



Ministry of Environment, Forest  
and Climate Change

# Net Zero Emissions and Global Carbon Budget

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# GLOBAL CLIMATE TREATIES

- UNFCCC (1992)
- Kyoto Protocol (1997)
- Paris Agreement (2015)

Gradual shift from emission reduction targets only for developed countries , towards nationally determined , binding targets for all countries .

IPCC : CLIMATE CHANGE AND ITS IMPACTS

# WG-I Report to AR6 (IPCC)



**Increase in global temperatures of 1.07 Deg. C** since the pre-industrial period, is **proportional to the global cumulative emissions** over this period



To limit increase in global temperature since the pre-industrial period, the cumulative emissions must stay within a **Global Carbon Budget**



Global cumulative emissions determine the global temperature that will be reached .

# Why Neutrality?

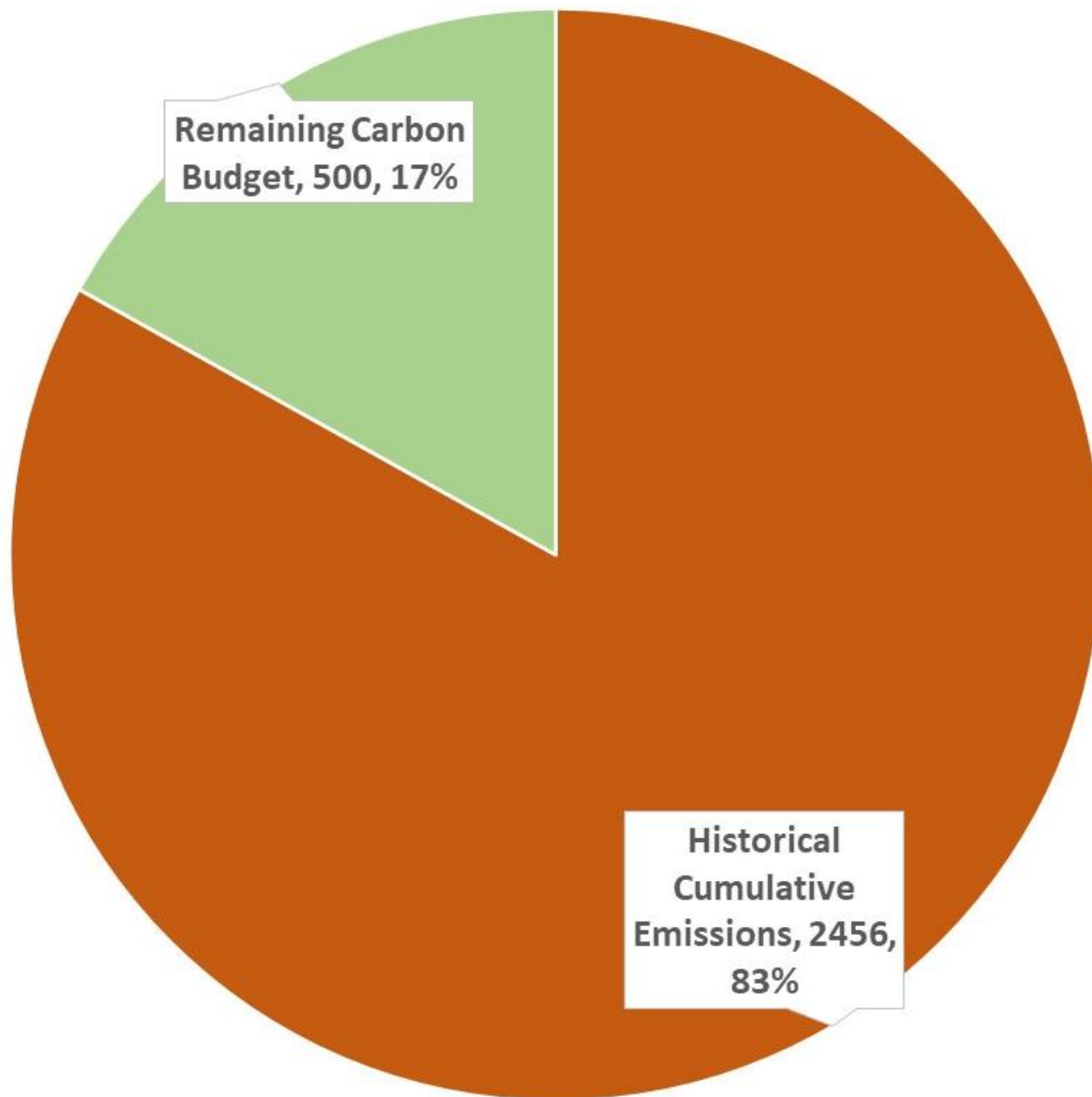
- Considering the huge climate change impacts as a result of cumulative emissions, it is important to sequester as much carbon as emitted.
- Since climate change is global collective action problem, the response also needs to be global but based on equity and CBDR-RC.

