

Climate Change & India



Centre for Science and Environment
New Delhi



-
- **How has India warmed over the past 117 years?**
 - **How the temperatures have increased seasonally?**
 - **How far away we are from 1.5 degree C target?**



Methodology

- **117 years (1901-1916) data on annual and seasonal mean, maximum & minimum temperature from IMD**
- **1901-1930 average temperature considered as baseline**
- **Temperature anomaly calculated as departure from the baseline**



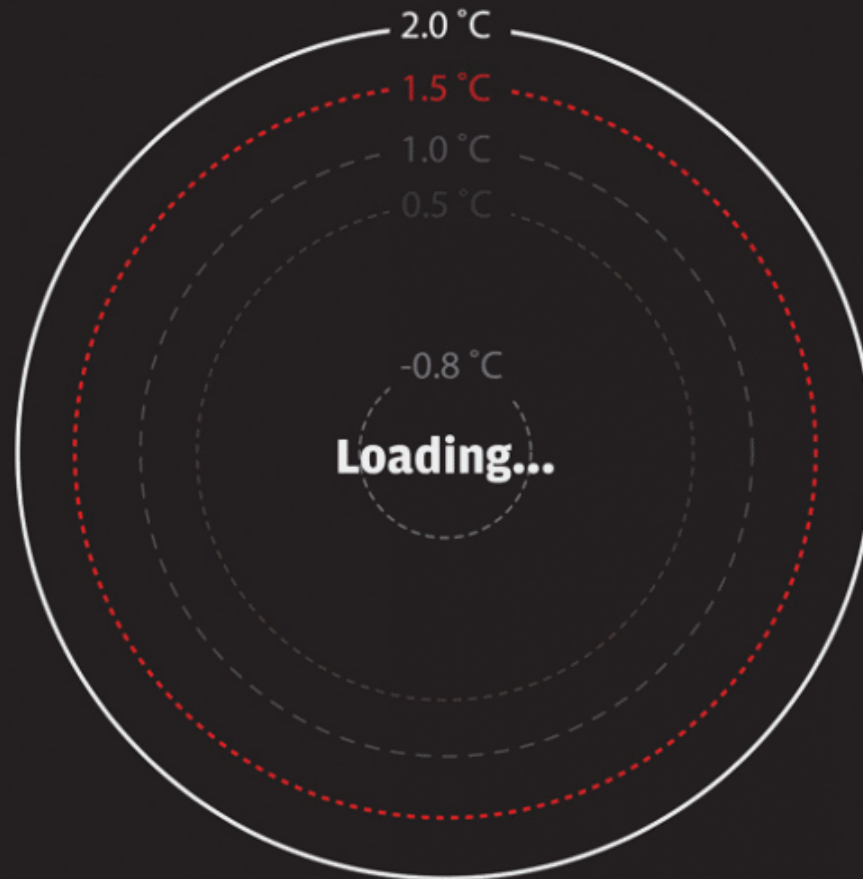
Spi

ure

