

Energy-climate policy packages: Indian experiences

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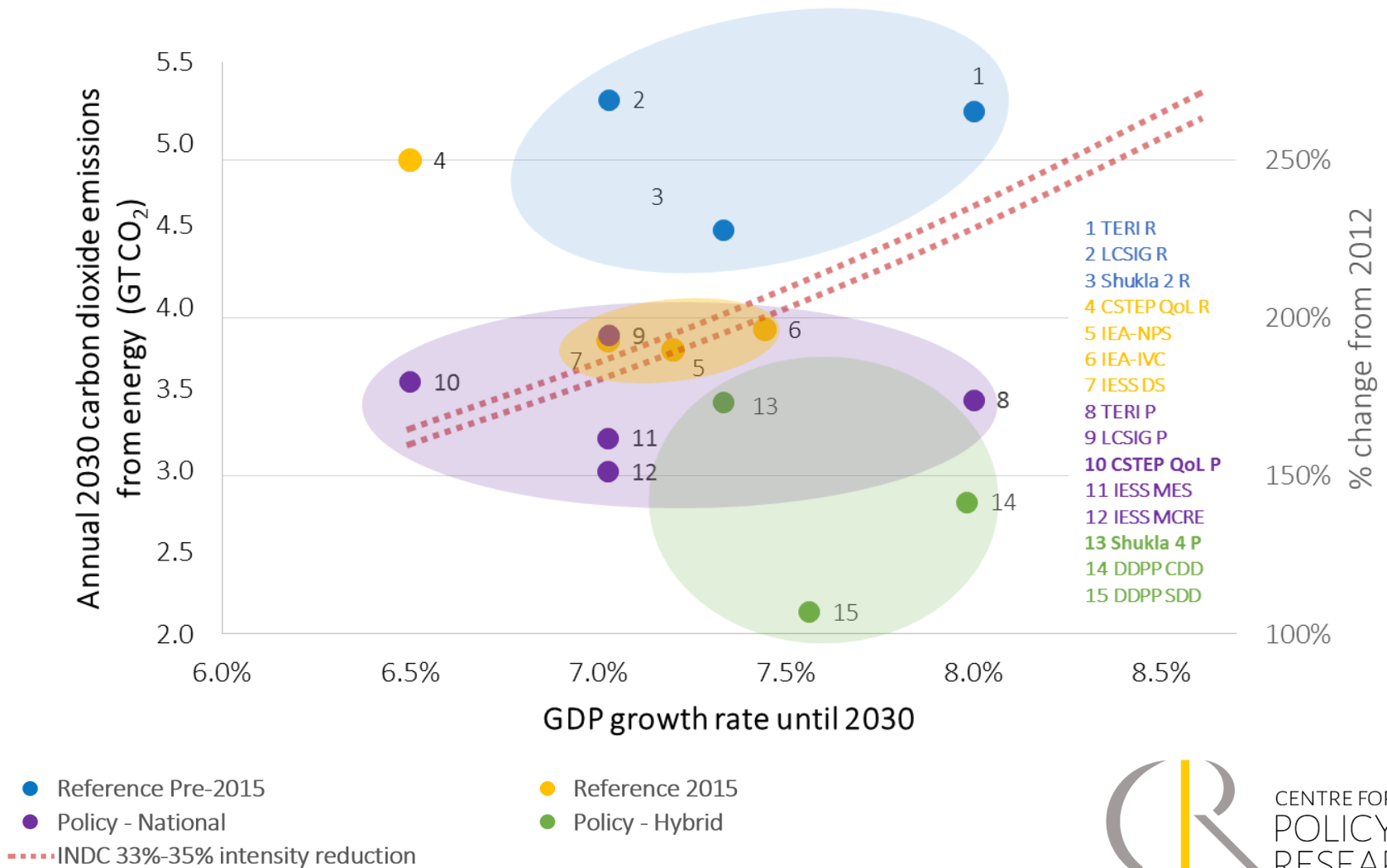
IEA Workshop

27 June, 2017

Indian energy and climate: State of play

- Transitions:
 - Urbanisation: Urban population to double between 2014 and 2050 & two-thirds of building stock in 2030 yet to be built
 - Jobs: 10 million people to enter the job market annually in the next two decades
 - Access: 800 million lack clean cooking fuel, 300 million lack access to electricity
- RE prices drop:
 - Solar: 17.91 INR/kWh in 2011 to 2.44 INR/kWh in 2017
 - Wind: 4.83 INR/kWh in 2015 to 3.46 INR/kWh in 2017
 - Average coal tariff is 3.20 INR/kWh
- Turn around on climate, from villain to hero:
 - From Copenhagen to Paris & Montreal

Recent evolution in policy landscape



Current policy packaging

ENERGY EFFICIENCY & CLEAN TECHNOLOGY

Perform, Achieve and Trade (PAT) Scheme

Domestic credit trading scheme for Industrial Energy Efficiency (2012)

LED bulbs at subsidized rates

To replace 770 million bulbs by 2019 (2014)

