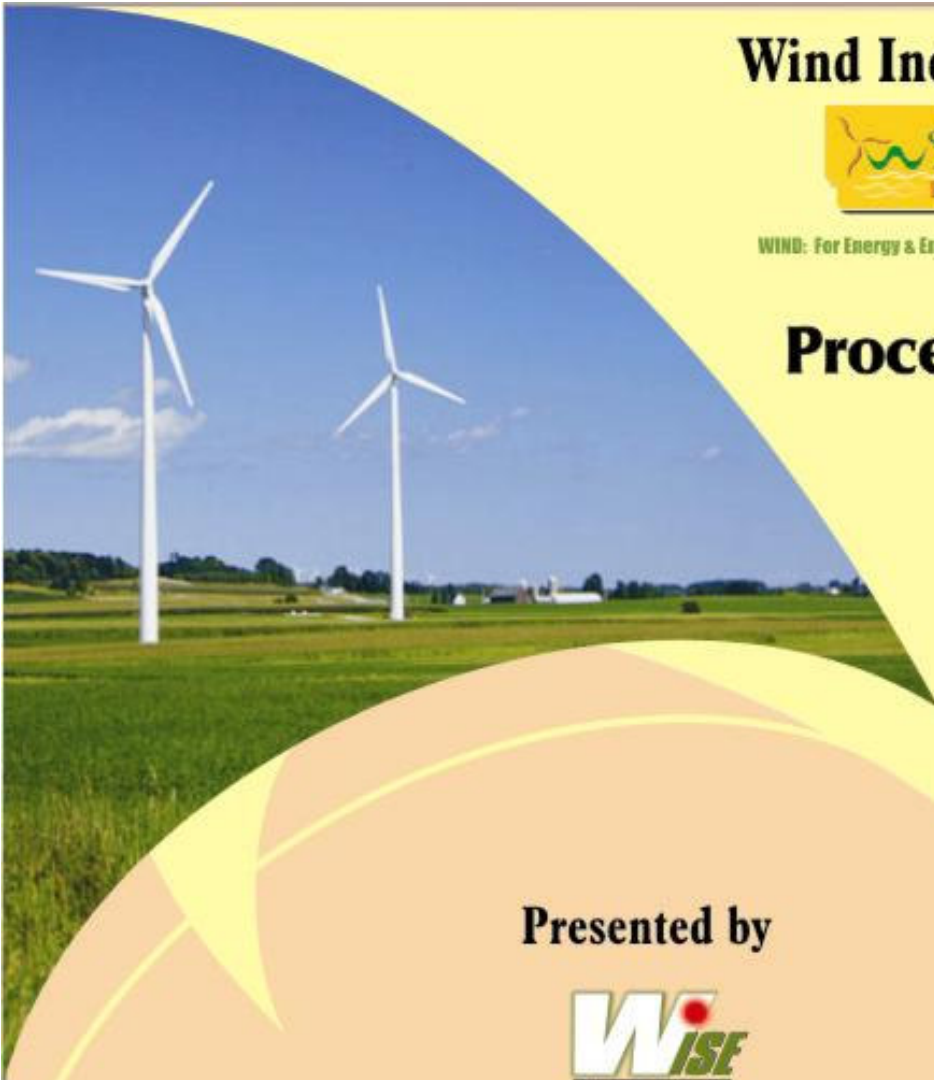


Wind India 2006



WIND: For Energy & Environment Security

Proceedings



Presented by



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INAUGURAL SESSION

SPEAKERS

Vinay Kore	: Minister of Non-Conventional Energy, Government of Maharashtra
Padmavibhushan Dr. Mohan Dharia	: Founder, Vanarai and Former Dy Chairman, Planning Commission, Government of India
V. Subramanian	: Secretary, Ministry of Non-Conventional Energy Sources, Government of India

