FCDIC Report 32nd Issue

To World Members

"FCDIC Report No.32" is issued on 31st March 2023. Please refer to the following contents. The topics of this issue are a new approach by Honda in the variety of many fields. It is appreciated if you give us any comment on this new report.

1. The Journal of Fuel Cell Technology

Spring Issue, Vol.22(No.4) is in progress. It is focused on the state of the art of SOFC and will be published on 30th April.

2. Topics related to fuel cell, hydrogen energy and renewable energy: from 29th January to 26th March, 2023

<Government/ENV, NEDO>

1) "**Governmental projects for the creation of a hydrogen society**", 6th Feb. down-loaded, 2023
URL: https:/ www.env.go.jp/seisaku/list/ondanka_saisei/lowcarbon-h2-sc/en/demonstration-business/index.html
In English

2) "**Publish of roadmap on fuel cell and technological problems on water-electrolysis**", 9th Feb., 2023
URL: https:// www.nedo.go.jp/news/press/AA5_101608.html
In Japanese

2') "**Report on "Technological development road-map on fuel cell and hydrogen" meeting**", 22nd Feb., 2023
URL: https:// www.nedo.go.jp/events/report/ZZFF_100028.html
In Japanese **PDF available (Road-map, Program, Other documents)**

3) "**The 11th NEDO-CDTI joint workshop "Technologies for hydrogen valley in Spain and Japan-Regional H2 value chain"**", date not available, 10th Feb. down-loaded, 2023
URL: https:// www.nedo.go.jp/content/100956613.pdf
In English

3') "**Ammonia as a green hydrogen carrier: ARENHA Project in the 11th NEDO-CDTI joint workshop**", 10th Feb. down-loaded. 2023
URL: https:// www.nedo.go.jp/content/100956615.pdf
In English

<Business Papers and Sites>

[General Topics]
<About Honda – refer to press release by Honda in press releases in FCDIC members>
1) "**Honda to sell next-generation hydrogen fuel cell system from mid-2020s**", 2nd Feb., 2023
URL: https:// www.japantimes.co.jp/news/2023/02/02/business/corporate-business/honda-fuel-cell/
In English

1') "**Honda outlines hydrogen power plans to go green**", 2nd Feb., 2023
URL: https:// www.asahi.com/ajw/articles/14830044
In English

1") "**Honda to expand hydrogen business**", 2nd Feb., 2023
URL: https:// www3.nhk.or.jp/nhkworld/en/news/20230202_34/
Honda Motor says it will start selling a hydrogen fuel cell system that it is developing with General Motors to other companies. The aim is to help accelerate a shift toward creating a 'hydrogen society'.
Honda plans to roll out a fuel cell vehicle equipped with the system in Japan and the United States next year.
It says it will start offering the fuel system to other firms in the mid-2020s.
The automaker aims to slash production costs to one-sixth of the current level and enhance durability by four-fold.
The fuel cell system will also be fitted in construction machinery and used for hydrogen-fueled power generation equipment.
Honda plans to produce 60-thousand units of the system annually by 2030 and several hundred thousand by the late 2030s.

<**Other Topics**>
2) "**Kawasaki Heavy throws weight behind hydrogen**", 5th Feb., 2023
URL: https:// japannews.yomiuri.co.jp/business/companies/20230205-88994/
In English

3) "**e-methane, methanation by Japan Gas Association**", 9th Feb., 2023
URL: https:// www.gas.or.jp/en/gastainable/e-methane/index.html
In English

4) "**Fuel cell bus trails on the BRT Hikoboshi Line"**, 8th Feb., 2023
URL: https:// www.jcnnewswire.com/pressrelease/81052/3/
In Japanese

In English

5) "**Results of joint research into hydrogen energy solutions supported by the Toyota Mobility Foundation were published in the international journal of hydrogen energy**", 8th Feb., 2023
URL: https:// www.jcnnewswire.com/pressrelease/81063/3/Results-of-Joint-Research-into-Hydrogen-Energy-Solutions-Supported-by-the-Toyota-Mobility-Foundation
In English

6) "**Panasonic sells ultrasonic hydrogen flow/concentration meter, expecting to accelerate FC research and development**", 13th Feb., 2023
URL: https:// kaden.watch.impress.co.jp/docs/news/1477854.html
https:// news.mynavi.jp/article/20230212-panasonic/
Both in Japanese

