Environment and energy – Some developments

Aditi Chaubal

aditichaubal@iitb.ac.in

Background

Year	Important events recognizing the impact on the environment
1972	United Nations Environment Programme (UNEP) estd. to act as a catalyst, advocate, educator and facilitator to promote the sustainable development of the global environment.
1988	**Intergovernmental Panel on Climate Change (IPCC)**, a UN body for assessing the science related to climate change established. 1990 – IPCC First Assessment Report
1992	**UN Framework Convention on Climate Change (UNFCCC)** adopted at the Rio Earth Summit; intergovernmental treaty developed to address the problem of climate change. Enacted in 1994 after ratification by 50 countries.
1995	1st **Convention of Parties (COP 1)** meeting held in Berlin [Berlin Mandate] Supreme decision-making body of the Convention.
1997 (Enacted in 2005)	**Kyoto Protocol** – Parties commit to take internationally binding emission reduction targets. Protocol places a heavier burden on developed nations under the principle of "common but differentiated responsibilities." **India ratified the protocol in 2002**.

Background...

Year	Some of the major COP meetings
2007	**COP 13 (Bali)**: Introduction of Nationally Appropriate Mitigation Actions (NAMA), to engage developing countries in voluntary mitigation effort.
2009-10	**COP 15 & 16 (Copenhagen and Cancun):** Comprehensive international system for collective action and major developing countries (including India) announced voluntary mitigation pledges
2013	**COP 19 (Warsaw):** Intended nationally determined contributions (**INDC**) to be prepared and presented by all members to present at COP 21
2014	**COP 20 (Lima):** Nature of INDCs relaxed – need not be mitigation centric and could include other components as per country priorities
2015	**COP 21 – Paris Agreement**: universal agreement adopted by 195 countries & EU to turn INDCs into public policies and investment plans for mitigation and adaptation, and ensure implementation.

https://unfccc.int/process/bodies/supreme-bodies/conference-of-the-parties-cop

India @ COP 21 (Paris Agreement)

- **COP 21**: Includes objectives to peak greenhouse gas emissions as soon as possible, to limit the global average temperature increase above pre-industrial levels to well below 2°C, and to pursue efforts to limit the increase to 1.5°C.

India's INDCs:

- represent targets and actions for the post-2020 period. India ratified its contribution in October 2016.
- comprehensive and balanced: includes adaptation, mitigation, requirement for finance, technology transfer, capacity building

India @ COP 21 (Paris Agreement)

- **India's first NDC** includes commitments:
  - to **reduce the emissions intensity of its GDP by 33-35%** from **2005 levels by 2030.**
  - to achieve about 40% cumulative electric power installed capacity from **non-fossil fuel based energy resources by 2030** with the help of transfer of technology and low cost international finance including from Green Climate Fund (GCF).
  - to **create an additional carbon sink of 2.5 to 3 bn tonnes of CO_2 equivalent** through additional forest and tree cover by **2030.**
  - to **better adapt to climate change** by enhancing investments in development programmes in sectors vulnerable to climate change, particularly agriculture, water resources, Himalayan region, coastal regions, health and disaster management.

Reduce Emission Intensity of GDP

Goal:

- to reduce the emissions intensity of its GDP by 33 - 35% by 2030 from 2005 level.
- (represents a 75% jump in ambition over 2020)

- Thrust on renewable energy and promotion of clean energy; enhancing energy efficiency
- Climate resilient urban centres and sustainable green transportation network

Increase the Share of Non Fossil Fuel Based Electricity

Goal:

- To achieve 40% of electric power installed capacity from non-fossil fuel by 2030
- (represents jump of 33% over non-fossil fuel capacity of 2015)

- The 175 GW target by 2022 will result in abatement of 326 million tons of CO2 equivalent/year.
- To include wind power, solar, hydropower, biomass, waste to energy and nuclear power.
- Solarization of petrol pumps, toll plazas, airports etc. across country

