The role of coal in India's energy mix and power

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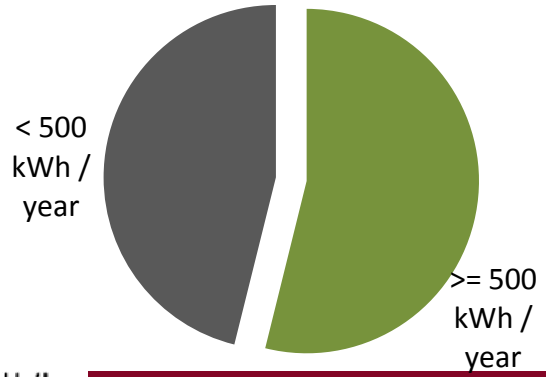
Plan

- India's energy challenge
- Share of coal in India's energy and power mix
  - Past trend and projections
- Some recent trends
  - Current overcapacity and limitations on generation
  - Increasing cost of generation
  - RE becoming more lucrative for paying consumers
- Implications and Challenges

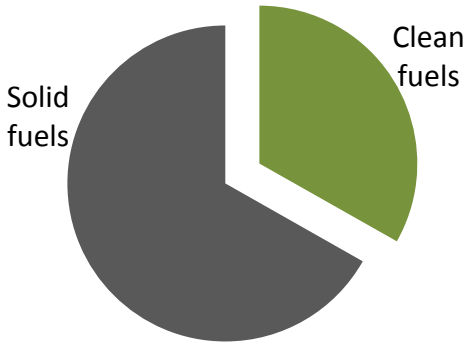
Energy poverty

- Insufficient consumption of modern energy in homes and enterprises
- ~50% households consume < 500 kWh / year
  - EU average: 3862 kWh / year
- ~67% households depend on solid fuels for cooking / heating
- ~75% of rural enterprises don't use any modern energy
- India's per-capita energy consumption <= Africa's!?