SPIRALLING TEMPERATURE

ANNUAL WARMING TRENDS IN INDIA

1901 - 2016



ANNUAL TEMPERATURE ANOMALIES FROM 1901-1930 BASELINE

@CSEINDIA

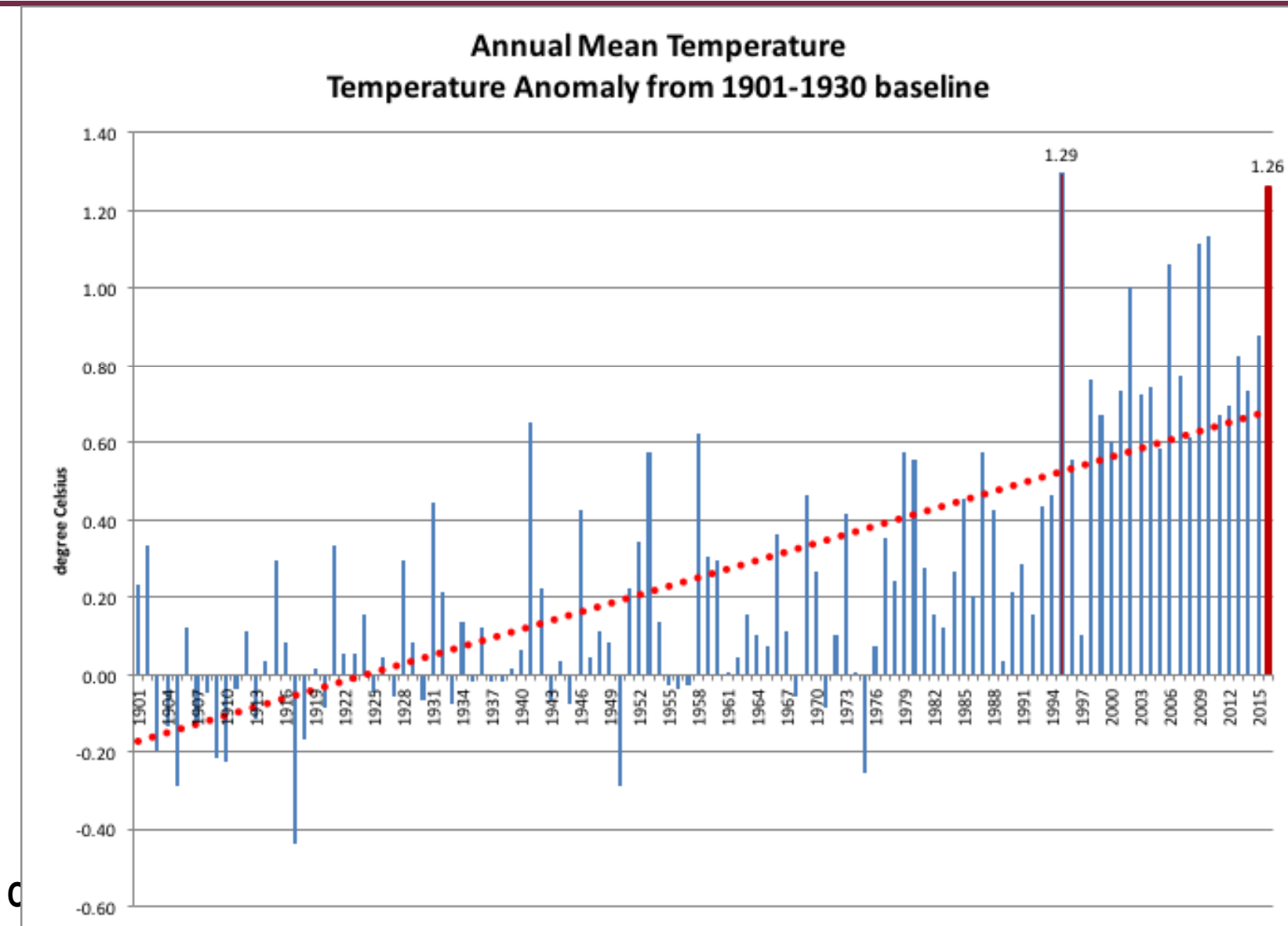
CENTRE FOR SCIENCE AND ENVIRONMENT

DATA SOURCE: INDIAN METEOROLOGICAL
DEPARTMENT, PUNE

Centre for Science and



Spiraling Temperature





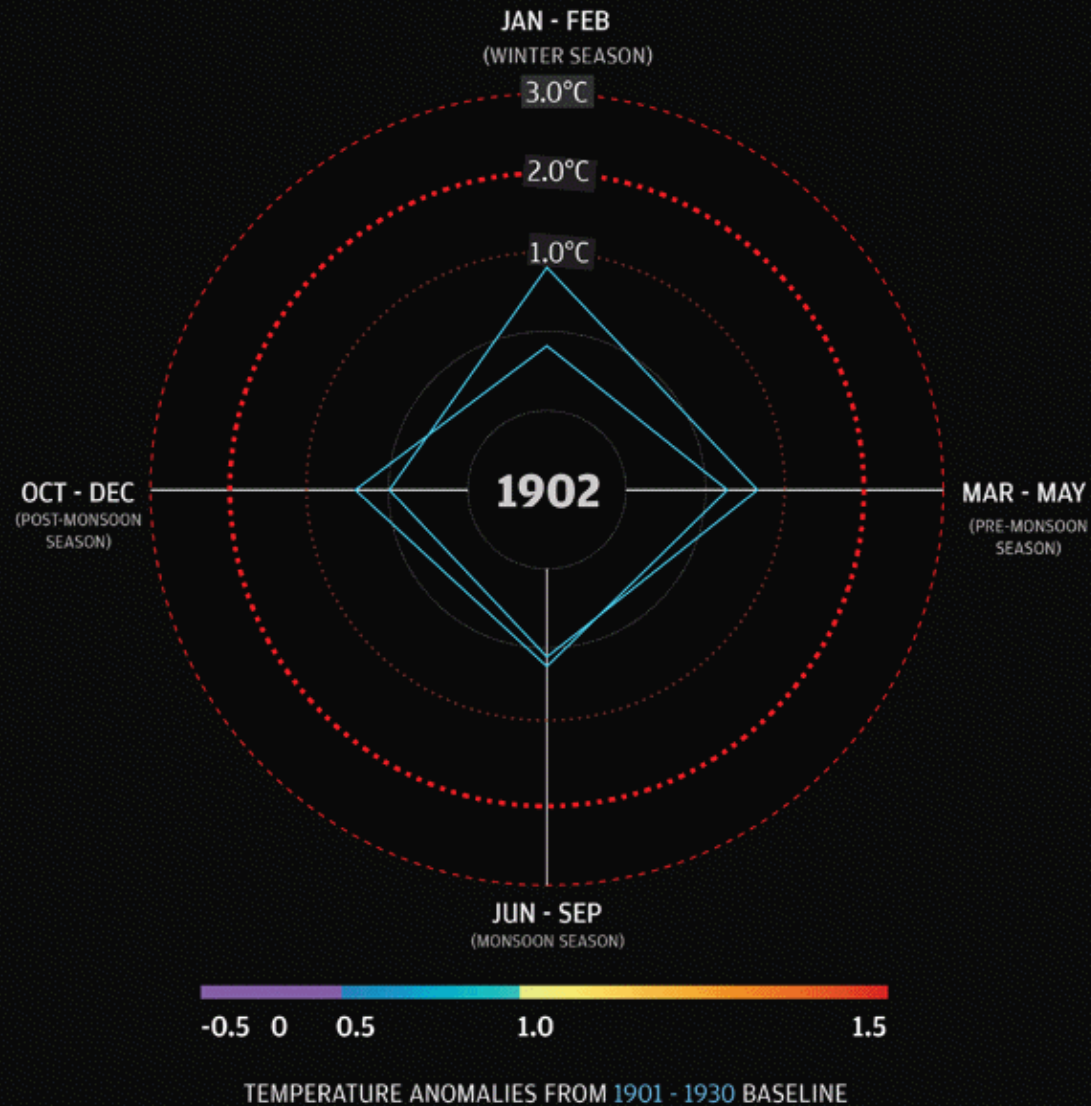
Sp

e

SPIRALLING TEMPERATURE

SEASONAL WARMING TRENDS IN INDIA

1901 - 2017



Centre for Science

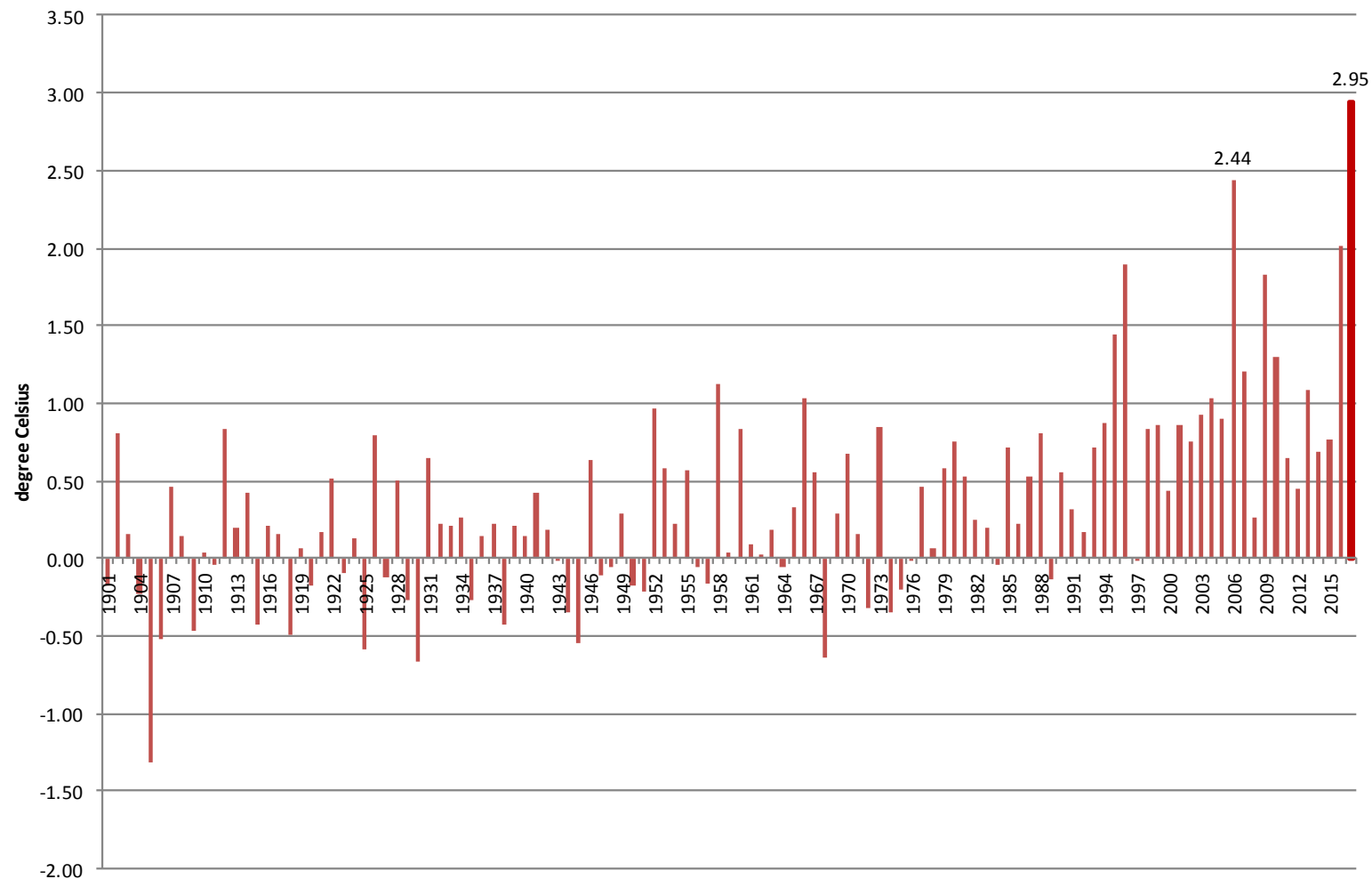
@CSEINDIA
CENTRE FOR SCIENCE AND ENVIRONMENT

