

Management response template

UNDP management response template

[Terminal Evaluation for PIMS 5349 CPR DevCom FCV Project] Date: 23 Dec 2021

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Evaluation recommendation 1.

Recommendation 1 (to UNDP and MOST): The GEF should continue to support decarbonization of transport through FCVs in China.

This recommendation is made in consideration of the interest expressed by the demo cities during the TE mission, the need to mainstream FCVs in most Chinese cities, and the critical role that hydrogen and fuel cells potentially play in mitigating the adverse impact of climate change. While GoC is likely able to promote FCVs in public transport and HRS construction in some of their plans, some of the aspects for GEF support includes:

- the application of fuel cells on urban service vehicles, industrial vehicles such as forklifts, heavy duty trucks, waterway vessels, and trams. Involvement of private sector companies would be necessary.
- the promotion of FCVs in other cities in China. There are over 100 cities in China with over 1 million people, and over 360 cities with a population between 100,000 and 1.0 million. Mainstreaming FCVs will take an extraordinary effort; and
- the promotion of innovative solutions for hydrogen transportation and storage such as ammonia and methanol piped gaseous hydrogen transportation, blending hydrogen into natural gas networks, transport-curtailed electricity through the grid and produce hydrogen locally, and renewable energy production (see Action 2).

Management response: Agree

Key action(s)	Completion date	Responsible unit	Tracking*	
			Comments	Status
1.1 To thoroughly discuss and evaluate the possibility of pipelining future projects to support decarbonization of	Dec 2021	UNDP China	Action completed successfully. Line Ministries/high-level policy makers had affirmed their commitment in leveraging hydrogen-based solutions for China's low carbon transition, including exploring on the possibility of applying for further funding from GEF. Local governments and relative	Completed

transport through FCVs in China with relevant stakeholders such as line Ministries and relevant associations in China.			<p>associations are also supportive of advancing hydrogen and fuel cell economy with GEF and UNDP's support both in terms of funding and technical expertise and network.</p> <p>Not only can UNDP's value added be programmatic, but it can also be policy and research-oriented i.e. in the form of meetings and dialogues. For example, the UNDP Hydrogen Industry Conference 2021, as an important platform for dialogues between government, industry, and the academia, gained support from the National Development and Reform Commission and the National Energy Agency. This is especially true considering whether the Ministry of Finance, where the GEF Secretariat is housed, or the GEF board will support another project with sufficient funding, is beyond the decision of the UNDP Country Office.</p>	
1.2 To support China in furthering hydrogen application in transport. This included expanding the application scenarios of FCVs (heavy duty trucks, forklifts, trams etc.) and in cooperation with regions and private sector companies.	Dec 2021	UNDP China	<p>Action completed successfully.</p> <p>Despite turnaround period of the GEF programme cycle, UNDP mobilised a total budget of USD 21 million to support China in mainstreaming hydrogen application in transport. The resource is being/will be used for 3 FCV related pilot projects in 2 of its the current demo cities (Foshan and Changshu) and another city anchored in the Yangtze River Delta hydrogen industrial cluster - Rugao.</p> <p>Meanwhile, the CO also initiated collaboration and liaison with the National Energy Administration which has already expressed interest in applying for a new GEF project. The project is envisaged to expand the types of applications of FCVs for industries and urban services by cooperating with private sector companies on feasibility studies and piloting demonstration operation of such vehicles. The project is also envisaged to work with relevant institutions and industry experts to identify the current technological barriers for transportation and storage technologies to provide tailored support for future infrastructure innovations and development.</p>	Completed
1.3 The CO worked with various institutions on exploring innovative solutions for developing a hydrogen economy, including the transportation and	Dec 2021	UNDP China	<p>On 8 Dec 2022, UNDP China organised a seminar on "hydrogen and ammonia economy" with participation of academia and private sector companies in the renewable energy, hydrogen, and chemical industries. The participants exchanged views on the feasibility and possible scenarios for coupling ammonia with hydrogen-based solutions and formed a task force to explore future research and project opportunities on this front.</p>	Completed

storage of hydrogen and use of ammonia.				
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Evaluation recommendation 2.

Recommendation 2 (to MOST, UNDP and GEF): Support the demonstration and promotion of renewable energy hydrogen production through a GEF-supported project that provides more focus on the energy -related aspects of hydrogen production.

Through further decarbonizing the transport sector with the application of fuel cells on urban service vehicles, the project would support renewable-based hydrogen production as an integration into the grid, large-scale integration, and carbon pricing mechanism. Through continued support to the demonstration and promotion of FCVs in more models, fields, and scenarios, the project could fully exploit the potential of fuel cells in commercial vehicles, and support China to further explore the feasibility of developing hydrogen fuel cell passenger cars in UMIC countries and compare them with electric passenger car applications, providing lessons for other countries, such as Malaysia and Chile, to develop zero- and low-carbon transportation energy sector project that would support the transport sector and beyond. Through support for deeper exploration of the potential of renewable energy sector, the project would support the transport sector by:

- piloting different types of renewable based hydrogen production from biomass, wind and solar.
- decarbonizing the power system through coupling renewable energy to gas technologies, hydrogen storage and transport solutions such as pipelines and ammonia;
- shaping private sector investments towards cost reductions on renewable energy projects.
- integrating renewable energy into the grid;
- demonstrating a carbon pricing mechanism in demonstration cities; and
- developing and scaling-up of a set of replicable solutions for training first line technicians and workers in the hydrogen industry, from hydrogen production to end-user operations and maintenance support.