1. Vinay Kore

The Hon Minister during his inaugural address, threw light on the difficult journey of wind power in the late 1990s. He said that the journey has been worth the effort, as today India is the 4th largest producer of wind power in the world. He stressed on 100% indigenisation of wind turbine generators, besides focusing on the need to have maximum benefits in Clean Development Mechanism for obtaining maximum carbon credits for investors in the country. He pointed out that Maharashtra was the first state in the country to have a separate minister for non-conventional energy and that the state had moved ahead in the development of renewables much faster as compared to earlier years. The Minister requested the Secretary, MNES, to bring out a scheme for transferable tax incentives at the national level. He also emphasised on the need for a Special Economic Zone (SEZ) for renewables. Mr. Kore concluded by saying, "The future belongs to renewables. We should concentrate on developing this source for a safe environment".

2. Padmavibhushan Dr. Mohan Dharia

During his address as Chairman of the Organising Committee, Dr. Mohan Dharia, the revered philanthropist emphasised on empowering rural India. He stressed that when 70% of India lives in villages, it is essential to look at alternatives to grid expansion as grid is not always a viable option. In this regard, electrification using renewable energy technologies needs to be given serious consideration. This would go a long way in the development of rural areas and upliftment of the destitute.

3. V Subramanian

Mr. Subramanian underscored the contribution of wind energy development to the economy of the country. He also emphasised the need for development of hybrid systems such as wind and solar or wind and biofuels. Further, he stressed on the necessity to develop wind turbines to harness low wind regimes. In his remarks, he also stated that service organisations need to be developed in a big way. While concluding he highlighted the capability of Indian organisations in the area of testing and certification and stressed on the urgency to focus on development of a globally recognised certification mechanism.

SESSION 1: CEO Forum: Indian Wind Power by 2017

SPEAKERS

Tulsi Tanti	: CMD, Suzlon Energy Ltd., Pune
Ramesh Kymal	: MD, NEG Micon (India) Pvt. Ltd., Chennai
Nirmal Kumar Gupta	: MD & CEO, LM Glasfiber India Pvt. Ltd., Hosakote
K V S Subrahmanyam	: G M (Power), MSPL Ltd., Bangalore

1. Tulsi Tanti: A global outlook for Indian wind industry

He gave insights into the growth of the wind sector across the globe as well as in India, besides explaining challenges confronting the wind sector.

Keeping in view the targets set in the National Electricity Policy, which mandates electrification of all villages by 2007 and every household by 2012; about 1,00,000 MW additional capacity is required. Mr. Tanti opined that given this target, the actual growth demonstrated by the conventional power sector in the last few years is not satisfactory. However, the wind sector has shown 24% growth in the last 5 years. Capacity addition in the wind sector is thus significant when compared to capacity addition by other players in the conventional power generation segment.

He also emphasised on the following points for development of the wind power sector in India:

- Significant contribution of wind energy towards energy, economy, and ecology.
- Robust regulatory and policy framework for the budding wind power sector to grow in a big way.
- Need for development of new performance based incentive mechanisms such as Production Tax Credit (PTC).

2. Ramesh Kymal

Mr Kymal, presented a video film giving insights about NEG Micon and its presence in India, and emphasised on harnessing immense wind power potential with a vision to make India a world leader in wind power generation.

1 **Nirmal Kumar Gupta: Open House Discussion**

Mr Gupta started his discussion by segregating wind power development into two time periods, viz. pre 2007 in which India successfully achieved addition of 5000 MW and post 2007. He emphasised on development of supportive policy and regulatory framework as a pre-requisite for sustainable sectoral growth, post 2007. He further spoke about the growth of Glasfiber and associated industries.

2 **K V S Subrahmanyam: *Project promoters' perspective: case study of MSPL***

Mr. Subrahmanyam began his discussion by providing information about MPSP, the flagship company of the Baldota Group, and the single largest producer of wind energy in the country with an installed capacity of 111.0 MW. He threw light on the present power scenario in India and explained that the present correlation of electricity consumption to GDP is 1.5, which means power requirement is likely to grow at the rate of 12% when GDP growth of 8% is being targeted. He emphasised the need for utilities to source minimum percentage of power (around 10%) from renewable sources, which would be a step forward towards mitigating national electricity shortage.

