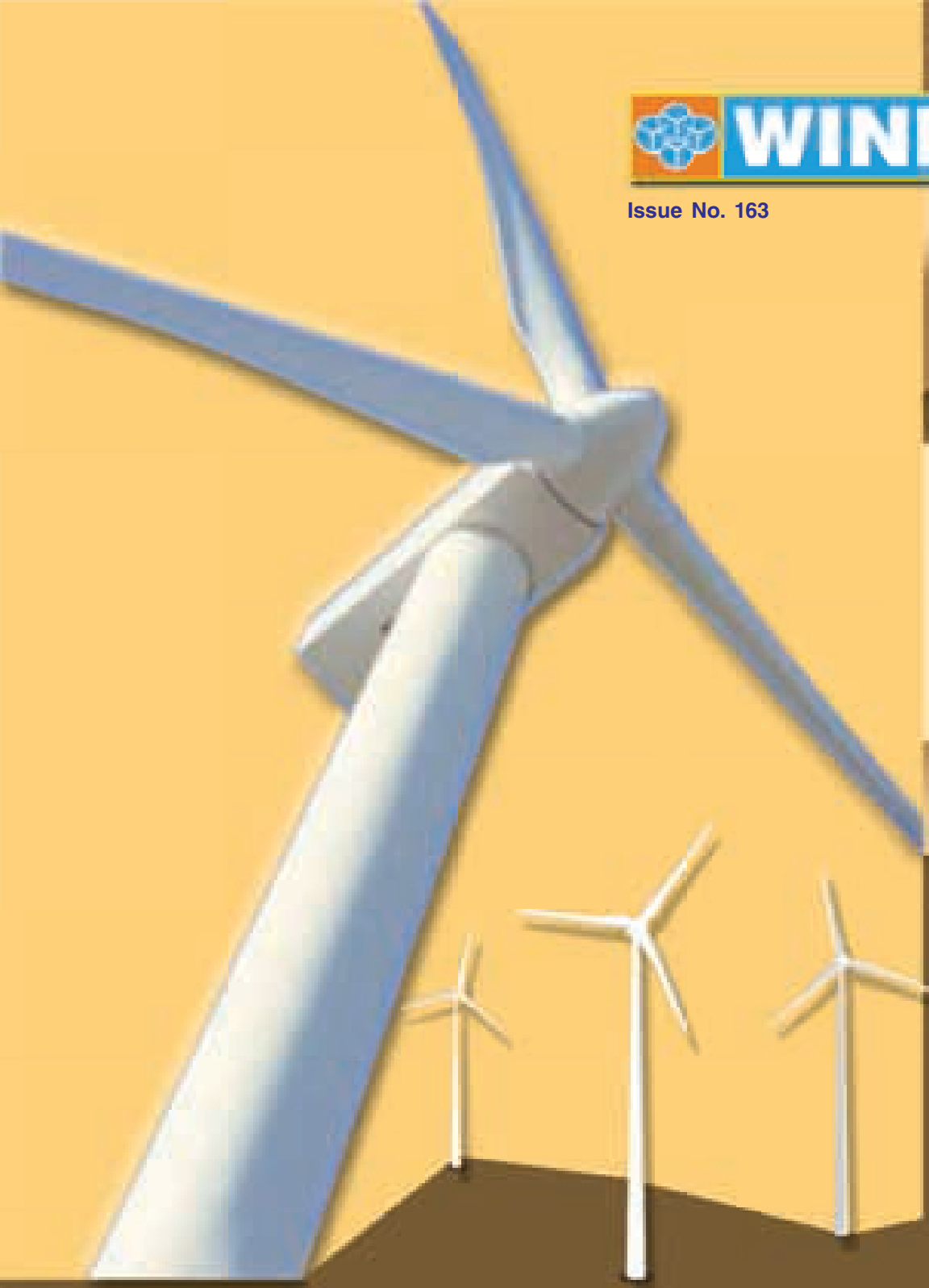
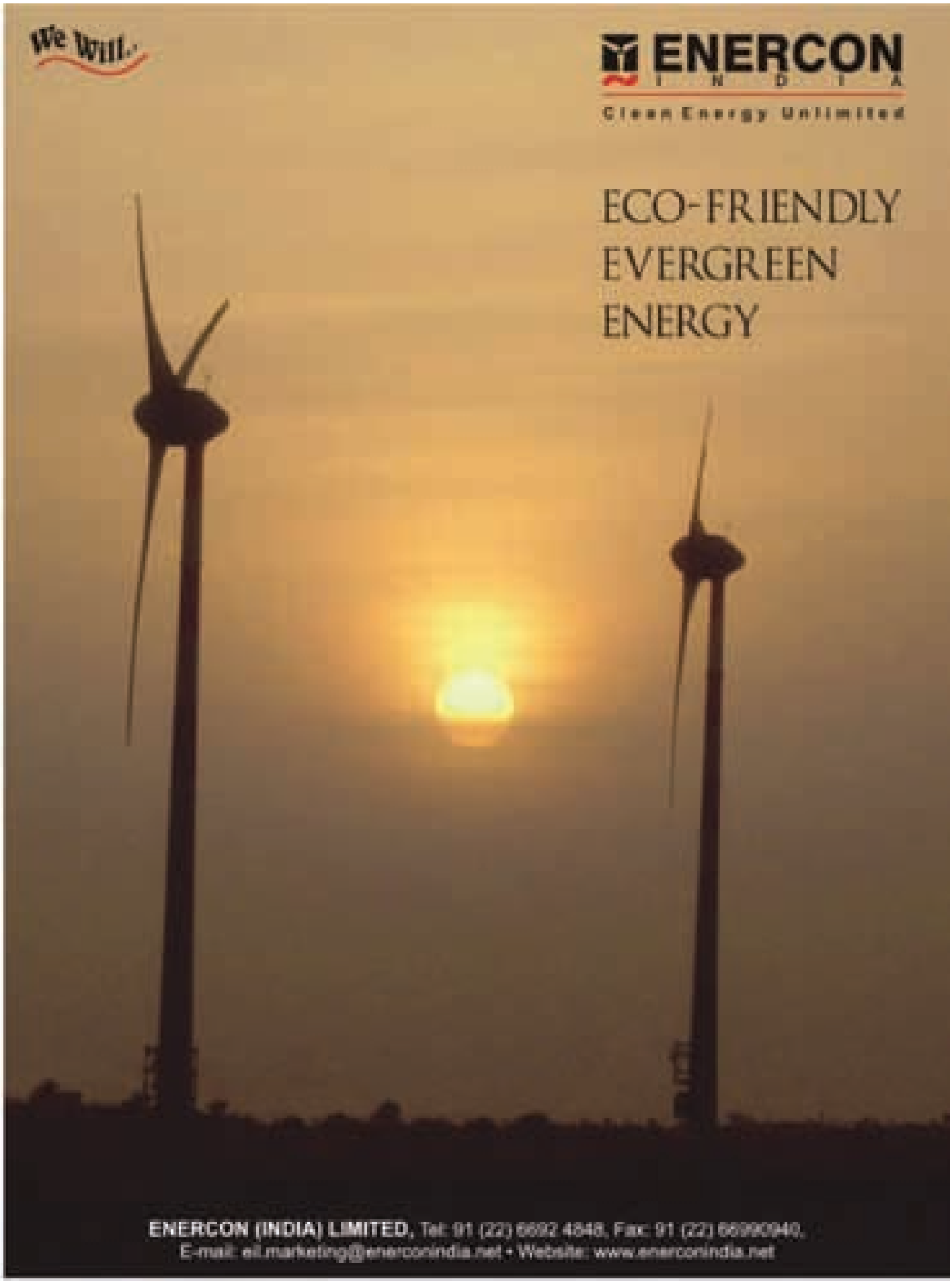
WINDPRO

Issue No. 163

May 2011





Enercon India Limited has a pending dispute with Enercon GmbH on the use of ENERCON

From the Editor's Desk...

