INDIA'S ENERGY & DECARBONISATION POLICIES AND POTENTIAL FOR COLLABORATION

INDIA-JAPAN Environmental Business Seminar

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- INDIA’S EMISSIONS
- NDC GOALS: TOWARDS ENERGY TRANSITION
- ADVANCING DECARBONISATION
- NEXT STEPS

Global Emissions in 2019

Country	CO_2 Emissions/year (Billion Tons)/ Gross	Share of global CO2 emissions	Emission of CO_2 per Capita (Tons/Person)
China	14	26%	9.7
United States	6.6	13%	20.0
EU-28	4.3	9%	8.6
India	3.2	5%	2.7
Russia	2.5	5%	17.4
Japan	1.4	3%	10.7
Germany	0.8	2%	10.1
World	57.4 (Gross) 49.5 (Net)		

Source: Trends in Global CO2 Emissions 2020 Report. PBL Netherlands Environmental Assessment Agency)
https://www.pbl.nl/sites/default/files/downloads/pbl-2020-trends-in-global-co2-and_total-greenhouse-gas-emissions-2020-report_4331.pdf

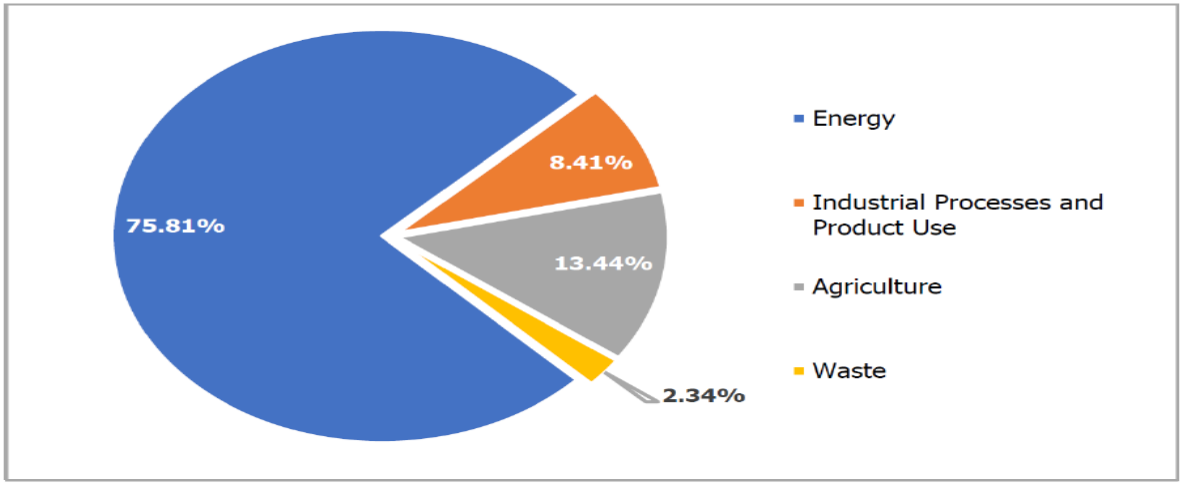
INDIA'S EMISSIONS (2019)

Table 2.4: Sector-wise National GHG emission in Gg for 2019

GHG sources and removals	CO_2 emission	CO_2 removal	CH_4	N_2O	HFC 23	CF_4	C_2F_6	SF_6	CO_2 equivalent
Energy	2305998	NO	2034	83	NO	NO	NO	NO	2374330
IPPU	183044	NO	222	12	2	5	1	0.004	263540
Agriculture	NO	NO	14542	373	NO	NO	NO	NO	420968
LULUCF	9726	496656	48	1	NO	NO	NO	NO	-485472
Waste	NO	NO	2684	54	NO	NO	NO	NO	73189
Memo Items	801279	NO	0.12	0.17	NO	NO	NO	NO	801335
Total without LULUCF	**2489042**	**--**	**19482**	**522**	**2**	**5**	**1**	**0.004**	**3132028**
Total with LULUCF	**2498768**	**496656**	**19531**	**523**	**2**	**5**	**1**	**0.004**	**2646556**

