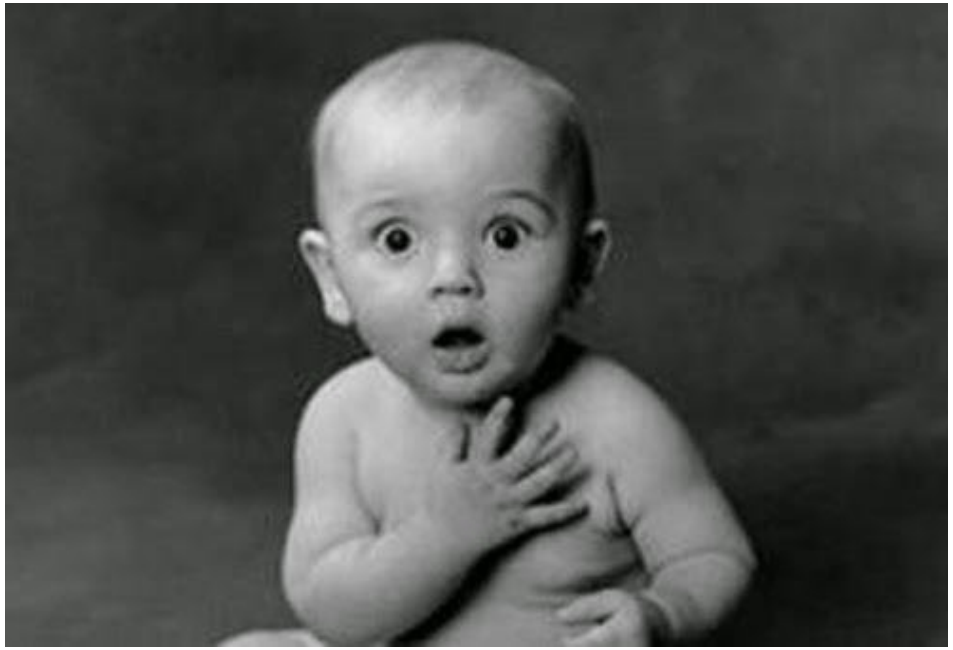
Road map to NetZero through sustainability & adopting ESG

Why????

World we are leaving behind….

World we are leaving behind….

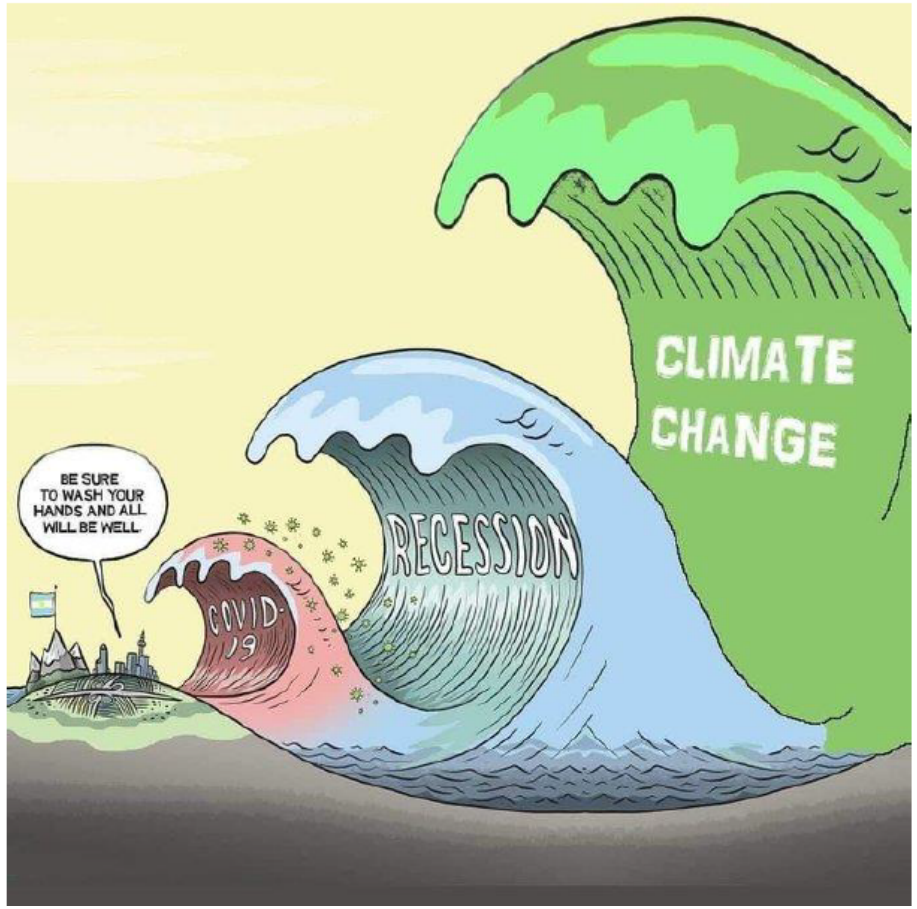
A few eye openers

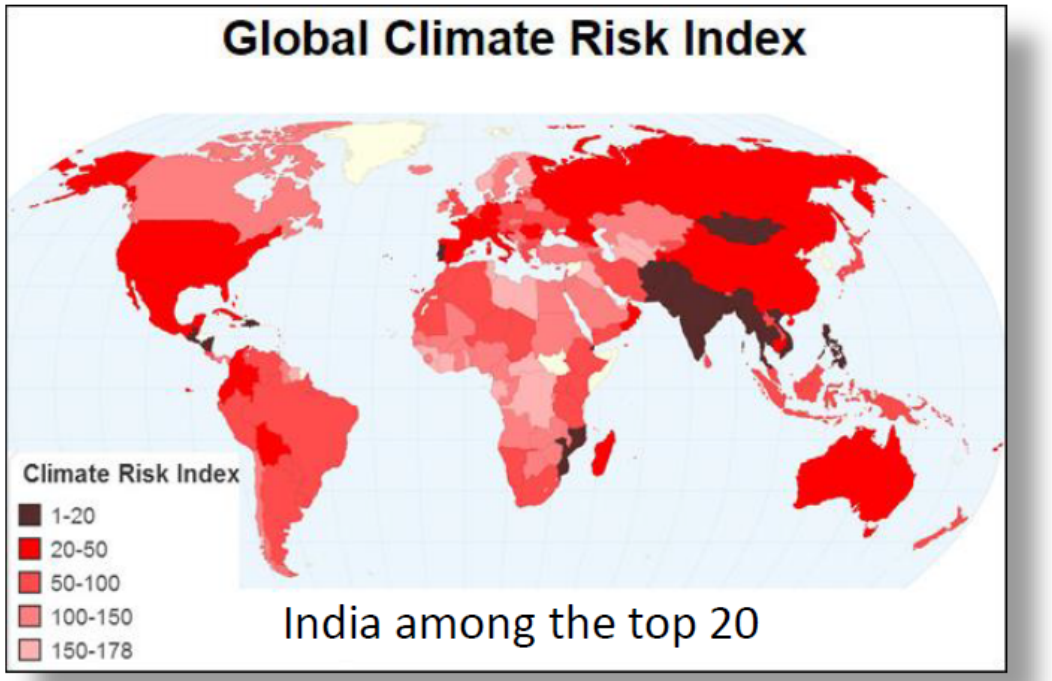


- Before Industrial Revolution CO_2 was280 ppm. In May 2019 it was419 ppm highest in the human history.
- **2019 was the 2nd hottest year**
- **2010-2019 = warmest decade**
- Methane is responsible for more than 25% of global warming
- By 2050, sea levels may rise between one to 2.3 feet above present levels. As a result coastal areas of the world may be flooded with seawater.
- 30% of the emissions from industry and fossil fuels are absorbed by forests. Yet every year our planet loses 10 million hectares of forest lands.
- Breathing polluted air has 5.5 million premature deaths a year, and researchers predict that by 2030, air pollution-related deaths could rise by 60,000 a year due to the effects of climate change

Climate Risk

Climate risk looming large





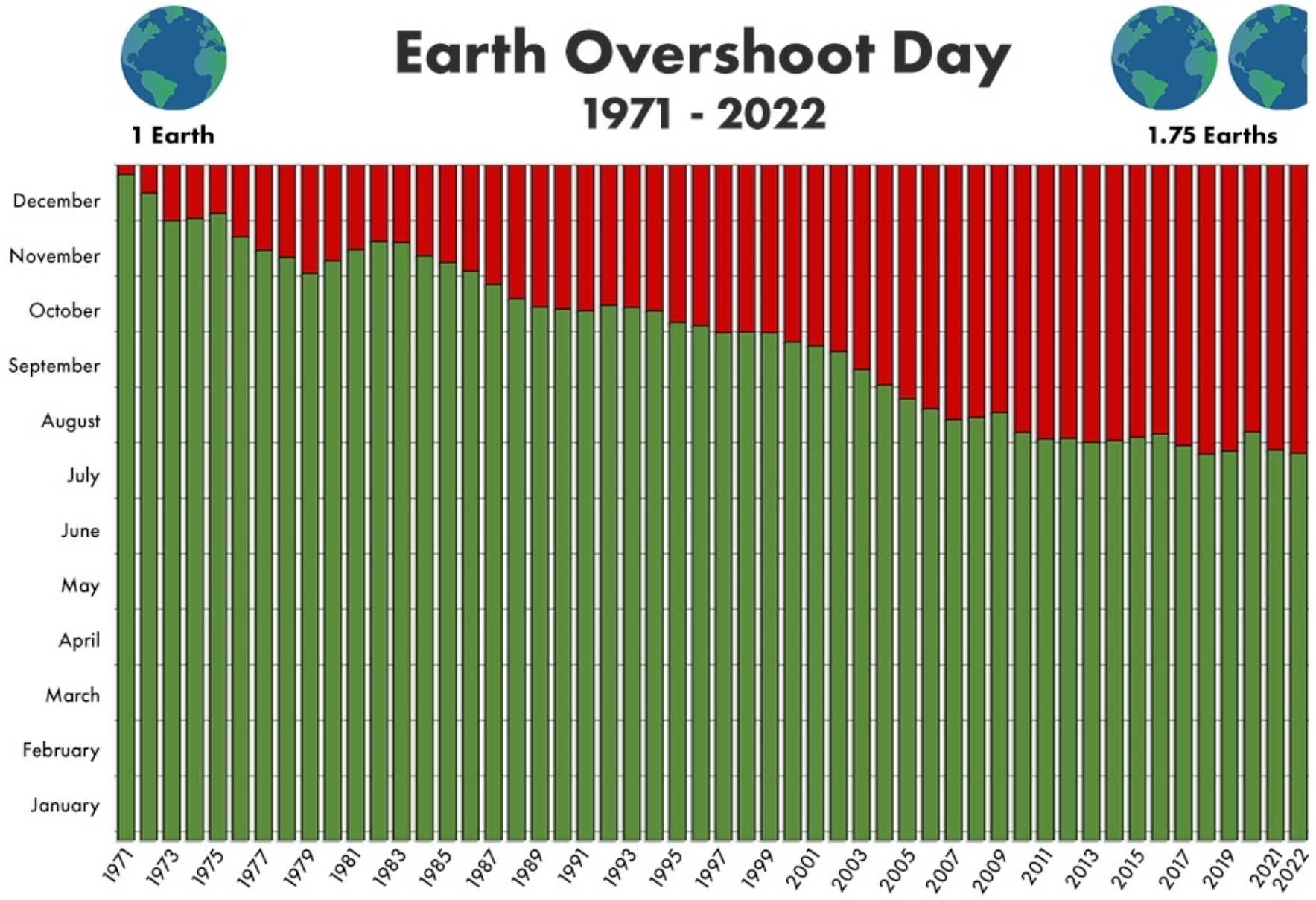
Physical risk:

Direct damage to life, assets or facilities (due to natural calamities, sea-level rise)

Transitional risk:

Risk due to policy, regulation or consumer preference that reduce reliance on carbon-intensive products and services

Earth Overshoot day .....marks the date when humanity has exhausted nature's budget for the year