The 12th Five Year Plan (2012-17) envisages new installations to the tune of 1.0 Lakh MW of power and most of it to come from the nuclear power. While nuclear power can not be put aside totally, past experience with nuclear power should certainly be a guiding point. The Coalition for Nuclear Disarmament and Peace (CNDP) has sought moratorium on setting up nuclear plants in India. Proposed Jaitapur Nuclear Power Plant in Maharashtra is facing regular agitations.

The recent crisis in Japan is still alive in our memories, in which unspecified quantities of radio activity were released. This highlights the inherent hazards of atomic power generation world over. It also confirms the scientific assessment that that all nuclear reactor types can undergo catastrophic accidents. Despite the precautions and safety systems installed accidents took place in the year 1979 at Three Mile Island reactor in US and in the year 1976 at Chernobyl reactor in Ukraine. An estimated 65000 to 110000 people perished in Ukraine. We are all well aware about our preparedness to face the catastrophic incidents.

The nuclear establishment should seek to answer every question regarding the safety of the country's nuclear plants, and no question in this regard should be taken lightly, according to Mr. Baldev Raj, Director, Indira Gandhi Centre for Atomic Energy (IGCAR), Kalpakkam. Fukushima radiation crisis in Japan has caused global apprehensions about the safety of nuclear plants across the world. And we all are aware that the radio activity does not recognize the human made boundaries of the countries.

The IPCC (Intergovernmental Panel on Climate Change) is a body consisting of the leading climate scientists of the world convened by the United Nations. The observation of the IPCC is that if the full range of renewable technology is deployed, the world can keep greenhouse gas concentrations to less than 450 ppm. 450 pp is the limit, which the scientists have predicted as the limit of safety, beyond which the climate change becomes catastrophic and irreversible. The report also says that the renewable resources are available, it is the public policies which are required to promote the renewable energy.

According to Mr. Rajendra Pachauri, Chairman, IPCC, the investing in the renewables to the extent needed would cost only about 1% of the world GDP annually. Presently wind energy is contributing only little above 2% globally and 8.5% in India. It is the time for action. Governments should come with all out help to promote the wind energy before it is too late.

The ground reality of shortage of electricity is bringing the people ton the road to demand their rights for running the industry. Besides other articles, a report on the rallies demanding power in various parts of Tamilnadu is covered in this issue. Electricity is the basic need for industry and general living. Though the scope is available, till what time such requirement will be ignored?

INDIAN WIND POWER ASSOCIATION
Door No. E, 6th Floor, Tower-1, Shakthi Towers
No. 766, Anna Salai, Chennai 600 002
Phone : 044 4550 4036 | Fax : 044 4550 4281
E-mail : iwpacno@windpro.org
Website : http:\\windpro.org

Minutes Of The Andhra Pradesh State Council Annual General Meeting Held On 9.04.2011

Members Attended :

20 members attended the meeting.

IWPA APSC AGM in Progress

Welcoming the Members :

Sri S.V. Arumugam, Vice Chairman, IWPA welcomed the members and gave a glimpse of the wind power situation in India and Andhra Pradesh. Speaking about Andhra Pradesh, he told that there is a potential of 8275 MW with a technical potential of 2100 MW while the installations are just 170 MW only. He requested all the members to speak out about the problems in setting up the wind mills to enable the Association to take up the matter with the concerned authorities. He cited the example of Tamilnadu, which has installed more wind mills than the scope exists.

Presentation of the Secretary's Report:

Mr. S. Sri Murali, Secretary presented the Annual Report for the year 2010-11 as follows :

The Association has filed a petition before the APERC for the revision in tariff in line with CERC guidelines making Energy Department, AP Transco and APCPDCL as respondents.

Another petition has been filed before APERC to designate the State Agency for accreditation, recommending renewable energy projects for registration and to undertake other functions and issue directions/set a framework, and take such other steps towards implementation of trading in power generated by Renewable Sources (Wind) as envisaged under Section 86(1) (e) of Electricity Act, 2003 as well as under Central Electricity Regulatory Commission (Terms and Conditions for recognition and issuance of Renewable Energy Certificate for Renewable Energy Generation) Regulations, dated 14-01-2010

APCPDCL has formed a Task Force Committee to resolve evacuation related issues for the Wind Farms in the state. This committee has been formed on October 8, 2010 with four members including Director (Operation/Rural) APCPDCL, Director (Grid) AP TRANSCO, Dy. General Manager (T) NEDCAP and IWPA National Council Member Mr UB Reddy.

Another Task Force Committee has been formed a week ago by AP TRANSCO to resolve evacuation problems in Wind Energy sector. This committee will be headed by Mr Ranganadham, Joint Managing Director, AP TRANSCO along with the Director Operations of APCPDCL, Director (Grid Operations) of AP TRANSCO, Director (T) of AP Transco and the Dy. General Manager (T) from NEDCAP.

Mr. T.G. Bharat, Newly Elected President of Andhra Pradesh State Council

We have represented to the Managing Director NEDCAP on 26th October, 2010 over the commissioning of Wind Farms in September and March months and requested him to provide all necessary clearances on priority, so that the depreciation customers will get benefited.

We have represented to Principal Secretary (Energy) on 21st January, 2011 over the allotment of Government land "free of cost" for the Wind Mast installations in the state. We have also requested the Government to formulate a specific policy on this, so that District collectors can allot land for Wind Monitoring Study.

A.P. State chapter would continuously pursue all the matters with the various ministries to ensure that more and more investment comes to the state and the entire potential is realized in the years to come.

