

## **An Overview**

- Wind Energy & Latest Trends**

- Ramesh Kymal, MD**  
**Gamesa Wind Turbines Pvt Ltd., Chennai.**  
**(100% subsidiary of Gamesa Group, Spain)**

# AGENDA

## ⊙ **Wind Energy - India**

- ⊙ Legislative & Policy Measures
- ⊙ Wind Power Growth In India
- ⊙ Future Scenario for Wind Power Development

- ① *An overview of the legislative framework along with policies and incentives for renewable energy and the historical drivers for wind power development*

### **Legislative framework for Renewable Energy in India**

Renewable Energy has an encouraging legislative framework to facilitate Investments in renewable energy. The Electricity Act, 2003, the primary legislation for the Electricity sector has a number of important provisions and mandates regulators to declare preferential tariffs and stipulate a minimum percentage of procurement from renewable energy generators.

The Act, is supported by favourable provisions in the National Electricity Policy and Tariff Policy which reiterate the implementation of Renewable Purchase Obligation (RPO).

## Legislative & Policy Measures - 2

A brief summary of the policy measures and incentives provided by the Central government/agencies is as below

### **Concessionary Customs duty on wind energy equipments and components**

#### **Excise Duty Exemption for capital goods for wind energy**

Water pumping wind mills, wind aero-generators and battery chargers.

Wind operated electricity generator, its components and parts thereof including rotor and wind turbine controller

#### **Accelerated Depreciation**

Wind energy projects are allowed accelerated depreciation benefit of up to 80% of the project cost in the first year plus additional depreciation @ 20% for projects commissioned after March 2005 with new plant & machinery.

#### **Tax Holidays**

Wind energy projects are eligible for exemption on Income Tax on earnings from the project under section 80 IA for 10 years

#### **Renewable Purchase Obligation (RPO)**

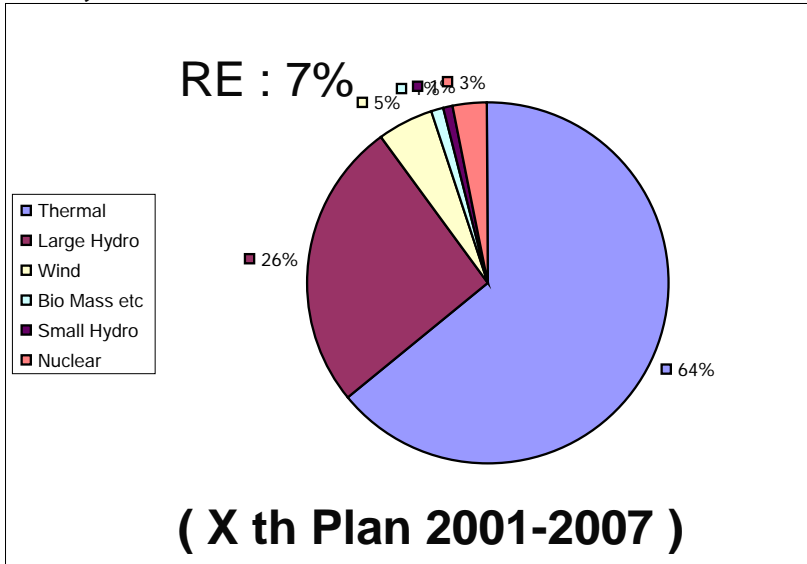
The Electricity Act, 2003 mandates SERCs ( State Electricity Regulation Committee) to stipulate a minimum procurement obligation, or the renewable purchase obligation (RPO) for distribution licensees in each state. Presently, 13 SERCs have notified RPO targets for their respective states.

