FCDIC Report 34th Issue (No.34)

"FCDIC Report No.34" is issued on 30th July, 2023. Please refer to the following contents. The main topics of this issue are 3 items, revised basic hydrogen strategy, new organization and strategy for FCV by Toyota and latest relation to Far East. It is appreciated if you give us any comment on this new report.

1. Publication of "The Journal of Fuel Cell Technology", Vol.23 No.1

Summer Issue, Vol.23(No.4) is published on 30th July 2023. It has been upped to the website of FCDIC with 91 pages.

The special issue is "Fuel cell systems on various application" with a general perspective issue on various applications, in the air, maritime and on the ground or stationary and mobility.

2. Topics related to fuel cell, hydrogen energy and renewable energy: from 28th May to 22nd July, 2023

<Government/Tokyo Metropolis, METI, NEDO, Jetro, Fukuoka Pref., Yokohama City, JOGMEC>

1) "**Go with hydrogen truck**", 2nd June, 2023 Photo available
URL: https://www.koho.metro.tokyo.lg.jp/diary/report/2023/06/02/01.html
In Japanese

2) "**Project on the fuel cell cargo work machine, Rubber Tyre Gantry Crane in Tokyo Bay, participants companies introduced",** 30th May, 2023
URL: https://www.metro.tokyo.lg.jp/tosei/hodohappyo/press/2023/05/30/04.html
In Japanese

3) "**METI and the government of British Columbia, Canada confirmed cooperation in the fields of energy and R&D**", 30th May, 2023
URL: https://www.meti.go.jp/english/press/2023/0530_001.html
In English

4) "**Plug Power, U.S. to supply the world biggest residential fuel cell, 8 MW class**", 8th June, 2023
URL: https://www.jetro.go.jp/biznews/2023/06/e319b0836196a7e0.html
In Japanese

5) "**Tokyo hydrogen Navigation with the activities on hydrogen including participants**", 10th June down-loaded, 2023
URL: https://www.tokyo-h2-navi.metro.tokyo.lg.jp
In Japanese

6) "**Fukuoka Prefecture launches 'Fukuoka Prefecture Hydrogen Base Promotion Council**", 5th June, 2023
URL: https://www.kigyorichi.pref.fukuoka.lg.jp/en/news/detail/205
In English

7) "**City of Yokohama "Carbon-neutral port initiatives"** ", 12th June down-loaded, 2023
URL: https://www.city.yokohama.lg.jp/lang/overseas/port/kankyo/cnp/initiatives.html
In English

8) "**Produce clean hydrogen and ammonia from hydrocarbons**", 24th June down-loaded, 2023
URL: https://mirai.jogmec.go.jp/en/clean-h2nh3/
In English

9) "**Itochu International Inc., AGC Chemical Americas, Inc. and Asahi Kasei Corporation joined Japan Hydrogen Forum (JH2F)**", 12th July, 2023
URL: https:// www.jetro.go.jp/usa/japan-hydrogen-forum/press-release-07122023.html
In English

10) "**Carbon-neutral port initiatives**", 20th July up-datet and 24th down-loaded, 2023
URL: https:// www.city.yokohama.lg.jp/lang/overseas/port/kankyo/cnp/initiatives.html
In English (Please refer to 7), to be suitably up-dated)

<Business Papers and Sites>

[Revised basic hydrogen strategy]

1) "**Basic hydrogen strategy draft, shown in PDF**", 6th June, 2023
URL: https://www.meti.go.jp/shingikai/enecho/shoene_shinene/suiso_seisaku/pdf/20230606_1.pdf
In Japanese

2) "**Japan to invest ¥15 trillion in hydrogen supply for decarbonization**", 6th June, 2023
URL: https://www.japantimes.co.jp/news/2023/06/06/business/economy-business/hydrogen-supply-investment-plan/
In English

3) "**Revised strategy to promote hydrogen usage**", 6th June, 2023
URL: https://www3.nhk.or.jp/nhkworld/en/news/20230606_13/
In English

Government officials have agreed on a new strategy to promote the use of hydrogen in Japan. It's the first revision to their basic strategy in six years. It comes as the United States and countries in Europe are increasing investments to reduce greenhouse gas emissions.

Nine technologies are to be positioned as strategic fields. They are to receive public and private investments of over 15 trillion yen, or more than 107 billion dollars, over the next 15 years. Among them are fuel cells and water electrolysis, areas that Japan is seen as having a competitive advantage. A basic strategy on hydrogen was originally formulated in 2017. It called for Japan to lead the world in creating a "hydrogen society." The government has since been encouraging the use of hydrogen in fuel cells for automobiles and for thermal power generation. The revised strategy includes plans to build larger vessels to import hydrogen, thereby constructing a reliable supply chain.