LPG access

Gas connections for Below Poverty Line families, complementing Direct Benefit Transfer (2013)

National Electric Mobility Mission Plan

Increasing fuel efficiency standards (2014) hybrid and electric vehicles (2013)

ENERGY SUPPLY

175 GW target of RE capacity by 2022

Solar target of 100 GW by 2022

Increasing domestic coal production to 1500 MTpa by 2022 (2015)

Clean energy cess on domestic, imported coal

To finance clean energy (2010), cess doubled annually from INR 50/t (2014) to Rs 400/t (2016)

INFRASTRUCTURE TRANSITIONS

Dedicated freight corridors

Rail freight infrastructure to connect metros

Electricity for All

24/7 supply across by 2022 (2014)

“Make in India” programme for manufacturing

Enhanced urban infrastructure

Smart Cities Mission, AMRUT and Housing for All and building energy codes

Energy transformation under uncertainty

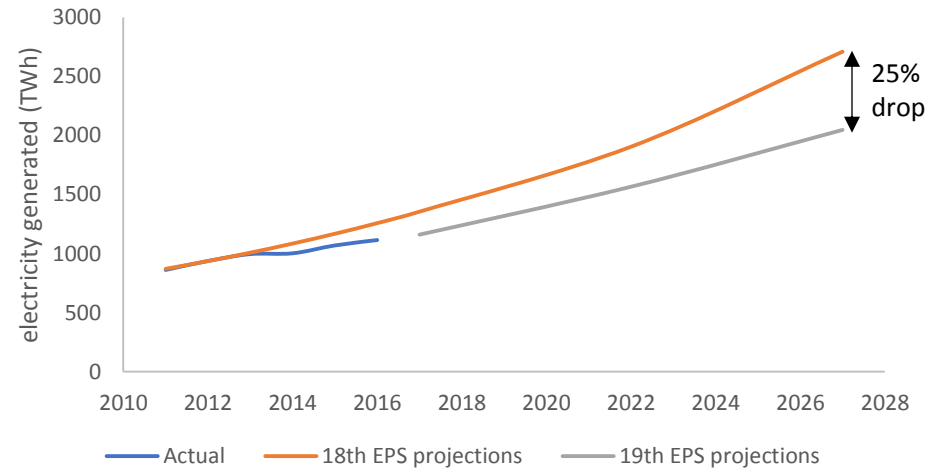
Mixed signals on coal

- 2014: 1500 MT coal consumption target for 2022
- 2016: only 25% increase in existing coal fleet needed until 2027

Revised demand estimates

- 2011-2017: Demand projections for 2027 drop by 25%
- Energy models show uncertainty of 150% for current 2030 projections
- 2030 electricity generation: upper limit of ~4000 TWh, lower limit of ~2000 TWh (270-100% above current levels)
- All new vehicles in 2030 to be electric

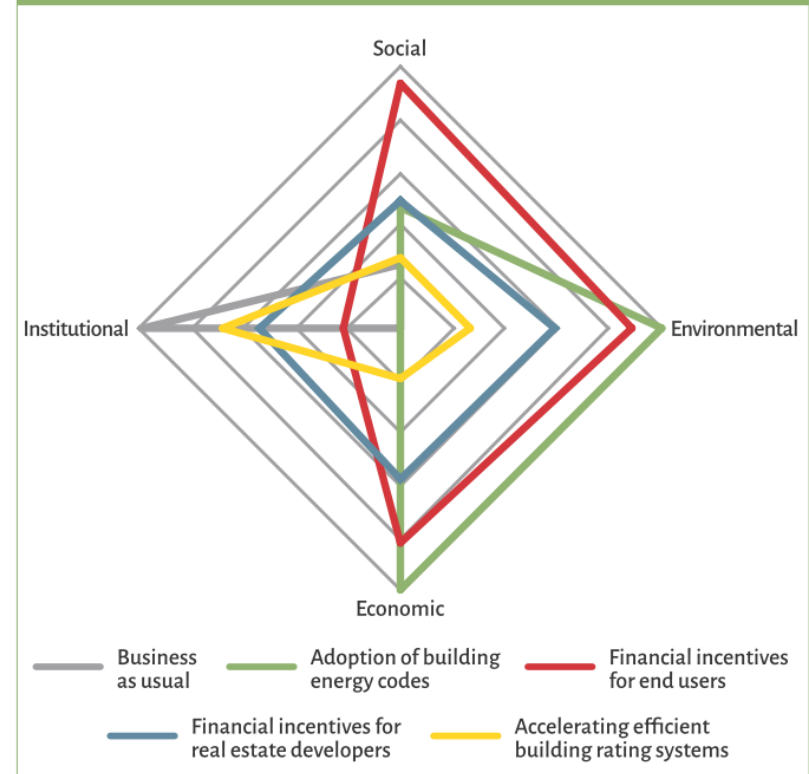
India's electricity generation projections