He further emphasised the need for enabling policies to boost the growth of wind power in India. According to him, the key policies which could encourage growth are as follows:

- Treat wind power policies independently.
- Abolish category restrictions for third party sale by developers.
- Cap wheeling charges to a maximum of 5% of the wheeled energy with no charges other than wheeling charges being levied.
- Provide enhanced energy banking facilities.
- Extend banking period to 12 months with a uniform banking charge of 2%.
- Promote captive utilisation of wind power.
- Exempt electricity duty for a period of 10 years on sale of power.
- Strengthen evacuation facilities.

SESSION II: Integration of Wind Power

SPEAKERS

Prof. S.A Khaparde	: Dept. of Electrical Engineering, IIT, Mumbai
M Rasmussen	: Product Manager, Vestas Asia Pacific, Denmark
P R Raghuram	: AGM, Grid Management, SLRDC, PGCIL, Bangalore
Jami Hossain	: Jt. Secretary & Advisor, Technical, InWEA, New Delhi

1. Prof. S.A Khaparde: *Solutions for power quality and grid integration of wind turbines in India*

Prof Khaparde explained about the various types of wind energy generators used in the country and power quality issues associated with them. The power quality issues can be broadly classified into two categories: those caused by meteorological and geographical conditions, and those caused by technology used by the wind turbine. He presented solutions to power quality as well as grid integration issues and highlighted the fact that as the percentage of wind generation capacity in the total grid capacity is insignificant, the concerns of grid quality are not that critical.

2. M Rasmussen: *European experience on integration of wind power with the grid*

He gave an overview of development in the wind sector in European countries like Denmark, Germany, etc. Further he offered insights into the current technologies used for wind turbines to ensure integration of wind farm with the grid, especially in case of weak grids.

3. P R Raghuram: *Wind energy forecasting and power dispatch integration*

He focused on the overall wind generation scenario in the southern region and the development of wind power in the recent past. He emphasised on 'tight' integration of wind generators with the power system to ensure quality power at the least cost-to-end consumers. According to him, major issues to be addressed to ensure successful integration of wind generators into the power system are as given below:

- Real time system operational issues like reserve capability, accurate short-term forecasting of wind, etc.
- Market issues like participation of wind generators in trading of power with the present market imbalance settlement system, etc.

- Grid infrastructure issues like congestion management.
- Contribution of wind power to the system adequacy and other ancillary services.

4. Jami Hossain: *Panel discussion*

While wind capacity addition has seen significant growth in the recent past, in order to harness further wind potential, Mr. Jami Hossain emphasised on strengthening of power evacuation facilities, coordination between system operator and wind power generators, short-term forecasting techniques, and inter-state wheeling mechanism, etc.

SESSION III: HRD and R&D for the Sector

SPEAKERS

Ashwin Gambhir	: Sr. Research Associate, WISE
Dr. S K Gupta	: Prof. Centre for Measurement and Evaluation, NITTR, Bhopal
Rajendra V Kharul	: Fellow, WISE
Dr. Sathyajit Mathew	: Asst. Professor, KCEAT, Tavanur, Kerala
Dr. Sujay Basu	: School of Energy, JadHAVpur University, Kolkata
Prof. Shireesh B Kedare	: Adjunct Associate Professor, Energy System Engineering, IIT, Mumbai
S J Krishnamurthy	: Dy. Director, NAL, Bangalore

1. Mr. Rajendra V Kharul: *HRD - Theme paper*

During his presentation, Mr. Kharul emphasised on the following points:

- Need for HR development in the Indian wind industry to cater to shortage of skilled and trained manpower.
- Need to start full-time academic programmes for minimising demand-supply gap in the wind industry.

