

Effects of INDCs Submitted by Major Economies

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**Policy Research Workshop
on How to enhance climate actions to meet a long-term goal**

**Jointly organized by Ministry of the Environment (MOEJ), Japan and
The Energy and Resources Institute (TERI), India**

29th September 2015, New Delhi

INDCs: Mandate

- Decision 1/CP.19 para 2:
 - **Invited all Parties to communicate INDCs well in advance of the COP21**
 - without prejudice to the legal nature of the contributions,
 - **in the context of adopting a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties**
 - towards achieving the objective of the Convention as set out in its Article 2
 - in a manner that facilitates the **clarity, transparency and understanding** without prejudice to the legal nature of the contributions;
 - By first quarter of 2015 (those who are in the position to do so)
 - **Urged and requested** developed country Parties, the operating entities of the financial mechanism and any other organizations in a position to do so **to provide support for the related activities** ---as early as possible in 2014

INDCs: Mandate

- **Decision 1/CP.20 added that**
 - INDCs Will represent a **progression beyond** the current undertaking of that Party
 - All Parties will “consider communicating their undertakings in **adaptation planning** or consider including an adaptation component in their intended nationally determined contributions”.
- Asked the Secretariat to prepare by 1 November 2015 a synthesis report on the **aggregate effect** of the intended nationally determined contributions communicated by Parties by 1 October 2015

Content of the INDC



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- **Statement of actions** (mitigation and adaptation)
 - **Base year (Reference)**
 - **Target and target year**
 - **Coverage**
- **Information** on data, methodologies used
- **Justification** of fairness and ambition in the context of national circumstances
 - **Can fairness be decided in a non-comparative manner?**
- **Means of implementation** support

Reality-1



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- **Silence on means of implementation and adaptation, except Mexico**
- **US relies more on existing regulation, new is doubtful**
 - **Acceleration as justification of ambition?**
- **Russian submission:**
 - **May mean NO “progression beyond” 2020 pledge**
 - **Condition of the extent of use possible of the “forestry sector” is vague**
- **EU submission:**
 - **“at least” is positive**
 - **but the possibility of going beyond “at least” through offsets is not included in formal submission, which has been clarified to the media post INDC submission (Poor signaling)**
- **Switzerland, Mexico are more forward looking**