DATA SOURCE: INDIA METEOROLOGICAL
DEPARTMENT, PUNE



Spiraling Temperature - Winters

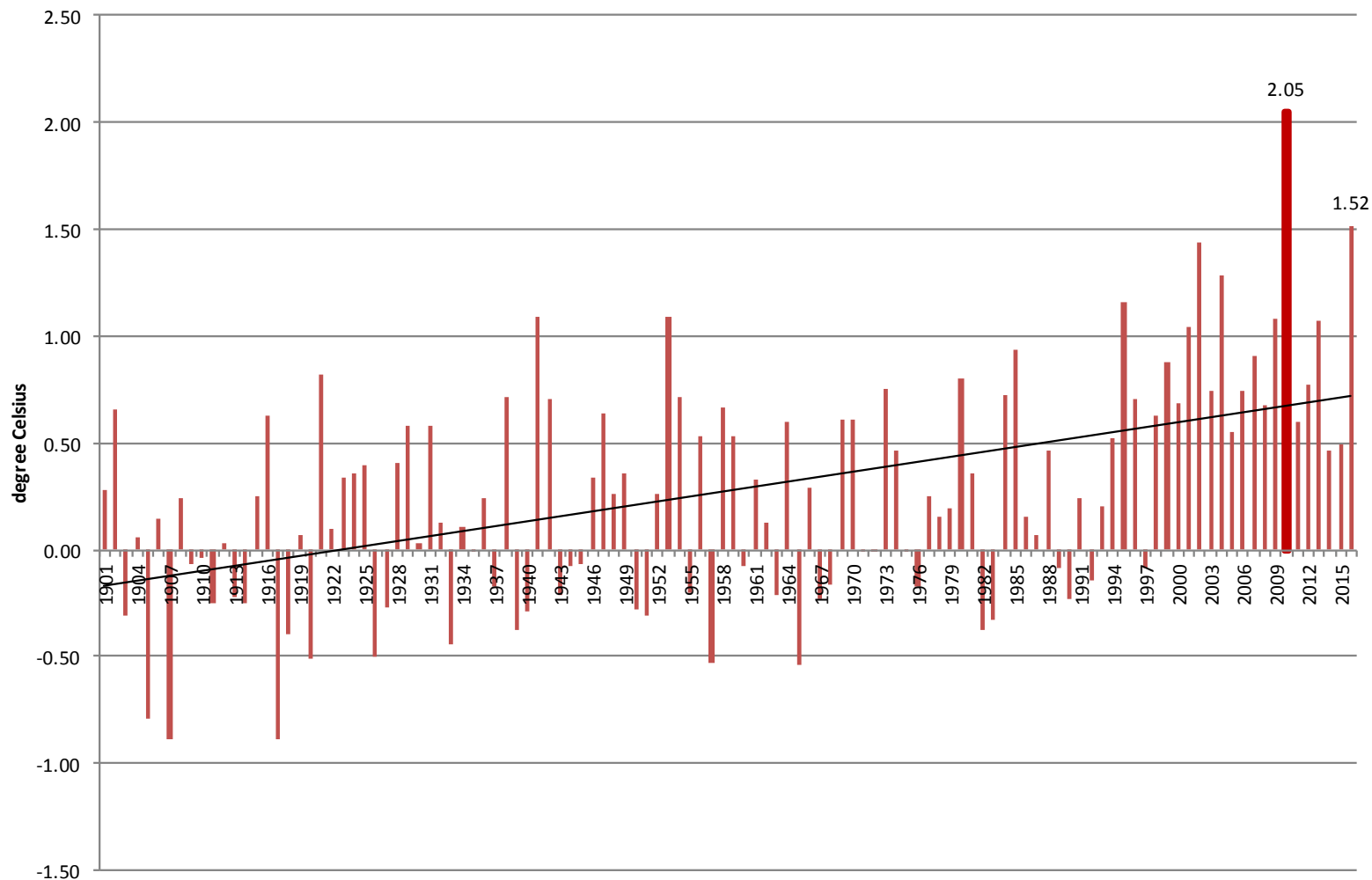
Temperature Anomaly in Winter Season (January-February)
from 1901-1930 Baseline





Spiraling Temperature - Summers

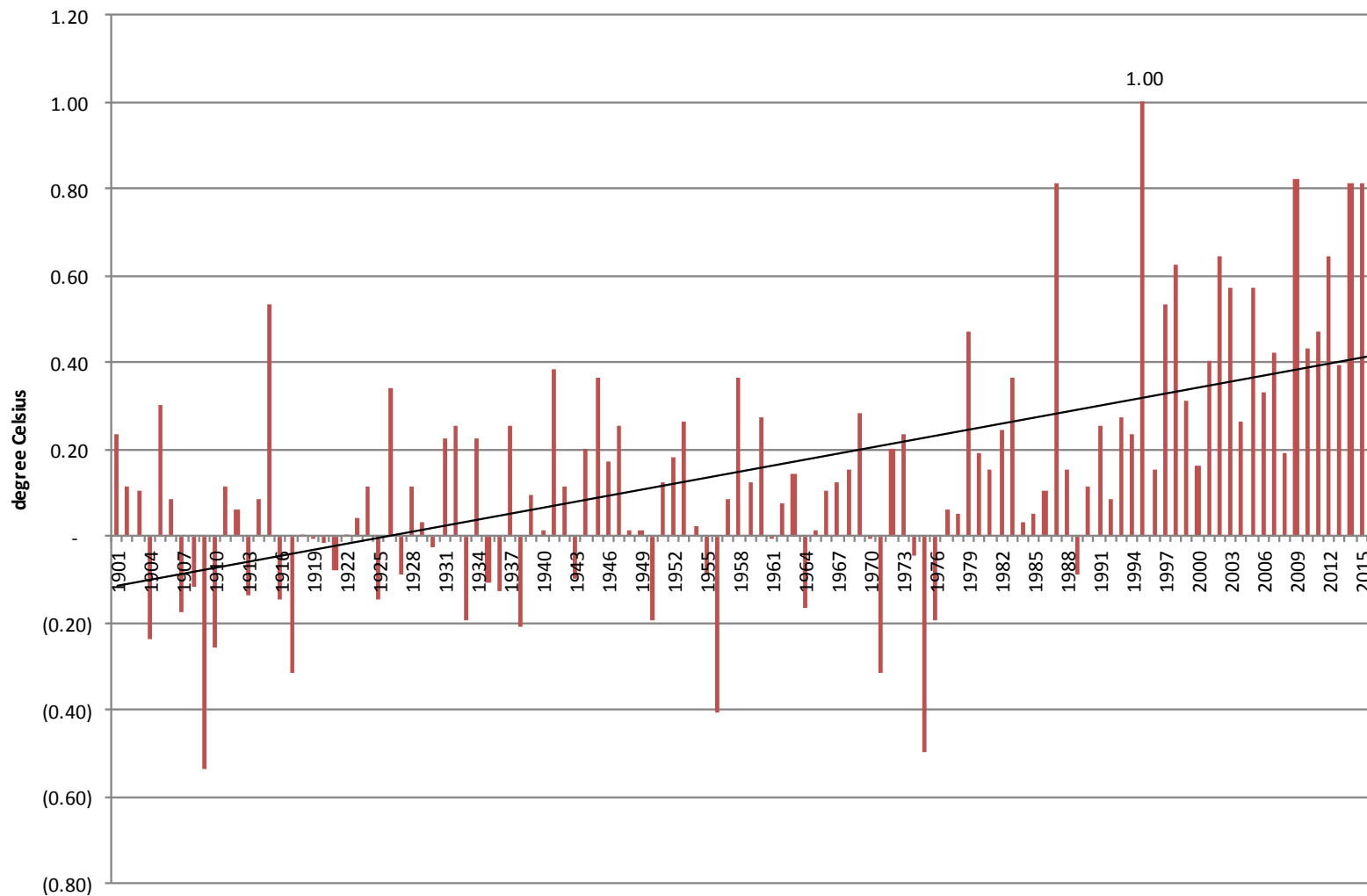
Temperature Anomaly in Pre-Monsoon Season (March-May)
from 1901-1930 Baseline