# Wind Power Growth In India :

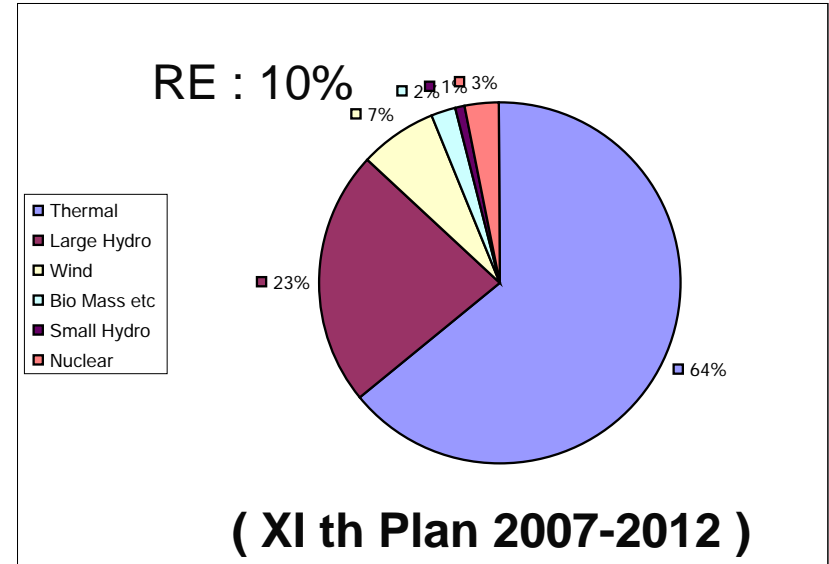


## RE & Conventional Energy Mix in India

### Installed capacity by Fuel 133,565 MW



### Planned capacity by Fuel 226,142 MW

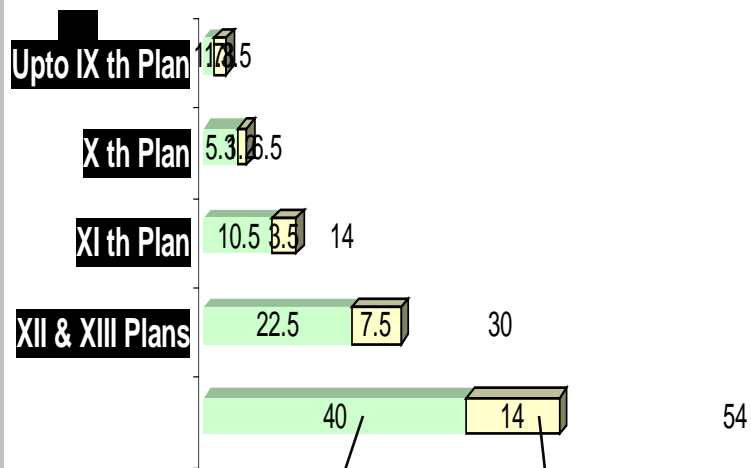


### X th Plan Performance:

	Conventional	RE	Total
Target	41,110	3,884	44,994
Actual	21,080	6,525	27,605
% Ach	51.3%	168%	61.4%

