INTERNATIONAL PARTNERSHIP FOR
HYDROGEN AND FUEL CELLS IN THE ECONOMY

IPHE Country Update July 2020: China

Name	Mingzhe XUE
Contact Information	mzxue@tongji.edu.cn, 86-21-69583895
Covered Period	November 2019 – June 2020

1. New Initiatives, Programs, and Policies on Hydrogen and Fuel Cells

On November 10th, 2019, 15 Ministries, including National Development and Reform Commission (NDRC), Ministry of Industry and Information Technology (MIIT), Ministry of Education (MoE), Ministry of Finance (MoF) released "*Implementation Opinions on Promoting the Deeply Integrated Development of Advanced Manufacturing and Modern Service Industries*". Within the part "Explore new paths for integrated development of key industries and key areas", "Promote innovation and agglomeration development of hydrogen energy sector, and improve facilities and services for hydrogen production, storage, transportation, and refuelling" was mentioned.
http://www.gov.cn/xinwen/2019-11/15/content_5452459.htm (in Chinese)

On December 3rd, 2019, MIIT released "*New Energy Vehicle Industry Development Plan (2021-2035) (Draft for Comment)*". In the field of technology innovation, "Strengthening the innovation on vehicle integration technology (including fuel cell vehicle) and making breakthrough in key component technology (including fuel cell system)" was mentioned. In the field of infrastructure, "Improving the economics of hydrogen fuel production, storage and transportation and promoting the construction of hydrogenation infrastructure" was indicated.
http://www.miit.gov.cn/n1278117/n1648113/c7553623/content.html (in Chinese)

On January 19th, 2020, MoE, NDRC and National Energy Administration (NEA) released "*Energy Development Technology Discipline Development Action Plan (2020-2024)*". It proposed to promote basic theoretical research on fuel cell, hydrogen storage, etc.
http://www.moe.gov.cn/srcsite/A08/s7056/202002/t20200210_419693.html (in Chinese)

On April 10th, NEA released an announcement on public solicitation on "*Energy Law of the People's Republic of China (Draft for Comment)*". Hydrogen energy was classified as an energy category. This is the first legal confirmation of hydrogen energy in China.
http://www.nea.gov.cn/2020-04/10/c_138963212.htm (in Chinese)

On April 16th, MoF, State Taxation Administration and MIIT released "*Announcement on Policies Regarding Exemption of Vehicle Purchase Tax on New Energy Vehicles*". New energy vehicles including fuel cell vehicles are exempted from vehicle purchase tax from January 1st, 2021 to December 31st, 2022.
http://www.chinatax.gov.cn/chinatax/n810341/n810755/c5148808/content.html (in Chinese)

On April 16th, MIIT released "*Main Points of New Energy Vehicle Standardization in 2020*". In the field of fuel cell vehicles, it asked to "accelerate the formulation of standards for the hydrogen nozzle, complete the standard for hydrogenation communication agreement; promote the establishment of vehicle standards such as fuel cell electric vehicle safety requirements after collision, vehicle test method standards such as low temperature cold start-up, energy consumption, driving range and power performance, key components standards such as fuel cell vehicle engine, air compressor, on-board hydrogen system.

http://www.miit.gov.cn/n1146285/n1146352/n3054355/n3057585/n3057592/c7864986/content.html (in Chinese)

On April 23rd, MoF, MITT, Ministry of Science and Technology (MoST) and NDRC released "*Notice on Improving the Financial Subsidy Policies for the Promotion and Application of New Energy Vehicles*". The current purchase subsidies for fuel cell vehicles will be adjusted. Cities or regions with foundation, enthusiasm, and characteristics will be selected for demonstration on technical research of key components and industrialization application. The central government will reward the model cities incentives, instead of subsidies (relevant notice will be issued separately).
http://www.gov.cn/zhengce/zhengceku/2020-04/23/content_5505502.htm (in Chinese)

On April 29th, MoF issued "*Letter regarding soliciting opinions on "Notice on the Demonstration and Promotion of Fuel Cell Vehicles (Draft for Comments)*"" to eight provinces including Beijing, Shanxi, Shanghai, Jiangsu, Henan, Hubei, Guangdong, and Sichuan. This Draft for Comment was a continuation of the guideline for the promotion of fuel cell vehicles in the "Notice on Improving the Financial Subsidy Policies for the Promotion and Application of New Energy Vehicles" issued by the four ministries and commissions on April 23rd.