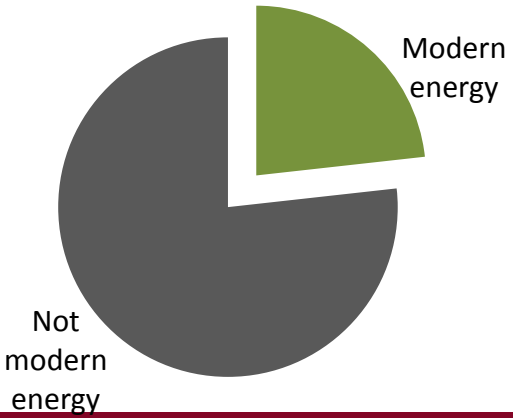
% Households consuming electricity



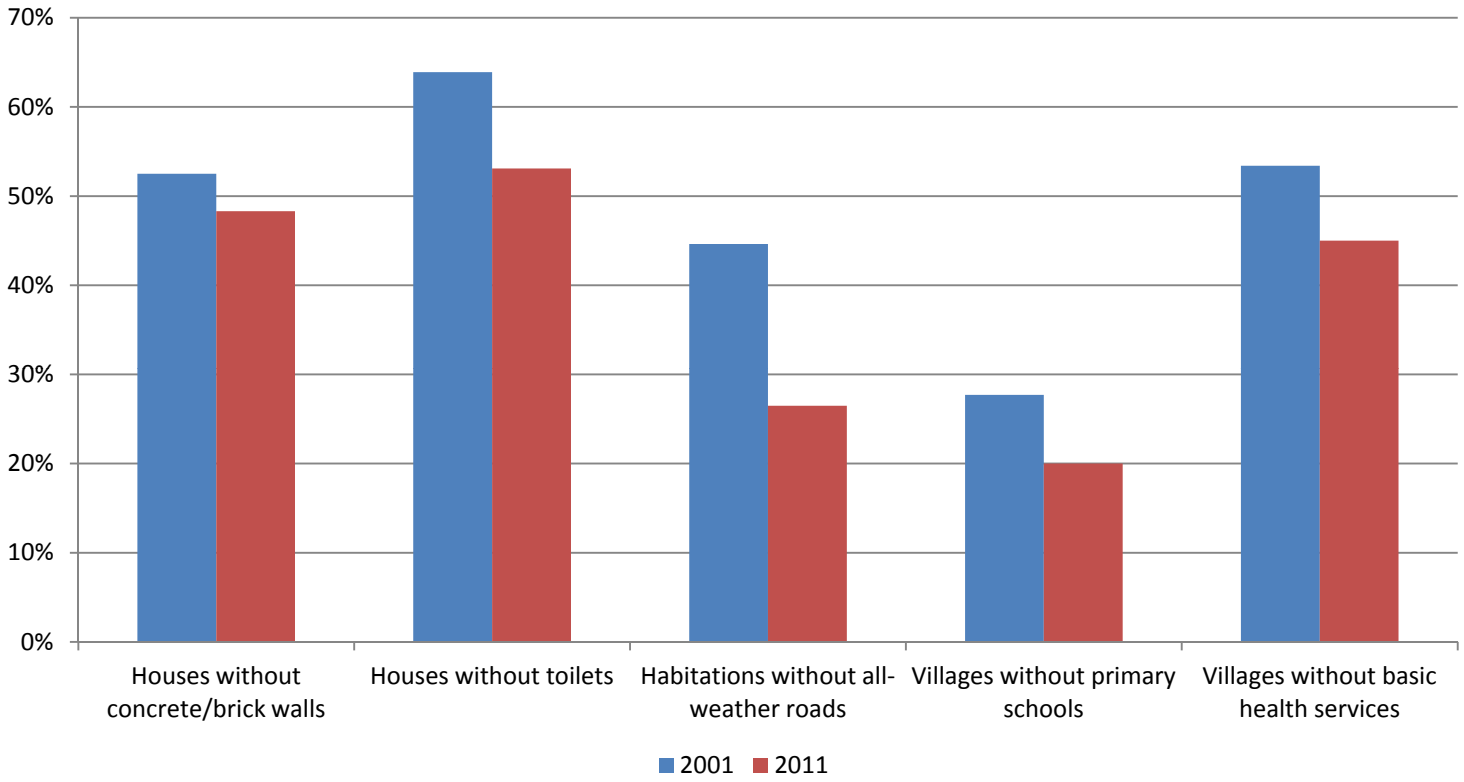
Cooking fuel used by % Households



Energy use in rural enterprises



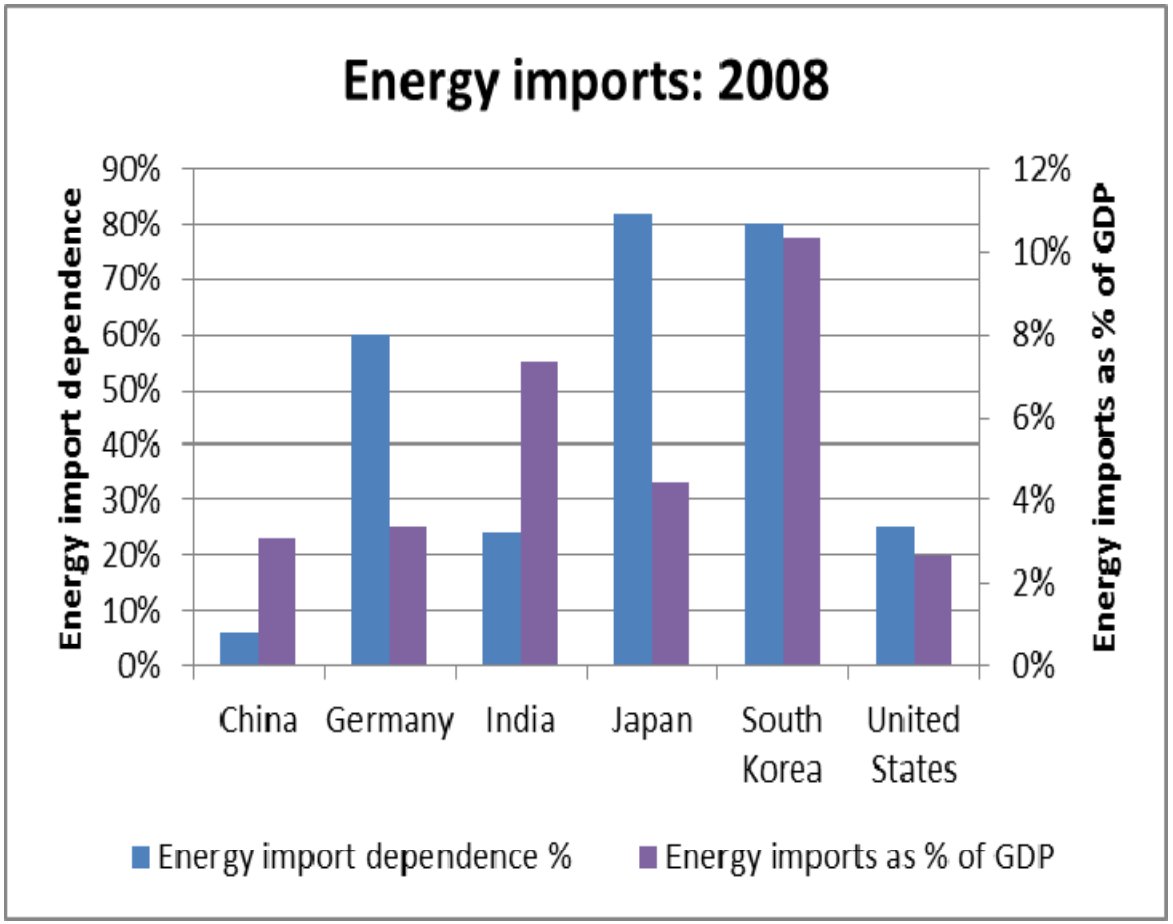
Energy and infrastructure deficit and inequity



- Half the households do not have pucca houses, toilets
- Half the villages do not have primary health care
- One-fourth villages have no proper road access, one-fifth no primary school

