

How can India Negotiate Climate Change? Politics, Policy, and Pathways

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Workshop on Climate Studies

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Outline

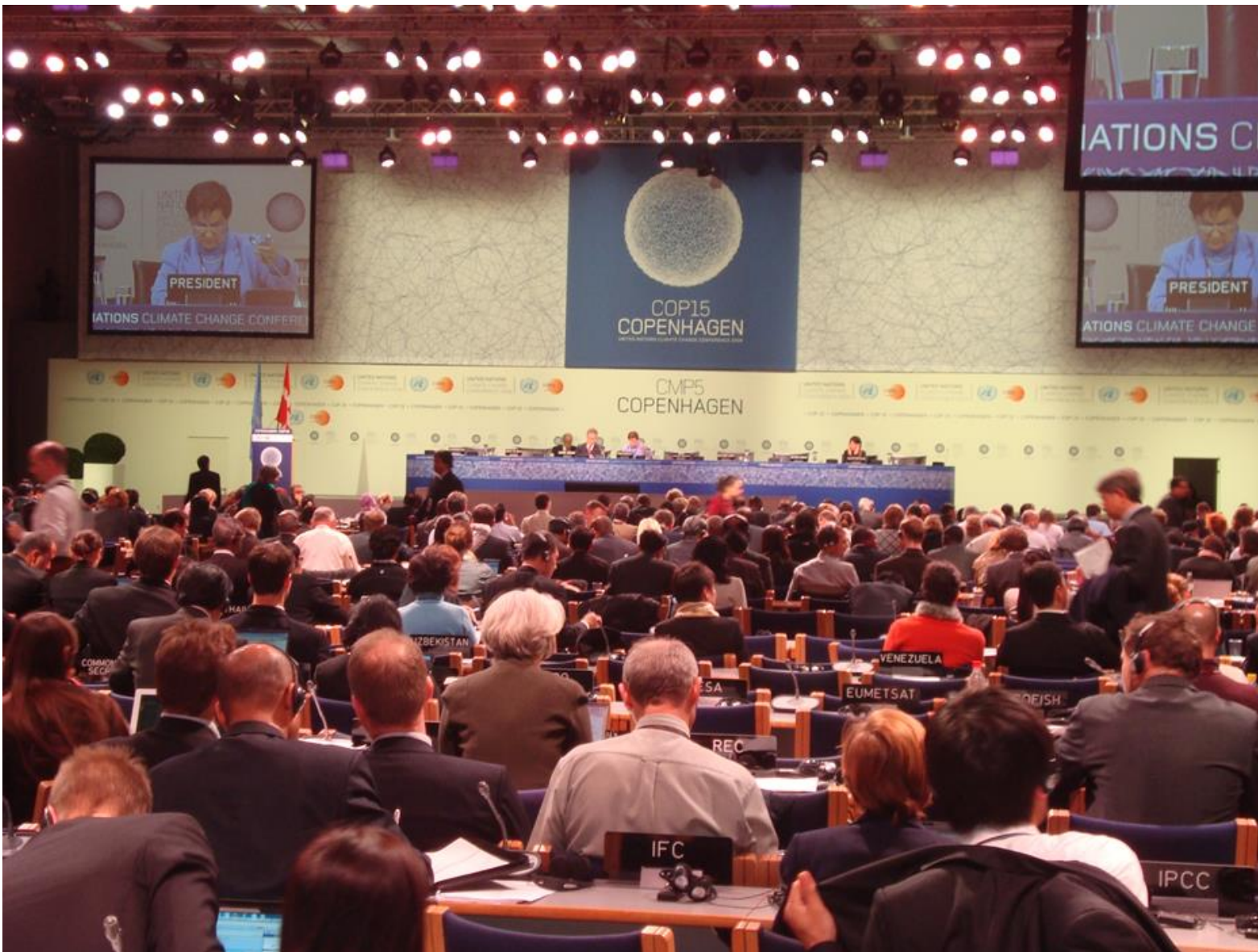
- Climate Negotiation – A Potted History
- India – A Premature Power
- India's Climate Policy Framework – From Opportunism to Strategy?
- Puzzles and Questions

Climate Negotiations A Potted History



Climate Change as a ‘Wicked’ Problem

- Scale and scope
 - Halting the co-evolution of industrial development and fossil fuels
 - Integrating climate considerations into water, agriculture, land use etc.
- Conflicting interpretations
 - Environment issue OR
 - Justice issue OR
 - Technical and economic challenge?
- Scientific complexity
 - ‘Hothouse earth’ OR
 - Latest in a line of environmental challenges that can be managed by human ingenuity?



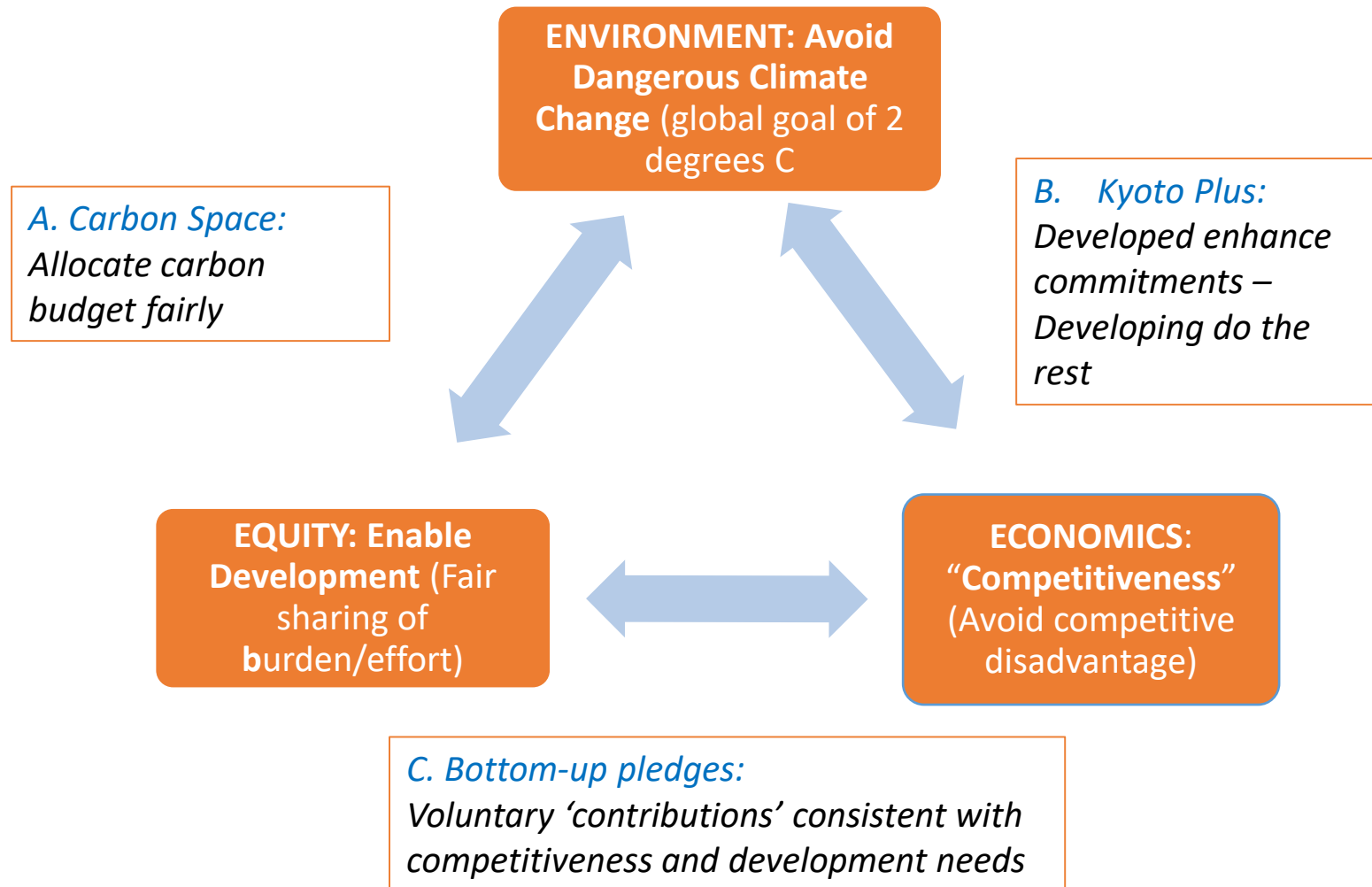


Climate Negotiations

Contention and Constructive Ambiguity

- UN Framework Convention on Climate Change 1992
 - Who should act and on what basis?
 - “Common *but* differentiated responsibility and respective capabilities”
- Kyoto Protocol mid 1990s to operationalize action
 - “Annex 1” or developed countries to act first
 - US did not ratify – competitiveness concerns
- Copenhagen (2009) to Paris (2015)
 - It is time for developing countries to step up? Have developed countries done enough? How do we judge?
 - Common responsibility or differentiated responsibility?
- Glasgow Pact 2021
 - Completing the ‘Paris Rulebook’
 - ‘Net zero’ targets

