NEDO's Activities and Support program in Hydrogen field

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NEDO's Mission

Positioning of NEDO（New Energy and Industrial Technology Development Organization）

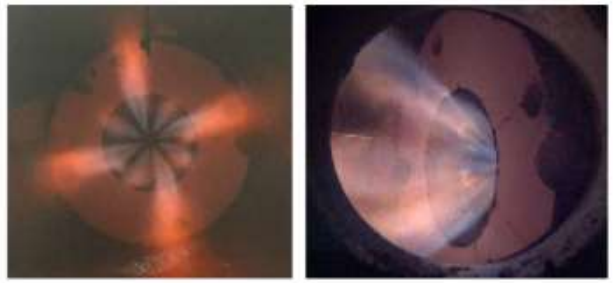
- In its role as an **innovation accelerator**, NEDO formulates project plans and establishes project implementation frameworks by combining the capabilities of industry, academia, and government, including public solicitations of project participants.
- NEDO carries out research and development projects and set targets based on changes in social conditions in order to realize maximum results.

NEDO's Activities in Hydrogen

The world's largest-class hydrogen production (10MW) at Fukushima Hydrogen Energy Research Field

World's first liquefied hydrogen carrier ship was launched

Hydrogen Burner Technology for Industrial Boilers



https://www.mhi.com/jp/news/22022803.html

Production

- Electrolysis System (Alkaline, PEM, etc.)

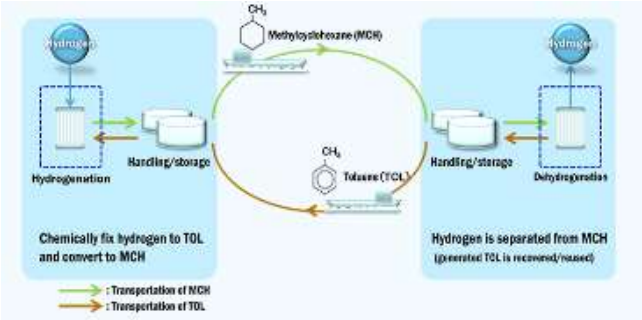
Transportation

- Energy Carrier (Liquefied H_2, MCH, etc.)

Use

- H_2 Co-firing
- Fuel Cells (Mobility, Generation) etc.

1.5MW PEM electrolysis (Yamanashi Hydrogen Company)



An int'l hydrogen supply chain using MCH as the hydrogen carrier in the demonstration project

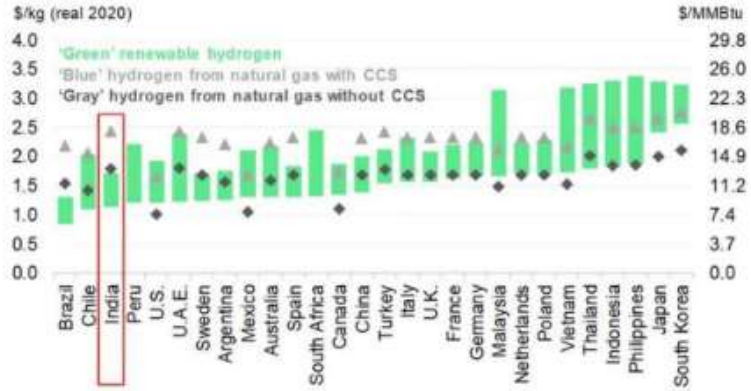
https://www.ahead.or.jp/en/research.html

FCV, Hydrogen charging station, etc.

