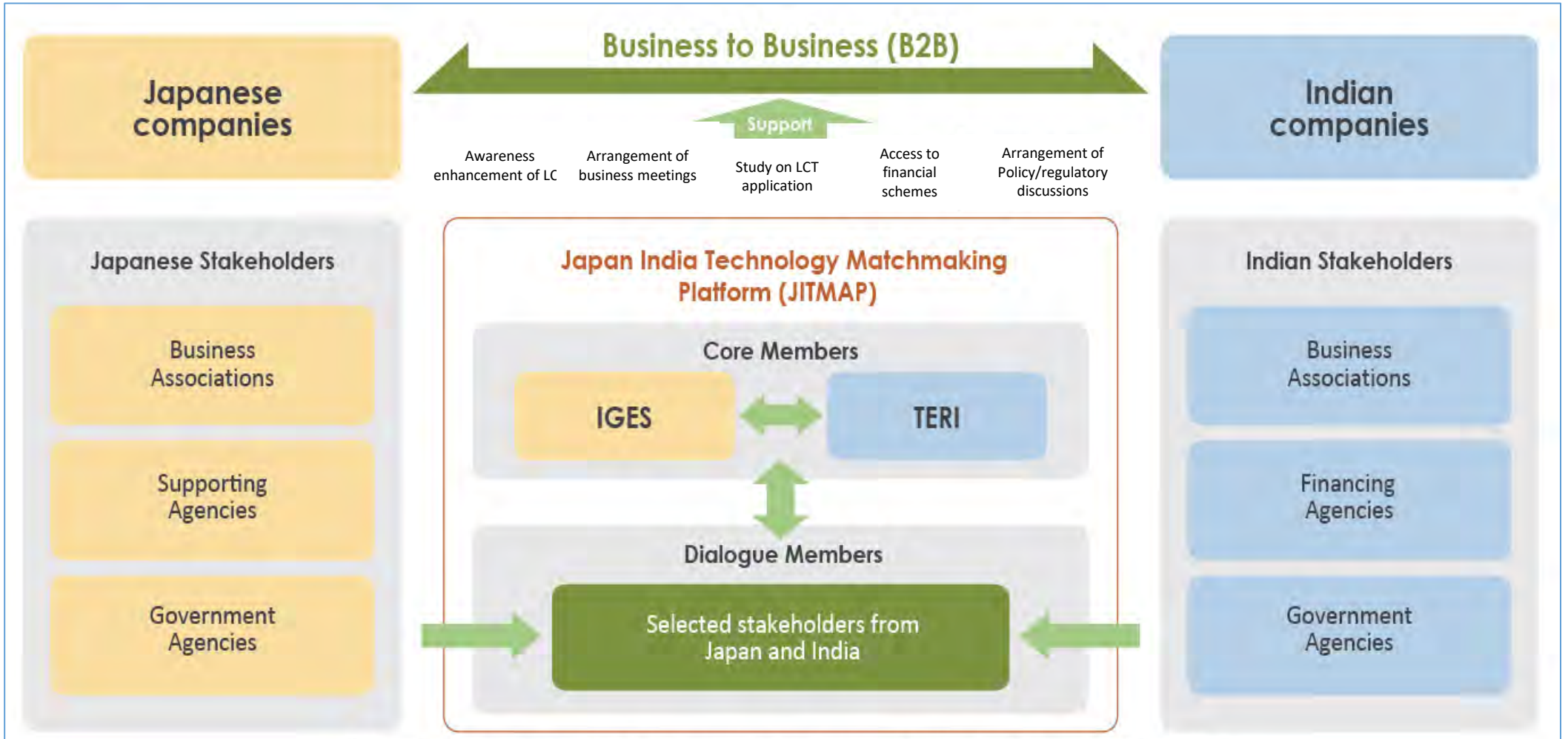
Japan-India Technology Matchmaking Platform (JITMAP)
日本・インド技術マッチメイキング・プラットフォーム

IGESとTERIが共同で運営する技術移転を目的とするプラットフォーム。日本国環境省及び兵庫県の支援。



Schematic diagram of JITMAP as a supporting mechanism to promote business matchmaking

http://jitmap.org/index.php

JITMAP activities

IGES-TERI, with partners, have engaged over 100 Indian companies

Business matchmaking

Market assessment to identify potential matches between technology suppliers and end-users