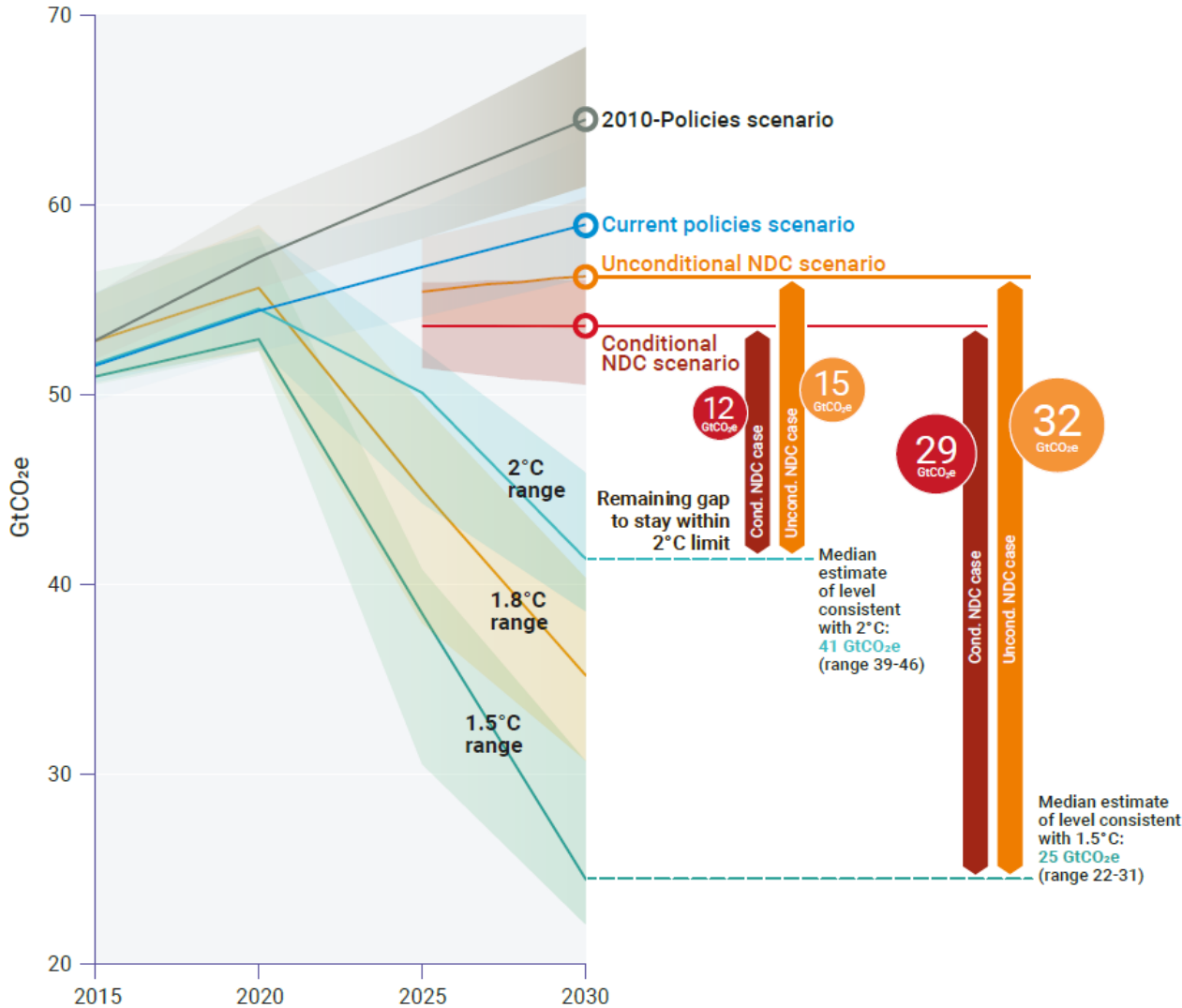
Hard Choices at Paris: The Climate Trilemma



The Paris Agreement Explained: Bottom-up Meets Top-down

- Differentiation or Symmetry across countries?
 - developed countries “should continue taking the lead” developing countries are “encouraged to move over time toward ... emission reduction or limitation targets.”
- Establish processes for *nationally determined* climate contributions (NDCs) on mitigation and adaptation
 - Pledges not set through international negotiations but bottom-up country by country
 - Legally binding obligations of conduct (procedural) not obligations of outcome (substantive)
- “Ratchet” mechanism
 - Global aggregate “stocktake” of country pledges
 - Five yearly updated pledges
- Weak promises of finance and technology support for developing countries

Nationally Determined Contributions and the emissions gap in 2030



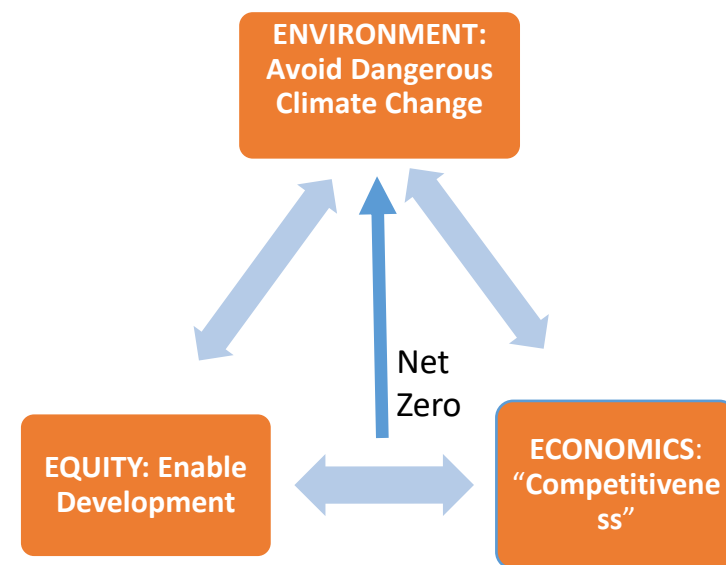
Bridging the emissions gap requires that countries increase their NDC ambitions threefold to limit warming to 2°C and more than fivefold for the 1.5°C goal

Hard Questions after Paris

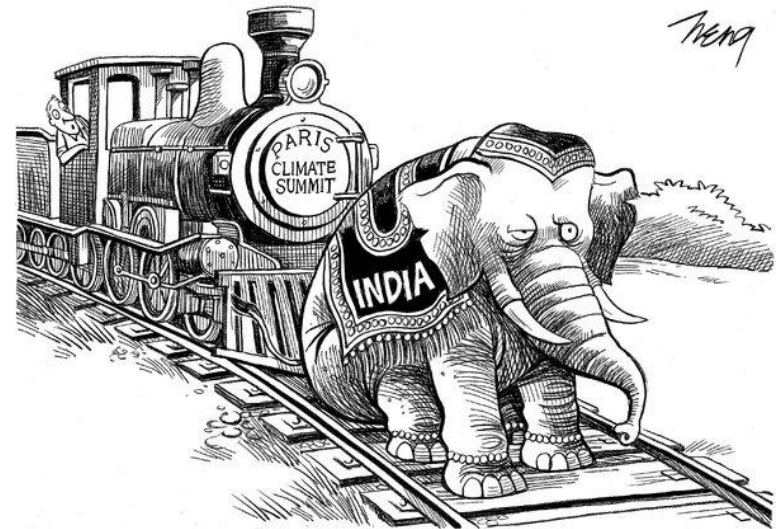
- Global collective action problem or aggregate of national development and economic choices?
- Will Paris be effective?
 - Add up to what is required by science?
 - Stimulate 'bottom up' action within countries
 - Create a tipping point toward 'green growth'?
- Will Paris be fair?
 - Stimulate action consistent with responsibility and capability?
 - What are reasonable benchmarks for fairness?

Net Zero – the new game in town

- Net zero:
 - Paris Ag.: Balance sources and sinks in the second half of the century
 - IPCC: Reach net zero CO₂ by 2050 to limit rise to 1.5°C
- Net zero as a bridge from Paris back to the environment goal?
- Does equity still matter if we all have to get to net zero?