The government hopes its efforts will increase hydrogen use by six-fold to around 12 million tons in 2040.

4) "**A look at Japan's latest hydrogen strategy"**, 8th July, 2023
URL: https://www.newsonjapan.com/html/newsdesk/article/137919.php
In English

[**New organization and future plan of Toyota**]

1) "**Toyota announces changes to organizational structure and senior professionals/senior management**", 31st May, 2023
URL: https://www.jcnnewswire.com/pressrelease/84330/3/Toyota-Announces-Changes-to-Organizational-Structure-and-Senior-ProfessionalsSenior-Management
In English
Corresponding news in Japanese - please refer to following URL
URL: https://www.nikkan.co.jp/articles/view/674765

2) "**Toyota to concentrate FC business – Externally supply 100,000 FC in 2030**", 13th June, 2023
URL: https://www.webcg.net/articles/-/48411
In Japanese

3) "**Toyota to show the future of car in the workshop on the technology of next generation -3 pages**", 13th June, 2023
URL: https://toyotatimes.jp/report/technical_workshop_2023/001_1.html
In Japanese

4) "**Toyota unveils decarbonization roadmap**", 13th June, 2023
URL: https://www3.nhk.or.jp/nhkworld/en/news/20230613_13/
In English
Toyota Motor has unveiled a multi-pronged strategy to reduce its carbon footprint amid the global shift toward emissions-free vehicles. Japan's biggest carmaker says it's focusing its efforts on developing models powered by solid-state batteries and hydrogen.
Toyota plans to offer electric vehicles running on solid-state batteries as early as 2027. It also targets cutting the cost for development and production in half for its next-generation models to be launched in 2026.
It expects to reduce investment on production lines by having vehicles move on their own during assembly. Toyota says models achieved through these efforts are to account for nearly half of the 3.5 million vehicles it aims to sell worldwide in 2030.
Toyota also plans to bolster its fuel-cell vehicle lineup, with a focus on trucks and other commercial vehicles.

5) "**Toyota reveals the future of cars with next-generation battery and hydrogen technologies**", 23th June, 2023
URL: https://toyotatimes.jp/en/report/technical_workshop_2023/001_2.html
In English

6) "**Toyota to supply fuel cells for 100,000 vehicles in 2030**", 11th July, 2023
URL: https://jen.jiji.com/jc/eng?g=ind&k=2023071100899

In English

7) "**Toyota to rush to make FC business profitable – Key is FC market in Japan**", 13th July, 2023
URL: https://newswitch.jp/p/37718
In Japanese

[**Relation to Far East – Saudi Arabia and UAE**]

1) "**UAE's revised energy strategy includes big hydrogen plans**", 11th July, 2023
URL: https://jp.reuters.com/article/emirates-energy-idAFL8N38X26Q
In English

2) "**"UPDATE2-Riyadh, Tokyo to cooperate on energy security, hydrogen and ammonia – Saudi Arabia**", 16th July, 2023
URL: https://jp.reuters.com/article/japan-saudi-energy-idAFL1N39206S
In English

3) "**Masdar, Mitsubishi Chemical Group and INPEX agree on joint feasibility study for carbon recycle chemical project in Abu Dabi., UAE- Targeting world's first polypropylene production from CO_2 and green hydrogen**", 18th July, 2023
URL: https://www.mcgc.com/english/news_release/01655.html
In English

4) "**Saudi Energy minister examines Japanese hydrogen carrier at Jeddah Islamic Port**", 20th July, 2023
URL: https://www.arabnews.jp/en/business/article_99533/
In English

5) "**Nawah Energy Company (UAE) signs memorandum of understanding with Toshiba to advance net zero collaboration in supply chain diversification**", 21st July, 2023
URL: https://www.global.toshiba/ww/news/energy/2023/07/news-20230721-01.html
In English

[General Items]
1) "**Alternative fuels take the spotlight at Japanese endurance race - liq.-H2 Corolla in a 24-hour endurance race**", 30th May, 2023
URL:
https://www.japantimes.co.jp/news/2023/05/30/business/corporate-business/toyota-alternative-fuels/
In English

2) "**IHI develops one of world's lightest and most compact electric turbo compressors incorporating proprietary air bearing technology that could help materialize aircraft fuel cell propulsion systems**", 16th June, 2023
URL: https://www.ihi.co.jp/en/all_news/2023/technology/1198316_3531.html
In English

3) "**PAG renewables announces commercial operations of 309MW of mega-solar projects across Japan in close partnership with Toshiba**", 13th June, 2023
URL: https://www.global.toshiba/ww/news/energy/2023/06/news-20230613-01.html
In English