Current Status surrounding Hydrogen in India

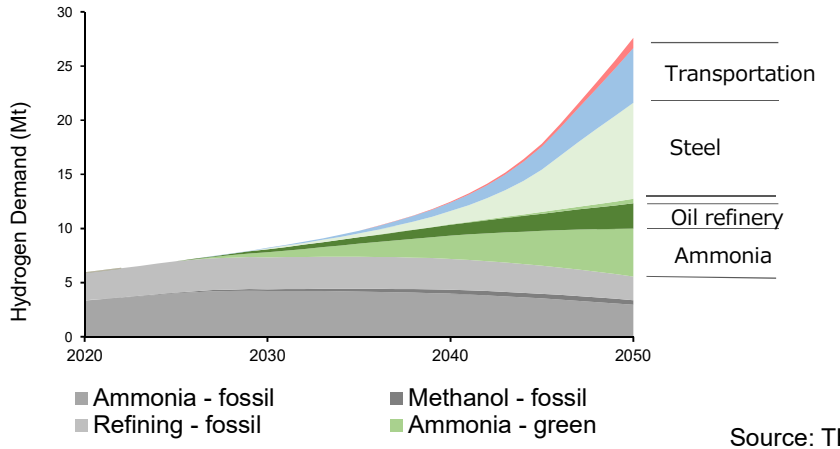
- India concentrates on supporting **green hydrogen/ammonia**, backed by solar power's potential (bidding price : INR 1.99 in December 2020). India aims to become a **global hub of hydrogen**.
- Some analyses say that India's **green hydrogen is highly cost competitive** in the world.
  (According to an analysis by TERI, a local think tank, the cost of hydrogen production is expected to be **"$2/kg in 2030, $1/kg in 2050"**)
- The Indian government announced the **"National Hydrogen Energy Mission"** in 2021, and is currently promoting and considering various policies to promote hydrogen.
- **Demand for hydrogen** in India is estimated to increase five-fold, mainly in the manufacturing and transportation sectors.
- Against these backgrounds, **India's public or private conglomerate companies** are stepping up their hydrogen efforts. Also, **US and European companies** are actively cooperating with them.

Figure: Global levelized costs of hydrogen production, 2030 ($/kg)



Source: BNEF, 2021

Hydrogen demand projection in the Low-Carbon scenario, 2020-2050



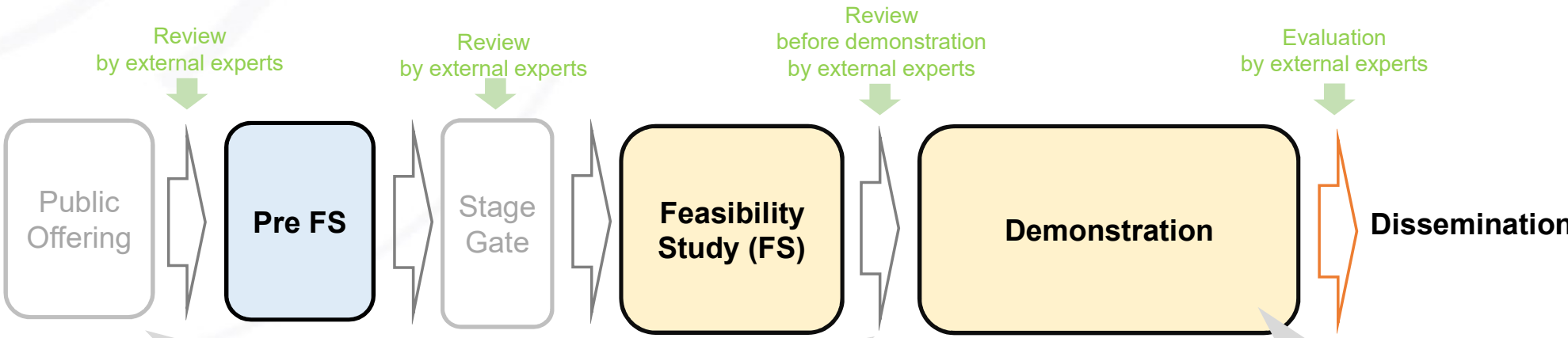
Source: TERI Analysis

International Energy Demonstration Project

Purpose

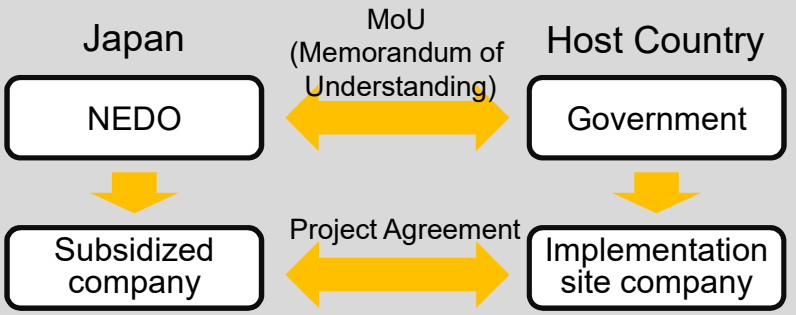
- ✓ Contribute to solving foreign energy problems through a demonstration of Japanese technology and systems for energy conservation.
- ✓ Contribute to obtaining energy security by reducing energy consumption through the dissemination of technology.