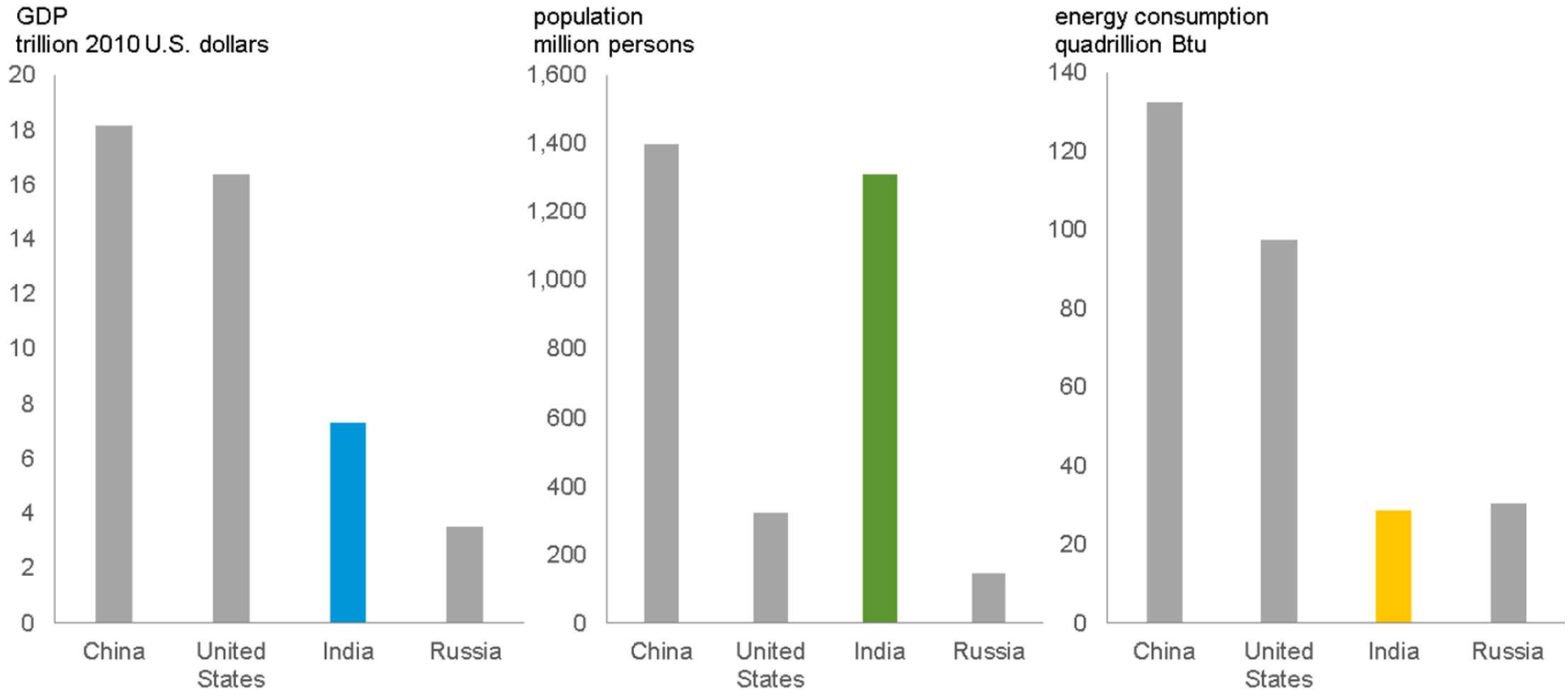
Ministry of Environment, Forests and Climate Change

- Nodal agency of the Central Government for the planning, promotion, coordination and overseeing the implementation of India's environmental and forestry policies and programmes.
- Nodal agency for various international programmes and agreements that India is a part, including membership of multilateral bodies of. E.g. United Nations Environment Programme (UNEP).
- Broad objectives include
    - Conservation and survey of flora, fauna, forests and wildlife
    - Prevention and control of pollution
    - Afforestation and regeneration of degraded areas
    - Protection of the environment and
    - Ensuring the welfare of animals