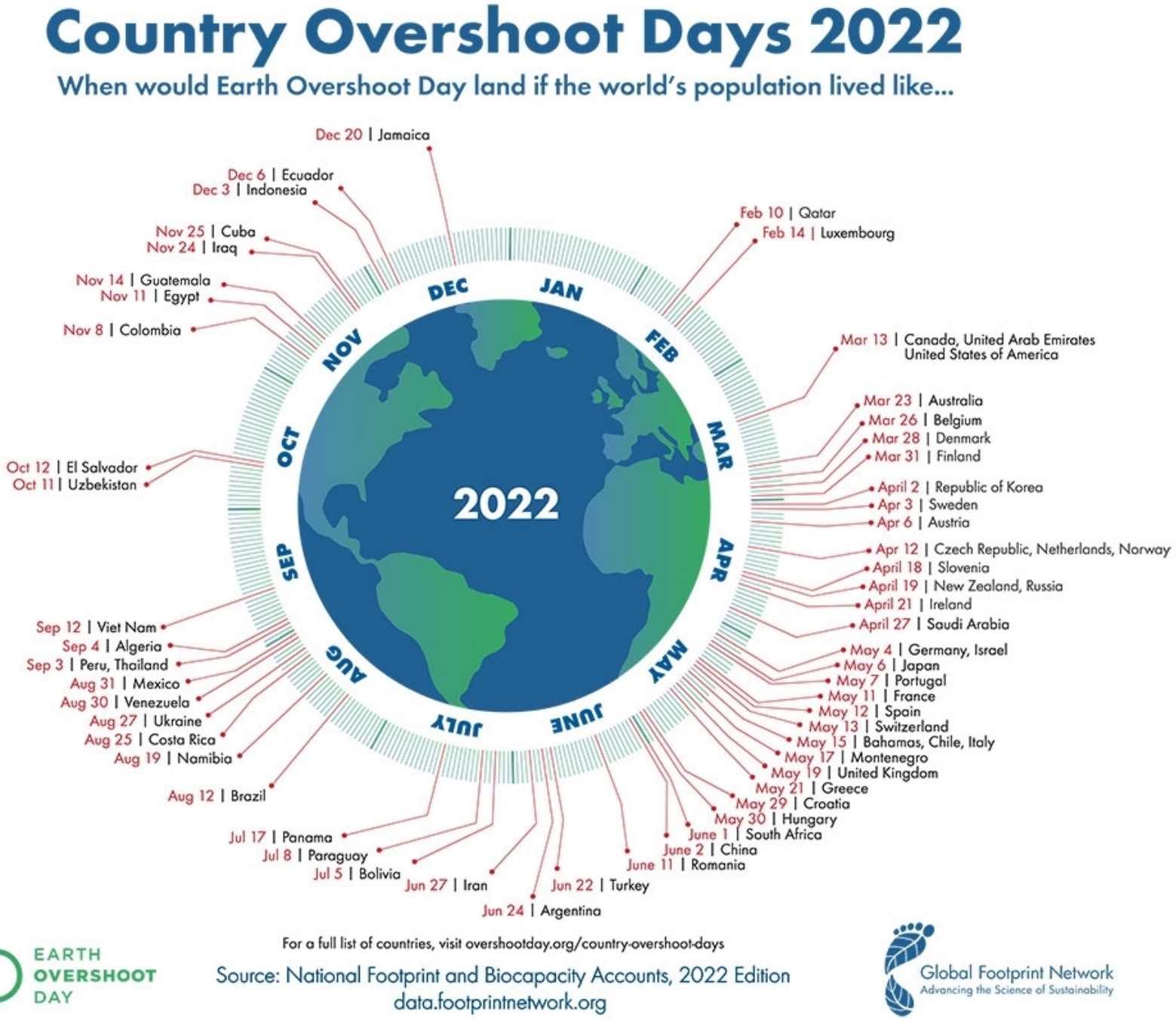
EARTH OVERSHOOT DAY

FOOTPRINT DATA FOUNDATION

Global Footprint Network

Source: National Footprint and Biocapacity Accounts 2022 Edition
data.footprintnetwork.org

Earth Overshoot Day marks the date when humanity's demand for ecological resources and services in a given year exceeds what Earth can regenerate in that year.



Performance varies from country to country
….. and so are the risks
and challenges!

SOCIAL AND ECONOMIC IMPACT

OF CLIMATE CHANGE

The cost of **adapting coastal areas** to rising sea levels

Relocation of **whole towns**

Loss of the **capacity to work** due to heat

Shrinking **productivity of harvests**

More wars to gain **access to limited resources**

Prices of **basic foodstuffs and consumer goods** will rise

Fresh water will be in short supply in some areas

Extreme meteorological **phenomena** will cause widespread poverty

Diseases will spread due to **higher temperatures**

Knock at the door….

- Heatwaves in India to last 25 times longer by 2036-65.
- By 2030 job loss of 34m.

In 15 years' time, India will generate the demand for a new air conditioner every 15 seconds.

India's Heat Waves could Break Human Survivability Limit: World Bank Report

'By 2030, India may account for 34m of projected 80m global job losses from heat stress'

Thiruvananthapuram: Severe heat waves, responsible for thousands of deaths across India over the last few decades, are increasing with alarming frequency and soon the country could become one of the first places in the world to experience heat waves that break the human survivability limit, according to a new report.

The World Bank report titled "Climate Investment Opportunities in India's Cooling Sector", said the country is experiencing higher temperatures that arrive earlier and stay far longer. "In April 2022, India was plunged into the grip of a punishing early spring heat wave that brought the country to a standstill, with temperatures in the capital, New Delhi, topping 46 degrees Celsius (114 degrees Fahrenheit). The month of March, which witnessed extraordinary spikes in temperatures, was the hottest ever recorded", it said.

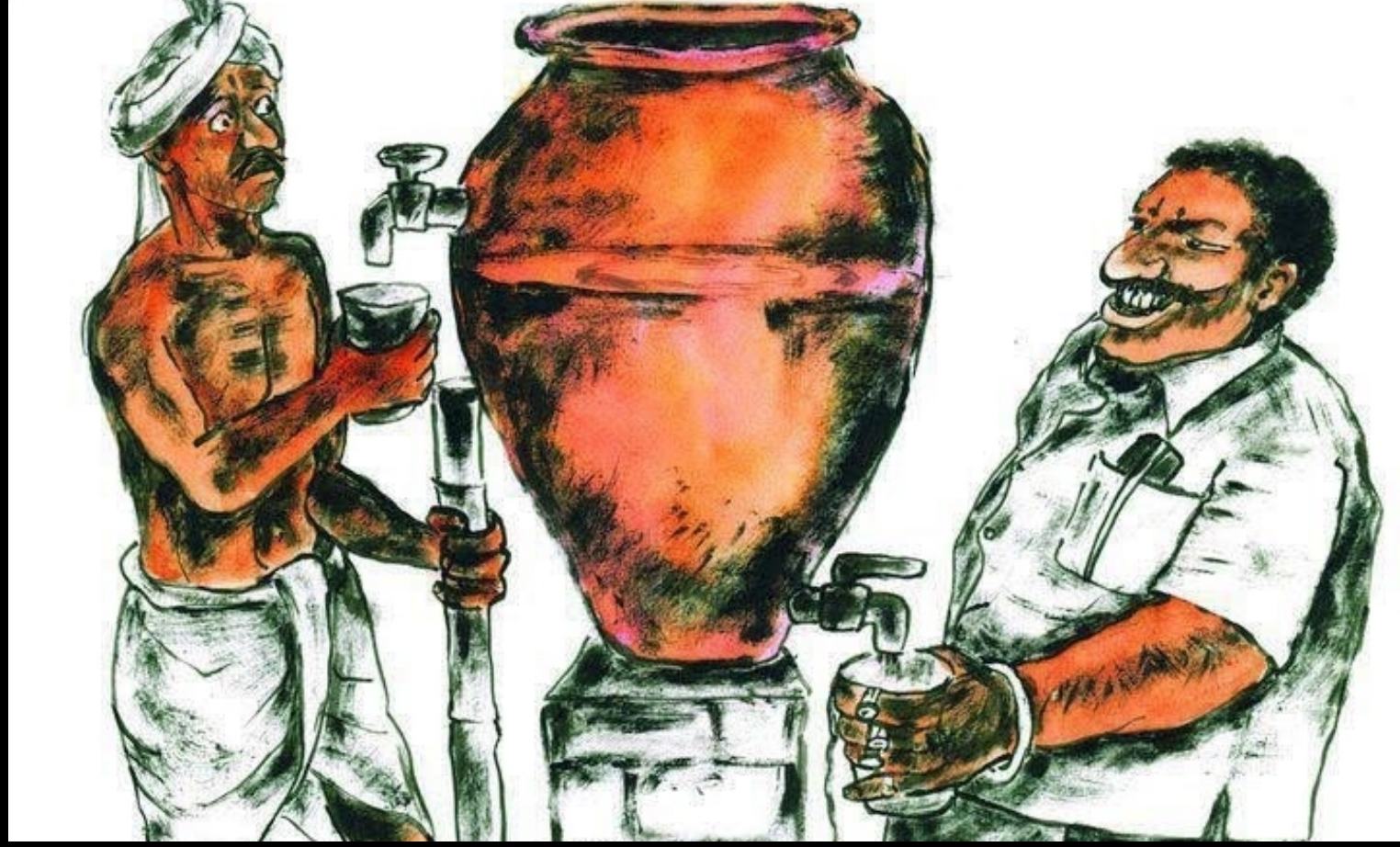
The report will be released during the two-day "India Climate and Development Partners' Meet" being organised by the World Bank in partnership with the Kerala government here.

Predicting that the heat wave situation in India could break the human survivability limit, it said the recent heat wave supports what many climate scientists have long cautioned about with reference to rising temperatures across South Asia. "In August 2021, the Sixth Assessment Report of the Inter-governmental Panel on Climate Change (IPCC) warned that the Indian subcontinent would suffer more frequent and intense heat waves over the coming decade."

The G20 Climate Risk Atlas also warned in 2021 that heat waves across India were likely to last 25 times longer by 2036-65 if carbon emissions remain high, as in the IPCC's worst-case emission scenario," the report said.

It also warned that rising heat across India can jeopardise economic productivity. "Up to 75% of India's workforce, or 380 million people, depend on heat-exposed labour, at times working in potentially life-threatening temperatures. ...By 2030, India may account for 34 million of the projected 80 million global job losses from heat stress associated productivity decline," the report said.

It further said India showed the largest heat exposure impacts on heavy labour among South Asian countries, with more than 101 billion hours lost a year. **PTI**



Widening chasm between people

What is Sustainability?