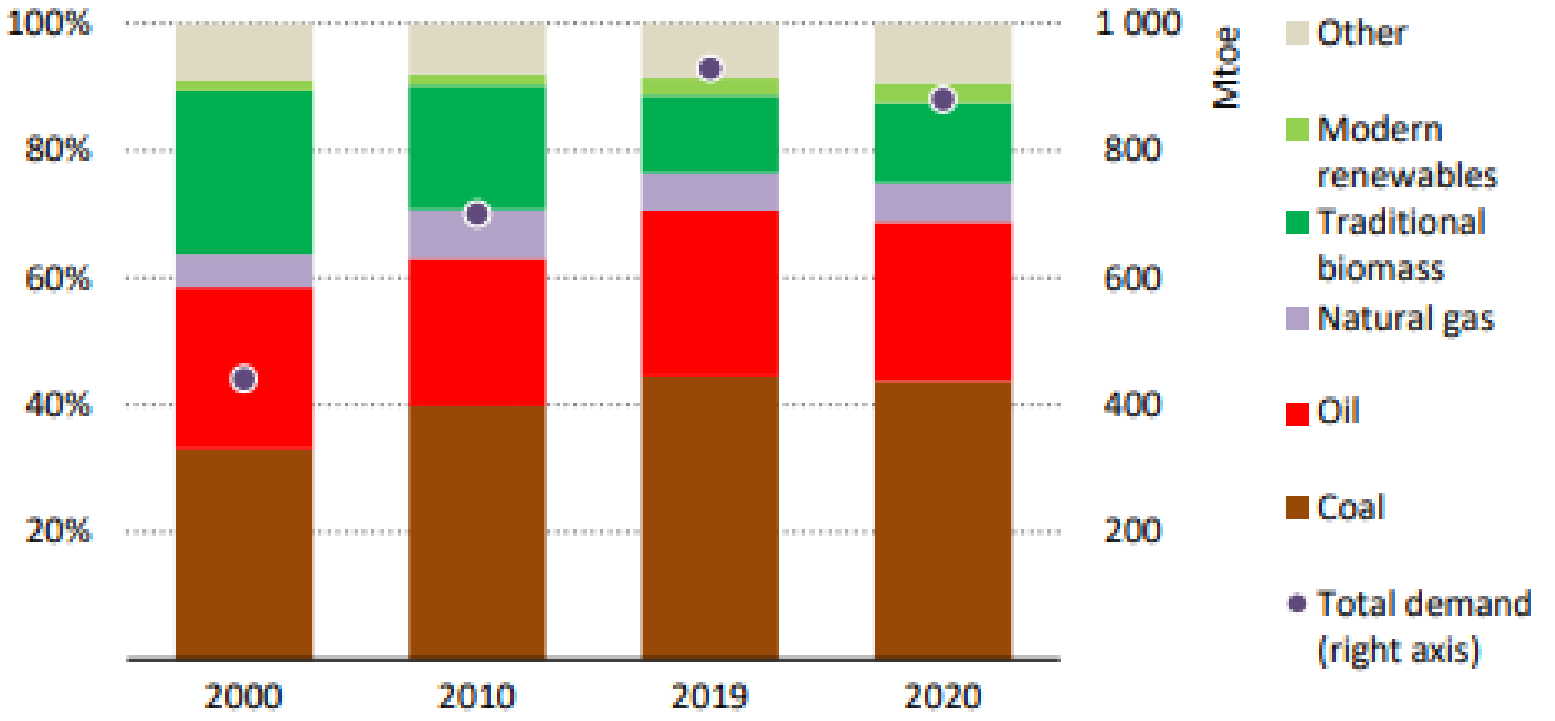
Gas-wise emissions

- CO_2 → 78.59%
- CH_4 → 14.43%
- N_2O → 5.12%
- Other gases → 1.86%



Source: 3rd National Communications 2023

Growth in Primary Energy Demand (Mtoe)



