



Renewable Energy Market Potential and Policy Overview in India

Ministry of New and Renewable Energy
Government of India

Hannover, 14th April, 2015

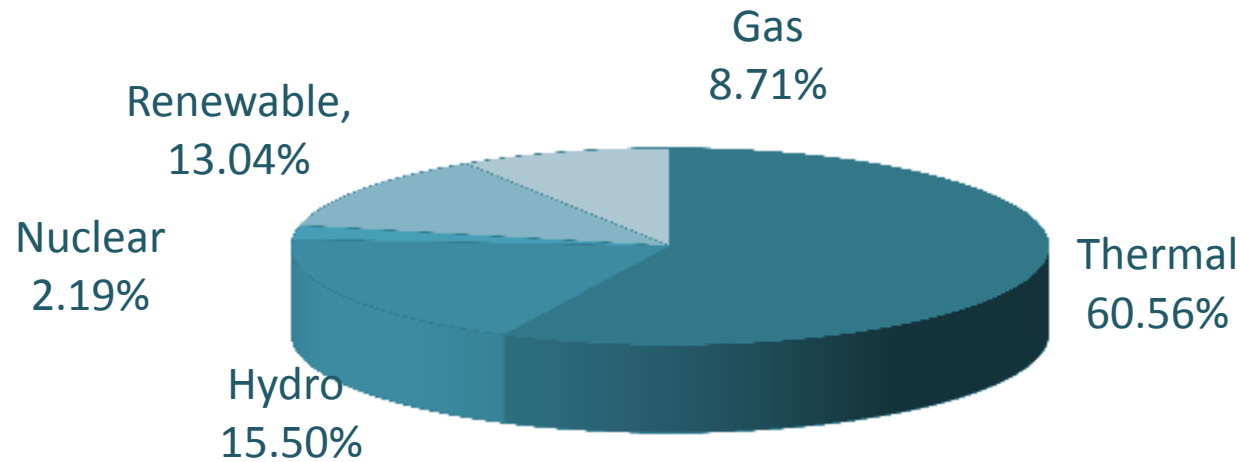
Webpage: www.mnre.nic.in

Structure

- Renewable Energy Scenario in India
- Market Potential
- Policy Overview