Scheme



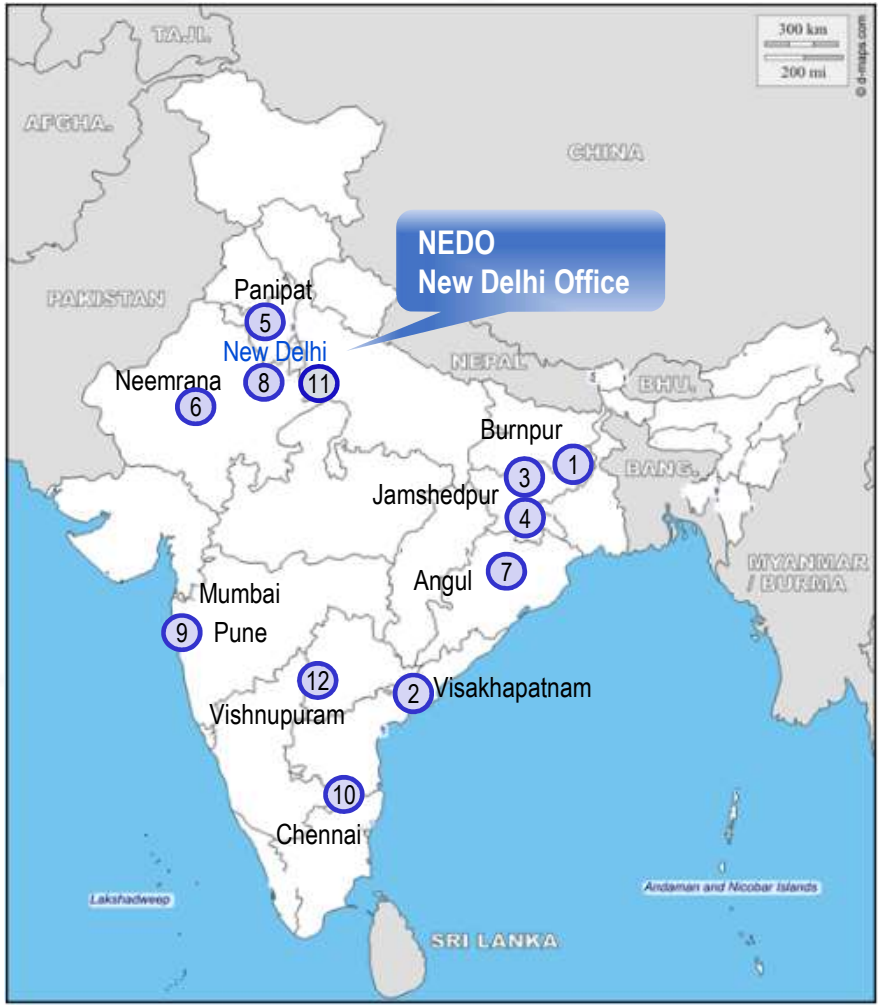
2 public bids / year
(A new public offering has just started since July 11th.)

※ Indian companies or universities may participate in the projects, together with Japanese companies which are supposed to apply for the offering.



Maximum for each project is around **3 Billion Rupees** (4 Billion Yen)

Implemented Demonstration Projects in India



Current Projects

NEW Micro-Substation for electrification using transformers for Large-Capacity Instruments

Completed Projects (FY)

1. EMS for Multiple Energy Sources at Steel Plant
2. Sinter Cooler Waste Heat Recovery (2014)
3. Coke Dry Quenching System (2011)
4. Utilization of Sensible Heat from Blast Furnace Hot Stove Waste Gas (2004)
5. Green Telecom Tower Project (2016)
6. Micro-Grid System with PV Power Generation (2019)
7. Highly Efficient Coal Preparation Technology (2014)
8. Smart Grid Pilot Project (2018)
9. Converting a Diesel Generator to Dual-fuel Operation (2011)
10. Regional Energy Efficiency Centre (2011)
11. ICT Based Green Hospital (2019)
12. Waste Heat Recovery System of Cement Plant (2004)

International Energy Demonstration Project (Current Projects)