Feasibility studies and technology implementation

Business meetings

Feasibility studies

Implement pilot projects

On-site training

Meeting with financing agencies

Meeting with policy makers

Knowledge sharing

Workshops and seminars

Locations of JITMAP activities

Partners:

KOBELCO TLV MAYEKAWA MYCOM BANDO HITACHI Inspire the Next

Constraints for transferring low-carbon technologies

低炭素技術移転の障害

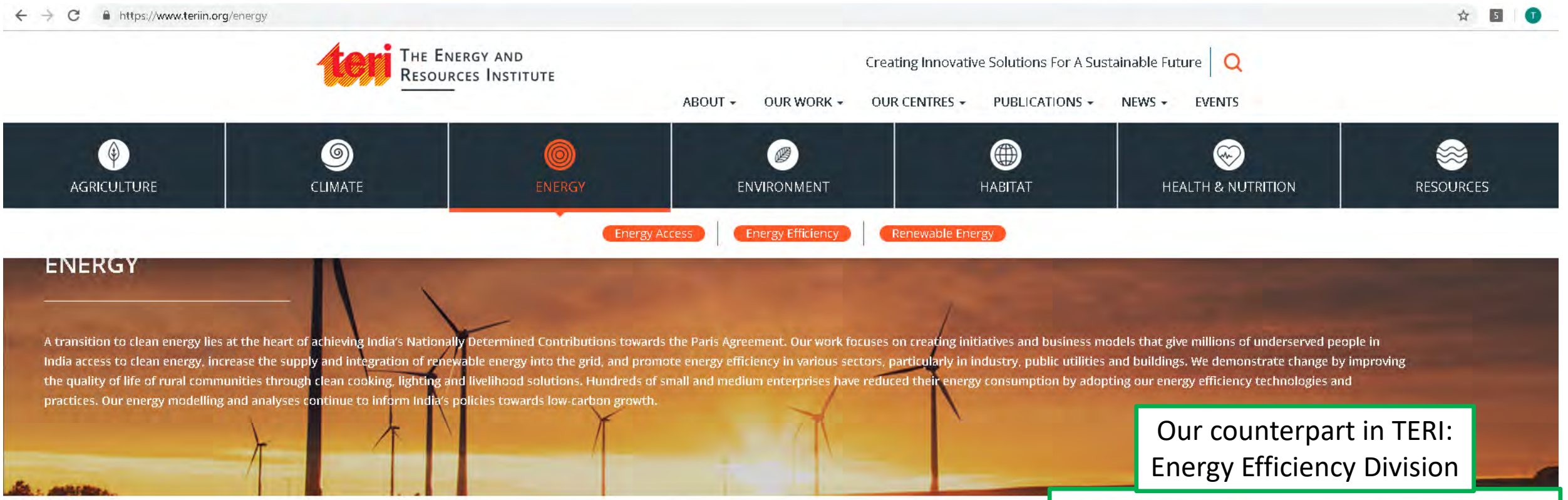
- **Capital cost:** Low-cost technologies are tend to be selected without the consideration of the lifecycle cost including the operation and maintenance.
- **価格差：**初期投資の小さい技術が選定されがち。維持管理費も含めた長期的便益が評価されない。

- **Financial information:** Payback period and return on investment of the technologies are not well known.
- **財務情報：**技術や設備に関する投資回収期間や投資収益率が十分に共有されていない。

- **Environmental regulations:** Environmental benefits are not well evaluated due to the low enforcement.
- **環境規制：**環境法令等の遵守が徹底されていないため、環境管理面の長所が評価されない。

TERI's scope

https://www.teriin.org/



Our counterpart in TERI:
Energy Efficiency Division

Mr Girish Sethi
Senior Director, Energy

Mr Prosanto Pal
Area Convenor, Indl. Energy Efficiency & Sust. Techn

India's Intended Nationally Determined Contribution (INDC)

To reduce the **emissions intensity** of its GDP **by 33 to 35 percent** by 2030 from 2005 level.