Spiraling Temperature - Monsoon

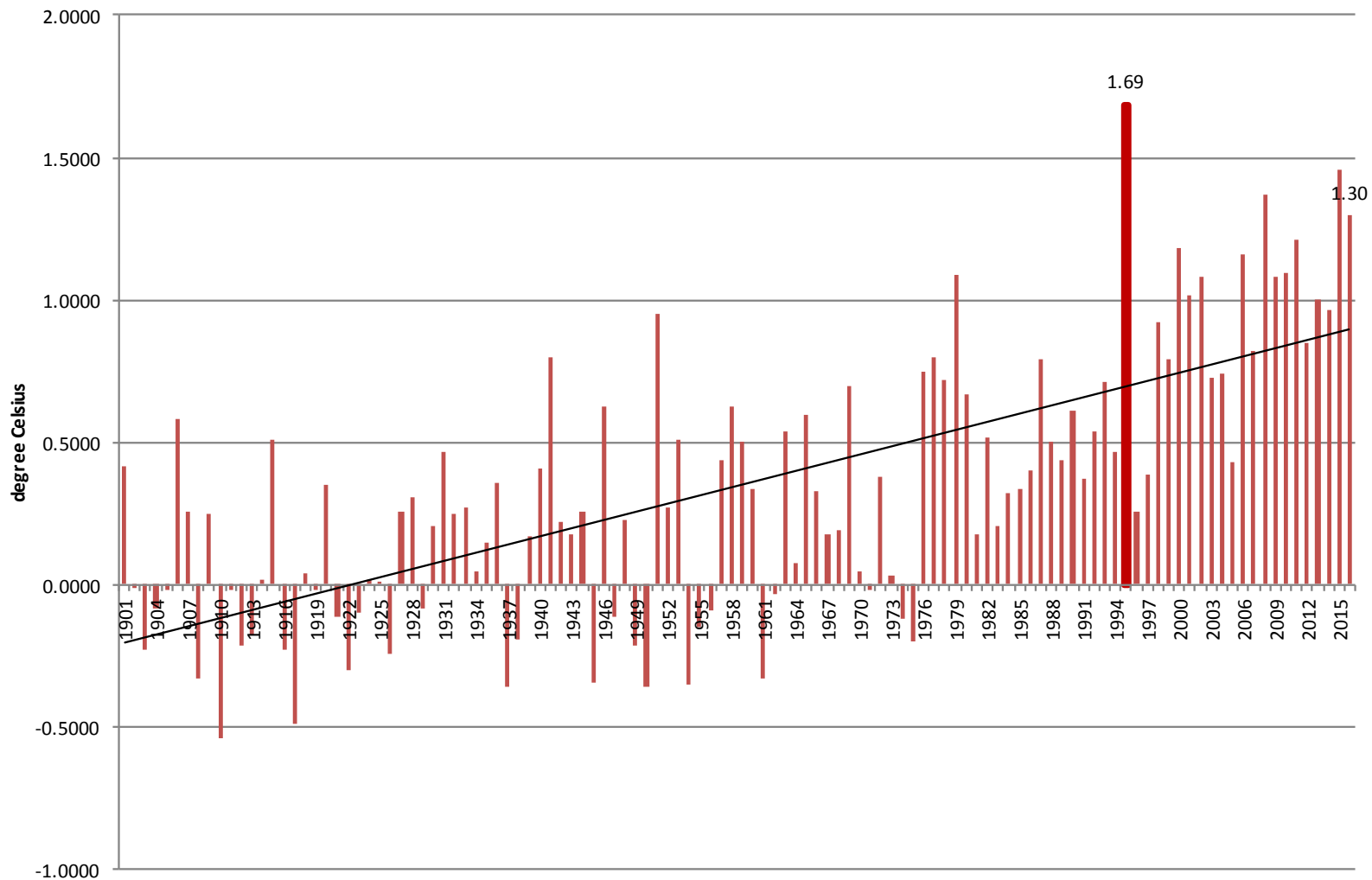
Temperature Anomaly in Monsoon Season (June-September)
from 1901-1930 Baseline





Spiraling Temperature – Post-Monsoon

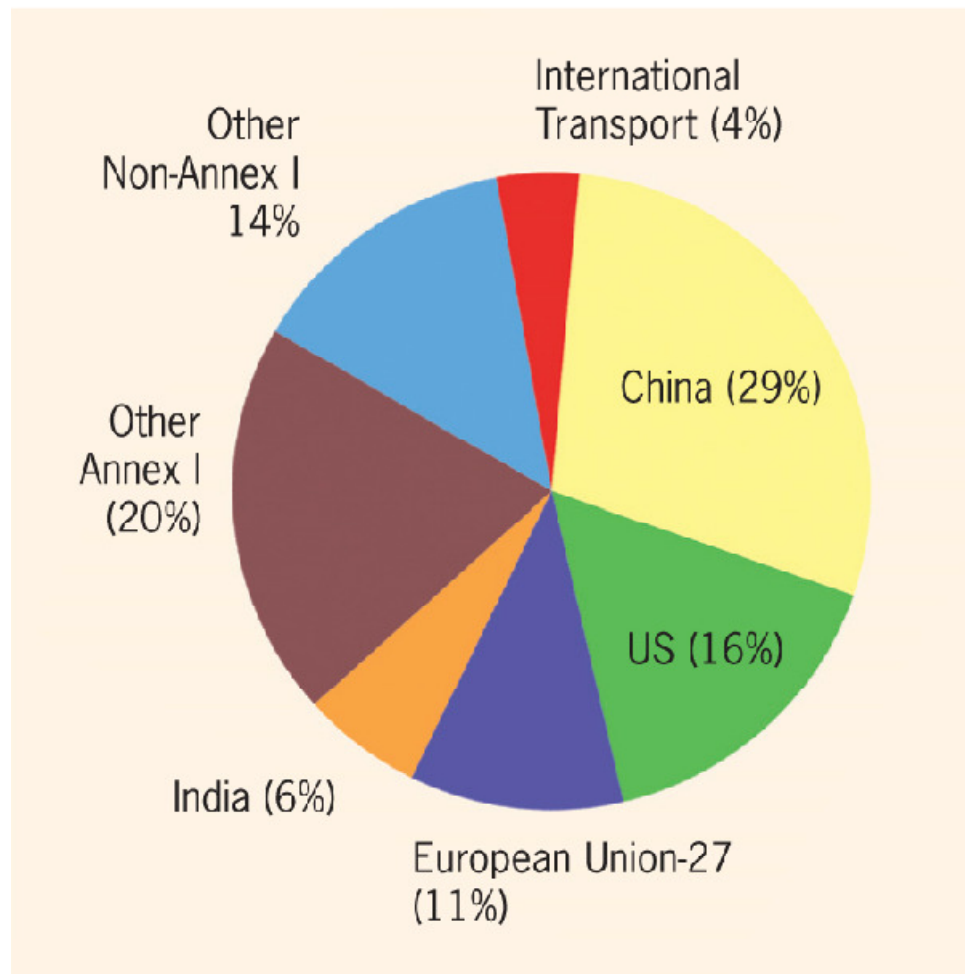
Temperature anomaly during Post-Monsoon Season
(October-December)



Who is emitting how much? Who is responsible?



