energy possesses the “clean” trait of traditional renewable energy sources and has a wide range of applications, making it one of the highly regarded new energy sources in pursuance of the target to achieve carbon neutrality. Hydrogen energy can be used in transportation, power generation and energy storage, as well as construction site equipment.

3. In 2022, the Government set up the Inter-departmental Working Group on Using Hydrogen as Fuel (“the Working Group”) to coordinate preparation works of bureaux/departments for using hydrogen as fuel locally, with a view to encouraging local adoption of hydrogen energy.¹ The Working Group is also tasked to review and assess applications for hydrogen fuel trial projects and advise on aspects such as safety and planning, so as to assist applicants in commencing the trials as early as possible.

¹ The Working Group comprises the Environment and Ecology Bureau, Transport and Logistics Bureau, Development Bureau, Security Bureau, Environmental Protection Department, Electrical and Mechanical Services Department, Fire Services Department, Transport Department, Marine Department, Planning Department, Lands Department, Buildings Department and Architectural Services Department.

4. As announced in the 2023 Policy Address, the Government will formulate the Development Strategy and commence the preparatory work for legislative amendments pertinent to the production, storage, transportation and application of hydrogen energy, and target at introducing an amendment bill into LegCo in 2025.

Promoting new energy commercial vehicles

5. The Government has been encouraging the trade through the New Energy Transport (“NET”) Fund to introduce new energy commercial vehicle models which are suitable for local adoption, and has earmarked \$200 million under the Fund to subsidize trials on hydrogen fuel transport technologies. The Government is reviewing the subsidy framework, approach and levels of the NET Fund so that it can focus on subsidizing new energy technologies that are more suited or better placed in meeting market needs.

6. As at mid-December 2023, the Working Group had examined and given agreement-in-principle to nine applications of trial projects on hydrogen fuel cell double-deckers, hydrogen fuelled light rail vehicles, hydrogen tube trailer, hydrogen refuelling facilities and hydrogen power generation at construction sites, etc.

Conversion of petrol filling stations

7. With the transition from conventional fuel-propelled vehicles to electric vehicles (“EVs”) becoming a dominant trend, the Government expects that the demand for auto-fuel will continue to decrease and is planning ahead for the future development of the existing petrol filling stations (“PFSs”), including their conversion to quick charging stations or petrol-cum-charging stations for EVs. In this pursuit, the Government is mindful of the possibility of new types of energies (e.g. hydrogen and methanol), and the related technical aspects and other issues such as cost and upstream supply chain.

Major views and concerns expressed by Members

8. Members’ major views and concerns are summarized in the ensuing paragraphs.

Facilitating adoption of hydrogen energy for transportation

Legal framework

9. Members requested the Administration to expedite the establishment of an overarching legal framework that broadly covered the local use of hydrogen

fuel and other potential zero-carbon fuels (such as ammonia and green methanol which were interchangeable with hydrogen); and drawing up the relevant legislative and implementation timeframes.

10. The Administration advised that it would introduce legislative amendments to the Gas Safety Ordinance (Cap. 51) to cover hydrogen as fuel, with a view to laying a solid foundation for the high quality and safe development of hydrogen energy. Its plan was to introduce an amendment bill in 2025. The Electrical and Mechanical Services Department (“EMSD”) had developed safety guidelines for hydrogen fuel system of vehicles and hydrogen refuelling stations, as well as technical guidelines for quantitative risk assessment of hydrogen refuelling stations by benchmarking relevant regulations and standards in the Mainland and overseas in the fields of hydrogen storage, transportation, and refuelling, etc. EMSD had consulted the professional bodies, trade and stakeholders concerned in early 2024 to refine the guidelines and to prepare for the incorporation of the Codes of Practice into the regulatory framework in future. Before the legal framework was set up, the Working Group would continue to facilitate trial projects on hydrogen fuel technology on a case-by-case basis while ensuring proper safety or other requirements.

Strategy of hydrogen development

11. Members enquired whether the Administration would make specific plan in the Development Strategy for the production, storage, transportation, refuelling and safety standards of hydrogen energy in Hong Kong.

12. The Administration advised that in formulating the Development Strategy, it would adopt the basic principles set out in the National Hydrogen Plan, and make reference to the experiences and research and development (“R&D”) results of cities in the Mainland and overseas, for the purpose of exploring and promoting a comprehensive development of hydrogen production, storage, transportation, refuelling and adoption, with a view to preparing Hong Kong for the wider application of hydrogen energy in the future. Currently, the technologies of low-carbon hydrogen were still at the R&D stage in various parts of the world. Flexibility should therefore be maintained when formulating the Development Strategy, so that the scale and pace of the development of hydrogen energy could be adjusted in tandem with future technological and market developments for the purpose of maximizing the development potential of hydrogen energy in Hong Kong.

