



Centre for Science and Environment
ANIL AGARWAL DIALOGUE
**ENERGY ACCESS &
RENEWABLE ENERGY**
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SCALING UP DECENTRALISED RENEWABLES FOR RURAL ELECTRIFICATION

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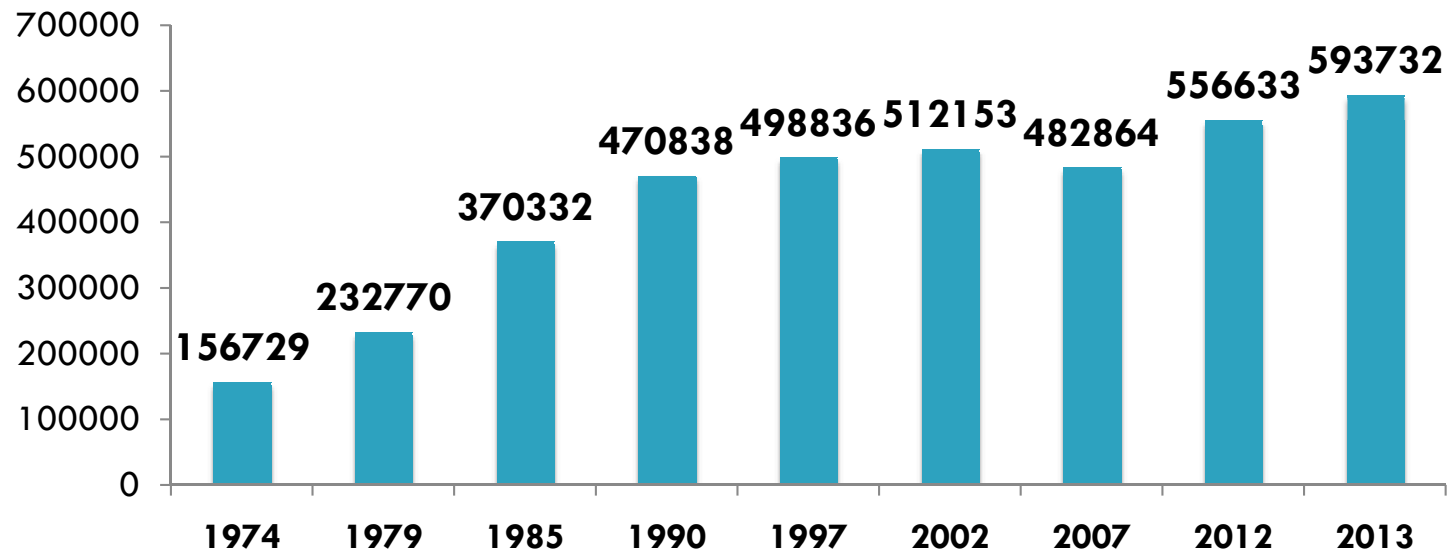
RGGVY: Status

- Electrifying all villages, providing access to all rural households and at least 1 kWh/household per day by 2012
- Electrified 97,000 villages, intensive electrification of 300,000 electrified villages, connection given to 23.3 million households