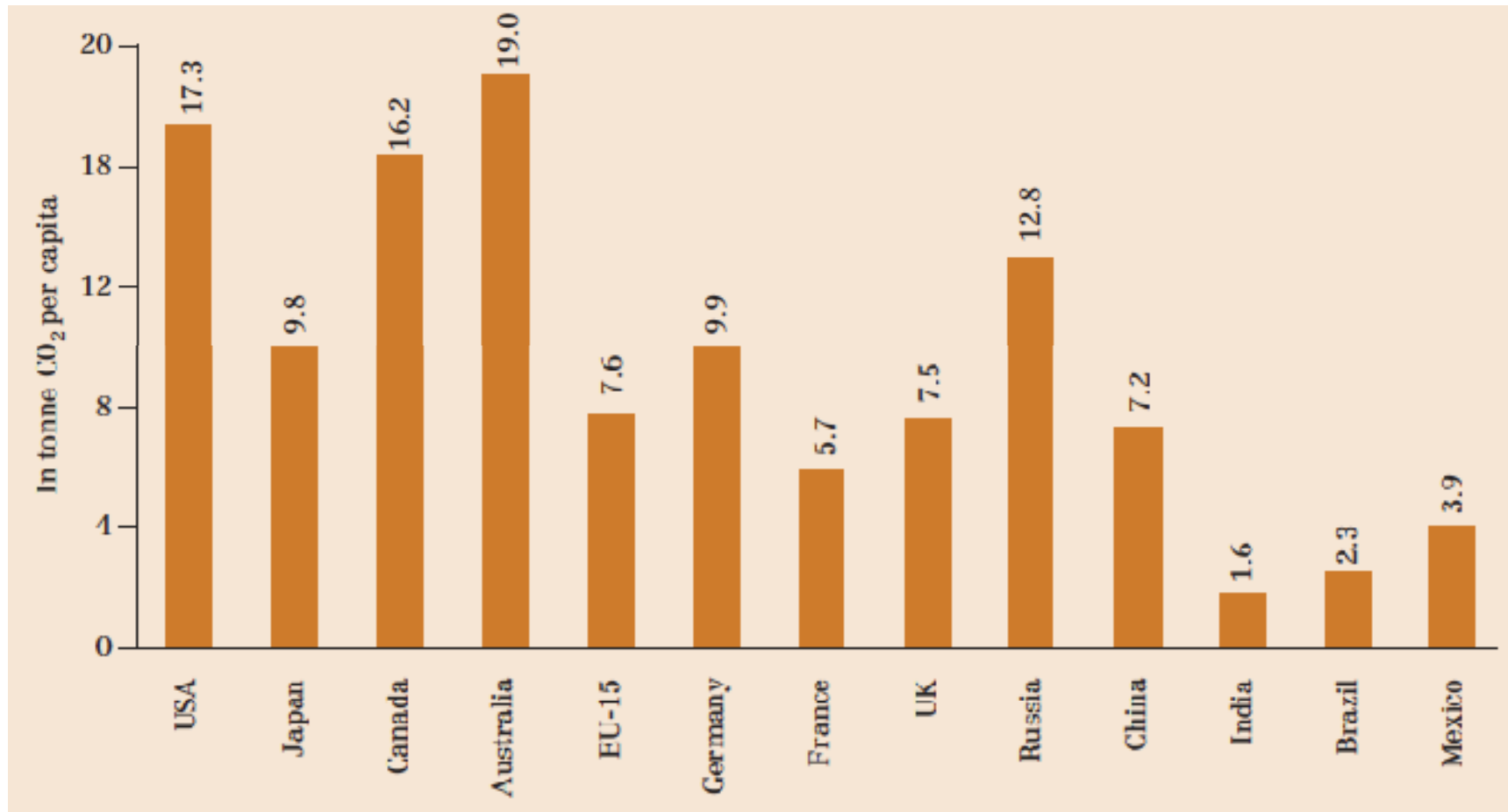
Present emissions: 2012



Source: NEA-EC Report

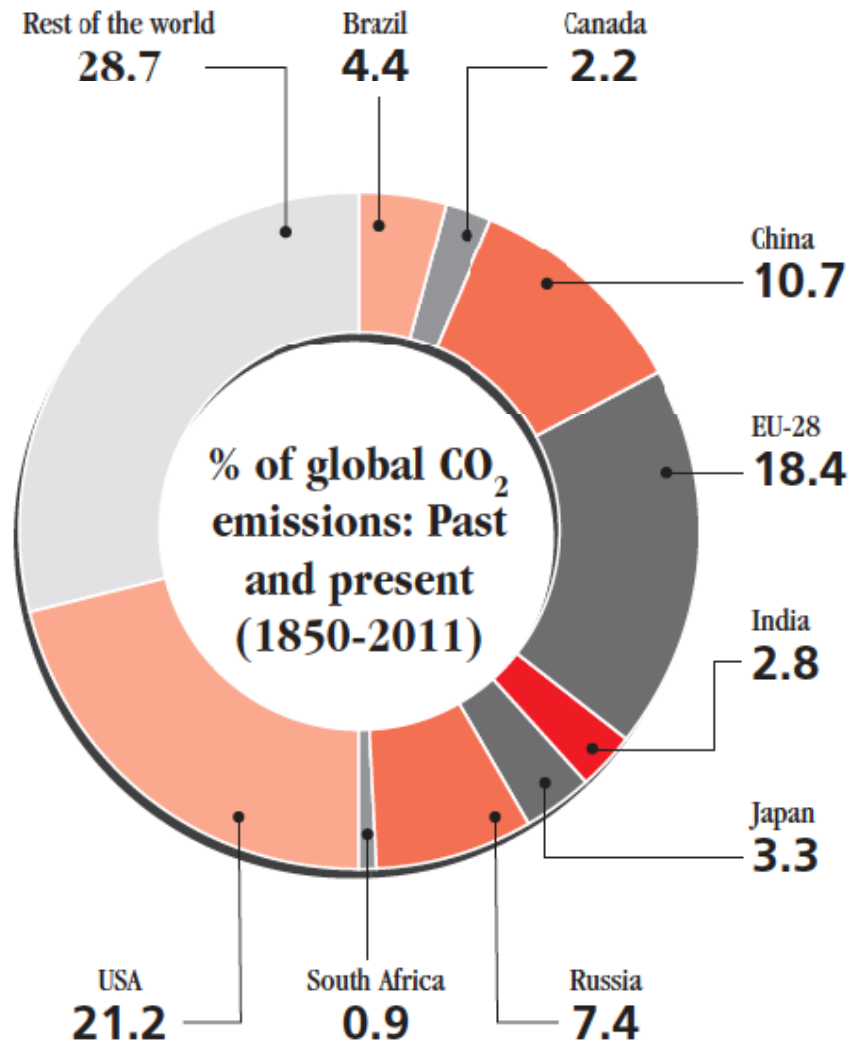


Per Capita Emissions: 2012





Who has contributed how much to climate change?





Coal, USA & India



Coal truth: Power sector

	Percentage of coal in electricity mix (%)	Percentage of gas in electricity mix (%)	Percentage of fossils in electricity mix (%)
US	38%	30%	68%
Japan	30%	43%	73%
EU	26%	15%	41%
Germany	45%	10%	55%
Australia	67%	20%	87%
China	72%	2%	74%
India	70%	6%	76%