Election of the Office Bearers and Council Members :

The nominations for the election of the Office Bearers and Council Members for Andhra Pradesh State Council were called earlier. Secretary General informed that the council received nominations for various positions. All nominations were found valid and there was no contest for various posts. He declared the results as follows:

	Position	Name	Designation	Company
1	President	Mr. T.G. Bharat	Chairman and Managing Director	Sree Rayalaseema Hi strength Hypo Ltd., Kurnool
2	Vice President	Mr. Sanjay S. Chaturvedi	Chief Executive Officer	NSL (Nuziveedu Seeds Ltd.) Renewable Power Pvt. Ltd. Hyderabad
3	Secretary	Mr. S. Sri Murali	General Manager	Enercon India Ltd. Hyderabad
4	Treasurer	Mr. S. Parthasarthi	Manager	Hyderabad Chemicals Ltd. Hyderabad
5	Council Member	Mr. Srinivas	Asstt. General Manager	Suzlon Energy Ltd. Secunderabad
6	Council Member	Mr. S.R. Deshmukh	Area Sales Manager	Vestas India, Hyderabad
7	Council Member	Mr. R. Muthukumaravel	DGM-Sales	M/S Gamesa Wind Turbines Ltd. Hyderabad
8	Council Member	Mr. Veerabhadra Rao	Senior Manager	Enercon India Ltd. Hyderabad
9	Council Member	Mr. Ramu Kuppa	Asstt. Manager	M/S Vestas India Ltd. Hyderabad 9000598886
10	Council Member	Mr. Komaraiha	Managing Director	Shalivahana Green Power Energy Ltd., Hyderabad
11	Council Member	Mr. G.V. Sai Prasad	Marketing Manager	M/S Suzlon Infrastructure Services Ltd. Hyderabad
12	Council Member	Mr. K. S. Ramesh	Chartered Accountant	M/S K.S. Ramesh Company, Hyderabad

Address by the President, APSC, IWPA :

Mr. T.G. Bharat, President, APSC thanked all the members for electing him as President of Andhra Pradesh Council, IWPA. He told that the development of wind energy in Andhra Pradesh is very poor and he will take all out steps to ensure that wind energy installations improve. He also gave the example of solar energy tenders where there was a big rush for putting tenders due to favourable tariff. There were about 5000 tenders received out of which only 10 to 12 were accepted. He told that he will see that the policies in wind power are also favourable for its development.

Vote of Thanks :

Mr. S. Sri Murali, Secretary, APSC proposed the vote of thanks and assured the members that the Association under the young leadership of the President will take up the matters with respective Departments for the development of wind power in Andhra Pradesh.

Minutes Of Investors Meet Convened At Hyderabad On 9.04.2011

An Investors' Meet was convened on 9th April 2011 at Hyderabad to discuss the ways and means to develop wind energy in Andhra Pradesh. The meeting was attended by about 50 of the present and prospective investors in wind energy.

Investors' Meet in Progress

Mr. S.V. Arumugam, Vice Chairman, IWPA Welcomed the Gathering

Sri S.V. Arumugam, Vice Chairman, IWPA welcomed Shri Chandan Mitra, IFS, VC & MD, NEDCAP, Shri Munindra, IFS, Special. Secretary to Govt., Energy Department, Andhra Pradesh, Shri TG Bharath, President of IWPA-APSC, newly elected Office bearers and Council members of the IWPA Andhra Pradesh Council and all the invitees. Sri Arumugam told various benefits of wind energy and that the gestation period for installation of wind energy is very low, it is self sustaining, wind farm brings growth in rural areas, value of the waste land goes up bringing more prosperity to rural areas. He told that for the lower PLF the rate should be Rs. 5.07 and only with proper tariff, soft policies, more RPPO, faster evacuation, the wind investors will come forward. He added that in Andhra Pradesh, a potential of 8275 MW is available while the installations are just 170 MW. The capacity added last year in Tamilnadu alone is 997 MW, which has already crossed the capacity. This meet will discuss the ways and means for faster growth of the wind industry in Andhra Pradesh.

Thereafter Shri S Sri Murali, Secretary IWPA – APSC Introduced the newly elected Office bearers to the investors. He told that the wind power capacity added to the grid is only 170 MW due to low PLF and low tariff of Rs. 3.50 and IWPA AP Council has submitted a petition to APERC for tariff declaration in tune with CERC guidelines.

Key Note address by Shri Chandan Mitra, IFS, VC & MD, NEDCAP :

Sri Chandan Mitra delivered the Key Note Address. He told that the solar energy cost is prohibitive and there is no cost involved to the Government in case of wind energy. Government has to buy the power at very high cost in open market and we have to find the ways how to promote the wind energy. We have to sort out various issues like tariff, wind site specific, social specific, geographical specific etc. There are other issues like Grid Connectivity, Economic Action Plan, how much MW is to be added to the grid, 2 years to study data, what should be the policy of allotment etc. A system has to be put in place to avoid the discrimination. It should not create the ground water like situation, hence all the complex situations to be discussed. NEDCAP will provide 100 % cooperation and any body is welcome to sort out the problems.

Address by Shri Munindra, IFS, Spl. Secretary to Govt., Energy Department

Mr. Munindra informed the gathering that the potential has not been exploited. The air, land and other assets are available but they have not been exploited. For this IWPA should have regular interaction with NEDCAP. He informed

that the projects sanctioned have not been implemented and what is blocking wind power is a mystery. We have to look in to it. He agreed that the performance is not good and the Government is open for suggestions and regular meetings can be convened for which the initiative should come from the wind investors. IWPA Andhra Pradesh unit should take the lead for this and Government will be a party to that. He told that the wind energy sector is the only sector which has got viability. Be a partner to have more installations.

Address by Shri TG Bharath, President of IWPA-APSC

Mr. T.G. Bharat, President, APSC thanked all the members for electing him as President of Andhra Pradesh Council, IWPA. He told that the development of wind energy in Andhra Pradesh is very poor and he will take all out steps to ensure that wind energy installations improve. He told that he will have the meetings with NEDCAP and other Government organizations every month and see that the wind power progresses. He also told that he will take up the tariff issue and other policies for development of wind power in the State.

Thereafter question answer session was there. The questions on various matters were satisfactorily replied by the NEDCAP officials.

Dr. Rishi Muni Dwivedi, Secretary General, IWPA, informed the participants about the various activities of the Association and the issues being taken up with various Government Departments.

Vote of Thanks by Sri Srinivas, Council Member, APSC

The meeting concluded with vote of thanks by Mr. Srinivas, Council Member, APSC of IWPA.

WIND MONITOR TABLE FOR THE MONTH OF APRIL 2011

This Section has been started to give an idea to our members on the behavior of wind at different locations of Tamil Nadu to start with. For purposes of easy comparison, the daily generation have been converted to Kilo Watt hours per Mega Watt basis under ideal conditions of 100% Grid Availability and 100% Machine Availability

Date	ACC Limited (ACC)	Tamilnadu Newsprint and Papers Limited (TNPL - 1)	Tamilnadu Newsprint and Papers Limited (TNPL - 2)	VVD and Sons Limited (VVD - 1)	VVD and Sons Limited (VVD - 2)
	Aralvoimozhy Pass	**Shengottah Pass**	**Shengottah Pass**	**Aralvoimozhy Pass**	**Shengottah Pass**
	Location - Udayathur District - Tirunelveli Make - Suzlon Capacity - 1.500 MW Hub Height - 78.5 Meter Rotar Diameter - 82 Meter	Location - Devarkulam District - Tirunelveli Make - NEPC Micon Capacity - 0.250 MW Hub Height - 30 Meter Rotar Diameter - 26 Meter	Location - Devarkulam District - Tirunelveli Make - NEG Micon Capacity - 0.750 MW Hub Height - 55 Meter Rotar Diameter - 48.2 Meter	Location - Udayathur District - Tirunelveli Make - Suzlon Capacity - 1.500 MW Hub Height - 78.5 Meter Rotar Diameter - 82 Meter	Location - Sankarankoil District - Tirunelveli Make - Suzlon Capacity - 2.100 MW Hub Height - 79 Meter Rotar Diameter - 88 Meter
01.04.11	1376	4	729	1506	1697
02.04.11	4272	948	2159	5179	3470
03.04.11	8066	780	2481	7400	6571
04.04.11	3664	648	2268	3742	4366
05.04.11	2224	160	680	2215	2283
06.04.11	1438	221	913	1107	834
07.04.11	3600	184	968	3555	617
08.04.11	1200	124	543	1037	245
09.04.11	576	136	701	1008	425
10.04.11	640	20	627	119	281
11.04.11	720	0	253	695	184
12.04.11	880	292	721	700	551
13.04.11	1088	204	820	462	668
14.04.11	4192	416	1354	3881	1048
15.04.11	528	235	636	502	728