## RE Growth in India :

INDIA - GRID INTERACTIVE RENEWABLE ENERGY CAPACITY ADDITIONS BY 5 YEAR PLANS IN GW



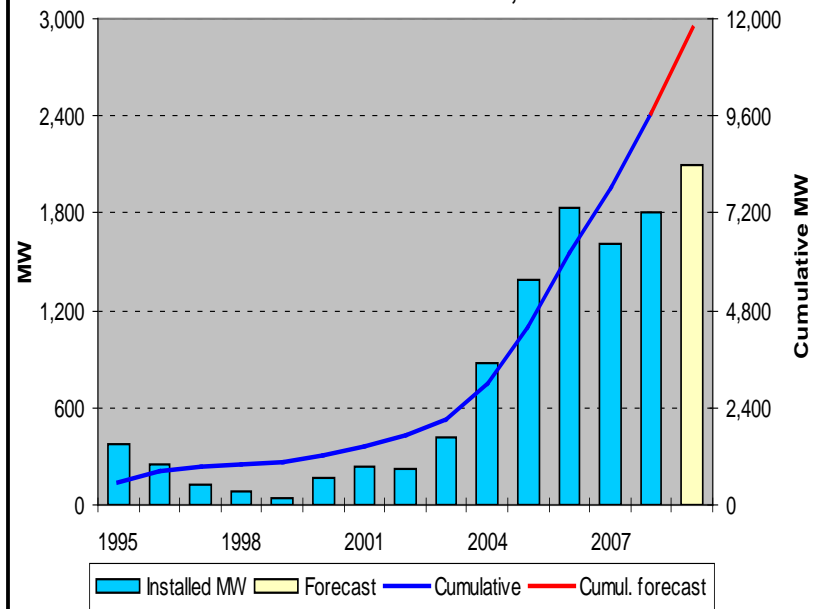
Source: MNRE

Wind Other RE

## Wind Power Installations:

Installed capacity in India

Cumulative end 2008: 9,655MW



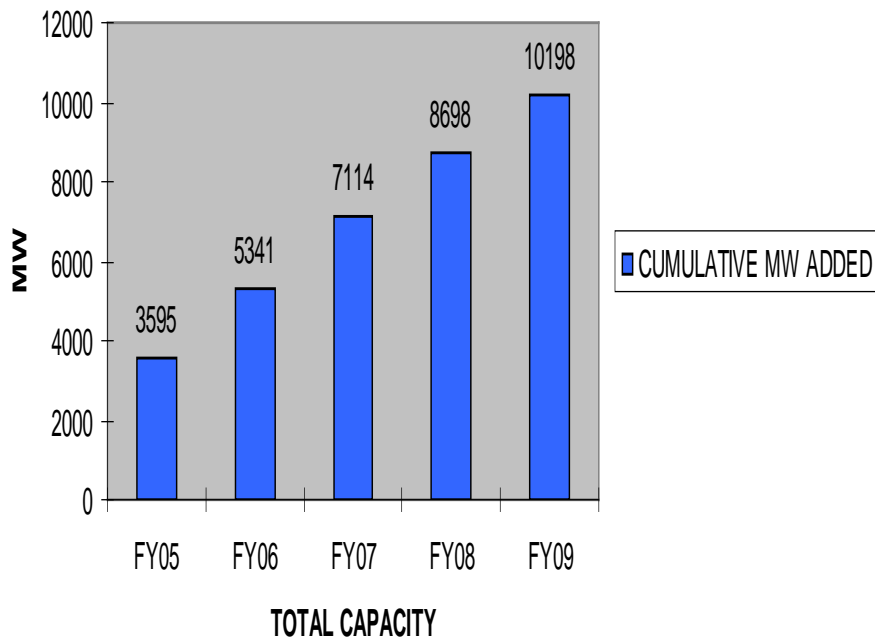
Source: BTM Consult ApS - March 2009

- ③ MNRE plans a total installed base of 54 GW of grid connected RE capacity (excluding solar power) by 2022
- ③ Unlike past experience in thermal power projects, where actual additions was merely 48% of planned capacity addition, RE's actual capacity added during Xth Plan exceeded (168%) the planned capacity addition
- ③ As a part of national action plan on climate change, it has been mooted that Utilities buy 5% of their power from RE sources starting this year. Utilities will be required to meet the new standard by the end of 2010 and then the minimum for RE will be increased every year by 1% for the next 10 years

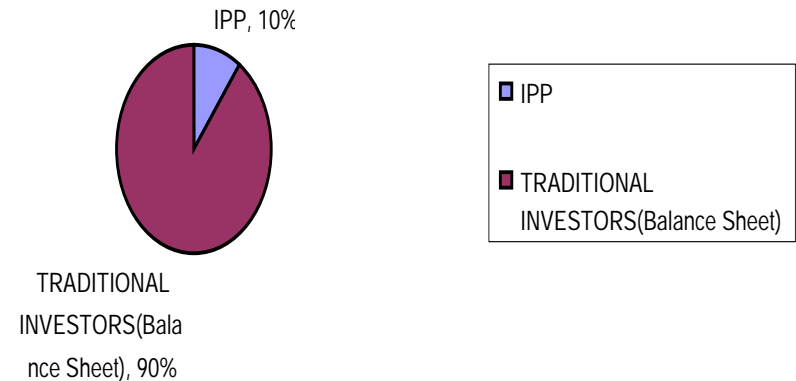
# Wind Power Growth In India-4 :

As of FY'09, >10,000MW of Wind energy is installed in India with only 10% from IPP investors