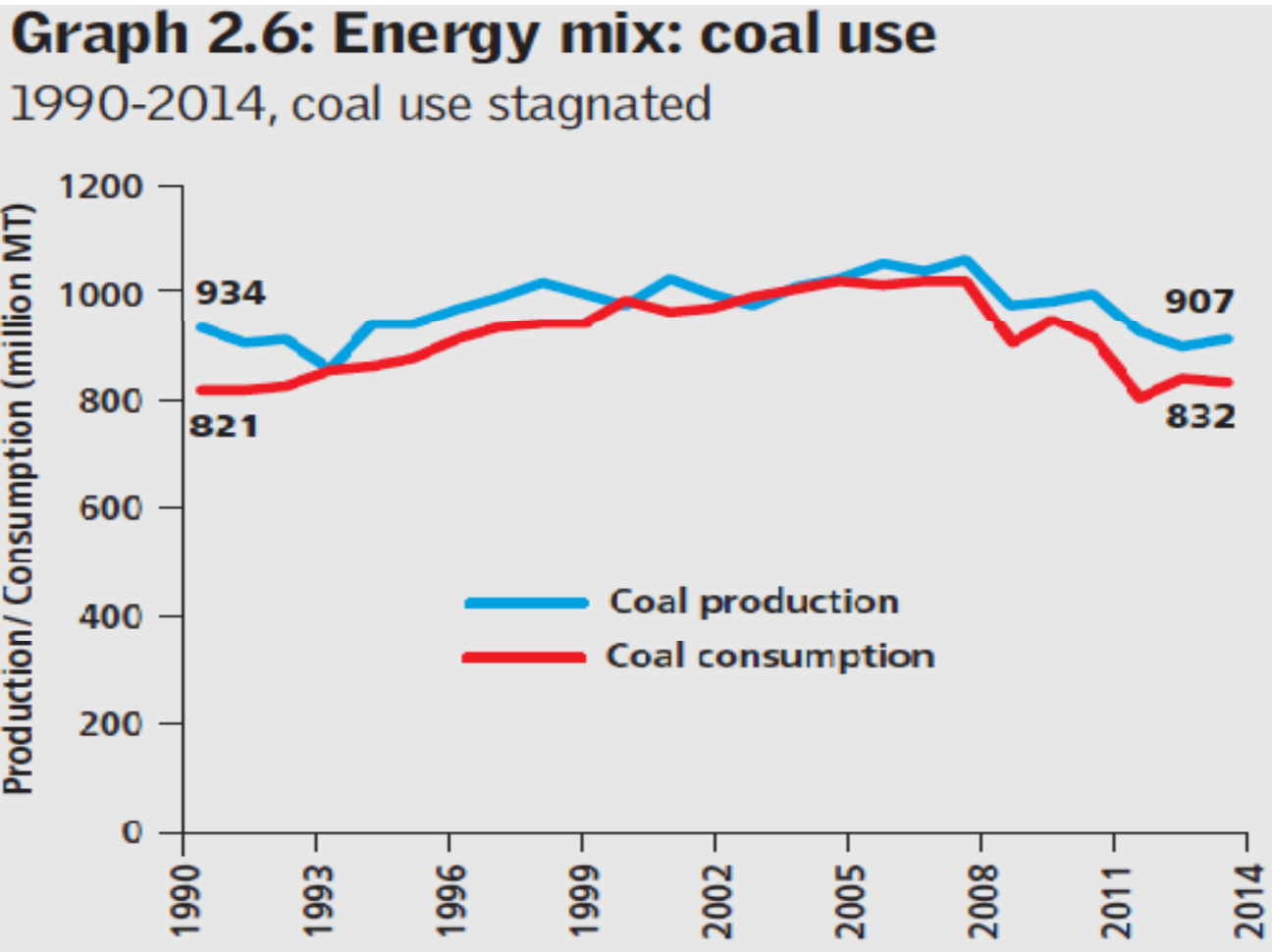
Coal truth: Consumption

	Coal Consumption (MTOE): 2014	Per Capita Coal Consumption (MTOE): 2014
USA	453	1.5
EU	270	0.5
Germany	77	1
Australia	44	2
Canada	21	0.6
Japan	127	1
China	1960	1.4
India	360	0.3



Coal truth: In the US

2014 coal use > 1990 coal use



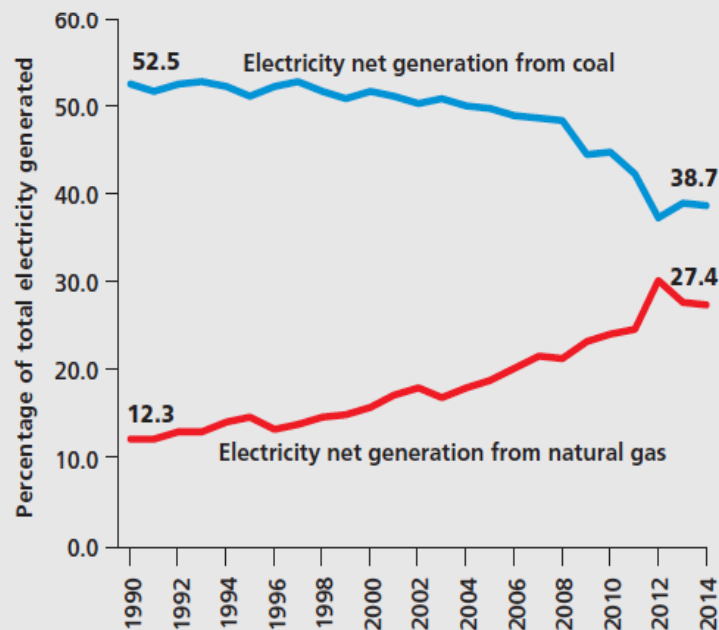


Fossil truth: In the US

Shale gas use exploding: US today consumes more fossils than ever in its history

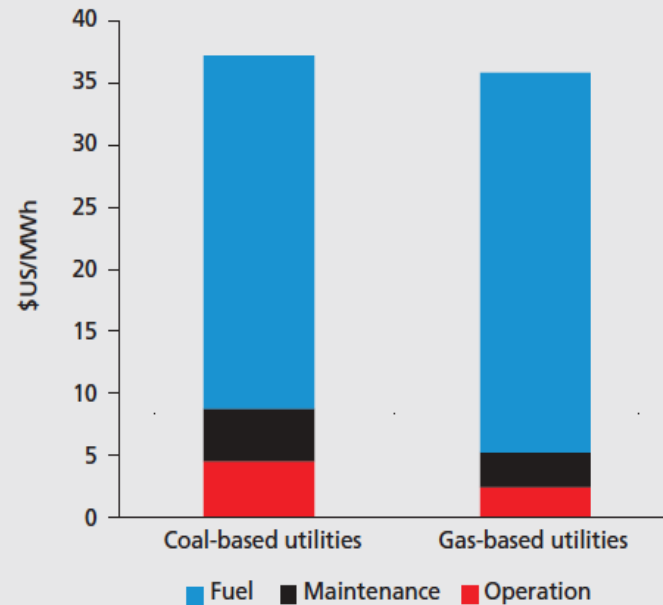
Graph 3.8: Contribution of electricity from coal and natural gas

A matter of time before gas use overtakes coal use



Graph 3.9: Average power plant operating expenses: 2012

Gas-based ones win hands down

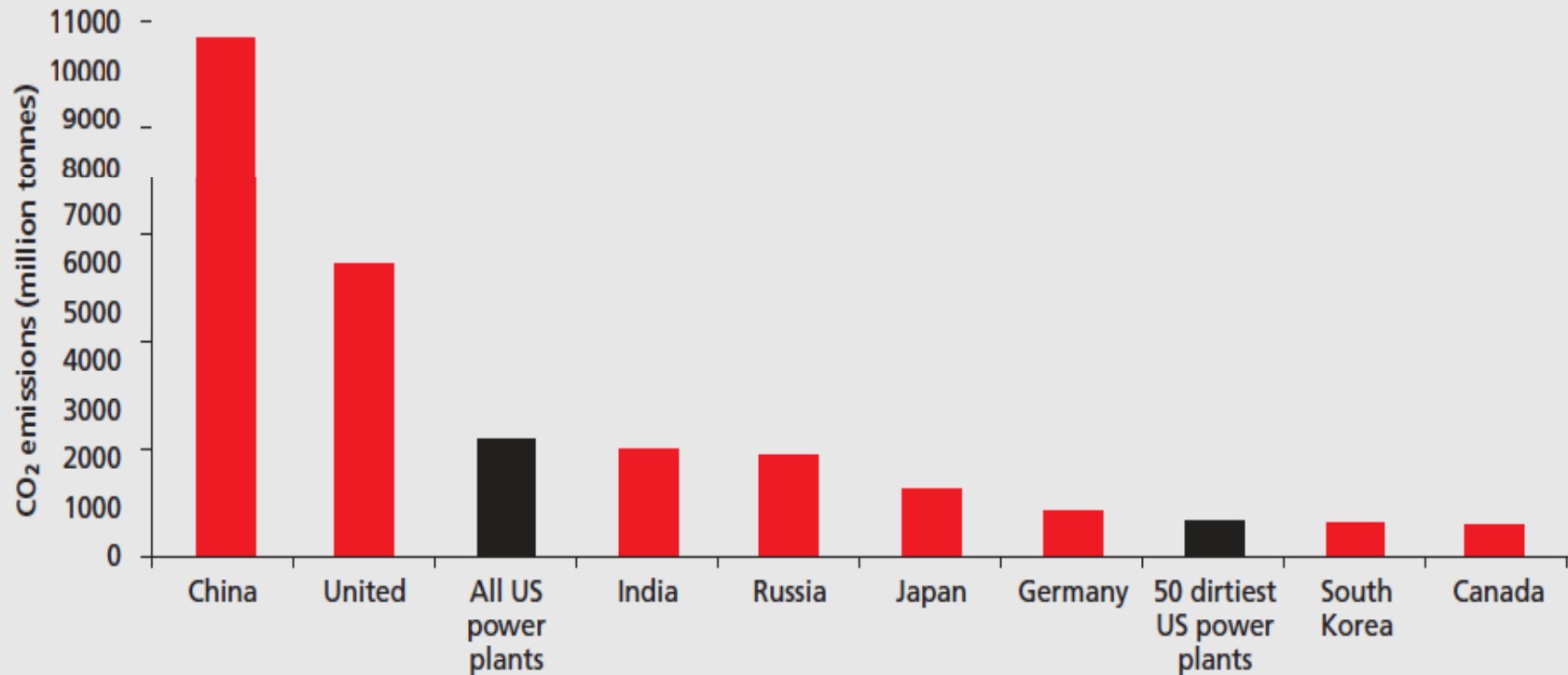




Coal power Truth: In the US

WHAT ALL POLLUTE: MILLION TONNES OF EMISSIONS IN 2013

If all US power plants were a country, it would be the third highest polluter in the world. If the 50 dirtiest power plants were a nation, that country would be the 8th largest emitter of CO₂ in the world. Just behind Germany, and just ahead of South Korea.