Certification and grading standards

13. As the Mainland was actively promoting the international standardization of hydrogen energy, Members suggested the Administration consider establishing relevant standards and certification systems that were internationally recognized, so as to facilitate the entry of the hydrogen energy industry of the Guangdong-

Hong Kong-Macao Greater Bay Area and even the whole country into the international market.

14. The Administration concurred that establishing standards and certification systems for hydrogen energy and green hydrogen production could facilitate low-carbon transformation and promote international cooperation. Although the International Organization for Standardization (“ISO”) had established a standard for carbon emission calculation, there was currently no uniform and internationally recognized certification system for hydrogen energy. On the other hand, ISO had been setting up a technical group to prepare for the establishment of a greenhouse gas emission standard specifically for hydrogen production and transportation, with the aim of drafting a set of international standards by 2025. As for the Mainland, its National Hydrogen Plan pointed out the need to establish comprehensive standards and systems for the hydrogen energy industry. The Administration would maintain liaison with relevant stakeholders and make reference to the development of certification standards and systems for hydrogen energy in the Mainland and internationally, so as to set up an appropriate certification system in Hong Kong.

Hydrogen supply and refuelling

15. Members asked about the sources of hydrogen supply and whether the Administration would consider hybrid use of PFS sites, with both EV charging and hydrogen refuelling.

16. The Administration advised that:

- (a) some local suppliers were supplying hydrogen that was produced by electrolysis of water. Fossil fuel companies might import hydrogen fuel in future for sale in Hong Kong. In addition, the Hong Kong and China Gas Company had plans to try out hydrogen extraction from its gas supply; and
- (b) hydrogen fuel technologies were unlikely to overtake EV technologies, and it would not be cost-effective to develop a separate set of infrastructure for refuelling hydrogen fuel cell light vehicles at this stage. If there were proposals from PFS operators on hybrid use (i.e. EV charging and hydrogen refuelling) of PFS sites, the Administration would give due consideration to the proposals.

Hydrogen fuel cell electric buses

17. Some Members suggested including in the bus franchise conditions relevant requirements for franchised bus companies (“FBCs”) to adopt new energy buses, and promoting adoption of hydrogen fuel cell buses (instead of electric buses) in the longer run.

18. The Administration advised that it had already imposed requirement on FBCs in the bus franchise conditions to, when acquiring new buses, acquire the most environmentally friendly buses as far as reasonably practicable, with the ultimate objective of fully adopting zero emission buses. As the type of buses adopted by FBCs in Hong Kong were mainly double-deckers and there were limited number of suppliers of new energy double-deckers in the market that could meet Hong Kong's local operational requirements, a reasonable degree of flexibility should be allowed for FBCs to select their bus models. The Administration would continue to collaborate with FBCs and other stakeholders in the trials of hydrogen fuel cell buses, with a view to assessing their operational performance under local circumstances.

Latest development

19. On 24 June 2024, the Administration will brief the Panel on Environmental Affairs about the Development Strategy after its announcement in June 2024.

Relevant papers

20. A list of relevant papers is set out in the **Appendix**.

Council Business Division 1 and Public Complaints Office
Legislative Council Secretariat
19 June 2024

Strategy of Hydrogen Development in Hong Kong

List of relevant papers

Committee	Date of meeting	Paper
Panel on Environmental Affairs (“EA Panel”) and Panel on Transport	28 November 2022	Agenda Item II: Promoting the adoption of new energy transport Minutes
EA Panel	21 April 2023	Agenda Item III: Charging network in support of the popularization of electric vehicles in Hong Kong Minutes
	19 October 2023*	Report of the duty visit to Mainland cities of the Greater Bay Area
	15 December 2023	Agenda Item II: Conversion of petrol filling stations into quick charging stations Minutes
Finance Committee	13 April 2023	Administration’s written reply to Members’ initial question on the Estimates of Expenditure 2023-2024 (Reply serial numbers: EEB(E)118, 124, 125, 139, 146, 149, 153, 157, 165, 169, 175, 176, 177, 178 and 180)
	17 April 2024	Administration’s written replies to Members’ initial questions on the Estimates of Expenditure 2024-2025 (Reply serial numbers: EEB(E)018, 032, 129, 158, 161, 162, 183, 185, 186, 196, 199, 202, 206 and 214)

*date of issue of the paper

Council meeting	Paper
13 December 2023	Council question 4 : Development of hydrogen energy
19 June 2024	Council question 11 : Promoting green transformation of public land transport