7) "**We need all colours of hydrogen , says German finance minister**", 21st Feb., 2023
URL: https:// jp.reuters.com/article/germany-economy-idAFL8N35121A
In English

8) "**Truckers and subsidies rev up interest in fuel cell vehicles**", 26th Feb., 2023
URL: https://www.japantimes.co.jp/news/2023/02/16/business/truckers-hydrogen-fuel-cells-interest/
In English

9) "**Developed the world's first liquid hydrogen booster pump**", 24th Feb., 2023
URL: https://www.ebara.co.jp/en/corporate/newsroom/release/company/detail/1208853_10220.html
In English

10) "**Japan pledges financial support to help ASEAN decarbonize**", 3th March, 2023
URL: https:// www.japantimes.co.jp/news/2023/03/04/business/hydrogen-australia-japan/
In English

10') "**Japan pledges support to help ASEAN decarbonize its economies**", 4th March, 2023
URL: https:// www3.nhk.or.jp/nhkworld/en/news/20230304_14/
In English

Ministers from Japan, Australia and Southeast Asian countries have agreed to work together to achieve decarbonization by making use of hydrogen and ammonia that do not emit carbon dioxide when burned. The first ministerial meeting of the 11-member Asia Zero Emission Community, or AZEC, took place in Tokyo on Saturday. Asian nations emit about 60 percent of global CO2 emissions. Their energy consumption has been increasing as their economies have developed. The countries acknowledge that they need to achieve decarbonization without harming their economic growth.

In a joint statement, the AZEC ministers pointed to the need to achieve both a shift from fossil fuels to new energy sources and economic growth. They stressed the importance of utilizing various energy sources and technologies depending on the industrial structure and geographical conditions of each country. The Asian nations agreed to cooperate in efforts to develop technology for hydrogen and ammonia and create businesses at the same time.

Japan pledged to provide financial support to help build necessary infrastructure. Japan, as the chair of the Group of Seven summit to be held in Hiroshima in May, aims to take the initiative in discussions related to decarbonization, and to promote its technology across Asia.

11) "**UPDATE2- Japan to promote gas, LNG, hydrogen investment during G7 presidency**", 28th Feb., 2023
URL: https:// jp.reuters.com/article/g7-japan-energy-investment-idAFL1N3590W0
In English

12) "**Japan, Australia to tie up on hydrogen supply for zero emission in Asia**", 4th March, 2023
URL: https:// mainichi.jp/english/articles/20230304/p2g/00m/0bu/026000c
In English

13) "**Honda's zero emission stationary fuel cell provides back up power to a data center**", 3rd March, 2023
URL: https:// menafn.com/1105703553/Hondas-Zero-Emission-Stationary-Fuel-Cell-Provides-Back-Up-Power-To-A-Data-Center
In English

14) "**Japan's Marubeni, Saudi's PIF weighing clean hydrogen production in kingdom**", 2nd March, 2023
URL: https:// www.arabnews.jp/en/business/article_90836/
In English

15) "**TEPCO HD - Pertamina NRE memorandum of understanding on commercial development of green hydrogen**

and green ammonia", 3rd March, 2023
URL: https:// www.tepco.co.jp/en/hd/newsroom/press/archives/2023/20230303_01.html
In English

16) "**Industrial hydrogen engine - Kubota hydrogen series (4-cylinder) 3.8L-Hydrogen**", 6th March down-loaded, 2023
URL: https:/ global.engine.kubota.co.jp/en/exhibition/highlights/file/sheetcatalog_3.8L-Hydrogen_A4_eind.pdf
In English

17) "**Japan offers $1.6 billion to aid Australia's coal-to hydrogen plan**", 7th March, 2023
URL: https:// www.japantimes.co.jp/news/2023/03/07/business/corporate-business/australia-coal-hydrogen/
In English

18) "**Joint feasibility study on clean hydrogen production extracted from gasified Latrobe Valley coal in Victoria, Australia**", 8th March, 2023
URL: https:// www.jpower.co.jp/english/news_release/pdf/news230308e.pdf
In English

19) "**MOL concludes MoU on building clen hydrogen/ammonia value chain in Thailand - Collaboration with EGAT, Mitsubishi Thailand and Chiyoda Corporation -**", 6th March, 2023
URL: https:// www.mol.co.jp/en/pr/2023/23024.html
In English