India: A Premature Power



“The Great Regrouping” Durban 2012



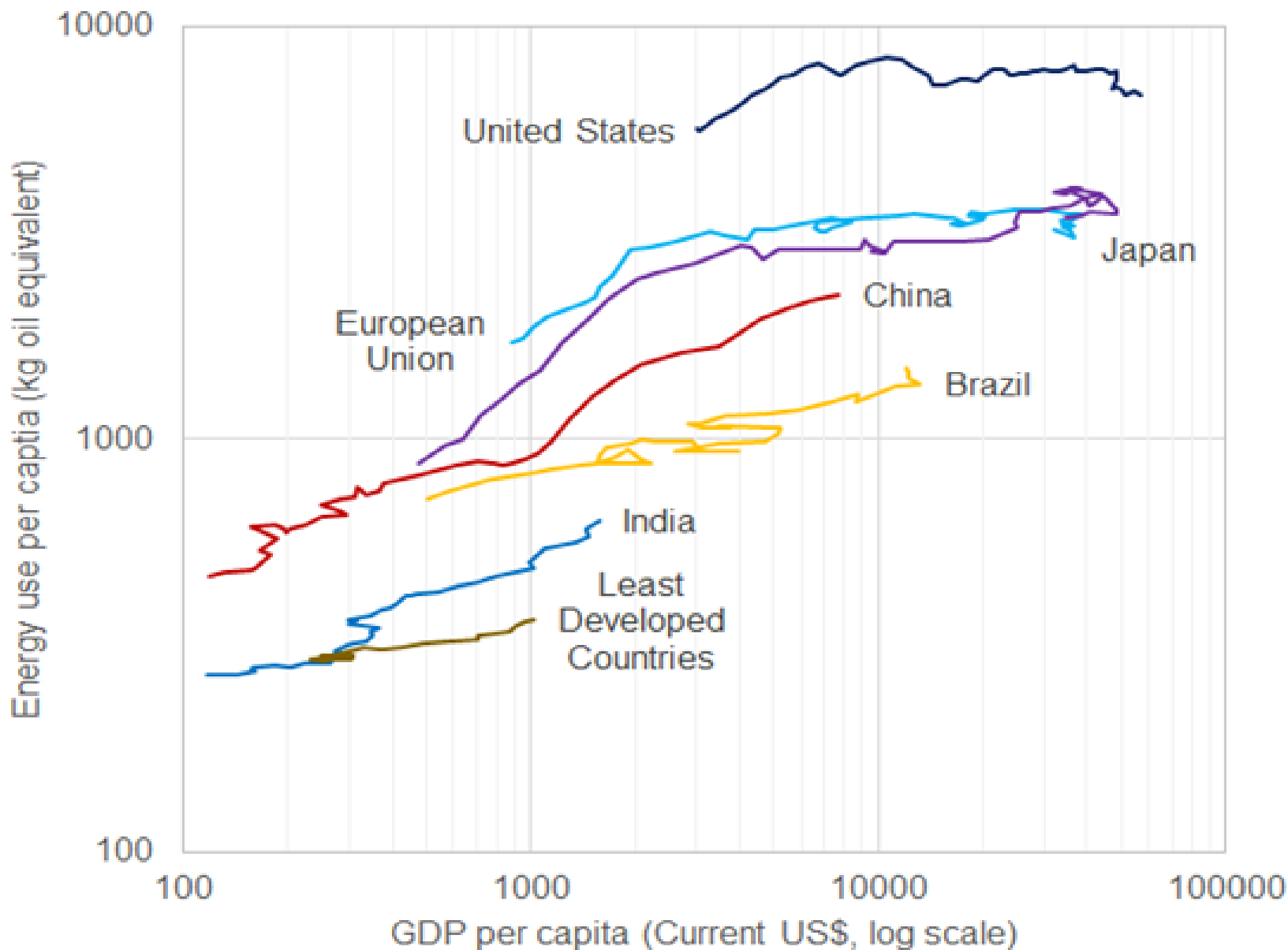
Climate Equity and Ethics

- Climate change as a North-South issue
- Differentiated responsibility
- Climate as diplomatic challenge *not* development challenge



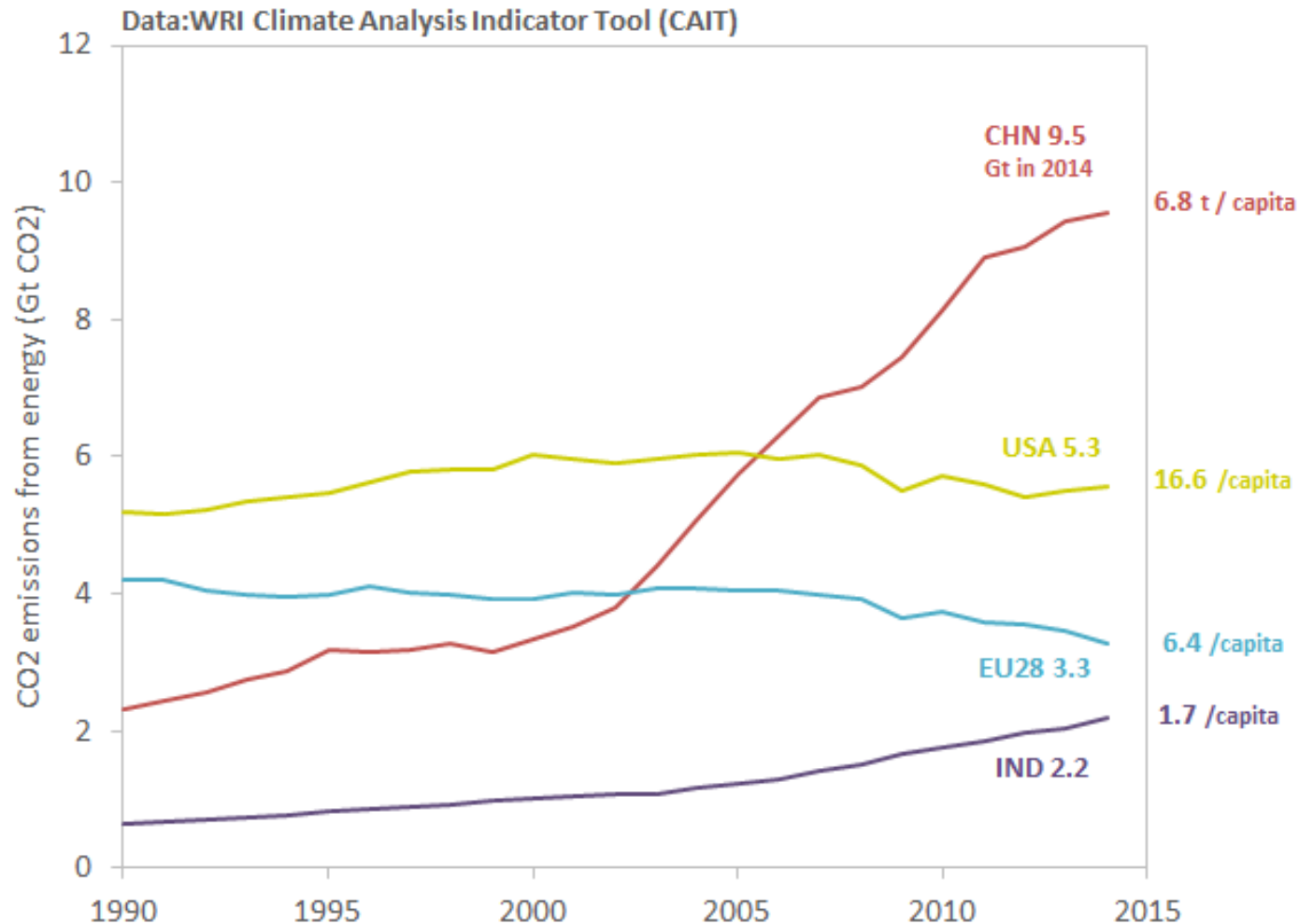
Agarwal and Narain, 1991

Energy and economic growth from 1961-2017



Annual Emissions Trends

The Spectre of China






Complicating Climate Equity

- ‘Hiding behind the poor’ (Ananthapadmanabhan et al. 2007)
- A focus on vulnerability - beyond a North-South axis - (Bidwai, 2010, 2012; Chakravarty and Ramana 2011)

Growing Attention to Climate Impacts (IPCC WG1)

