



# Role of Good Governance in Mitigating Climate Change

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# India's Climate change Goals - *Panchamrit*



## Announcements

**India will increase its non-fossil energy capacity to 500 GW by 2030.**

**India will meet 50 percent of its installed power capacity from renewable energy by 2030.**

**India will reduce the total projected carbon emissions by one billion tonnes from now to 2030.**

**By 2030, India will reduce the carbon intensity of its economy to less than 45 percent.**

**By 2070, India will achieve the target of net zero emissions.**



# Climate change – Key Issues



**GHG emissions – CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs, SF<sub>6</sub>**

**Climate Change – Mitigation & Adaptation**

**NAPCC – 8 + 3 Missions, ICAP, NCAP**

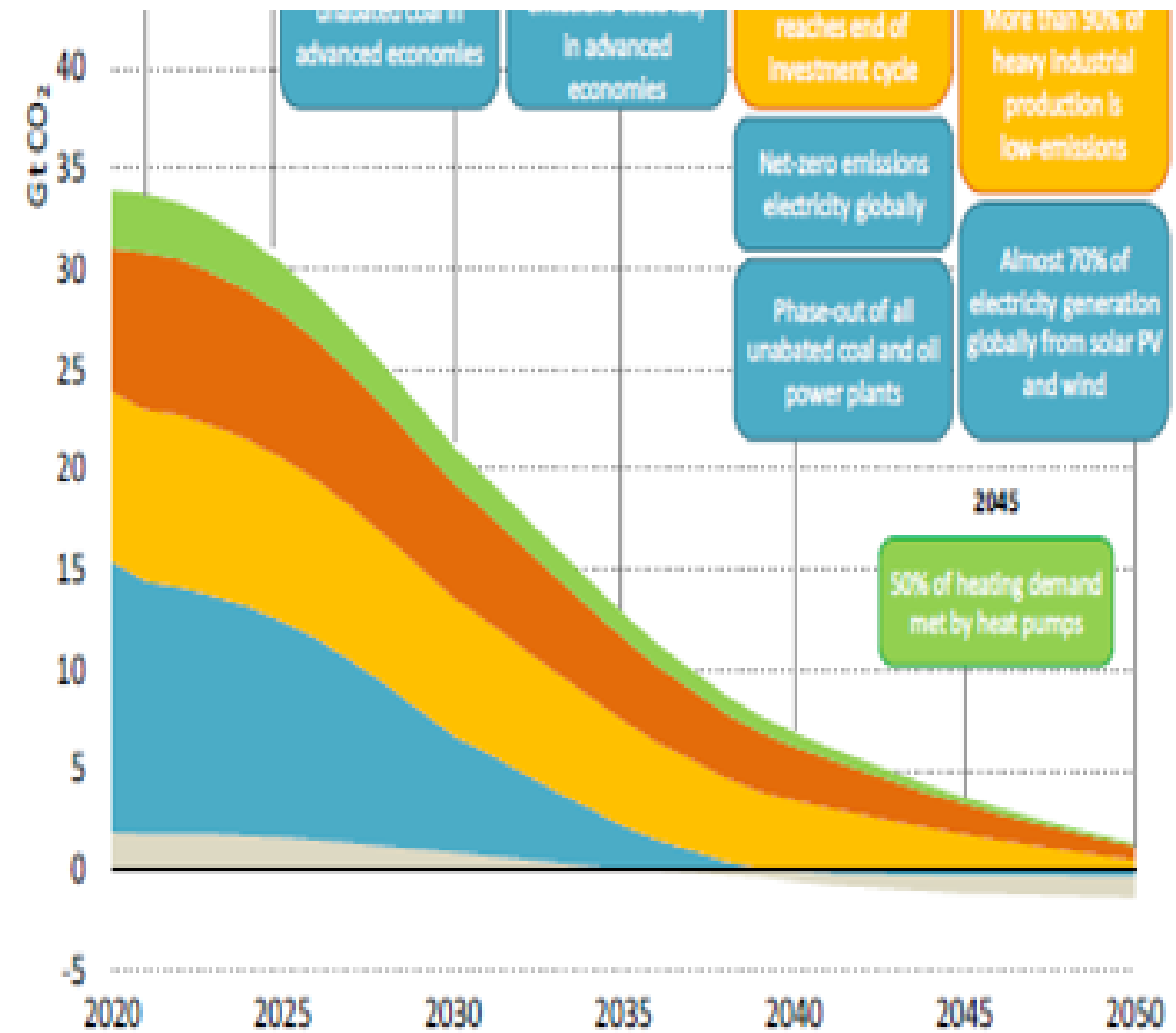
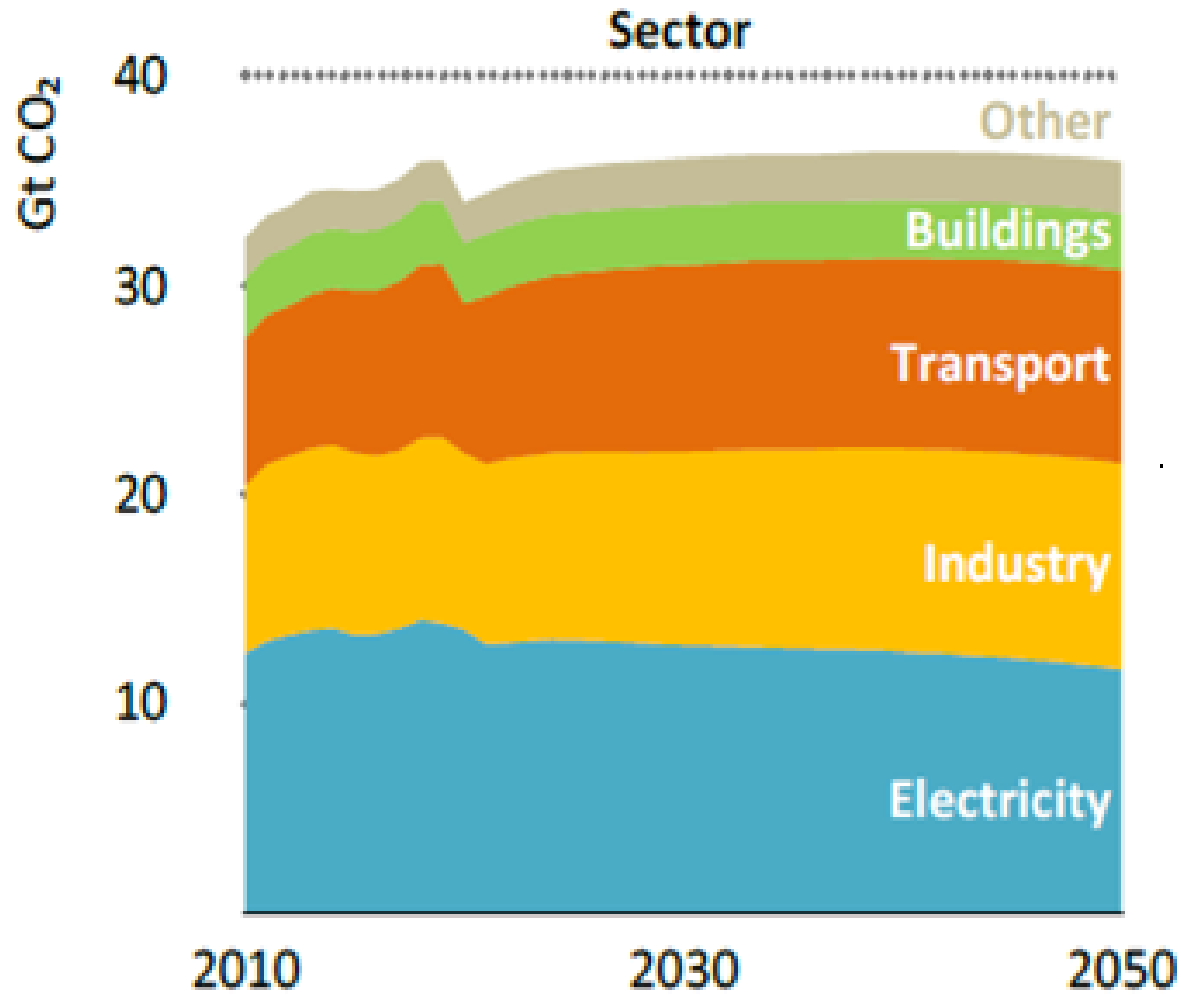
**SAPCC - SEEAP**