## ***Carbon budget***

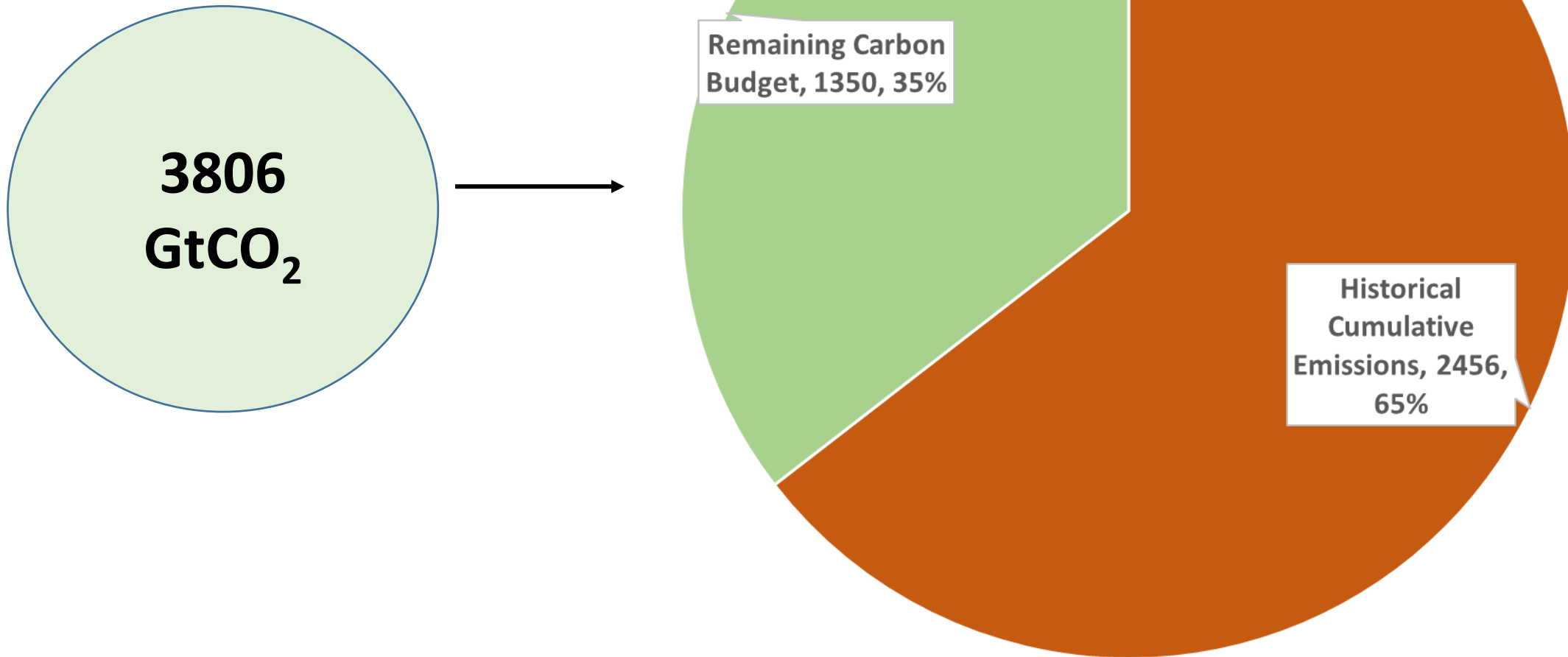
- Cumulative amount of carbon dioxide (CO<sub>2</sub>) emissions permitted over a period of time to keep within a certain temperature.
- Amount left is 500 GtCO<sub>2</sub> for limiting temperature rise to 1.5 degrees and 1350 GtCO<sub>2</sub> for 2 degrees.