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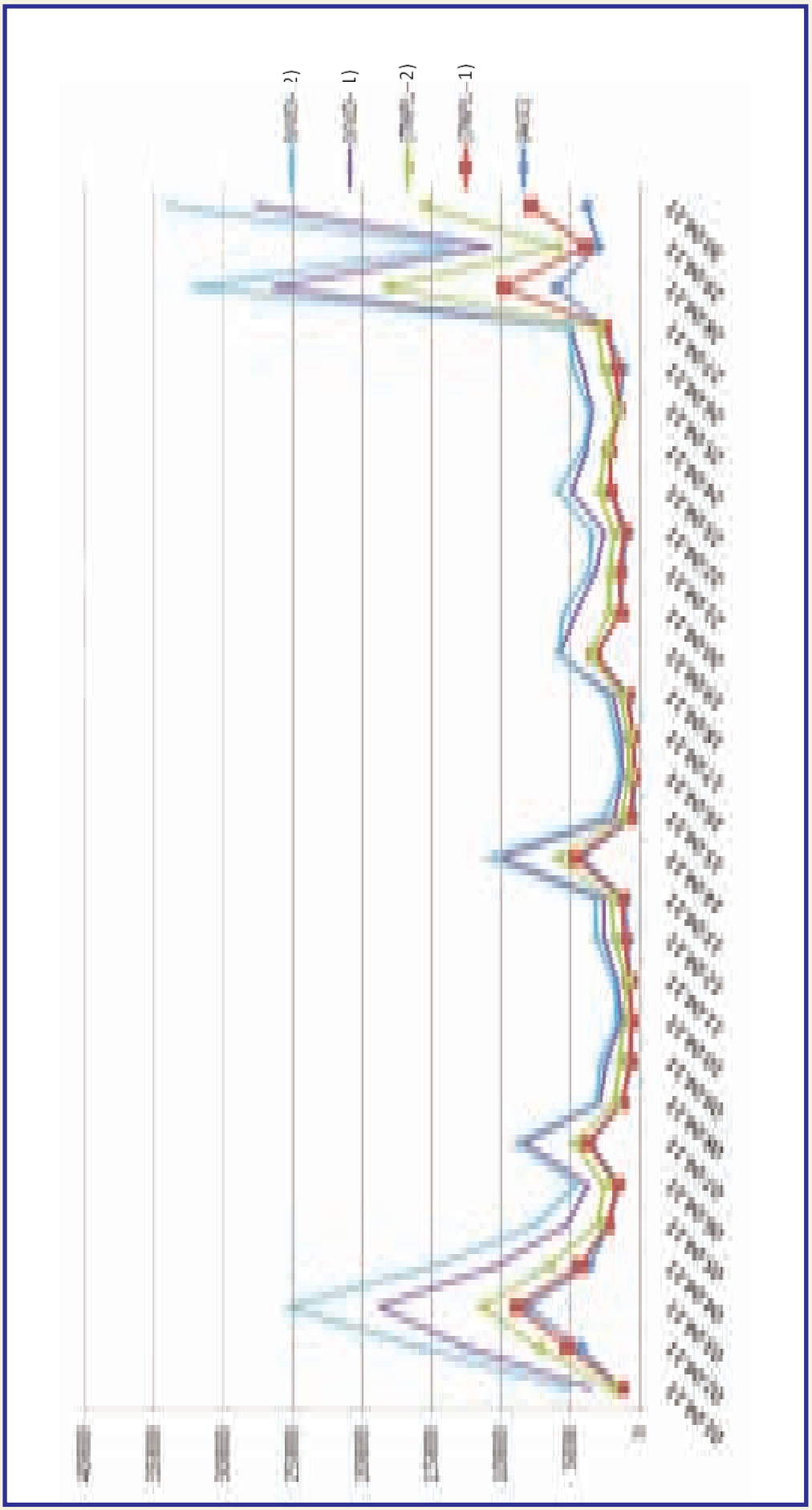
16.04.11	384	93	349	463	133
17.04.11	512	28	360	486	315
18.04.11	784	137	488	527	471
19.04.11	3152	156	331	2133	86
20.04.11	1376	0	869	2328	912
21.04.11	1280	248	688	1048	407
22.04.11	896	251	715	751	808
23.04.11	2101	64	816	1923	1070
24.04.11	2161	24	267	1362	256
25.04.11	1532	6	146	1792	124
26.04.11	1214	525	900	1472	687
27.04.11	2512	29	539	1901	124
28.04.11	6022	3728	8480	8140	5642
29.04.11	2990	913	2168	4746	2692
30.04.11	3805	4030	7702	12018	6325
Total	**65185**	**14604**	**40671**	**74198**	**44020**

WIND MONITOR - GRAPH FOR THE MONTH OF APRIL 2011



Pioneer Wincon, the market leader in 250 kw wind turbines, now introduce their most powerful and cost-effective 750 kw wind turbines with 49 metre rotor diameter at hub height of 61.1 metres. These robust, easy to maintain turbines extract maximum energy from the wind. A part of the Pioneer Asia Group, Pioneer Wincon provide comprehensive turnkey wind power solutions to their customers, ensuring high return on investment. The superior Danish technology backed by full fledged operations and maintenance service, provides complete peace of mind to the customers. Invest in Pioneer's unmatched expertise in wind energy and watch your profits soar. **Pioneer for Prosperity.**

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Abdul Razaq 1st Street, Saidapet, Chennai - 600 015
Phone : +91 44 2431 4790 / 91 / 92 / 93
e-mail : marketing@pioneerwincon.com
www.pioneerwincon.com

Wind Energy: Financing

February 15, 2011

IFC – Part of the World Bank Group

IFC is owned by its 179 member countries, which collectively determine policies

International Finance Corporation, 1956

International Bank for Reconstruction and Development, 1945

International Development Association, 1960

Multilateral Investment Guarantee Agency, 1988

Agenda

- IFC and Wind
- Project Finance in Wind
  - Approaches
  - Issues
- Evolving models/ mechanisms in financing wind

Defining Characteristics of IFC

- Participates only in private sector ventures
- Shares same risks as other investors
- Provides long term debt financing, as well as equity and quasi-equity
- Has market pricing policies
- Does not accept government guarantees
- Is profit oriented