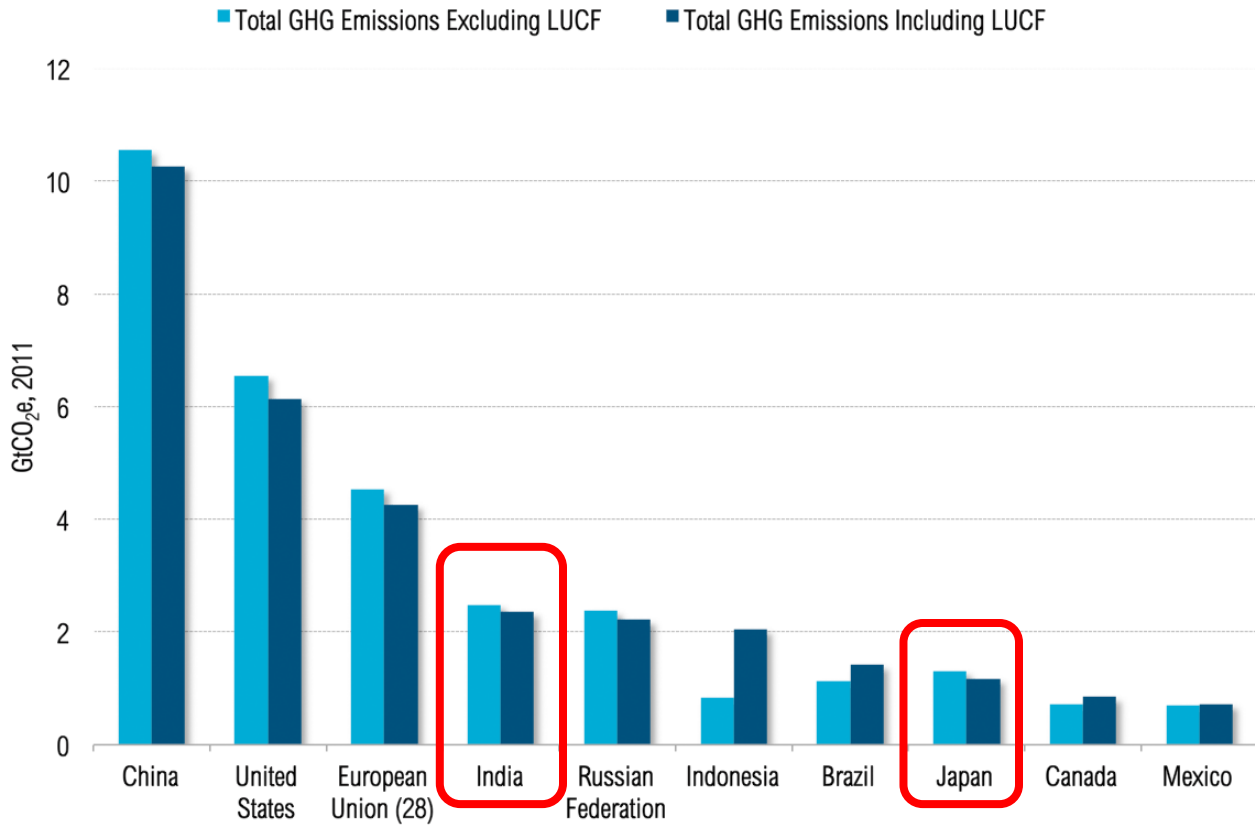
National Action Plan on Climate Change (NAPCC)

- Nation Mission for Enhanced Energy Efficiency (NMEEE)
  - Perform Achieve and Trade (PAT)
  - Market Transformation for Energy Efficiency (MTEE)
  - Energy Efficiency Financing Platform (EEFP)
  - Framework for Energy Efficient Economic Development (FEEED)

Source: Bureau of Energy Efficiency, "Perform, Achieve and Trade (PAT) Scheme: Market Based Mechanism to Improve Industrial Energy Efficiency", https://www.nedo.go.jp/content/100859382.pdf