Source: Census, NSSO, PM Sadak Yojana, Prayas estimates

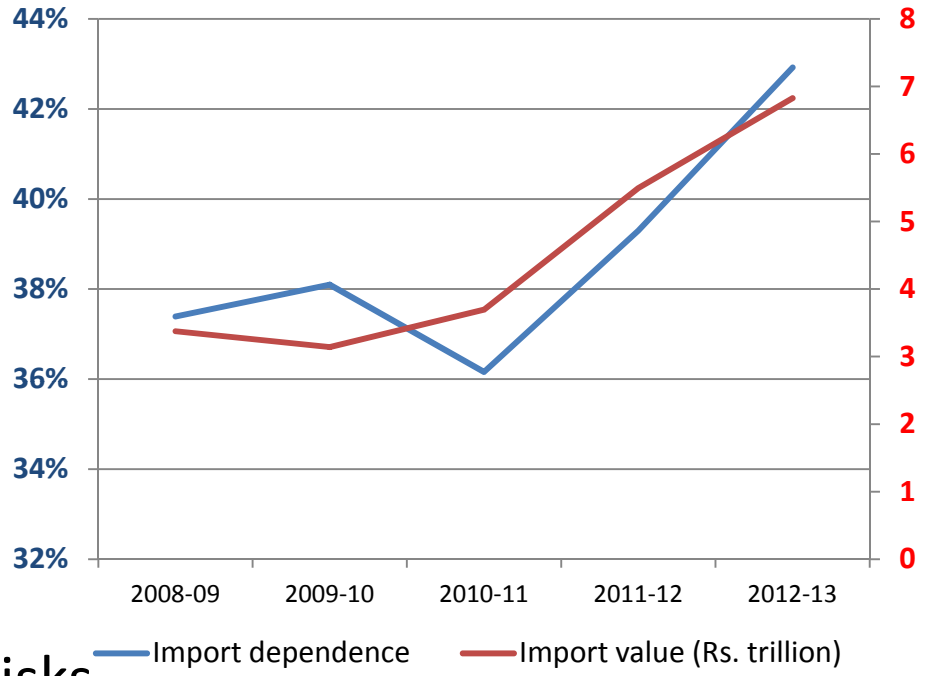
Limited natural resources => high import costs



- India's energy imports as % of GDP higher than many other countries
- India's energy imports growing
- Many negative impacts (cost, trade deficit, geo-political risks)

Rising imports and viability

- Not well endowed with conventional energy
  - Domestic inefficiencies
  - Rapid rise of imports
- Land, water, location constraints
- Rising imports
  - Trade deficit, geo-political risks
  - Increased costs – harder to provide access
- Energy pricing
  - Viability
  - Subsidy targeting and subsidy delivery
  - Quality of supply