2. Ashwin Gambhir: *R&D in wind power: theme paper*

World over, the wind power sector is undergoing the process of fast technological development. However, in India, R&D initiatives necessary to sustain growth are not in tandem with those taken up in other countries, especially those in Europe. He emphasised on the following points:

- Quick resource mapping of the entire country to calculate the potential for wind power, in line with technological developments.
- Short-term wind forecasting techniques for predicting variation in electrical output.
- Processes and systems for coordination between system operator and wind turbine operator.
- Introduction of production linked incentives.
- Development of Clean Energy Funds such as in Maharashtra.
- Long-term policy and robust regulatory framework.

3. Dr. S K Gupta: *Technical education and wind energy: strategies that can make a difference*

“With the rapid growth in the wind sector envisaged, the role of education becomes very important.”

There has been consistent growth in the wind industry in India with focus shifting from European countries to Asian countries. As a result, India has emerged as one of the leading five countries in the world. However, the irony is that the technical education system in the country has not kept pace with these developments. As a result, hardly any institute is offering technical courses and programmes developed exclusively for wind energy professionals. The industry is facing acute shortage of competent wind turbine engineers, technicians, and artisans. Dr. Gupta remarked that multipronged strategies are needed to achieve the aim of developing competent manpower for performing different tasks related to wind power plants. Some of the initiatives needed in the technical education system are :

- Need to start elective courses on wind energy technology in core branches such as electrical, electronic, mechanical and instrumentation engineering.
- M. Tech programme devoted to wind energy technology.
- Diploma programme at post graduation level for professionals serving in the industry.
- Modular programme in distance learning mode for working professionals.
- Strong support from government agencies in the form of financial and policy framework

4. Dr. Sathyajit Mathew: *Global advances in wind power R&D*

Dr. Mathew emphasised on accelerating R&D activities in India in order to sustain a growth rate of 25%, which has been experienced by the industry during the last five years. He emphasised that in view of this, sufficient investments should be made to strengthen the R&D base. According to Dr. Mathew, priority areas for research should be:

- Rotor Aerodynamics
- Wind Resource Assessment
- Turbine Engineering
- Offshore Wind Energy
- Grid Integration Issues
- Environmental Aspects

5. Dr. Shireesh B Kedare: *Wind power R&D in India: status and prospects*

Dr. Kedare emphasised efficient wind resource data collection and analysis to explore potential wind energy sites, inland as well as offshore. He also stressed on micro-siting studies and indigenous development of wind turbine equipments. He suggested initiation of a national initiative for sustainable development of the wind power sector in India.

6. Prof. Sujay Basu: *Panel Discussion*

According to Prof Basu, with steady increase in installed capacity of wind generation in India, the integration of wind power to the grid should be the focal area of research and development. Grid penetration higher than 20% definitely warns careful integration of wind energy with the electrical network. He emphasised on the following issues:

- Weakness of the grid should be taken up seriously.
- Short-time forecasting techniques should be developed for efficient integration of wind generation.
- Decentralised generation should be promoted in rural and remote areas.
- Hybrid technologies such as wind and solar, wind and biomass, should be promoted.

7. S J Krishnamurthy: *Panel Discussion*

Mr. Krishnamurthy opined that with increase in prices of fossil fuels, renewables are expected to play a key role in development of the economy. In the current scenario, wind energy is the fastest growing renewable source. In his presentation, he gave insights into the aerodynamics of the wind turbine, explaining various theories, computational tools like IMPRNS, CFD_ACE, GH-Blade and analysis of wind turbines.

SESSION IV: Economics, Financing and Market Development

SPEAKERS

Joseph Chaly	: Director, Marketing, NEG Micon (I) Pvt. Ltd., Chennai
G N Kamath	: MD, Karma Energy Ltd. Mumbai
Chintan Shah	: GM, SenergyGlobal, New Delhi
Jotdeep Singh	: Associate director and Head, Rabo India Finance, New Delhi
Pushkala Lakshmi Ratan	: Senior Analyst, Carbon Advisory Services, NEG Micon (I) Pvt. Ltd., Chennai

1 Joseph Chaly: *Market distortions and barriers in India*

Mr Chaly opined that although the wind industry has grown from few kilowatt machines to multi-megawatt machines in the recent past, it lacked proper planning, especially in critical technical research. Further, availability of proper infrastructure for wind power development was always a major issue. Market barriers such as uncertain policy framework, unfair competition, unacceptable conditions for international investors in PPA, funding issues, etc., pose considerable hindrance to the growth of the wind power sector in India. He stressed on the need to get rid of these problems.