**GCF, GEF, Adaptation Fund**

**GST, Carb. Market (Art.6), Loss & Damages, CDRI, Methane Pledge**

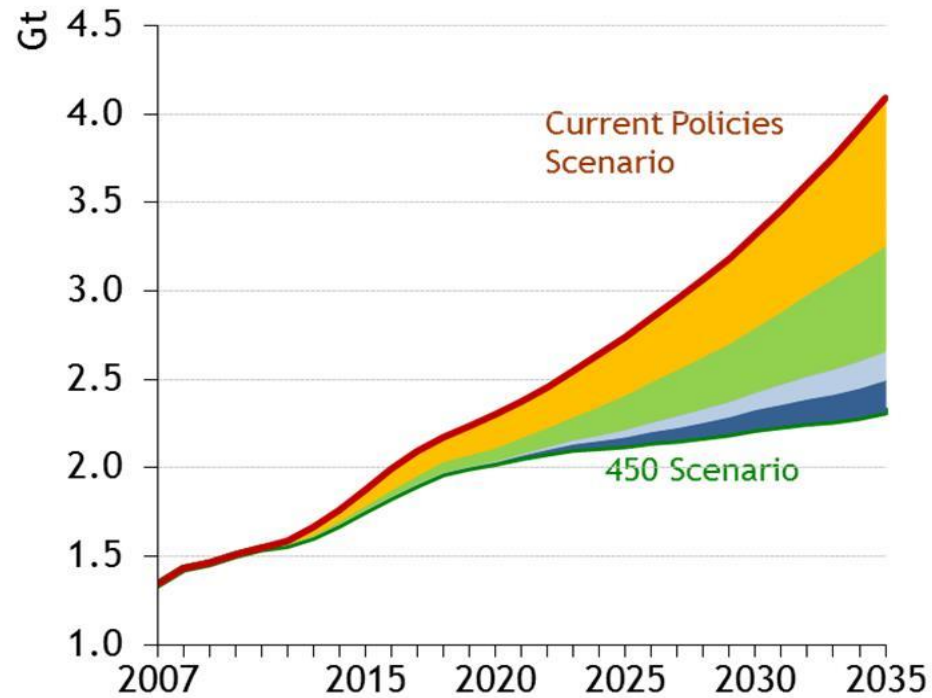


# CO<sub>2</sub> emission pathways for Net Zero World





# Indian Scenario



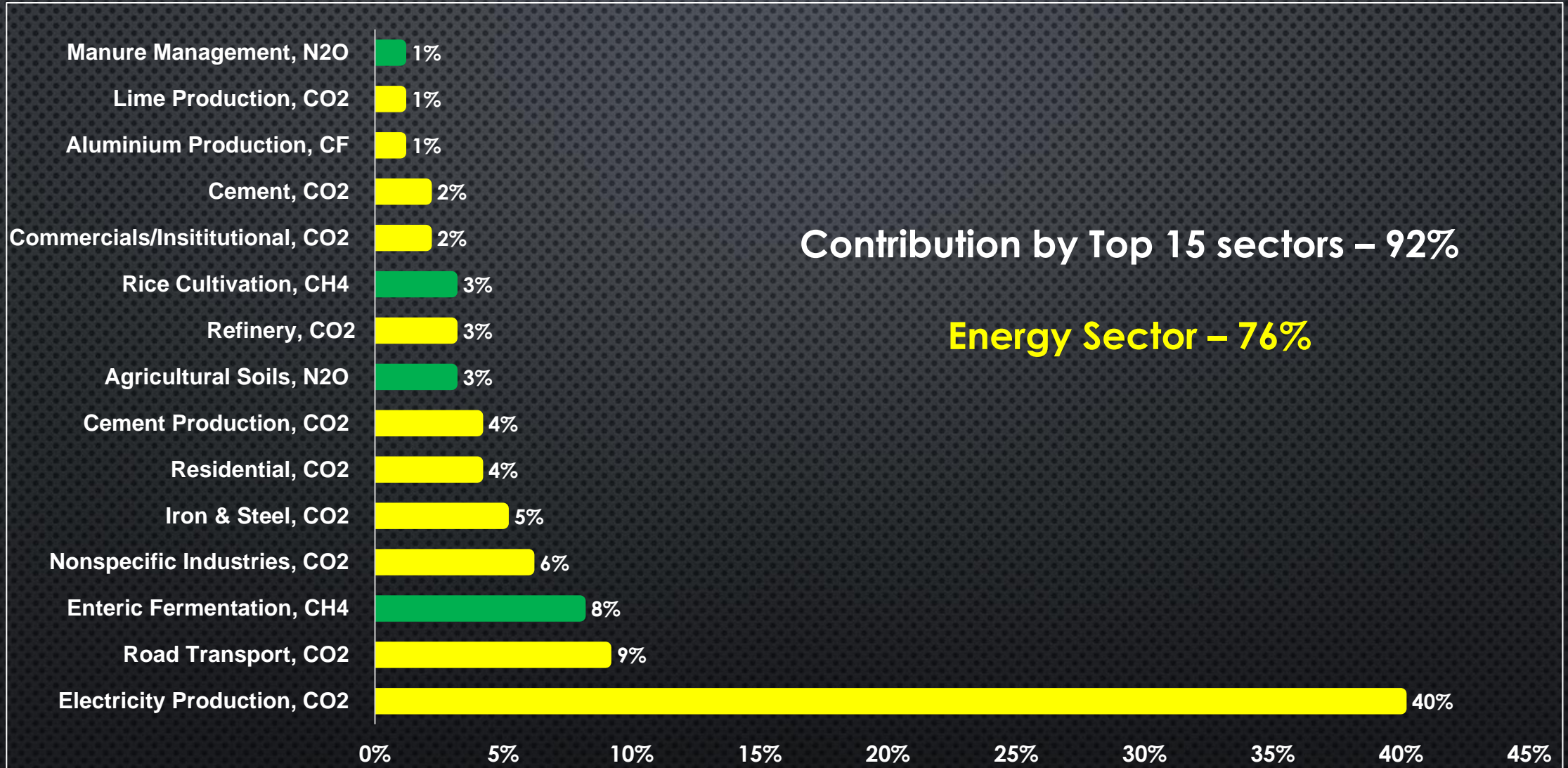
4.1 Gt  
1.8 Gt  
2.3 Gt

## Share of cumulative abatement between 2010-2035

Efficiency	51%
Renewables	32%
Biofuels	1%
Nuclear	8%
CCS	8%



# Share of Emissions from various sources (2016)





# Target to achieve 45% Emissions Intensity Reduction (CO2 Savings of One Billion Tonne by 2030)



Emissions Profile In 2030 (in MT CO2)	Emissions in 2030 as per 2005 EI (Base year)	Emissions on 33% reduction	Emissions on 45% reduction
Emissions Intensity [kgCO2e/INR GDP at 2010-11 prices]	0.028	0.019	0.015
Energy Emissions	7620	5105	4191
Non energy emissions	2540	1702	1397
Total Emissions (with GDP Rs 363 Lakh Crore)	10160	6807	5588
Total Emissions (with GDP Rs 320 Lakh	8960	6003	4928

