

Paris target & challenges for realizing (urban and rural) low-C development (in India)

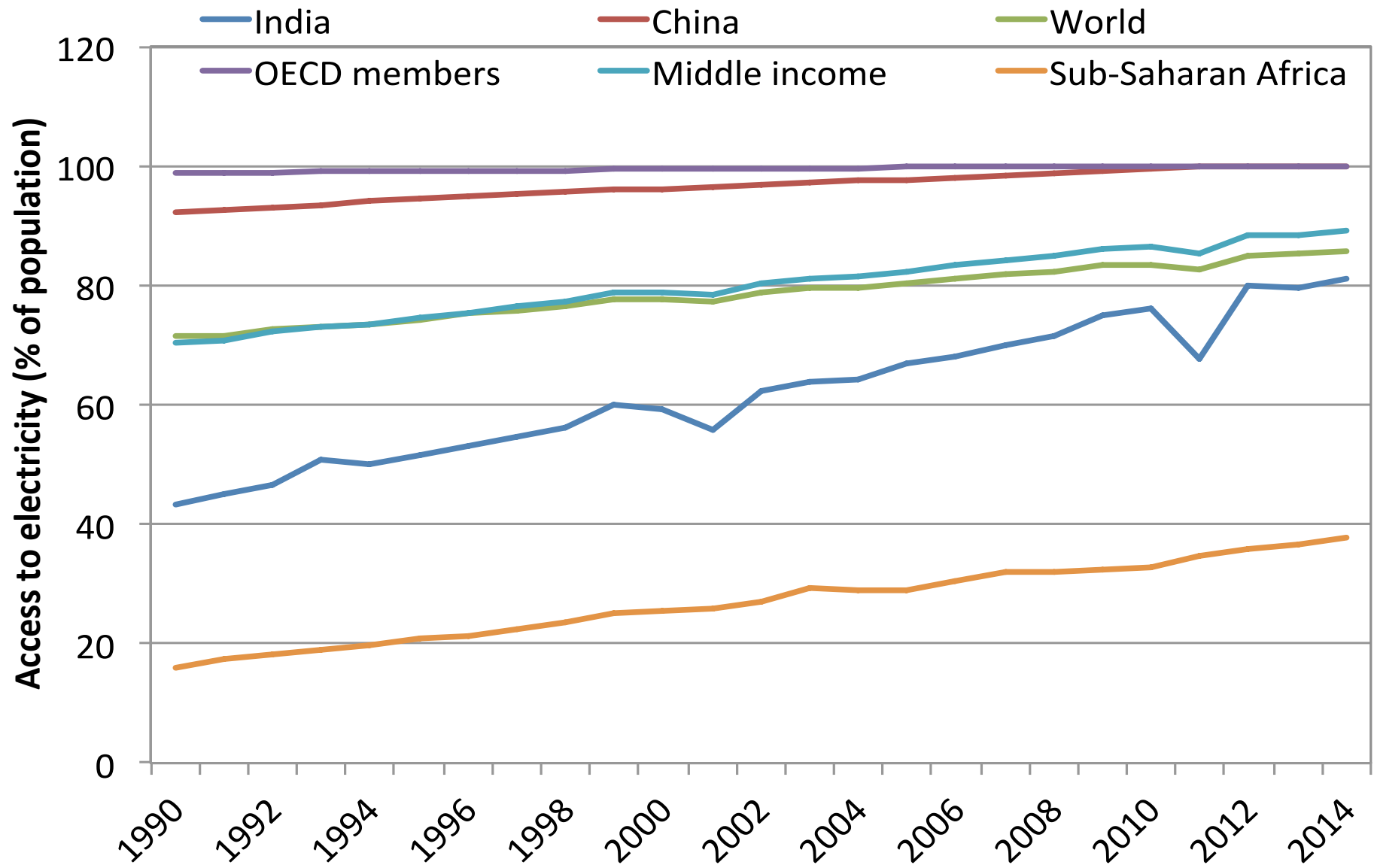
Ambuj Sagar
Vipula and Mahesh Chaturvedi Professor of Policy Studies
Indian Institute of Technology Delhi
asagar@iitd.ac.in