The Environment (Protection) Act

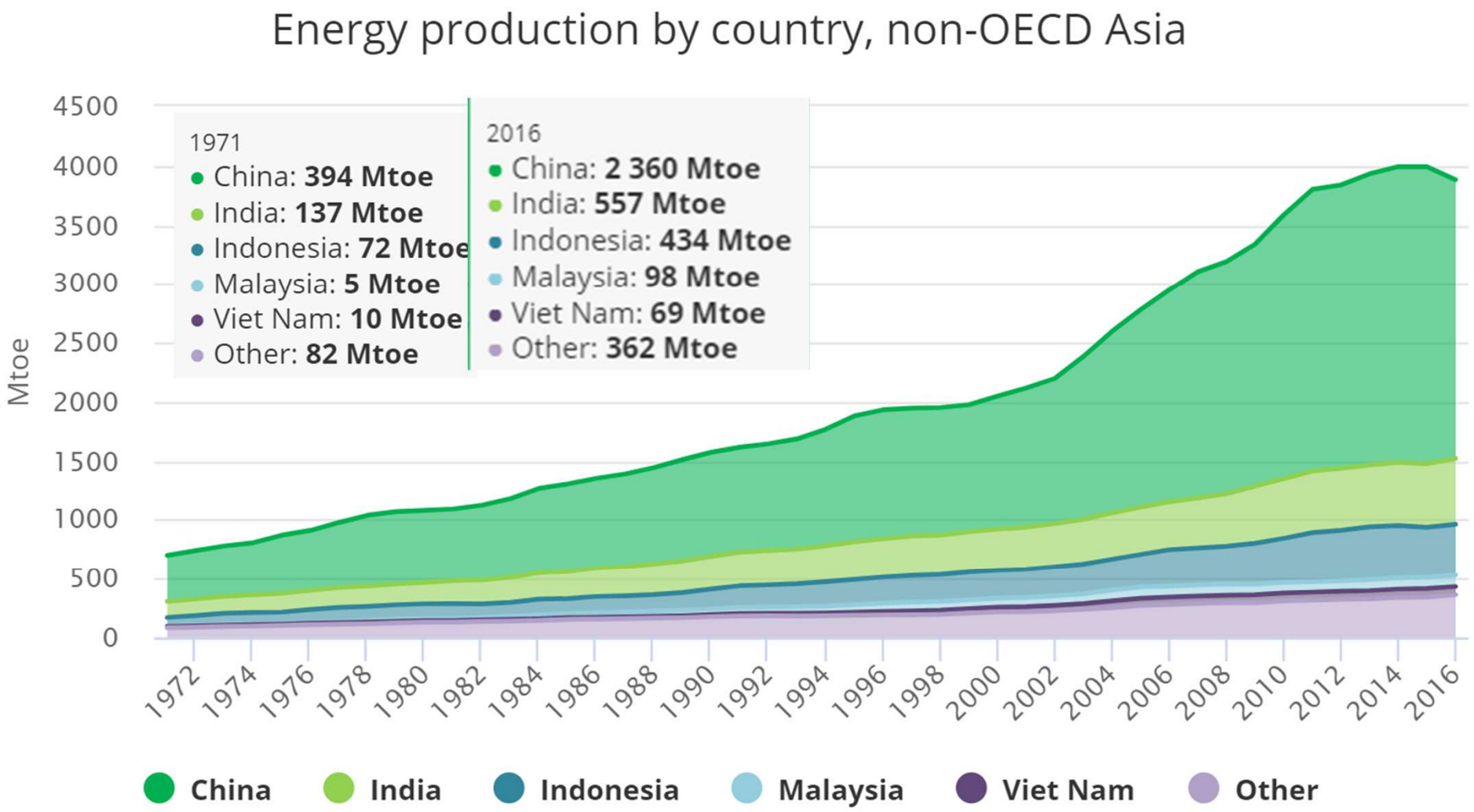
- **The Environment (Protection) Act** was enacted in 1986 with the objective of providing for the protection and improvement of the environment (following the Bhopal gas tragedy in 1984).
- It empowers the Central Government to establish authorities charged with the mandate of preventing environmental pollution in all its forms and to tackle specific environmental problems that are peculiar to different parts of the country.
- The Act covers: coastal regulation zones, environmental standards, water pollution, hazardous substance management, wildlife protection etc.
