



Status of Sustainable Energy Development in India (As on July 31, 2013)

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Sequence of Presentation

1. Sustainable Development
2. Renewable Energy Potential in South Asia
3. Status of Sustainable Energy Development in India
4. Legal & Policy Support for RE in India

Sustainable Development

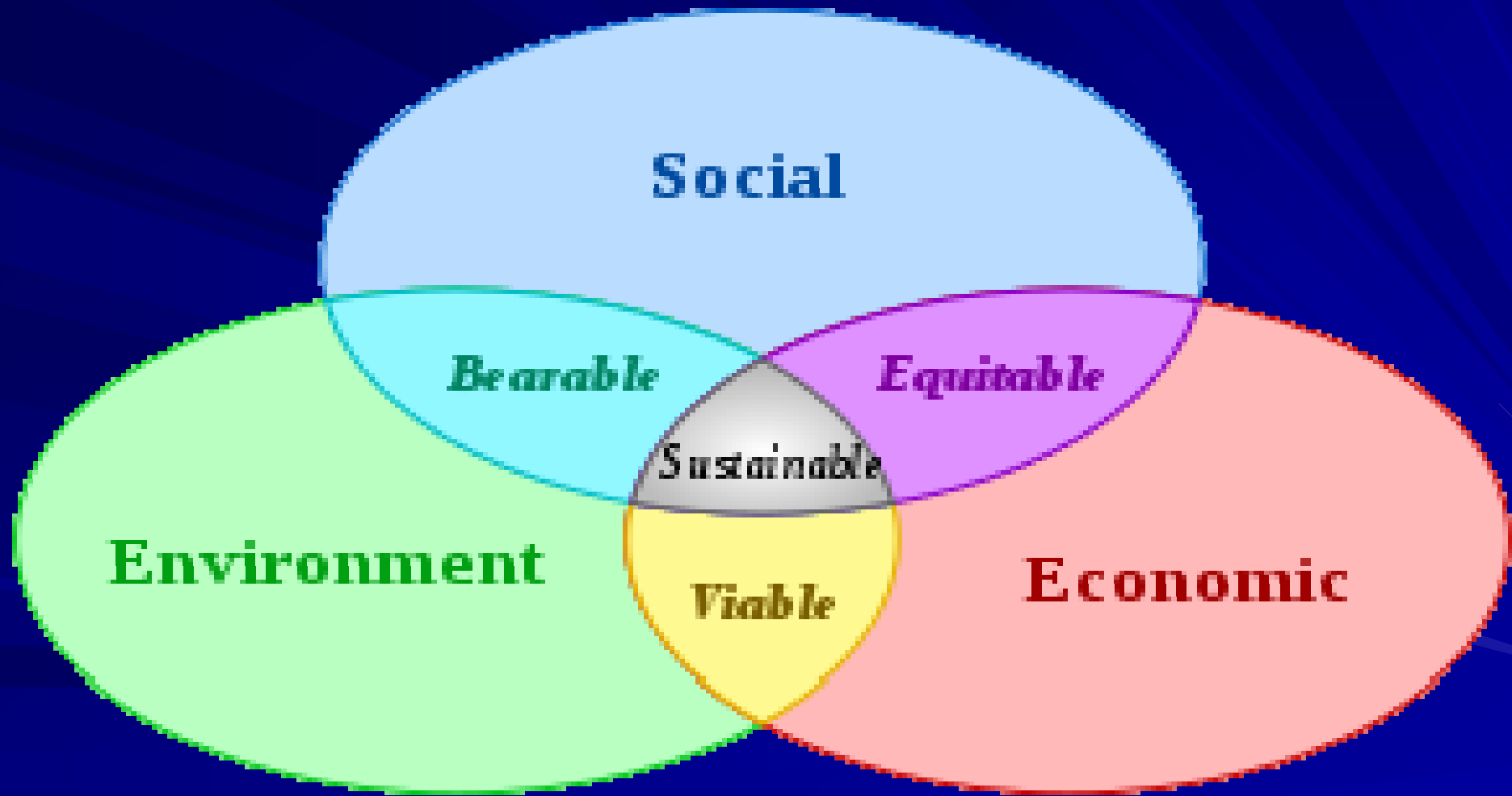
As per the Brundtland Report released by UN in 1987:

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

It contains within it two key concepts:

- i. the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given; and
- ii. the idea of **limitations** imposed by the state of technology and social organization on the environment's ability to meet present and future needs."

