

# **India - Japan Business Potentials in Energy & Environment Field**

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# Overview of NEDO

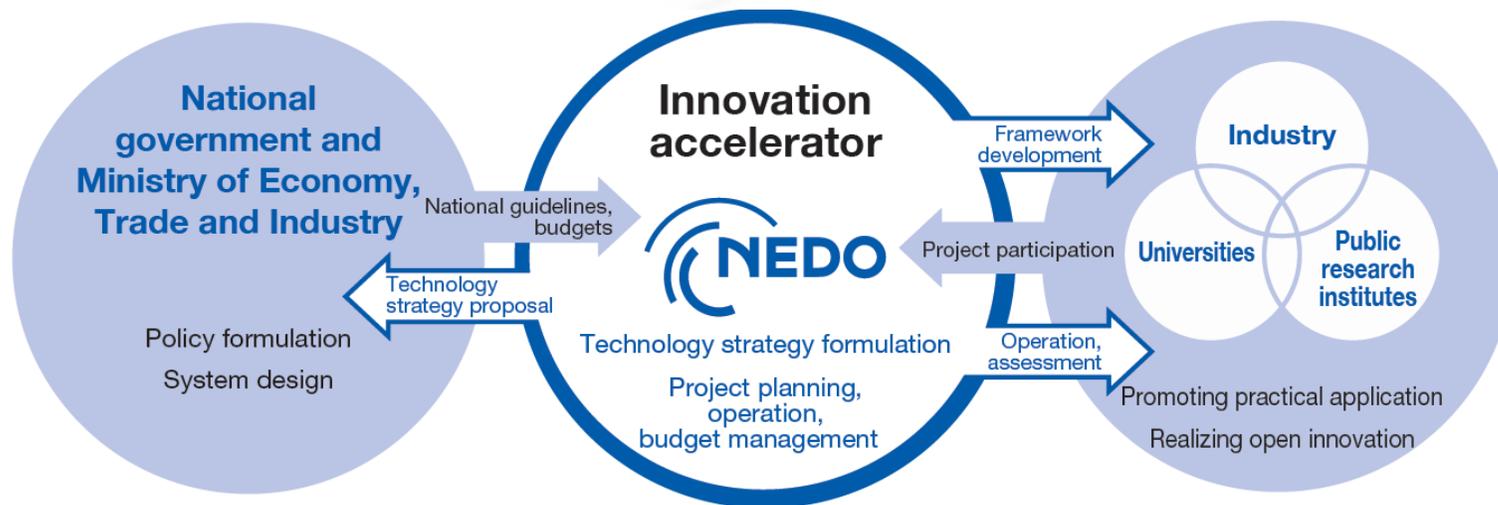
(New Energy and Industrial Technology Development Organization, under METI, Gov. of Japan)



## Positioning of NEDO

- 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.

Head Office:	Kawasaki City, Japan		
Personnel:	1,256 (as of 1 <sup>st</sup> April, 2021)		
Budget:	Approx. \$1.28 billion (2022FY) * \$=122 yen		
Fund:	Green Innovation	\$16.39	billion
	Semiconductor	\$5.06	billion
	Post 5G	\$2.54	billion
	Economic Security	\$1.02	billion
	Moonshot	\$207	million



## 6 Overseas Branch Offices



# NEDO's Targeting Technologies



Renewables



Energy Conservation



Electronics / ICT



Materials/Nanotech



Hydrogen / Battery



Water Treatment

Smart Community



Environment/  
Next Generation  
Thermal  
Power/CCUS



Robotics/AI



Energy  
Demonstration  
Projects

Joint R&D Projects  
in Clean Energy  
Field

Research / Study

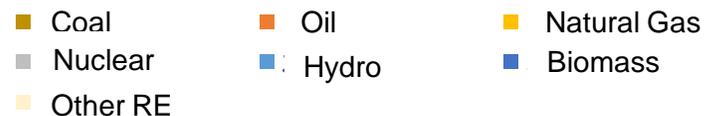
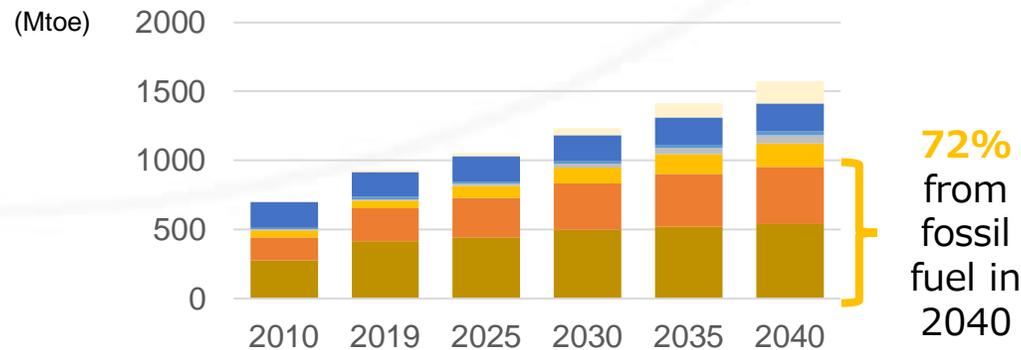
Outreach / Event