- **The Air (Prevention and Control of Pollution) Act** was enacted in 1981 to provide for the prevention, control and abatement of air pollution in India. (Enforced by the Central Pollution Control Board)

Figure 1: Gross domestic product, population, and energy consumption in four countries, 2015



Sources: U.S. Energy Information Administration, World Energy Projection System Plus (2018)

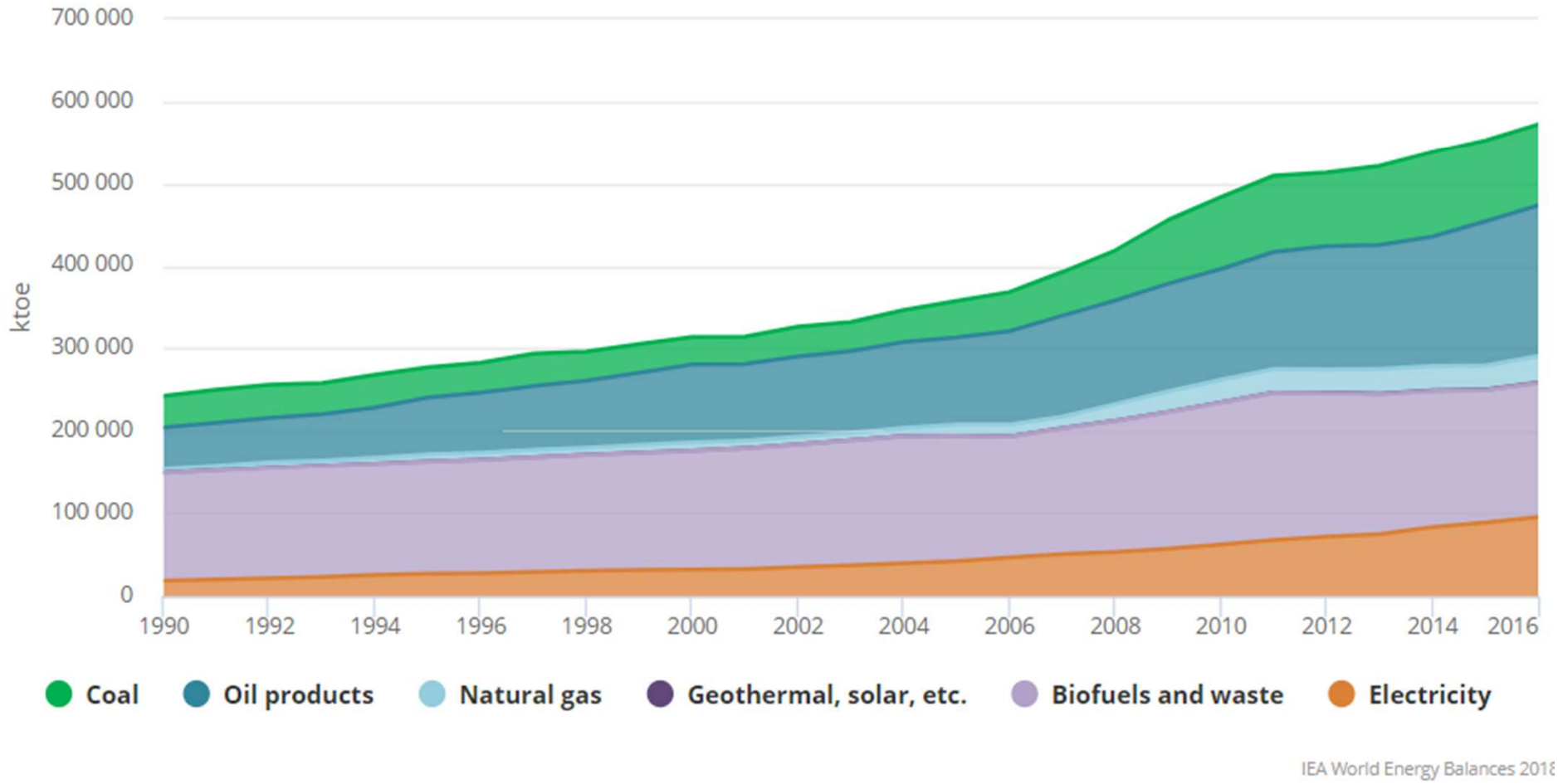
Ref: International Energy Outlook (2018), Energy implications of faster growth in India with different economic compositions, US Energy Information Administration