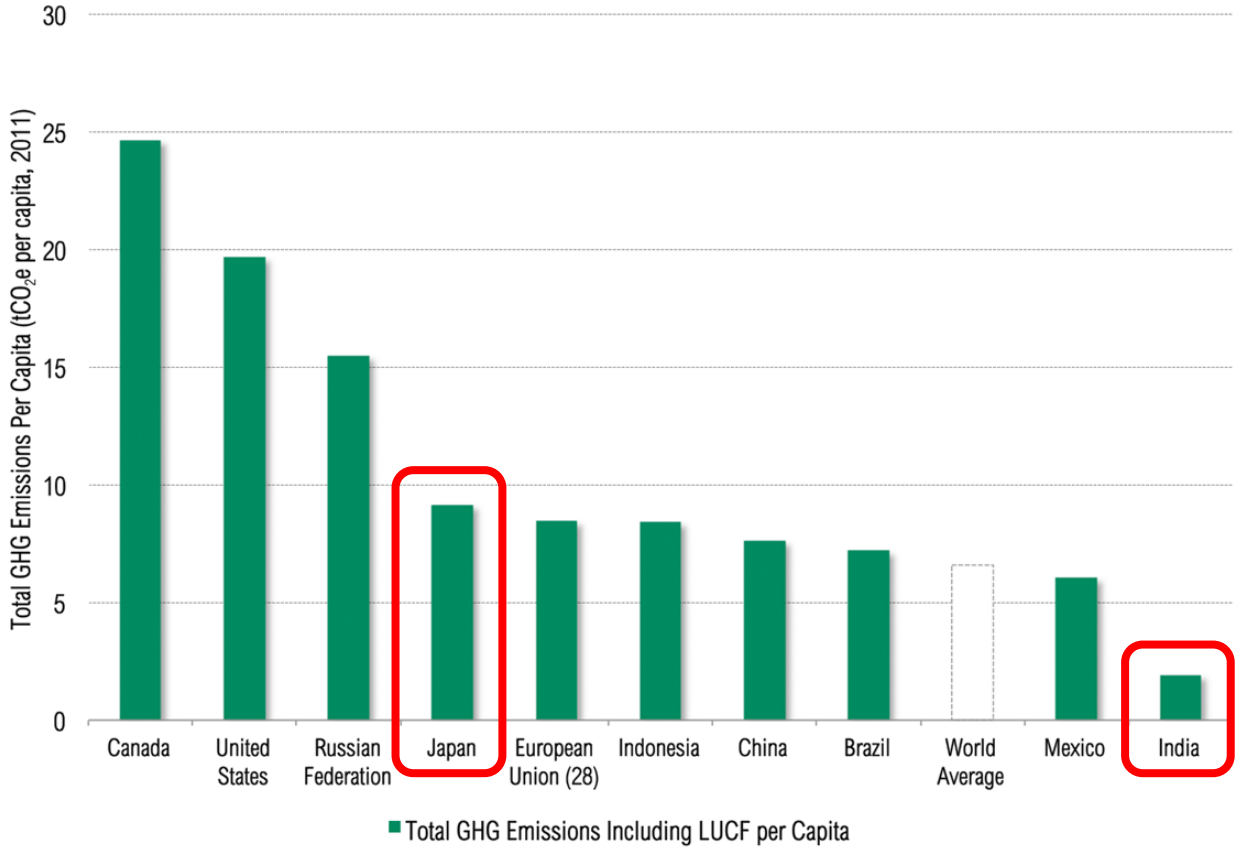
GHG emissions in India and Japan

Top 10 Emitters



http://bit.ly/11SMpjA

Per Capita Emissions for Top 10 Emitters

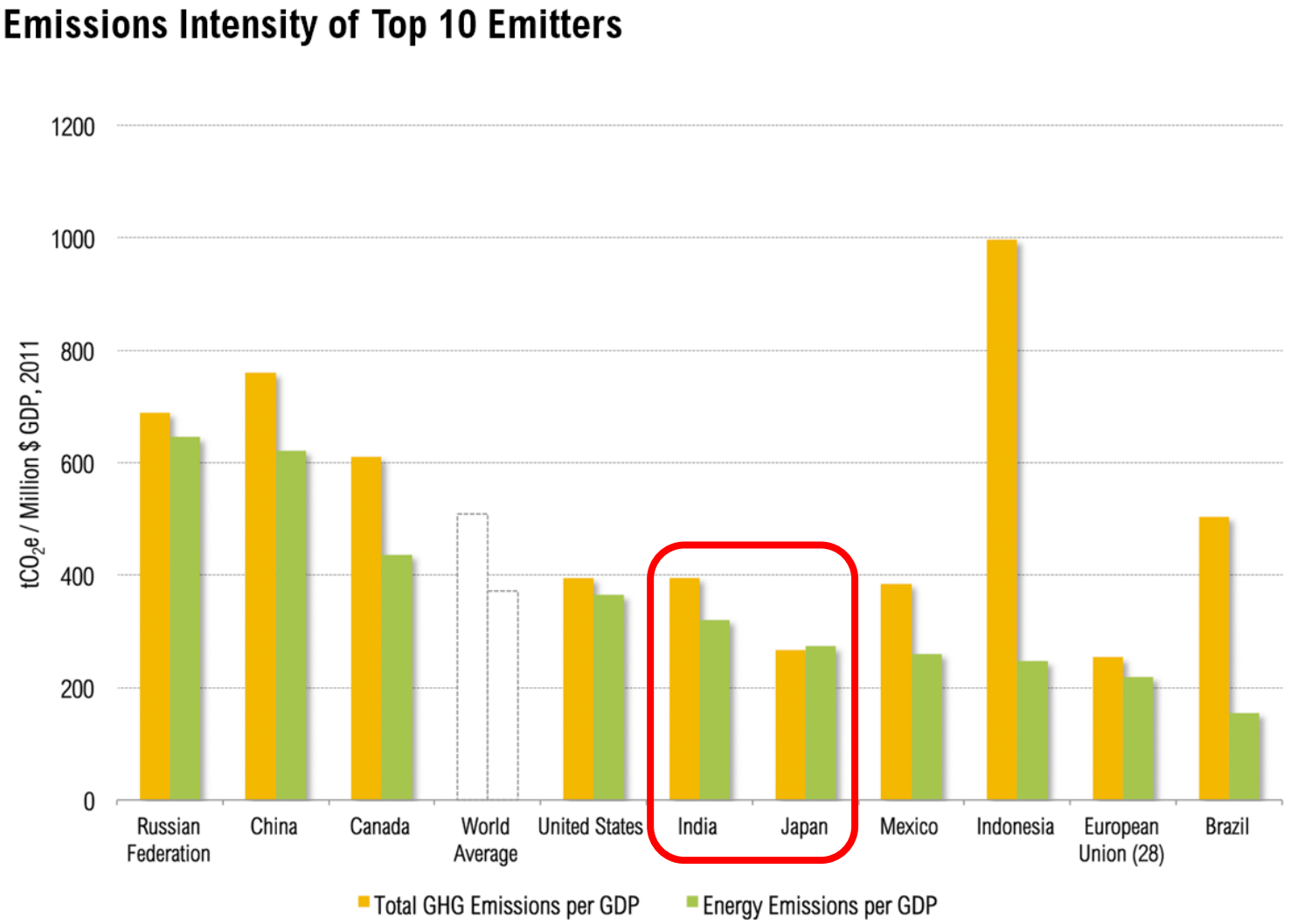


WORLD RESOURCES INShttp://bit.ly/11SMpjA

WORLD RESOURCES INST

Source: World Resources Institute, “6 Graphs Explain the World’s Top 10 Emitters” https://www.wri.org/blog/2014/11/6-graphs-explain-world-s-top-10-emitters

Emissions intensity in India and Japan



http://bit.ly/11SMpjA

WORLD RESOURCES INSTITUTE

Source: World Resources Institute, “6 Graphs Explain the World’s Top 10 Emitters” https://www.wri.org/blog/2014/11/6-graphs-explain-world-s-top-10-emitters