On May 19th, NEA released an announcement on publicly soliciting opinions on "*Guiding Opinions on Establishing and Improving Long-term Mechanism for Clean Energy Consumption (Draft for Comment)*". It will explore the establishment of on-site clean energy consumption model. Clean energy-rich areas are encouraged to promote the application of electric heating, electric vehicles, port shore power, and hydrogen production by electricity, and take various methods to increase power consumption demand and expand local consumption space.
http://www.nea.gov.cn/2020-05/19/c_139069819.htm (in Chinese)

On May 30th, China's National News Agency, Xinhua News Agency, was authorized to release "*Report on the implementation of the national economic and social development plan in 2019 and the draft plan for national economic and social development in 2020*". Formulating a national strategic development plan for hydrogen energy sector was mentioned in the tasks of 2020.
https://www.ndrc.gov.cn/xwdt/xwfb/202006/t20200601_1229648.html (in Chinese)

On June 4th, Ministry of Transport (MoT) released "*Inland shipping development outline*". It proposed to "increase the promotion and application of new energy and clean energy, explore the development of pure electric power, fuel cell and other power ships, study and promote the application of solar energy, wind energy, hydrogen energy, etc. in the sector".
http://xxgk.mot.gov.cn/jigou/zhghs/202006/t20200604_3388090.html (in Chinese)

2. Hydrogen and Fuel Cell R&D Update

2.1 Fundamental Research

On April 27th, researchers from Chongqing University reported a Ru/TiO2 catalyst, which can exhibit particularly high activity for the HOR (hydrogen oxidation reaction) at potentials up to 0.9 V (versus reversible hydrogen electrode) and unexpected CO tolerance up to 10 vol% CO. This discovery suggests that the surface oxophilicity and electronic structure of Ru nanoparticles can be effectively modified by lattice confinement in semiconductors and offers an alternative concept for designing catalysts with unique properties for use in the field of catalysis and beyond. The work was published on "Nature Catalysis".
https://doi.org/10.1038/s41929-020-0446-9

3. Demonstration, Deployments, and Workforce Developments Update

3.1 Deployments

From November 2019 to June 2020, more and more cities started demonstration operations of fuel cell public transportation buses. Key information of some of them are as follows:

Date	City	Province	Number
November 20th	Yancheng	Jiangsu	10
November 22nd	Zhangjiakou	Hebei	30
November 24th	Jinan	Shandong	40
December 26th	Luan	Anhui	2
January 17th	Changshu	Jiangsu	40
May 28th	Zhengzhou	Henan	20
May 31st	Zhengzhou	Henan	10
June 1st	Weifang	Shandong	150
June 26th	Guangzhou	Guangdong	15

On December 30th, the first hydrogen tram in China started commercial service in Foshan, Guangdong Province. The length of the line is 6.57 km, with 10 stations. The maximum operating speed of the tram is 70 km/h and the maximum capacity is 285 passengers. Each tram is equipped with 6 gas cylinders, with a hydrogen storage capacity of 20 kg and the driving range is up to 100 km.

4. Events and Solicitations

From November 5th-10th, 2019, the 2nd China International Import Expo was held in Shanghai. Toyota, Honda, Toshiba exhibited theirs products on fuel cell systems and fuel cell vehicles. https://www.ciie.org/zbh/en/

From August 21st-23rd, 2020, the 5th China International Hydrogen and Fuel Cell Conference & Exhibition will be held in Beijing, China. http://en.chfce.com/

From August 23rd-25th, 2020, the Second International Hydrogen and Fuel Cell Industry Conference (Chengdu) will be held in Chengdu, China.

From September 15th to 17th, 2020, the 5th International Hydrogen Fuel Cell Vehicle Congress will be held in Rugao, China. http://www.fcvc.org.cn/EN/Home/

5. Investments: Government and Collaborative Hydrogen and Fuel Cell Funding

On November 18th, 2019, MoF publicized "*The result of the allocation of energy-saving and emission-reduction subsidies to local governments*". The subsidy amount for fuel cell public transportation buses was 2.42 million CNY (≈0.35M USD) for 2018. Hebei (1.9M CNY), Sichuan (0.24M CNY), Guangdong (0.18M CNY), Beijing (0.5M CNY), and Henan (0.5M CNY) was granted for the subsidy.