Ref: https://www.iea.org/statistics/balances/

Total Final Consumption (TFC) by source

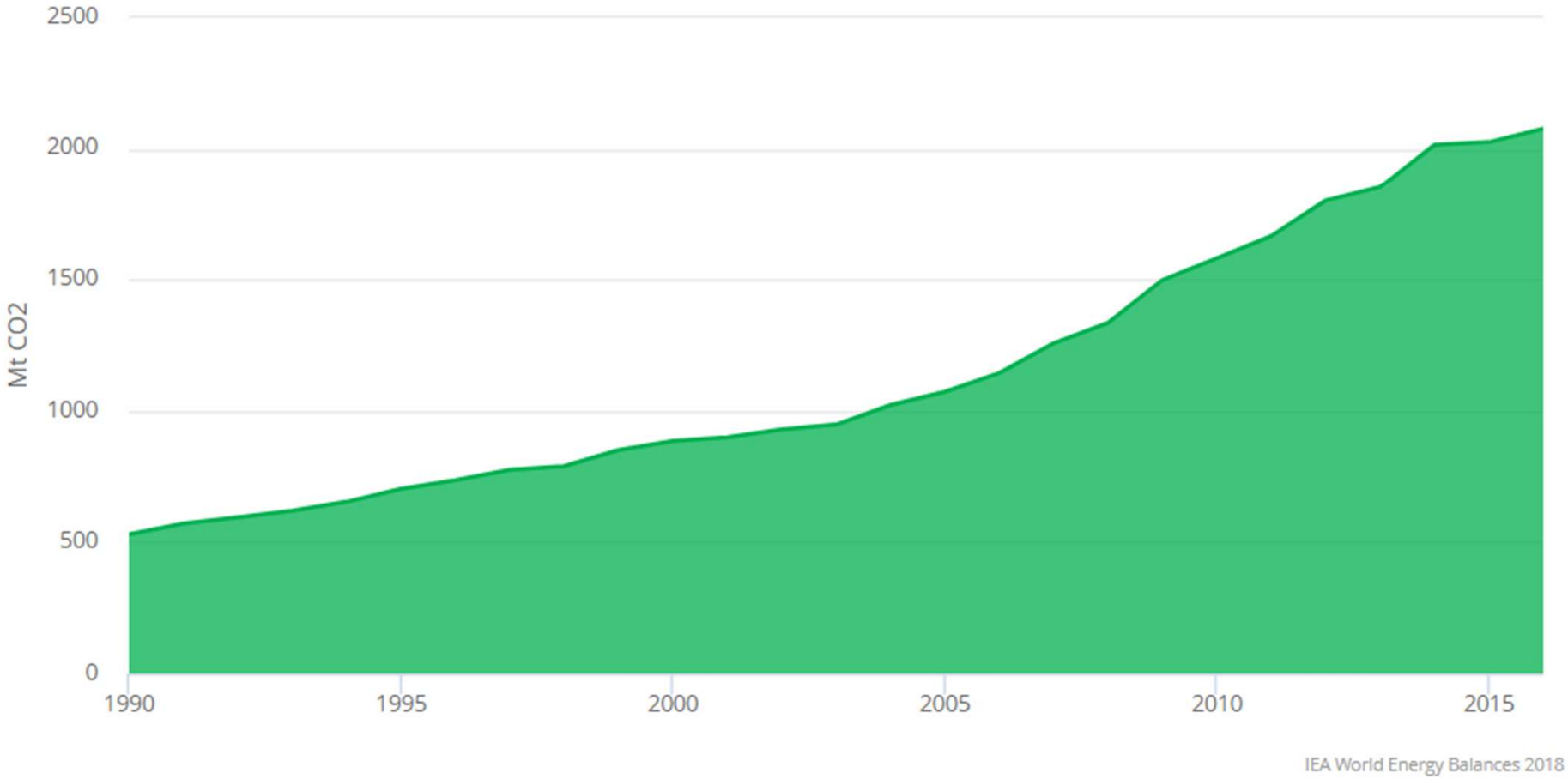
India 1990 - 2016



Ref: https://www.iea.org/statistics/balances/

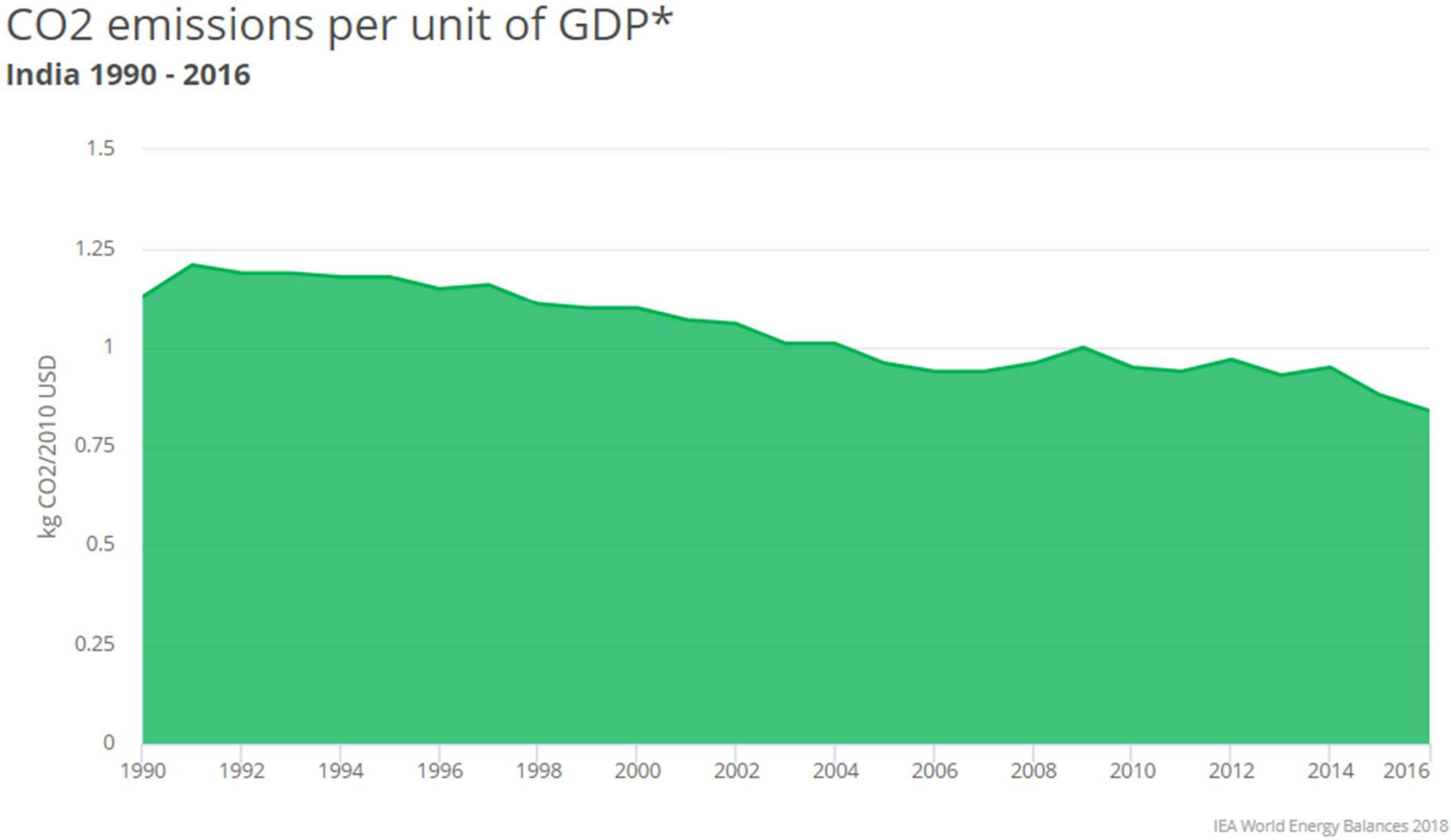
CO2 emissions*

India 1990 - 2016