### TOTAL CAPACITY OF WIND ENERGY IN MW (FY 05-09)



### INVESTOR SEGMENTATION OF WIND ENERGY (09)



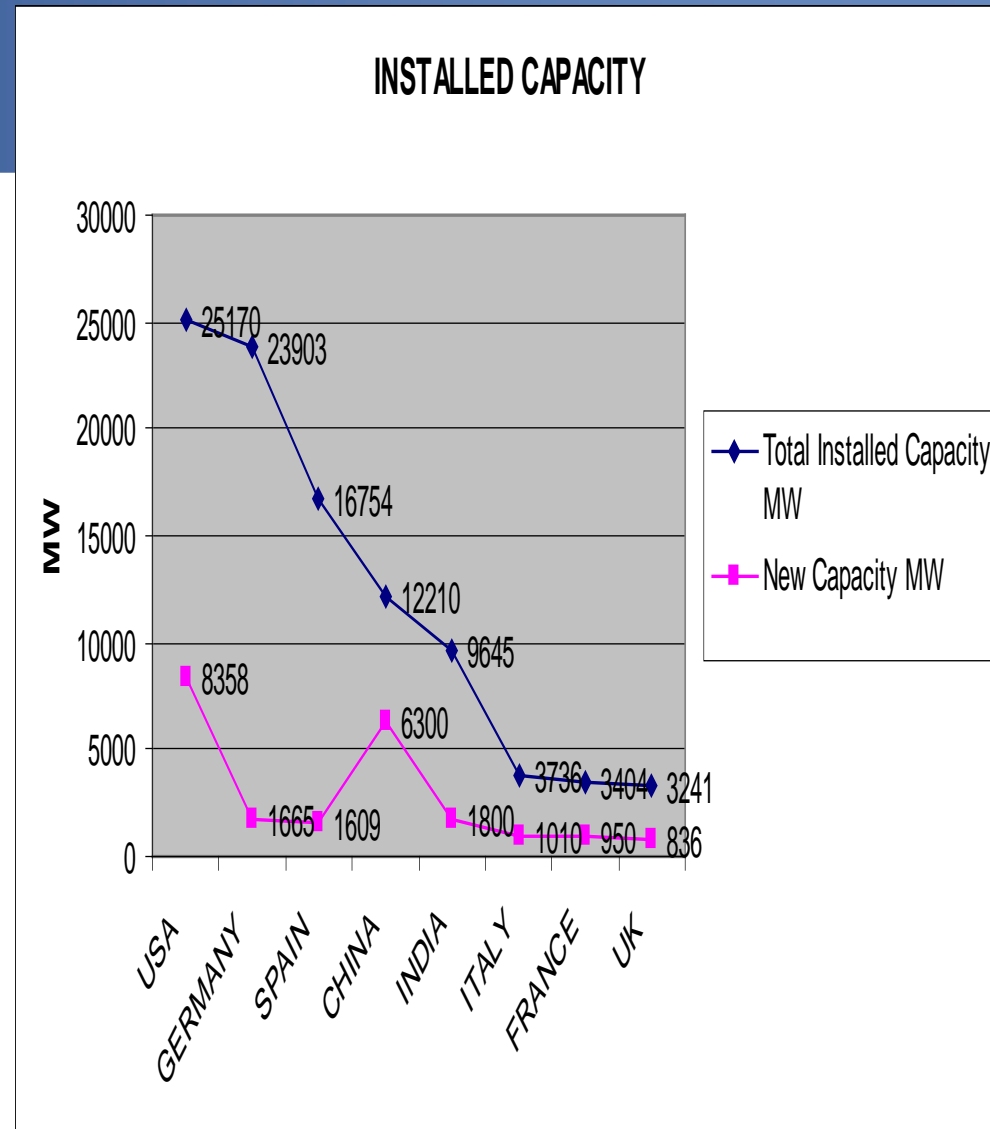
Introduction of GBI to increase IPP share

Source: MNRE

Source: MNRE

# Wind Energy Global Installation in Calendar year 2008 has been good, with about 28.8% growth rate

- By 2008 end, global installed wind energy capacity reached 120.8 GW mark, with a 27 GW capacity addition in 2008 (28.8% growth)
- China installed capacity is doubling for fourth year in a row and reached 12 GW in 2008
- In EU there are ten countries with more than 1000MW of wind installed capacity, leaders being Germany and Spain
- In EU it is the legal binding target of 20% of energy consumption from renewable energy by 2020
- Three regions are driving the global wind development : North America, Europe and Asia, each contributing equally in 2008
- As per Global wind energy council projection, wind power is on track to supply 10-12% of global electrical demand by 2020