1. the ability to be maintained at a certain rate or level.
2. "the sustainability of economic growth"
3. avoidance of the depletion of natural resources in order to maintain an ecological balance.
4. "the pursuit of global environmental sustainability"

Meeting the needs of the present without compromising the ability of future generations to meet their own needs

-United Nations World Commission of Development and Environment

Latin word sustinere

Tenere-to hold

Sus: pig

Avdhesh Hans
CM (AE&SD) CO BD
Indian Oil Corporation Ltd

Emissions growth

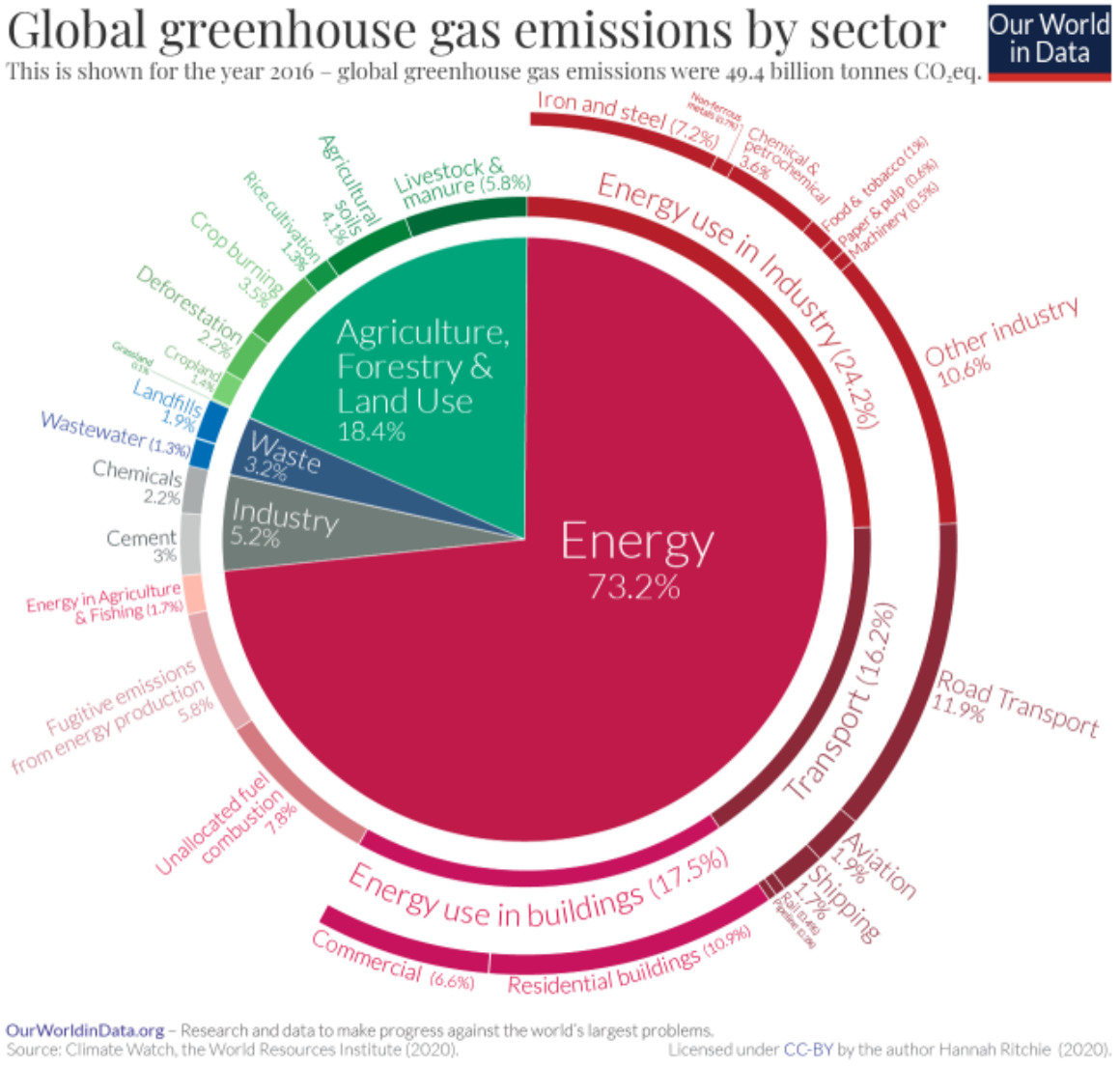
ATMOSPHERIC CO_2 CONCENTRATION IS

146% OF

PRE-INDUSTRIAL LEVELS (2017)

Source: NASA & UNEP 2019

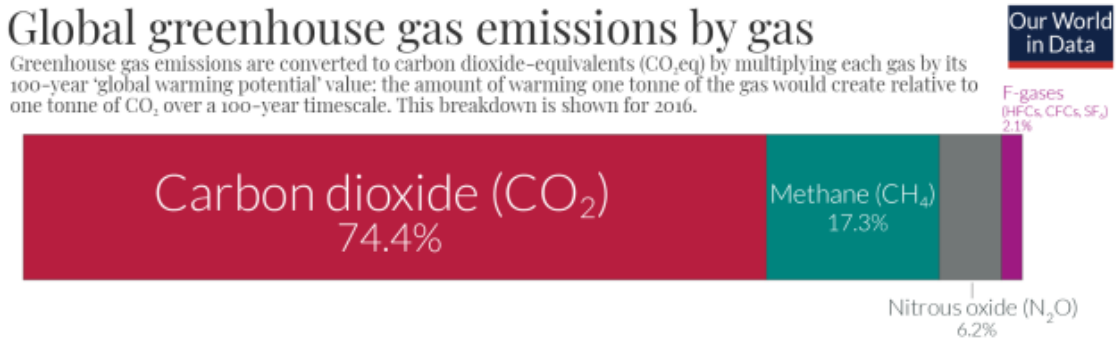
The energy sector contributes to around 75% of the greenhouse gas emissions today and holds the key to avert the worst effects of climate change.



Annual GHG Emissions – At a Glance

~52 $GtCO_2$ eq

Global GHG Emissions



~41 $GtCO_2$ eq

Global GHG Emissions from Energy consumption

~36 $GTCO_2e$ (~90%)

CO_2 Emission

Coal – 42%; Oil – 30%;
Gas – 21%; Ind. Processes – 6%

~4 $GTCO_2e$ (~9.5%)

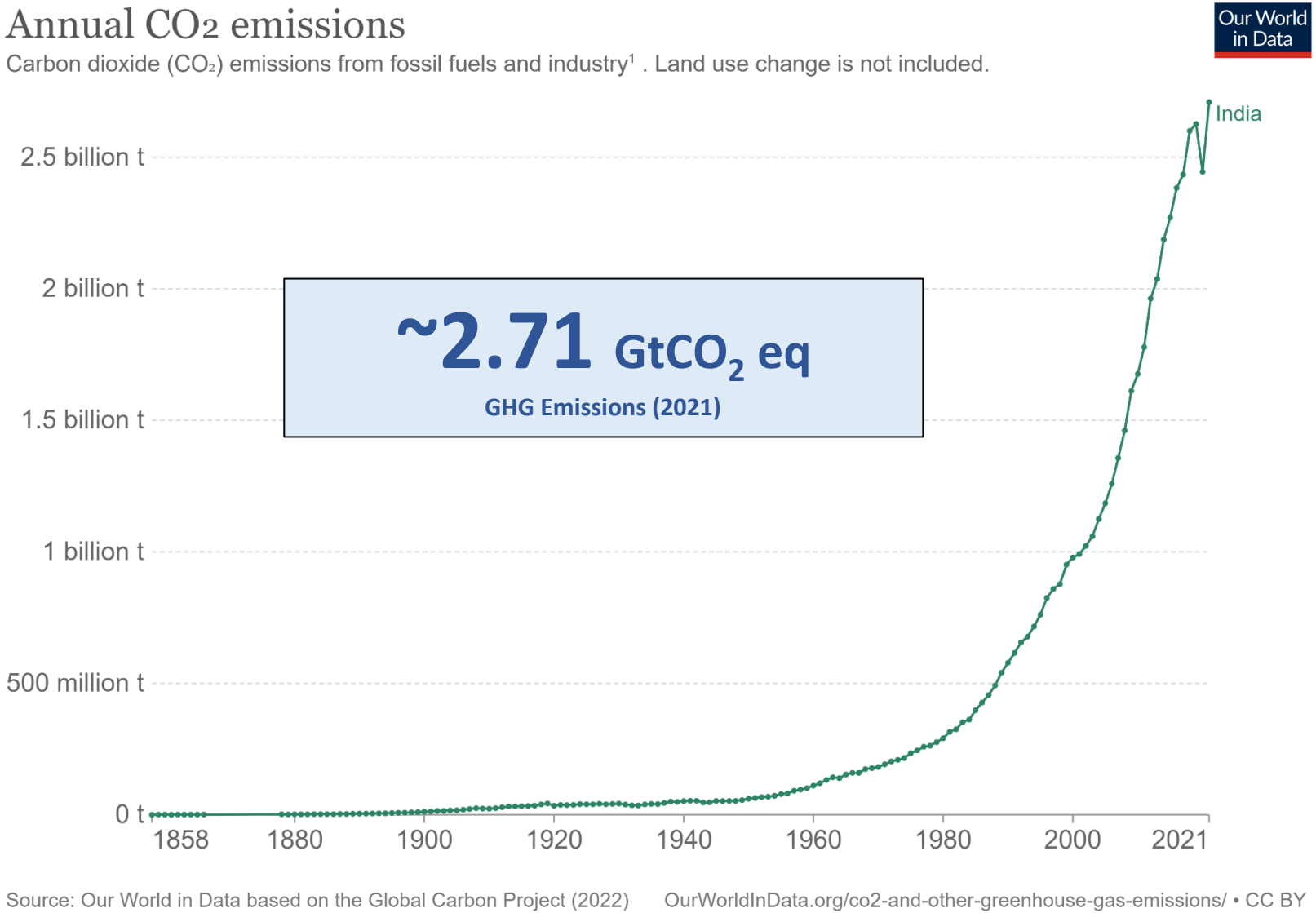
CH_4 Emission

~0.3 $GTCO_2e$ (~0.5%)

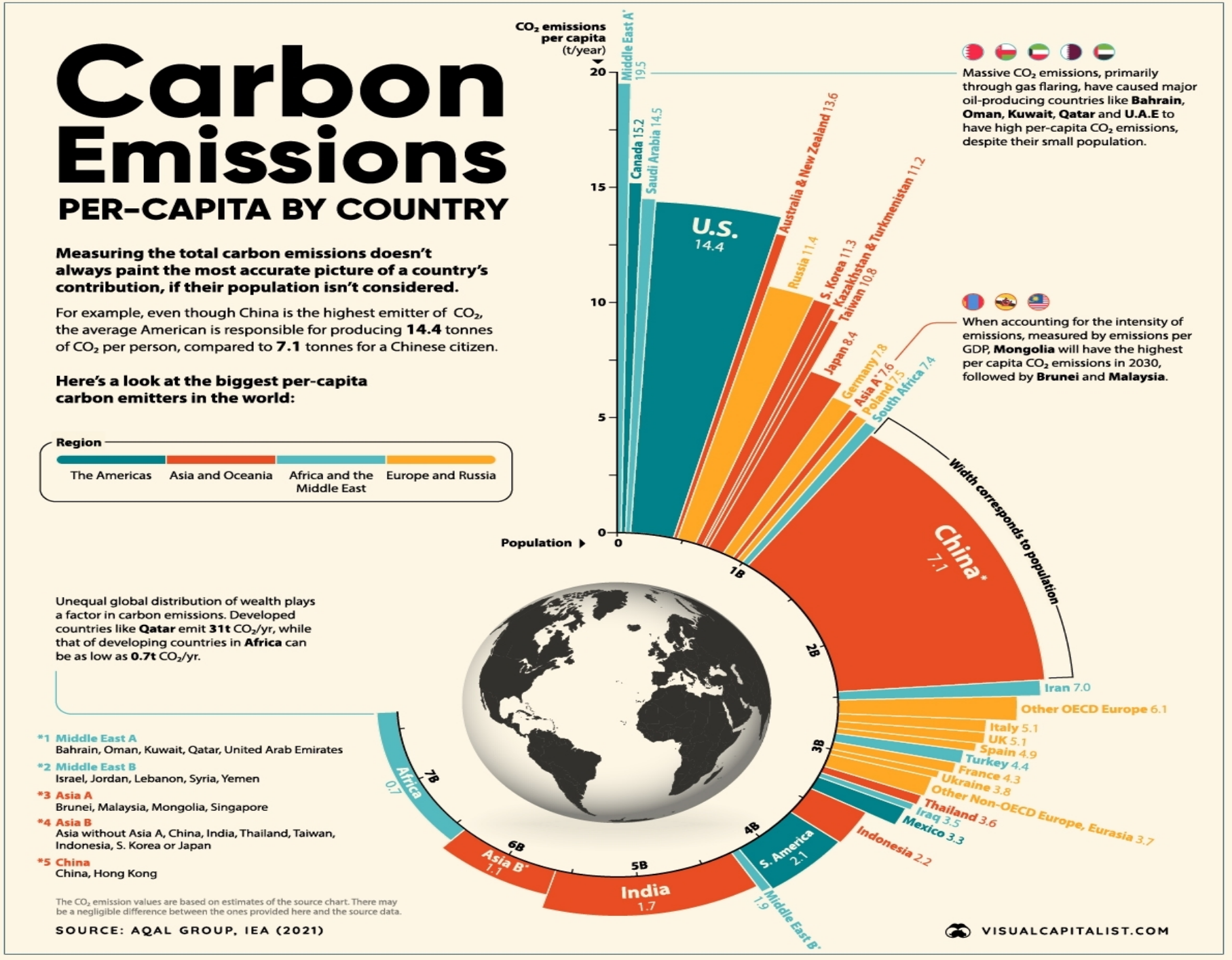
N_2O Emission

Source: IEA & Our World in Data

India- Emissions



- Middle East 20t/cap/y
- US 14t/cap/y
- China 7.1t/cap/y
- EU : 5.2 t/cap/y (avg)
- India 1.7 t/cap/y
- Africa 0.7t/cap/y



Landmark Global Climate Talks

1972: UN Stockholm Conference
Common outlook towards environment

1987
Sustainable Development term coined

1992: Rio Earth Summit
United Nation Framework Convention on Climate Change (UNFCCC) formed

1997: Kyoto Protocol (COP-3)
GHG emissions reduction obligation (6-8% from 1990 to 2012)
Emissions trading / clean development mechanism

2015 : Conference of Parties – 21 at Paris
Limit temperature increase to 1.5-2°C
Sustainable development goals

2021 : Conference of Parties – 26
The signing of the Glasgow Climate Pact and agreeing the Paris Rulebook.
Declaring Net Zero

COP
27

2022 : Conference of Parties – 27

The goals of the Paris Agreement

Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels

...aim to reach global peaking of greenhouse gas emissions as soon as possible;

…achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century.