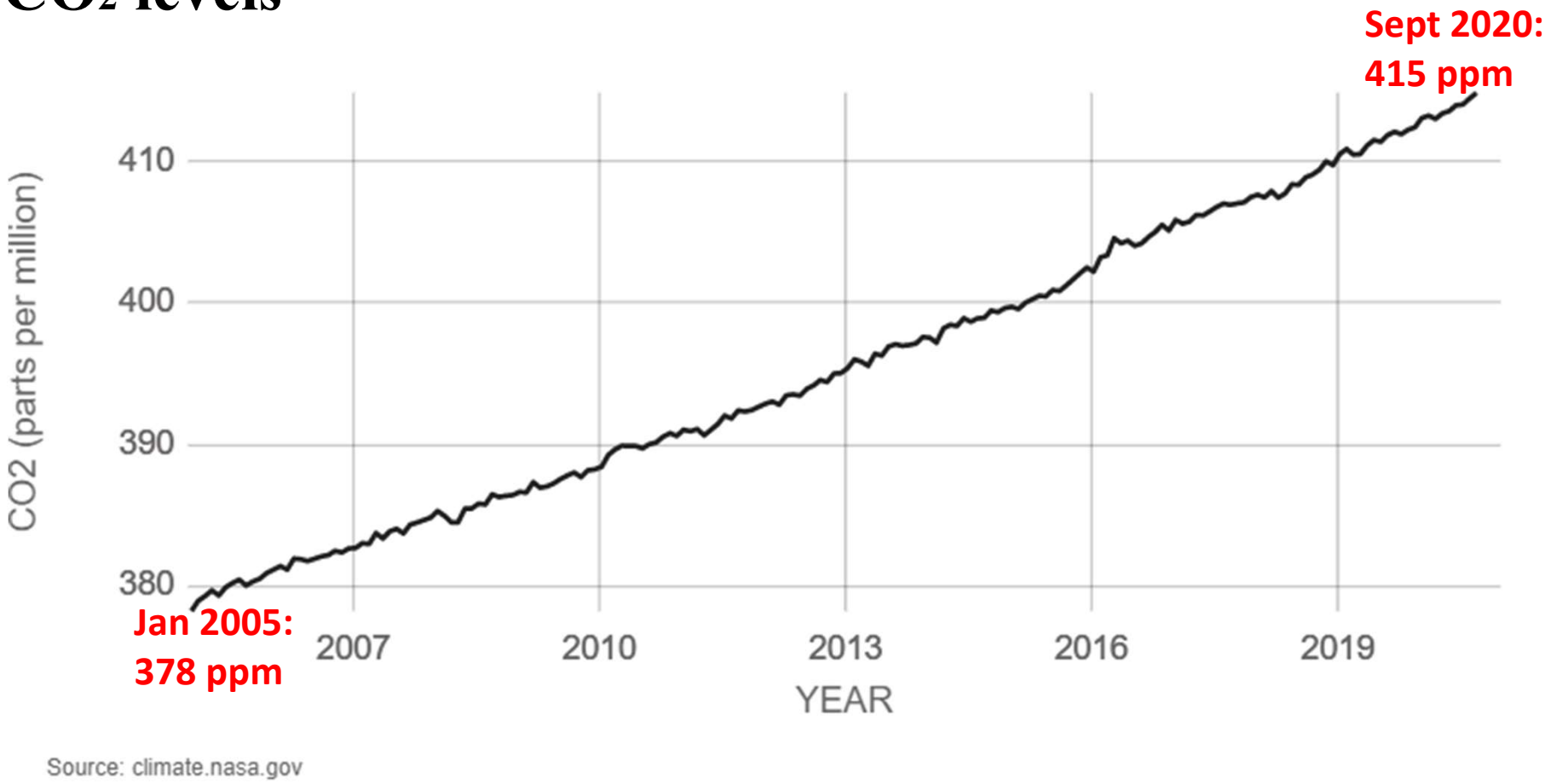
** CO2 Emissions from fuel combustion only. Emissions are calculated using IEA's energy balances and the 2006 IPCC Guidelines.*

Ref: https://www.iea.org/statistics/?country=INDIA&year=2016&category=Emissions&indicator=CO2ByGDP&mode=chart&dataTable=INDICATORS