Rural electrification: Status

Number of villages electrified

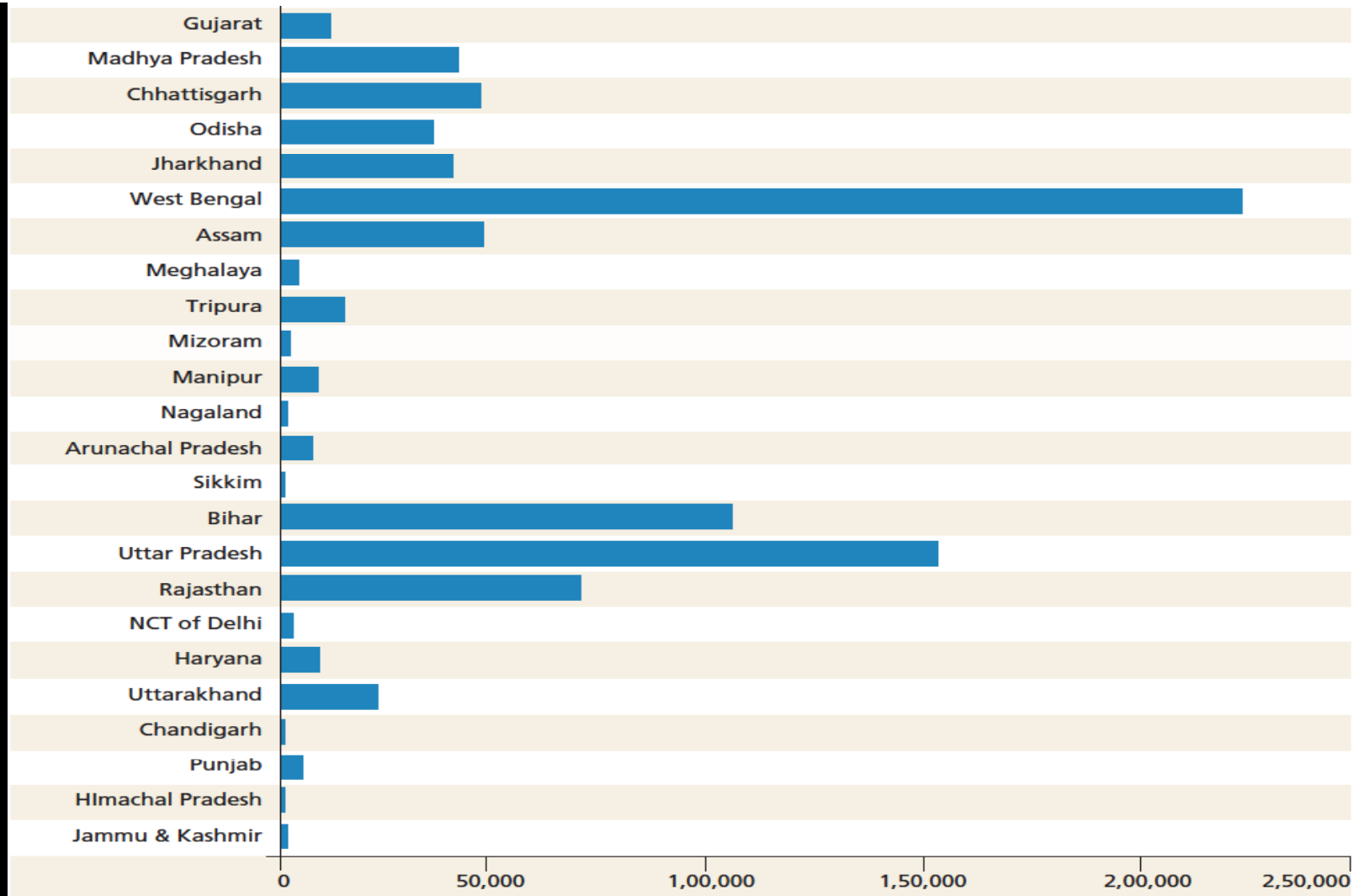




Census 2011: Rural lighting

- 44.2% households use other energy sources for lighting apart from grid-electricity
 - 72.4 million households (about 350 million people), use kerosene
 - **About 1.0 million households use solar for lighting**
 - 1.2 million households go dark after sunset

Anil Agarwal
Dialogue
Energy Access and
Renewable Energy





Census 2011: Rural lighting

- 55.3% households are connected to the grid.
 - But, the availability of electricity supply continues to remain poor; 75% get less than 6 hours supply.
 - Per capita consumption is about 10 kWh per month
 - **145 million households with no electricity or less than 6 hrs supply**



Role of decentralised renewables

- RVEP – operated for more than a decade – targeted 18000 remote villages and hamlets -- provided SHS/ mini-grids to about 10,000.
- Big problems in SHS – service, maintenance, corruption – uncertain outcomes
- Mini-grids working well but not meeting the aspirational needs
- Discontinued; to be replaced with Rural energy access programme



Role of decentralised renewables

- Social entrepreneurs, businesses, NGOs – providing renewables solutions – limited opportunity models
- Not meeting the aspirational needs
- **How do we scale up and meet the unmet and aspirational needs?**



DDG under RGGVY

- Community based power plants for un-electrified villages and electrified villages with less than 6 hrs supply; 200 W load/ household.
- Funded through 90% capital subsidy – renewable mini-grid allowed
- Poor performance so far – 639 project proposals and 85 projects commissioned (all in AP)



Proposed Rural Energy Access Programme, MNRE

- Community based power plants (mini-grid) for un-electrified villages and electrified villages with less than 6 hrs supply
- Basic lighting facility (58 W load/household) through RE for at least 6 hrs
- Funded through 90% capital subsidy – renewable mini-grid priority



Converging interest

- Grid in more than 95% villages
- Price of renewable energy going down
- Unmet energy needs
- **Upscale to converge**



Small RE plants and mini-grids

- Cluster based approach for densely populated states: RE plants and mini-grids for a cluster of villages for tail-end generation and distribution
- Mini-grids to be grid-ready and interactive
- Stand-alone plants or household level solutions for remote villages



Small RE plants and mini-grids

- Model similar to large-scale grid-connected
- Bidding on FiT or VGF to discover tariff
- Developer has the choice to use mix of renewable energy to lower tariff for a predefined service quality.
- Households to pay grid-price for 1kWh/day
- Govt. to support remaining through FiT or VGF
- Consumption beyond 1 kWh/household to be paid



Small RE plants and mini-grids

- Developer to operate as a distribution franchisee of the utility – buy power from the grid (when available and required) and supply to the consumers
- Developer to export power to the grid at a pre-defined rate -- FiT



Small RE plants and mini-grids

- Low interest rate loans, tax benefits (given to all large projects) and priority lending status would reduce the price further.



Upscaling renewables for 145 million households @1kWh/day

- 50,000 MW of renewable energy
- At Capital subsidy proposed by MNRE @240/Wp, the cost would be about 12 lakh crores – will never happen
- Feed in Tariff @ Rs. 7.5/unit with storage (mix of RE); **Rs. 45,000 crore/ year**
- Big number???



Upscaling renewables for 145 million households @1kWh/day

- If we charge Rs 5/unit – **replacement cost of Kerosene for lighting** – annual collection would be Rs 27,500 crore
- The remaining Rs. 12,500 crore can come from many possible sources – Rs. 0.2/ kWh cess on all fossil fuel electricity (green cess like Gujarat) or contribution from Clean energy development fund etc.
- But this cost will come down year after year as grid prices will increase and renewable prices come further down



Upscaling renewables for 145 million households @1kWh/day

- Thousands of small power producers would import and export power from the grid
- Help build local economy and create local jobs
- Model suitable for urban areas – rooftop power producers
- Big step towards mainstreaming RE