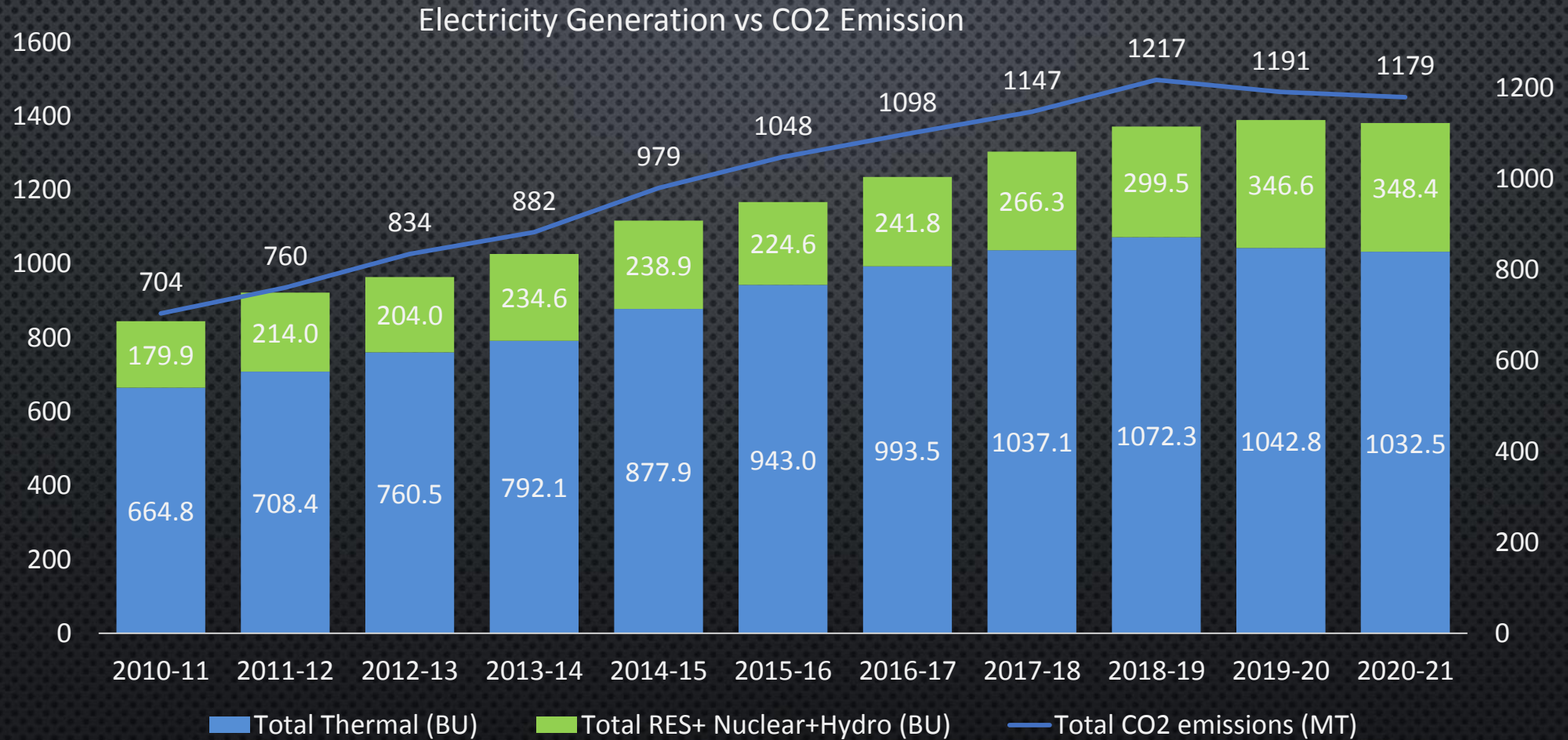
Emission in 2030	Emissions (MtCO2e)
Targeted Reduction (over baseline)	4572 (10160-5588) 4032 (8960 – 4928)
Reduction achieved (upto 2019-20)	2800
Additional savings required (2020-30)	1772 /1232
Power Generation	858
Energy Efficiency (Demand Side)	890
Carbon Sink & Others	1500 (TBC)



# CO2 Emissions from Power Generation



## Electricity Generation vs CO2 Emission of India





## Part A: Supply Side Initiatives (All figures in Million Tonnes of CO<sub>2</sub> )

S. No.	Sector	Activity Area	BAU Emissions (2030)	Target Emission (2030)	CO <sub>2</sub> Emission reduction	Programme
1.	<b>Power Generation</b>	Installing 350 GW of Additional Non-fossil capacity	772	--	772	RE / Non fossil Deployment
2.		Fossil based Power Plant (Efficiency improvement)	1254	1168	86	PAT Scheme
		<b>Sub- Total</b>	<b>1926</b>	<b>1168</b>	<b>858</b>	



# Part B: Demand Side Initiatives

(All figures in MTCO<sub>2</sub>)