Environment Activism

WION

Shell ordered to cut emissions in landmark Dutch climate case

Shell must reduce its carbon emissions by 45 percent by 2030 as it is contributing to the "dire" effects of climate change, the district court in The ...

3 weeks ago

The New York Times

Climate Change Activists Notch Victory in Exxon Mobil Board Elections

... shareholders of Exxon Mobil elected at least two board candidates ... to force the oil giant to change its environmental policies and approach.

In-Depth · 3 weeks ago

Reuters

Chevron investors back proposal for more emissions cuts

The most comprehensive solution to manage all your complex and ever-expanding tax and compliance needs. Checkpoint. The industry leader ...

3 weeks ago

Business Line

IEA report on 'Net Zero by 2050' suggests need to stop oil, gas projects

IEA report on 'Net Zero by 2050' suggests need to stop oil, gas projects ... International Energy Agency said in a special report released today.

1 month ago

Mint

ESG investing is fast gaining traction in India

The trend of sustainable investing by incorporating environmental, social ... Globally, the assets under management of funds incorporating ESG ...

1 week ago

Bloomberg Quint

Low GDP, High Transition Costs: India's Net Zero Quandary

India is already at high physical risk due to climate change if the world fails to keep the rise in temperature to less than 1.5 degrees Celsius...

2 days ago

World faces the existential threat of climate change, …

1.5^0 Paris Ambition (Global Warming by 2100)

- - 8 % GDP
- +2 months of drought

2^0 Paris Goal (Global Warming by 2100)

- -13% GDP
- +4 months of drought
- **Key Tipping Points may happen**

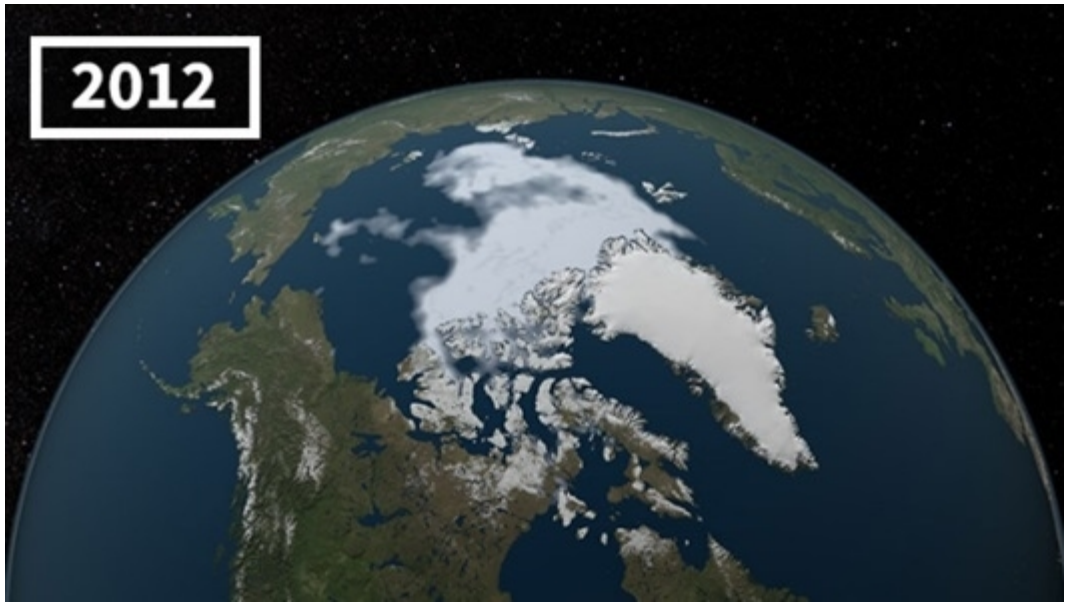
4^0 Current Path (Global Warming by 2100)

- -30% GDP
- +> 10 months of drought[1]
- Flood, Food Crisis Risk, Wildfire….

Tipping Points: https://news.climate.columbia.edu/2021/11/11/how-close-are-we-to-climate-tipping-points/#:~:text=The%20concept%20of%20tipping%20points,2%C2%B0C%20of%20warming

A few eye openers…**Difference between 1.5°C to 2°C**

The world will see serious climate impacts at a 1.5°C increase in global temperature. But after that, it will get much worse. At 1.5°C,	And, if it rises up to 2°C
• 70% of coral reefs will die. • one ice-less summer in the Arctic per century. • 6 million affected by sea-level rise.	• 90% of coral reefs will die. • one ice-less summer in the Arctic per decade. • 16 million affected by sea-level rise. • 1 meter added to sea-level rise.



Artic Sea

Aral Sea

A few facts

In 2021, the global mean temperature was about 1.1°C above the pre-industrial level.

The global annual mean temperature is projected to rise beyond 1.5°C above pre-industrial levels in at least one of the next five years.

It is estimated that $1.6 trillion to $3.8 trillion will be needed each year through 2050 for the world to transition to a low-carbon future and avoid warming exceeding 1.5 °

3 billion to 3.6 billion people live in contexts that are highly vulnerable to climate change.

By 2030, an estimated 700 million people will be at risk of displacement by drought alone.

SDG: Sustainable Development Goals

The General Assembly culminated in the subsequent adoption of the 2030 Agenda for Sustainable Development, with 17 SDGs at its core, at the UN Sustainable Development Summit in September 2015

Supporting SDGs

SDG 13: Climate Change

13

Goal 13

Take urgent action to combat climate change and its impacts.

5 Targets
15 Events
33 Publications
1503 Actions

More info

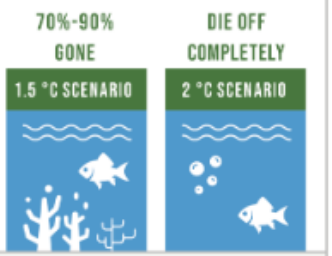
13 CLIMATE ACTION

TAKE URGENT ACTION TO COMBAT CLIMATE CHANGE AND ITS IMPACTS

CLIMATE CHANGE IS HUMANITY'S "CODE RED" WARNING

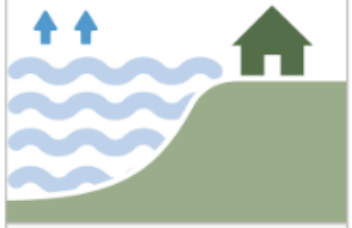
OUR WINDOW TO AVOID CLIMATE CATASTROPHE IS CLOSING RAPIDLY

DIFFERENT TEMPERATURE SCENARIOS FOR CORAL REEFS



CORAL REEFS

SEA LEVEL WILL RISE 30-60 CM BY 2100



SEA LEVEL RISE

DROUGHT ESTIMATED TO DISPLACE 700 MILLION PEOPLE BY 2030

DROUGHTS

MEDIUM- TO LARGE-SCALE DISASTERS WILL INCREASE 40% FROM 2015 TO 2030

DISASTERS

SDG 13: Climate Change

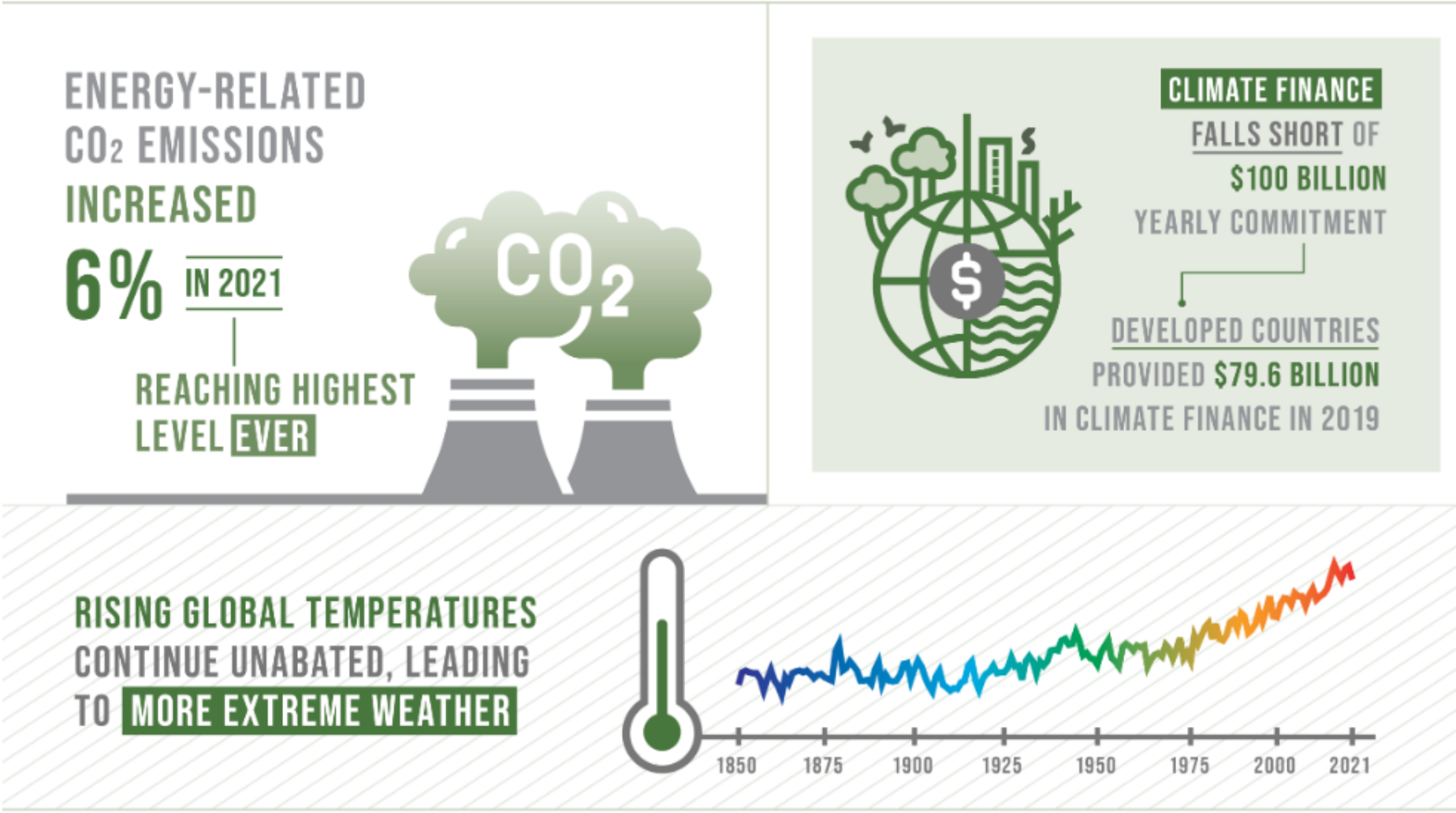
13

Goal 13

Take urgent action to combat climate change and its impacts.

5 Targets	15 Events
33 Publications	1503 Actions

More info



GLOBAL & INDIAN RESPONSE

Net Zero

What is Net Zero?

