INDIA'S DECARBONISATION POLICIES AND POTENTIAL FOR COLLABORATION

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

Global Emissions, 2024

Country ,0	CO_2 Emissions/year (Billion Tons)/ Gross	Share of global CO2 emissions	Emission of CO_2 per Capita (Tons/Person)
China	15.5	29%	10.8
United States	6.0	11%	17.4
EU-28	3.3	6%	7.20
India	4.3*	7%	2.70
Russia	2.6	5%	18.0
Japan	1.1	2%	8.52
Germany	0.68	1.3%	8.17
World	53.2	**100**	**6.56**

Source: European Commission Emissions Database for Global Atmospheric Research (EDGAR), 2025, https://edgar.jrc.ec.europa.eu/report_2025#emissions_table

*This is at variance with GoI data which was 3.13 bn tons in 2019 and would reach a maximum of 3.8 bn in 2024 @4 % p.a. growth.

INDIA'S EMISSIONS (2019)

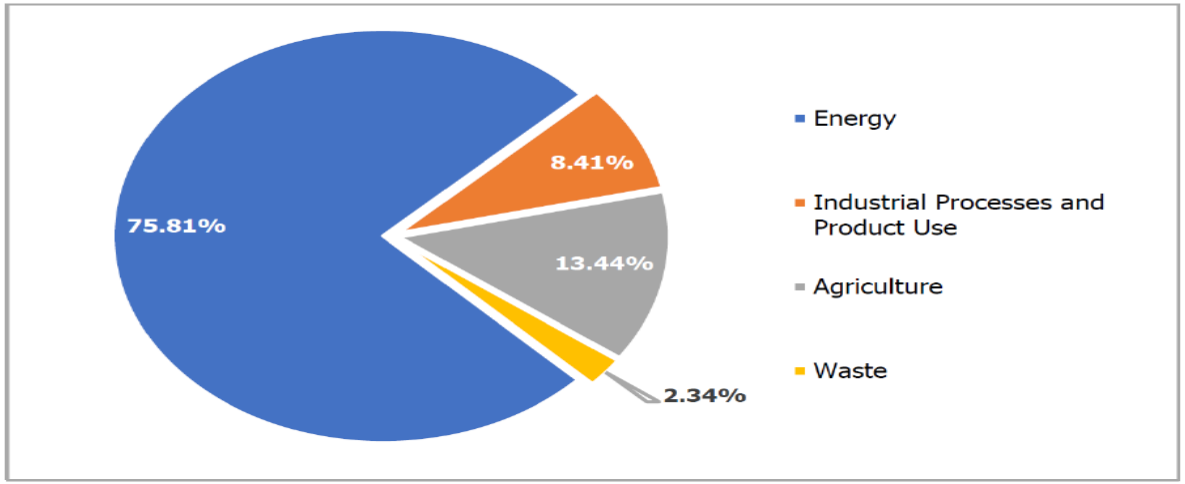
Table 2.4: Sector-wise National GHG emission in Gg for 2019