This type of project would support China's drive to further explore the feasibility of renewable energy for hydrogen fuel production for FCVs and further reduce the GHG emissions of the transport sector.

Management response: **Agree**

Key action(s)	Completion date	Responsible unit	Tracking	Status
			Comments	
2.1 To conduct feasibility studies on building a hydrogen economy, or a hydrogen society, that includes energy-related aspects	Dec 2021	UNDP China	The project team has commissioned a report on developing a hydrogen society in China, which explores options such as renewable-based hydrogen production, to complement the intermittence when integrating renewable energy to grid, hydrogen transportation via pipelines, as well as nurturing the necessary technical vocational talents for meeting the rapid-growing industry. The research set the foundation for China to further explore	Completed

of hydrogen production and application.			<p>the feasibility of renewable energy for hydrogen fuel production for FCVs and further reduce the GHG emissions of the transport sector.</p> <p>The research had been completed for providing advisory to the demo cities, relevant institutions, and the project team.</p>	
2.2 To explore project options for piloting such applications, with possible funding from GEF and/or other sources in regions that are committed to advance its hydrogen economy or building a hydrogen society.	Dec 2021	UNDP China	<p>UNDP mobilised a total budget of USD 21 million for 3 FCV related pilot projects in 2 of its the current demo cities (Foshan and Changshu) and another city anchored in the Yangtze River Delta hydrogen industrial cluster - Rugao.</p> <p>The 3 cities and possibly more have been ready to further scale up FCVs and developing the hydrogen industrial chain regardless of whether GEF will continue to fund, which requires a long process to explore. Of which, 2 of the 3 cities committed to develop technical vocational education and training for meeting the needs of local and nearby hydrogen industry.</p> <p>Meanwhile, the CO also initiated collaboration and liaison with the National Energy Administration which has already expressed interest in applying for a new GEF project.</p>	Completed

Evaluation recommendation 3

Recommendation 3 (to UNDP and MOST): Strengthen the system of cultivating technical talent for fuel cell and hydrogen energy value chains. Further strengthening of the talent pool will involve the vocational colleges that setup a unit to focus on hydrogen and FCVs in cooperation with a host city. For example, the Greater Bay Area Hydrogen Economy Vocational College cooperates with Foshan City on multiple levels for the domestic and international community, promoting the transformation of scientific research results related to hydrogen energy and FCVs, and meeting the demands of the FCV and HRS industry.

Management response: Agree

Key action(s)	Completion date (specified to month)	Responsible unit(s)	Tracking	
			Comments	Status ("Not initiated", "initiated", "completed", Or "no longer applicable")

3.1 Conduct research on talent development for the hydrogen industry	Dec 2021	UNDP China	In 2021, the project commissioned a report on talent development needs for the hydrogen industry, covering not only fuel cell system and vehicle manufacturing, but also talent needs for hydrogen safety, infrastructure operations and maintenance etc. and the missing link in the current higher education system to fulfill such needs.	Completed
3.2 Set up new projects and partnerships to advance the agenda	Dec 2021	UNDP China	The project has laid a foundation for training first line technicians and workers in the industry. UNDP built on its current progress and established further cooperation with Foshan and Changshu, for mapping and developing a technical vocational education and training system for the hydrogen industry, based on the result of 3.1. So far, the ProDoc for the project in Foshan has been signed. The ProDoc for Changshu is in development.	Completed

Evaluation recommendation 4

Recommendation 4 (to MOST): Strengthen policy support and sustainability for hydrogen and FCVs. This can be achieved by:

- building on the 2022 Winter Olympics for Beijing and Zhangjiakou, to cultivate more internationally renowned enterprises spearheading the FCV industry, to formulate an industrial cluster of key components and equipment manufacturers, to strengthen the exploration of business models and application scenarios for sustainable development, and to disseminate these experiences internationally, especially to developing countries;
- further exploring policies, regulations and business models for FCVs in the private sector, first locally and then nationally;
- supporting the FCV industry by means of enhancing macro policy incentives and relevant approval mechanisms;
- drawing from the experience of Shanghai and Foshan in changing the land category for new HRSs and coordinating and promoting the commercial operations of HRSs; and
- strengthening the government organization and guidance functions and the optimal allocation of resources to promote the sustainable development of the renewable energy hydrogen production industry.
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Management response: Agree

Key action(s)	Completion date (specified to month)	Responsible unit(s)	Tracking	
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4.1 MOST and/or other ministries to issue policy incentives that promotes the deployment of FCV and hydrogen technologies in cities spearheading the industry.	Dec 2021	MOST (Information collected by UNDP China)	MOST issued a series of research catalogues and guidance on renewable energy based hydrogen production technology, hydrogen infrastructure, and fuel cell technology etc. Together with MOF, MIIT, NDRC and NEA, the ministries selected 3 clusters (covered 4 out of 7 demo cities under the GEF project as well as another city that UNDP China works with under government cost sharing) and planning to select another 2 clusters (covering 2 additional cities under the GEF project). The overlap between UNDP's demo cities and the ministries' decision also reflected the project's value added to the development of the hydrogen and fuel cell industry in China. MOST also launched the "Hydrogen into Ten Thousand Homes", expanding the focus from fuel cell vehicle deployment to more energy-focused scenarios.	Completed
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* Status of implementation is tracked electronically in the ERC database.