Policy decisions as multiple objective problems

- **Energy security:** Renewables; Domestic coal consumption
- **Energy access:** Electricity for All; LPG access scheme
- **Clean environment:** Coal Cess
- **Climate change** not primary driver
 - But boosts national policies via the National Climate Action Plan and NDC process
- Climate change has implications for development
 - E.g. Energy security and climate mitigation often go together, but energy access and cost need not

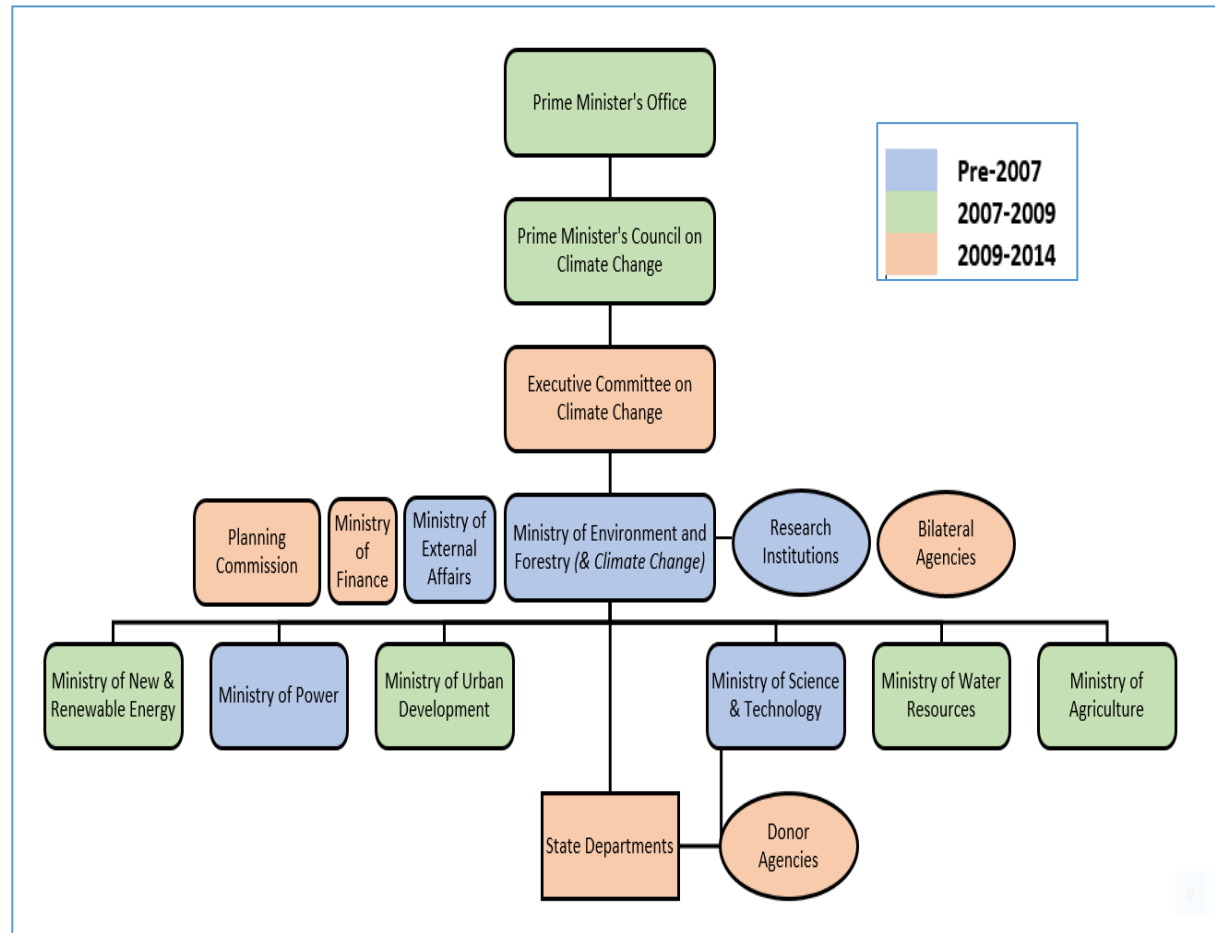
Figure 2: Illustrative MCDA results for the buildings sector study



Khosla et al. (2015), "Towards methodologies for multiple objective based energy and climate policy"

National institutions and sectoral silos

- Multiple objectives map to different departments
- Limited coordination with sectoral silos
- Incremental actions with limited larger vision or basis for prioritization
- Motivations, tradeoffs and links of policies and packages not explicit
- Mismatch between decision-making reality and analytical constructs?



Constructing policy packages

- Challenge for India: decarbonise, increase energy access and use, simultaneously under demographic change and urbanization
 - High uncertainty, mixed policy signals, weak institutions
- Multiple objectives approach offers a pathway: Identify and link objectives and policies—understand synergies, trade-offs
 - Jobs, energy access, poverty at national and sectoral scale
- Examine and strengthen institutions to identify and coordinate on linkages – to identify ‘directional changes’
 - From potentials to implementation
- Focus on context specific transitions with lock-in potential
 - Interaction between technology, behaviour, infrastructure

Thank you

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