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Subsidies are key to hydrogen refueling infrastructure, but just how much money is needed?

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Interact Analysis' Hydrogen Refueling Stations Report contains a highly-detailed global database of refueling locations, market forecasts and key insights on technical and policy trends that are driving the rollout of infrastructure.

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negatively
- But how much is needed, and what are different countries doing?

High Construction and operational costs have been obstacles to the deployment of hydrogen refueling stations (HRS), posing a significant challenge to the promotion of hydrogen vehicles. Our research shows how subsidies of different amounts are being used in different countries to stimulate the deployment of HRS.

Construction Subsidies: Generally not lower than 30%, with a maximum of 80%

Hydrogen refueling station subsidies typically consist of two parts: a portion for the construction itself and a portion for the station's operation. Construction subsidies are aimed at covering construction costs beyond civil engineering expenses, typically representing a percentage of the total investment.

How are different countries approaching subsidies for hydrogen refueling stations?

In China, which has built the largest number of hydrogen stations, subsidy policies are issued by local governments. Construction subsidies generally range from 30% to 50%, depending on the type of HRS. For example, stationary/skid-mounted hydrogen refueling stations typically correspond to different subsidy amounts, while some provinces provide higher subsidies for integrated hydrogen production and refueling stations.

cluster" have been in action for some time. For example, in November 2021 the Shanghai Municipal Development and Reform Commission issued its *"Policies on Supporting the Development of Fuel Cell Vehicle Industry in Shanghai,"* announcing that subsidies will be provided at a rate not exceeding 30% of the approved total investment. More specifically, for hydrogen refueling stations that obtain gas operating permits in 2022, 2023, and 2024-2025, the maximum subsidy per station will not exceed 5 million RMB (approximately US$0.7 million), 4 million RMB (~US$0.5 million), and 3 million RMB (~US$0.4 million) respectively.

In Japan, on top of central government subsidies, some local governments also provide financial incentives to support HRS construction. National subsidies now stand at 50% and 67%, and, when combined with local subsidies, can reach up to 80%. As the table below demonstrates, subsidies are determined based on hydrogen refueling capacity and the type of hydrogen refueling station.

HRS Type	Segmentation	Subsidy Rate	Maximum Subsidy (in millions of JPY)	Equivalent Subsidy in USD (in thousands)
Large-scale		2/3	450	2,880
Medium-scale	Packaged Solution	2/3	250	1,600
	Does not fall into the above-mentioned categories	1/2	250	1,600
Medium-scale	Packaged Solution	2/3	180	1,152
	Does not fall into the above-mentioned categories	1/2	180	1,152
Small-scale	Stationary	2/3	100	640
Mobile	Mobile	1/2	130	832
	Location/application site change	2/3	33	211
Optional (excluding mobile and small-scale)	On-site hydrogen production unit (SMR)	Expansion: 1/2 Newly established: Depends on the scale and method	60	384
	On-site hydrogen production unit (electrolysis)		150	960
	Liquid hydrogen equipment		40	256
	Installation of additional hydrogen refueling equipment		200 (large-scale) 100 (medium-scale)	1,280 (large-scale) 640(medium-scale)
	Remote monitoring equipment	2/3	10	64
Centralized hydrogen production facilities (one per supplier, up to 10 units)		1/2	60	384
Centralized hydrogen liquefaction facilities		1/2	2,500	16,000

Note: This is the subsidy standard for hydrogen refueling stations in Japan in 2024.

> Subsidies for HRS construction and operation in Japan can reach a maximum of 80%

subsidies in the current fiscal year into account. Japanese subsidies for the construction of hydrogen refueling stations and related equipment are based on refueling capacity and the type of station. The national subsidy rate is determined based on the supply capacity and method, and subsidy rate can reach 50% and 67%. Regionally, taking Kanagawa as an example, the combined subsidy from both local and national governments can be as much as 80% of the total investment cost.

In South Korea, both central and local governments issue subsidies for HRS construction, and the central government subsidy rate is 70% across the board, with the maximum subsidy rate capped for liquid hydrogen refueling stations. The Ministry of Environment releases hydrogen refueling station installation and fuel cost support projections annually. In the latest document for 2024, the subsidy rate for all declared projects is 70%, while the upper limit of the subsidy rate is determined based on the type of hydrogen refueling station and whether it is newly constructed (as shown below).