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**

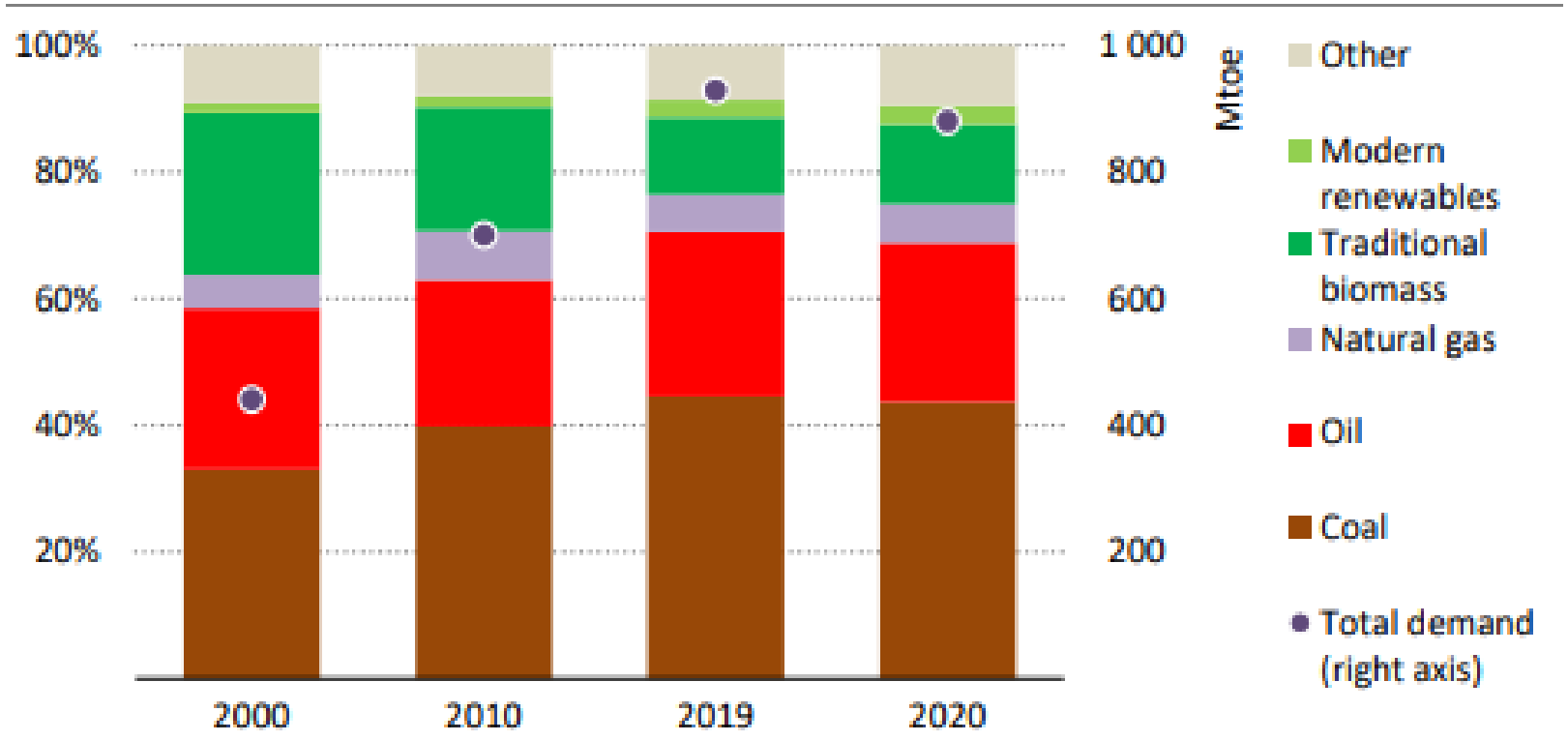
Gas-wise emissions

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

Source: 3rd National Communications 2023



Growth in India's Primary Energy Demand (Mtoe)