- IFC presence reassures
  - Foreign investors
  - Local partners
  - Governments
- Measure of political risk cover
- Catalyst for other investors and lenders

IFC – over $95 billion invested

- Largest multilateral source of loan/equity financing for the emerging markets private sector
- Founded in 1956 with 179 member countries
- AAA-rated by S&P and Moody's
- Equity, quasi-equity, loans, risk management and local currency products
- Takes market risk with no sovereign guarantees
- Promoter of environmental, social, and corporate governance standards
- Resources and know-how of a global development bank + flexibility of a merchant bank
- Holds equity in >600 companies worldwide

IFC

IFC and Wind: Key Wind Emerging Markets

- Gigamarkets: China >2GW & India >1GW
- Large Markets: Poland 999MW, Turkey 607MW, Brazil 604MW, Egypt 430MW, Mexico 415MW, Morocco 253MW, Hungary 201MW, Czech R. 192MW, Bulgaria 177MW, Chile 164MW, Estonia 142MW, Costa Rica 125MW, Ukraine 94MW, Lithuania 62MW, Tunisia 54MW, Nicaragua 46 MW, Philippines 33MW, Argentina 30MW, Latvia 29MW, Jamaica/Croatia/Colombia 25MW (each)
- Growth Leaders: China, India, Turkey, Poland, Brazil
- Poised for Growth: Mexico, Bulgaria, Romania, Morocco, Chile
- Planned Projects: e.g. Argentina, Azerbaijan, Colombia, Croatia, Dominican Republic, Honduras, Jordan, Kazakhstan, Malaysia, Namibia, Kenya, Nicaragua, Pakistan, Panama, Peru, Philippines, Russia, Seychelles, South Africa, Sri Lanka, Tanzania, Tunisia, Thailand, Ukraine, Uruguay, Vietnam, Yemen
- Uneven Market Growth except in China & India

IFC

Project Type	IFC Investment
Greenfield, total cost less than $50 million	Up to 35% of project cost for IFC's account
Greenfield, total cost more than $50 million	Up to 25% of project cost for IFC's account
Expansion or rehabilitation	Up to 50% of project cost

- Umbrella for participants in IFC's syndication program: IFC lender of record, immunity from taxation and provisioning requirements.

- IFC's total financing (for its own account) must be less than 25% of total company capitalization, and IFC does not manage or have largest stake.

IFC

IFC has a strong pipeline of wind projects

- IFC recently financed wind projects in Bulgaria, Chile, Turkey and Mexico
- IFC is currently evaluating support for new wind transactions in China, India, Romania, Thailand, the Philippines and Pakistan
- IFC has developed expertise in structuring wind projects
- Understanding of various regulatory support mechanisms (feed-in tariffs, renewable energy credits, accelerated depreciation, etc)
- Relationships with all top consultants for detailed energy yield analyses
- Good overview of turbine supply and balance of plant structures and terms
- Flexible subordinated tranches to address generation volatility and increase leverage

IFC

Project Finance: Wind Energy Yield Estimates

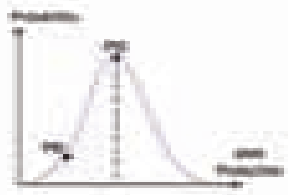
- Wind energy yield (i.e. production) estimates (i.e. forecasts) generally extrapolate wind characteristics from a limited amount of data.
  - Data is generally limited due to the highly site-specific nature of wind.
  - As little as ~12 months of on-site data is acceptable since it captures a full year of seasonality, though 2+ years is better.

Wind energy yield estimates incorporate uncertainty and are expressed in probabilistic terms. E.g.:

P50 refers to the average or mean expectation.

P90 values have a 90% chance of being exceeded.

P99 values have a 99% chance of being exceeded.



O&M: Typical Arrangements, Issues

- O&M responsibilities usually shared between Company and turbine supplier
  - In India, at least for the initial period (3M+ years with supplier)
- IPC likes to see the turbines supplier involved in the project for 2-5 years:
  - To keep the supplier on the hook during the first years
  - To allow time for skills transfer
- Regarding O&M Agreements:
  - Availability guarantees and adequate LDs align incentives; should be in place for duration of contract
- O&M costs tend to be lumpy, and may increase over the life of the turbine
  - Structuring approaches:
    - DRA/Balancing to account for lumpiness and reserve (here is credit-dominant)
    - Require spare parts inventory onsite
- Turbine longevity

Energy Yield Estimates – Debt Structuring Approaches

- Given the various uncertainties in the energy yield estimation, IFC employs the following when sizing Senior Debt:
  - **Base Case**: P90 10 year is used.
    - This is different from hydro projects
    - Wind is otherwise similar to other power projects
  - **Breakeven**: Ensure that the Project breaks even in even the worst case scenarios

- Flexible repayment can be used to "absorb" some of the variability, and help meet Sponsor's target capital structure; structure will be project-specific:
  - senior debt with back-ended repayment
  - sub-debt with flexible repayment
  - combining with concessional funding

O&M: Mechanical failure

- Serial Defect – more than 10-20% of any component of the WTG failing within a given period, due to design defect or a "bad batch". Generally occurs within first 2 years of the project.
- This is generally not an insurable risk.

- Structuring Approaches:
  - Depend on level of concern over the technology and the manufacturer
  - Turbines Supplier can cover this risk under the warranty period.
  - Sponsor can cover this risk.
  - MRA sized to cover risk

Interconnection / Transmission

- All power projects must ensure interconnection and transmission.
- Wind projects can face special issues:
  - First of many in a windy area: concentration of development may lead to curtailment
  - High resource margins required due to low capacity factor
  - Interconnection and transmission of RE project often governed by new RE regulation
- Difficult to structure around this risk; due diligence will indicate level of comfort
  - Interconnection rules, sufficiency of grid capacity, dispatch rules, e.g. which plants have priority of dispatch etc. are checked during due diligence

PPA vs. Merchant

- PPA: Typically PPAs cover fixed in tariffs with no capacity payment. As such yield estimation is very important. Also, typically wind energy is "must-run" – however grid issues need to be covered. Approaches:
  - Manage debt service obligations in PPA scenario
  - Understand place of wind in merit order
  - Debt capacity/ Regulatory support
- Merchant Plants: Beginning to offer interesting possibilities:
  (1) price risk (can be addressed through market study and adequate DSCR)
  (2) cost of production vs. alternative cost of power will be key determinant
  (3) full merchant – i.e. selling through exchange – will take some time
  (4) cost-competitive projects being developed through shorter span PPAs directly with bulk consumers using open access. Issues of regulation, wheeling/ banking charges, overall demand growth projection etc. Future switching to PPA an option?