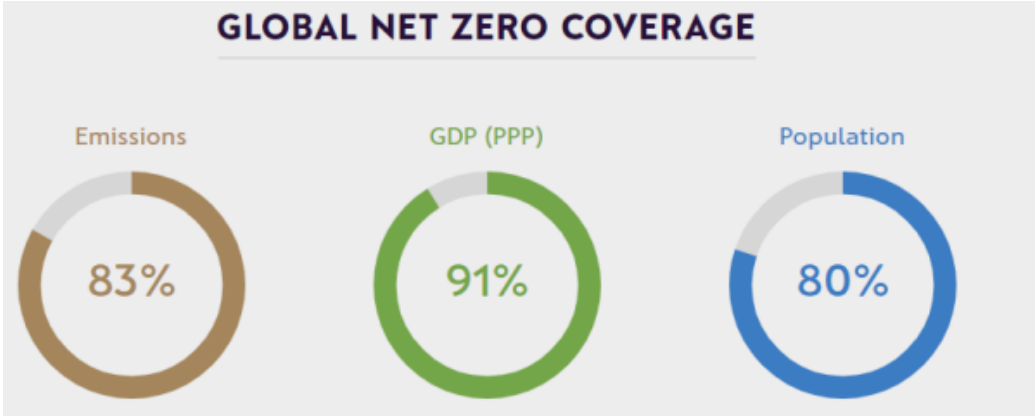
Net zero refers to a state in which the greenhouse gases going into the atmosphere are balanced by their removal out of the atmosphere.

To achieve net zero, world must reduce greenhouse gas emissions and/or to ensure that any ongoing emissions are balanced by removals.

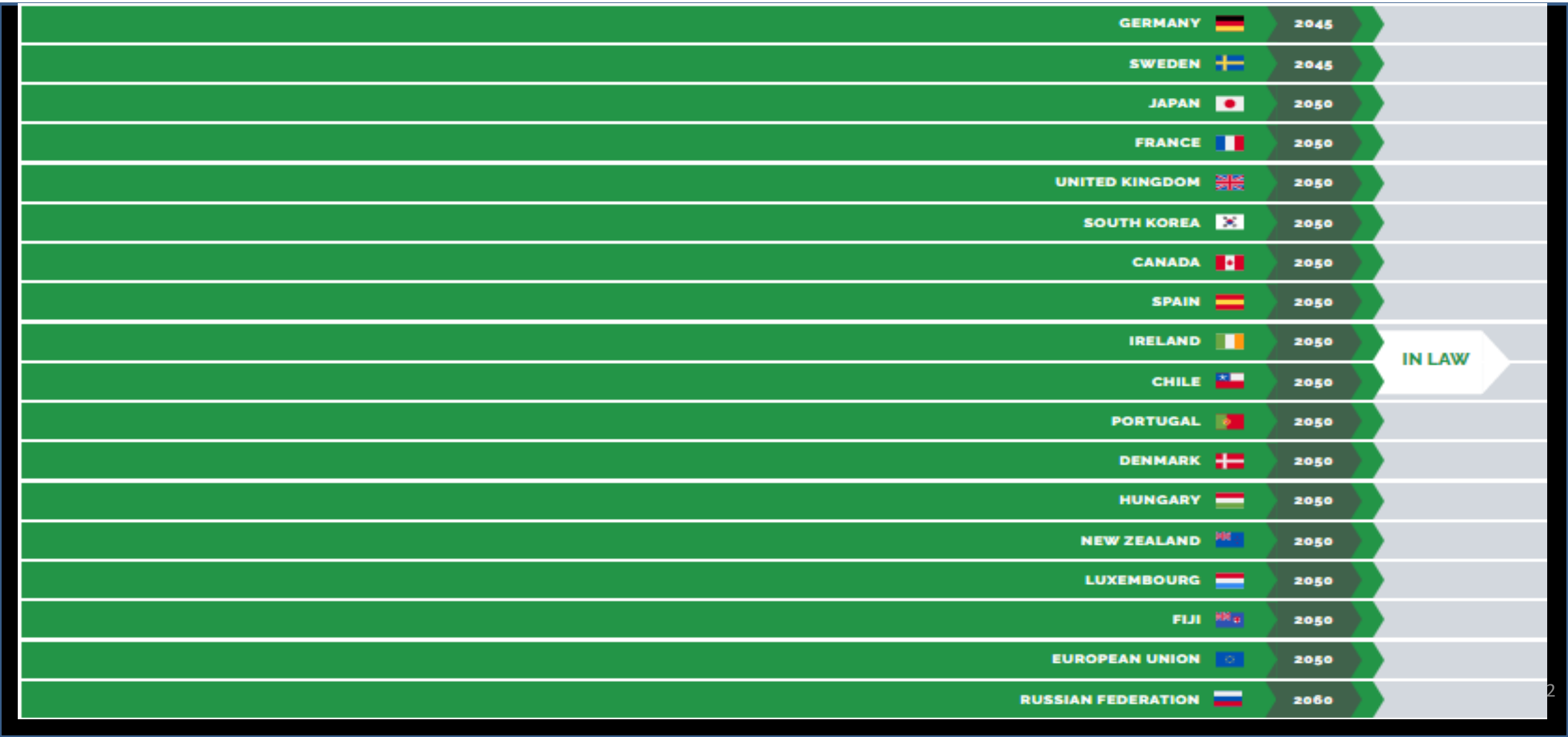
The '**net**' in net zero is important because it will be very difficult to reduce all emissions to zero on the timescale needed.

Net-Zero Coverage

- 137 Countries have pledged to become Net Zero
  - 83% of the global Emissions
  - 91% of global GDP
  - 80% of global Population
- Three of the world's smallest nations – Bhutan, Suriname and Panama – stood out from the rest by showing that they absorb more greenhouse gas than they emit.
- India has pledged net zero commitments by the year **2070**.



Countries Implementing NetZero in Law



Most emissions come from just a few countries

3%

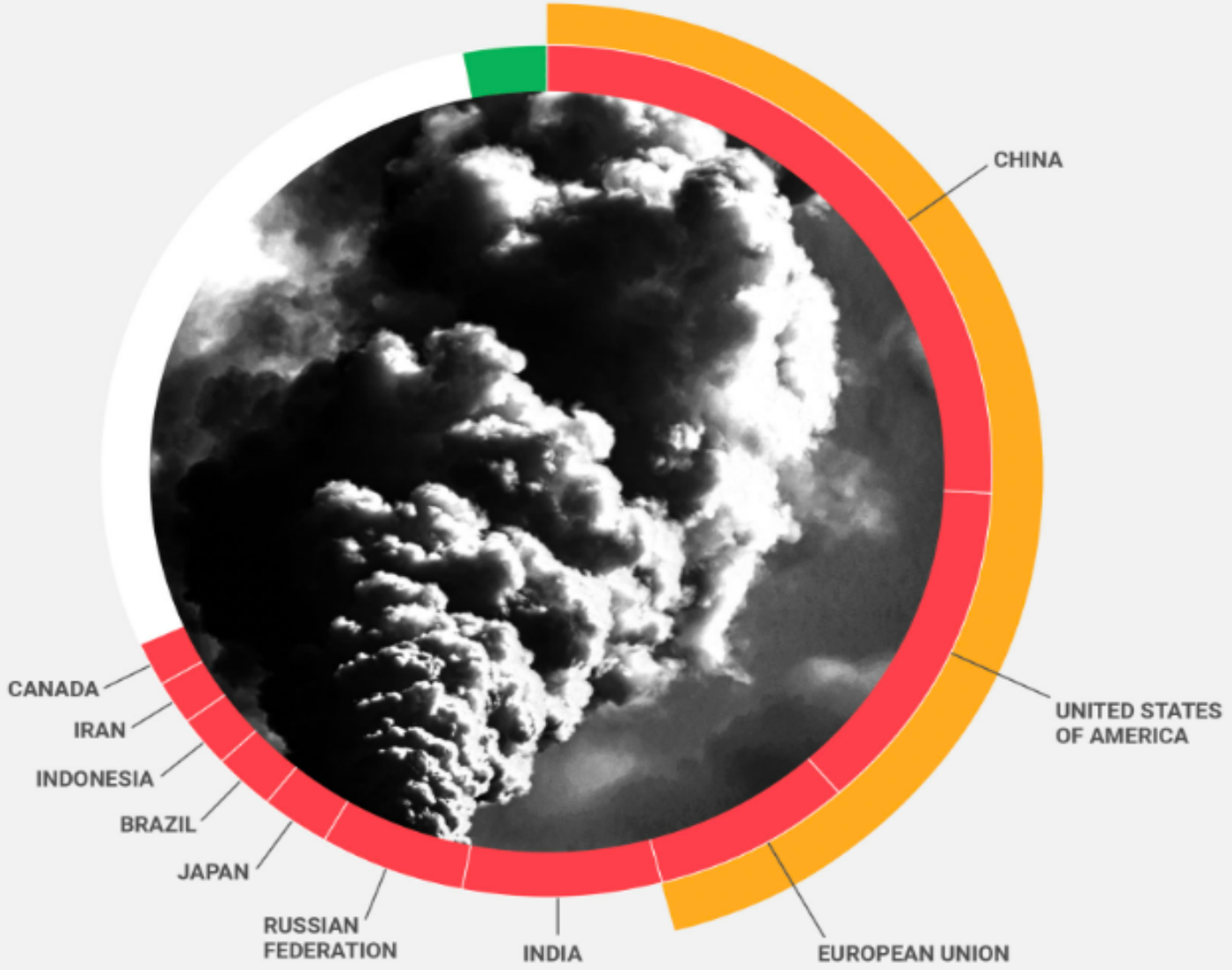
Contribution of the 100 least-emitting countries

68%

The 10 largest greenhouse gas emitters contribute over two-thirds of global emissions

46%

The top 3 greenhouse gas emitters contribute 16 times the emissions of the bottom 100 countries



Important Trends

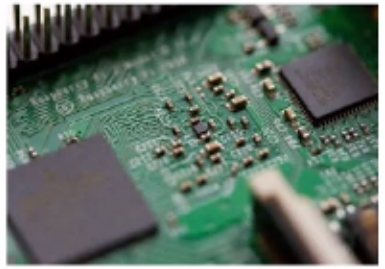
Integrating ESG

Valuing Human Capital

Responding to climate change

Safeguarding natural systems

Building sustainable & resilient supply chains



Enabling sustainable consumption and production

Applying technology to sustainability

Protecting fundamental rights

Shaping policy, regulation, and norms

Moving towards stakeholder capitalism

Source: DJSI 2021

India's Contribution to GHGs

- Historically (From Year 1750 to 2020) world has emitted cumulative GHG emissions of 1696.5 billion metric tons of CO_2 equivalent.
- Meanwhile India has emitted only 54.4 billion metric tons of CO_2 equivalent which is only 3.2% of the world.
- In 2020 world has emitted total GHG emissions of 34.81 billion metric tons of CO_2 equivalent, meanwhile India has emitted only 2.44 billion metric tons of CO_2 equivalent.
- About 17% of world's population lives in India but country contributes to only 7% of the world GHG emissions in 2021.