S. N.	Sector	Activity Area	BAU Emissions (2030)	Target Emission (2030)	CO <sub>2</sub> Emission reduction	Programme
1.	Industrial (including MSME)	Energy intensity improvement in large industry, Use of clean tech in MSMEs	1685	1310	375	<ul style="list-style-type: none"> <li>PAT Scheme</li> <li>SME Programme</li> <li>Tech. Upgradation</li> </ul>
2.	Transport	Improving fuel efficiency of vehicles, Adoption of EVs, Modal shift from road to rail	844	619	225	<ul style="list-style-type: none"> <li>Fuel efficiency norms</li> <li>Electric Mobility</li> <li>Net zero Railway / Modal Shift</li> </ul>
3.	Domestic	Deployment of LEDs, Use of efficient appliances, Energy efficient homes	683	543	140	<ul style="list-style-type: none"> <li>UJALA</li> <li>Star Rated Appliances</li> <li>ECO Niwas Samhita</li> </ul>
4.	Commercial	Energy efficient /NZ buildings, Use of efficient appliances	320	230	90	<ul style="list-style-type: none"> <li>ECBC , Net Zero Campus</li> <li>Star Rated appliance</li> </ul>
5.	Agriculture	Solarization of Diesel Pumps, Promoting Star Rated pumps	269	229	40	<ul style="list-style-type: none"> <li>KUSUM</li> <li>DSM</li> </ul>
6.	Municipal	Deployment of energy efficient streetlights and pumps	98	78	20	<ul style="list-style-type: none"> <li>SLNP</li> <li>DSM</li> </ul>
	<b>Sub-total</b>		<b>3899</b>	<b>3009</b>	<b>890</b>	



# Targeted emission reduction – Industry



Sector	Emission Reduction Targets (MtCO <sub>2</sub> )	Programme / Scheme	Nodal Ministry/ Department	Key intervention
Iron & Steel	173.68	<ul style="list-style-type: none"> <li>National Steel Policy,</li> <li>PAT Scheme</li> </ul>	Ministry of Steel	(Energy Efficiency improvement, Fuel substitution, clean technology)
Cement	39.34	<ul style="list-style-type: none"> <li>PAT Scheme</li> </ul>	DPIIT	
Aluminum	36.54	<ul style="list-style-type: none"> <li>PAT Scheme</li> </ul>	Ministry of Mines	
Petroleum Refinery	29.84	<ul style="list-style-type: none"> <li>Refinery Improvement Programme &amp; PAT Scheme</li> </ul>	MoPNG	
Pulp & Paper	39.70	<ul style="list-style-type: none"> <li>PAT Scheme</li> </ul>	DPIIT	
Textile	5.03	<ul style="list-style-type: none"> <li>Technology Upgradation,</li> <li>PAT Scheme</li> </ul>	Ministry of Textile	
Chlor Alkali	8.00	<ul style="list-style-type: none"> <li>PAT Scheme</li> </ul>	Department of Chemicals & Petrochemicals	
Petrochemicals (Cracker units)	27.37	<ul style="list-style-type: none"> <li>PAT Scheme</li> </ul>		
Steel Re-rolling (SME)	9.00	<ul style="list-style-type: none"> <li>Technology Upgradation,</li> <li>Fuel switching,</li> <li>RE deployment</li> </ul>	Ministry of Medium, Small and Micro Enterprises	
Foundry (SME)	3.90			
Forging (SME)	2.60			
<b>Total</b>	<b>375</b>			



# Targeted emission reduction – Transport



Area	Emission Reduction (MtCO <sub>2</sub> )	Nodal Ministry/ Department	Key intervention / Programme
Conventional fuel driven vehicle	10.00	MoRTH	Enforcing fuel efficiency norms
Electric mobility	42.00	DHI	EV policy, EV charging infrastructure
Modal shift & Net Zero Railway	110.00	Ministry of Railways	Augmenting Rail Capacity & NZ Rail Mission
Urban Mass transit system, Green Highways, Bio-fuels, Coastal Shipping and Inland Water Transport	63.00	MoRTH/ MoPNG/ MoUD/ MoSHP	Alternate fuel technologies, low carbon infrastructure, fuel switching / Sagarmala



# Targeted emission reduction – Buildings



Area	Emission Reduction (MtCO <sub>2</sub> )	Nodal Ministry/ Department	Key intervention
<b>Commercial</b>	60	MoHUA	Adoption of ECBC in building bye-laws
<b>Domestic (Residential)</b>	30		Promoting Eco Niwas Samhita
<b>Commercial</b>	30	BEE	Star labelling programme
<b>Domestic (Residential)</b>	110		



