# India-Japan Partnership Towards a Low-Carbon Economy

Comments by Meeta K Mehra, CITD, JNU,
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# Climate change negotiations: current state of play

- The Conference of Parties (CoP 15) under the UN Framework Convention on Climate Change met during Dec 7-18, 2009 at Copenhagen
- Congregation of delegates from 192 nations to thrash out a global deal on climate change
  - successor to Kyoto Protocol, whose term ends on 2012
- The Conference did not achieve a binding agreement for long-term action,
  - a Political Accord negotiated by around 25 parties championed by US, China, India, Brazil and S Africa
  - 'noted' by the CoP merely as an external document, not negotiated within UNFCCC process
  - refers to collective commitment by developed countries for new and additional resources, through international institutions, around US$ 30 billion for period 2010-12
  - working groups on long-term cooperative action now due to report to CoP 16 at Cancun

# Involvement of developing countries..

- Climate scientists – world emissions to stop growing and begin to fall between 2015 & 2020
  - by 2050 an 80% cut required to limit global warming to 2°C rise
- Developing countries to play decisive role in negotiating post-Kyoto climate agreement
  - No effective program to reduce global emissions is possible without their support
  - Developing countries face a delicate task in balancing their growing responsibility for a liveable climate with pursuit of continued economic development and poverty alleviation

# India's position

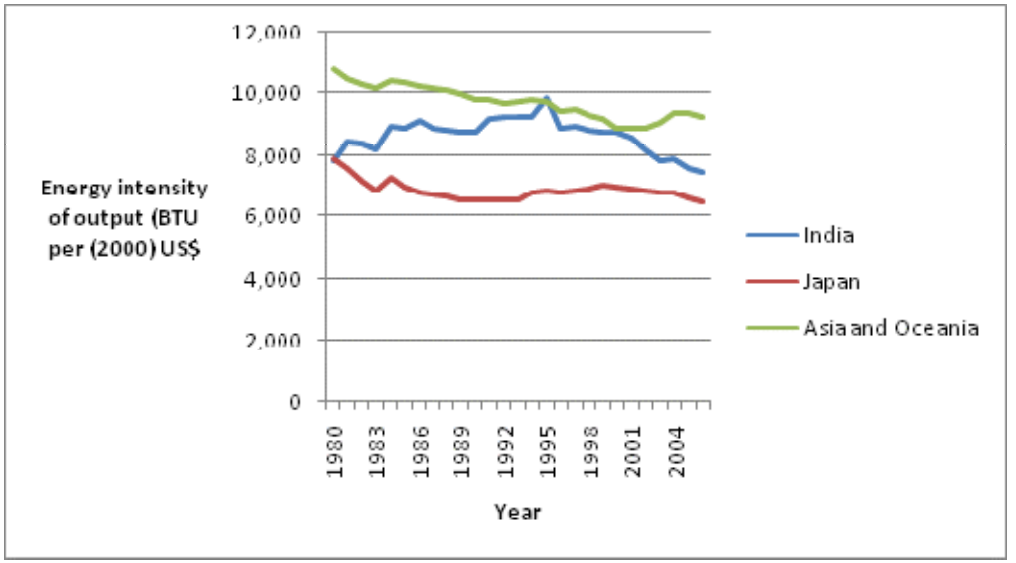
- Prevailing Kyoto regime – India has no legally binding commitments for emissions reduction
  - Faces diplomatic challenge of carbon emissions reduction in post-2012 period
- India voluntarily pledged to lower carbon emissions intensity by 20-25% below 2005 by 2020
- India put forth a National Action Plan on Climate Change – thrust areas – greater reliance on solar energy (1000 MW per year of PV and 1000 MW of concentrated solar) and energy efficiency technologies (current initiatives to yield 10000 MW by 2012)
- The Indian Prime Minister stated its per capita $CO_2$ emissions will remain far below that of developed countries even after two or three decades