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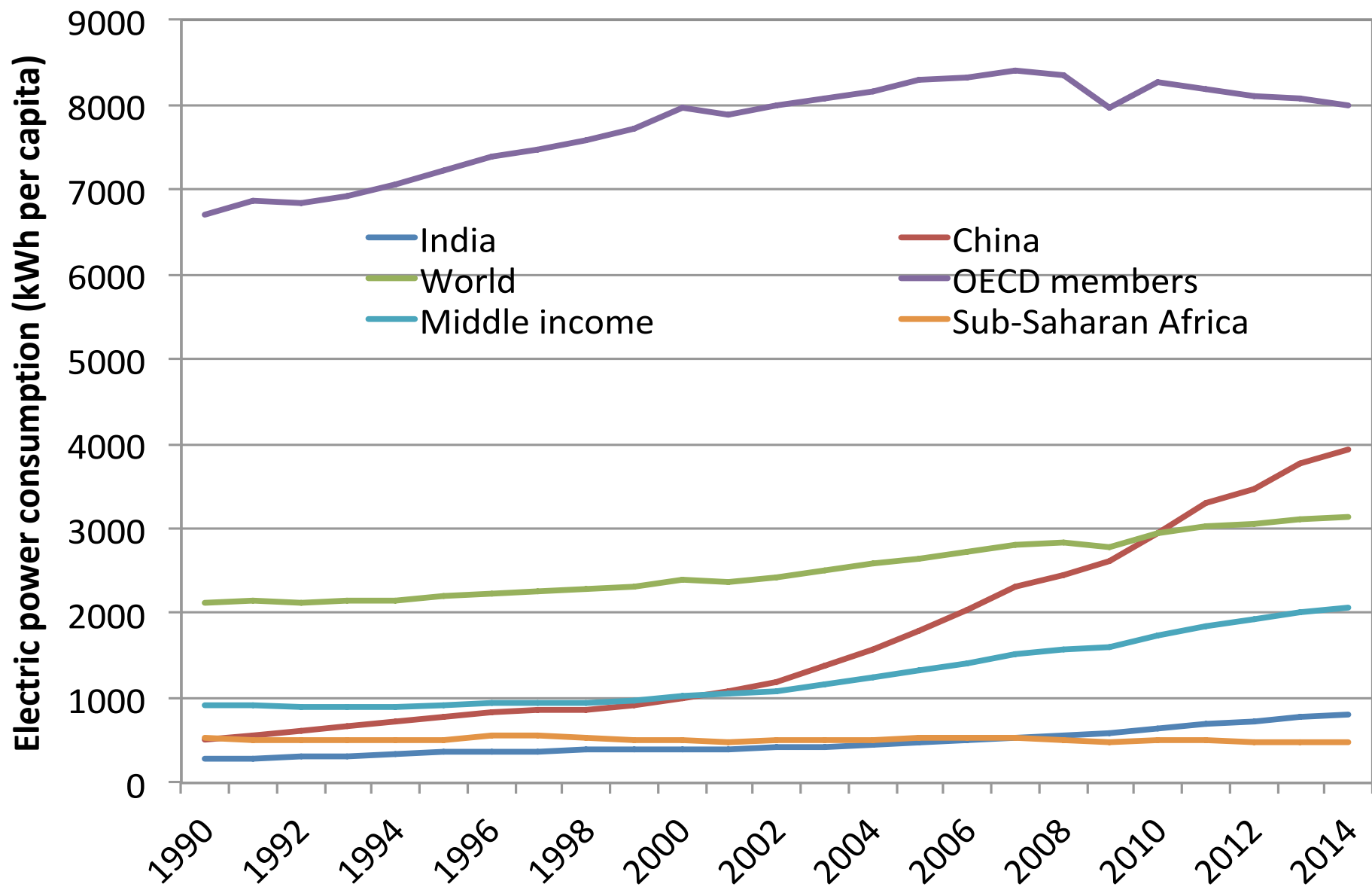
The Indian energy transition – goals and challenges