Reality- 1



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China

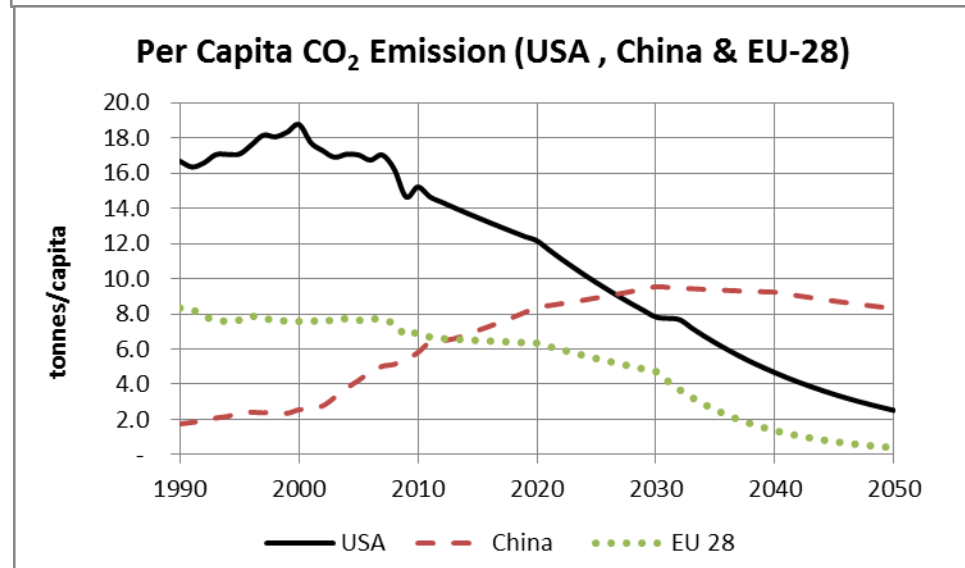
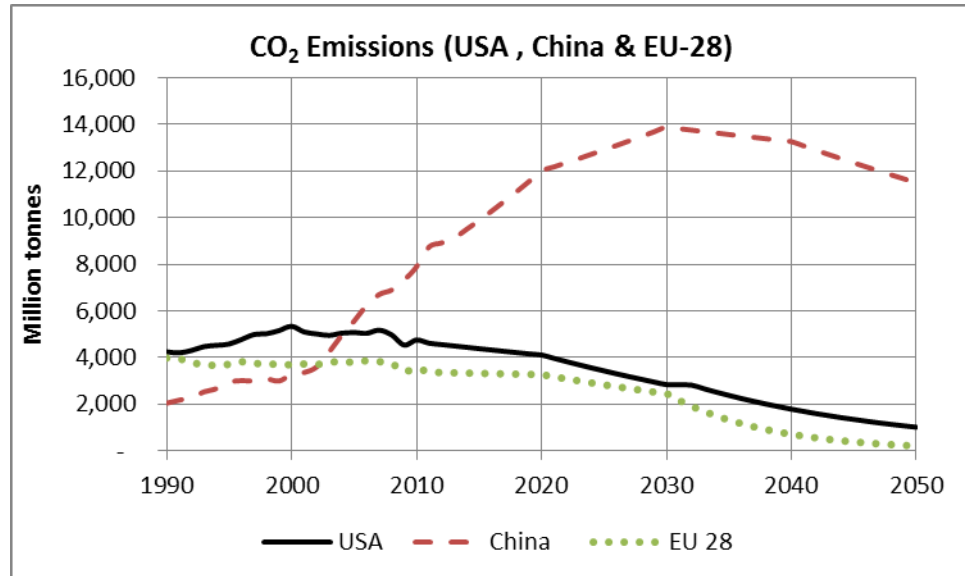
- Achieved % reduction in emission intensity
 - 2005-2011: 21%
- Likely achievement in emission intensity reduction by 2020
 - 2005-2020: 44.3%
 - (commitment 40-45%)
- Likely achievement in emission intensity reduction by 2030
 - 2005-2020: 62.3%
 - (commitment 60-65%)

USA

- Actual GHG reduction
 - 2005-2011: 8%
- Likely achievement in emission reduction by in 2020
 - 2005-2020: 21%
 - (commitment 17%)
- Likely achievement in emission reduction in 2025
 - 2005-2020: 28%
 - (commitment 26-28%)

Reality -3

- What happens to carbon budget and its fair allocation?
 - **US, EU and (assumed INDC) China will utilize 66-124% of the available carbon budget during 2011-2050.**



INDIA's Case



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- INDC preparation process
 - Modeling studies
 - Consultations with think tanks, civil society
 - Inputs from line ministries and state governments
- What is certain
 - Both mitigation and adaption
 - Two parts: with support and with domestic resources
- What should not be expected
 - A peaking year
 - Stronger than China, USA

Can the world do better?