# Future Scenario for Wind Power Development

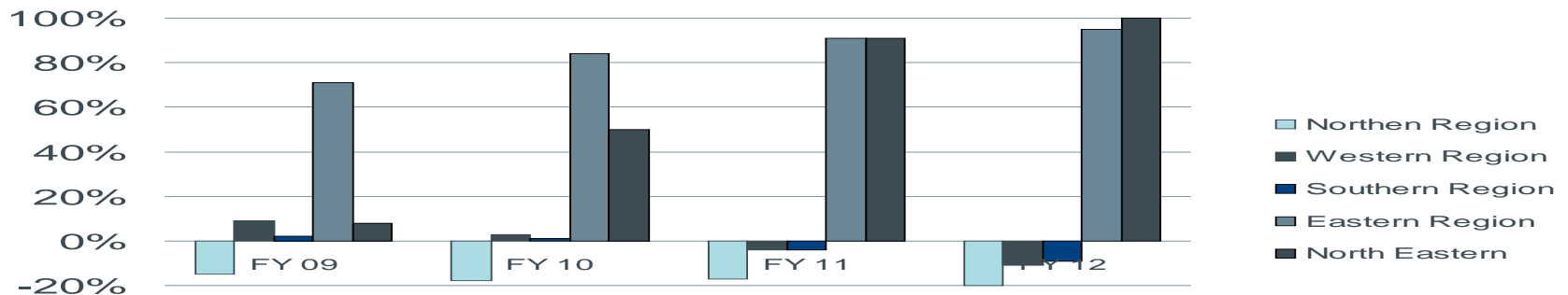
## 1. Future Demand Supply Scenario:

a) National electricity plan has projected the future demand supply scenario for India. From the figure below it can be seen that eastern and north eastern regions are always surplus and are in a position to export their generated power.

b) Northern region is always a power deficit region, western region and southern region have surpluses during FY 09 and FY 10 but due to higher demand they are deficit regions during FY 11 and FY 12.

c) The actual addition of generation capacity has been much less than the targeted capacity in the last five year plans. There is significant deficit expected in future, which emphasises the need for additions in generation capacity.

### Demand Supply Projections :



# Future Scenario for Wind Power Development -- 2

## ⊙ Tradable Renewable Energy (RE) Certificates :

a) RE potential is state and site-specific, leading to a mismatch in RPO and RE availability in the country

b) To overcome this difficulty, MNRE has been deliberating on introducing a Renewable Energy Certificate (REC) Mechanism

# Future Scenario for Wind Power Development -- 3



## ⦿ **Proposed Renewable Energy Law :**

Govt, released a draft model RE law envisaged and its major highlights are as below (the law, which still remains a draft as of date, when enacted would provide a significant boost to the RE sector) :

**a)** Increase the target for electricity generation via this route to 10% by 2010 (as against 2012 currently) and 20% by 2020.

**b)** The law envisages making RE electricity purchase obligatory by mandating electricity utilities to purchase power from renewable sources. It also calls for stringent penalties in case of violations.

## ⦿ **Power Market developments :**

**a)** Power markets in India have undergone a radical change since the Electricity Act 2003 came into place. Electricity Act 2003 has established electricity trading as a separate function and Availability Based Tariff (ABT) mechanism announced in 2004 provides a market for balancing and settlement. This mechanism has helped to evolve the market for power trading and improve competition.

**b)** Generators who wish to market its power in the open market can look at options like short term sale, power exchange or even third party sale (Short term rates in the recent past have moved close to INR 7-9 / kwhr, nearly 100 % higher than feed in tariffs for wind energy).

# Future Scenario for Wind Power Development -- 4

- ⊙ Wind Prediction tools for scheduling of wind power for ABT – to realise higher Availability Based Tariff on 30-40% of total wind power output at least.
- ⊙ Uniform Grid Code (already exists in SL) to ensure stability & quality of wind power generation (through LVRT & converter as in Gamesa Wind Turbines)
  - ⊙ Ensures better grid penetration of more than 10% (Denmark has high grid penetration of >15%).

- ◎ CEB's major drive for wind power installation sees start of 3 \* 10 MW construction in Puttalam region
- ◎ 20 MW wind power project (1\*10 MW at Seguwantivu & 1\*10 MW at Vidatamunai) is under construction with Gamesa's highly grid compatible & synchronous Wind Turbines (AE59/800kw)

**Thank you for your attention**