Regulatory Support Risk – Issues

- Wind projects often, but not always, rely on regulatory support for financial viability.
- Countries employ various revenue-based regulatory tools for promoting RE development:
  - Feed-in tariffs: E.g. in Brazil, Bulgaria, China, India, South Africa, Thailand, Viet Nam
  - Tariff floor: E.g. in Turkey
  - Kyoto-based certified emission reductions ("CERs")
  - Other market-based green certificates: E.g. Chile, Romania
  - Tenders: Brazil, Peru, Turkey
- Fiscal incentives can include VAT reimbursement/exemption; tax exemptions
- Other preferential treatment, including preferential interconnection, preferential off-take, lower transmission fees, etc.
- These regulations are generally new and sometimes untested

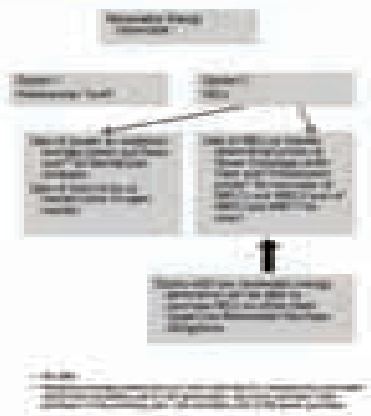
IFC Post-2012 Carbon Facility

- €150M Facility to forward purchase carbon credits up to 2020
  - Purchase Certified Emission Reductions (CERs) from projects being financed directly or indirectly by IFC
  - Capitalizes on IFC's due diligence as financier to projects
- Uncertainty beyond 2012 has led to a decline in climate friendly investments that could benefit from the carbon markets
  - Longer term high quality carbon revenue stream increases financing options
- IFC will contribute a certain portion of the Facility's capital
  - Balance mobilized primarily from 6-7 European power utilities & energy companies
- Expected to be launched in Q1 2011
  - Facility to be managed by IFC

Pricing structure and payment terms

- IFC will offer combinations of a floor price and a % of relevant market price index, subject to a cap
  - Price indexed to market price with floor and cap enables projects to use CER revenues to service debt
- Payment in Euros on delivery of CERs
- Prices paid adjusted for CER conversion values into EU compliance units at the time of delivery – "multipliers"

Incentives for Renewable Energy



IFC Post-2012 Carbon Facility – key terms

- Project could get an AAA-rated carbon revenue stream up to 2020
  - IFC will front for participating European utilities and energy companies
- Price indexed to CER spot price at delivery with floor and cap
  - Project transfers Post-2012 CER price risk to the Facility
- Payment on delivery in Euros from IFC on delivery of CERs
  - IFC does not price in project performance risk
- Project would not owe IFC any liquidated damages for project under-performance
  - No contingent liability on project

Certain disclaimers based on time of registration of the project - being worked out

Welcome to New Members

S.No.	Name of the Wind Mill Developer / Company	Name of the Person and Designation	Installed Capacity in MW	State at Which Wind Farm
	Generating Members :			
1	M/s. RRD Tex (Unit of Best Corpn. Ltd)	Mr. R. Rajkumar, M.D.,	8.750	Tamil Nadu
2	M/s. Mandovi Distilleries & Breweries Ltd	Mr. Shivkumar Reddy, M.D.,	0.500	Tamil Nadu
3	M/s. Balaji Enterprises (Pondy) P. Ltd	Mr. Kasinathan, M.D.,	0.500	Tamil Nadu
4	M/s. Sree Anadhakumar Mills Ltd	Mr. R. Rathindran, M.D.,	1.500	Tamil Nadu
5	M/s. Samudra Finvest Private Ltd	Mr. Shridhar Pittie, Director	0.750	Tamil Nadu
6	M/s. Surya Marketing	Mr. S.K. Kalani, M.D.,	0.600	Rajasthan
7	M/s. Raj Trans Stampings Private Ltd	Mr. Rishab Golecha	0.600	Rajasthan
	Total		**13.200**	

IWPA Members State Wise
(Generating Members)

S.No.	State	No. of Members	Installed Capacity in MW
1.	Andhra Pradesh	41	195.240
2.	Gujarat	42	101.970
3.	Karnataka	60	420.035
4.	Maharashtra	78	1079.505
5.	NRC	43	459.600
6.	Rajasthan	34	33.750
7.	Tamil Nadu	715	1905.440
	Total	**1013**	**4195.540**

IWPA Members State Wise
(Non - Generating Members)

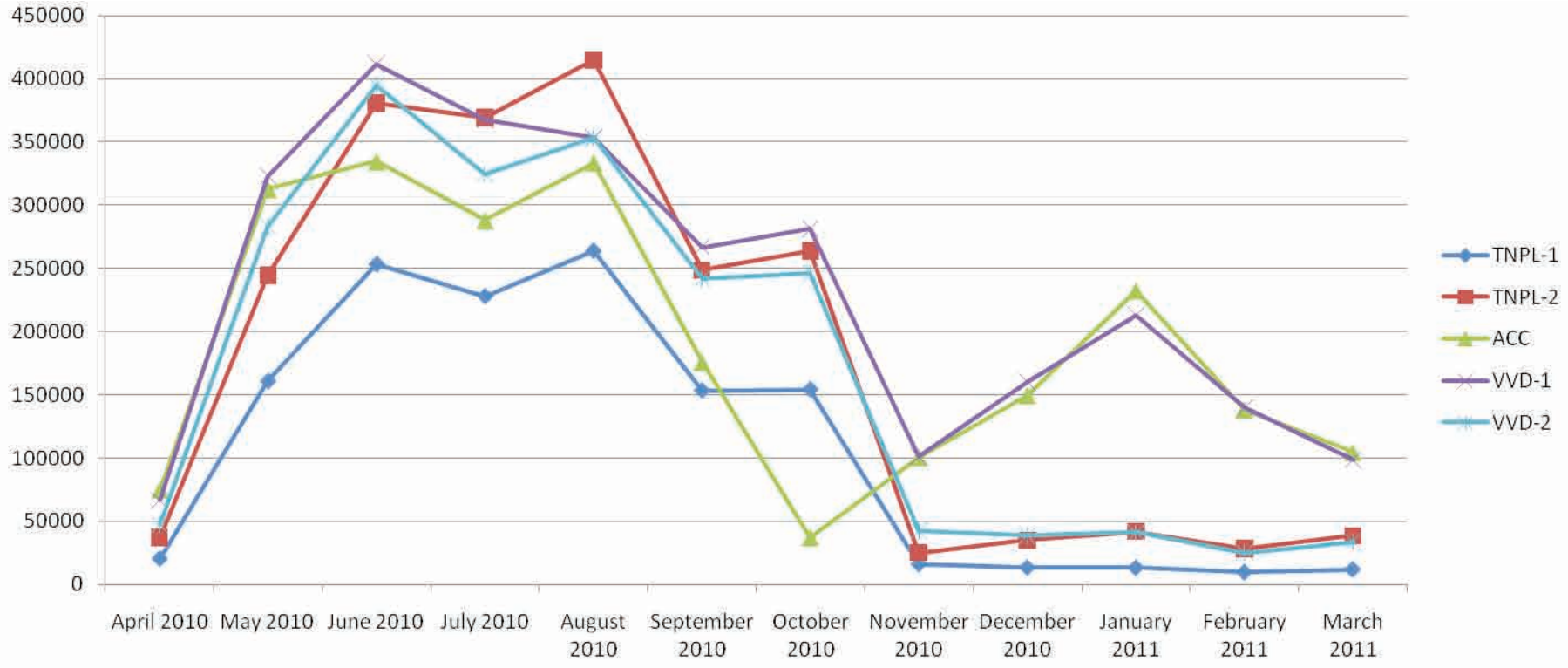
S.No.	State	No. of Members
1.	Andhra Pradesh	4
2.	Gujarat	4
3.	Karnataka	25
4.	Maharashtra	17
5.	NRC	11
6.	Rajasthan	1
7.	Tamil Nadu	48
	Total	**110**