- India is **the world's third-largest energy consuming country**, after China and US.

IEA estimates that by 2040, India's primary energy use will be 1.7 times larger than now, which almost equals to that of US. **Even in 2040, around 70% will come from fossil fuels.**

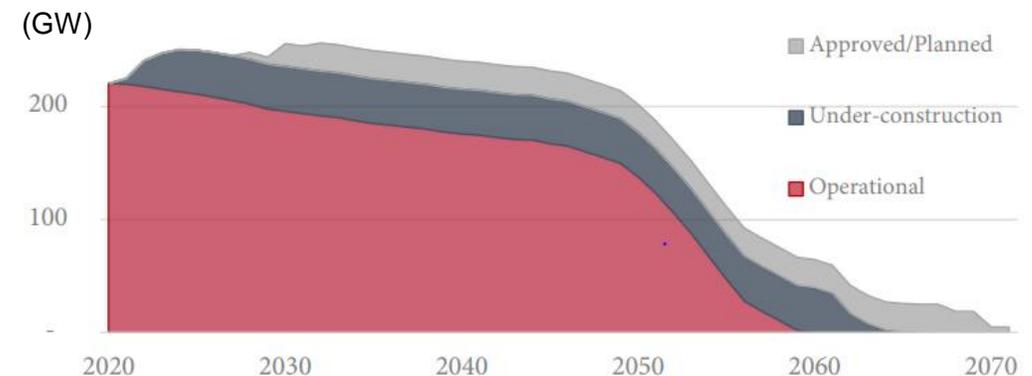
- As the volume of coal thermal power in India will keep increasing in the relatively short term, India aims for **realistic energy transition** as said by the Asia Energy Transition Initiative (AETI) led by Japan. The importance of technologies such as **ammonia co-firing, biomass co-firing and CCUS** are on a rise.

### Projected demand for primary energy in India



Sources : IEA "India Energy Outlook 2021" (p220)

### Pipeline of existing and planned thermal power plants



Sources : CSEP "Getting to Net Zero" (2021)

# Environment & Energy



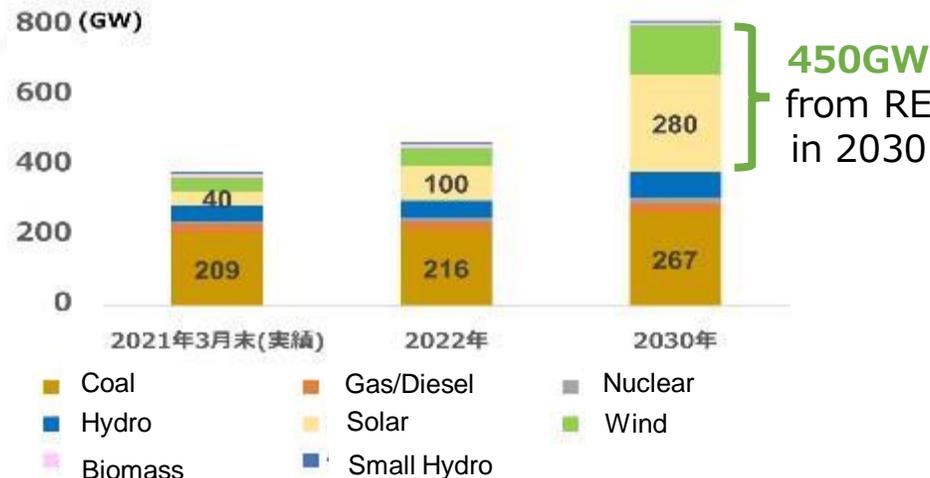
- **India is also active in introducing Renewable Energy (RE).** It should be noted that **the utilization of RE is proceeding simultaneously worldwide** (not necessarily led by developed countries), taking into account its geographical characteristics.
- For **solar**, the lowest price of 1.99 rupees (about 3 yen) was recorded in December 2020, and some projects of hybrid with wind and 24 hours supply has progressed since then. Due to competitiveness in RE, India is quite active in the introduction of **green hydrogen** and has provided policy support under the “National Hydrogen Energy Mission.”
- In addition, India has made progress in utilizing **biomass resources** (Bio-ethanol diesel, biogas and biomass co-fired).
- As above, India will promote the domestic production of energy and aim to transform it **from a “have-not” nation to a “have” nation**. As US and EU companies continue to collaborate with Indian companies, **there will be significant space for the introduction of hydrogen and other technologies developed by Japanese companies.**