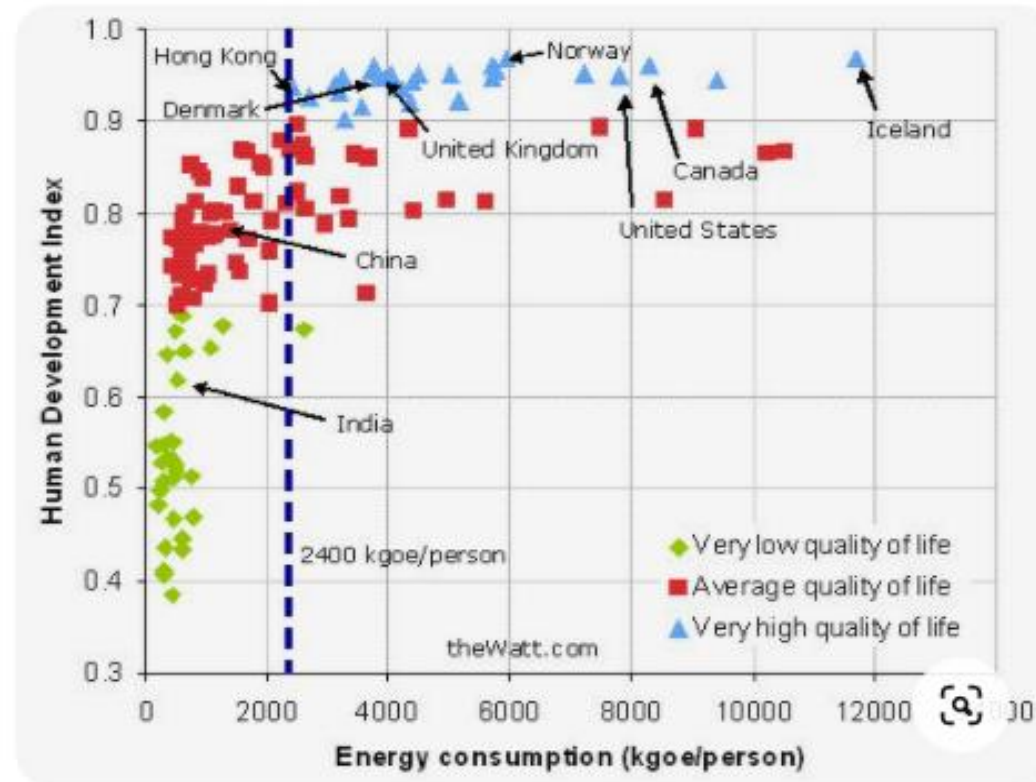
Impacts on South Asia and India

Research insights from Working Group 1 to the Intergovernmental Panel on Climate Change's (IPCC) 6th Assessment Report on global climate change

 <p>Temperature increases & heatwaves</p>	<ul style="list-style-type: none"> • Increase in frequency, duration & intensity of heatwaves in India (<i>medium confidence</i>) (Ch 12: 40; Ch 11:50) • Depending on the modelling scenario, warming of 2.5°C to 5°C in India by the end of the century (<i>Atlas: 58</i>); SSP2-4.5: South Asia likely to experience end-of-century warming of 2.8°C (<i>Interactive Atlas: median values</i>) • Total number of days per year with max temp exceeding 35°C increases by an additional 30 days (<i>Interactive Atlas: median values</i>)
 <p>Monsoons & changes in precipitation</p>	<ul style="list-style-type: none"> • Increase in heavy rainfall at the expense of low & moderate rainfall, particularly over central India (Ch 8: 36) • Significant decline in summer monsoon precipitation, weakening of the large-scale monsoon circulation; decrease in frequency of monsoon depressions forming over Bay of Bengal (Ch 8: 50). • At 1.5° and 2°C, mean precipitation & monsoon extremes projected to intensify in summer & over central India (Ch 8: 87; 11: 51). • Protracted delays in the onset of monsoon & reduction in rainy season length (Ch 8: 71) (<i>Atlas: 58</i>) • Increase in frequency and duration of monsoon breaks or 'dry spells' (Ch 8: 50)
 <p>Flooding & extreme events</p>	<ul style="list-style-type: none"> • Increase in flood frequency and magnitude in India (Ch 11: 67) • Coastal floods that take place once in 50 years projected to occur around 3 times a year by the end of the century (Ch 12:47) • Increase in Category 5 cyclones in southern Indian ocean (Ch 12: 36)
 <p>Droughts, aridity & fires</p>	<ul style="list-style-type: none"> • At 2°C, the length and frequency of fire seasons in India are projected to increase (<i>medium confidence</i>) (Ch 12: 43) • More frequent and intense droughts in northwest and peninsular India (Ch 12: 43) • Increases in concurrent droughts and heat waves in India (Ch 11: 108)
 <p>Agriculture and soil</p>	<ul style="list-style-type: none"> • Significant decrease in moisture in the topsoil projected in all warming scenarios (Ch 11: 83; Ch 8:50) • Declining groundwater storage due to human withdrawals for irrigation, particularly in northwest India (Ch 8: 28, 46) • Increased aridity in recent decades over most parts of India, projected to continue as temperatures soar (<i>medium confidence</i>) (Ch 12: 42)
 <p>Urbanisation and cities</p>	<ul style="list-style-type: none"> • Since 1950, Kolkata has warmed by an estimated 2.6°C, largely attributed to urban warming – as distinct from surrounding surface-air temperature warming, making it the city with the largest share of urbanisation-caused warming sampled by the IPCC (<i>Regional Factsheet: Urban Areas</i>) • City geometry, heat from human activities, and heat-retaining roads and buildings in urban centres will exacerbate heat extremes in cities (<i>very high confidence</i>) (<i>Regional Factsheet: Urban Areas: 2</i>)
 <p>Air quality</p>	<ul style="list-style-type: none"> • Sulphur dioxide levels doubled over India between 2005 to 2015; nitrogen dioxide levels have increased over South Asia by 50% from 2005 to 2015 – both are precursors for secondary particulate matter in India (Ch 6: 33, 28) • Rise in particulate matter causes adverse health impacts – but short-lived aerosols over South Asia also significantly mask the overall warming effect (Ch 6:91, Ch 11:47)
 <p>Warming in the Indian Ocean</p>	<ul style="list-style-type: none"> • Increase in intensity, duration of marine heatwaves. Indian Ocean has seen the fastest surface warming, leading to increased risk of deoxygenation and release of CO2 (<i>very high confidence</i>) (Ch 9: 5, 14) • Increases in sea surface temperature (SST) leading to heavier rainfall, precipitation extremes from torrential rains or tropical cyclones (Ch 11:51) • Sandy shorelines will retreat by upto 10m – 50 m under both RCP4.5 and RCP8.5 (<i>high confidence</i>) (Ch 12: 47) • SSP2-4.5: South Asia to experience SST increase of 2.2°C, sea level rise of 0.5m by 2100 (<i>Interactive Atlas: median values</i>)
 <p>Snow, ice & glaciers in the Himalayas</p>	<ul style="list-style-type: none"> • Decrease in area and volume of snow mass, retreating glaciers & rising snowline elevations in this century (<i>high confidence</i>) (<i>Factsheet: Mountains: 2</i>) • Increased annual or summer monsoon precipitation this century, intensifying by ~22% in the southeastern Himalaya (Ch 10: 118) • Increase in incidence of glacial lake outburst floods due to rising temperature (<i>high confidence</i>) (<i>Factsheet: Mountains: 2</i>) • Increase in landslides due to heavy precipitation & permafrost thawing in the Himalayas (<i>medium confidence</i>) (Ch 12: 42) • Increase in frequency of snow avalanches in recent decades (limited evidence) (Ch 12: 46) • Permafrost thawing leading to increased thickness in the active layer (<i>high confidence</i>) (Ch 12: 45)

Energy – A Shifting Narrative

- Growing energy needs
 - Low levels of access to commercial energy and electricity
 - Low per capita consumption
 - Future infrastructure needs
- Energy efficiency and renewable energy bring developmental gains
 - Demand-side measures
 - Energy security
 - Lower costs over time
 - Air quality co-benefits (Rao et. al. 2015)



Geopolitical Drivers

- Pressure at meetings of G8/G8+5/G20/Major economies forum
- Rise of BASIC (Brazil, India, South Africa, China) and growing willingness to take measures in partner countries
- Projection of a ‘responsible power’ and growing alliance with the US
- Global pressures to ‘keep 1.5 alive’

Shifting Domestic Politics



- Complicating equity
- Growing attention to climate impacts in India
- Co-benefits of climate change
- Geo-political positioning



Is there a Third Act to Indian Climate Politics?



Dual objectives of development and avoiding dangerous climate change?

Recognising the climate crisis | HT Editorial

The world, and India, face an existential threat. Wake up to it

EDITORIALS Updated: Nov 24, 2019 16:20 IST

ht Hindustan Times



Due to carbon emissions, global temperatures have warmed by 1 degree Celsius above pre-industrial levels. It may not seem like a lot. But a world that is just a degree warmer has resulted in wildfires in California and Sydney, and annual wildfires in the Arctic (Bloomberg)

f Words matter. The impending catastrophe of our times—a drastic modification of the world’s climate, and steeply rising global temperatures — seems minor when you call it a “climate change”. The term does not correctly reflect the enormity of the existential threat. This is why, from today, *Hindustan Times* will call this emergency what it is – a “climate crisis”.

India's Climate Policy Framework From Opportunism to Strategy?