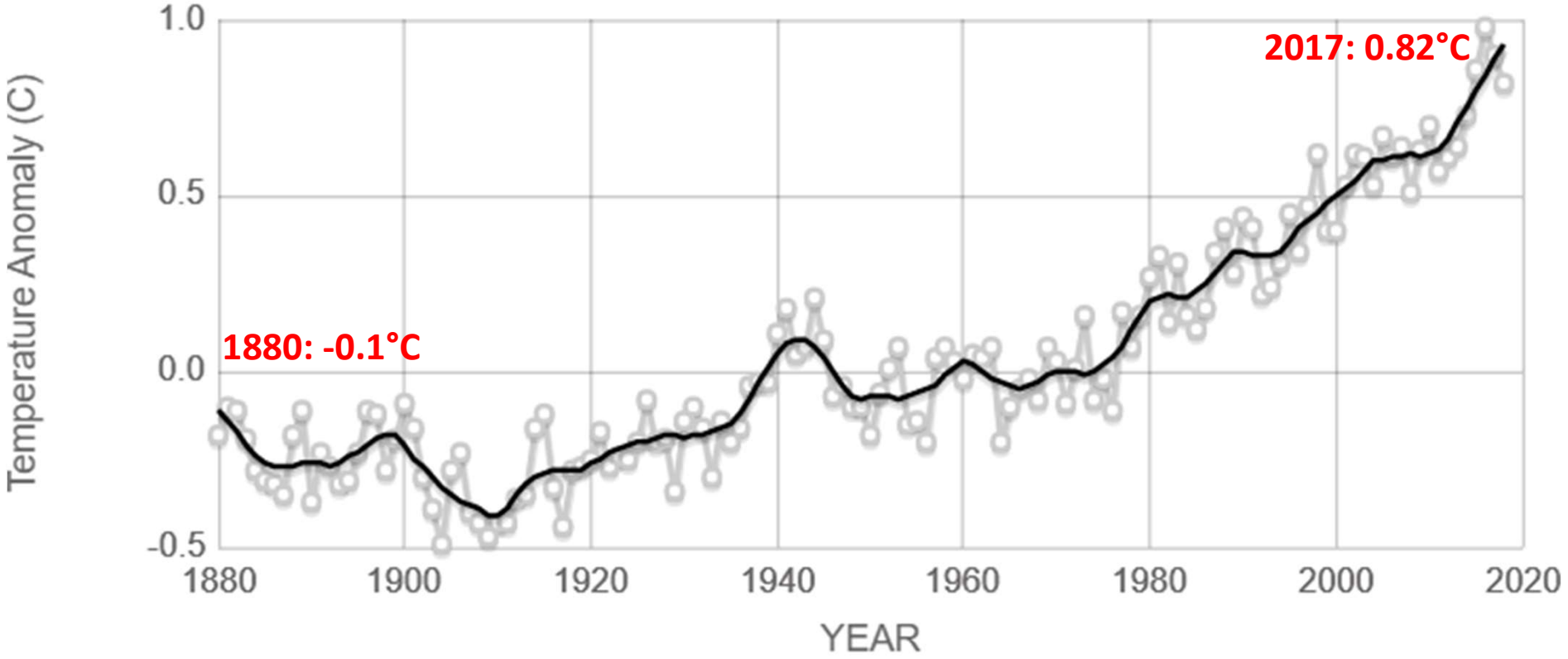
Ref: https://www.iea.org/statistics/?country=INDIA&year=2016&category=Emissions&indicator=CO2ByGDP&mode=chart&dataTable=INDICATORS

CO_2 levels



Data source: Data source: Monthly measurements (average seasonal cycle removed)
https://climate.nasa.gov/vital-signs/carbon-dioxide/