# Share of electricity use in demand Sectors



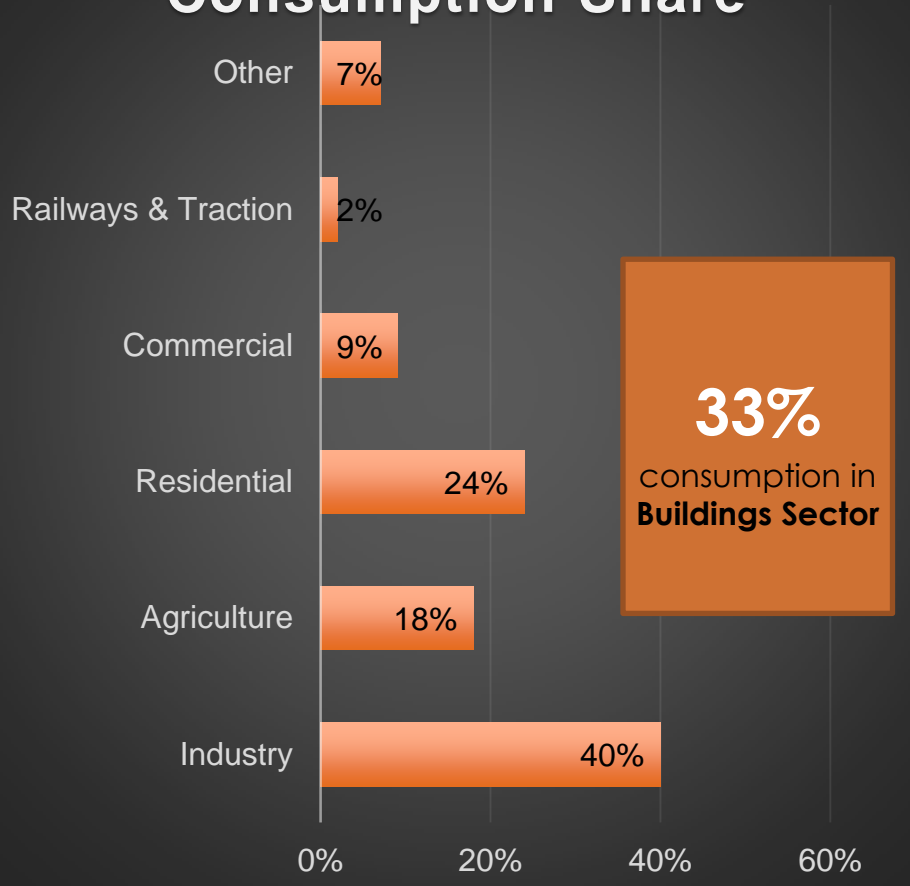
Year	Electricity Consumption		Non-Electricity Consumption		Total Energy Consumption (MTOE)
	MTOE	% of Total	MTOE	% of Total	
2014-15	81.56	16.85	402.39	83.15	483.95
2015-16	86.09	16.58	433.19	83.42	519.28
2016-17	91.25	16.87	449.65	83.13	540.90
2017-18	96.60	17.44	457.30	82.56	553.90
2018-19	104.04	18.27	465.50	81.73	569.54
2019-20	111.05	19.10	470.32	80.90	581.37
2020-21 (P)	118.98	<b>19.49</b>	491.46	<b>80.51</b>	610.44