Indian Power Sector at a Glance

Total installed capacity : 2,63,663 MW

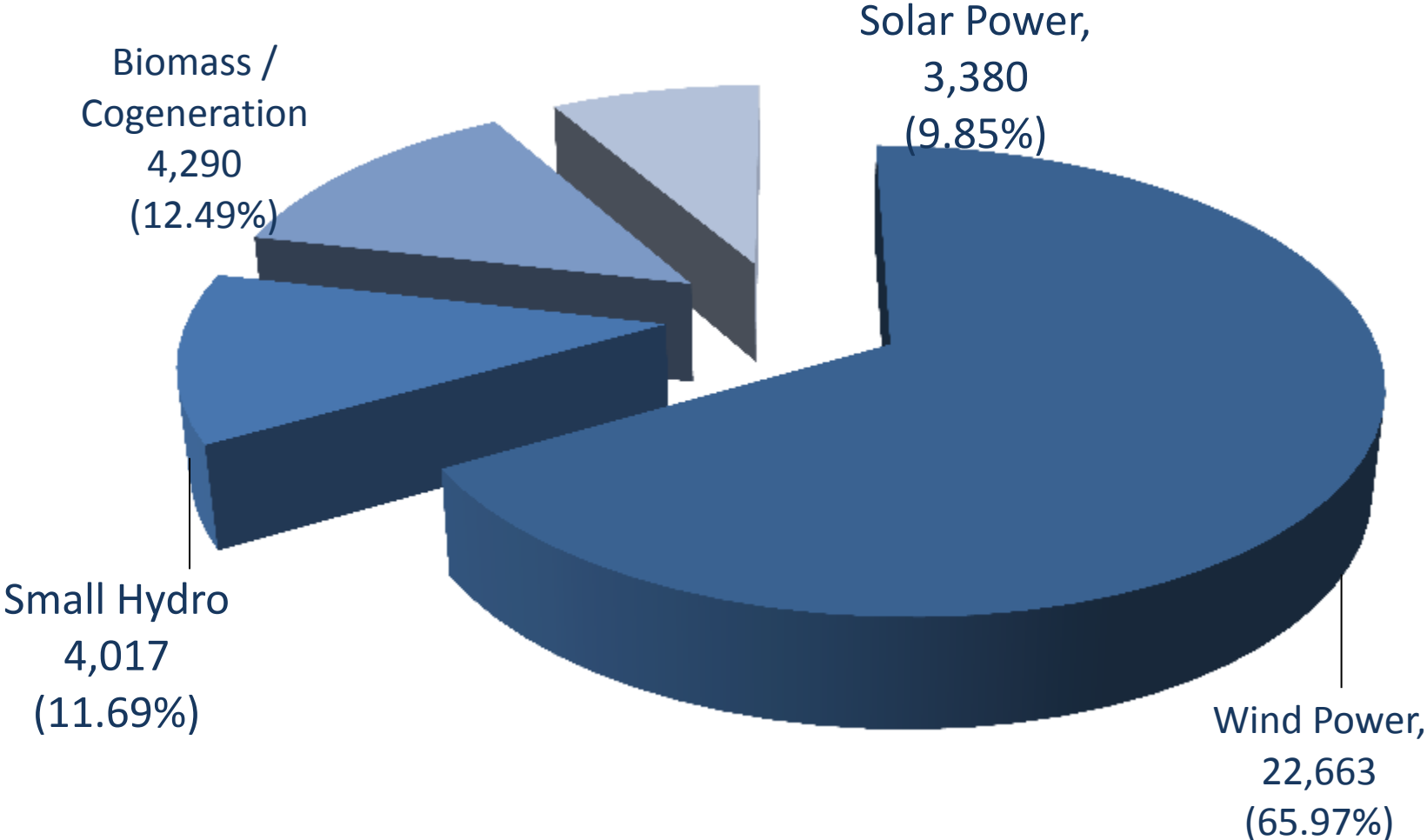


Thermal	Hydro	Gas	Renewable	Nuclear
1,59,695	40,867	22,971	34,350	5,780

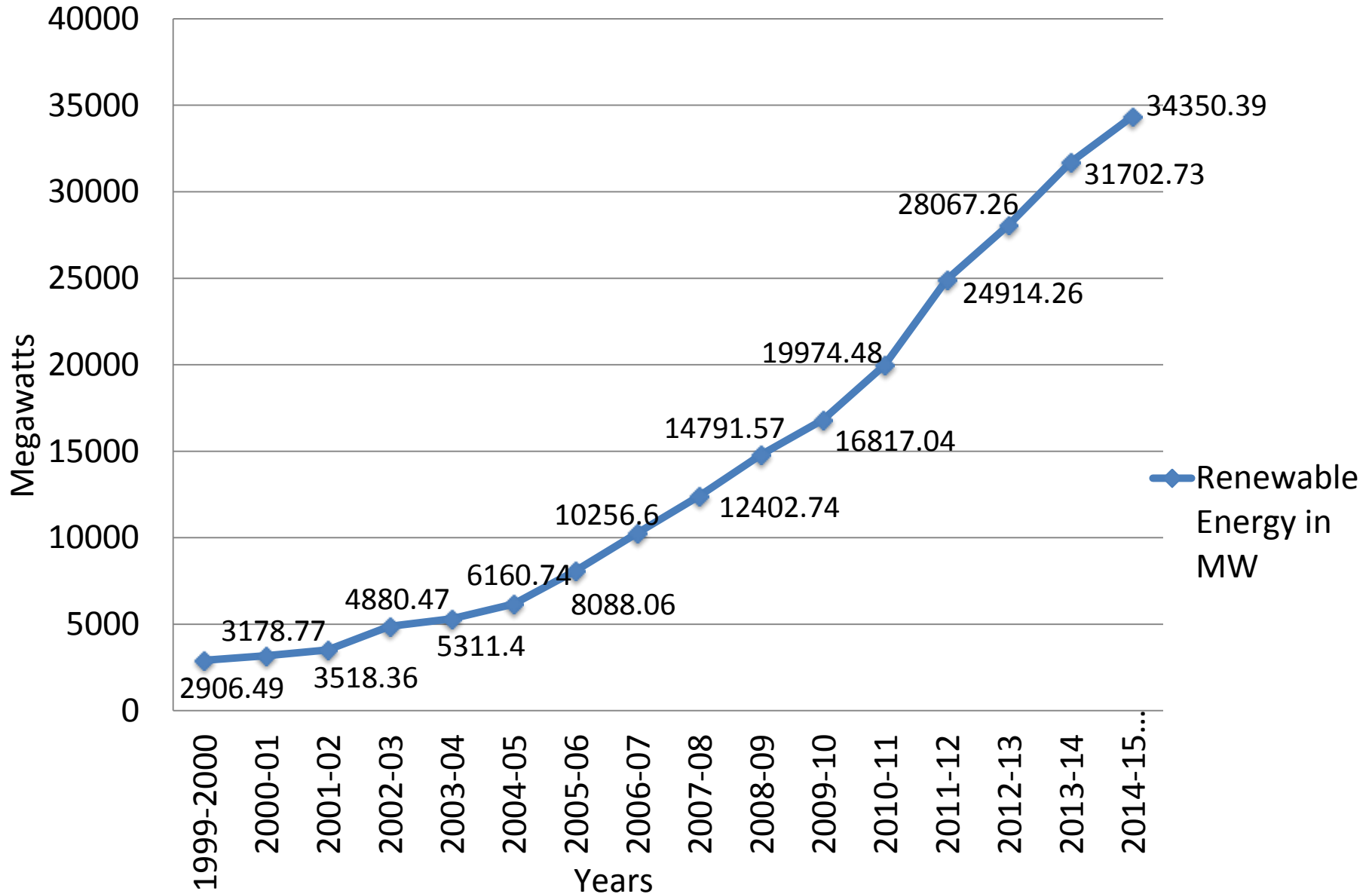
- Renewable contributes 34,350 MW – 13.04%
- If we take large hydro under RE – 28.54%

Present Status-Renewable Energy

Total Installed capacity 34,350 MW



Renewable Energy Installed Capacity - Growth



Future market opportunities

In next 12 years India's electricity requirement to grow 2.5 times

Electricity shortage estimated at 25-35 GW



Climate Change is also an important issue (RPO/RGO)