## 50% Probability of 1.5 deg. C

Total Carbon Budget



## 50% Probability of 2 deg. C



## But emissions are continually rising

	Population Share (% of Global Population)	Share of Global Cumulative Emissions 1850-1990	Share of Global Cumulative Emissions 1991-2018
	2018	%	%
<b>All Annex-I</b>	<b>18%</b>	<b>71%</b>	<b>46%</b>
USA	4%	29%	18%
Canada	0.5%	2%	2%
Australia	0.3%	1%	1%
Japan	2%	3%	3%
Germany	1%	6%	3%
UK	1%	6%	2%
EU (28)	6%	25%	13%
Russian Fed	2%	7%	6%
<b>All Non-Annex-I</b>	<b>82%</b>	<b>29%</b>	<b>54%</b>
China	18%	6%	21%
Brazil	3%	1%	2%
South Africa	1%	1%	1%
<b>India</b>	<b>18%</b>	<b>4%</b>	<b>5%</b>

# OVERWHELMING DOMINATION OF DEVELOPED COUNTRIES IN PAST EMISSIONS

	Past Emissions: Cumulative Emissions 1850-1990		Present Emissions: Cumulative Emissions 1991-2018		Share of Global Population
	[GtCO <sub>2</sub> eq]	Share of Global Emissions (%)	[GtCO <sub>2</sub> eq]	Share of Global Emissions (%)	(2018)
All Annex-I	976	<b>71%</b>	500	<b>46%</b>	<b>18%</b>
All Non-Annex-I	395	29%	584	54%	82%

# Carbon Debt/Credit for Past Emissions

Based on Per Capita Fair Share (2018 Basis)

The developed countries owe India about 15 trillion USD because of their excessive use of the global carbon space.

## Carbon Debt/Credit from 1850 to 1990 and 1991-2018

All numbers in GtCO<sub>2</sub>eq (without LULUCF)

■ Carbon Debt/Credit: 1850-1990 [GtCO<sub>2</sub>] ■ Carbon Debt/Credit: 1990-2018 [GtCO<sub>2</sub>]