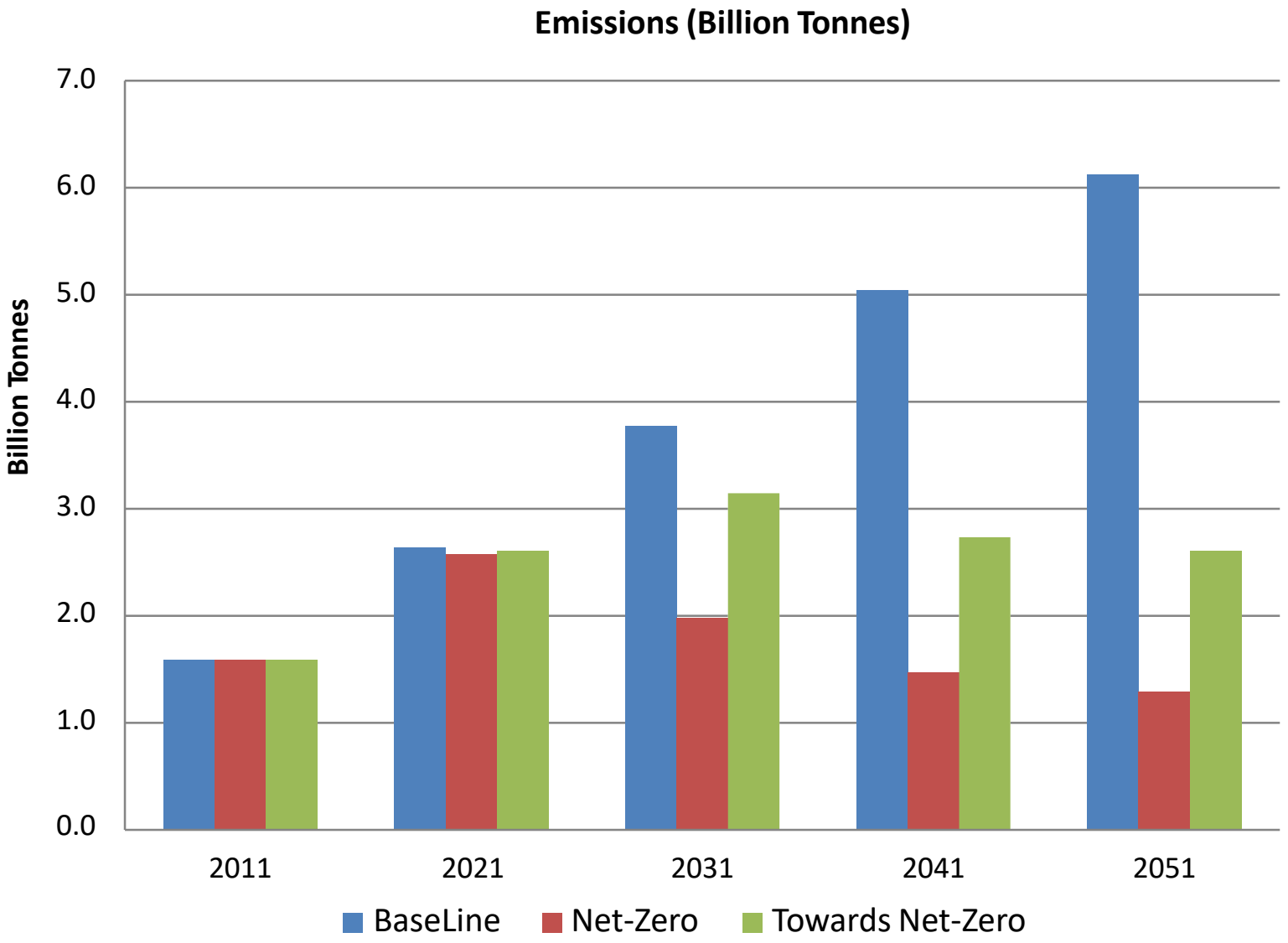
India's energy demand has tripled over the last three decades: the share of traditional biomass has fallen, leaving coal and oil dominant.

Note: Mtoe = million tonnes of oil equivalent.

Source: IEA

Projections of India's Emissions in Future

Source: TERI, 2019



NDC GOALS: TOWARDS ENERGY TRANSITION

EVOLUTION OF CLIMATE POLICY IN INDIA

2008: National Action Plan on Climate Change

2009: Copenhagen goal

2015: Nationally Determined Contributions(NDC)

2021: Net Zero goal

2022: Long Term Low Emission Development Strategy (LT-LEDS)

India's climate goals for 2030: NDC

Commitments

- ✓ To **reduce** the **emissions intensity** of **GDP** by **45 percent** from 2005 level. [To reduce 1 bn tons in absolute terms by 2030]
- ✓ To achieve 50**% cumulative electric power** installed capacity from **non-fossil fuel** sources. [500 GW to be installed by 2030]
- ✓ To create an **additional carbon sink** of **2.5** to **3 billion tonnes** of **CO2 equivalent** through additional forest and tree cover.