2 G N Kamath: *Alternative business models and creative market development*

Mr. Kamath mentioned that wind power development in India has been primarily promoted by the manufacturers, who have pushed their products, thus creating a sort of supplier's market. He felt that existence of such markets does not provide healthy competition. He stressed on the development of a 'Business Model' which will cater to the interests of all stakeholders. Aspirations of other stakeholders in the power sector such as developers, manufacturers, and utilities, need to be fulfilled.

3 Chintan Shah: *Economics of investing in wind power projects*

Investment in any project has to be based on economic considerations, and wind energy cannot be an exception to this rule. Chintan Shah provided a look at the investor's perspective in wind power development and remarked how the change in policy framework can affect the economics of investment. He further stressed on the urgent need to move from 'tax driven' to 'performance driven' incentive models.

4 Jotdeep Singh: *Financing wind power: Indian experience and innovation possibilities*

Mr Singh briefed the audience about wind energy financing models being used in other countries such as Netherlands. He emphasised on the need to encourage limited recourse and non-recourse financing of wind power projects in India. He stressed on the need for single window clearance from all government entities i.e. state and central government and development of appropriate regulatory framework so as to enhance non-recourse financing.

5 Pushkala Lakshmi Ratan: *Carbon credits as additional revenue stream: Status and prospects*

Ms Pushkala elaborated on carbon credit mechanisms and 'key essentials' for its implementation in the Indian context. She emphasised on the following key issues:

- Need for enactment of the 'International Trade transaction Law' (ITL)
- Setting up of a National Registry in India
- Difference between EUAs and CERs
- Need to appreciate that every wind project need not be a CDM project.
- Evolution of guidelines and common understanding regarding registration of the project.

SESSION V: O & M, Supply Chain and Efficiency Improvements

SPEAKERS

A. S. Karanth	: CEO, BF Utilities Ltd., Pune
Girish Paliwal	: GM, Enercon (India) Ltd., Mumbai
T Pradeep Kumar	: Global Head, Technology, Suzlon Energy Ltd., Pune
Rajendra Khanolkar	: Asst Manager, Kansai Nerolac Paints Ltd., Mumbai

1. A. S. Karnanth: *Effective O&M for performance improvements*

Mr. Karanth expressed that it is generally considered that operation and maintenance of wind turbines is similar to operation and maintenance of any other power plant. He felt that O & M of WEGs is much more complex than that. Experience in India is different from other places in the world due to the approach we adopt towards wind investments. In India, wind investments are primarily done for the purpose of tax planning. Further, no turbines in India have completed 20 years of life expectancy, so it is difficult to conclude what the impact of Indian conditions on wind turbine operations would be. Therefore, it is necessary to focus on the following key requirements:

- Culture for 'data collection & analysis'
- Need of 'passion for excellence'
- Team work to maximise generation and minimise outage time
- Manpower orientation and organisational development

2. Girish Paliwal: *Supply chain and indigenisation of turbine component development*

Mr Paliwal emphasised on key aspects of supply chain management and indigenisation of turbines and components for sustainable development of the wind power sector in India. He also submitted that indigenisation means sourcing of components and resources globally which suit the local condition at a unique region and site, thereby offering value addition to the customer. According to him, following five points are key drivers for indigenisation in the industry:

1. Cost
2. Creating additional vendor support
3. Technology transfer
4. Nodes of optimisation (closer)
5. Move towards localisation

3. **T Pradeep: *Benchmarking practices in development of wind energy projects***

Mr Kumar stated that best practices in wind energy projects can be classified into (a) project related, and (b) information related. The influencing factors should be carved out minutely and an attempt should be made to minimise the adverse impact through project design and mitigation measures.