- Very ambitious Paris targets for India
 - reduce the emissions intensity of GDP by 33%–35% by 2030 below 2005 levels
 - Increase share of non-fossil-based electric power capacity to 40% by 2030 [175 GW total renewables by 2021-22 (30 GW in 2016-17), of which 100 GW solar (12.3 GW in 2016-17)]
- Major energy challenges (expansion, access, affordability)
- Other pressing developmental challenges (health, nutrition, economic growth, livelihoods...)
- Requires deployment of suitable renewable energy technologies - effective, fast and at scale

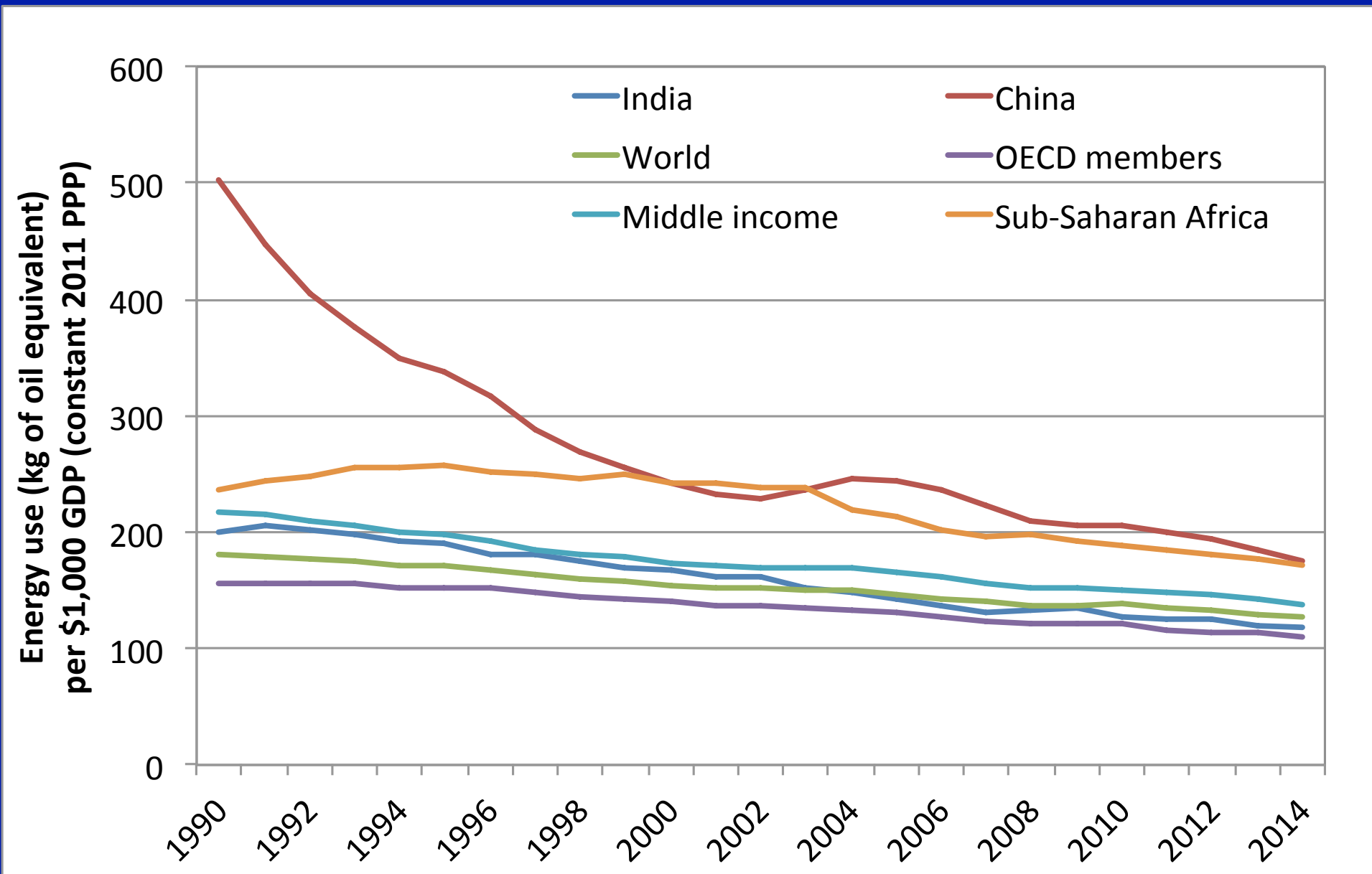
Paris target and low-carbon development in India