Progress on NDC Targets

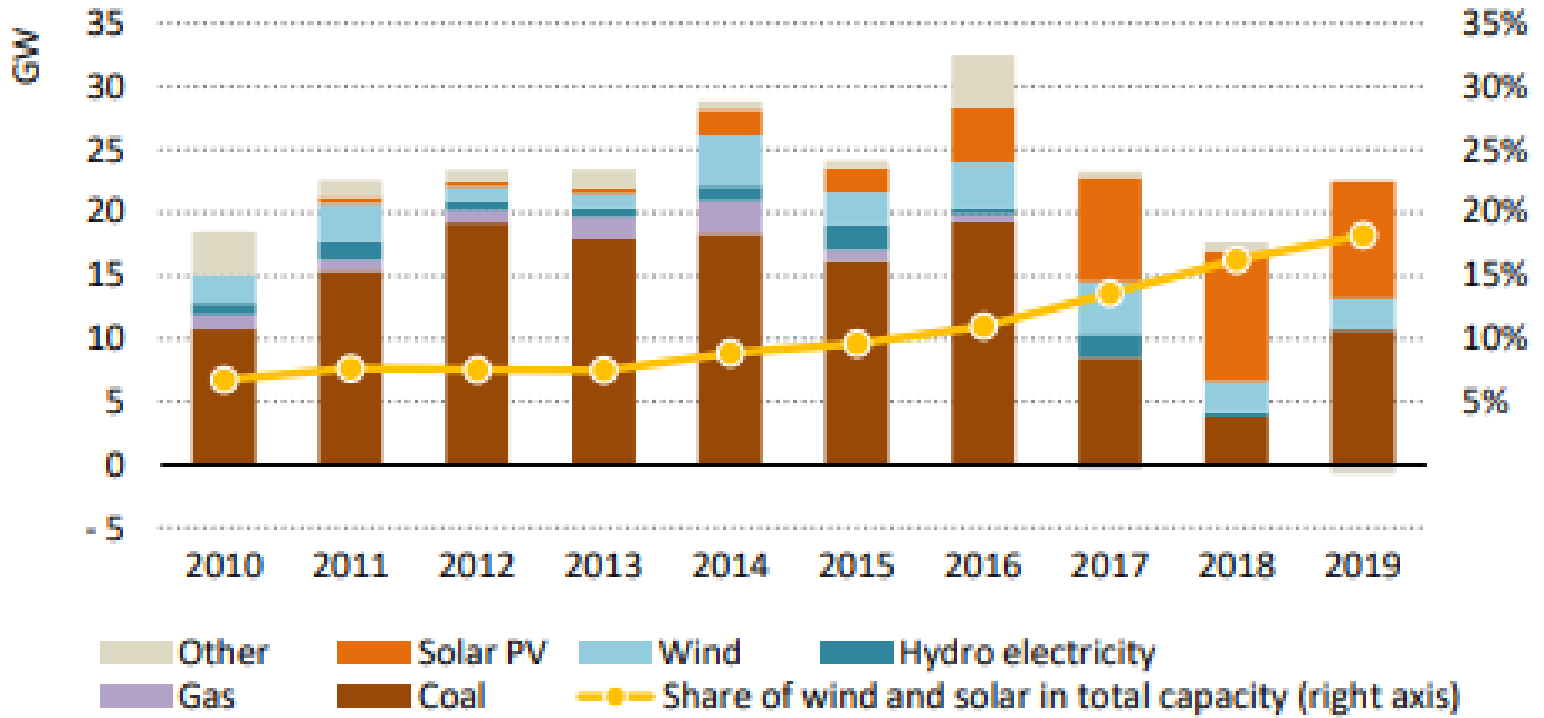
- **India was rated the only major G20 economy, with 2^{o}C goal compliant NDC under Paris Agreement in 2020**