20) "**Toyota to accelerate plant decarbonization efforts in Fukushima using hydrogen**", 9th March, 2023
URL: https:// www.jcnnewswire.com/english/pressrelease/81823/3/Toyota-to-Accelerate-Plant-Decarbonization-Efforts-in-Fukushima-Using-Hydrogen
In English

[**Market Information**]
1) "**Hydrogen fuel cell vehicle market to generate $43,208.3 Million by 2031: Allied Market Research**", 31st Jan.., 2023
URL: https:// menafn.com/1105506058/Hydrogen-Fuel-Cell-Vehicle-Market-To-Generate-432083-Million-By-2031-Allied-Market-Research
In English

2) "**Global automotive fuel cell systems market to reach 754.8 thousand units by 2030**", 30th Jan., 2023
URL: https:// menafn.com/1105496505/Global-Automotive-Fuel-Cell-Systems-Market-To-Reach-7548-Thousand-Units-By-2030
In English

3) "**Green hydrogen market report 2023-2033 GBP4,500/ 305pp, Jan. 2023 published**", 6th Feb. down-loaded, 2023
URL: https:// www.dri.co.jp/auto/report/visiongain/230125-green-hydrogen-market-en.html
In English

4) "**Hydrogen FCV market projected to reach USD 46.8 billion, at a 68.52% CAGR by 2030 report by Market Research Future**", 14th Feb., 2023
URL: https:// menafn.com/1105572030/Hydrogen-Fuel-Cell-Vehicle-Market-Projected-To-Reach-USD-468-Billion-At-A-6852-CAGR-By-2030-Report-By-Market-Research-Future-MRFR

In English

5) "**Fuel cell powertrain market is expected to reach at USD 12,530.5 Million by 2030, At a CAGR of 89.3% during forecast period 2023 to 2030/ Data by contrive datum insights Pvt Ltd.**", 20th Feb., 2023
URL: https:// menafn.com/1105604648/Fuel-Cell-Powertrain-Market-Is-Expected-To-Reach-At-USD-125303-Million-By-2030-At-A-CAGR-Of-893-During-Forecast-Period-2023-To-2030-Data-By-Contrive-Datum-Insights-Pvt-Ltd
In English

6) "Global green hydrogen market 2022-2026 / 2022, May published / 120pp--2,500US$", 22nd Feb., 2023
URL: https:// www.dri.co.jp/auto/report/technavio/220506-global-green-hydrogen-market-2022-2026-en.html
In English

7) "**Stationary FC market to reach $9.0 billion, globally by 2031 at 13.1% CAGR: allied market research**", 27th Feb., 2023
URL: https:// menafn.com/1105661473/Stationary-Fuel-Cell-Market-To-Reach-90-Billion-Globally-By-2031-At-131-CAGR-Allied-Market-Research
In English

8) "**Global Fuel Cell Market (PENFC,PAFC,MCFC & SOFC): Insights & forcast with potential impact of COVID-19 (2023-2027) / Eng./100 pp**", 25th March down-loaded, 2023
URL: https:// www.gii.co.jp/report/koan1238854-global-fuel-cell-market-pemfc-pafc-mcfc-sofc.html
In English

9) "**Hydrogen fuel cell vehicle market to reach $ 43.2 billion by 2031**", 22nd March, 2023
URL: https:// menafn.com/1105835392/Hydrogen-Fuel-Cell-Vehicle-Market-To-Reach-432-Billion-By-2031
In English

10) "**Low-carbon hydrogen presents attractive alternative investment opportunities for infrastructure investors**", 21st March, 2023
URL: https:// www.bcg.com/ja-jp/press/21march2023-low-carbon-hydrogen-alternative-investment-infrastructure-investors
In English

<General papers & other publications>

1) "**What's hydrogen –Mandala chart of Hydrogen by Hydrogen Energy Navi**", 10th Feb. down-loaded, 2023
URL: https:// hydrogen-navi.jp/en/property/index.html
In English

2) "**Policy design for diffusing hydrogen economy and its impact on Japanese economy by 2050 carbon neutrality using E3ME-ETT model**", 26th March down-loaded, 2023
URL:www.econ.kyoto-u.ac.jp/renewable_energy/stage2/pbfile/m000517/HydrogenEconomyJapan_final_20230302.pdf
In English

3) "Global hydrogen economy: merchant hydrogen and hydrogen purification technology / Eng. 171pp", 26th Feb. down-loaded, 2023

URL: www.gii.co.jp/report/bc1239688-global-hydrogen-economy-merchant-hydrogen-hydrogen.html
In English (Web written in Japanese)