India's climate and energy goals

NDCs

- 33-35% below 2005 emissions intensity of GDP by 2030 (unconditional)
- Non- fossil fuel share of cumulative power capacity 40% by 2030 (conditional upon technology transfer and climate finance)
- Additional (cumulative) carbon sink of 2.5 to 3.0 GtCO₂e by 2030

Domestic targets and policy directions

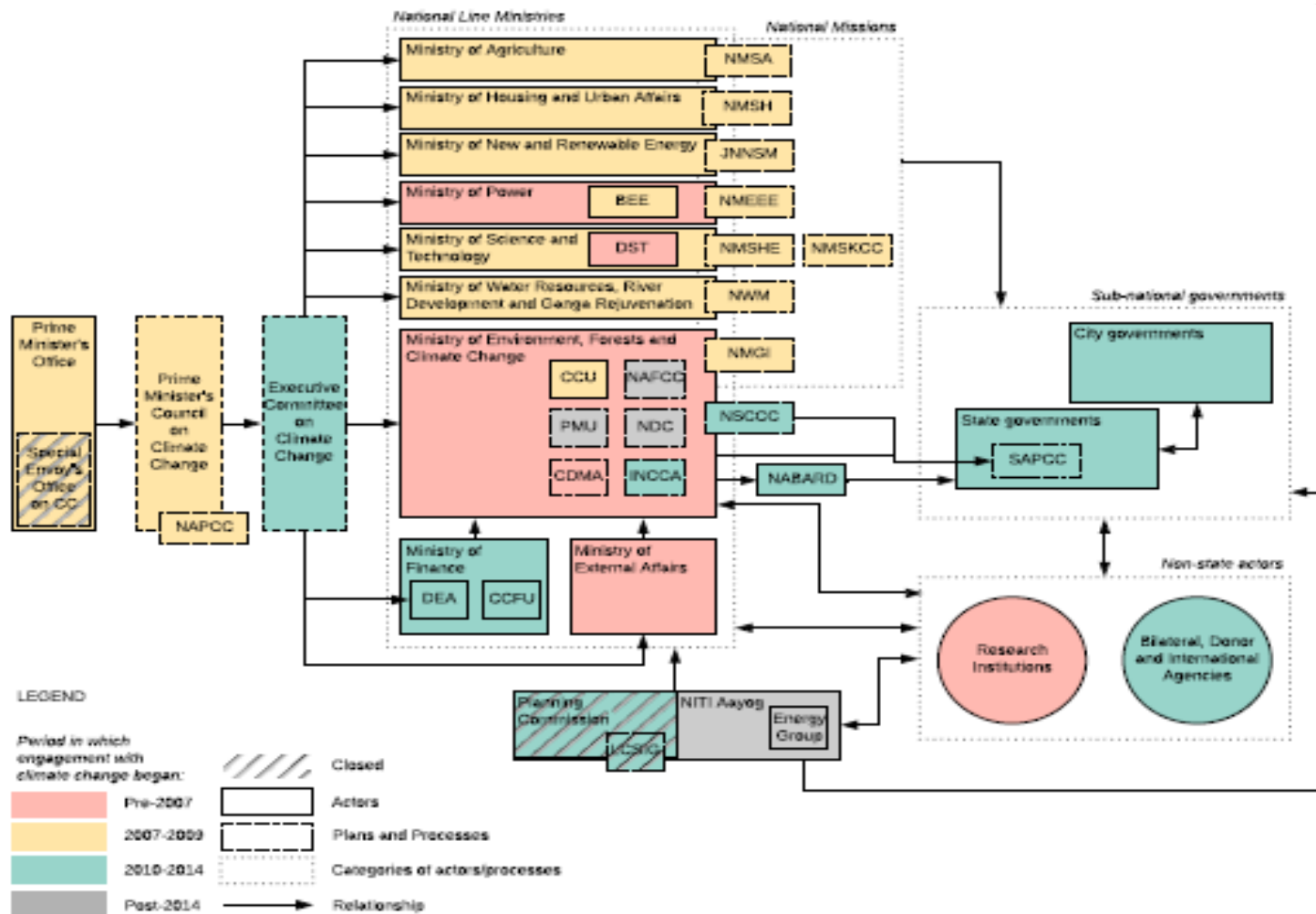
- National Action Plans on Climate Change – 8 Missions
- 22 State Action Plans (more adaptation focused)
- 175 GW RE capacity by 2022 (possible increase to 450GW)
- Rs 400/ton (approx. Euro 4/ton) coal cess
- Projected addition of 66GW coal thermal capacity by 2030
- FAME programme for electric vehicles
- India Cooling Action Plan
- KUSUM scheme to promote solar agricultural pumps
- Broaden electricity and clean cooking fuel access
- Smart Cities Programme
- Electrify broad gauge railways
- Discussions underway on hard to mitigate industrial sectors

Updated Pledge Anticipated

- 'Panchamrit' Glasgow 2021
 - Non-fossil fuel capacity to 500GW by 2030
 - 50% of energy (electricity? capacity?) through RE
 - Cut down net projected C emissions by 1BT from now until 2030
 - Reduce C intensity by >45% by 2030
 - Net zero emissions by 2070

States and Cities

- State Action Plans across states (2012-13)
 - Predominantly focused on adaptation
 - Nationally driven but local concerns
 - Coal in Odisha
 - Desertification in Rajasthan
 - “strategic bundling” of local development and climate concerns (Dubash and Jogesh 2014)
 - Revisited state plans (ongoing)
- City level network based action
 - Bringing together international narratives of climate resilience, local institutions, and urban political actors
 - E.g. urban public health and climate resilience



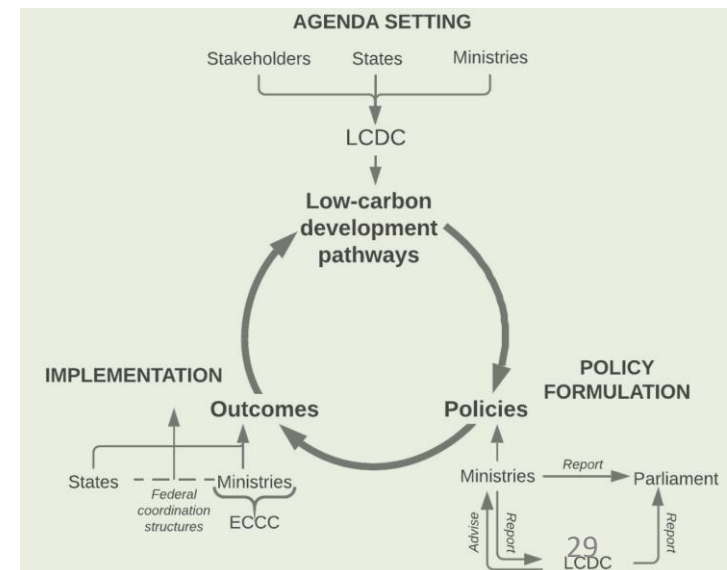
List of abbreviations

BEE	Bureau of Energy Efficiency	NAPCC	National Action Plan on Climate Change
CC	Climate Change	NDC	Nationally Determined Contribution
CCFU	Climate Change Finance Unit	NMEEE	National Mission on Enhanced Energy Efficiency
CCU	Climate Change Unit	NMGI	National Green India Mission
CDMA	Clean Development Mechanism Authority	NMSA	National Mission for Sustainable Agriculture
DEA	Department of Economic Affairs	NMSH	National Mission on Sustainable Habitat
DST	Department of Science and Technology	NMSHE	National Mission for Sustaining the Himalayan Ecosystem
INCCA	Indian Network on Climate Change Assessment	NMSKCC	National Mission on Strategic Knowledge for Climate Change
JNNSM	Jawahar Lal Nehru Solar Mission	NSCCC	National Steering Committee on Climate Change
LCSIG	Expert Group on Low Carbon Strategies for Inclusive Growth	NWM	National Water Mission
NABARD	National Bank For Agriculture And Rural Development	PMU	Project Management Unit
NAFCCC	National Adaptation Fund on Climate Change	SAPCC	State Action Plan on Climate Change

Dubash, Navroz K., Radhika Khosla, Ulka Kelkar, and Sharachandra Lele. 2018. "India and Climate Change: Evolving Ideas and Increasing Policy Engagement." Forthcoming. Annual Review of Environment and Resources (43): 12.1-12.3.

Institutional Vacuum

- Indian institutional structure
 - MoEFCC as nodal ministry: limited convening capability and analytical capacity
 - Executive Committee on Climate Change: reproduces ministerial hierarchies
 - PM Advisory Council: limited activity, limited transparency
- Three governance roles required*
 - Coordination
 - Strategy development
 - Building Consensus
- Future options
 - Low Carbon Development Commission e.g UK Climate Change Committee
 - Deliberative body e.g. South Africa's Climate Commission
 - Federal structure to inform states and encourage state experimentation



* Dubash Et al. *Science*, 5 Nov. 2021

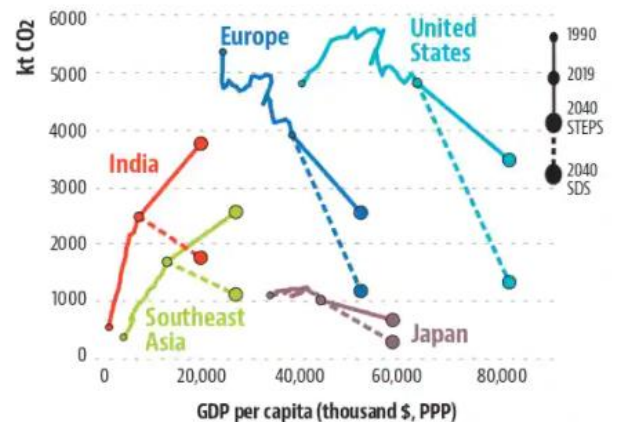
From Opportunism to Strategy?