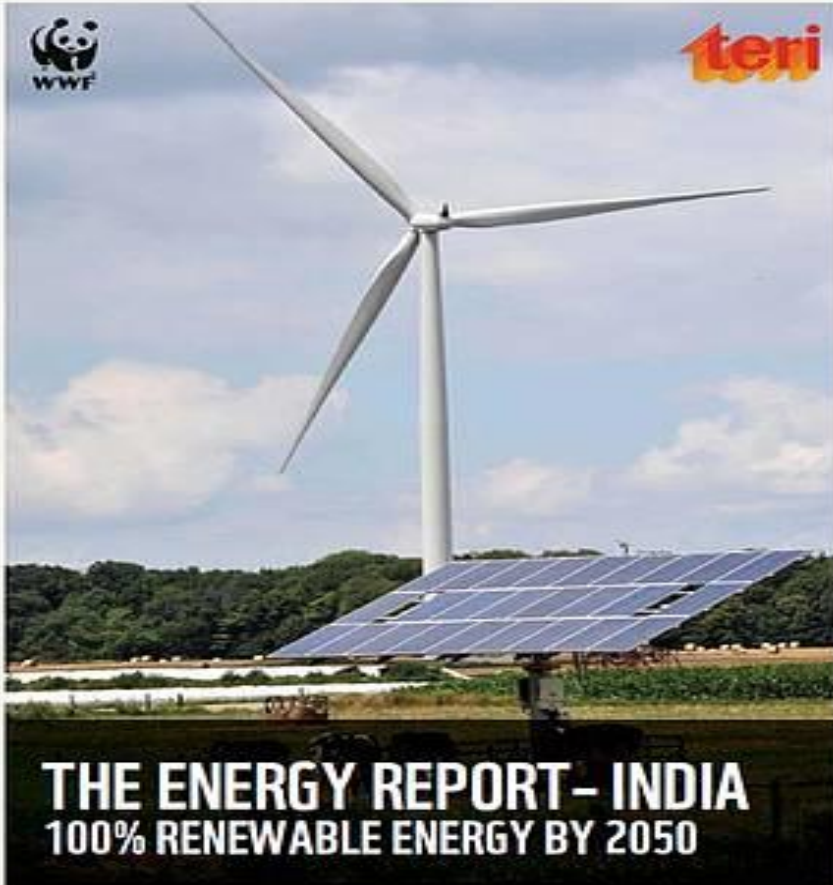
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- **Yes, provided aggressive, collective and immediate actions are taken for ensuring:**
 - **Next generation RE technologies' commercial viability**
 - So far not on policy radar
 - **Rapid scaling-up of existing and next generation options together with accelerated build-up of supporting infrastructure economically viable**
 - Upfront costs
 - **Adequate public finance**