  [German watch, 2020]

- **Emission intensity of GDP declined by 32% between 2005 and 2019, led by energy efficiency improvements and renewable energy shift;**

- **India's forests a net sink of emissions. Forestry carbon sink added @ 450 mn tons in CO2 eq terms p.a.**

Power sector capacity additions



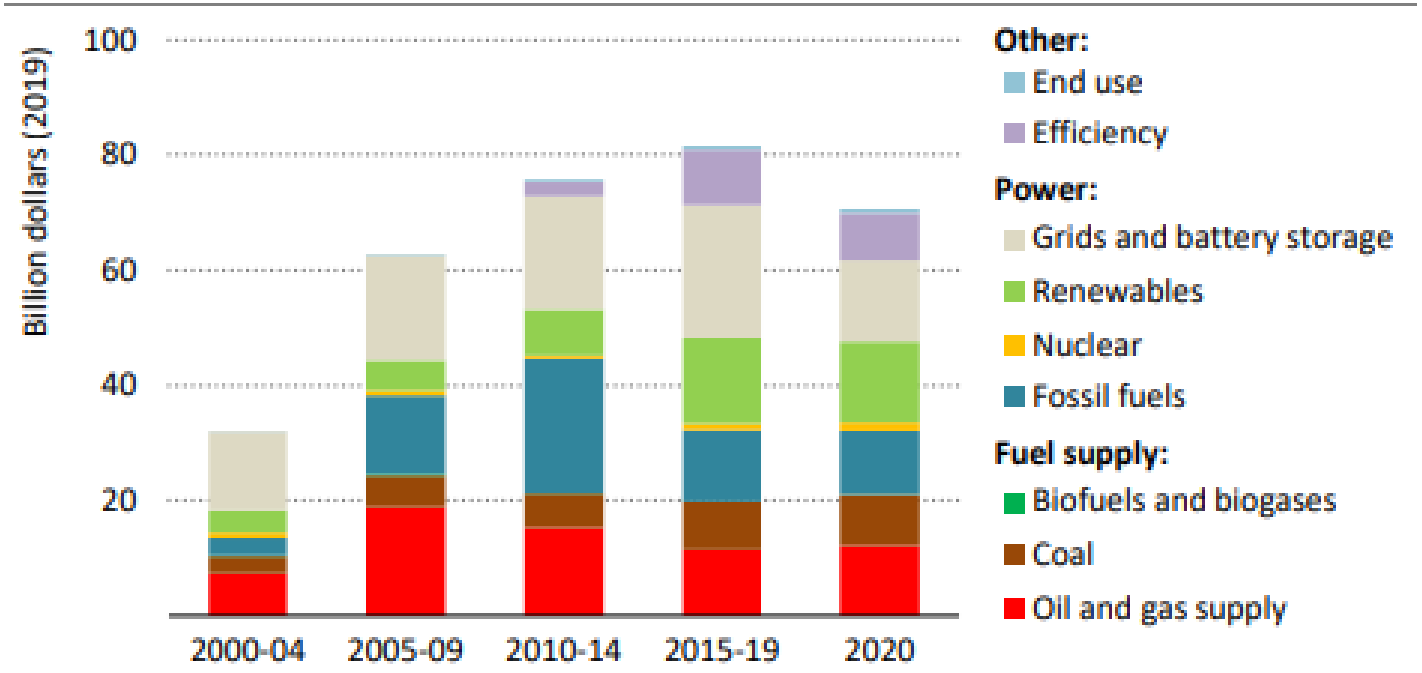
With coal capacity growth slowing down and solar PV and wind ramping up, the share of variable renewables in installed capacity has doubled since 2014.

Renewable energy capacity has reached a level of 43 % of total electricity generation. 211 GW against total capacity of 442 GW in 2022

Source: IEA

Investment trends in energy

5-year annual averages



Investment in renewables exceeded fossil fuel power investment for the fifth year in a row in 2020, while investment in networks has been falling recently in absolute and relative terms.

Notes: Efficiency and other end use investment estimates are not available prior to 2014. Other end use includes carbon capture, utilisation and storage (CCUS) in industry, spending to meet the incremental cost of EVs, and investment in private EV charging infrastructure.