Project	Companies	Period	Phase
Micro-Substation for electrification using transformers for Large-Capacity Instruments	Nissin Electric	2020~	Demonstration
Electric Mobility Operation System for realizing Last-mile Transportation	Panasonic	2020~	FS
Energy optimization in chemical industry	Toyo Engineering Corp.	2020~	Pre FS
Empirical research about LNG delivery by Indian railways and improvement of cold chain infrastructure in India with LNG cold energy for the energy-consumption efficiency & the CO2-emission reduction	Sojitz Corp. JR Freight Suzuki Motor Corp.	2021~	Pre FS
NEW Demonstration of Ammonia Co-Firing at existing Coal Fired Power Plant in the state of Gujarat	IHI Corp. Kowa Company	2022~	Pre FS
NEW Study on Conformity with Demonstration Requirements for Hydrogen Technology to Achieve Efficient Thermal Operation in Indian Factories	Yamanashi Hydrogen Company Suzuki Motor Corp.	2022~	Pre FS

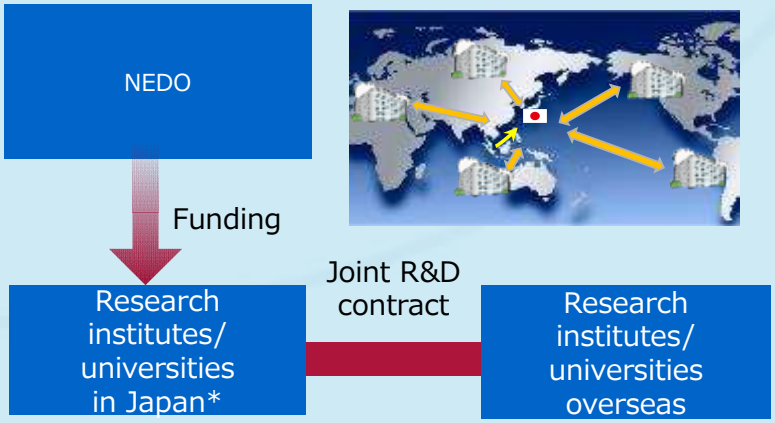
R&D Program for Promoting Innovative Clean Energy Technologies Through International Collaboration

● Program Outline

✓The aim of this program is to develop and strengthen international joint Research and Development between Japan and other countries in order to create new and innovative clean energy technologies that will have practical use after 2030.

✓This program supports Japanese research institutes and universities conducting joint international R&D projects with institutions from G20 member and other countries.

● Program Scheme



※Indian universities and companies may also participate in the program together with Japanese research institutes/universities.

● Project Details

Project scheme	International collaboration between Japanese research institutes/universities and research institutes/universities overseas. Private companies may participate but only when research institutes/universities also participate.
Project budget	Maximum of almost **INR 1.7 crores** (25 Million Yen) per project/per year. Note: NEDO will only fund the Japanese side of the international collaboration.
Project term	**Maximum of 3 years.**
Target technologies	- Clean energy technologies, including RE and energy-saving and environmental technologies that will have practical application after 2030. - 2 R&D themes have been selected for FY2022.
NEW **Project with India-Japan collaboration**	**"Development of Innovative High-temperature Thermal Energy Storage technology" (Hokkaido Univ., AIST, IIT Jammu etc.)** has been adopted in FY2021.

NEDO New Delhi Office Webinar (Launched in 2021)

(1) 4th of February 2021
Theme : India Electricity situation and Renewable energy
Speakers : CEA, SECI, Avaada, Toshiba JSW Power Systems Pvt.

(2) 10th of March 2021
Theme : Power distribution, Grid management
& Energy Distribution Management and Energy Storage
Speakers : NITI Aayog, POSOCO, Tata Power Delhi, Sumitomo Electric, etc.

(3) 24th of March 2021
Theme : Indo-Japanese Drone Ecosystem and Potential Collaborations
Speakers : MOCA, DFI, Gov. of Japan(Cabinet Secretariat, METI), ACSL

(4) 14th of January 2022
Theme : Carbon Neutrality in India
Speakers : NITI Aayog, MOP(BEE), CEEW, Reliance Industries, Mizuho Bank

(5) 15th of February 2022
Theme : Mobility and Battery Storage
Speakers : CESL, ETO Motors, Ather Energy,
TDSG(TDS Lithium ion Battery Gujarat)