Getting to Net Zero COP-26 (Glasgow) Commitments

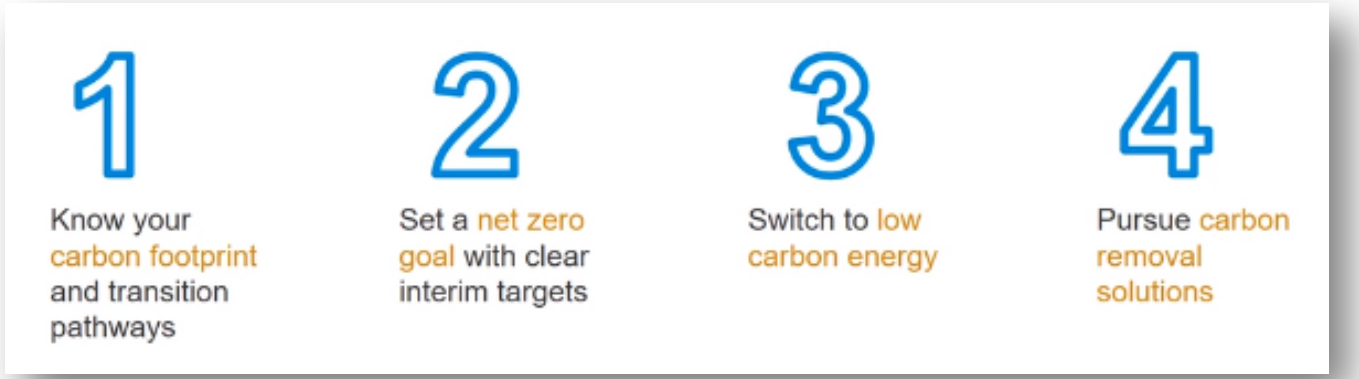
To achieve net zero and keep 1.5C within reach, actions have been proposed during the COP26 summit. So far, **more than 100 leaders have pledged to stop and reverse deforestation by 2030.**

India’s climate commitment at COP26, Glasgow

1. Enhance non-fossil fuel energy capacity to **500 GW** by 2030
2. Meet **50%** of energy requirements from renewable energy by 2030
3. Reduce total projected carbon emissions by **1 billion tonnes** from now onwards till 2030
4. Reduce carbon intensity of its economy by **less than 45%** by 2030
5. Achieve **net zero** by 2070

With India’s COP26 pledges, the policy environment will gear up to support shift to renewable energy

Define Climate Strategy



To achieve net zero emissions or percentage emission reduction

Note: For aligning to global requirement to contain global warming to 1.5^{0}C from pre-industrial level, net emissions should drop to zero by 2050. For restricting warming to 2^{0}C, emissions should drop to zero by 2070. In 1.5^{0}C scenario, industrial emission should reduce by 65-90% by 2050 as compared to 2010 levels. For 2^{0}C scenario emissions should reduce by 50-80% in the same interval. May make phased target for 2025 / 2030 / 2040 / 2050 and beyond.

Increasing share of low carbon products / reducing product related emissions / investing in green technology – Targets for 2050

Note: For aligning to global requirement to reduce emissions by containing global warming to 1.5^{0}C from pre-industrial level, renewable energy should be 70-85% of total electricity in 2050. Fossil fuel consumption with carbon capture and storage (CCS) and nuclear energy would increase. Share of gas would be 8% and coal would see steep reductions.

ESG Disclosures

- Global reporting Initiative (GRI): Covered in Sustainability Report
- United Nations Global Compact (UNGC): Covered in Sustainability Report
- International Integrated Reporting Council **(**IIRC): Covered in Integrated Annual

  Report (IAR)
- SEBI's Business Responsibility & Sustainability Report (BRSR): Covered in Integrated Annual

  Report (IAR)
- Climate Disclosure Project (CDP)
- Dow Jones Sustainability Index (DJSI)

OUR Approach to net zero

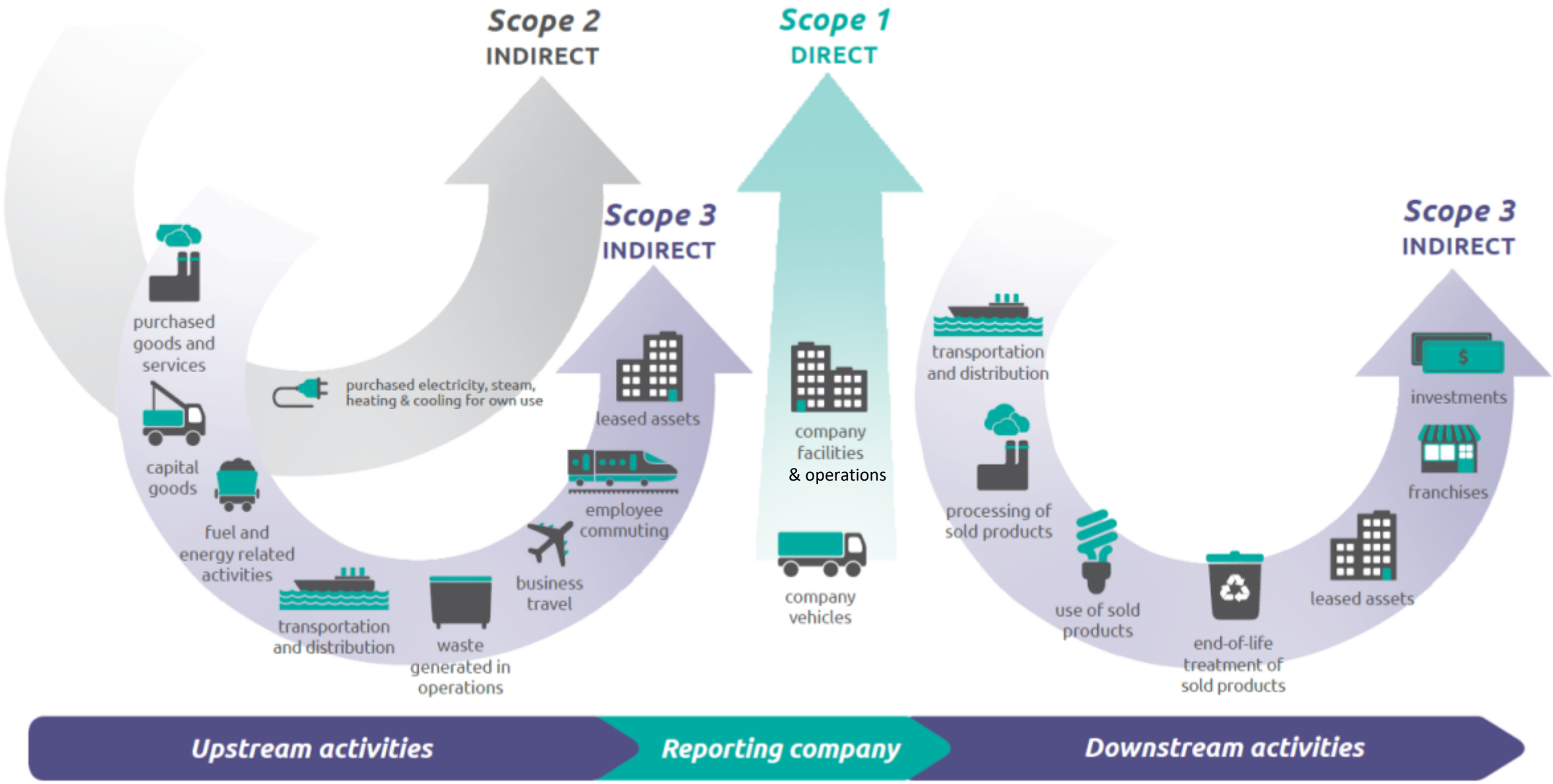
Setting Net Zero Targets

"India is committed to achieve Net-zero Carbon emissions across its wholly-owned operated assets by **2070**
To achieve this ambition, IndianOil is undertaking efforts towards:

- Operational Excellence
- Switch to Low Carbon Fuels
- Green Hydrogen
- Renewable Power / Biofuels
- Innovative & Emerging Technologies
- Nature based Solutions
- Long-term stakeholder value creation

IndianOil will continue to share its climate action strategy and roadmap with its stakeholders with an aim to achieve **Net Carbon Zero target by 2046**.

GHG Emission Scope



what are the scopes of carbon emissions?

scope 1

PFCS SF6 CH4 CO2 HFCS N2O

GREENHOUSE GAS EMISSIONS

Scope 1 emissions are direct greenhouse (GHG) emissions that occur from sources that are controlled or owned by an organization (e.g., emissions associated with fuel combustion in boilers, furnaces, vehicles).

SOURCE: EPA.GOV

SCOPE 1
Direct Emissions from Reporting Company

greenworldwide SHIPPING

scope 2

CO2 CH4 PFCS SF6 N2O HFCS

GREENHOUSE GAS EMISSIONS

Scope 2 emissions are indirect GHG emissions associated with the purchase of electricity, steam, heat, or cooling and are a result of the organization's energy use.

SOURCE: EPA.GOV

SCOPE 2
Indirect Emissions from Upstream Activities

greenworldwide SHIPPING

scope 3

CO2 CH4 SF6 PFCS HFCS N2O

GREENHOUSE GAS EMISSIONS

SCOPE 3
Indirect Emissions from

Upstream Activities
Purchased Goods & Services
Capital Goods
Fuel & Energy Related Activities
Transportation & Distribution
Waste Generated in Operations
Business Travel
Employee Commuting
Leased Assets
and...

Downstream Activities
Transportation & Distribution
Processing of Sold Products
Use of Sold Products
End-of-Life Treatment of Sold Products
Leased Assets
Franchises
Investments

Scope 3 emissions are all indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions.

SOURCE: EPA.GOV

greenworldwide SHIPPING

Mitigation Option: Timelines

Short Term

1-2 Years

- Complete GHG inventory
- Firming Mitigation Targets / Plans incl. phased targets
- ENCON Schemes (in progress)
- Renewable Energy

Medium Term

2-5 Years

- ENCON Schemes
- Switch to NG
- Conversion to imported grid electricity (upto approved infra)
- Tree Plantation
- CCUS
- Renewable Energy

Long Term

5-10 years

- Boiler / Furnace Efficiency
- Grey to green hydrogen
- Conversion to imported grid electricity
- NG to CBG / Green Hydrogen
- Tree Plantation
- CCUS
- Renewable Energy

Natural Investment Cycle

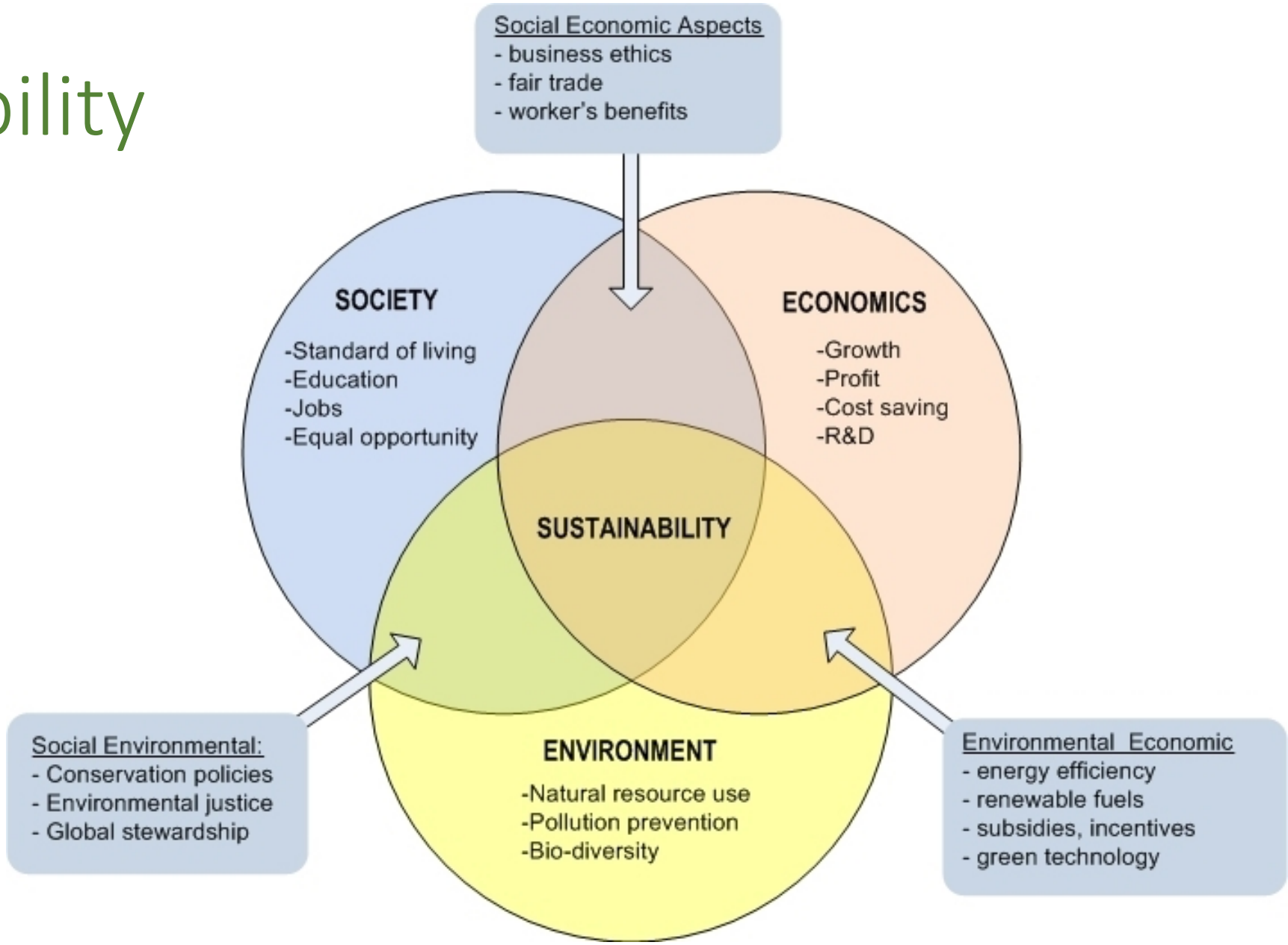
> 10 years

- Improving Boiler / Furnace efficiency
- Grey to green hydrogen
- Maximizing grid power import
- Improve Distillate Yield
- NG to CBG / Green Hydrogen
- Tree Plantation
- CCUS
- Renewable Energy

Other than Environment ….
More on sustainability

Sustainability is not just environmentalism. Embedded in most definitions of sustainability we also find concerns for social equity and economic development.