Protest Rally At Coimbatore Condeming The Power Cut On 5th May 2011

WIND MONITOR TABLE (YEARLY) (FROM APRIL 2010 TO MARCH 2011)

Month	Tamilnadu Newsprint and Papers Limited (TNPL - 1)	Tamilnadu Newsprint and Papers Limited (TNPL - 2)	ACC Limited (ACC)	VVD and Sons Limited (VVD - 1)	VVD and Sons Limited (VVD - 2)
	Shengottah Pass	**Shengottah Pass**	**Aralvoimozhy Pass**	**Aralvoimozhy Pass**	**Shengottah Pass**
	Location - Devarkulam District - Tirunelveli Make - NEPC Micon Capacity - 0.250 MW Hub Height - 30 Meter Rotar Diameter - 26 Meter	Location - Devarkulam District - Tirunelveli Make - NEG Micon Capacity - 0.750 MW Hub Height - 55 Meter Rotar Diameter - 48.2 Meter	Location - Udayathur District - Tirunelveli Make - Suzlon Capacity - 1.500 MW Hub Height - 78.5 Meter Rotar Diameter - 82 Meter	Location - Parameshwarpuram District - Tirunelveli Make - Suzlon Capacity - 1.500 MW Hub Height - 78.5 Meter Rotar Diameter - 82 Meter	Location - Sankarankoil District - Tirunelveli Make - Suzlon Capacity - 2.100 MW Hub Height - 79 Meter Rotar Diameter - 88 Meter
April 2010	20263	36838	74750	66694	47570
May 2010	160597	244526	312690	323104	283368
June 2010	253059	380608	334637	411575	394498
July 2010	227768	369014	288103	367455	324731
Aug. 2010	263606	414530	333664	353204	353119
Sep. 2010	153220	248564	175719	266838	241758
Oct. 2010	154083	264068	37160	281586	246199
Nov. 2010	15957	25088	100725	101038	42405
Dec. 2010	13269	35024	149755	160084	38670
Jan. 2011	13095	41807	232571	212740	41206
Feb. 2011	9508	28424	138409	139998	25158
Mar. 2011	11800	38440	104493	98662	33899
Total	1296225	2126931	2282676	2782978	2072581

WIND MONITOR GRAPH (YEARLY) (FROM APRIL 2010 TO MARCH 2011)




isn't it time we
looked at the wind as
a serious alternative?
Today, wind energy is the fastest growing source of alternate energy. This makes it ideal in ensuring a sustainable future. At Suzlon, our expertise, experience and unfaltering commitment enables us to deliver profitable wind energy solutions, which add to global power portfolios. We have also helped propel socio-economic and infrastructural development. Partner with us, and let us show the world how efficiently the wind can power a cleaner, greener future.

Wind Energy Towards 20% By 2020

Continued from April 2011 Issue

9 Prospects of Repowering and Offshore Wind in India

9.1 Repowering Old wind farms

Repowering is replacement of small-capacity wind turbines of old wind farms with modern megawatt scale wind turbine, thereby enhancing the generation capacity of the wind farm. Countries like Germany, USA, and Denmark have already implemented repowering programmes to effectively utilisation of wind resources. Experiences from these countries have shown that onshore project capacities and energy generation can be increased 2 to 4 times by repowering old wind turbines. Today, a single wind turbine of 6 MW is available in Europe and the global trend is towards multi-megawatt wind turbines. Wind power development in India was started around two decades ago and has led to large windy resource rich areas occupied by the small rating (less than 500 kW) wind turbine operating at low capacity factor on potentially good wind resource site. Approximately 25% of turbines in India have rating below 500 kW. These turbines were installed during the early stages of wind power development in the country. Thus, there are many potential sites in states like Tamilnadu, Gujarat, and Maharashtra having turbines with low rating. Hence, there is need to repower such sites with turbines of higher rating in order to augment electricity generation by optimal utilisation of land.

Advantages of Repowering wind turbine sites :

- More wind power from the same area of land : Wind power generation is multiplied without the need for additional land.
- The number of turbines is greatly reduced while the natural landscape is enhanced.
- Modern turbines make better use of available wind energy. The cost of production is significantly lowered.
- Better power grid integration: Modern turbines offer much better grid integration since they use a connection method similar to conventional power plants and also achieve a higher utilization degree.
- Modern turbines rotate at a much lower speed and are thus more visually pleasing than older, faster-rotating turbines.
- Greater nature conservation: Isolated management errors from the past can be remedied.

A detailed study undertaken by the MNRE to assess the repowering possibilities in the state of Tamil Nadu has revealed that the capacity of some wind farms can be doubled and electricity generation can easily be increased to three times, since the higher capacity wind turbines with higher rotor diameter and hub height can harness wind energy more efficiently.

9.1.1 Issues of concern in Re-Powering

There is a good scope of learning from international experience in repowering as World Wind Energy

Association (WWEA) has founded a permanent working group to discuss all issues pertaining to repowering. There are many issues that need to be addressed for implementing this option of repowering. The issues of ownership of turbines and land may create problem while implementing the option. Repowering is associated with additional cost, hence the issues such as source of funding and economic incentive becomes critical issues in repowering.

There need to be clarity as regards applicable tariff, revenue recovery principle on this front in advance. Further, a new policy package which would cover additional project cost should be evolved to overcome initial economic barrier for exploring the repowering option. Technical issues like suitability of new machines according to site conditions and wind resource study should be done in advance. In addition to this one of the most important elements is the extent of financial benefits associated with the option of repowering to be shared amongst the Developer and Utility. These factors would decide the scope and prospects of repowering of wind turbines in India.

9.2 Tapping offshore potential of Wind

In order to accomplish a target of providing 20% of India's Power from Wind energy by 2020, it is imperative that the offshore wind power potential is tapped, especially as India has a over 7,000 km long coastline. Although more expensive than onshore installations, offshore turbines can derive economic mileage from higher and more stable wind power. Some countries like Denmark, Norway, Germany, UK and China have established large offshore wind power projects and are making a significant contribution to the total wind capacity addition. The growth rate of offshore wind installations is over 30%. Total installed capacity for off shore wind farm amounted to almost 2 GW worldwide in year 2009. In India, C-WET has taken some steps to measure the offshore wind potential. However, these efforts are very limited due to resource constraints. So far, only two or three sites have been identified in Tamil Nadu and Gujarat. Due to constraints on land availability for onshore projects, the development of offshore wind projects would be an option for sustainable growth of wind industry.

9.2.1 Issues of Concern for exploiting Off-Shore Wind

Although, it is perceived that there is huge untapped potential for off-shore wind energy in India, what is needed is a clear policy framework to support wind energy generation of such kind. Further, there is a need for an integral approach from all stakeholders to

exploit off shore potential in India, which would be an imperative requirement to realise the envisaged level of wind power penetration in the Indian grid.