- An opportunistic approach
 - Energy efficiency as a win-win
 - Solar power driven by energy security + cost reductions
- Systematic consideration of synergies and trade-offs?
 - Air pollution?
 - Job creation around RE?
 - Urban planning for resilience and low-carbon?
- Sectoral transitions
 - E.g. Decarbonisation of electricity
 - E.g. Climate Resilient agriculture
 - E.g. Cooking transition
 - E.g. Just transition for coal
- Institutional development
 - Knowledge bodies
 - Mainstreaming into ministries
 - Climate law (?)
- Shifting development pathways



Puzzles and Questions

Energy-related CO₂ emission and GDP per capita by region

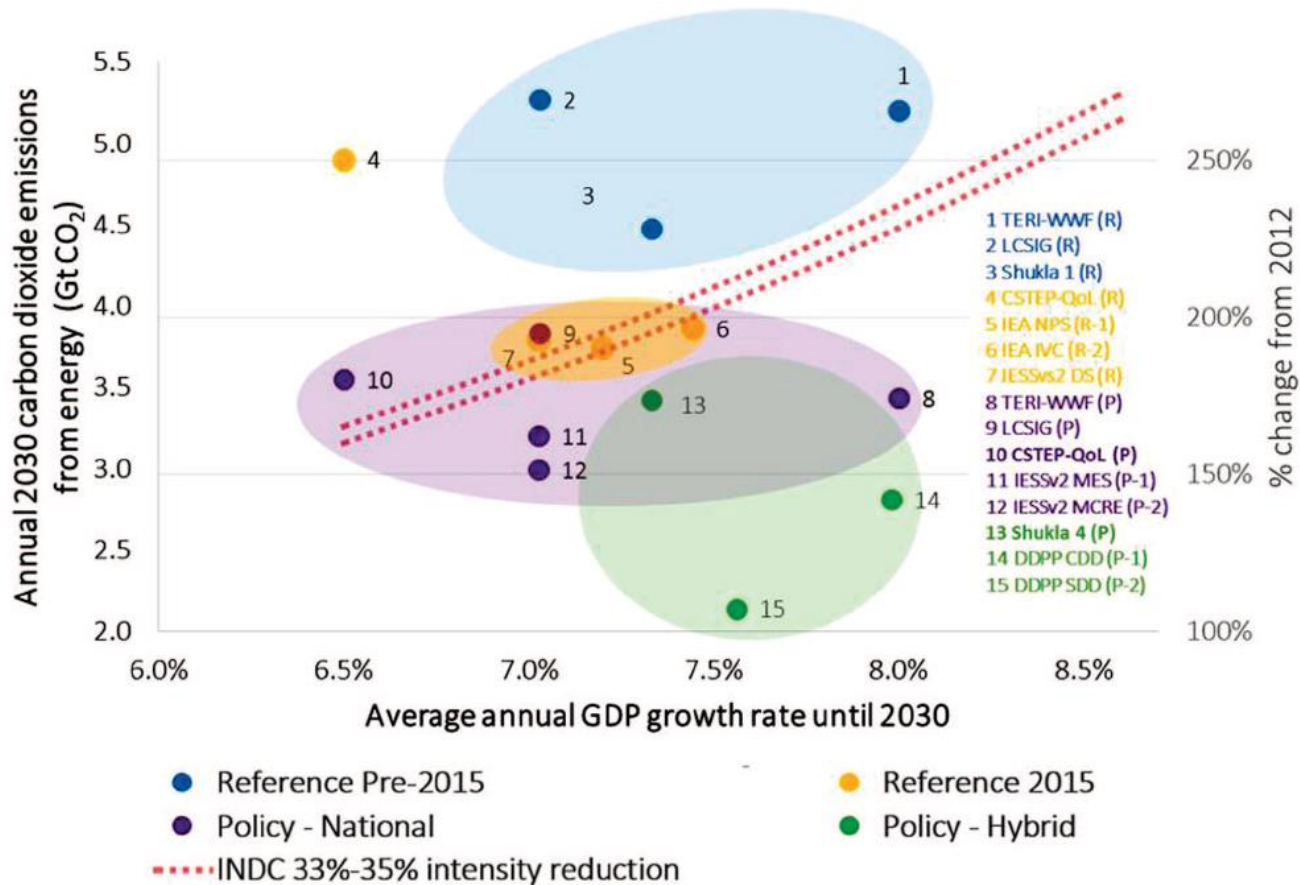


STEPS is Stated Policies Scenario and SDS is Sustainable Development Scenario

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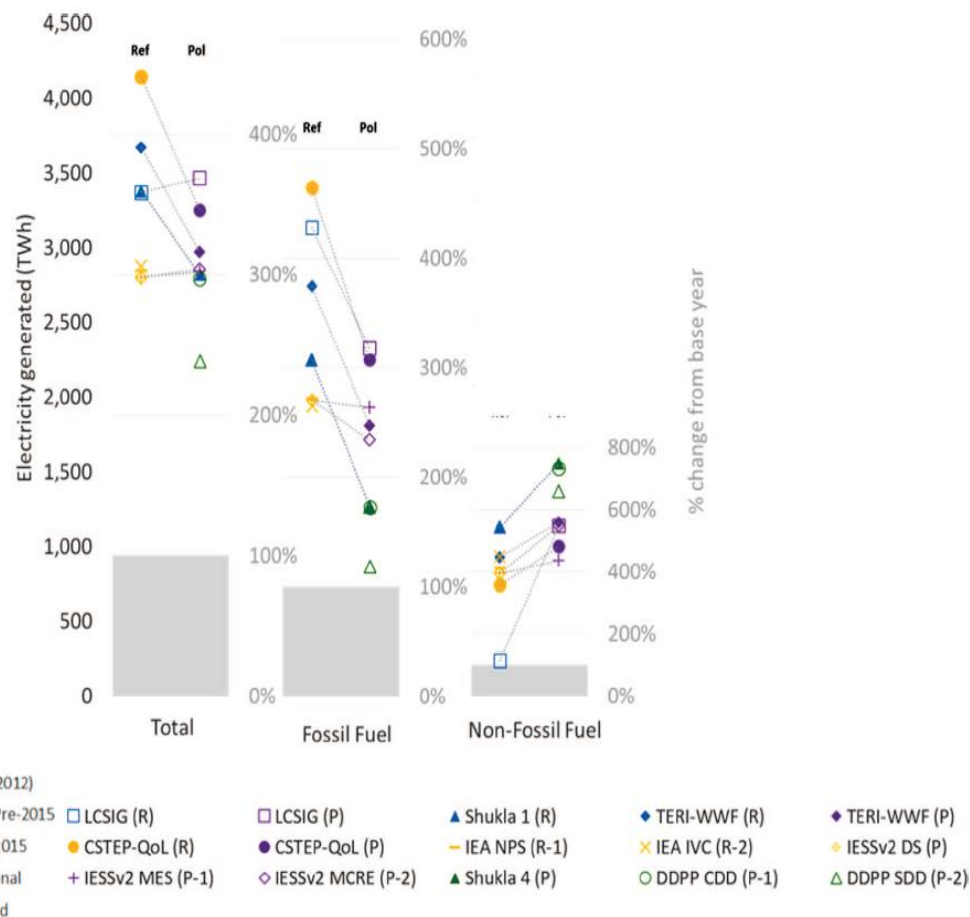
India's 2030 projected emissions

How well do we know?