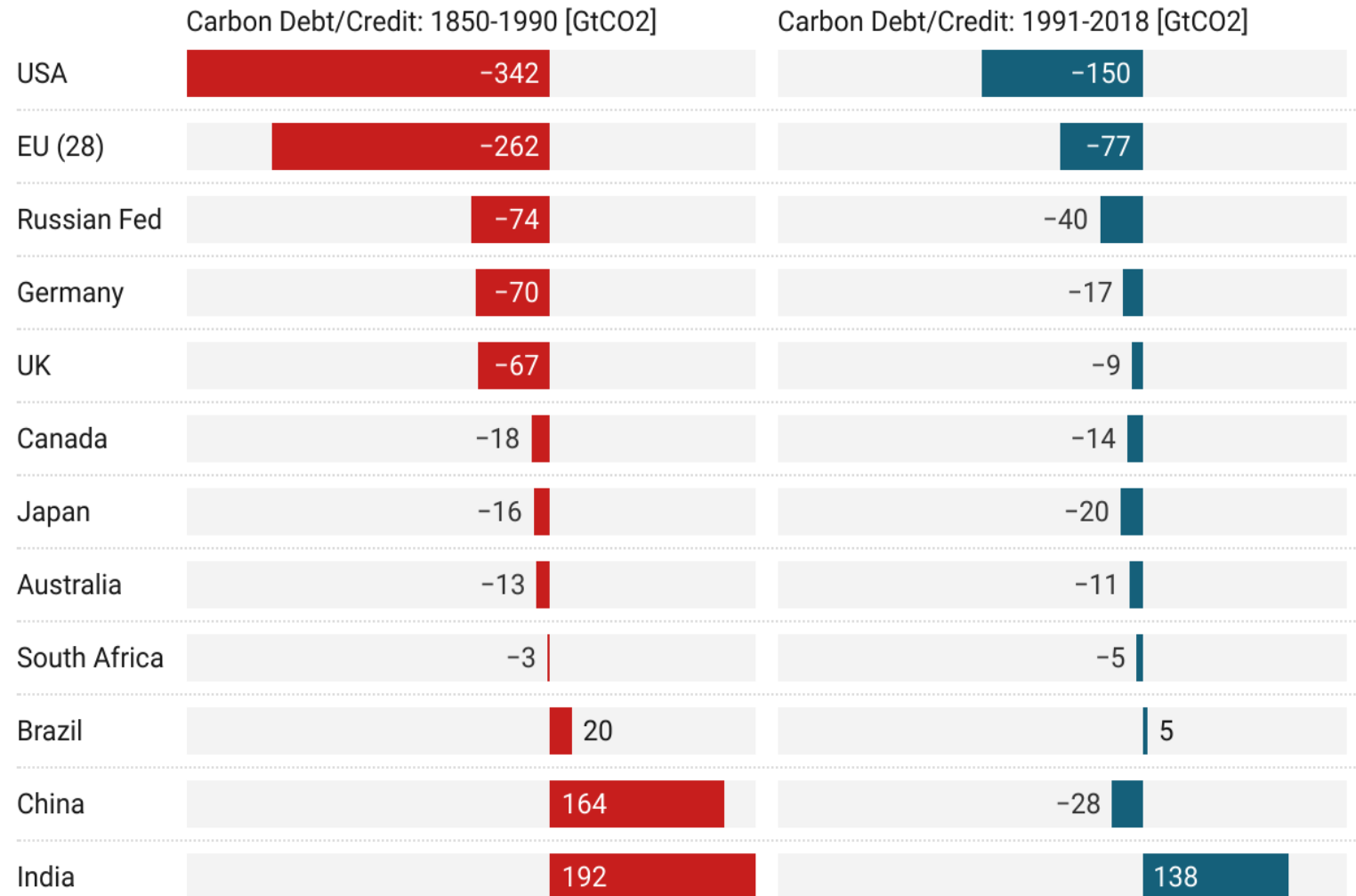


Chart: tejalk@nias.res.in • Source: Gütschow, J.; Günther, A.; Jeffery, L.; Gieseke, R. (2021): The PRIMAP-hist national historical emissions time series v2.2 (1850-2018). zenodo. doi:10.5281/zenodo.4479172. • Created with Datawrapper

# THE CONCEPT OF NET ZERO

- **UNFCCC** - Prevent dangerous anthropogenic interference with the climate system.
- **Paris Agreement** – Balance between anthropogenic emissions by sources and removals by sinks , in the second half of the century

IPCC SR 1.5 degrees report - Emissions to be reduced 45% below 2010 levels by 2030 and NET ZERO by 2050

# WHAT ACTIONS DOES NET ZERO ENTAIL?

- **Mitigation of emissions** – Energy , Transportation, Industry etc
- **Absorption by Sinks** – Forests ; Oceans
- **Removals** through Direct Air Capture ; CCUS

Objective : To prevent net addition to the stock of GHGs, beyond the global carbon budget

# Net-Zero Targets Highly Inadequate

	Current Declared/Proposed year of reaching net zero	Year of reaching net zero for fair share of remaining carbon budget (linear reduction)	
		1.5 deg. C (50% Probability)	2 deg. C (67% Probability)
<b>USA</b>	<b>2050</b>	<b>2025</b>	<b>2032</b>
<b>Canada</b>	<b>2050</b>	<b>2025</b>	<b>2033</b>
<b>Australia</b>	<b>None</b>	<b>2024</b>	<b>2031</b>
<b>Japan</b>	<b>2050</b>	<b>2031</b>	<b>2046</b>
<b>Germany</b>	<b>2045</b>	<b>2030</b>	<b>2045</b>
<b>UK</b>	<b>2050</b>	<b>2035</b>	<b>2057</b>
<b>EU (28)</b>	<b>2050</b>	<b>2031</b>	<b>2047</b>
<b>Russian Fed</b>	<b>None</b>	<b>2026</b>	<b>2036</b>
<b>China</b>	<b>2060</b>	<b>2031</b>	<b>2047</b>
<b>World</b>	Second half of century	<b>2037</b>	<b>2062</b>