Sustainability



ESG Landscape

The ESG landscape is evolving rapidly with increasing focus on "Outcome" rather than just "Intentions"

Stakeholders are increasingly interested in knowing - **"How do you make profits" rather than "How much profits do you make"**

Why "ESG" is becoming mainstream?

- **Investors** are increasingly committed to responsible investment- invest in companies that are responsible, sustainable and resilient.
- **Regulators** are setting high social, governance and environmental standards for companies.
- **Consumers** are more connected, more aware and more demanding- increasingly embracing brands that align with their social values..
- **Retaining talented staff**, millennials who will make up 75% of working force in four years- more so the 'Gen Z' are prioritising purpose over salaries and publicly calling out irresponsible behaviour.
- **Aggressive activism and negative** perception can have substantial impact on business.- the cost of non compliance can be exorbitant ranging from ousting of CEOs to closure of facilities

89%

of investors say their firm has changed its voting and/or engagement policy to be more attentive to ESG risks

Source: Edelman

2/3

of institutional investors believe that ESG will become "industry standard" within 5 years

Source: NATIXIS INVESTMENT MANAGERS

$20T

BoA estimate of ESG market demand in the next two decades

Source: CNBC Article

~4000

Global institutional funds have pledged to UN PRI (Principles for Responsible Investments).

Source: UNPRI.org

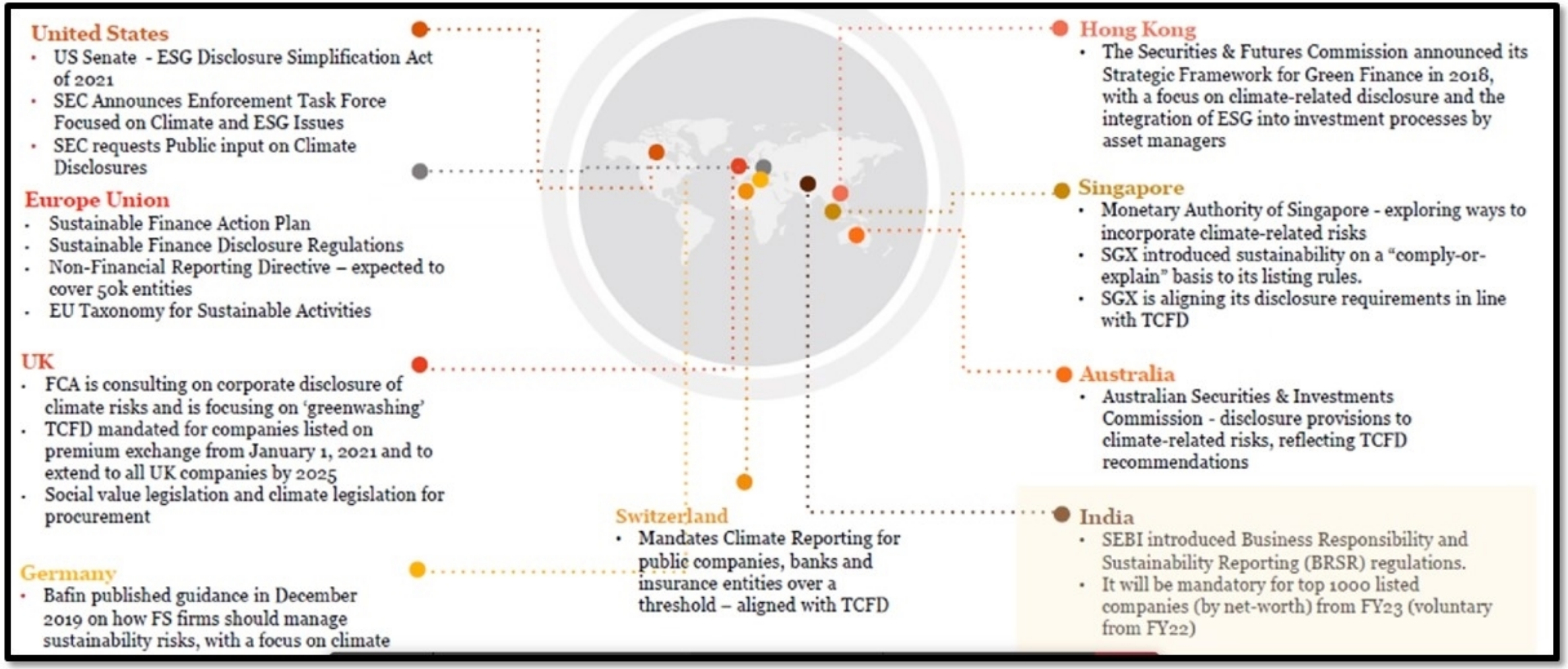
88%

of consumers in India were willing to purchase a more sustainable product once they were made aware of the sustainability issues

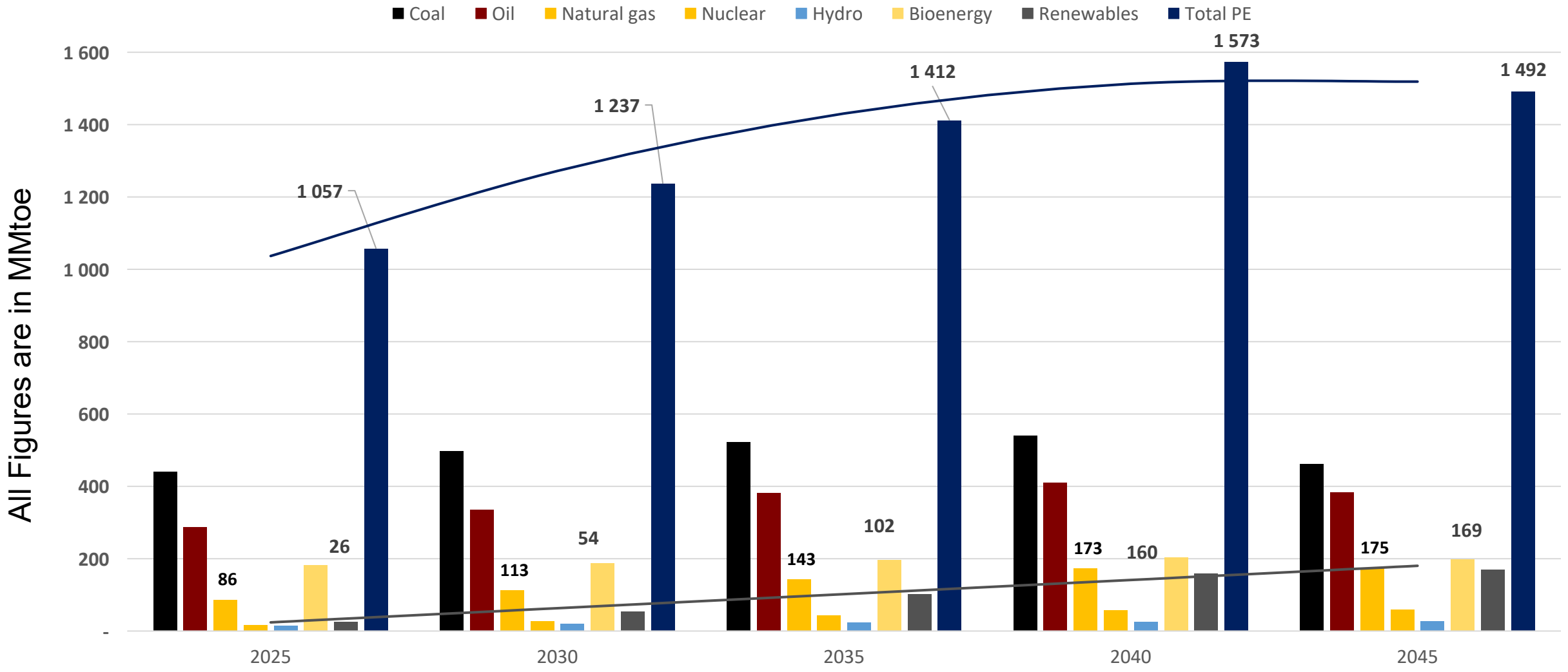
64%

Of Indian consumers say that buying sustainable products makes them feel happy about their purchases