Targets and achievements of PAT Cycle-I (2012-2015)

Realized Impacts – PAT 1 (2012-2015)

Energy Saving

8.67 mtoe
5635 MW

1.25% of India's total primary energy supply

Emission Reduction

31 million tonnes of CO_2

1.93% of India's emissions

Skill Development

Capacity building: 5000+ Engineers and operators

13718 Energy Auditors & Managers

219 Accreditation

Savings

Rs 37,685 Crores ($5.8 Billion)

from saved **energy consumption** and **avoided generation**

Investment

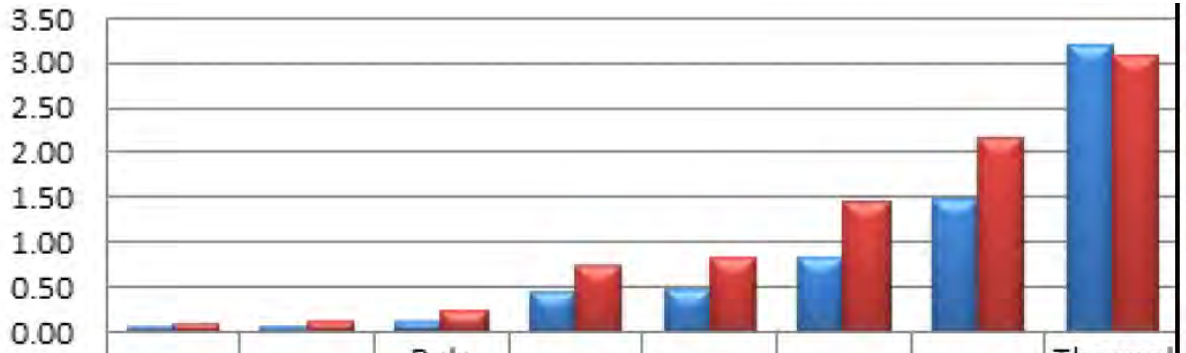
Encouraged investments for energy efficient technologies for domestic manufacturing

