

# Renewable Energy World India Track

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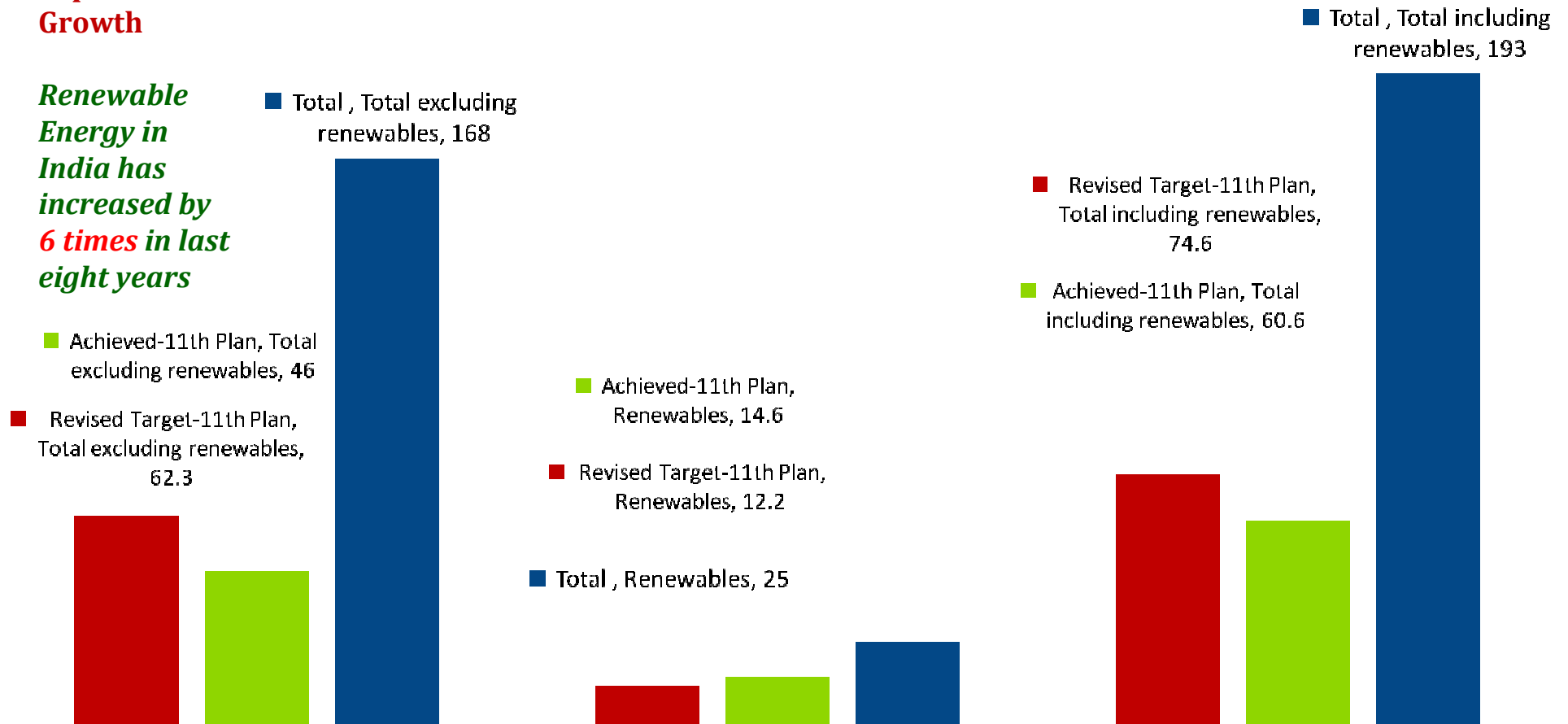
# Rapid Growth of Renewable Power

## Installed Capacities (GW)

■ Revised Target-11th Plan ■ Achieved-11th Plan ■ Total

**Exponential Growth**

*Renewable Energy in India has increased by 6 times in last eight years*



## Rapid Growth of Renewable Power

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<b>Renewable Power (as on 1 April)</b>	<b>Capacity (MW)</b>	<b>% of total installed capacity</b>	<b>% of Renewable power in total Electricity Mix</b>
<b>2002</b>	<b>3497</b>	<b>3.3</b>	<b>1.7</b>
<b>2007</b>	<b>10258</b>	<b>7.6</b>	<b>3.9</b>
<b>2012</b>	<b>24910</b>	<b>12.8</b>	<b>6.5</b>

**Growth in installed capacity**

**3.3% to 12.8%**



## Projection 2020

<b><i>National Action Plan on Climate Change Advice</i></b>	<b><i>5 % of total electricity mix 2009-10 and then increase by @ 1 % per year over next 10 years</i></b>
<b><i>At 6% growth of electricity consumption targeted 15% Renewable Power share 2020</i></b>	<b><i>80 GW</i></b>
<b><i>Low carbon growth draft report projections</i></b>	<b><i>55 GW ( including 15 GW solar ) ( comprise 49GW non-hydro renewable power &amp; presuming the share of SHP is 6 GW in total hydro)</i></b>
<b><i>Achievements 2020 –as per Ministry’s projections</i></b>	<b><i>80 GW feasible – would require supportive policy measures</i></b>
<b><i>* CUF %(Wind : 20; Biomass : 60; Solar PV: 19; Solar Thermal : 20; SHP: 40) Different from low carbon report</i></b>	