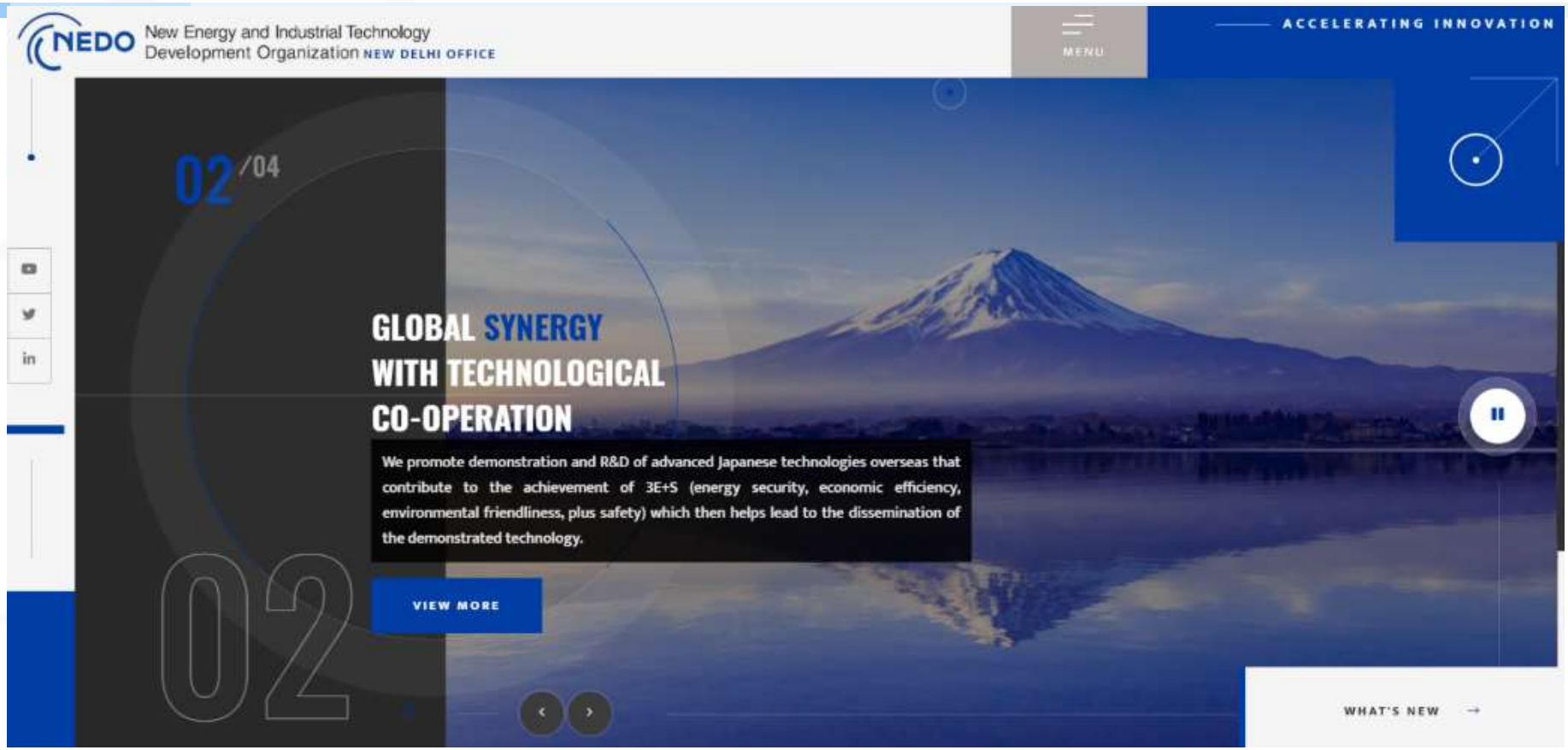
(6) 24th of February 2022
Theme : Biomass Energy
Speakers :MoPNG, PRESPL, IOCL, Hitachi Zosen

(7) 15th of March 2022
Theme : Solar Power and Mini Grid
Speakers : ISA, OMC Power, Gov. of Uttar Pradesh etc.

(8) 24th of March 2022 (Hybrid of Physical & Online)
Theme : Hydrogen
Speakers : NITI Aayog, MNRE, MoPNG(CHT), Kerala State,
TERI, Gateway House, Emb.of Japan in India, JBIC etc.

(9) 30th of March 2022
Theme : Drones
Speakers :Tech-Sci Research

Thank you for your attention!



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