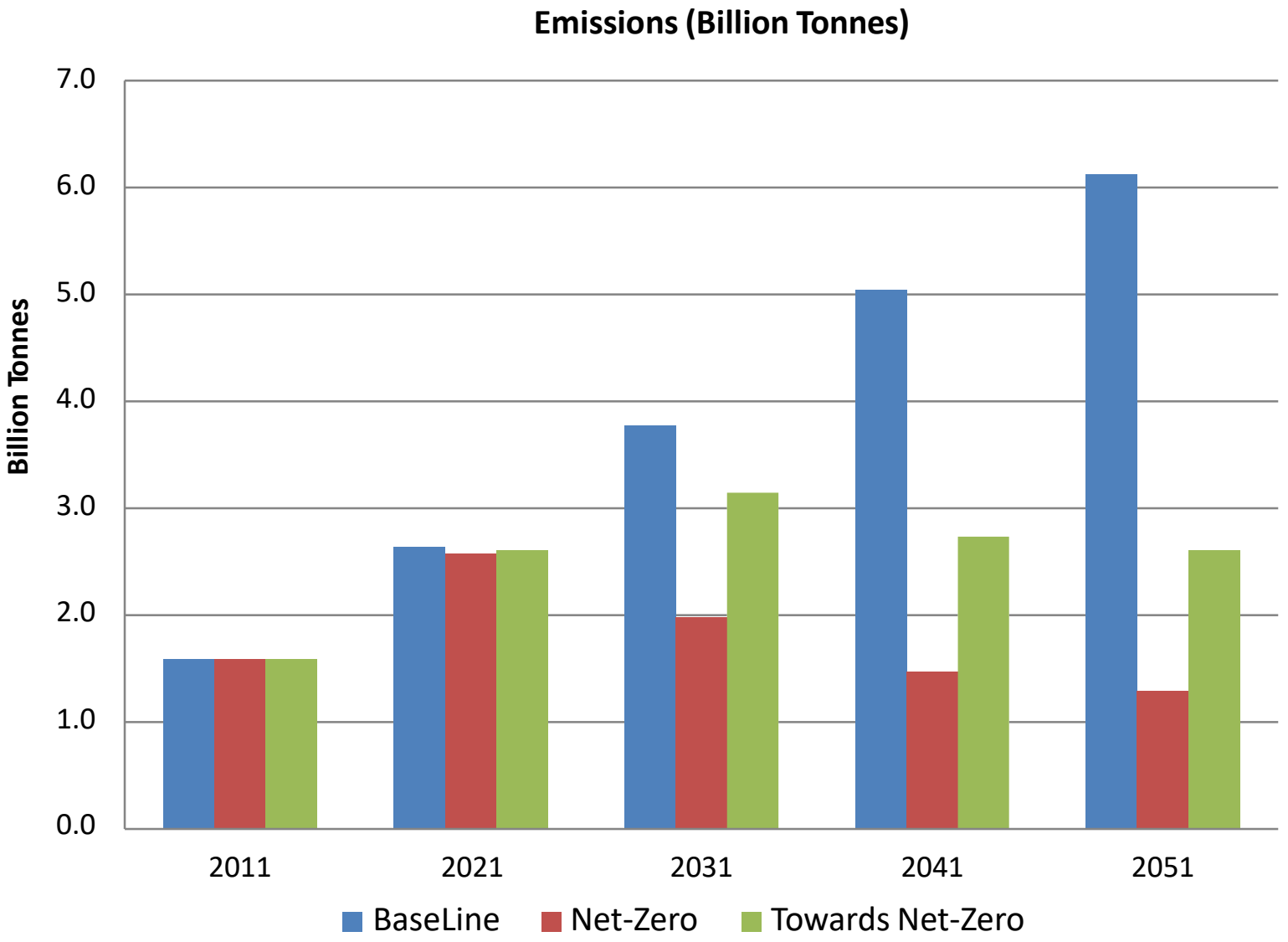
India's energy demand has tripled over the last three decades: the share of traditional biomass has fallen, leaving coal and oil dominant.

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.

India’s 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]

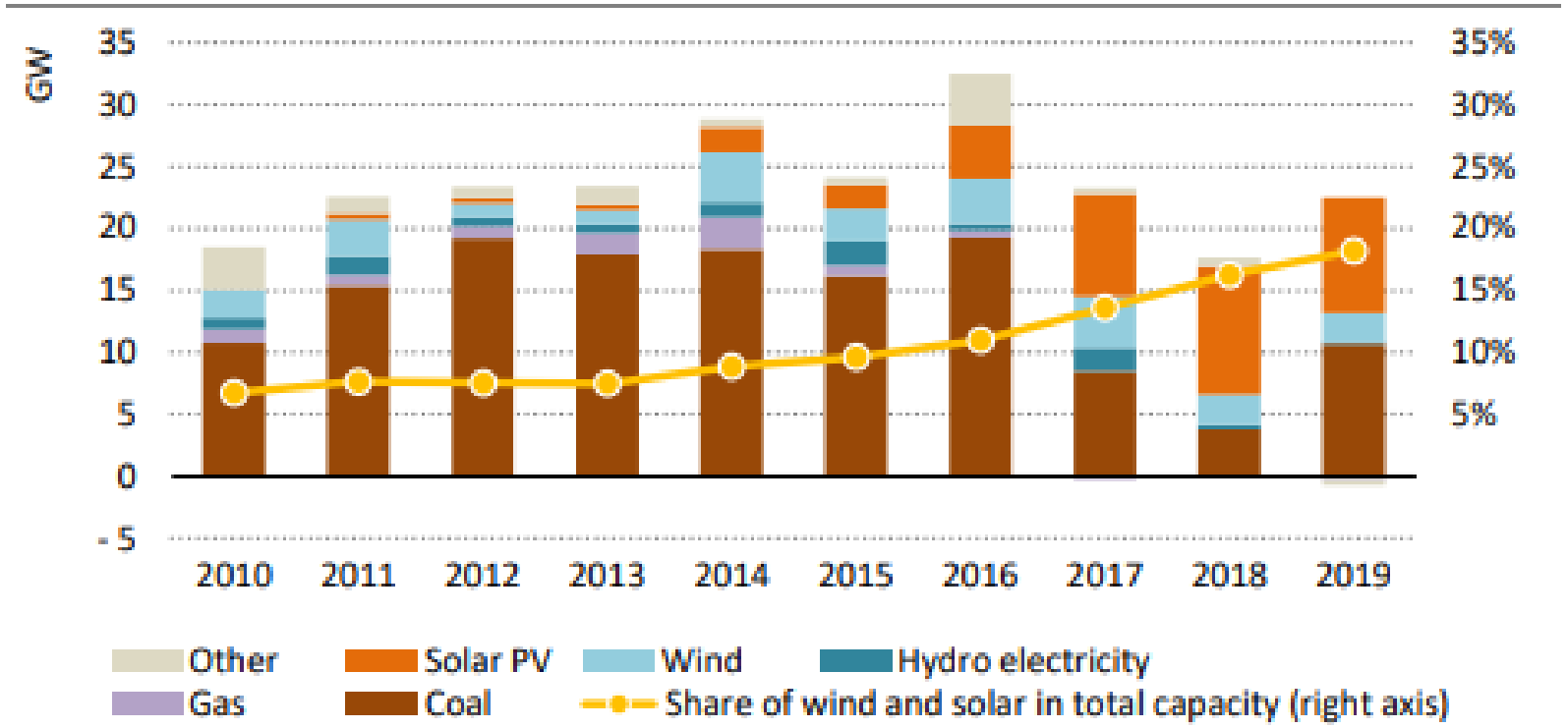
- **Emission intensity of GDP declined by 32% between 2005 and 2019, led by energy efficiency improvements and renewable energy shift;**