The Energy Report – India 100% Renewable Energy by 2050



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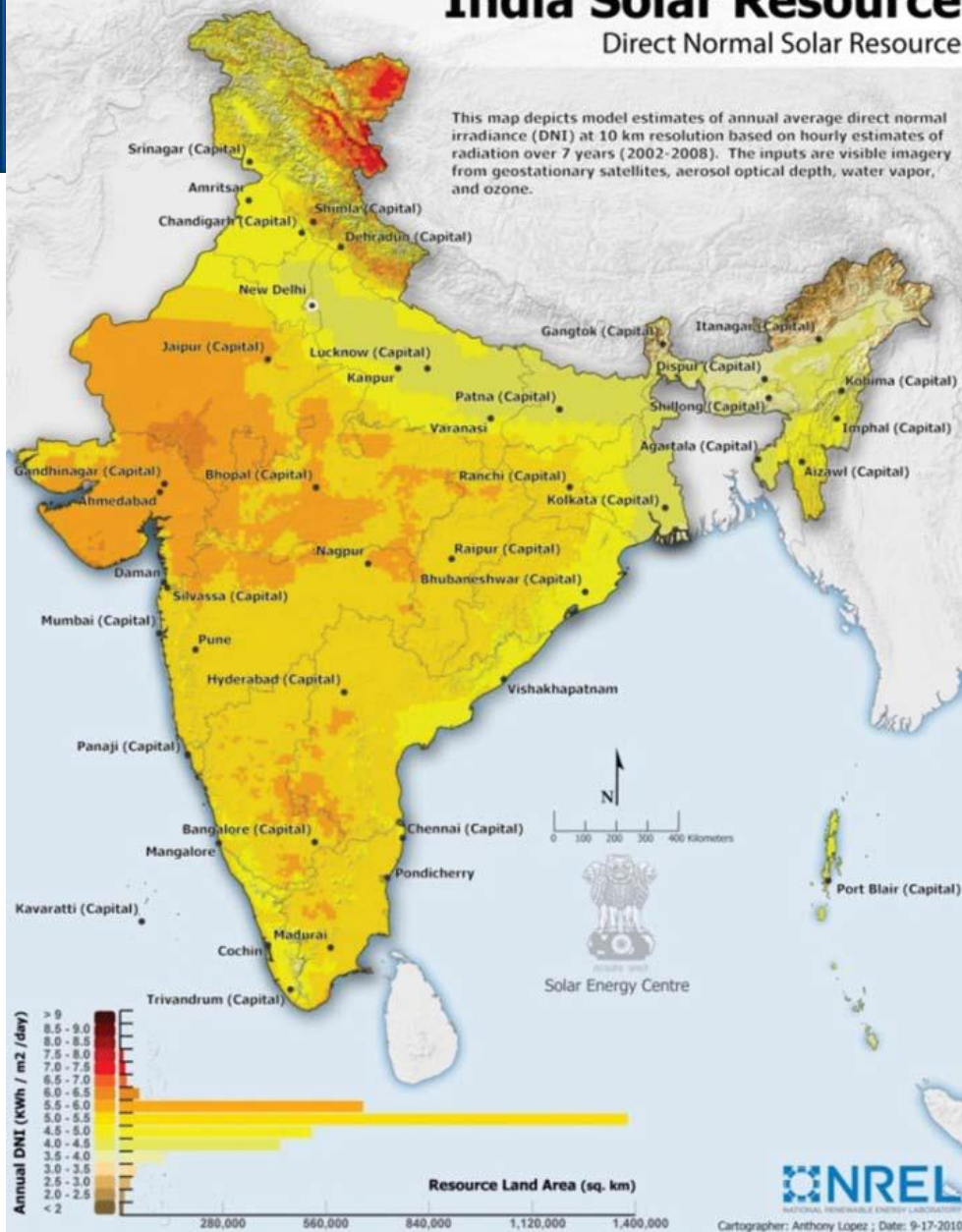
- Why the study?
 - Renewables can provide centralized or decentralized energy solutions
 - With zero or negligible GHG emissions
 - Without the risk of resources depletion
 - Address energy access and energy security

India must look at alternative resources with a sense of urgency from energy security, energy equity as well as environmental perspective

India Solar Resource

Direct Normal Solar Resource

This map depicts model estimates of annual average direct normal irradiance (DNI) at 10 km resolution based on hourly estimates of radiation over 7 years (2002-2008). The inputs are visible imagery from geostationary satellites, aerosol optical depth, water vapor, and ozone.