Tightening ESG compliance across the world



Primary Energy Mix – India

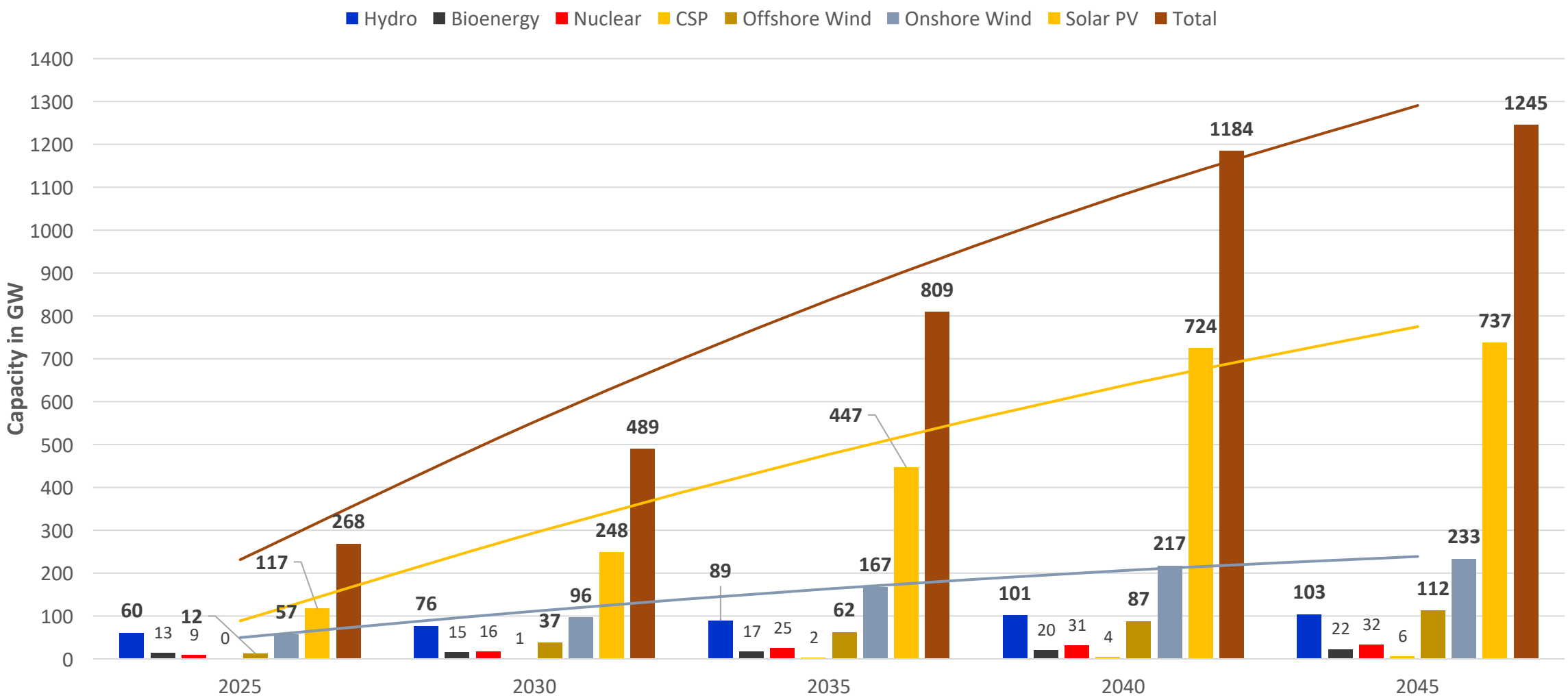


Renewables would continue to grow

Source: WEO (IEA) STEPS till 2035; 2040 – India Vision Case; 2045 - SDS

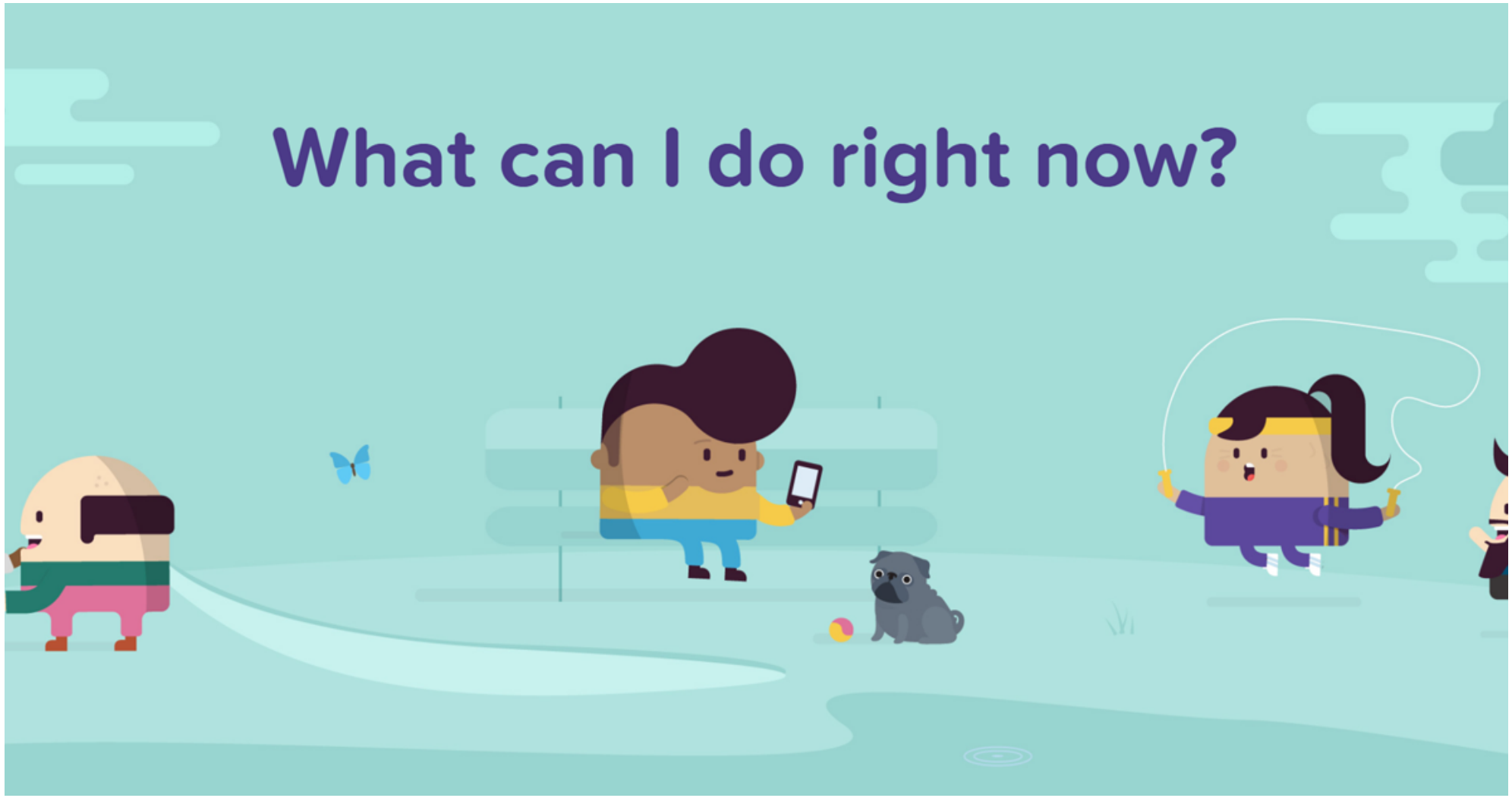
WEO (IEA) Feb 2021 Study – Solar and Onshore wind included in Renewables

Clean Energy Capacity Growth in India



India has to ride the growth wave till 2040-45

Source: WEO (IEA) STEPS till 2035; 2040 – India Vision Case; 2045 – SDS; Offshore Wind Projection: MNRE Strategy Paper (July'22) – Target 37 GW by 2030, 5GW addition per year up to 2045.


What can I do right now?

Every step starts with an individual

"You have taken away my dreams, my childhood with your empty words. How dare you?"

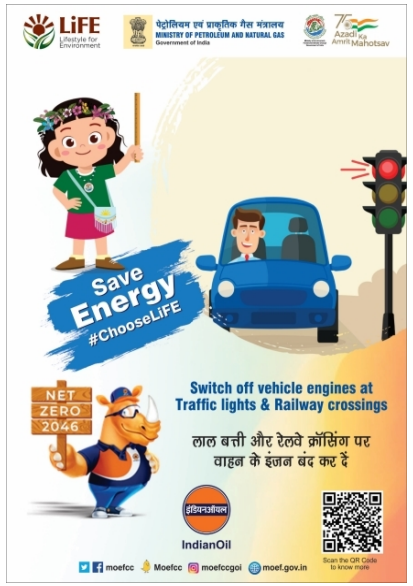
"Adults keep saying: 'We owe it to the young people to give them hope.' But I don't want your hope. I don't want you to be hopeful. I want you to panic. I want you to feel the fear I feel every day. And then I want you to act."

What can we do …

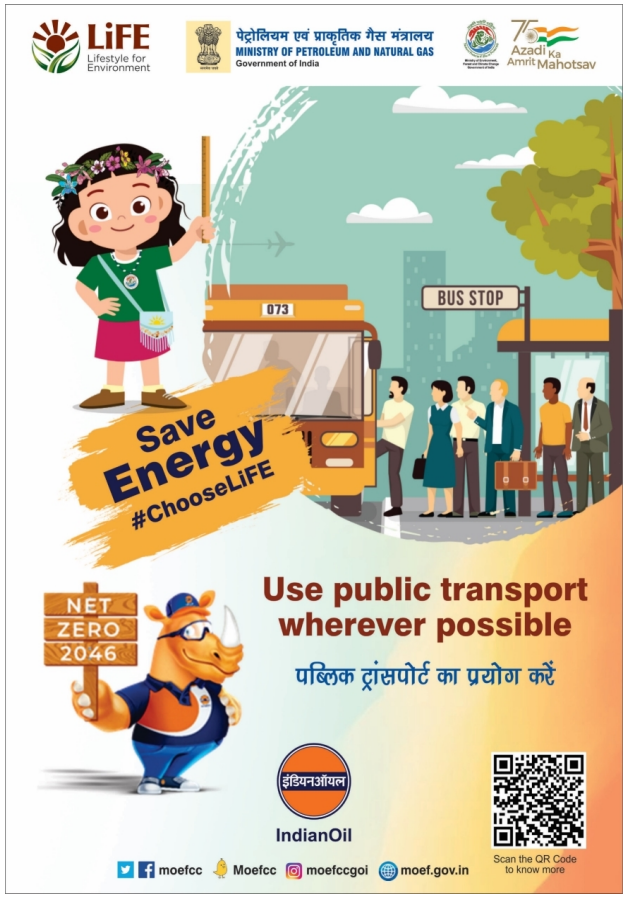
- Palpable everyday steps in daily routine
  - At Home: Saving energy, Saving resources, not wasting, reusing, Carry cloth bag, Train others
  - Carbon footprint mapping
  - At work: following safety and work protocols, Saving energy, Saving resources, better work ethics, train others, Carbon footprint mapping and making events carbon neutral

  https://www.tatapower.com/sustainability/sustainability-initiatives/customer/calculate-carbon-footprints.aspx

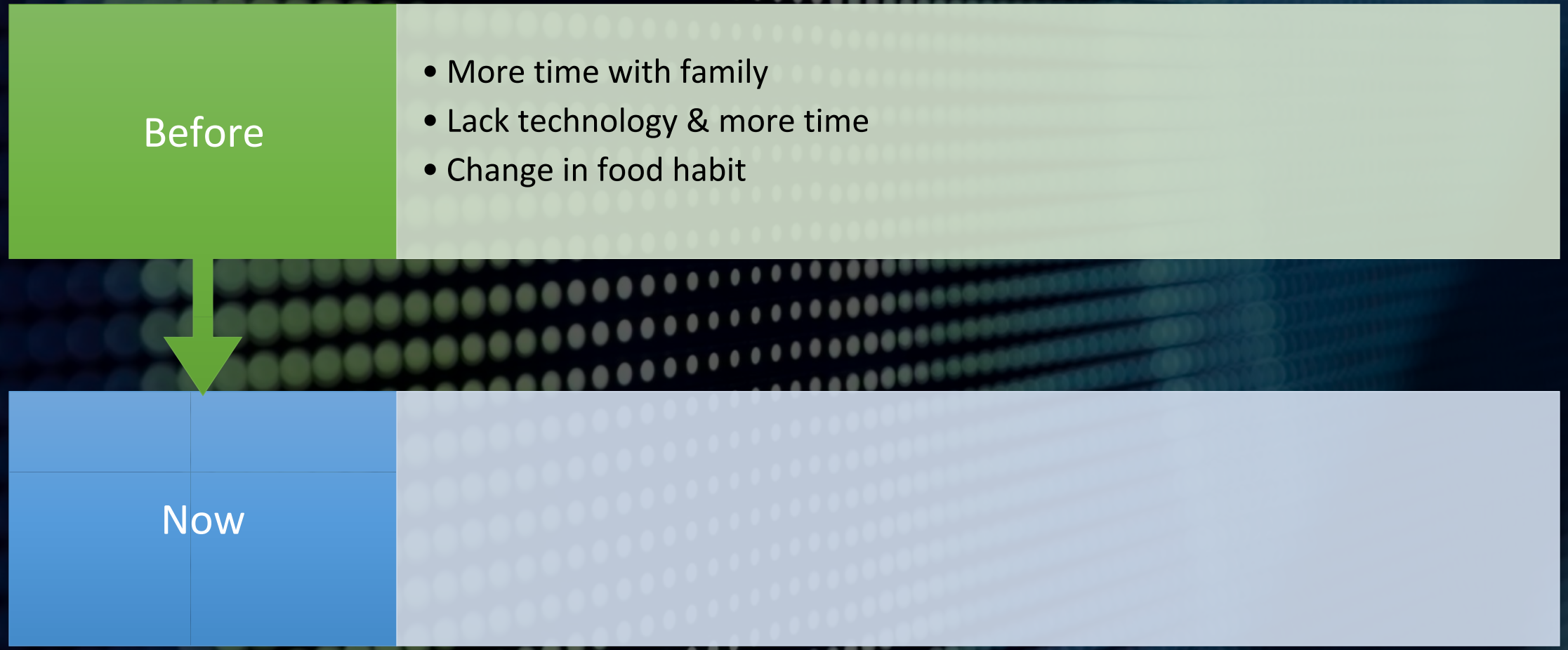
  https://www.carbonfootprint.com/calculator.aspx
  - At Society: lead by example, respect.



LiFE
Lifestyle for Environment



Lets open our hearts




All the best for your journey to leave
a better and sustainable tomorrow
But before we depart….

A quality time with life, will fill your life with quality

Appreciate life , be respectful, be grateful …

this will increase longevity and sustain life..

Till we meet again…

- Avdhesh Hans