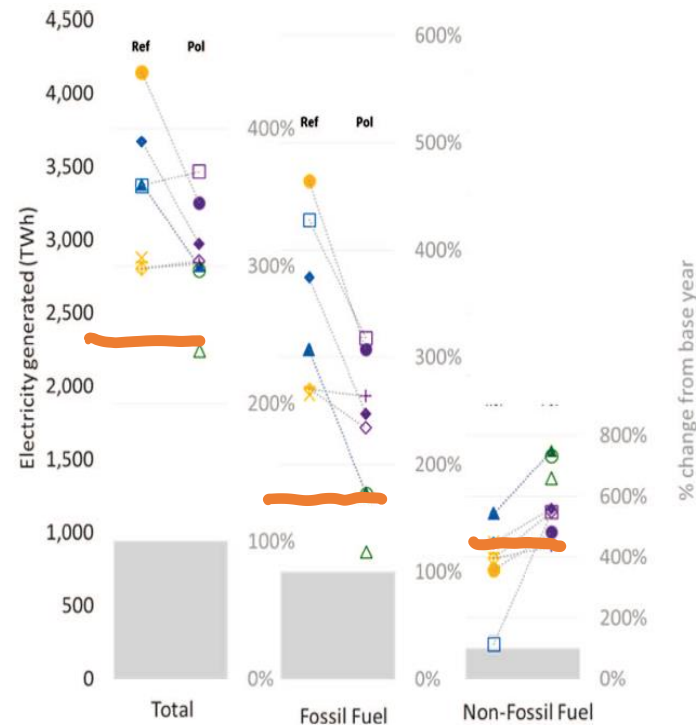
Electricity supply in 2030

- Very steep increase in projected electricity need
- Fossils still dominate



Electricity supply in 2030

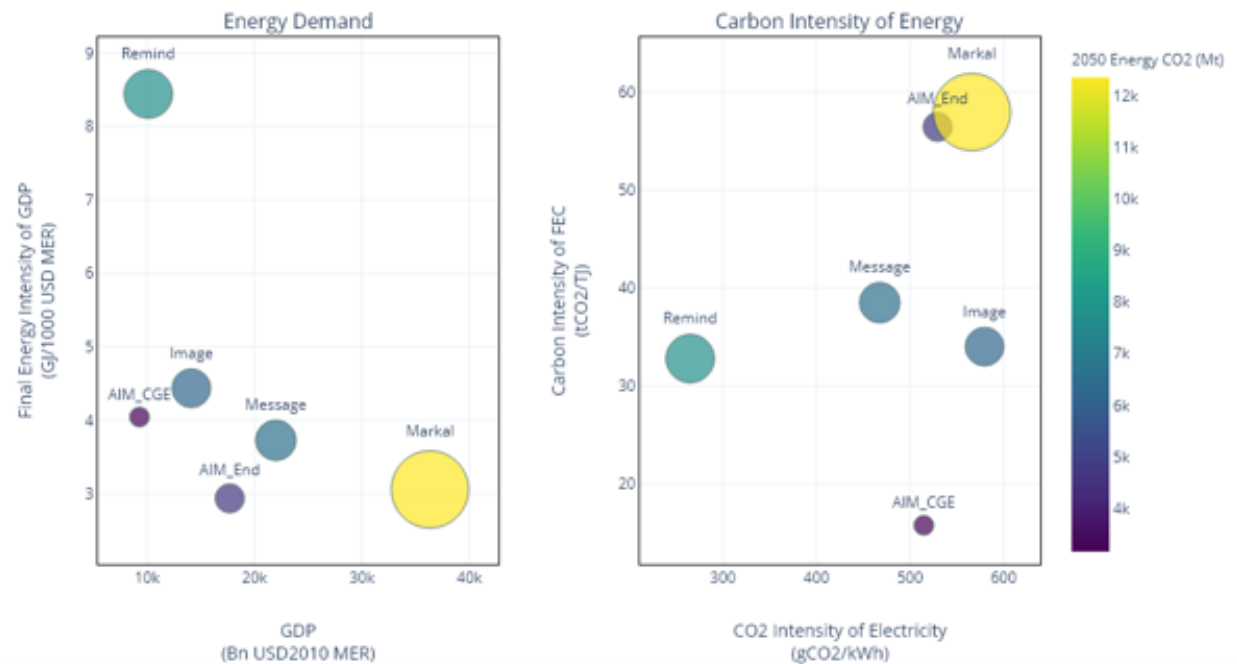
- Steep increase in projected electricity need
- Fossils still dominate
- Govt (CEA) 2019 projections for 2030 in
 - ‘never built’ vs. ‘phase out’ or ‘phase down’



Different Future Indias in 2050

- Industrialisation and urbanization pathways shape emissions outcomes as much or more than mitigation policies

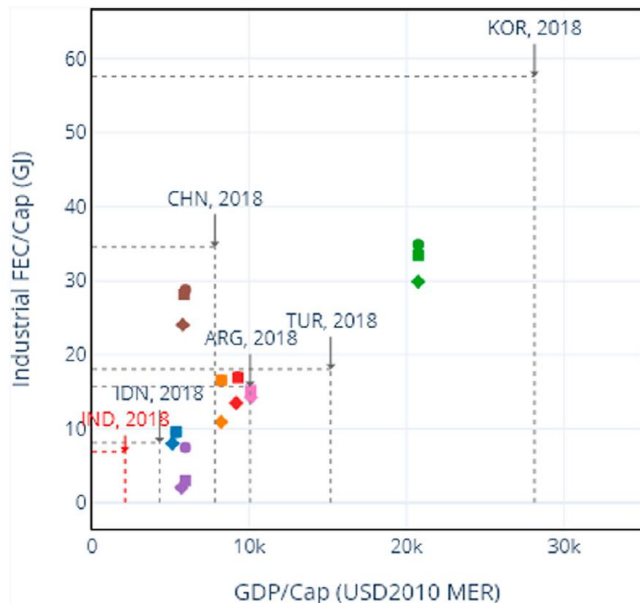
Energy and CO2 Indicators, 2050, Moderate Policy Scenarios



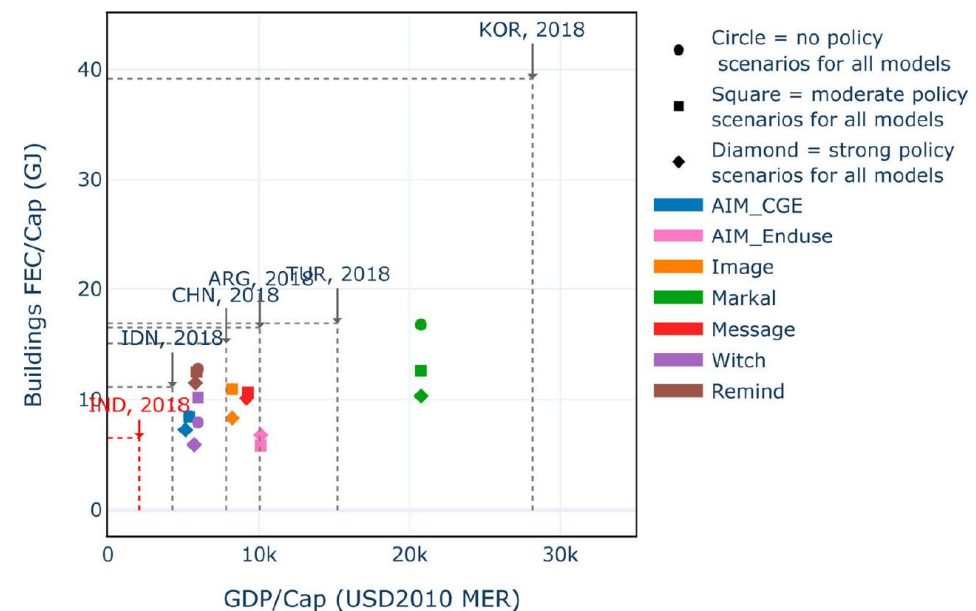
Spencer and Dubash, "Scenarios for Different 'Future Indias': Sharpening Energy and Climate Modelling Tools" *Climate Policy*, Forthcoming 2021

Development Pathways Shape Emissions Futures

- Development pathways are a challenge to model
- Transparent and well justified assumptions