# COP 26 – WHAT DID THE DEVELOPED COUNTRIES DO?

- Refuse to acknowledge [their historical responsibility](#) for the current climate crisis!! (by 2020 would reduce annual emissions only by ~ 10 percent below 1990 levels)
- [Insufficient NDCs and net-zero commitments](#) – continued cumulative emissions far more than their fair share.
- US + EU = 94 + 54 GtCO<sub>2</sub> – Out of 500 GtCO<sub>2</sub> available for limiting to 1.5 degrees C warming. (China – 400 GtCO<sub>2</sub> till net zero in 2060).
- Lot of promises – Yet to see little action in policy corresponding to their responsibility (UNFCCC Synthesis Report on NDCs).
- Net-zero diverted attention from real and immediate action (echoed by civil society and a significant section of scientists)
- But [intensified efforts to push the burden on to developing countries](#).

# INDIA : FRAMEWORK FOR CLIMATE ACTIONS

- Achievement of SDGs
- Availability of reliable and affordable energy
- Responsive to the call of Science
- In light of national circumstances , equity and CBDR-RC

Government is implementing the National Action Plan on Climate Change (NAPCC) through National Missions that address climate change mitigation and adaptation across a range of sectors. NAPCC is the overarching policy framework and comprises of national missions in specific areas of solar energy, enhanced energy efficiency, water, agriculture, Himalayan ecosystem, sustainable habitat, green India and strategic knowledge on climate change. Three Missions on Transport, Health and Coastal are on the anvil.

# INDIA - Being a part of the solution..

There is no sector of our economy, where some initiative or the other is not happening for climate action. So, we are fully committed to addressing Climate Change

- Decoupling growth from emissions. Reduction of emissions intensity of GDP by 24% below 2005 levels.
- Non-fossil installed capacity is more than 40% today. At COP 21, as part of its NDCs, India had committed to achieving 40% of its installed electricity capacity from non-fossil energy sources by 2030. We have achieved this target in November 2021 itself nine years ahead of our promise to do so.
- The likely annual CO2 emission reductions on achieving 450 GW RE capacity (excluding large hydro) in 2030 would be around 877 million tonnes of CO2.
- Clean coal technology initiative: Shutting down inefficient thermal units, 241 Units retired, new capacity addition through supercritical units only.
- Shift from BSIV to BSVI for cleaner transportation; push for electric vehicles.
- Ministry of Railways has envisioned to be a 'Net Zero Carbon Emitter' by 2030. With this, total CO2 emissions reduction by 2030 is estimated to be 60 million tons.
- UJALA: Largest LED programme of the world for energy savings. Total CO2 emissions reduction 40 Million tonnes per year.
- Perform, Achieve and Trade scheme saved 60 million tonnes in Phase-II.

# INDIA - Being a part of the solution..

- Apart from resolutely addressing climate change domestically, for the world, India has created and continue to nurture International Solar Alliance (ISA) and Coalition for Disaster Resilient Infrastructure (CDRI). We are also taking the lead with Sweden in innovation for hard to abate sectors with a view to promoting voluntary action for low carbon transition. So, when India speaks on climate change, it does so from a position of strength and responsibility.
- India has been proactive in helping nations impacted by Climate Change. This is evident from the recent launch of 'Infrastructure for Resilient Island States (IRIS)' by India, UK, Australia, Fiji, Jamaica and Mauritius at The World Leaders Summit at COP26.
- The Prime Minister, at COP-26, launched the Green Grids Initiative—One Sun One World One Grid (GGI-OSOWOG), the first international network of global interconnected solar power grids, jointly with his UK counterpart Boris Johnson.

# India Further Intensified her Climate Actions

- At COP-26, the Hon'ble Prime Minister of India announced India's climate action agenda, naming it as 'panchamrit' or five nectar elements that would be India's contribution to tackling the challenge of global warming. This "Panchamrit" announced were the following:
  - **First**– India will increase its non-fossil energy capacity to 500 GW by 2030.
  - **Second**– India will meet 50 percent of its energy requirements from renewable energy (non-fossil) by 2030.
  - **Third**– India will reduce the total projected carbon emissions by one billion tonnes from now onwards till 2030.
  - **Fourth**– By 2030, India will reduce the carbon intensity of its economy by less than 45 percent.
  - **Fifth**- By the year 2070, India will achieve the target of Net Zero.
- Inspired by our traditional ethos of living in harmony with the environment, India has adopted low-carbon and climate-resilient development practices.