# Building Sector Profile



## Total Electricity Consumption Share

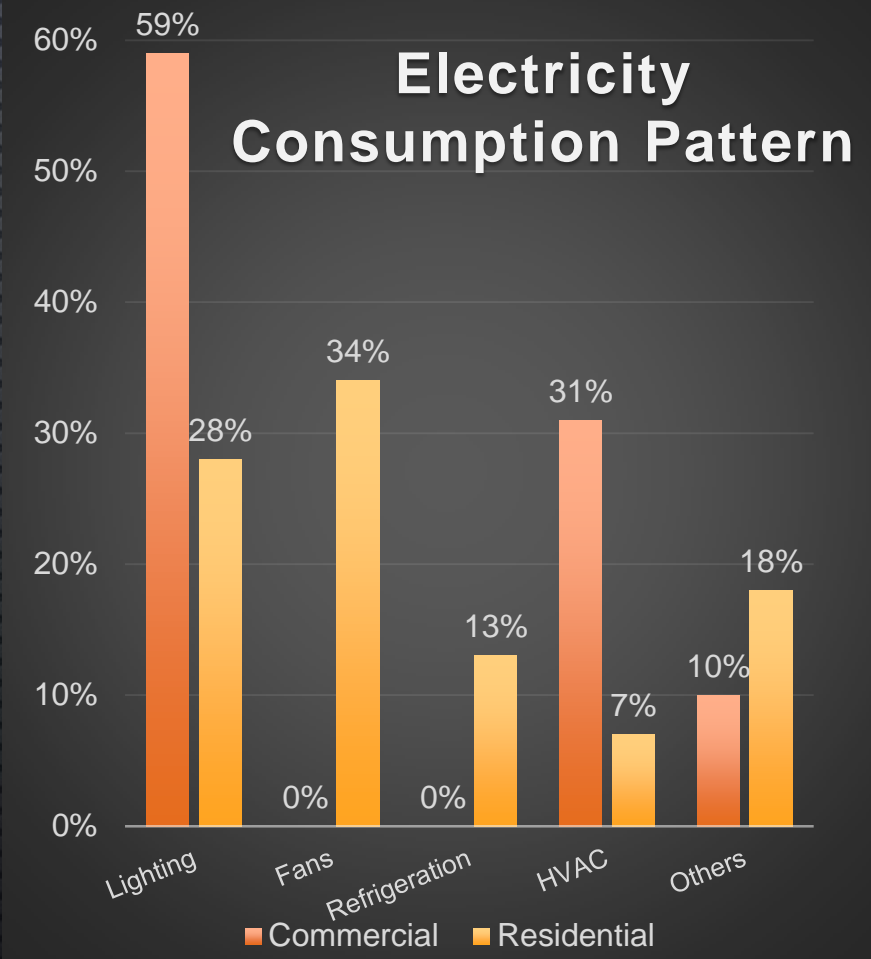


**1 Billion m<sup>2</sup>**  
Commercial Buildings  
will be  
added by **2030**

**3 Billion m<sup>2</sup>**  
Residential Buildings  
will be  
added by **2030**

**Building Sector will surpass Industry by 2030**

## Electricity Consumption Pattern





# STAR LABELING PROGRAMME FOR APPLIANCES



## Mandatory Regime

1. Room Air Conditioners
2. Frost Free Refrigerator
3. Tubular Florescent Lamp
4. Distribution Transformer
5. Room Air Conditioner  
(Cassette, Floor Standing)
6. Direct Cool Refrigerator
7. Color TV
8. Storage type Electric  
Water Heater
9. Inverter Air Conditioner
10. LED lamps

## Voluntary Regime

1. Induction Motors
2. Pump Sets
3. Ceiling Fans
4. LPG-Stoves
5. Washing Machine
6. Computer (Notebook/Laptops)
7. Ballast (Electronic/Magnetic)
8. Office Equipment's (Printer,  
Copier, Scanner, MFD's)
9. Diesel Engine Driven Mono-set  
Pumps
10. Solid State Inverter
11. DG Sets
12. Chillers
13. Microwave Ovens
14. Solar Water Heater
15. Light Commercial Air  
Conditioners
16. Deep Freezers
17. UHD TV
18. Air Compressors
19. Li-ion traction batteries and  
Systems
20. Tyres



# Way Forward – Emerging Areas/ Technologies



- to enhance the rate of electrification in end-use sector
- to promote clean energy technologies in MSME clusters
- **Energy Efficient Cold chain sector**
- **Encouraging District Cooling Systems (DCS) in India**
- **Adoption of Hydrogen as alternate fuel in demand sectors**
- **To implement thermal / battery / pumped Storage**



# Way Forward – Key Policy initiatives



- **Dedicated Financing Facility to enhance investment in energy efficiency / low carbon projects**
- **Launch of National Carbon Market**
- **Industry de-carbonization**
- **To facilitate De-centralise RE applications (incl. Solar Thermal)**
- **Net Zero Energy Buildings / Campuses / Tourist Locations**



**Thank You**