Solar Power Potential



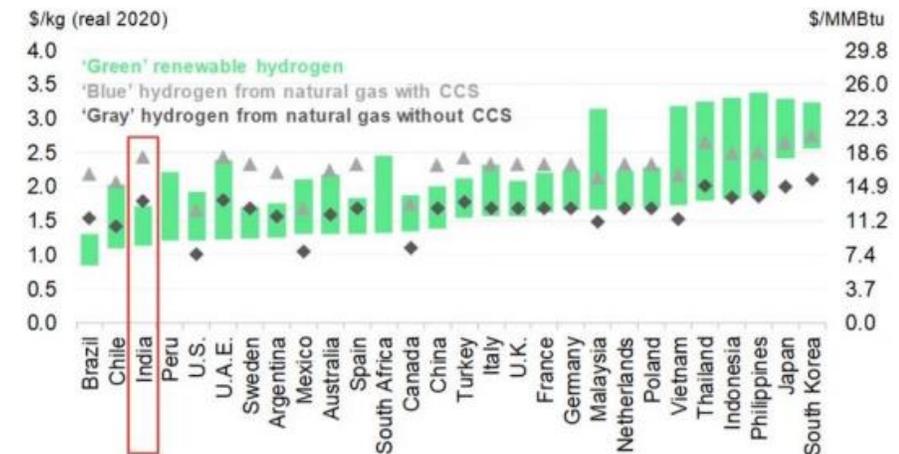
Sources : World Bank

Changes in power sources (Capacity-based)