# CLOSURE OF COP26 – ASSERTING EQUITY

- Before the final session of the COP India called for phase out of all fossil fuels. (See <https://twitter.com/i/status/1460628604799397894> and <https://youtu.be/ru5FhNOINCc>)
- India had repeatedly asserted its need for coal as its fossil fuel resource essential for development.
- **Sun does not shine at night nor does the wind blow all the time!!**
  - Fossil fuels are essential for more renewables – development cannot wait for batteries to become cheaper.
- Developed countries reaching net zero early – means phase out for all fossil fuels.
- At closing plenary, India provided a studied and articulate response, leveraging the China-US agreement language, emphasizing development, especially poverty eradication and just transition (though could not entirely correct the biased language)
- Post-COP26: Strong global support and understanding of India's dilemma!!

# India's Use of Fossil Fuels

Per Capita Total Fossil Fuel Consumption (2018)	Coal Consumption (tonnes per capita)	Natural Gas Consumption (CM per capita)	Oil Consumption (Mt per capita)
USA	1.91	2.59	2.37
Germany	2.62	1.12	1.14
Australia	4.52	1.84	1.96
UK	0.20	1.20	0.89
China	2.70	0.20	0.42
India	0.73	0.04	0.16

# LOW CARBON TRANSITIONS : ECONOMY WIDE

- Energy
- Transportation
- Industry
- Agriculture, Forests and Land Use
- Waste management

The net zero transition requires all hands, on board .

# ROLE OF GOVERNMENT

- Enabling Policy and Regulatory Environment
- Facilitate R&D in clean technologies
- Encourage innovation

Union Budget 2022-23 – Clear focus on green transition towards carbon neutral economy

# ROLE OF INDUSTRY

- Sectoral low carbon transition plans
- Enhanced ESG commitments
- Shift to clean technologies
- Investment in innovations

# INDIA : LONG TERM LOW GHG EMISSIONS DEVELOPMENT STRATEGY

- Under Preparation
- To be submitted by COP27 , November 2022.
- Inputs from all stakeholders will be sought

# India and the Way Forward

- COP26 shows India the merits of a two-track approach – active engagement with climate action at home, while insisting on international equity at the global level. Worked effectively at COP26 and put forward a positive viewpoint.
- Equitable, inclusive growth at the national level is essential but not the subject of international negotiations and cannot dictate our stand vis-à-vis international equity.
- Rational assessment of costs of mitigation without overplaying benefits of going “green”, while striving to maximise the value of available carbon space.
- Greater attention to and investment in adaptation – keeping the positive aspect of the “development as adaptation” approach that has been pursued.
- India’s share of the remaining carbon budget (at the minimum) is a strategic national resource and care needs to be exercised in the domestic regulation that will be part of Article 6 mechanisms. Our focus should be on benefits accruing to the agricultural sector and the MSME in industry.
- Early formation of institutions, especially in laws, rules and procedures, and their implementing bodies are in danger of clashing with the open-ended requirements of development and rigidifying the forms of climate action, and must be avoided.

ॐ द्यौः शान्तिरन्तरिक्षं शान्तिः  
पृथिवी शान्तिरापः शान्तिरोषधयः शान्तिः ।

- यजुर्वेद, ३६.१७

“वसुधैव कुटुम्बकम्”

- महा उपनिषद् ६.७२

*Unto Heaven be Peace, Unto the Sky and the Earth be Peace,  
Peace be unto the Water, Unto the Herbs and Trees be Peace*

*- Yajur Veda 36.17*

# Thank You!

ईशावास्यमिदं सर्वं यत्किञ्च जगत्यां जगत् ।  
तेन त्यक्तेन भुञ्जीथा मा गृधः कस्यस्विद्धनम् ॥

-ईशावास्योपनिषद्

आ नो भद्राः क्रतवो यन्तु विश्वतः।

- ऋग्वेद, १.८९.१

*‘Let noble thoughts come to us from all directions’*

*-RigVeda,1.89.1*