# Japanese stanpoint

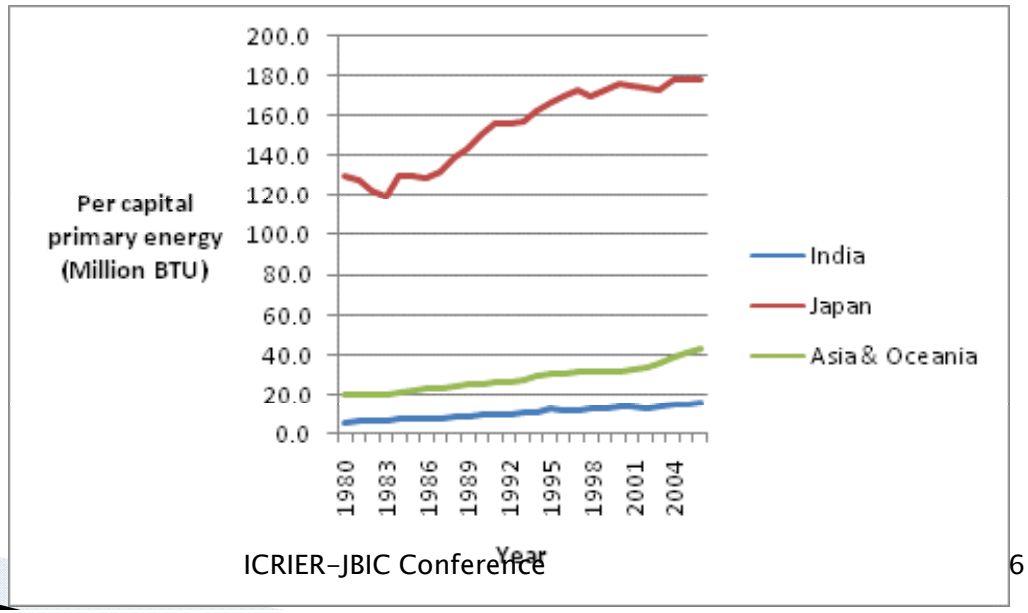
- Japan legally bound to reduce emissions by 6% as compared to 1990 during the first commitment period 2008-12
  - Actual emissions rose by 6.5% during 1990-2004 and by 0.7% during 2000-04 (UNFCCC)
- Japan's current rather ambitious emissions reduction target of 25% as compared to 1990 levels or 29% below 2005 level
- Japanese capital Tokyo spearheading the task of reducing GHG emissions through its first ever cap and trade system
  - Major reductions in emissions envisaged as part of bylaws approved by Tokyo Metropolitan Assembly from electricity use in commercial buildings and offices.
- But, past performance mars the credibility of future commitments being met independently

# Energy intensity and per capita energy consumption (US, EIA)

- Japan's energy intensity of GDP lower than India's (by around 10-15%) – India could benefit from Japanese experience
- India's energy efficiency lower than the Asian average

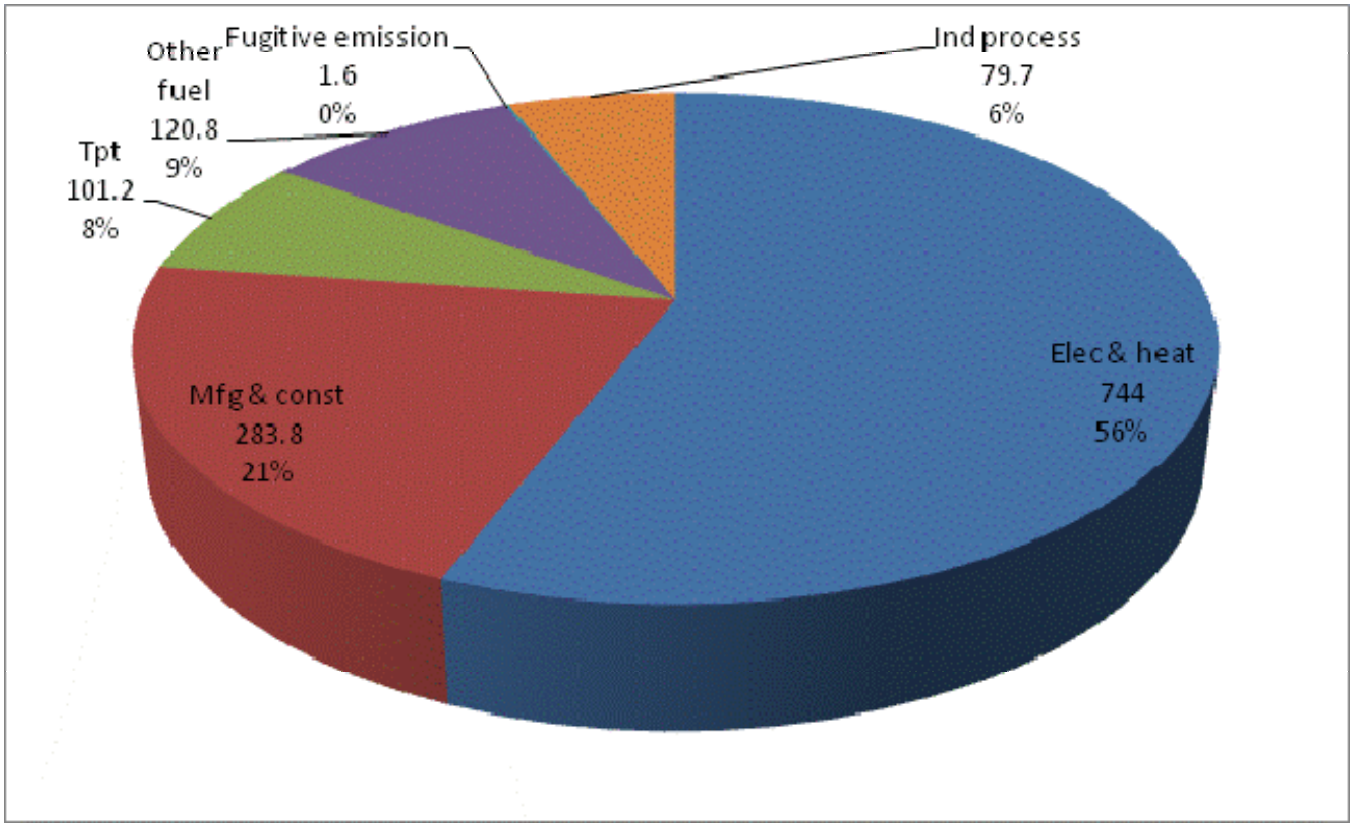



- India's per capita primary energy demand markedly lower than Japans (around 1/10th)
- Also lower than that for Asia