Sources : CEA

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

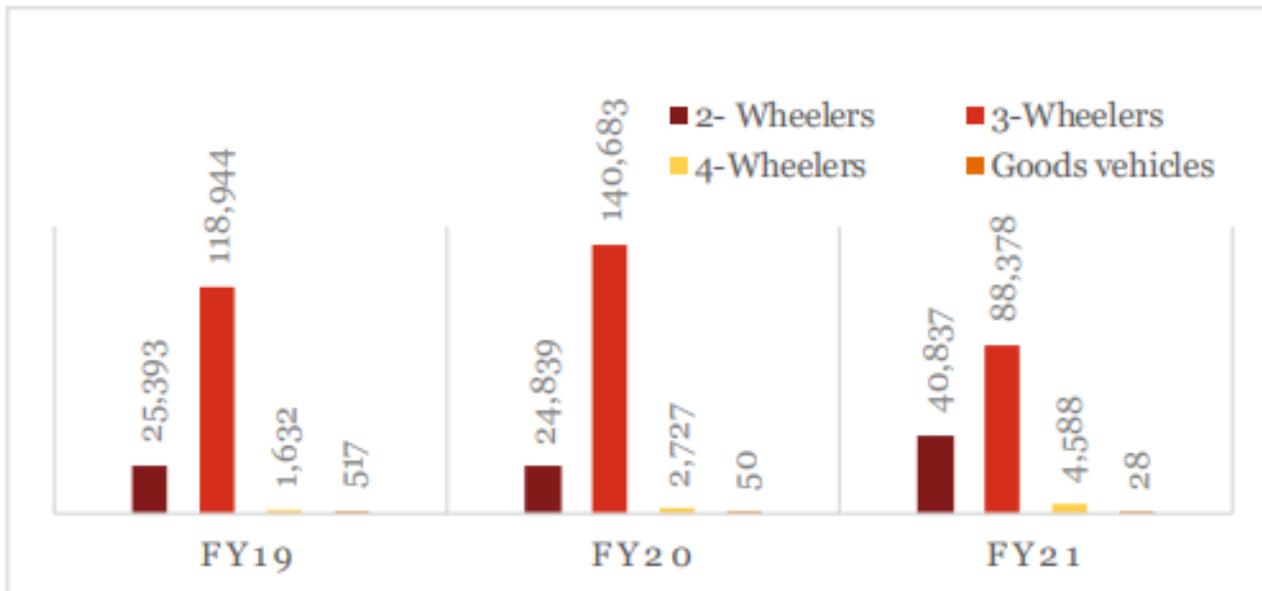


Source: BNEF, 2021

- Minister of Power announced that **30% of new sold car will be EVs by 2030.**
- In India, **2-wheeler EVs and 3-wheeler EVs are expected to become widespread.** Local manufacturers' competitiveness has increased sharply. (The Federation of Indian Industries projects an EV penetration rate of 25~35% for 2-wheelers, 65~75% for 3-wheelers and 10~15% for 4-wheelers by 2030.)
- **When getting eco-friendly 4-wheelers in India, it's not a binary choice between gasoline (hybrid) vehicles or EVs.**

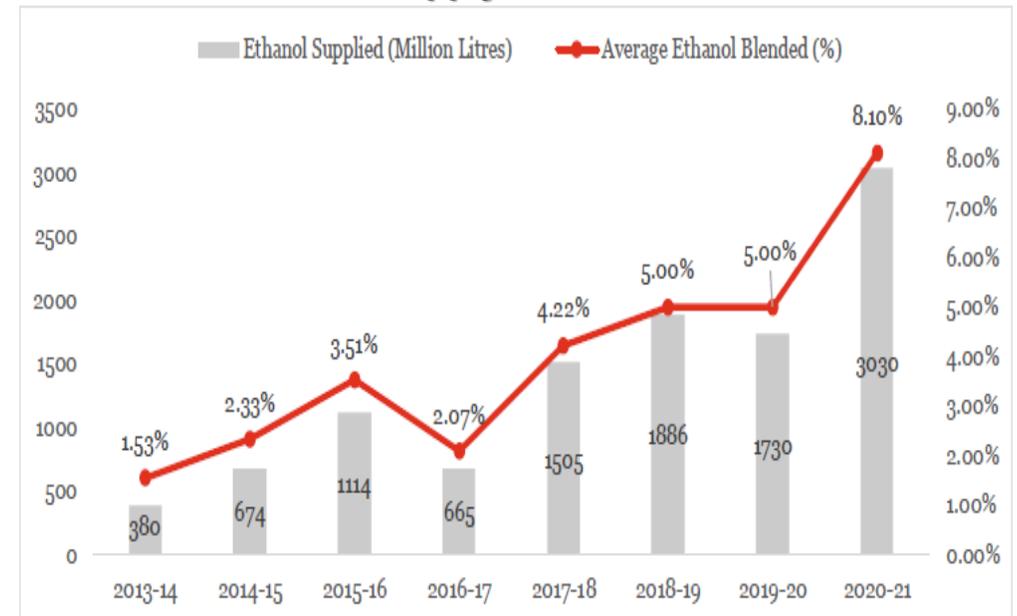
(There is a third option to use CNG, biomass, hydrogen, etc. 4-wheeler EVs will be aimed at high-income consumers due to their high prices.)

Category wise EV Sales



Source: PwC

Bio-Ethanol supply and blended share



Source: PwC

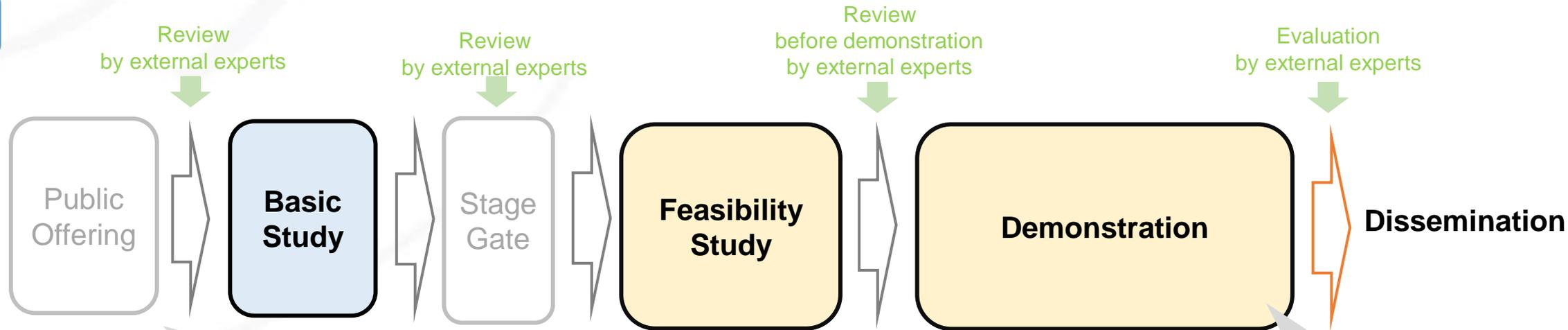
# International Energy Demonstration Project