4) "**How to think about climate-tech solutions** ", 16th June, 2023
URL: https://www.japantimes.co.jp/opinion/2023/06/16/commentary/world-commentary/climate-change-solutions/
In English

5) "**Toyota to believe the possibility of hydrogen – H2 engine Lexus LX, FC truck in the workshop, many figures available**", 18th June, 2023
URL: https://motor-fan.jp/mf/article/146382/
In Japanese

6) "**New company for green hydrogen business "Eneco Diamond Hydrogen" established in Europe** ", 22nd June, 2023
URL: https://www.mitsubishicorp.com/jp/en/pr/archive/2023/html/0000051535.html
In English

7) "**Toyota, Toyota Tsusho, and Mitsubishi Kakoki to introduce Thailand's first bio-gas-derived hydrogen production equipment, operation to begin in 2023**", 26th June, 2023
URL: https://www.jcnnewswire.com/pressrelease/84868/3/Toyota,-Toyota-Tsusho,-and-Mitsubishi-Kakoki-to-Introduce-Thailands-First-Biogas-Derived-Hydrogen-Pr
In English

8) "**First fixed wing UAV "ASUKA" for whale survey, applied on the ocean or shipboard**", 2nd July, 2023
URL: https://trafficnews.jp/post/126708/2
In Japanese

9) "**Hydrogen refueling takes 3-4 minutes, fuel cell vehicle for BMW "X5"**"", 5th July, 2023
URL: https://portalfield.com/en/news/vehicle/5106743
In Japanese

10) "**Hydrogen-powered trucks hit the roads in Fukuoka**", 4th July, 2023
URL: https://www.fukuoka-now.com/en/news/hydrogen-powered-trucks-hit-the-roads-in-fukuoka/
In English

11) "**Yamaha president backs hydrogen as green fuel option for carbon neutrality**", 10th July, 2023
Photo of Yamaha's hydrogen engine generator prototype available
URL: https://www.japantimes.co.jp/news/2023/07/10/business/yamaha-hydrogen-fuel/
In English

12) "**Started selling hydrogen produced by AEM water electrolyzer at hydrogen refueling station**", 13th July, 2023
URL: https://www.tokyo-gas.co.jp/en/IR/support/pdf/20230713-02e.pdf
In English

13) "**INPEX commences construction of surface plant facilities of Kashiwazaki Clean Hydrogen/Ammonia project in Niigata Prefecture, Japan**", 12th July, 2023
URL: https://www.inpex.co.jp/english/news/assets/pdf/20230712.pdf
In English

14) "**Investment decision-making concerning the LNG-fired thermal power generation business in anticipation of the realization of carbon neutrality**", 21st July, 2023
URL: https://www.tokyo-gas.co.jp/en/IR/support/pdf/20230721-02e.pdf
In English

15) "**Iwatani to open specific website for the Osaka-Kansai Japan Expo -hydrogen fuel cell driven next generation ship for access to the venue**", 22nd July, 2023 down-loaded
URL: https://www.iwatani.co.jp/jpn/hydrogenfuelcellship/
In Japanese

16) "**Toyota eyes lunar rover powered by regenerative fuel-cell technology**", 22nd July, 2023
URL: https://www.japantimes.co.jp/news/2023/07/22/national/toyota-moon-rover/
In English

17) "**Policy for the deployment of FCV and hydrogen infrastructure, public-private council to disclose interim summary** ", 21st July, 2023
URL: https:// www.itmedia.co.jp/smartjapan/articles/2307/21/news075.html
In Japanese

[Market]

1) "**Market of FCV, deployment, trend, demand, growth and prediction in 2023-2035 by SDKI Inc., URL for the detailed report available**", 7th June, 2023
URL: https://newscast.jp/news/2370393
In Japanese

2)"**Global market size of FC power train in 2023-2030 by Global Information, detailed contents and free sample available**", 28th June, 2023
URL: https://newscast.jp/news/0804478
In Japanese

3) "**Global market size of FC to reach 36.4 billion $ in 2029, abstract, contents and free sample available**", 1st July, 2023
URL: https://presswalker.jp/press/16411
In Japanese

4) "**Global market size of FC bike in 2023-2030 by Global Information, free sample available**", 7th July, 2023
URL: https://newscast.jp/news/7424456
In Japanese

5) "**Results of market research for FC system and components-2023 – abstract available, ¥198,000**", 12th June, 2023
URL: https://www.yanoresearch.com/en/press-release/show/press_id/3274
In Japanese

6) "**Market size of H2FCV to reach around 12.3 billion $ in 2028, Global Information/detailed contents and free sample available**", 13sh June, 2023
URL: https://japan.zdnet.com/release/30867541/
In Japanese