Rs 24,517 Crore ($3.8 Billion) invested

Source: Bureau of Energy Efficiency, "Perform, Achieve and Trade (PAT) Scheme: Market Based Mechanism to Improve Industrial Energy Efficiency", https://www.nedo.go.jp/content/100859382.pdf

Targets and achievements in 8 sectors

Energy in Million TOE



	Chlor Alkali	Textile	Pulp and Paper	Aluminium	Fertilizer	Cement	Iron and Steel	Thermal Power Plant
Sum of Energy Savings Target in Million TOE	0.05	0.07	0.12	0.46	0.48	0.82	1.49	3.21
Sum of Achievements in Million TOE	0.09	0.13	0.24	0.73	0.81	1.44	2.16	3.08

Source: Bureau of Energy Efficiency, "Snapshot to PAT Performance", https://beeindia.gov.in/sites/default/files/Final%20Booklet%2029-9-2017.pdf

Projected Impacts – PAT 2 (2016-19)

Energy Saving

17.5 mtoe
11407 MW

2.09% of India's total primary energy supply

Emission Reduction

60 million tonnes of CO_2

3-4% of India's emissions

Skill Development

Capacity building: 12000+ Engineers and operators

15000 Energy Auditors & Managers

500 Accreditation

Savings

Rs 48110 Crores ($7.5 Billion)

from saved **energy consumption** and **avoided generation**

Investment

Encouraged investments for energy efficient technologies for domestic manufacturing

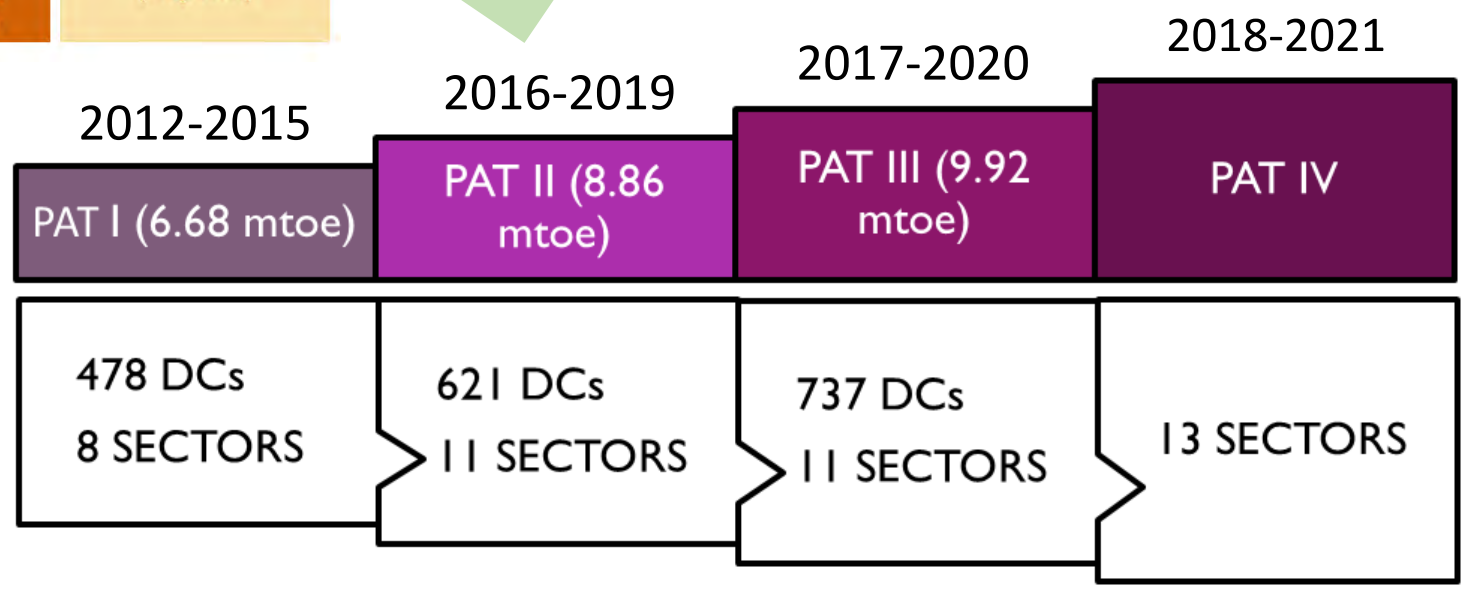
Rs 30,000 Crore ($4.6 Billion) (Projected)