- **India’s forests a net sink of emissions. Forests absorb carbon @ 450 mn tons net in CO2 eq terms per annum.**

India is emerging as a major player, with high ambition in Renewable energy

- India 3rd largest solar energy producer globally with almost 10% share, overtaking Germany and Japan.
- 4th largest producer pf wind energy. 7th rank in global hydro power;
- India has a goal of setting up 500 GW of renewable energy capacity by 2030;
- Targeted RE capacity 1180 GW in 2050 when energy demand will be 3 times;
- Coal being taxed. Coal tax rationalised/raised from 5% to 18%;
- Indian railways to be carbon neutral by 2030.
- Green shipping policy announced to promote renewable energy in shipping and ports

India’s power sector capacity additions have picked up momentum



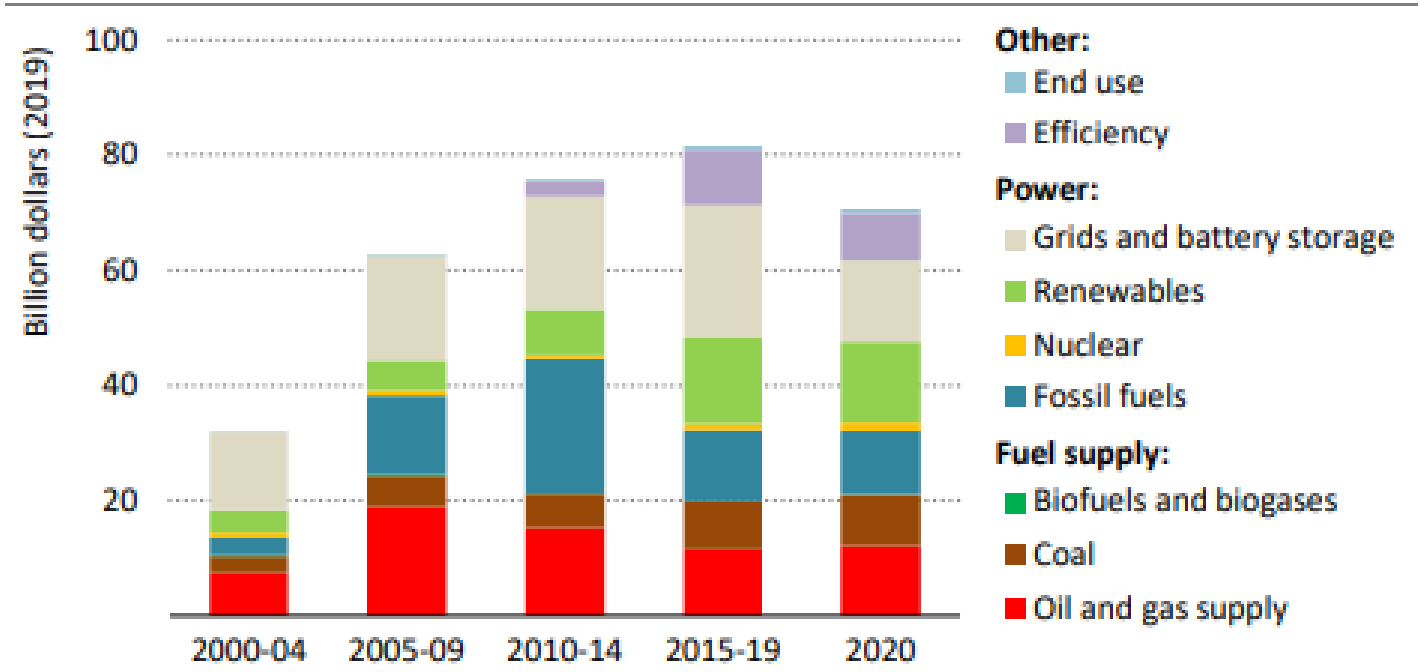
With coal capacity growth slowing down and solar PV and wind ramping up, the share of variable renewables in installed capacity has doubled since 2014.