## Purpose

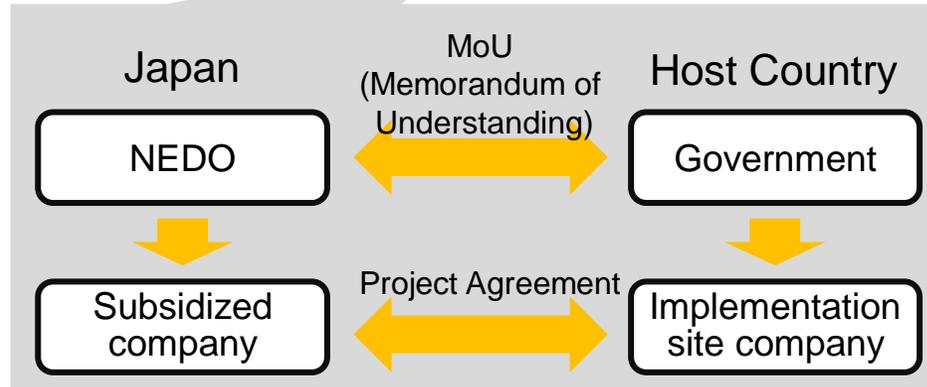
- ✓ Contribute to solving foreign energy problems through a demonstration of Japanese technology and systems for energy conservation.
- ✓ Contribute to obtaining energy security by reducing energy consumption through the dissemination of technology.

## Scheme



2 public bids / year

※ 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**

# Implemented Demonstration Projects in India



## Current Projects

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

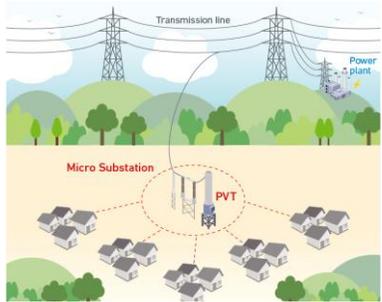
## Completed Projects (FY)

- EMS for Multiple Energy Sources at Steel Plant (2021)
- Sinter Cooler Waste Heat Recovery (2014)
- Coke Dry Quenching System (2011)
- Utilization of Sensible Heat from Blast Furnace Hot Stove Waste Gas (2004)
- Green Telecom Tower Project (2016)
- Micro-Grid System with PV Power Generation (2019)
- Highly Efficient Coal Preparation Technology (2014)
- Smart Grid Pilot Project (2018)
- Converting a Diesel Generator to Dual-fuel Operation (2011)
- Regional Energy Efficiency Centre (2011)
- ICT Based Green Hospital (2019)
- Waste Heat Recovery System of Cement Plant (2004)

# Examples of Recent Projects in India

## Demonstration

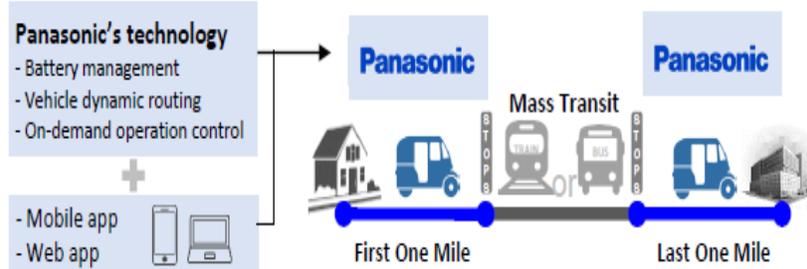
### 1 Nissin Electric (2020-)



- Aiming to ensure a stable supply of electricity in unelectrified areas.
- After the demonstration is completed in Delhi, Nissin will try to disseminate this technology to remote areas.

## Feasible Study (FS)

### 2 Panasonic (2020-)



- Introduction of a system to optimize the operation of EV operators and drivers
- Selection of demonstration sites under consideration

## Basic Study (Pre-FS)

### 3 Sojitz, JR Freight, Suzuki (2021-)



LNG Transportation by Railways



CNG Station



Refrigerated Truck

- This project's objective is to supply gas and cold heat, to places with underdeveloped gas pipelines and cold chains.