On May 25th, 2020, MIIT publicized the preliminary review of the 2018 new energy vehicle promotion and application subsidy funds. 37 fuel cell bused will be granted (500,000 CNY ≈70,000 USD per vehicle). To get subsidy, the vehicle is required to drive at least 20,000 km.

6. Regulations, Codes & Standards, and Safety Update

On June 2nd, 2020, the Standardization Administration of the People's Republic of China (SAC) released information listed as follows:

Implementation date	Regulation	Name
Dec. 1st 2020	GB/T 28816-2020	Fuel cell terminology
Dec. 1st 2020	GB/T 38914-2020	Test and evaluation method for service life of proton exchange membrane fuel cell stack for vehicles
Dec. 1st 2020	GB/T 38954-2020	Hydrogen fuel cell power generation system for UAV

On June 17th, 2020, Ministry of Housing and Urban-Rural Development issued a notice for public comments on the national standard *"Technical Specifications for Hydrogen Refuelling Stations (Draft for Partial Amendments)*".

Summary Country Update June 2020: China

Transportation	Target Number	Current Status	Partnerships, Strategic Approach	Support Mechanism
Fuel Cell Vehicles[1]	10,000 by 2020	Approx. 6178[2]	• FCV Technology Roadmap is released	•
FC Cars				Subsidy for purchase • 0.2M CNY (28K USD)
FC Buses				Subsidy for purchase • 0.3M or 0.5M CNY (42K USD or-70K USD)
FC Trucks				Subsidy for purchase 0.3M or 0.5M CNY (42K USD or-70K USD)
Forklifts	No national target	2		• No support policy
H_2 Refueling Stations	**Target Number**	**Current Status**	**Partnerships, Strategic Approach**	**Support Mechanism**
70 MPa On-Site Production	No national target	1		Subsidy for installation of a new hydrogen refueling station with 200kg H_2 capacity, 4M CNY (0.56M USD)
70 MPa Delivered	No national target	1		Same to above

[1] Including cars, buses and trucks

[2] Data released by China Association of Automobile Manufacturers till the end of 2019

35 MPa On-Site Production	No national target	1		Same to above
35 MPa Delivered	No national target	Approx. 40		Same to above
Stationary	**Target Number[3]**	**Current Status**	**Partnerships, Strategic Approach**	**Support Mechanism**
Small[4]	No target			
Medium[5]	No target			
Large[6]	No target	1		
District Grid[7]	No target			
Regional Grid[8]	No target			
Telecom backup	No target	Approx. 50 units		
H_2 Production	**Target[9]**	**Current Status**	**Partnerships, Strategic Approach**	**Support Mechanism**
Fossil Fuels[10]	No target			

[3] Targets can be units installed and/or total installed capacity in the size range indicated
[4] <5 kW (e.g., Residential Use)
[5] 5kW – 400 kW (e.g., Distributed Residential Use)
[6] 0.3MW – 10 MW (e.g., Industrial Use)
[7] 1MW – 30 MW (e.g., Grid Stability, Ancillary Services)
[8] 30MW plus (e.g., Grid Storage and Systems Management)
[9] Target can be by quantity (Nm^3, kg, t) and by percentage of total production; also, reference to efficiency capabilities can be a target
[10] Hydrogen produced by reforming processes

Water Electrolysis[11] (PEM, Alkaline, SOEC)	No target			
By-product H_2	No target			
Energy Storage from Renewables	**Target[12]**	**Current Status**	**Partnership, Strategic Approach**	**Support Mechanism**
Power to Power[13] Capacity	No target			
Power to Gas[14] Capacity	No target	1 (100kW)		

[11] Please indicate if targets relate to a specific technology (PEM, Alkaline, SOEC)
[12] Can be expressed in MW of Installed Capacity to use the electricity from renewable energy generation, and Annual MWh of stored energy capacity
[13] Operator has an obligation to return the electricity stored through the use of hydrogen back to electricity
[14] Operator has the opportunity to provide the stored energy in the form of hydrogen back to the energy system through multiple channels (e.g., merchant product, enriched natural gas, synthetic methane for transportation, heating, electricity)