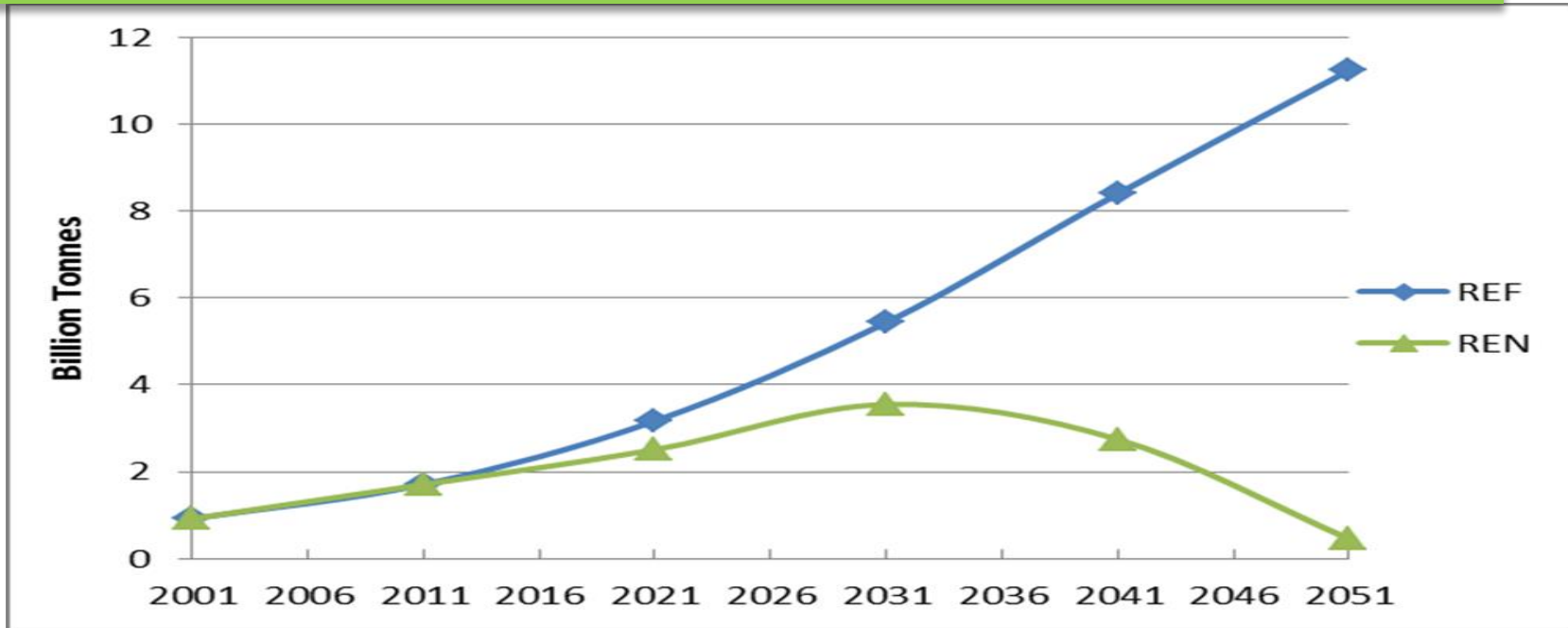


On shore Potential of Wind Power in India

| Source | Estimated potential (GW) | Hub height (m) | Other assumptions |
|---|--------------------------|----------------|--|
| C-WET | 49 | 50 | 2% land availability for all states except Himalayan states, North-eastern states and Andaman and Nicobar Islands |
| C-WET | 102 | 80 | |
| LBNL | 2,006 | 80 | Based on GIS data on topography and land use, the study found a significantly high availability of land (7%) that can potentially be used for wind power development. The study excluded land with low-quality wind, slopes greater than 20 degrees, elevation greater than 1,500m and certain other unsuitable areas such as forests, water bodies and cities. |
| LBNL | 3,121 | 120 | |
| Low Carbon Working Group (Twelfth Five-year Plan) | 500 | 80 | 6% land availability |

If World does take actions....

CO₂ Emissions from Energy Sector in India may look like:



- REF scenario: CO₂ emissions 1.7 billion tonnes in 2011 to 11.2 billion tonnes in 2051 (seven times increase)
- REN Scenario: CO₂ emissions drop drastically in the REN scenario to 26% of the 2011 levels by 2051
- Per capita CO₂ emission
 - REF scenario- 2011: 1.4 tonnes; 2051: 6.4 tonnes
 - Drops to 0.26 tonne per capita in 2051 in the REN scenario

Key interventions and challenges: in energy supply



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- A large renewable base would require large energy storage facilities as well as smart grid design
- Under the REN scenario, all industrial heating requirements up to 700°C are met through concentrated solar thermal (CST) technologies by 2051
 - **This implies that CST technologies for thermal applications need to be commercially viable even for small to medium manufacturers by 2041**
- Biofuels would have to account for very high per cent of the transport fuel requirement by 2051 in order to move toward the REN scenario
 - **Third generation biofuels could bring about a major transformation although this technology is still in the R&D stage. Accordingly, the developed countries could be pushed to invest in global R&D on these fronts**
 - **This technology would have to become commercially viable beyond 2031**
- Increase use of electricity across sectors
 - **Increase in power generation capacity and higher tariff to end users due to higher share of renewable technologies**