## Basic Study (Pre-FS)

### 4 IHI Corp., Kowa Company (2022-)

Demonstration of Ammonia Co-Firing at existing Coal Fired Power Plant in the state of Gujarat



← Mundra Coal Power Plant  
(Source : Adani Power)

- IHI Corp., Kowa Company and Adani Power Ltd. (APL), one of the largest private power generation companies in India, will jointly study various technologies and evaluate the economic feasibility of co-firing 20% ammonia gas into the existing boilers at APL-owned Mundra Coal Power Plant.

### 5 Yamanashi Hydrogen Company, Suzuki (2022-)

Study on Conformity with Demonstration Requirements for Hydrogen Technology to Achieve Efficient Thermal Operation in Indian Factories



← YHC's Green Hydrogen Demonstration Site in Komekurayama, Yamanashi Prefecture (Source : YHC)

- Yamanashi Hydrogen Company (YHC: invested by Yamanashi Prefecture, Tokyo Electric Power Company (TEPCO) and Toray Industries) and Suzuki Motor will study the possibility of establishing an optimal thermal operation system in Maruti Suzuki's automobile plant, by utilizing hydrogen produced by a Power-to-Gas (P2G: electrolysis of water) system and surplus solar power.

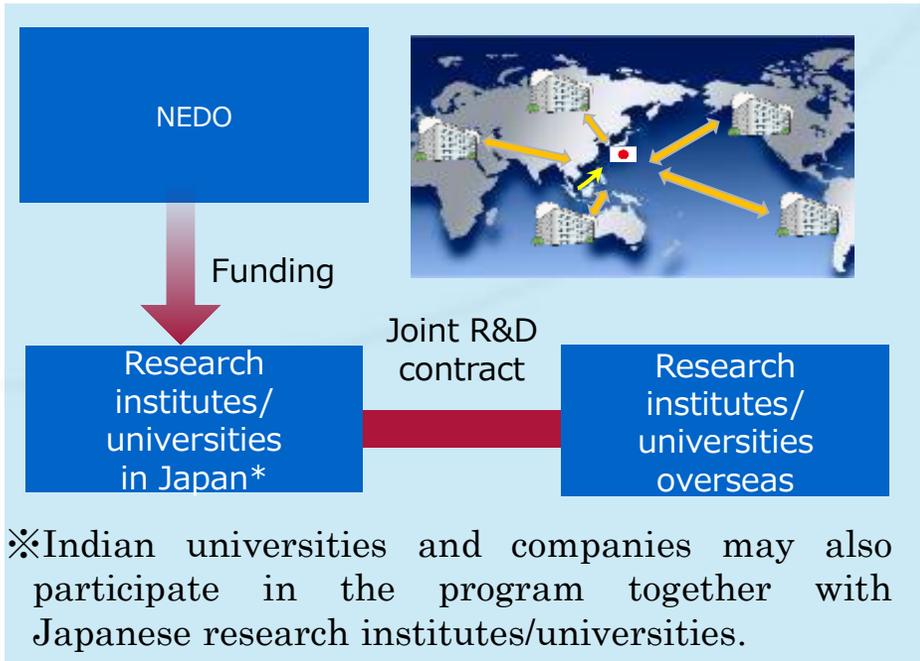
# R&D Program for Promoting Innovative Clean Energy Technologies Through International Collaboration



## ● 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



## ● Project Details

<b>Project scheme</b>	International collaboration between Japanese research institutes/universities and research institutes/universities overseas. Private companies may participate but only when research institutes/universities also participate.
<b>Project budget</b>	Maximum of almost <b>INR 1.7 crores</b> per project/per year. Note: NEDO will only fund the Japanese side of the international collaboration.
<b>Project term</b>	<b>Maximum of 3 years.</b>
<b>Target technologies</b>	- 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.
<b>Project with</b> <b>NEW India-Japan collaboration</b>	<b>“Development of Innovative High-temperature Thermal Energy Storage technology” (Hokkaido univ., AIST, IIT Jammu etc.)</b> has been adopted in FY2021.