400 Million people still without access to electricity

India is dependent on oil imports for 80% of its demand

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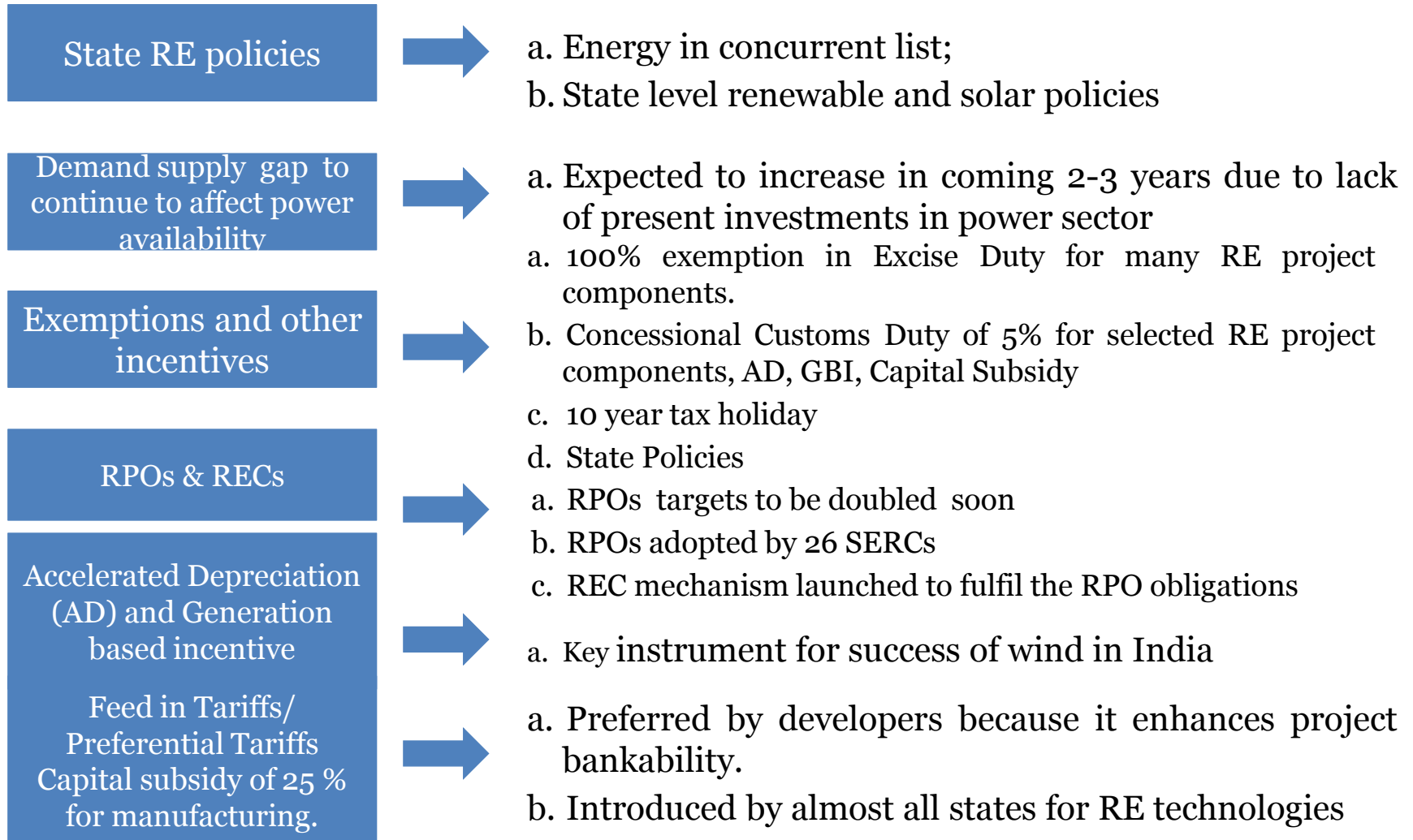
Renewable Energy Potential in India

RE Type	Potential (MW)
Wind Power (at 80m hub height)	102,788
Solar Power	748,980
Small Hydro	20,000
Biomass including cogeneration	23,000
Waste to Energy	2,600
Biogas	1,280

RE Policy Enablers in India

- **Dedicated Ministry since 1982: MNRE**
- **Dedicated Financial Institution – IREDA & banks with green energy commitments.**
- **Dedicated Technical Institutions – NIWE, NISE, and SECI**
- **Comprehensive Resource Assessment**
 - **Wind Atlas/ Solar Radiation Mapping/ Hydro Sites**
- **Enabling instruments**
 - **Renewable Power Obligations , Renewable Generation Obligations , Bundling & Preferential feed-in-tariffs**
- **Fiscal & Financial Incentives**
- **State specific RE policies**

Support Mechanism for Renewable Power In India



Policy and Regulatory Structure

Electricity Act, 2003:

- Umbrella act for electricity generation, transmission, distribution and trading activities as well in India
- It forms the basis for :
 - **National Electricity Policy, 2005**
 - **National Tariff Policy, 2006**
 - **National Electricity Plan** by Central Electricity Authority (CEA)
 - **Determination of Preferential Tariff for different RE sources**
 - **Open Access Regulations**
 - **Renewable Energy Policy**

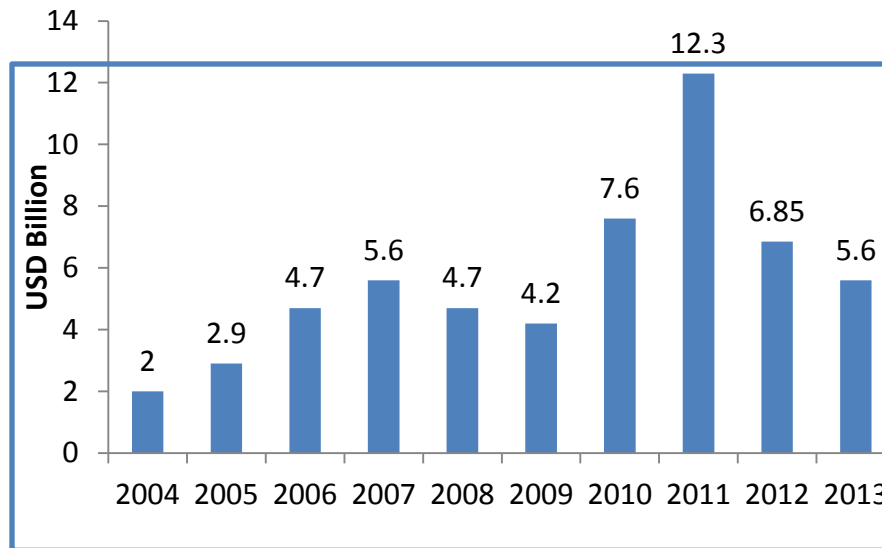
Renewable Energy Targets

- **India targets by 2022:**
 - **100 GW of solar**
 - **60 GW of wind**
 - **10 GW of bio-energy**
 - **5 GW of SHP**
- **Total target : 175 GW by 2022**
- **Increased focus on SHP, bio-energy, new & emerging technologies**
- **Setting up RE manufacturing bases in India**
- **Setting up a RE University and a Green Jobs Skill Council to create multiple job opportunities**
- **Investment opportunity : US\$ 200 billion**

Business Opportunities

- Manufacturing in RE sector
- Site Assessment agencies
- Project Developers
- Institutional Investors
- Equipment suppliers
- EPC and O&M Contractors
- Distributors

Clean Energy Investment in India

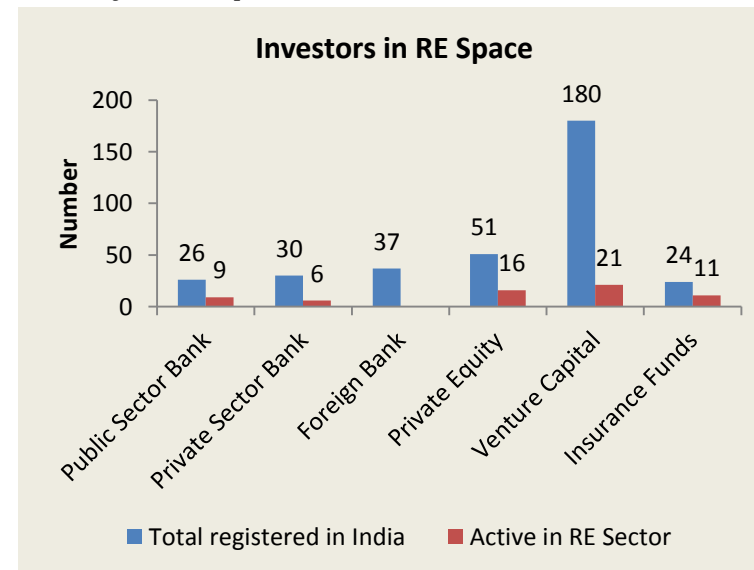


Source: Bloomberg Finance Report, 2014

Clean energy investment, 2013, \$billion				
	Asset finance	Public Market	VC/PE	Total
Solar	0.9	-	0.01	1.0
Bio-fuels	0.03	-	-	0.03
SHP	0.7	-	0.01	0.7
Biomass	0.5	-	0.02	0.6
Wind	3.2	-	0.1	3.3