Key interventions and challenges: in energy supply



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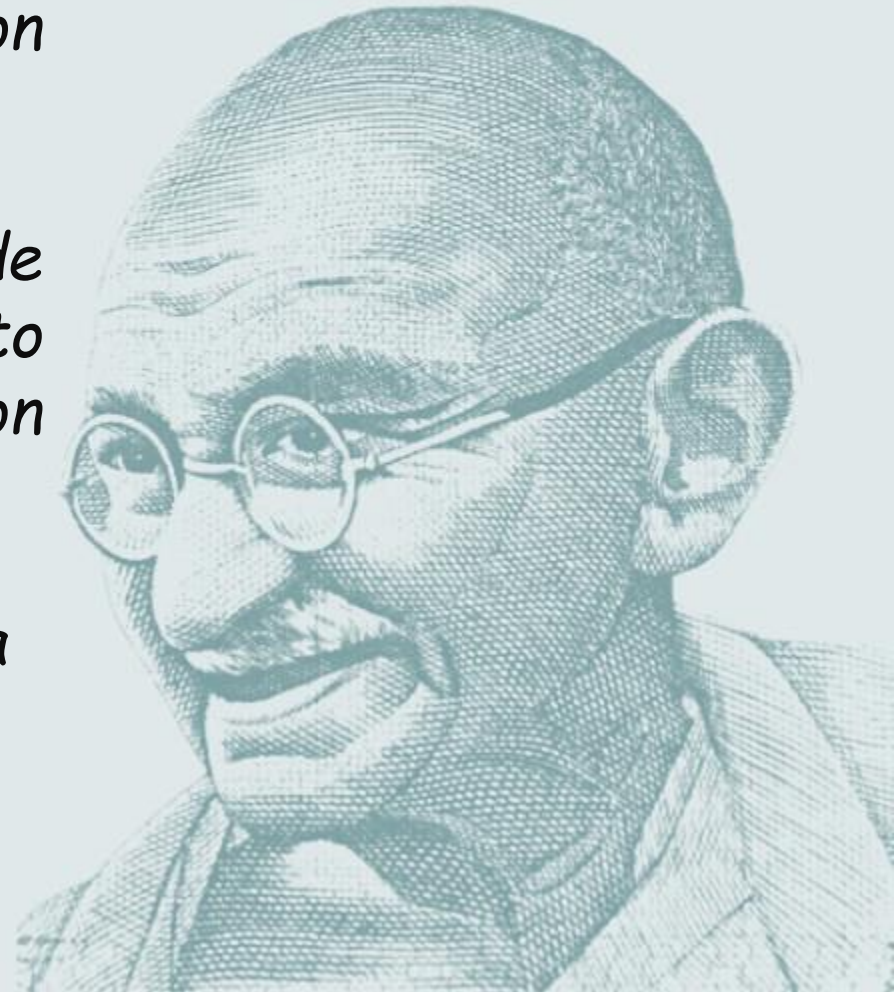
- A large renewable base would require large energy storage facilities as well as smart grid design
- Higher penetration of electric vehicles (two wheelers, three wheelers, and cars)
 - **Commercial availability with competitive prices and equivalent performance compared to conventional petroleum fuel based vehicles**
- Increase use of electricity across sectors
 - **Increase in power generation capacity and higher tariff to end users due to higher share of renewable technologies**

"A technological society has two choices. First it can wait until catastrophic failures expose systemic deficiencies, distortion and self-deceptions.

Secondly, a culture can provide social checks and balances to correct for systemic distortion prior to catastrophic failures."

- Mahatma

Gandhi





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Thank You

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