## Off-grid Renewable Energy Application -A Snapshot

- 20 million rural households to be covered by solar lighting systems by 2022 :  
( Saving 1.2 billion litre kerosene per annum- Abating 3.16 million tonnes CO<sub>2</sub> per annum)
- 10,000 Villages to be electrified through biomass gasification  
(saving 150 million litres of kerosene- Abating 0.40 million tonnes CO<sub>2</sub> per annum)
- 2,000 Villages to be electrified through micro hydel  
(saving 6 million litres of kerosene- Abating 0.02 million tonnes CO<sub>2</sub> per annum)
- 5,000 rice mills opt gasifier systems by 2020  
(Saving 250 million liters of diesel per year- Abating 0.7 million tonnes CO<sub>2</sub> per annum )
- 1000 MW solar PV capacity in Industry  
(Abating 400 million litre diesel per annum - Abating 1.0 million tonne CO<sub>2</sub> per annum)
- Adoption of 20 million sq meter collector area of Solar water heaters 2020 could avoid over 10,000 GWh of electricity and about 600 million litre of furnace oil  
(Abating 10 million tonnes of CO<sub>2</sub> per annum)

## Electricity Access to Villages

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- **Around 40 % of rural household lack electricity: unlikely all households will get electricity access by 2020 (assumption of full village electrification made in draft report unlikely)**
- **Utilities have no incentive to provide electricity to villages as : delivered cost is higher ; low recovery; supply constraint; and cost of delivery increases with distance @Rs1kWh/km**
- **Supply and distribution constraints will remain: Green peace report about Bihar**
- **Even if electrified, however:**
  - supply uncertainty – few hours/poor power quality/supply at night
  - not all houses getting connected
  - transformer issues
  - poor recovery

**So, no alternative but to supply lighting first, later electricity, through renewables**


- Paddy Map [\(link\)](#)
- Solar lighting
- Solar micro industry eg. spinning/weaving/mini dal mills
- Solar service centers
- Special efforts for LWE: **60% subsidy for rice husk based /90% for solar lantern charging station through SHG's**

## Electricity Access to Villages

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	<b>Subsidy cost (Rs in Crore)</b>	<b>Kerosene Saving in 2020 (million litre/annum)</b>	<b>Annual Kerosene subsidy saving in Rs crore ( @ Rs 26/litre)</b>
<b>20 million households solar lighting</b>	<b>8000</b>	<b>1200</b>	<b>3120</b>
<b>10000 villages gasification (av 400 HH per village)</b>	<b>240</b>	<b>150</b>	<b>390</b>
<b>2000 villages micro hydel (av 50 HH per village)</b>	<b>200</b>	<b>6</b>	<b>15.6</b>



# Institutional Infrastructure for Renewables

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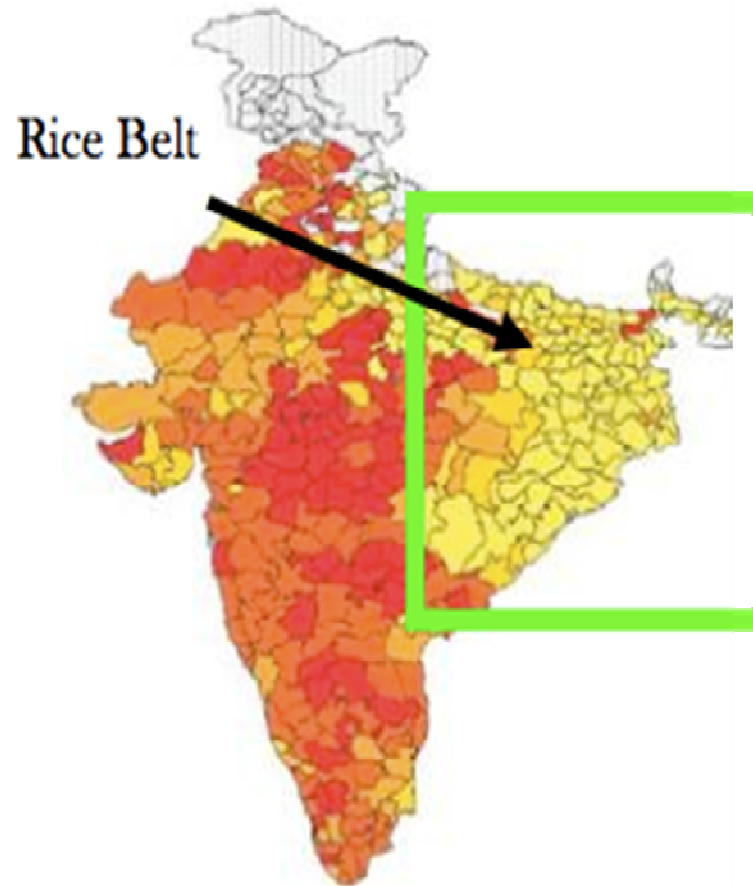
- **Ministry of New and Renewable Energy –At Apex level**
  - **State Nodal Departments-in every State**
  - **Technology Specific Resource Institutions**
    - National Institute for Solar Energy**
    - Center for Wind Energy Technology**
    - National Institute for Renewable Energy**
    - Centre of Excellences under National Solar Mission**
  - **Development of Cadre of Entrepreneurs for off-grid applications**
  - **Renewable Energy Cell in Financing Institutions**
  - **Indian Renewable Energy Development Agency**
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Thank You



Areas with lowest per capita electric energy availability fall in the rice belt and is also the most backward region.



Yellow – Lowest per capita electricity

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