

Frequently Asked Questions (FAQs)

1. Why does Hong Kong need to develop hydrogen energy?

Climate change has caused extreme weather conditions. To mitigate the impact of climate change on human life and social development, countries around the world are striving to reduce greenhouse gas emissions. We need to actively develop new low-carbon energy sources that are clean and efficient, in order to tackle the issue of carbon emissions at source. Hydrogen energy is gaining traction internationally, and the development of new energy transport has become a growing trend.

Hydrogen is a secondary carrier of energy. It can be produced from renewable energy (such as solar energy and wind energy) through electrolysis, and transported through compressed storage, refrigerated storage or pipeline to provide clean energy to users. It is highly energy-efficient with low polluting potential, and would only form water without emissions after generating energy. It can be used as a fuel for transportation, heating and power generation, etc. In the field of transportation, hydrogen fuel cell vehicles require fewer batteries, less volume, and lower load compared to pure electric vehicles, which also minimise the demand for battery disposal in future. Hydrogen will have even wider application to heavy goods vehicles.

2. What are “grey hydrogen”, “blue hydrogen” and “green hydrogen”?

Currently, hydrogen gas is generally classified according to the production methods and its environmental impact. It is typically divided into grey hydrogen, blue hydrogen and green hydrogen.

Grey hydrogen is mainly produced as a by-product of the oil refining process or by steam reforming using natural gas or other fossil fuels as raw materials. This hydrogen production method is currently the most mature and cost-effective, though it releases carbon emission. The hydrogen fuel produced can be used to support trial projects conducted to accumulate experience and provide reference for the wider use of hydrogen in Hong Kong in the future.

Blue hydrogen provides a more environmentally friendly option. While it is also produced by steam reforming, but with the addition of carbon capture and storage technology to offset carbon dioxide emission.

Green hydrogen is produced by the electrolysis of water powered by renewable energy such as solar or wind power with zero-carbon emission throughout the entire course of production.

3. Does Hong Kong have sufficient hydrogen supply, especially green hydrogen, to support the local development of hydrogen energy in the future?

On the supply of hydrogen energy, the issue of land and scale limits the development of renewable energy (such as solar energy and wind energy) in Hong Kong and thereby posing a constraint on the cost-effectiveness of local production of green hydrogen through conventional renewable energy. In the long run, apart from carrying on with the discussion on the feasibility of producing green hydrogen locally through innovative technologies, the Government needs to strategically consider importing low-carbon hydrogen energy from the Mainland and other countries and regions, including collaborating with other cities in the Greater Bay Area to study the co-ordination of a hydrogen supply network, with a view to strengthening the overall stability and competitiveness of the supply chain, as well as providing a necessary environment for the wider application of hydrogen energy. At the same time, we will formulate safety standards for relevant infrastructure and study the scope of their application.

4. What are the supporting facilities required for hydrogen transportation?

Regarding hydrogen transportation, hydrogen can be transported in the form of compressed gas, refrigerated liquid, liquid organic matter

(such as methanol or ammonia solution) or absorption-based solid depending on factors such as pressure, temperature, and chemical environment. Countries around the world have been actively developing the hydrogen industry in recent years, and there is already a certain basis for relevant technologies and regulations. The Electrical and Mechanical Services Department has appointed hydrogen fuel consultants to conduct studies on specific topics to draw reference from the practical experience of different countries and regions in hydrogen transportation. Overall speaking, the use of tube trailers to transport hydrogen in compressed gas form appears to be the main transport mode at this stage.

Since the carrying capacity of each tube trailer is limited, only pipeline transportation of hydrogen can produce the economic benefits from large-scale hydrogen use. At present, the technology of long-distance pure hydrogen pipeline transportation is still in the development stage. We expect that the technology, when mature, can be promoted for application in Hong Kong to reduce the transportation costs.

Hong Kong has a comprehensive town gas pipeline network, and the town gas fuels currently transported through the town gas pipelines comprise about 50% hydrogen. The extraction of hydrogen through the existing town gas pipelines at the user end is a feasible option, and it will reduce the need for tube trailers to travel between the Hong Kong Island and Kowloon as well as New Territories by sea.

Each existing mode of hydrogen transportation has its own merits and demerits. In the light of these technological and institutional developments, we will formulate the future storage and transportation modes of hydrogen in Hong Kong.

5. How will the Government regulate the use of hydrogen energy to ensure public safety?

Since 1991, the Electrical and Mechanical Services Department (EMSD) has been effectively regulating gas safety in Hong Kong by virtue of the Gas Safety Ordinance (the Ordinance) (Cap. 51), which regulates the entire gas value chain including importation, manufacture, storage, transport, supply and use, and the Ordinance has been successfully applied to the Liquefied Petroleum Gas (LPG) Vehicle Scheme. However, only LPG, towngas and natural gas are currently regulated under the Ordinance, but not hydrogen fuel.

To cope with the hydrogen fuel development in Hong Kong, the EMSD is studying the introduction of amendments to the Ordinance to cover the regulation of hydrogen fuel safety, including the hydrogen fuel systems of vehicles, hydrogen fuel facilities at hydrogen refuelling stations, hydrogen fuel value chain, and safety of hydrogen vehicle mechanics and repair workshops. The EMSD conducted a trade consultation and business impact assessment in early 2024 with general support received from the trade, and plans to

introduce the proposed legislative amendments to the Legislative Council in 2025.

6. How does the Government assist the trade in commencing trials on hydrogen energy?

To keep pace with the development of hydrogen fuel, the Government set up in 2022 the Inter-departmental Working Group on Using Hydrogen as Fuel (the Working Group), comprising representatives from 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. The Working Group provides technical advice on the launch of trial projects to test out the application of hydrogen energy, in a bid to prepare for the future popularisation of hydrogen energy in Hong Kong.

7. Will the Government introduce funding schemes to encourage the trade to commence trials on hydrogen energy?

To assist the transport trade to commence trials on hydrogen fuel transportation, the Government has earmarked funding under the New Energy Transport Fund for subsidising the costs associated with

the trial projects such as the procurement of hydrogen fuel cell heavy vehicles. Moreover, technological advancement plays a pivotal role in the wider application of hydrogen energy. In 2020, the Government set up the Green Tech Fund (GTF) to provide better and more focused funding support to research and development projects which help Hong Kong decarbonise and enhance environmental protection. A number of projects have been approved thus far, involving projects that contribute to the development of hydrogen energy technologies, such as the production of green hydrogen with renewable energy; hydrogen fuel storage and release technologies; and development of intelligent hydrogen fuel supply facilities, etc.