Source: Bureau of Energy Efficiency, "Perform, Achieve and Trade (PAT) Scheme: Market Based Mechanism to Improve Industrial Energy Efficiency", https://www.nedo.go.jp/content/100859382.pdf

PAT Cycle-II, III & IV

8 sectors + railways, electricity DISCOMs and refineries

11 sectors + commercial buildings of 24 hours usage (hotels) and petrochemicals



Evaluation of the PAT Scheme

- How was the PAT I performance evaluated?
- How is the performance of PAT II? How sever has the target become?
- How is the energy saving reported and verified?
- Is the investment in energy efficiency really taking place?
- Are there any reference books prepared compiling successful case studies?
- How are the perceptions of Designated Companies (DCs)?
- Will the PAT scheme get stricter? Will it involve SMEs?
- Are there any business opportunities for Japanese service providers?

Energy efficient technologies & best practices adopted by Textile Sector's Designated Consumers (DCs)

- Adoption of premier energy efficient motor with proper sizing in ring frame and open end spinning machine.
- Use of variable speed drives in humidification plants and optimization of blade angle and their types matches with efficient operation, approach for direct drive instead of belt drive.
- Installation photo cells for speed frames.
- Installation of synthetic flat belts for spinning ring frame.
- Optimization of suction pressure of Pneumofil in open and ring frame.
- Replacement of T8 tubelight with led tubelights.
- Replacement of CFL and HPSV and with Led lights and street Lights.
- Conversion of V belt drive to flat belt drive.
- Use of electronic ballast in place of conventional electromagnetic chokes.
- Optimum pressure setting for compressor and avoid its misuse.
- Replace old inefficient boiler with efficient boiler with require matched capacity of plant.
- Reuse of condensate and recover heat from hot water.
- Maintain steam traps and system.

Source: Bureau of Energy Efficiency, "Achievements under Perform, Achieve and Trade (PAT)", May 2017
https://beeindia.gov.in/sites/default/files/Booklet_Achievements%20under%20PAT_May%202017.pdf

Energy efficient technologies & best practices adopted by Cement Sector's Designated Consumers (DCs)

- Installation of Waste Heat Recovery systems
- Installation of Vertical Grinding Mill
- Installation of VAM
- Installation of High recuperation efficiency hydraulic cooler
- Installation of High efficient screw compressor
- Provided baffle plate (guide plate) inside twin cyclone
- Increasing the usage of AFR in the Kiln.
- Increasing the number of stages of preheater
- Installation of High Efficiency 3rd Generation Air-Separator