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: Renewables have led the pack.

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

Power sector has seen several policy interventions towards higher uptake of RE

- Solar variable cost lower than coal power (9 cents lowered to 4 cents per unit)
- Solar panels manufacturing supported under Production linked Initiative (PLI)
- Mandatory RE purchase by Discoms (8-10%) and trading in RE Certificates
- Minimum RE consumption norms likely to be enforced for major industries
- Green Energy Corridor (Phase III) in eight RE rich States with nearly 56000 crs outlay;
- Open RE access to consumers and captive power plants;
- Inter-State Transmission System (ISTS) charges waived for transmission of renewables,
- Solar rooftop (PM Surya ghar) and solar agricultural pumps (KUSUM) programmes for solar

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**: Biofuel blending 20% already achieved by 2025

- **Nuclear:** 100 GW taregtted addition by 2047, $2.5 bn investment in 5 SMR plants by 2030 in collaboration with private sector.

- **SAF:** SAF blending rates, SAF production and SAF certification underway.

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.
- Indian Railways to be carbon neutral by 2030

Shipping :

- Green shipping Policy announced for greening of ports and to promote infrastructure and uptake of low carbon fuels;
- Fuel mix and other measures to comply with GFI norms of IMO being contemplated;

Aviation:

- India to join CORSIA in 2026. SAF blending proposed @ 1% in ’27, 2% in ’28, 5% in ’30;

Industry:

- Emissions intensity targets notified for 8 sectors under CCTS from current year, 2025.

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)

There are regulatory signals for greening of corporates and financial institutions

- SEBI: **1,000 listed companies by market capitalization to file BRSR** reports. Mandatory filing of BRSR Core and assurance or assessment from 23-24. Value chain ESG disclosures and assessment from 2026-27. Disclosures for leading entities and their value chain partners.
- 25 corporates are putting an **internal price on carbon** to meet their climate targets
- **RBI guidelines on 'Disclosure framework on climate-related financial risks, 2024**' to mandate disclosure by regulated entities (REs). Covers 4 key areas: governance, strategy, risk management and metric & targets.
- RBI– Climate Risk Information System (RB-CRIS) being set up to support robust risk assessment for regulated entities in compliance with RBI's risk disclosure framework.
- India has issued **55 billion USD approx. in climate bonds** by 2024. High growth in last 4 years. But still at lower end-2.2% of global market.
- Nearly **USD 5.5 bn (Rs 480 bn) of green bonds are sovereign bonds**. Over 80% in RE and Transport sectors
- **Green taxonomy** draft notified by Govt of India in May 2025:

  Tier 1 (Power, Buildings, Mobility), Tier 2 (Agriculture, Food, Water security),
  Transition Supportive (HTA sectors- Iron & Steel, Cement)

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;
- Simultaneously, a **domestic carbon credit trading scheme (CCTS)** to run in parallel to meet domestic obligations;
- CCTS to lay down emissions intensity norms for about 1400 units in 13 industry sectors in a gradual manner;
- **EI caps notified for 8 sectors** of industry e.g. Aluminum, Cement, Paper& Pulp, Chlor-Alkali, Steel, Petrochemical, Petroleum refineries, and Textile
- Energy efficiency obligations to continue in parallel;
- Indian entities working in International Voluntary Carbon Market to continue;
- **Green Credit Scheme** notified for voluntary market.

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

OPPORTUNITIES FOR COLLABORATION

- Cooperation in development and dissemination of cleaner technologies including green hydrogen, carbon capture, low carbon fuels 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