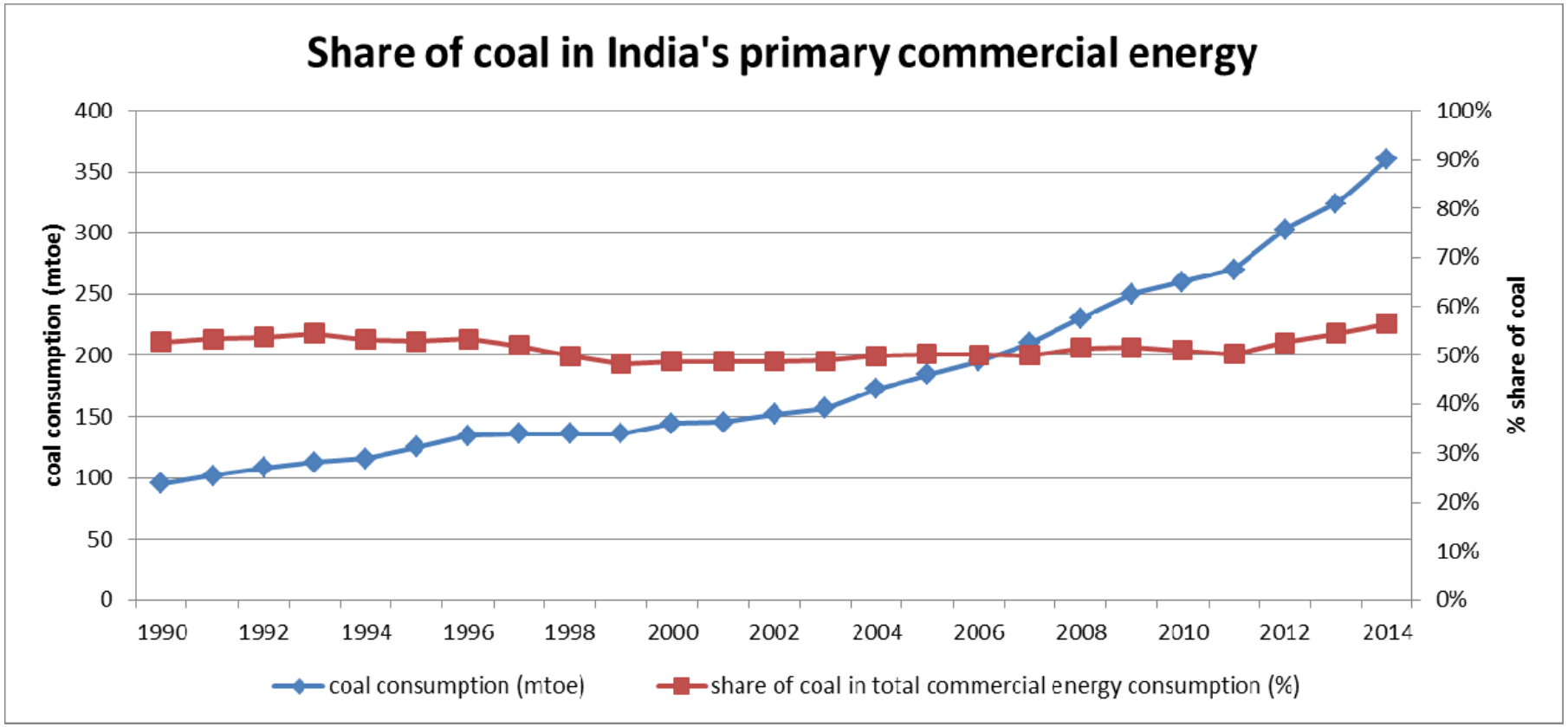
Social and Ecological impacts

- Displacement
- Air, water pollution
- Climate change

=> Economic impacts

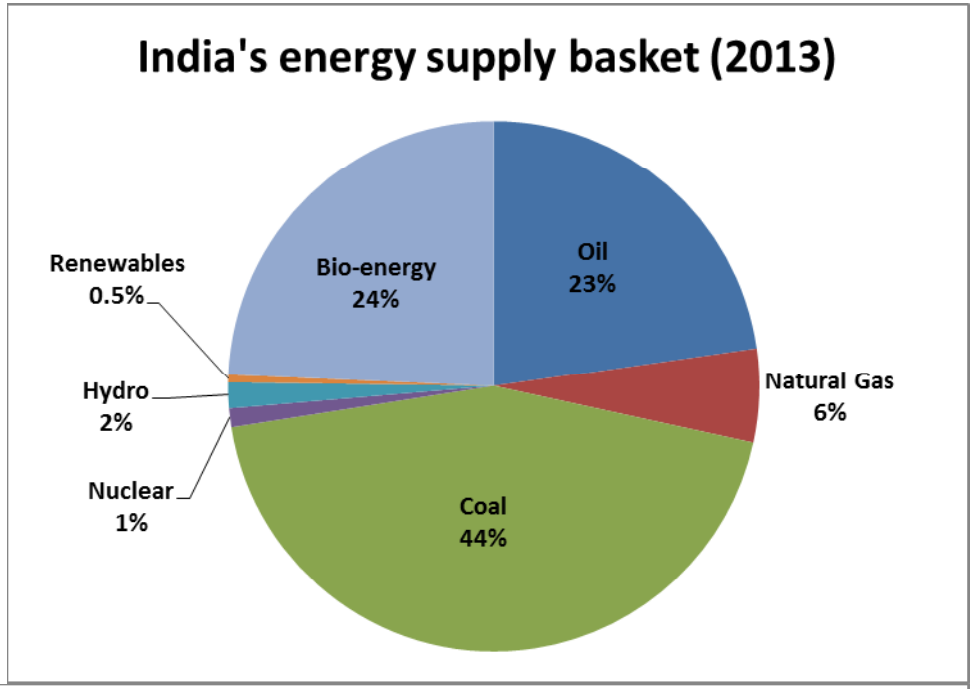
Indian coal sector in numbers

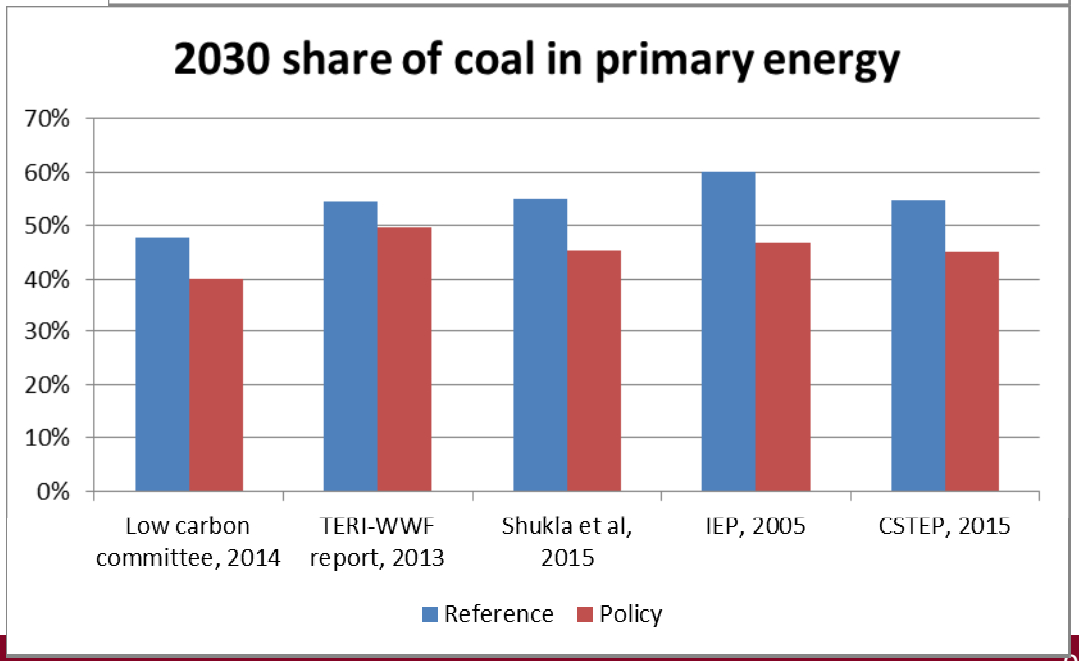
- Historically the most important source of energy