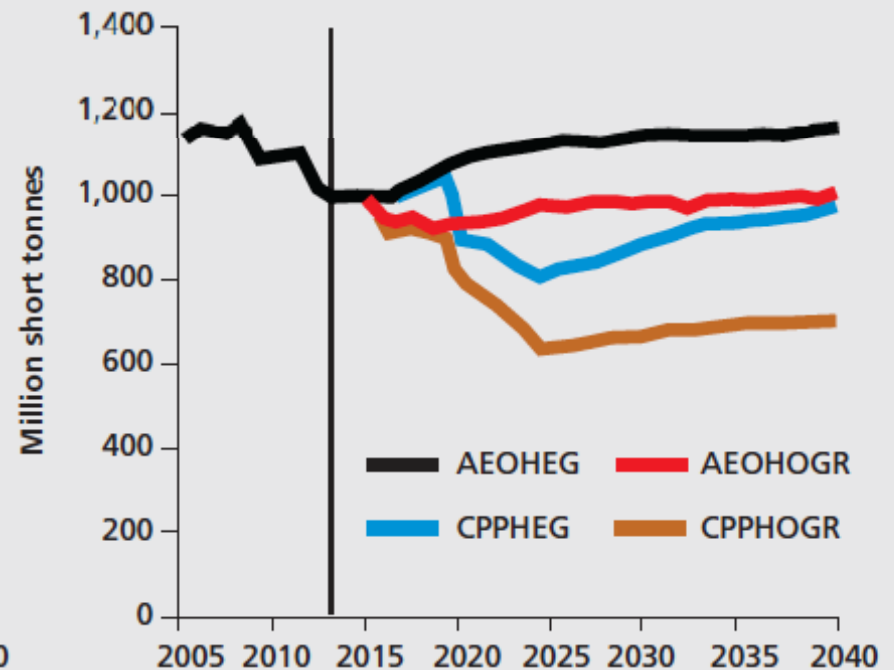
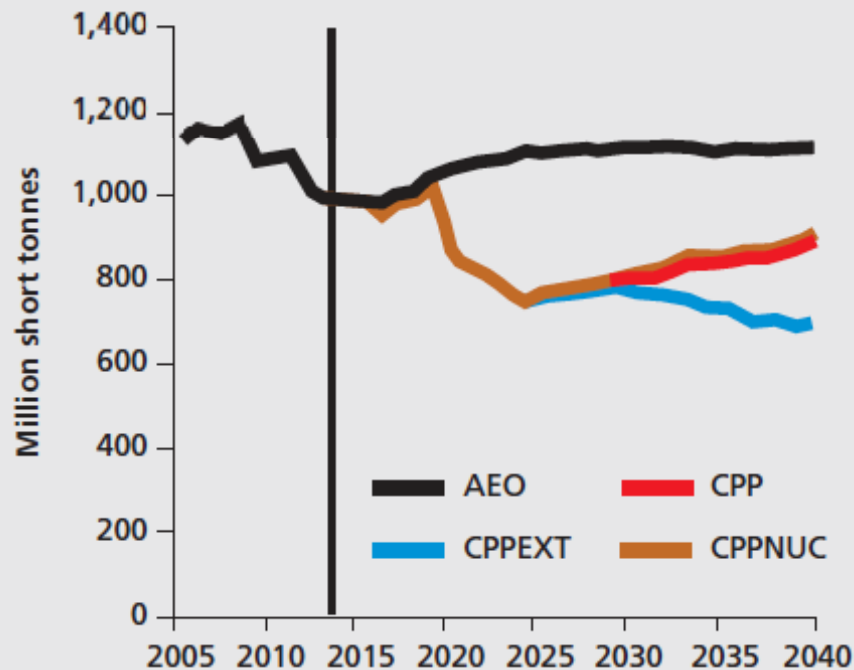
Sources: Environment America Centre, 2013



Coal power: USA in 2030

US coal production in 2030 same as India's in 2014

The US energy system is projected to remain heavily dependent on fossil fuels



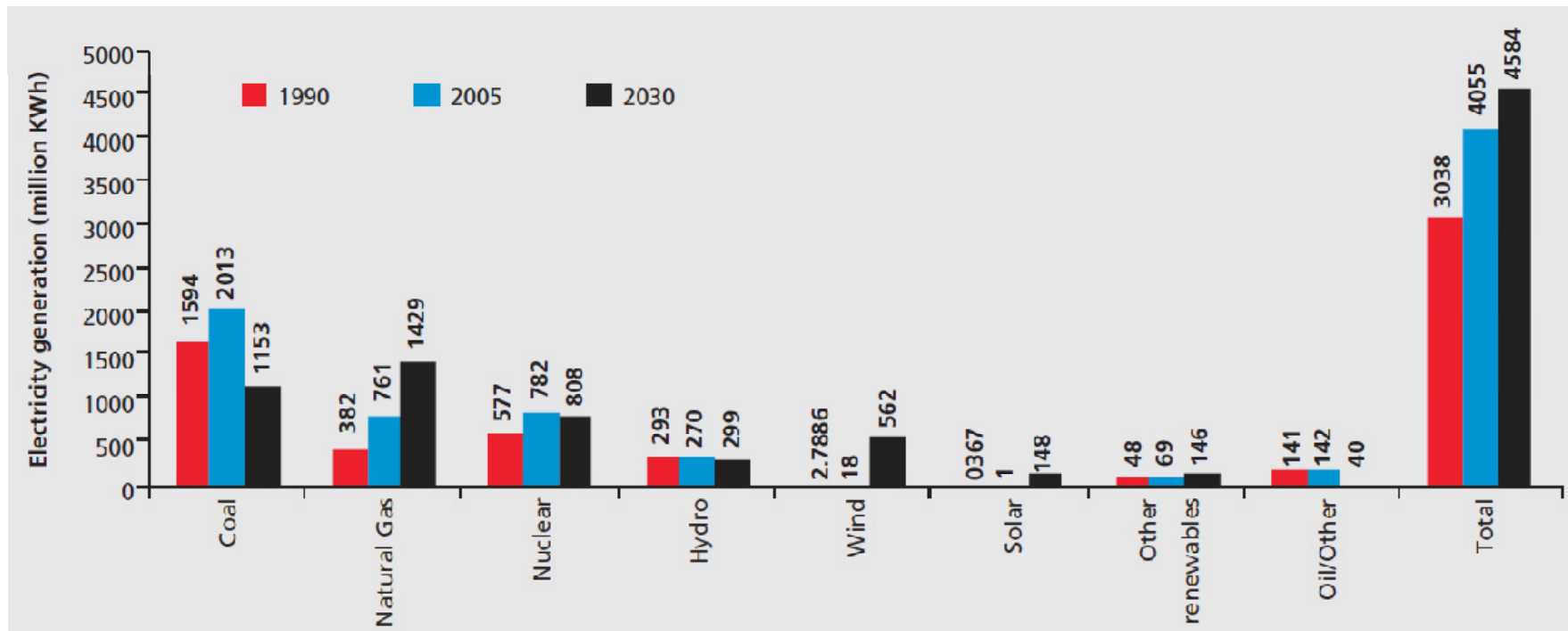
Note: 1 short ton = 0.907 metric tonne

Source: Analysis of the Impacts of the Clean Power Plan, Independent statistics and analysis, U.S. Energy Information Administration, May 2015



US Clean power plan: 2030

No fossil shift. *60% electricity from fossils in 2030 marginally down from 65% in 1990 & 66% in 2005*