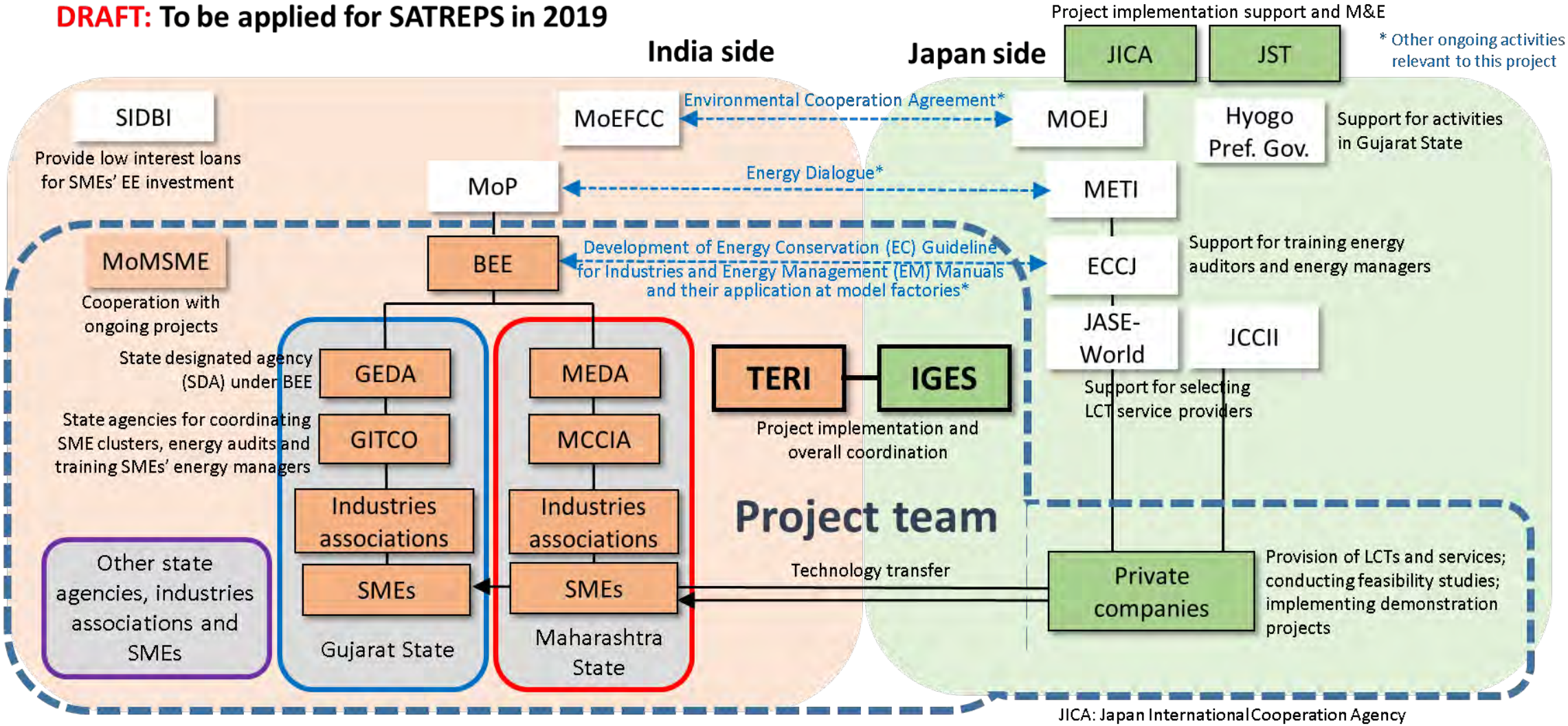
Source: Bureau of Energy Efficiency, "Achievements under Perform, Achieve and Trade (PAT)", May 2017
https://beeindia.gov.in/sites/default/files/Booklet_Achievements%20under%20PAT_May%202017.pdf

Discussion: For further diffusion of LCTs in India

- What technologies are in high demand?
- How Japanese service providers should reach out to Indian companies, particularly SMEs?
- In order to improve air and water quality and solid waste management in India, what kind of support from Japan would be beneficial?
- Is there any chance that some states spearhead in adopting stricter environmental regulations and implementing model projects?

Project implementation structure of Deep Dive EE Intervention in India's SMEs

DRAFT: To be applied for SATREPS in 2019



MoP: Ministry of Power
BEE: Bureau of Energy Efficiency
MoEFCC: Ministry of Environment, Forest and Climate Change
MoMSME: Ministry of Micro, Small & Medium Enterprises
SIDBI: Small Industries Development Bank of India

GEDA: Gujarat Energy Development Agency
GITCO: Gujarat Industrial and Technical Consultancy Organization Ltd.
MEDA: Maharashtra Energy Development Agency
MCCIA: Mahratta Chamber of Commerce, Industries and Agriculture
TERI: The Energy and Resources Institute
IGES: Institute for Global Environmental Strategies

JICA: Japan International Cooperation Agency
JST: Japan Science and Technology Agency
MOEJ: Ministry of the Environment, Japan
Hyogo Pref. Gov.: Hyogo Prefectural Government
METI: Ministry of Economy, Trade and Industries
ECCJ: Energy Conservation Center, Japan
JASE-World: Japanese Business Alliance for Smart Energy Worldwide
JCCII: Japan Chamber of Commerce and Industry in India