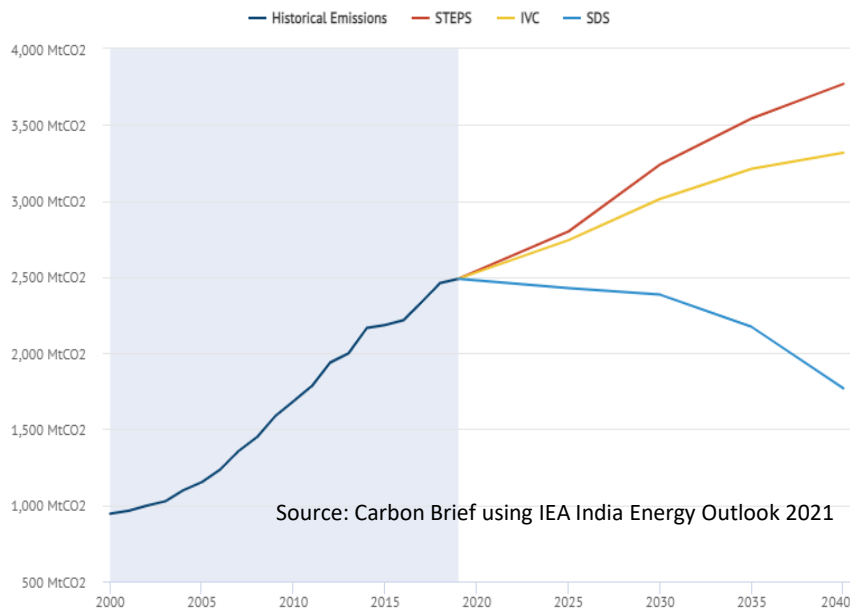
Industrial FEC/cap in 2050



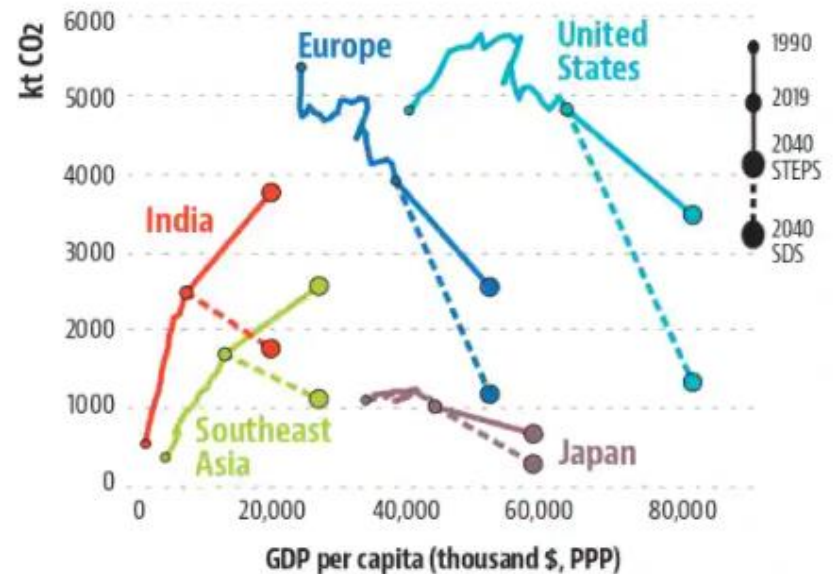
Buildings FEC/cap in 2050

What might net zero imply for India?

- IEA SDS scenario provides some indication of ambitious climate action
- Uncertainty goes up with the longer we go into the future
- Relative balance of costs vs opportunity is relatively unknown
- Credible just transitions to net zero



Energy-related CO₂ emission and GDP per capita by region



STEPS is Stated Policies Scenario and SDS is Sustainable Development Scenario

Reproduced with permission from India Energy Outlook 2021, International Energy Agency

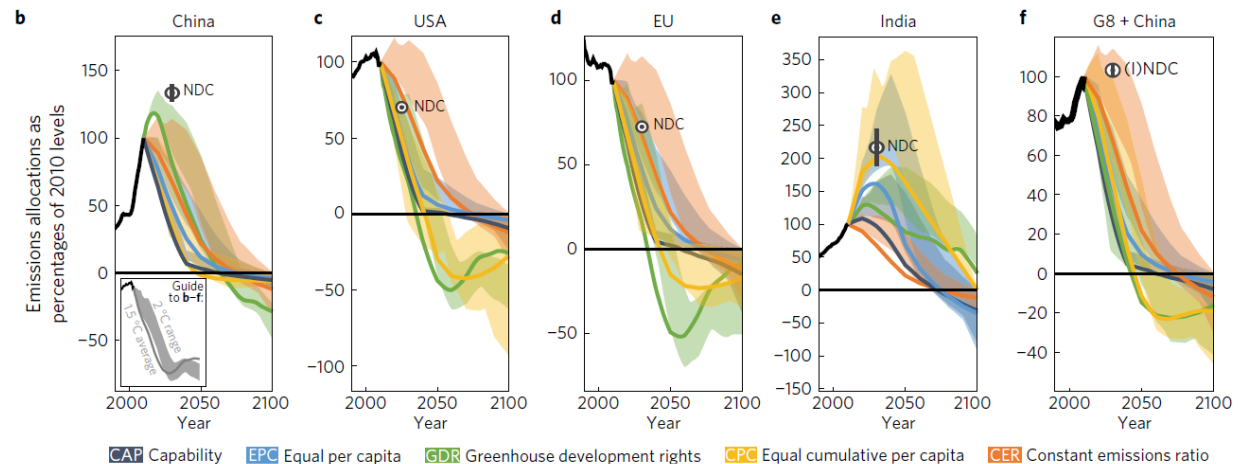
Credible Just Transitions to Net Zero

- Just: Overall net zero by 2050 need not mean net zero *by all* by 2050 – different rates of decarbonisation across countries
 - Finance and technology support needs to remain on the table
- Credible: More than long-term statements of intent
 - Backed by short and medium term action
 - Mechanisms of accountability
 - Careful with the ‘net’ –
 - Over-reliance on uncertain future technology
 - Dodgy emissions credits
- Transitions: Frame climate policy consistent with local politics
 - E.g. Net zero in EU, job creation in South Africa, jobs and electricity transition in India

Dubash et. al. 2021. <https://theconversation.com/developing-countries-need-to-chart-their-own-course-to-net-zero-emissions-159655>

How do we measure 'climate equity'?

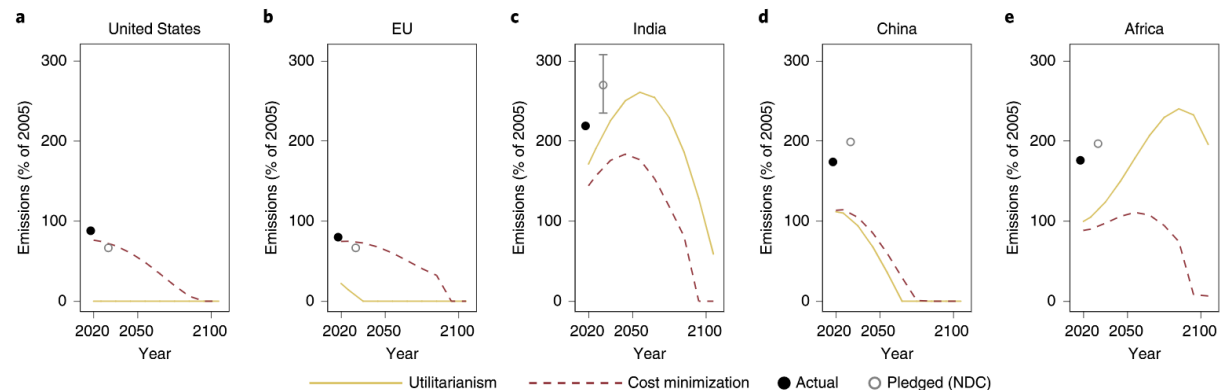
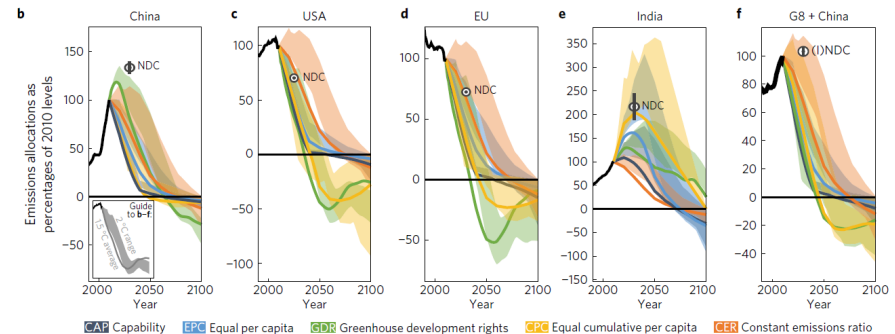
- Multiple benchmarks - divergent results
- How to judge 'fairness' of an NDC?



Du Pont et al, Equitable Mitigation to Achieve the Paris Agreement Goals, Nature Climate Change, 19 December 2016

Equity Benchmarks for 'Nationally Determined Contributions'

- Multiple benchmarks - divergent results
- How to judge 'fairness' of an NDC?
- Utilitarianism - Emissions to the most needy - mitigation happens faster
- Cost minimization approaches fail to account for distribution
- Looming Global Stocktake



Du Pont et al, Equitable Mitigation to Achieve the Paris Agreement Goals, *Nature Climate Change*, 19 December 2016
 Budolfson et al, Utilitarian Benchmarks for Emissions... *Nature Climate Change*, Sept 2021 Access: at <https://rdcu.be/cxFOY>

Some Key Gaps and Questions

- Credible national models for emissions scenarios accounting for development pathways
- Analysis of synergies and trade-offs across different development and mitigation objectives
- Downscaled climate impacts science, made accessible
- Keystone technologies and socio-technical transitions
- Questions related to the feasibility and desirability of different geoengineering options

Concluding Thoughts

- Can India combine a concern for equity with a focus on accelerated mitigation?
 - Energy for development + mitigation
- How can (should?) India pivot from climate opportunism to strategic climate policy?
- Can and should we think about development pathways and how they shape emissions futures?
 - How model?
 - How hedge against costs to the poorest?
 - Scope for international finance?
- How do we prepare for socio-technical transitions in key sectors?
- How do we integrate climate resilience into sectoral decisions: 'climate resilient development pathways'
- What changes do we need in our science and technology infrastructure to inform shifts in development pathway?
- What changes do we need in our legal and governance framework to bring about shifts in development pathways?

Thank you

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India in a Warming World

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<https://oxford.universitypressscholarship.com>