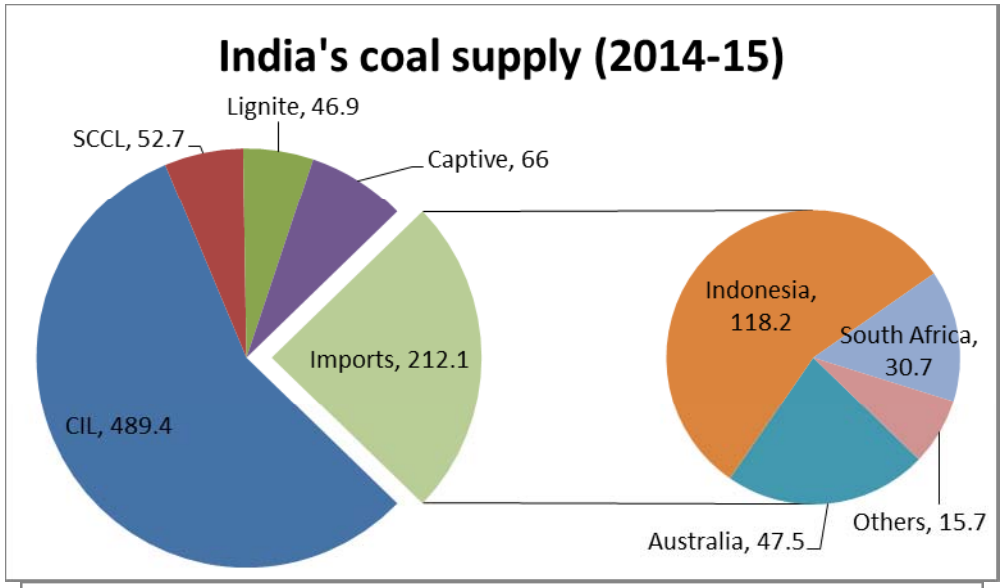
Role of coal

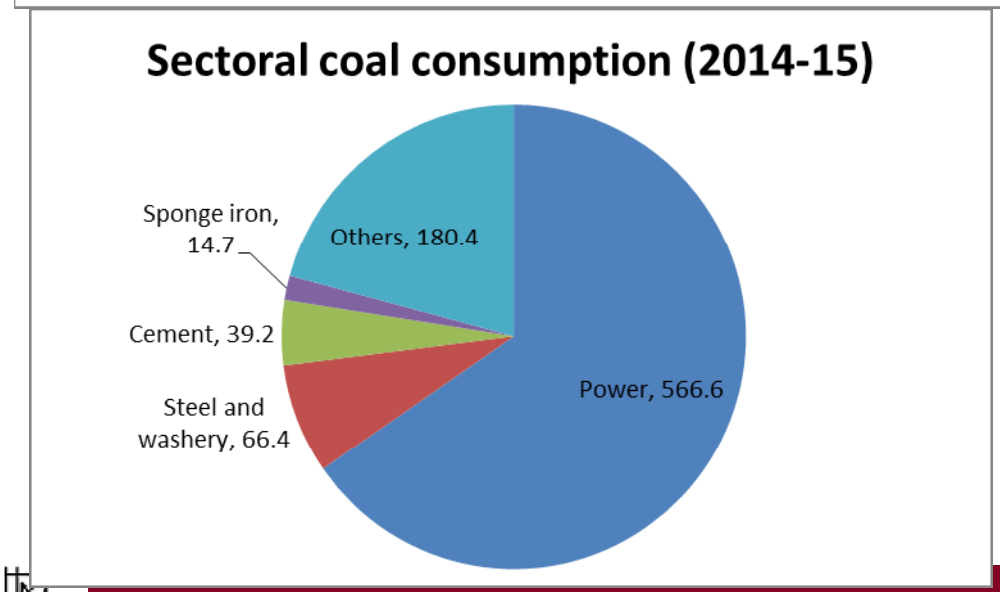
- Largest share even including non-commercial sources
- Most studies predict major role for coal up to 2030
- Ambitious targets
  - 1.5 BT coal by 2019