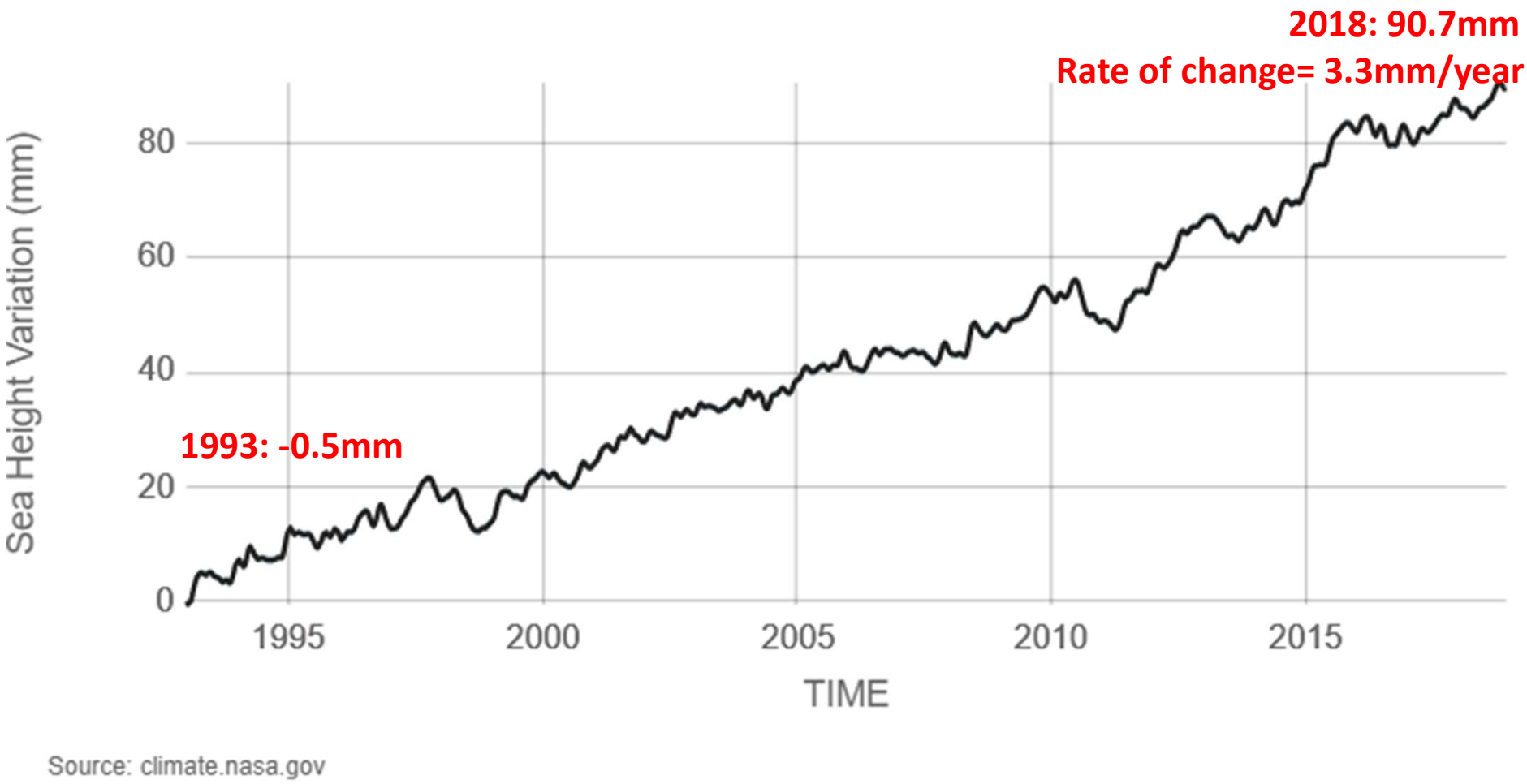
Global Land-Ocean Temperature Index



Source: climate.nasa.gov

Data source: NASA's Goddard Institute for Space Studies (GISS).
Credit: NASA/GISS https://climate.nasa.gov/vital-signs/global-temperature/

Sea Level



Data source: Satellite sea level observations.
Credit: NASA Goddard Space Flight Center https://climate.nasa.gov/vital-signs/sea-level/

Covid and Energy demand

- Drastic curtailment of global economic activity and mobility **during the first quarter of 2020** pushed down global energy demand by 3.8% relative to the first quarter of 2019.
- If lockdowns last for many months in the near future and recoveries are slow across much of the world, as is increasingly likely, **annual energy demand will drop by 6% in 2020,** wiping off the last five years of demand growth.
- Such a decline has not been seen for the **past 70 years**. If efforts to curb the spread of the virus and restart economies are more successful, the decline in energy demand could be limited to under 4%. However a bumpier restart, disruption to global supply chains, and a second wave of infections in the second part of the year could curtail growth even further.
- Countries with higher share of services in the economy and the greater stringency of lockdowns resulted in weather corrected demand reductions averaging close to 25%, reaching above 30% in some cases.

Covid and Energy demand

- **Case for India:**
- India's full national lockdown has reduced energy demand by almost 30%, meaning that with each additional week of lockdown, annual energy demand is reduced by 0.6%. Overall we estimate that an additional month of the restrictions in place as of early April would reduce global annual energy demand by around 1.5%.
- The impact on **Q1 2020 energy demand in India was modest**, with demand increasing by 0.3 relative to Q1 2019. The major impact of India's lockdown on weekly energy demand was only felt after the country moved into lockdown towards the end of March. As the lockdown continues, the impacts on energy demand are set to be notably larger Q2 2020.
- **Advanced economies**:
- It is advanced economies that will experience the greatest declines in energy demand in 2020. In both the European Union and the United States, demand in 2020 is likely to fall around 10% below 2019 levels, almost double the impact of the global financial crisis.

- Source: https://www.iea.org/reports/global-energy-review-2020/global-energy-and-co2-emissions-in-2020#abstract

References

- http://envfor.nic.in/division/environment-protection
- https://www.greenclimate.fund/who-we-are/about-the-fund
- http://pib.nic.in/newsite/PrintRelease.aspx?relid=128403
- https://www.iea.org/statistics/?country=INDIA&year=2016&category=Emissions&indicator=TotCO2&mode=chart&dataTable=INDICATORS
- https://www.iea.org/countries/India/
- https://www.eia.gov/international/analysis/country/IND
- https://unfccc.int/cop3/fccc/info/backgrod.htm#:~:text=The%20COP%20held%20its%20first,for%20meeting%20the%20Convention's%20objective.

Thank you