Coal as share of electricity has remained static since 2016.

Source: IEA

ADVANCING DECARBONISATION

Advancing decarbonisation: Power sector

- Targeted capacity 1180 GW by 2050 when energy demand is likely to be 3 times;
- Mandatory Renewable Purchase Obligations for distribution companies (8-10%) along with trading in RE Certificates
- Minimum RE consumption norms introduced for major industries
- Open RE access to consumers and captive power plants
- Green energy corridors to strengthen transmission networks in eight RE rich States.
- Indian railways to be carbon neutral by 2030

Advancing decarbonization: Low carbon Fuels

Hydrogen: National Green Hydrogen Mission with USD 2 bn outlay. 5 mn Ton capacity by 2030.

Gas: Gas share in energy supply to be raised to 15% by 2030;

- **Bio-fuel**: Bio fuel blending norms of 20% to be achieved by 2025

- **Nuclear:** 100 GW capacity addition by 2047 and USD 2.5 bn investment for development of 5 SMR by 2030 with private sector participation.

Advancing decarbonization: Other sectors

Mobility:

- Bharat VI and Fuel efficiency norms in force for vehicles;
- Incentives/subsidies for EVs buses and 2-3 wheelers
- Duty exemption to 63 addl capial goods for EV, mobile battery, lithium-ion battery scrap, cobalt powder, critical mineral waste.

Shipping :

- Green shipping Policy announced for greening of ports and to promote infrastructure and uptake of low carbon fuels;

Aviation:

- India to be part of CORSIA (ICAO scheme for aviation) from 2026

Industry:

- Emissions intensity targets to be introduced under CCTS from 2026

Production Linked Incentives

USD 11 bn earmarked for investment in 4 key areas:

- Solar Cell manufacturing (USD 2.5 bn),
- EV auto components (USD 3.25 bn),
- Advanced Cell batteries (USD 2.25 bn),
- Green Hydrogen & Electrolysers (USD2 bn)

CARBON MARKET IN INDIA

- 14 sectors notified for ITMO (Art 6.2) as well as PACM (Art 6.4) international trading in carbon credits;
- Projects can be set up by national or international investors with approval of designated authority in the MoEFCC to meet the requirements of international market;
- Simultaneously, a domestic carbon credit trading scheme (CCTS) to run in parallel to meet domestic obligations;
- CCTS to lay down emissions intensity norms to cover present units covered under the Perform Achieve & Trade (PAT) Scheme
- Emissions Intensity caps to be introduced for about 1400 units in 13 industry sectors in a gradual manner;
- EI caps for industry e.g. Iron & Steel, Cement, Pulp & Paper, Petrochemicals likely to be in place by 2026
- Energy efficiency obligations to continue in parallel;
- Indian entities working in International Voluntary Carbon Market to continue

NEXT STEPS

LONG TERM LOW EMISSION DEVELOPMENT STRATEGY (LT-LEDS), 2022

LT-LEDS for Net Zero by 2070 released by Govt of India at Sharm El Sheikh:

7 key sectors identified for intervention:

- Low carbon development of **electricity systems** consistent with development
- Develop an integrated, efficient, inclusive low-carbon **transport system**
- Promote adaptation in urban design, energy and material-efficiency in buildings, and **sustainable urbanization**
- Promote economy-wide decoupling of growth from emissions and development of an efficient, **innovative low-emission industrial system**
- **CO2 removal** and related engineering solutions
- Enhancing **Forest and vegetation cover** consistent with socio-economic and ecological considerations
- **Economic and financial aspects** of low-carbon development

Way Forward

- Sectoral roadmaps for transition:
  - Encourage better coordination within sectoral value chains
- Provide time-limited fiscal and financial incentives
- Create markets and demand for low-carbon fuels
- Support infrastructure planning and investment in renewables and cleaner fuels including green hydrogen
- Establish institutional programme for sequestration

OPPORTUNITIES FOR COLLABORATION WITH JAPAN

- Cooperation in development and dissemination of cleaner technologies including green hydrogen, carbon capture, etc.
- Capacity building, sharing of good practices, and investments for implementation of Article 6
- FDI in various sectors including infrastructure support for production linked schemes
- Public and private financing for industrial transition