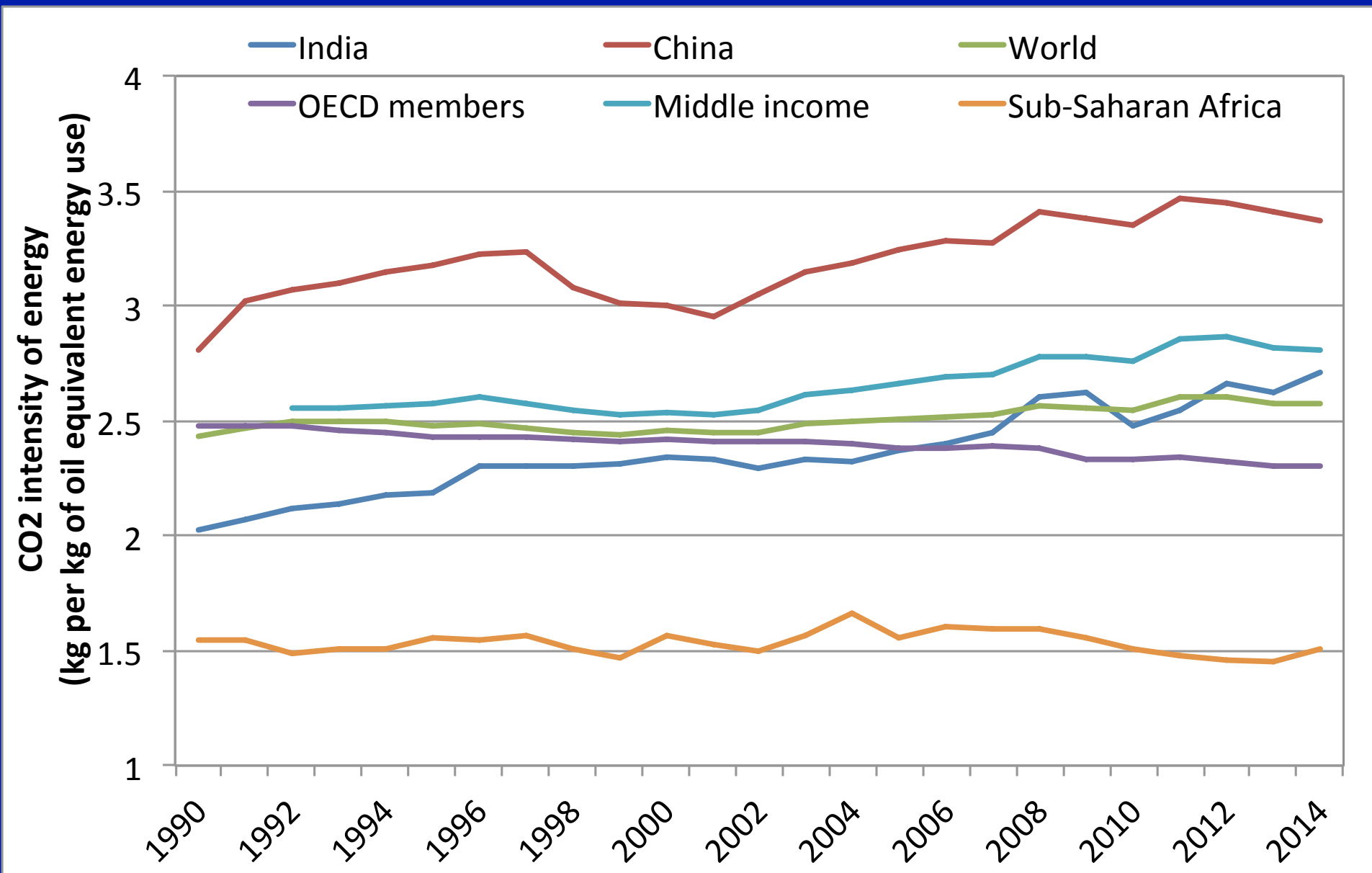
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