Source: Bloomberg Finance Report, 2014

- Market largely driven by asset-based finance (94% of the total investment)
- Institutional investors are either state-owned or bilateral and multilateral institutions
- Development Banks-IREDA, continue to represent a key source of funds for RE investments
- The estimated investment in Indian market will be about 100 billion USD in coming 4 years



Green Energy Corridor

- In 2012, Powergrid has planned high capacity transmission systems (green energy corridors) for evacuation of renewable power
- Aggregate capital outlay of around INR 425 billion(USD 6.964 billion) (~EUR 5 billion).
- With the implementation of the Green corridor, the pockets of the RE generation would get grid interactive and thereby the restrictions on RE evacuation, losses would reduce.
- The planned systems are:

Inter State Transmission System

Transmission Line	3,400 ckm
765kV	2,780 ckm
400kV	620 ckm
Substations	18,000 MVA (6 nos.)
765kV	15,000 MVA (5 nos.)
400kV	3,000 MVA (1 no.)

Estimated Investment : Rs. 9,081 Cr (USD 1,487.96 mn.)

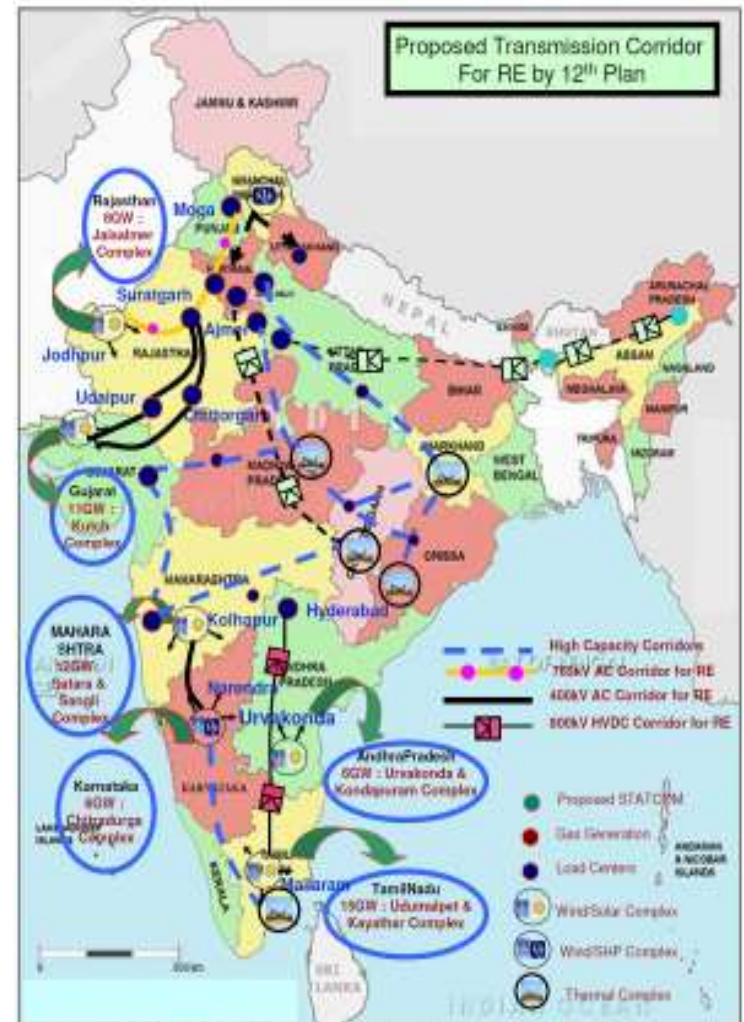


Figure 5-1: High Capacity transmission corridor for RE by 12th Plan

Source: Powergrid

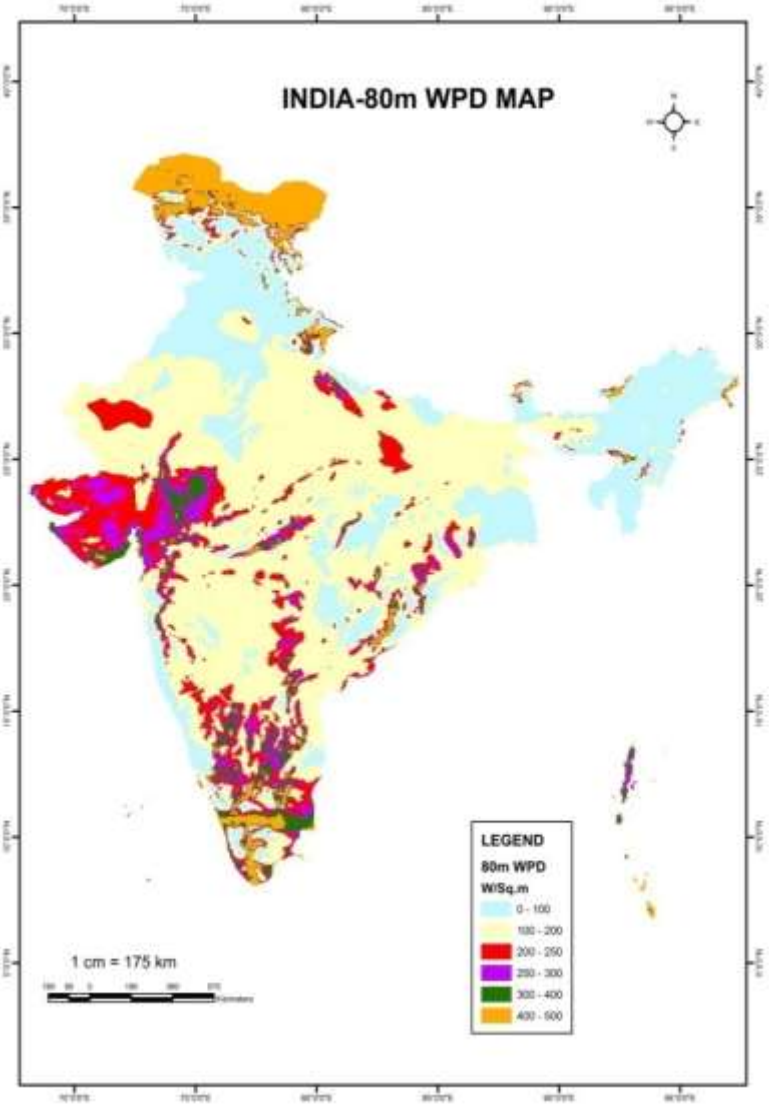
Solar Resource Measurement Stations

Phase I	51
Phase II	60
MEDA	04
AMS	04
Total	119



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Wind Atlas Map



RE-INVEST 2015 / 2016

RE-Invest 2015	Key Statistics
Total Speakers	202, from 29 countries
Total Delegates	2860, from 42 countries
Total Companies Represented	578 Indian, 124 International
Total Media Representatives	164, from 88 Publications / Agencies
THE EXHIBITION	
Total Exhibitors	118
Country Pavilions	Germany, UK, Italy, UAE
Green Energy Commitments	387 companies of 273 GW
Manufacturing Commitments	17 companies of 62.10 GW
Financing Commitments	30 banks and FIs to finance 70.50 GW

Powering the Renewable Energy Revolution

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Thank You