HRS Type			Subsidy Rate	Maximum Subsidy (in millions of KRW)	Equivalent Subsidy in USD (in thousands)
General	Newly built	Phase 1	70%	3,000	2,220
		Phase 2		5,000	3,700
	Expansion	Phase 1		2,000	1,480
Specialized	Newly built	Phase 2		6,000	4,440
	Expansion	Phase 1		2,500	1,850
Liquid hydrogen	Newly built	Phase 4		10,000	7,400
	Expansion	Phase 2		4,000	2,960

Note: This is the subsidy standard for hydrogen refueling stations in South Korea in 2024.

> HRS subsidies in South Korea are determined by the type of refueling station planned

Notably, the subsidy for liquid hydrogen refueling stations is significantly higher than for other types of stations. In recent years

liquid HRS by 2030. Although there are factors that can affect the process of project planning to actual operation, based on South Korea's currently announced hydrogen refueling station plans and subsidy policies, liquid refueling stations may play an important role in South Korea's HRS landscape.

Within the United States, California is the hydrogen hub and offers financial incentives for HRS construction, with rates of 50%-75% targeting medium and heavy-duty commercial vehicles. California launched the first round of its EnergIIZE Commercial Vehicles program in 2022, which aims to develop zero-emission commercial vehicles infrastructure. The project entered its third round this year and provides a 50% subsidy for hydrogen refueling stations, with a maximum of US$3 million per station. For projects that meet certain criteria, the subsidy will increase to 75%, reaching as much as US$4 million.

In Europe, both the European Commission and national governments provide construction subsidies for hydrogen stations. European Union subsidies within the European Union range from 30%-50%, while in Germany the subsidy rate can be up to 80%, with HRS subsidies mostly project based. In 2023, the EU passed new regulations aiming to deploy one hydrogen refueling station serving both cars and lorries every 200 kilometers along the Trans-European Transport Network (TEN-T) by 2030. As a result of this plan, various countries have successively advanced hydrogen refueling station construction projects. In April 2024, the European Commission announced a total of 115 million euros (US$123 million) in subsidies for 43 hydrogen refueling station projects (some of which include electrolyzers) in 7 countries, with the subsidy rate per station primarily **concentrated at 30%-50%.**

reduction of end-use hydrogen costs

In China, operational subsidies for hydrogen refueling stations are typically based on retail prices, providing subsidies based on hydrogen prices according to the actual amount of hydrogen dispensed. For example, in Guangdong HRS integrated green hydrogen production facilities that have a hydrogen pump price lower than 35 RMB/kg (US$4.8/kg) by the end of 2023 and 30 RMB/kg (US$4.1/kg) by the end of 2024 will be rewarded with 10 RMB/kg (US$1.4/kg) for hydrogen sales volumes. The subsidy for a single station will not exceed 5 million RMB (US$0.7 million).

Japan and South Korea also provide subsidies for the operation of hydrogen refueling stations, and the subsidy rates are predominantly related to operating entities, with the rate determined by operating performance, as well as the size of the enterprise.

- South Korea boasts the lowest hydrogen refueling price globally, which is largely attributed to the government's generous subsidies for terminal hydrogen prices. Under the Korean government's hydrogen refueling station installation and fuel cost support project, a subsidy of 70% of the price difference between the retail price of hydrogen and the break-even price is provided, with a maximum limit of 80% of the total loss.
- In Japan, Tokyo – as one of the regions with the largest number of hydrogen refueling stations nationwide – has been proactive in terms of operational subsidies, releasing its latest annual HRS operational subsidies in May 2024. For large-scale operators, a hydrogen price subsidy of 660 JPY/kg (approximately US$4.2/kg) and a subsidy of 60 JPY/kg (approximately US$0.4/kg) for other operational costs are provided. For small

Final thoughts

Providing the infrastructure for fuel cell vehicles, deployments of hydrogen refueling stations serve as an essential cornerstone for their commercialization. With the industry currently in the early stages of development, government support policies such as financial subsidies play an irreplaceable role in the deployment of hydrogen refueling stations and the promotion of fuel cell vehicles. As the level of industrialization continues and the pace of large-scale application accelerates, we will monitor closely how hydrogen refueling station support policies in various countries evolve in the future.

For more information about our Hydrogen Refueling Stations – 2024 report, please get in touch with Shirly Zhu.

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