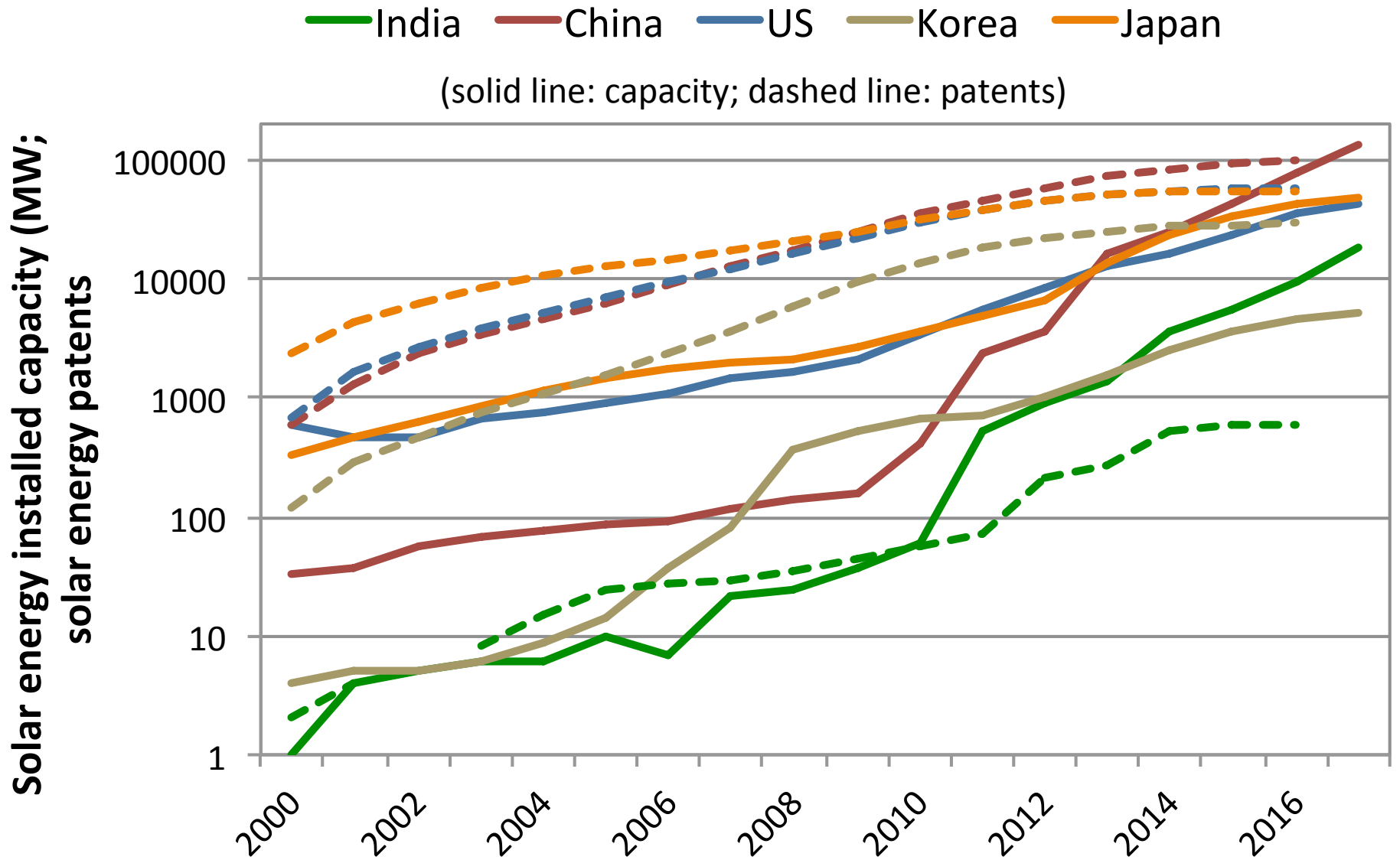