7) "**Hydrogen engine: Global markets/Report overview and scope, and Contents available**", 22th July down-loaded, 2023
URL: https://chosareport.com/bccegy188/
In English

8) "**Global hydrogen fuel dispenser market insights, forecast to 2029 - free sample available market size to reach 36.4 billion $ in 2029, abstract, contents and free sample available**", 18th July, 2023
URL: https://www.gii.co.jp/report/qyr1308557-global-hydrogen-fuel-dispenser-market-insights.html
In English

<General papers & other publications>

1) "**Dehydrogenation of methylcyclohexane using SOFC- A smart energy conversion (published in Applied Energy, June 2023)**", 22nd July down-loaded, 2023
URL: https:// www.waseda.jp/inst/res¥earch/news/74755
In English Journal published on April 12, 2023 Abstract available
URL: https://www.waseda.jp/top/news/92105
In Japanese Introduction of the article available

1') "**Direct generation by fuel cell (SOFC) from MCH as fuel, by Prof. Fukunaga and ENEOS**", 21st July, 2023
URL: newswitch.jp/p/37813
In Japanese

2) "**Recent advances in nanocarbon-based nonprecious metal catalysts for oxygen/hydrogen reduction/evolution reactions and Zu-Air battery**", 3rd June down-loaded, 2023
URL: https://www.journal.csj.jp/doi/full/10.1246/bcsj.20230051?af=R
In English

3) "**10 times power output on bio-fuel cell, to develop ethanol oxidation enzyme electrolyte by Prof. Shirai, Kyoto University**", 9th June, 2023
URL: https://news.yahoo.co.jp/articles/14f419cf19b8d31e8bb17a2bca67d94b8df8cfa6
In Japanese

4) "**Invention of new oxide having world top-level of proton conductivity without chemical substitution, by Prof. Yashima, TITECH**", 7th June, 2023
URL: https://www.titech.ac.jp/news/2023/066879
In Japanese

5) "**FC new catalyst to exceed Pt ? -12CaO/47Al_2O_3, by Prof. Wada, Tokyo University, patent granted** ", 22nd June, 2023
URL: https://www.innovations-i.com/iac/?id=388
In Japanese

6) "**New design for high-power-density fuel cell offers improved performance and durability – Los Alamos National Laboratory (LANL) – related information and English abstract available**", 27th June, 2023
URL: https://tiisys.com/blog/2023/06/27/post-123532/
In Japanese

7) "**Honda R&D Technical Review Vol.35: Fuel cell stack prediction model using Gaussian process regression model**", 1st July down-loaded, 2023
URL: https://www.hondarandd.jp/point.php?pid=1388&lang=en
In English

8) "**High-efficiency electric compressor that improves decarbonization technology and fuel cell performance/Mitsubishi heavy Industries Technical Revies - full paper available**", 1st July down-loaded, 2023
URL: https://www.mhi.co.jp/technology/review/pdf/e602/e602140.pdf
In English

9) "**Mitsubishi Heavy Industrial Review; CO_2 deduction by gas engine cogeneration system (Combined heat and power)**", 1st July down-loaded, 2023
URL: https://www.mhi.co.jp/technology/review/pdf/e602/e602120.pdf
In English

10) "**High power sugar fuel cells using PEDOT*PSS, CNT and PtRu composite anode/Chemistry Letters, open access**", 7th July down-loaded, 2023
URL: https://www.journal.csj.jp/doi/full/10.1246/cl.210656?src=recsys
In English

11) "**A safe, easy and affordable way to store and retrieve hydrogen**", 12th July, 2023
URL: https://www.riken.jp/en/news_pubs/research_news/pr/2023/20230710_3/index.html
In English

12) "**Hydrolytic hydrogen production from severely plastic deformed aluminum based materials**", 12th July down-loaded, 2023
URL: https://www.jstage.jst.go.jp/article/matertrans/64/7/64_MT-MF2022023/_article/-char/ja/
In English

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

4. Future Events

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.
URL: https://www.wsew.jp/hub/en-gb/about/fc.html

21st International Conference on Solid State Proton Conductors (SSPC-21)
Held on 17th to 22nd September 2023 in Fukuoka.
URL: https://q-pit.kyushu.ac.jp/yamazaki/sspc21.html

MRM2023/IUMRS-ICA2023, Symposium B-2 "Advanced analysis for fuel cell materials and technologies"
Held on 11th to 16th December 2023 in Kyoto.
URL: https://mrm2023.jmru.org

The 20th H_2 & FC EXPO 2024, Spring
The 20th H_2 & FC EXPO Autumn is scheduled to be held at Tokyo Big-site from 28th Feb. to 1st March.
URL: https://www.wsew.jp/hub/en-gb/about/fc.html