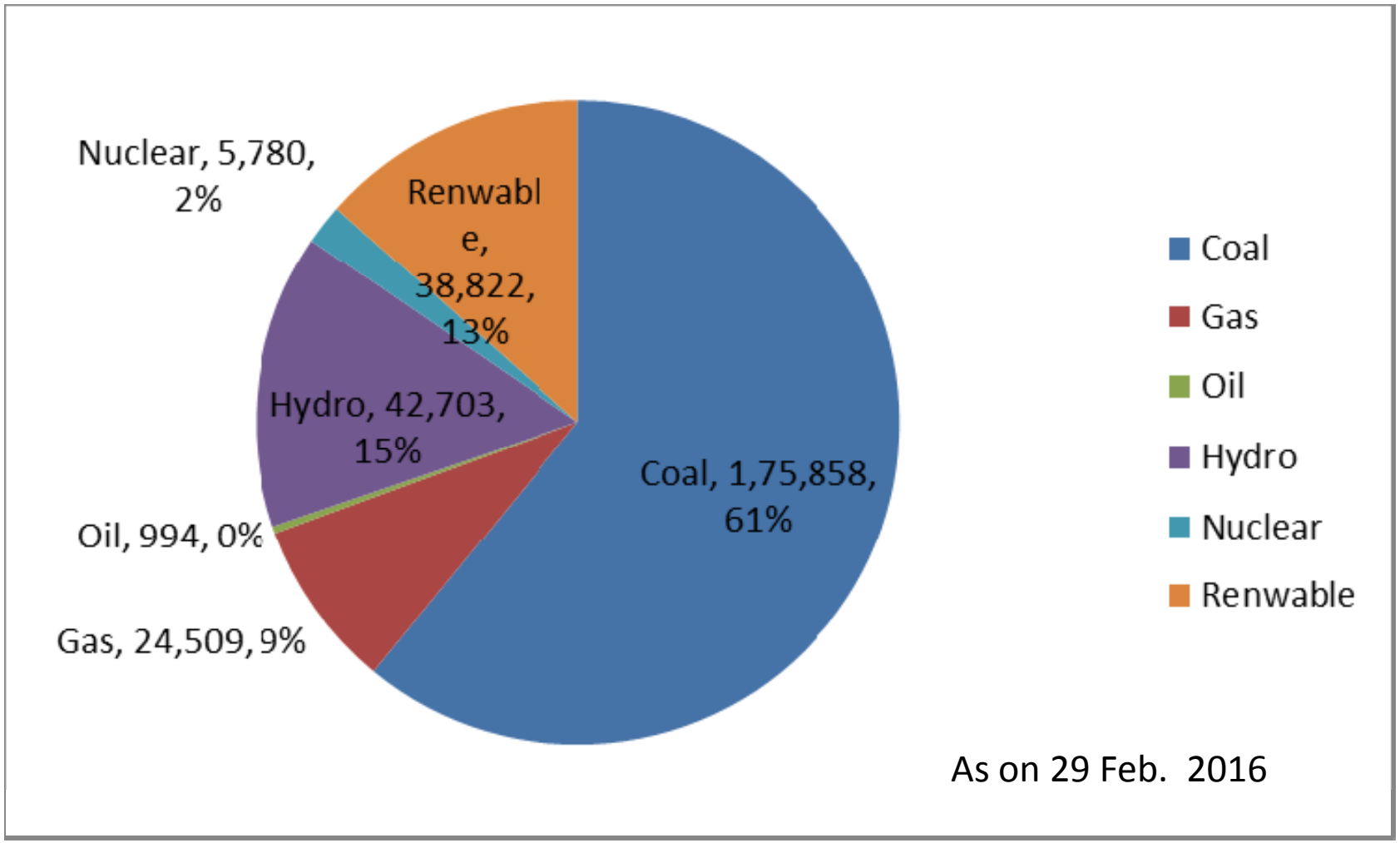
Coal supply and consumption



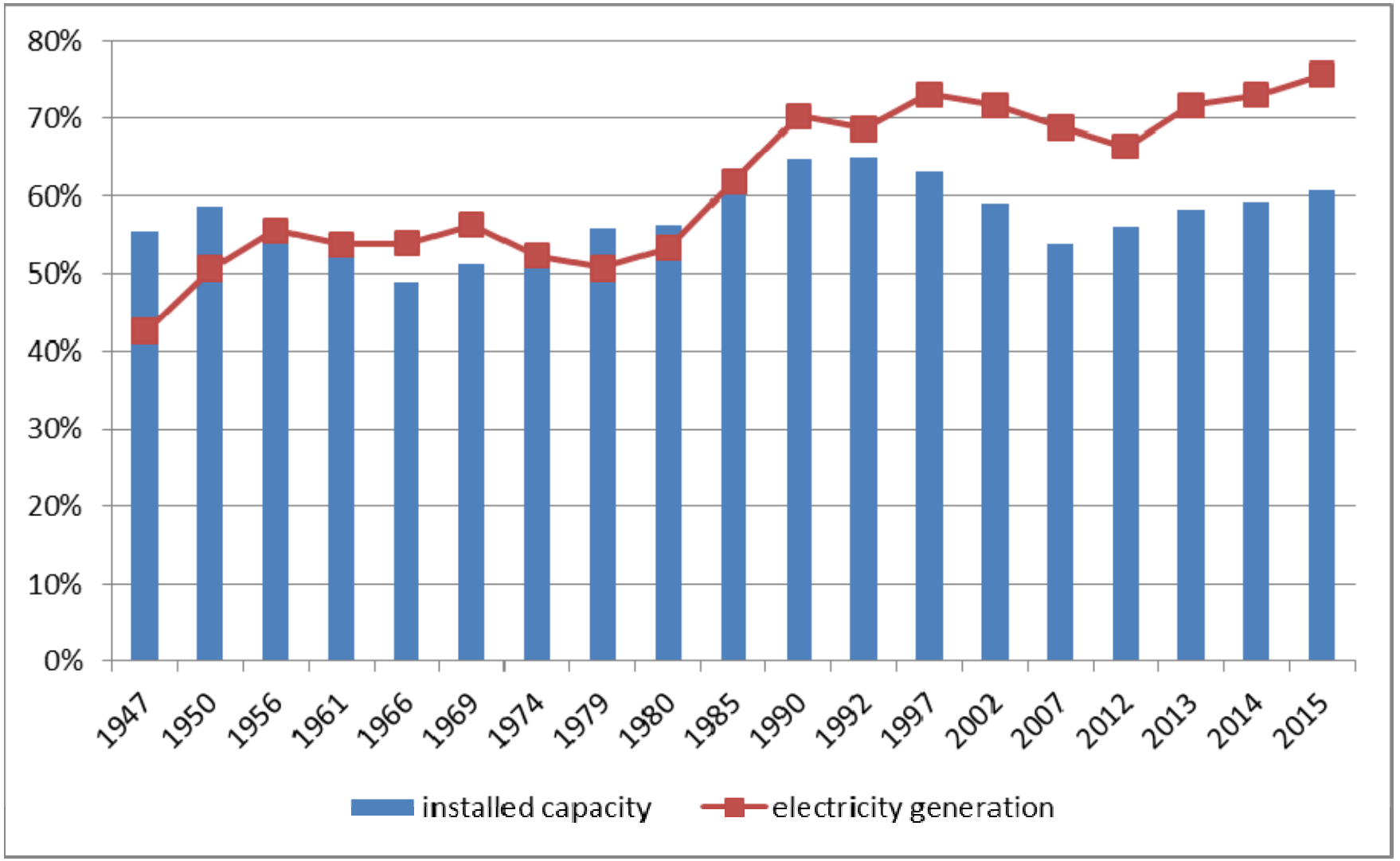


- CIL is dominant supplier (~80% of domestic supply)
- Indonesia largest source of imports (~55% of imports)
- Power largest consumer (~67% of consumption)