(1) Low-C development: The case of solar power

- ✓ Solar power capacity 22 GW, as of July-end 2018; 2% of utility power generation. Expected to reach 60-65 GW by 2022.
- ✓ Rapid drop in prices (combination of global trends and Indian approach) – solar tariffs down to INR 2.44/kWh in mid-2018 from INR 12.44 in 2010; wind power at INR 2.8
- ✓ Policy innovation and learning – success (e.g., reverse auctions) and failures (domestic content requirement)

(1) Low-C development: The case of solar power (contd)

- ✓ Solar deployment dominated by utility scale – of the 22GW installed in mid-2018, only ~1.2 GW rooftop and 760 MW off-grid
- ✓ Efforts at building domestic solar manufacturing base not very successful – one Indian manufacturer in top 20 worldwide; recent CEO survey expects <3GW of integrated manufacturing capacity by 2022
- ✓ Technological innovation also lagging (minuscule public investments in renewables R&D)



(2) Low-C development: The case of LED lighting

- ✓ Multi-faceted program by the Indian Bureau of Energy Efficiency aimed at enhancing deployment of EE lighting.
- ✓ Started initially with Bajat Lamp Yojana, aimed at replacing incandescent bulbs by CFLs, using CDM funds to support the transition. Latest avatar is Unnat Jyoti focusing on LED dissemination – world's largest LED lighting program
 - 315 million LED bulbs disseminated
 - 41000 GWh of electricity and 330 million tCO₂ saved per year
 - 7900 MW avoided peak demand
 - Procured price/unit dropped from Rs. 310 to Rs. 38
 - LED market expected to grow CAGR 30% 2016-2021; Rs. 216 billion by 2020 (60% of total lighting market by value)

(2) Low-C development: The case of LED lighting (contd)

- ✓ Large numbers of manufacturers but not very organized
- ✓ Government promoting LED industry by contributing 20% of the cost of setting up semiconductor labs in India(subject to certain conditions)
- ✓ But LED chips and micro-chips imported. Limits the development of product variety and innovations in LED lighting.

(3) Clean household energy: “Low-carbon’ vs health

- ✓ Around 2.8 billion people worldwide lack access to clean cooking
- ✓ “Cleaner” biomass cookstoves often seen as solution since biomass combustions regarded as climate neutral but these cookstoves not clean enough to protect human health, although they do offer climate benefits
- ✓ India’s current approach focused on expanding LPG access – an estimated 70 million new households but LPG still not affordable for complete switch. GHG emissions reduced compared to traditional stoves but not LPG climate neutral.
- ✓ Ideal longer-term solution of-grid solar with storage to power induction stoves?

India's low-carbon transition and challenges

- ✓ Significant achievements in low-carbon deployment but issues regarding addressing developmental challenges/opportunities
 - Many urban and rural transition opportunities sidelined by focus on aggressive deployment targets
 - Development of innovation and industrial base undermined by lack of appropriate strategy and limited S&T capabilities
- ✓ Shaped mainly by climate imperatives and "green industrialization" aspirations; enabled by private enterprise; focused mainly on extremely rapid deployment of low-carbon techs
- ✓ Critical to resolve conflicts/trade-offs and maximize synergies between aggressive climate goals and urgent development imperatives

Thanks!!

Comments/Suggestions/Questions:

asagar@iitd.ac.in