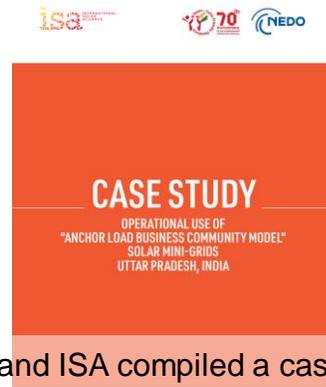
# Examples of Collaborations by NEDO India



## Collaboration with International Solar Alliance



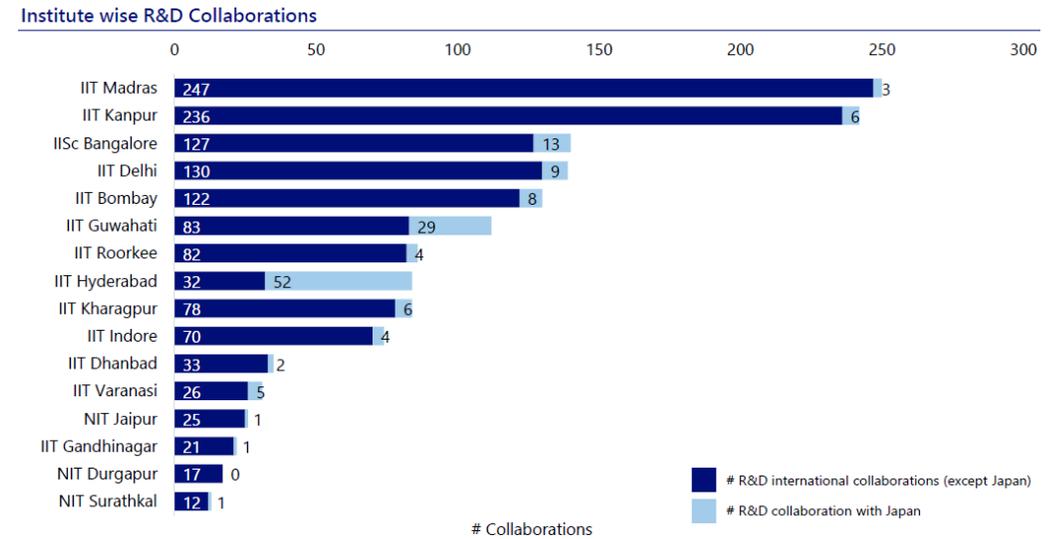
ISA and Gov. of Japan, JBIC, JICA and NEDO signed MOC in May 2022.



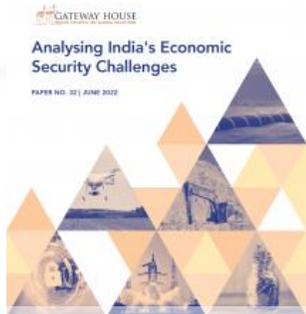
NEDO and ISA compiled a case study report concerning solar mini-grids in March 2022.

## Collaboration with Indian Universities

NEDO's report on Joint R&D, supported by NRI



## Collaboration in Economic security field



NEDO compiled this report in March 2022, with a support of Gateway House, an Indian think tank.



NEDO collaborates with ACSL India, JV of a Japanese leading drone maker and India's Aerodyne.



In August 2022, NEDO India held a webinar for discussing joint R&D between India and Japan. Eminent speakers there include Both Embassies, DST (Gov. of India), IIT Hyderabad, IIT Jammu.

# NEDO India Webinar series (Launched in 2021)



## **(1) 4<sup>th</sup> of February 2021**

Theme : India Electricity situation and Renewable energy

Speakers : CEA, SECI, Avaada, Toshiba JSW Power Systems Pvt.

## **(2) 10<sup>th</sup> 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) 24<sup>th</sup> of March 2021**

Theme : Indo-Japanese Drone Ecosystem and Potential Collaborations

Speakers : MOCA, DFI, Gov. of Japan(Cabinet Secretariat, METI), ACSL

## **(4) 14<sup>th</sup> of January 2022**

Theme : Carbon Neutrality in India

Speakers : NITI Aayog, MOP(BEE), CEEW, Reliance Industries, Mizuho Bank

## **(5) 15<sup>th</sup> of February 2022**

Theme : Mobility and Battery Storage

Speakers : CESL, ETO Motors, Ather Energy,  
TDSG(TDS Lithium ion Battery Gujarat)

## **(6) 24<sup>th</sup> of February 2022**

Theme : Biomass Energy

Speakers : MoPNG, PRESPL, IOCL, Hitachi Zosen



## **(7) 15<sup>th</sup> of March 2022**

Theme : Solar Power and Mini Grid

Speakers : ISA, OMC Power, Gov. of Uttar Pradesh etc.