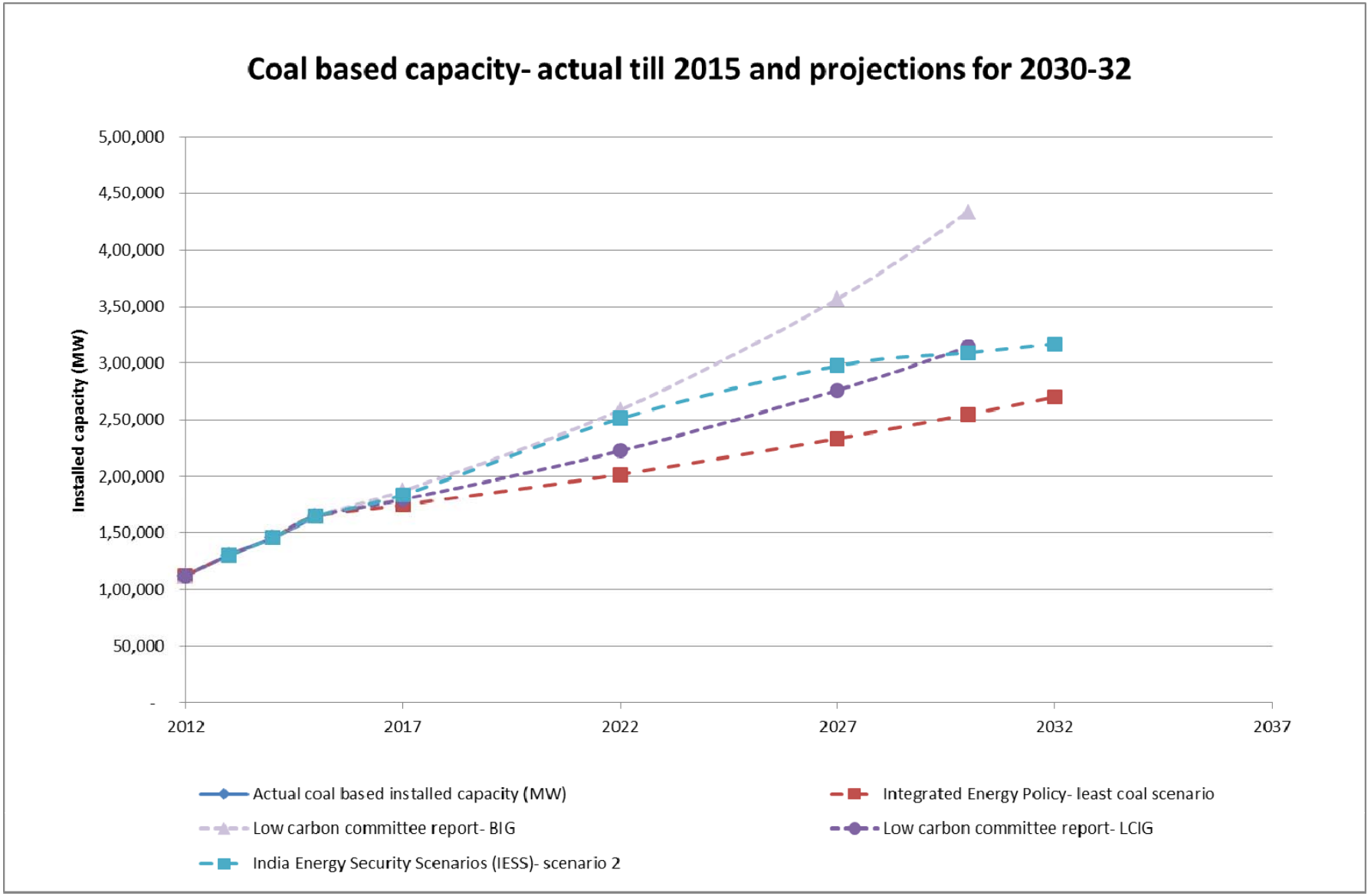
Power Generation Capacity – Fuel wise



Share of coal based generation



Coal Thermal Power Capacity - Projections



Current overcapacity and limitations on generation

- FY 15-16: 18 States/ UTs expected to have net surplus energy and 16 States/UTs to have peak surplus on annual basis (CEA – LGBR)
- ~ 10,000 – 15,000 MW capacity idle / low PLF
- Maharashtra – backing down of ~ 5000 MW capacity for next 3 years
- CIL – slowing down production due to lack of off-take
- Plants shutting down due to water shortage
  - Parali – 1130 MW –2 years
  - Farakka – 2100 MW

Increasing cost of generation …1

- > 15,000 MW coal capacity with **variable / fuel** cost ~ 3.75 Rs./ kWh

  - recent solar tariff @ 4. 5 Rs./ kWh – fixed for 25 years

- Claimed increase in coal generation cost (0.25 to 0.75 Rs./ kWh)
  - New environmental norms
  - Clean Environment Cess

Increasing cost of generation …2

Huge capacity under litigation, demanding tariff increase over and above agreed, competitively bid tariff (by 0.3 to 1.25 Rs./ unit)*