Sustainable Development



Renewable Energy Potential in South Asia

Resource	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka
Wind	4 m/s @ 20 m	2.46-3.96 m/s average speed	<45000 MW (gross potential)	225 – 350 W/m ² (5.8 – 6.7		1100- 40000 MW	24250 MW
Solar	4.1 to 4.6 kWh/m ² /day	4 kWh/m ² /day	4-7 kWh/ m ² /day	5-5.5 kWh/ m ² /day			4.5-6 kWh/ m ² /day
Small hydro		-	15000 MW (up to 25 MW)			~1000	300
Hydro (including large hydro)	775	30000 MW (gross potential)	84000 MW	0	42915	40000	2000
Biomass			52000 MW			~25 MT/year	141.8PJ 1800MW^ 12.0 MT/year
Bagasse			5000 MW			5206 GWh	

Sources: Promotion of various non-conventional sources of energy; *Mahesh Vipradas, Fellow TERI*

Environmentally Friendly Energy Sources

Electricity Act, 2003, policies framed under the Act, and National Action Plan on Climate Change (NAPCC) provide for a roadmap for increasing the share of renewable in the total generation capacity.

These include:

- Hydro
- Solar
- Wind
- Geothermal
- Biomass
- Bio Fuels
- Waste to Power
- Other RE systems

Deployment of RE Systems/Devices (31.07.2013)

<i>RE Program/ Systems</i>	<i>2013-14</i>		<i>Cumulative (31-07-13)</i>
	<i>Target</i>	<i>Achieved in 2013-14)</i>	
I. POWER FROM RENEWABLES:			
A. GRID-INTERACTIVE POWER (CAPACITIES IN MW)			
<i>Wind Power</i>	2500	608.20	19661.15
<i>Small Hydro Power</i>	300	74.50	3706.75
<i>Biomass Power</i>	105	-	1264.80
<i>Bagasse Cogeneration</i>	300	-	2337.43
<i>Waste to Power-Urban</i>		-	19
<i>-Industrial</i>	20	-	96.08
<i>Solar Power (SPV)</i>	1100	152.56	1839.00
Total	4325.00	835.26	28905.21

Source: MNRE, GOI

RE Systems/Devices Deployed (31.07.2013)

B. OFF-GRID/ CAPTIVE POWER (CAPACITIES IN MW_{EQ})

Waste to Energy-Urban	10	-	115.57
-Industrial	-	-	-
Biomass (non-bagasse)	80	15.69	486.84
Biomass Gasifiers-Rural	1	0.10	16.892
- Industrial	9	1.30	142.88
Aero-Genrators/Hybrid systems	1	0.03	2.14
SPV Systems (>1kW)	40	7.19	131.86
Water mills/micro hydel	500 Nos	-	10.65(2131 Nos)
Total	143	24.31	906.83

II. REMOTE VILLAGE ELECTRIFICATION

No. of Remote Villages/ Hamlets provided with RE Systems	1500	1466 Villages & Hamlets	8033 Villages & Hamlets
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RE Systems/Devices Deployed (31.07.2013)

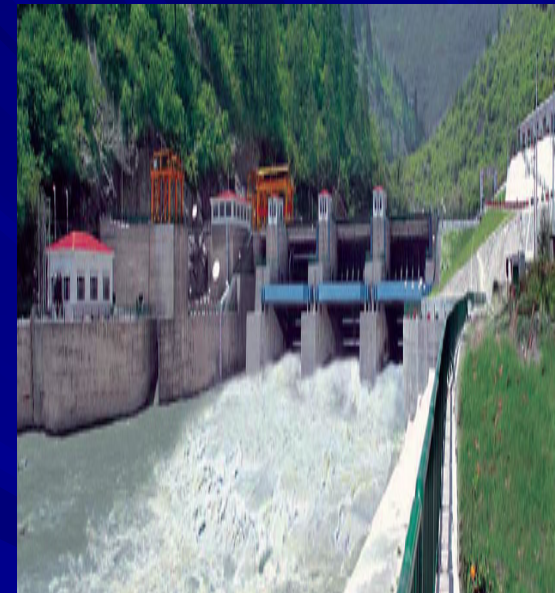
III. OTHER RENEWABLE ENERGY SYSTEMS

<i>SPV Home Lighting System (Nos)</i>	--		37279	6,56,707
<i>SPV Lanterns(Nos)</i>	-		3898	8,17,369
<i>SPV Street Lighting System(Nos)</i>	-		1471	1,22,697
<i>SPV Pumps(Nos)</i>	-			7495
<i>Family Biogas Plants(Nos in lakh)</i>		1.10	-	46.55
<i>Solar Water Heating – Coll. Area(in</i>		0.06	0.07	7.07

50,000 MW Hydropower Initiative

The main features:

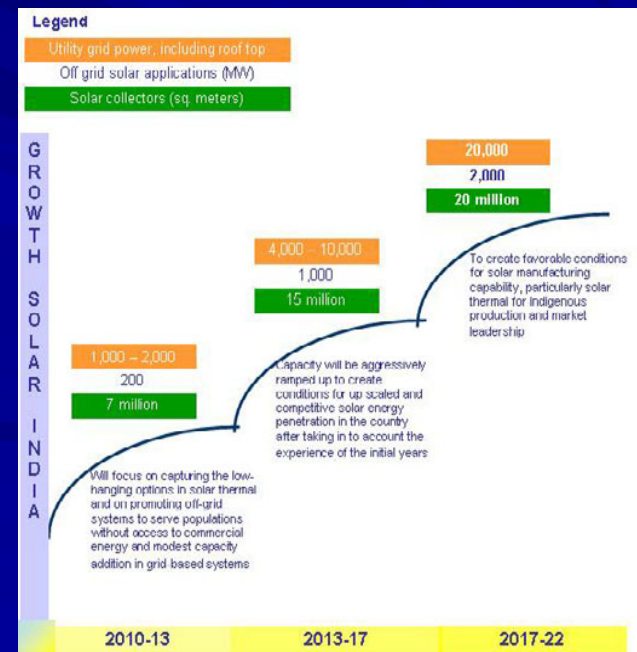
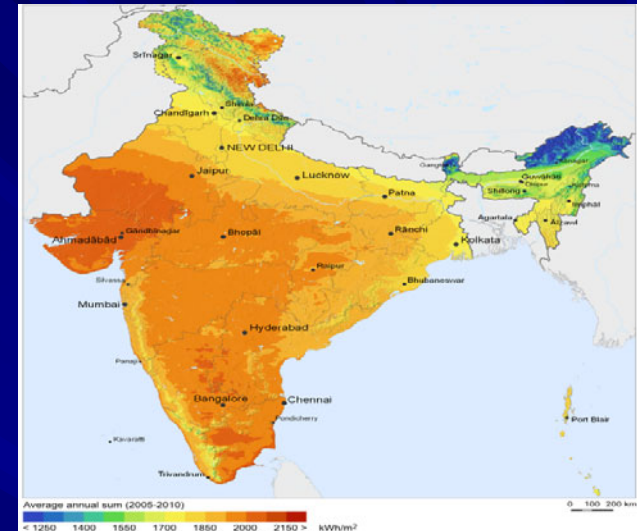
- Additional budgetary financial support for ongoing and new projects
- Basin-wise develop. of hydro potential (Ranking studies -399 Schemes)
- Advance action for capacity addition – 10 year ahead of execution
- Resolution of inter-state issues on sharing of water and power
- Renovation, Modernization & Up-rating of existing HEPs
- HEPs of <25 MW categorized “non conventional” qualifying for benefits
- Simplified procedures for clearances by CEA
- Rationalization of hydro tariff -premium during peaking period
- Promoting hydel projects in joint venture
- Selection of developer through MOU/Bidding route
- Govt. support for land acquisition/resettlement/rehabilitation/ catchment area development, etc.
- CERC approved 5% hydro development surcharge on central hydropower generation.



Jawaharlal National Solar Mission

Highlights:

- To create **enabling policy** for deployment of 20,000 MW by 2020
- **Grid-connected solar generation to 1000 MW** – by 2013 & 3000 MW by 2017 through **renewable purchase obligation backed by preferential tariff**.
- Create favorable conditions for **solar manufacturing capability**
- **Promote** programs for **off grid applications**, reaching 1000 MW by 2017 and 2000 MW by 2022.
- **Achieve 15 million sq. meters solar thermal collector area by 2017** and 20 million by 2022.
- To **deploy 20 million solar lighting systems** for rural areas by 2022.
- **Tariff based bidding adopted** for selection of Developers
- **Rs.16/17 per KWh tariff** offered in First Round of bidding
- **Rs.8/12 per KWh tariff** offered in Second Round of



Wind Power Development

Key Features

- Earnings **exempt from IT** for any single 10 year period during the first 15 years
- **Soft loan from IREDA: 11.75-12.9%**, repayment-10 year, moratorium 1 year, equity 30%
- **GBI of Rs 0.50/KWh** capped at Rs. 6.2m/MW spread over a minimum of 4 yrs
- Grid connected wind project can avail **accelerated depreciation** or GBI
- Provision of **accelerated depreciation in parallel with GBI** will continue until the 11th Plan period or the introduction of Direct Tax Code, whichever is earlier
- **GBI is over and above the feed-in tariff** specified by the respective SERCs
- The scheme is not applicable for third party sale and merchant plants but is applicable for Captive plants



Major Policies to Support RE Development

- Accelerated Depreciation
- Tax Holidays for designated period of time
- Preferential higher feed-in tariffs
- Obligatory purchase of energy from Renewable sources
- Renewable Energy Certificates

Thank You!