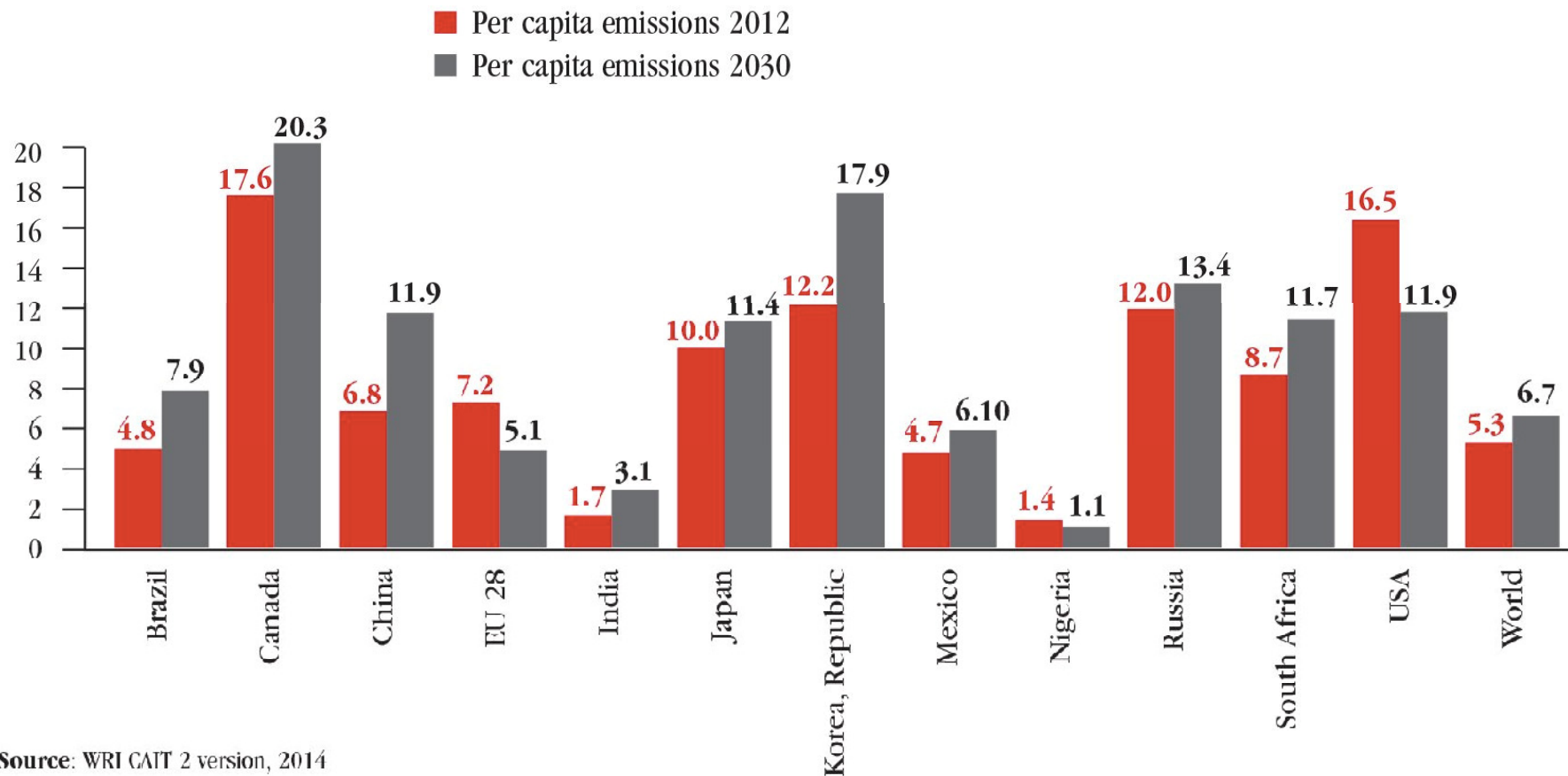


**India will be allowed to
emit while the US will have
to stop emitting**



1 American = 4 Indians in 2030

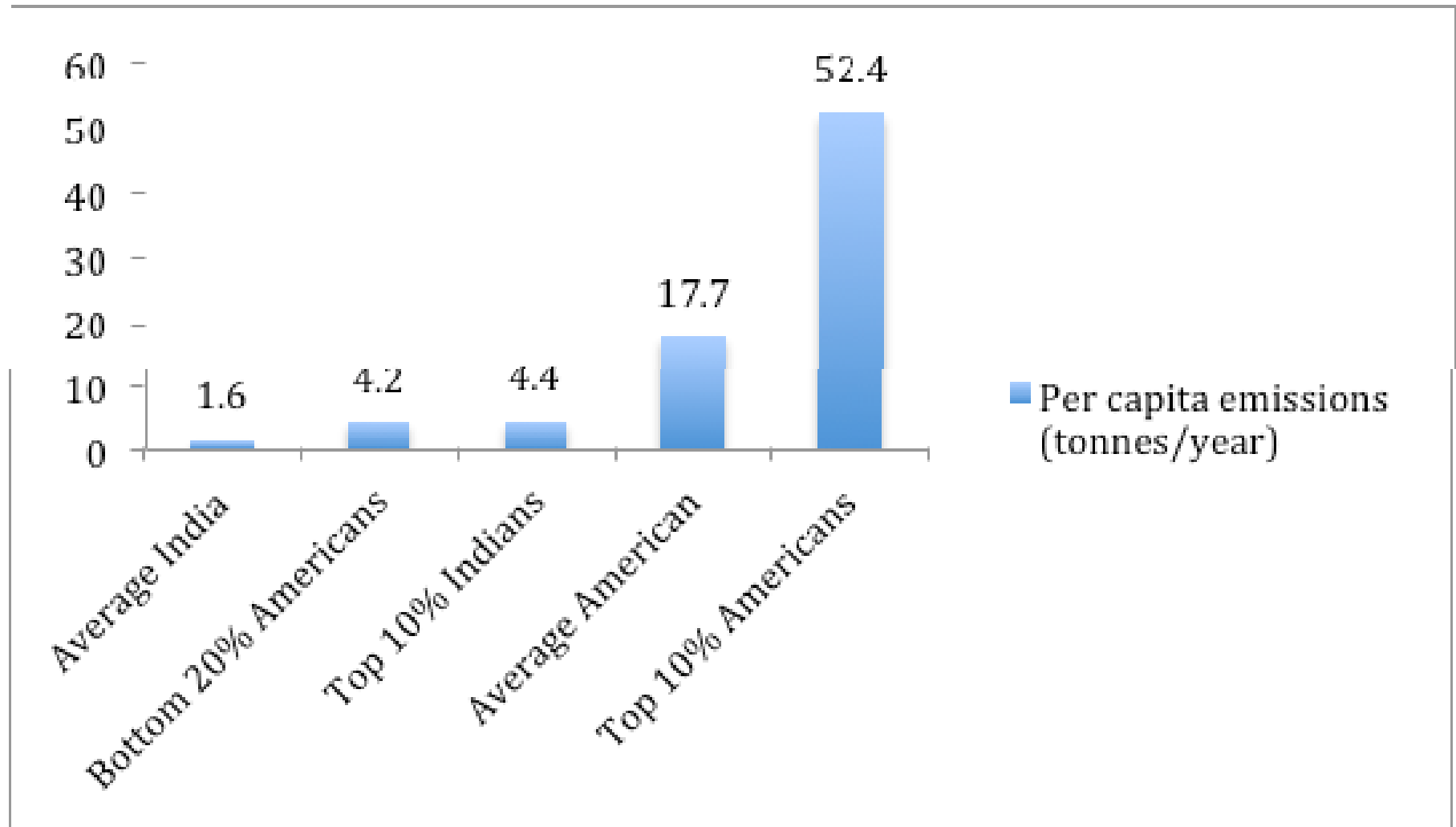
Per capita emissions: Present and future



Source: WRI CAIT 2 version, 2014



Inconvenient truth: Rich Indians vs. Poor Americans



India needs trillions of dollars to meet its commitments



- False and wrong information
- India had put out data of \$2.5 trillion as total cost it would incur to meet its INDC.
- It had never asked for this money from climate funds.

Fact: India receives very little finance from climate funds.