Project	Capacity in MW
Adani Power Ltd Mundra TPS	2425
Coastal Gujarat Power Ltd, Mundra UMPP	4000
Adani Power Maharashtra Ltd, Tiroda TPS	3300
Rattan India Power Limited	1200
Lanco Anpara Power Ltd	1200
Sasan Power Ltd, UMPPP	4000
EMCO Energy Ltd	300
Adani Power Rajasthan Ltd.	1320
GMR Kamalanga Energy Ltd	1400
Total	**19,145**

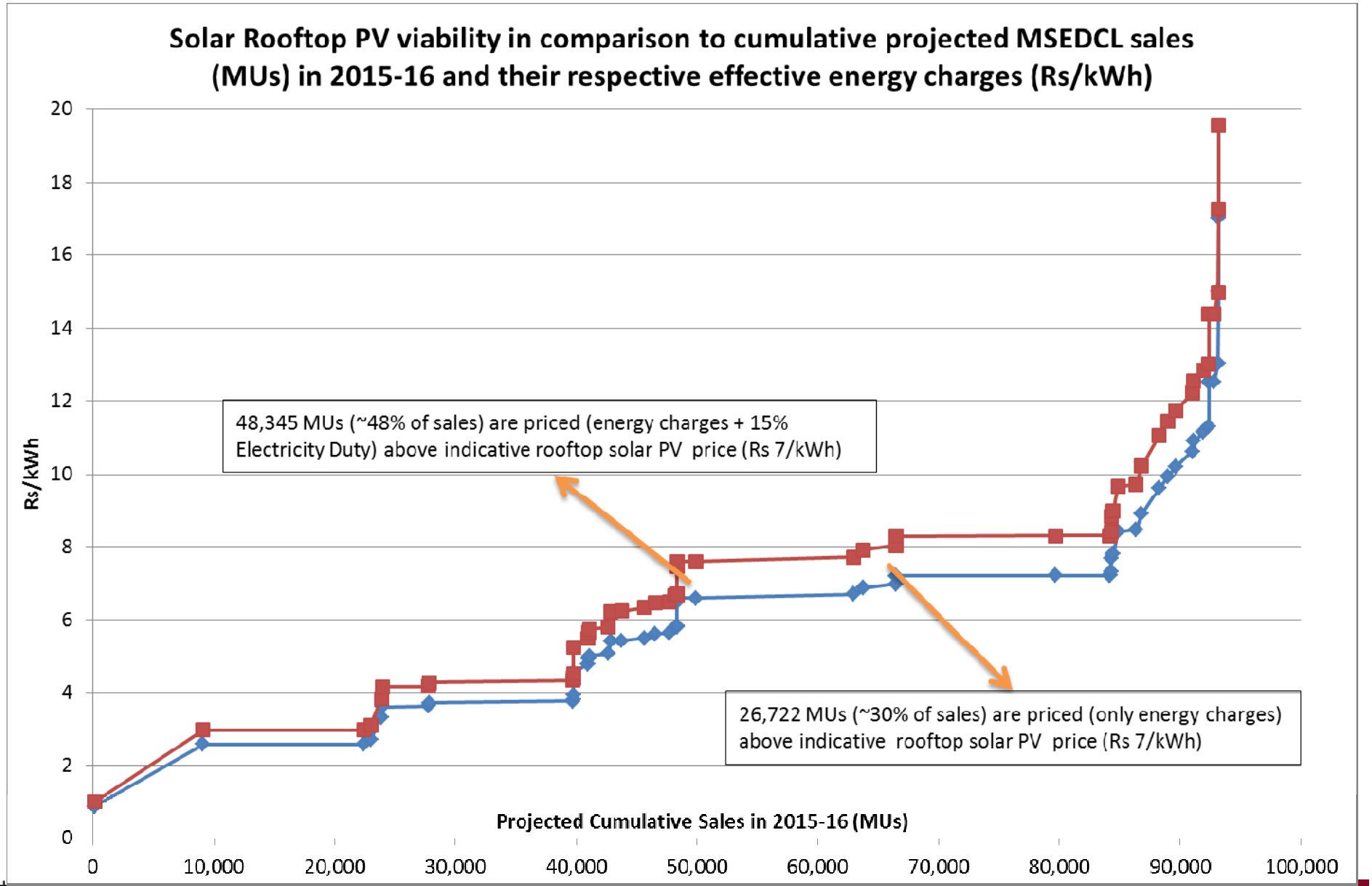
* excl. Recent increase in coal cess & costs due to new env. norms

RE becoming cheaper and more lucrative for paying consumers

- Last 3 months, > 1000 MW solar PV projects signed at tariff - 4.35 Rs./ kWh to 4.86 Rs./ kWh

- Legal, policy and regulatory push for retail competition and concessions for RE
  - Inter-state transmission charges waived off – NTP
  - Concessional CSS charges by various SERCs (100% to 25 % concession)
  - Net-metering and banking

Attractiveness of non-utility RE generation for paying consumers



Implications and Challenges

- Coal will remain king but with shrinking empire
- Much greater role for RE,
  - more lucrative and feasible for 'paying consumers' of utility
- Challenges
  - Equitable sharing of increasing cost of coal based generation and cost reduction
  - Preventing build up of stranded assets
  - Ensuring financial viability of DISCOMs (reducing cross subsidising consumers and increasing generation costs)
  - Preventing adverse impact of this transition on reducing energy poverty

THANK YOU

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