## **(8) 24<sup>th</sup> of March 2022 (Hybrid of Physical & Online)**

Theme : Hydrogen

Speakers : NITI Aayog, MNRE, MoPNG(CHAT), Kerala State,  
TERI, Gateway House, Emb.of Japan in India, JBIC etc.

## **(9) 30<sup>th</sup> of March 2022**

Theme : Drones

Speakers : Tech-Sci Research

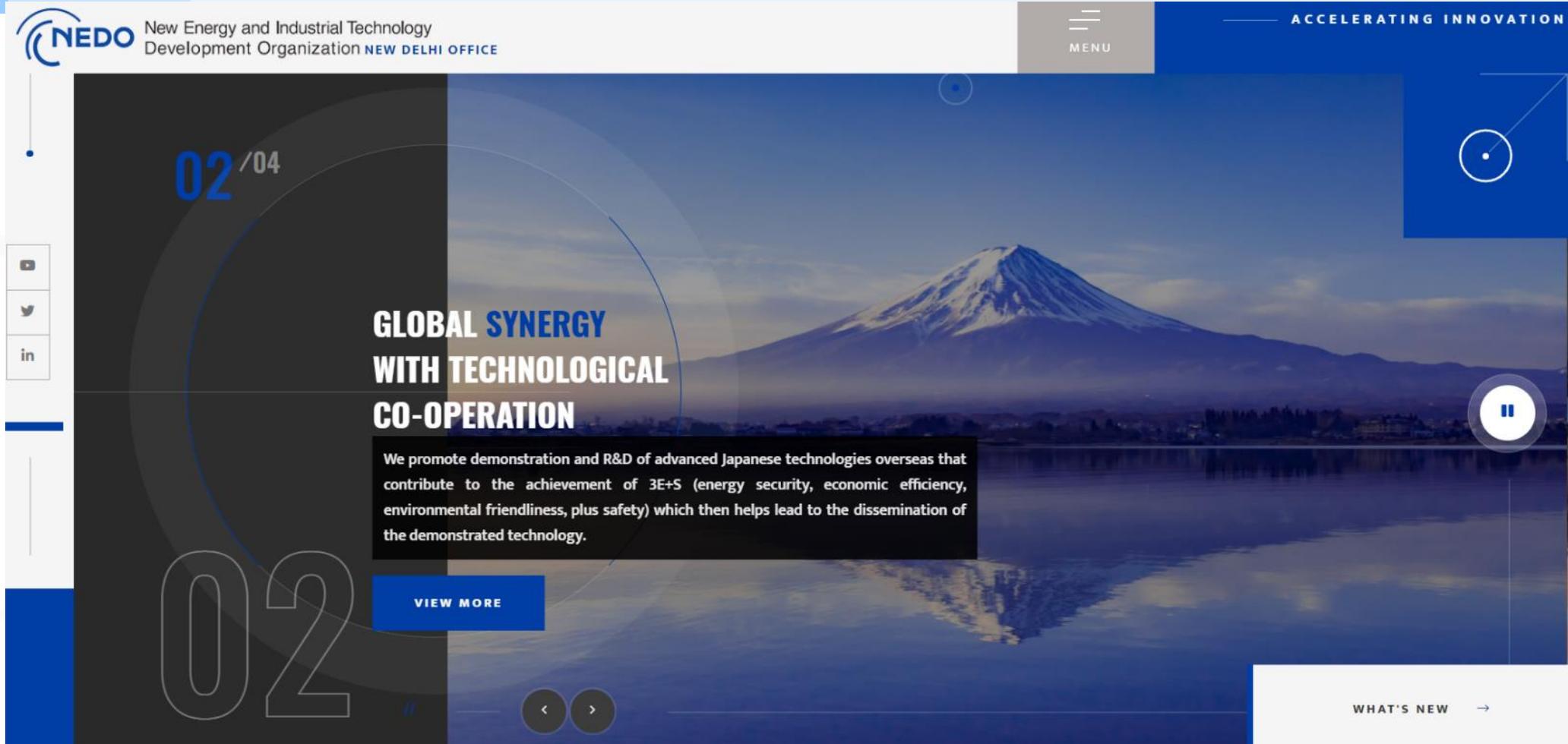
## **(10) 26<sup>th</sup> of August 2022**

Theme : International Joint Research

Speakers : NRI India, DST, ISAJ, IITH, IITJ, Emb. of India in Japan  
Emb. of Japan in India



# Thank you for your attention!



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