Wind Energy, which till recently was considered as an alternative energy source is now becoming a mainstream source of energy. It is necessary to inculcate best practices in setting up wind energy projects so as to contribute to the energy security of the country. It would be appropriate to identify best practices for each of its facets such as technology, finance, time, people, and attitude. Mr Pradeep also explained about best practices in the areas of site selection, project feasibility, project application, construction, operation, disclosure of generation details, insurance and indemnity factors, public filing of land related information, etc.

4. **Rajendra Khanolkar: *Protective coatings for wind turbine towers***

Mr Khanolkar expressed the need for implementing best practices in every process. He said that Indian conditions offered 3 main challenges that affected the exterior coating of the wind turbine towers. These were:

- Heavy Rainfall
- Temperature Changes
- Coastal Salinity

He emphasised on the initiatives undertaken by Nerolac Paints in achieving technical expertise, upgrading of application skills at vendors end, continuous supervisions, etc. He also attempted to quantify the impact of these practices on the ability of wind turbines to sustain odd weather conditions.

SESSION VI: Mainstreaming Wind Power in India

SPEAKERS

- Balawant Joshi : Managing Partner, ABPS Infrastructure Advisory, Mumbai
- Dr. Ajay Mathur : Director General, Bureau of Energy Efficiency, Ministry of Power, New Delhi
- Arun Bhalla : Executive Vice President, Business Development, PTC India Ltd., New Delhi

1. Balawant Joshi: *Theme paper: regulatory issues for mainstreaming wind power development*

Mr. Joshi explained key regulatory issues confronting the renewable energy sector in India. He addressed regulatory issues affecting tariff for sale to utilities, captive and open access transactions, as well as implementation of Section 86 (1) (e). He also emphasised the need to develop more aggressive targets under Section 86 (1) (e) to harness renewable energy sources. He stressed on the need to make renewable purchase obligation (RPO) applicable to open access and captive transactions.

2. Dr. Ajay Mathur: *Global experience curve in policy and regulation for wind power development*

Dr. Mathur highlighted various incentive mechanisms for promotion of renewable energy sources such as feed-in tariffs, subsidies, fiscal incentives, etc. He stressed that when markets and products are at a nascent stage, uncertainties necessitate upfront sharing of benefits. He discussed pre-conditions for introduction of competitive bidding in renewables, giving an example of NFFO in the UK.

3. Arun Bhalla: *Panel discussion: Future Indian policies for mainstreaming*

Mr Bhalla emphasised that continuous development of technology, R&D initiatives and scales of business have brought a lot of change in wind energy development. It is not merely an environmental saving device but a mainstream source of energy. Large investments by Indian companies in foreign countries in their energy sector and acquisition of European companies engaged in manufacturing wind turbines and related equipments by the Indian entrepreneur, signals that wind power is fast becoming a mainstream source

of energy and Indian companies have acquired an edge in this business. However, following key issues need to be addressed to mainstream wind energy:

- Tariff for electricity generated through renewable energy sources
- Share of renewables – fixation of quota for states
- Inter state/ intra state sale of power from renewable energy sources
- Introduction of tradable instruments e.g. credits/ penalties for renewable energy
- Rationalisation of wheeling charges and cross subsidies
- Introduction of feed-in tariff at the national level
- Banking and grid connectivity
- Integration of infirm power in grid management

Valedictory Session

1 Mr. Balawant Joshi

Mr. Joshi summarised the key findings of all sessions held during Wind India 2006. He also presented the deliberations during Expert Group discussion and presented the action plan developed during the Expert Group Meeting to encourage sustainable development of wind sector in India.

2 Dr. Pramod Deo

Dr. Deo, besides underscoring contribution of wind power to the economy of the country stressed on implementation of the RPS mechanism across all states. He also commented on the need for development of common approaches across regulatory commissions, practicality of implementing competitive bidding and need for feed-in tariffs. He also congratulated the World Institute of Sustainable Energy for organising such an event for the first time in the country.