<Press Releases by FCDIC members*>

*Member list: https://www.fcdic.jp/member-list/

1) "**Honda hydrogen strategy expanded to a new domain based on the technologies cultivated in fuel cell**", Honda , 2nd Feb., 2023
URL: www.honda.co.jp/stories/057/
In Japanese

2) "**Summary of briefing on Honda hydrogen business-Expanding hydrogen business with external sites of the next-generation FC system**", Honda, 6th Feb. down loaded, 2023
URL: https:// global.honda/newsroom/news/2023/c230202eng.html?from=top_headline_area
(Corresponded Japanese URL: https://www.honda.co.jp/news/2023/c230202.html)
In English

3) "**Hydrogen-powered engines head to the next stage: Super Taikyu Series Final Round in Suzuka**", Toyota, 7th Feb. 2023
URL: https:// toyotatimes.jp/en/report/hpe_challenge_2022/008.html
In English (Taikyu means "durability")

4) "**Toyota fuel cell module / PDF available**", Toyota., 15th March, 2023
URL: https:// www.toyota.co.jp/fuelcells/en/pdf/pdf1_202303.pdf
In English

5) "**Liquefied hydrogen supply chain commercialization demonstration project selects sites for shipping and receiving liquified clean hydrogen aiming to achieve hydrogen supply cost of 30 JPY/Mm^3 in 2030**", ENEOS., 8th March, 2023
URL: https:// www.eneos.co.jp/english/newsrelease/2022/pdf/20230308_01.pdf
In English

6) "**World-first! Liquid hydrogen official race test at Fuji**", Toyota., 9th March, 2023
URL: https:// toyotatimes.jp/en/report/hpe_challenge_2023/001.html
In English

7) "**Toyota high-pressure hydrogen tank**", Toyota, 3rd March, 2023
URL: https:// www.toyota.co.jp/fuelcells/en/pdf/pdf2_202303.pdf
In English

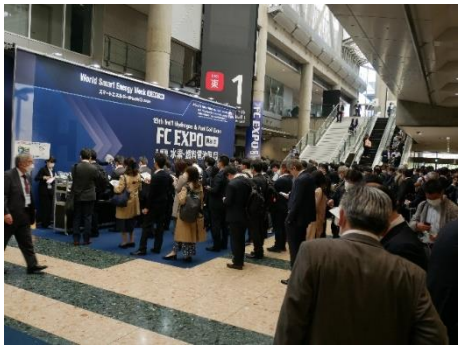
**The URLs are not always permanent. The article and its URL are examined this month.*

3. The 19th FC Expo 2023 Spring

RX Japan (former REED Exhibitions) held the 19th FC EXPO 2023 spring from 15th to 17th March at Tokyo Big Sight on-site only, co-organized by FCDIC and Hydrogen Energy System Society of Japan (HESS). Total participants increase up to about 65,000 to the level of common year before COVID-19. Also there are

many exhibitors including from abroad.

People in the venue



Reception on the second day

4. Future Events

The 30th Fuel Cell Symposium

The 30th Fuel Cell Symposium is scheduled on 25th and 26th May. Program preparation is in progress. The symposium will be held under the hybrid of on venue and on-line.
Entry could be accepted on our WEB (URL: https://www.fcdic.jp/symposium/) in Japanese.

The 3rd H_2 & FC EXPO 2023, Autumn (Title changed from FC EXPO to H_2 & FC EXPO by addition H_2)

The 3rd H_2 & FC EXPO Autumn is scheduled to be held at Makuhari Messe in Chiba Prefecture from 13st to 15th September. Details will be announced later; URL: https://www.wsew.jp/hub/en-gb/about/fc.html

5. FCDIC Award 2022 fy (All English titles are tentative)

Awards in Industry

Electric Works Company, Panasonic Corporation
"**Residential fuel cell "ENE-FARM": Cumulative production reaches 200,000 units**"

Fuji Electric Co., Ltd.
"**Fuji Electric's role in FC development in Japan**"

Award in Science

Professor Katsuyoshi Kakinuma
University of Yamanashi
"**Development and evaluation of fuel cell electrocatalysts with excellent activity and durability**"

Incentive Award

Assistant Professor Masaru Kato
"**Design and development of metalloenzyme-inspired electrocatalysts**"

The lectures done in the 30th FC symposium and the articles subscribed in the journal of FCDIC, Vol.23 No.1.