# India's sectoral $CO_2$ emissions, 2006 , WRI database

- A majority of emissions from energy sector (esp. electricity & heat applications) followed by manufacturing and transport.
- Agriculture a major contributor to $CH_4$ emissions.
- Thus, mitigation to be focused on these.



# Key carbon mitigation options

- Various studies (TERI, UNFCCC and McKinsey) identified technological changes to reduce carbon intensity
- Shift from subcritical to supercritical power generation for higher thermal efficiency (27-30% to 38-40%; EGoIEP, 2006 & IEA, 2007)
- Reliance on renewable energy – wind, solar PV and solar concentrated thermal, and biomass – cost competiveness an issue but technology development and diffusion reduce costs (200 GW by all by 2031 from11 GW in 2007; TERI, 2008)
- Source/ system — Potential 2032 (MW) — Installed 2008 (MW)
  - Wind — 45000 — 9521
  - Biomass — 61000 — 657
  - Solar PV — 50000 — 3
  - Small hydro
  - (upto 25 MW) — 15000 — 2221
- Energy efficiency –in large industry (4-7%), small and medium enterprises (higher potential), buildings (25-40%), household appliances (15-30%), transport (fuel efficiency improvements of 50%; EGoIEP, 2006, LBNL and BEE, 2009)

# Investment cost implications

- Sensitive to assumptions of mix of technological changes and costs
  - Coarse estimates by global studies, such as UNFCCC, 2007 – incremental annual cost of US$ 6.2 billion by 2030.
  - Finer estimates by national level studies
    - McKinsey , 2009 – incremental investment cost toward abatement to be Euro 13 billion (US$ 17 billion) annually between 2010-20 and Euro 23 billion (US$ 30 billion) annually between 2020-30
    - TERI, 2008 – power generation sector entails a range of costs from Euro 367 billion to Euro 5.6 trillion over 30-year period ⇨ Euro 10-190 billion (US$ 13 – 250 billion annually) – high estimate attributable to high diffusion of solar energy.

# Indo-Japanese future collaboration

- No empirical substantiation of Environmental Kuznets Curve (EKC) for $CO_2$ for either India or Japan – monotonically rising curve
  - nothing inevitable or automatic about the EKC – requires concerted policy push
  - if downturn occurs at some hypothetically high income level – environmental disaster unavoidable
- Japan's own cost effective options include
  - energy-efficient devices in homes and offices
  - well-insulated houses, labelling schemes for buildings
  - next-generation automobiles in transportation
  - solar and wind power generation
- For Japan, to achieve the Kyoto target/ any future carbon mitigation independently might be difficult and costly
  - marginal abatement cost (MAC) curve for Japan lies above that for India for any level of $CO_2$ abatement

# Indo-Japanese collaboration

- Could envisage achieving these by implementing projects with India in the framework of international cooperation
  - ODA – generally good track record in case of mass rapid transit system, water and sewage disposal, forestry, R&M of hydro plants
  - CDM – generally slow moving as beset with unease in implementing these projects, costs imposed due to credits for CERs etc.
    - India's potential for $CO_2$ equivalent emissions reduction – 418 mt per annum (NSS, World Bank, 2005) – a bulk in renewables (38%), fossil fuel based power (24%), solid waste based power (15%) and transport (10%), with small amounts in cement, I&S, aluminium and so on.
    - Most could be turned into likely candidates for CDM projects
  - Learn from Japanese experience of voluntary and mandatory cap and trade schemes, carbon offsets etc. – some bilateral emissions trading instances with India already identified

# Indo-Japanese future collaboration through CDM route

- Enhance thrust on areas such as
  - Energy efficiency in industrial processes
    - For large energy intensive units India generally competitive, but SMEs could benefit from Japanese experience – esp waste heat recovery systems
  - Residential energy use in appliances –
    - especially lighting, air-conditioning etc.
  - Energy efficient building design – new laws promulgated in Japan, India too identified huge potential (25-40%, BEE, 2009)
  - Solar, wind, small and large hydro – both India and Japan have ambitious targets – technology transfer as Japan a world leader in solar power (planning 28 GW of solar PV by 2020)
  - R&M of thermal and hydro plants, supercritical technologies and IGCC
    - already involved in several R&M CDM projects for hydro in China