9.3 Issues for Discussion :

– What is the potential of wind energy capacity addition through Repowering in India?

– What are the associated issues and challenges? – Do the current policy/regulatory framework support Repowering? – Identifying type of Regulatory support to be provided for Repowering? – What role can State Nodal Agencies play in supporting Repowering? – What is the realistic estimate of potential of offshore wind energy capacity addition in India? – What are the key guiding factors and policy/regulatory support required for encouraging off-shore wind power projects?

10 Wind Power Plants : Asset Management

10.1 Need for Asset Management

Asset management in context of wind power plant signifies management of assets such as wind energy converters (WECs), associated external electric infrastructure (EEI) including HT Switchgear, Protective gear & Overhead transmission network. Asset Management of Indian Wind Power Plants (WPPs) is notably discrete, unregulated and in its primitive stage. The Indian Policy and Regulatory framework has concentrated on supporting capital investment and developing new capacity addition plans at national level. However, in order to achieve the expected returns out of the wind investment venture, it is of utmost importance that the Asset management practices need to be streamlined and a systematic Asset management/O&M practice need to be evolved. Sufficient importance if not given to the asset management, may result in increase of only number of installations and cumulative capacity addition for sake of records, however, the same would not result into desired electricity production from such wind power assets. Such wind power assets will not operate effectively and will not contribute in achieving the desired level of wind penetration as envisaged within the stipulated time frame to accomplish NAPCC targets. Moreover, if not properly managed, there is every chance that the already installed capacity may highly under-perform and may result in degradation/non-performance of the asset. In such a scenario, compliance of RPO targets by obligated entities would become a difficult task. Thus, asset management holds significance and has to be rendered adequate importance.

Proper asset management results in increase in wind farm availability, efficiency, and reduction in O&M cost. Wind Farm certification is an important step in ensuring efficient operation of the wind turbine. Wind farm certification is a process where a Certification is obtained by the wind turbine manufacturer to demonstrate that a wind turbine generator system or installation (facility) meets specified standards for key elements such as identification and labelling, design, power performance, noise emissions, and structural integrity. Presently, C-WET, Chennai, provisionally certifies the wind turbine installations in India through Type Approval Provisional Scheme (TAPS- 2000). However, in view of the envisaged larger wind power capacity addition in the future, the certification unit of C-WET need to be enhanced with sufficient technical, and necessary financial support to meet the future requirements.

10.2 Role of Wind Farm Operator as Asset Manager

Wind farm operators must squeeze out every watt they can when the wind is blowing. To do so, wind projects must be reliable and maintained with minimum cost. With variable winds, high costs, and slim margins, everything has to work right to make sure that wind is attractive alternative power and a sound economic investment. So if a turbine is to work 20 years or more before retiring, it better be properly designed and maintained.

Asset Management is beyond practicing Standard procedures

Most wind turbines are maintained by a combination of traditional schedule-based preventive maintenance and threshold-based alarm systems. A problem with scheduled maintenance is that the standard six-month interval between inspections may be too long to detect an emerging problem. And fixed-threshold alerts, typically set by OEMs, activate too late to support proactive maintenance. That is because the alerts are intended to protect equipment from catastrophic damage and cannot take into account a wide range of normal wind-turbine operating conditions and unit-to-unit manufacturing variances. As a result, typical fixed-threshold-alert systems do not detect problems until a%er a failure occurs.

Likewise, traditional condition-monitoring and predictive maintenance tools, such as vibration analysis, oil analysis, and thermograph, are limited because of the difficulty in accessing the typical wind-turbine nacelle, the variable nature of the machine, and the time limitations and analytic capabilities of the technicians using them. Ideally, equipment maintenance should only be performed when something needs fixing. Most preventive maintenance works on the idea of regularly inspecting or servicing equipment to address potential failures before they progress. However, given the huge variations in operating profile and environment, it's easy to see that the regular, fixed inspection interval of traditional preventive maintenance may not catch critical emerging problems in the wind environment.

The conventional power industry, however, leads the industrial world in predicting impending equipment problems before they occur. And it is doing so using a technology directly applicable to the wind industry. In fact, several wind companies, Invenergy in Chicago for one, already use this technology to get early warnings, avoid surprises, and improve control of their operations. They reduce risk exposed by existing condition monitoring tools

and leverage SCADA data to remotely detect emerging problems by using predictive analytics. Briefly, predictive analytics precisely identifies impending problems by detecting subtle changes in equipment operation. It finds problems earlier than OEMs' alerting systems or other condition monitoring approaches, and well within traditional alarm limits. A predictive analytics primer It is a real-time solution that works by analyzing SCADA data once every 5 to 10 minutes. Predictive analytics compares real-time data to so%ware models of equipment when operating in good condition, and compensates for normal variations due to load and ambient conditions. Further, the method uses so%ware models customized for individual pieces of equipment to provide the earliest possible warning of emerging problems. It readily integrates with an existing data infrastructure and it is quick and easy to deploy, maintain, and use. The method needs no new sensors and analysts need not review masses of SCADA data. Instead, the so%ware analyzes data and alerts analysts only when it detects an exception, providing ample time to plan and respond. And, by using algorithms to identify pattern changes, the analysis is highly accurate. For wind applications, the so%ware uses models customized for each individual turbine, which compensates for fluctuations in wind speed, direction, and ambient conditions. In real time, the so%ware compares data collected in the nacelle to the model–literally tens of thousands of data points every 5 to 10 minutes across a fleet–and notifies maintenance and engineering of impending problems. Asset Managers then focus on fixing problems early, before catastrophic damage occurs. Given the high capital intensity of the wind-power business, reliable, long-term operation of the equipment is critical for generating positive returns and continued industry growth. It would not take many major equipment failures before the long term profitability of a farm is lost. As assets age, performing major work only when needed will be critical to maintaining economic viability. Remote monitoring and condition-based maintenance approaches will be required to maintain financial returns because wind turbines are hard to access and do not receive the same "walk-around" monitoring typical of industrial plants. Although wind has unique characteristics, wind turbines are just another kind of machine and successful operators can take advantage of best practices from other industries to outstrip their competition.

10.3 Key elements of Asset Management Plan

As prevailing in the international arena, proper Asset management plans should be chalked out and adhered to by the wind farm developers/operators to ensure efficiency and cost savings in terms of O&M cost. A typical comprehensive Asset Management Plan would ensure :

- Round the clock availability of field staff to watch wind farm operations. Training on safety and technique for operating personnel on an ongoing basis through specific focused modules could be a pre-requisite for a sound Asset Management.
- Proper material stocking and procurement arrangement to be in place in order to meet the site specific material needs.
- Dedicated standard & specialised machinery, safety tool kits, conveyance and communication mechanism to ease out the operations
- Availability of methods for asset care like periodic maintenance, fault analysis, corrective & preventive actions, reliability enhancement measures, design changes, so%ware & hardware changes, etc.
- IT enabled systems for capture, integration, analysis and use of data to enhance the effectiveness of O&M management function so as to gain distinct improvement in operational efficiency of the wind power plant.
- In analysing the performance of the asset, few KPIs like machine availability, Grid availability, and Capacity Utilisation Factor would be instrumental.

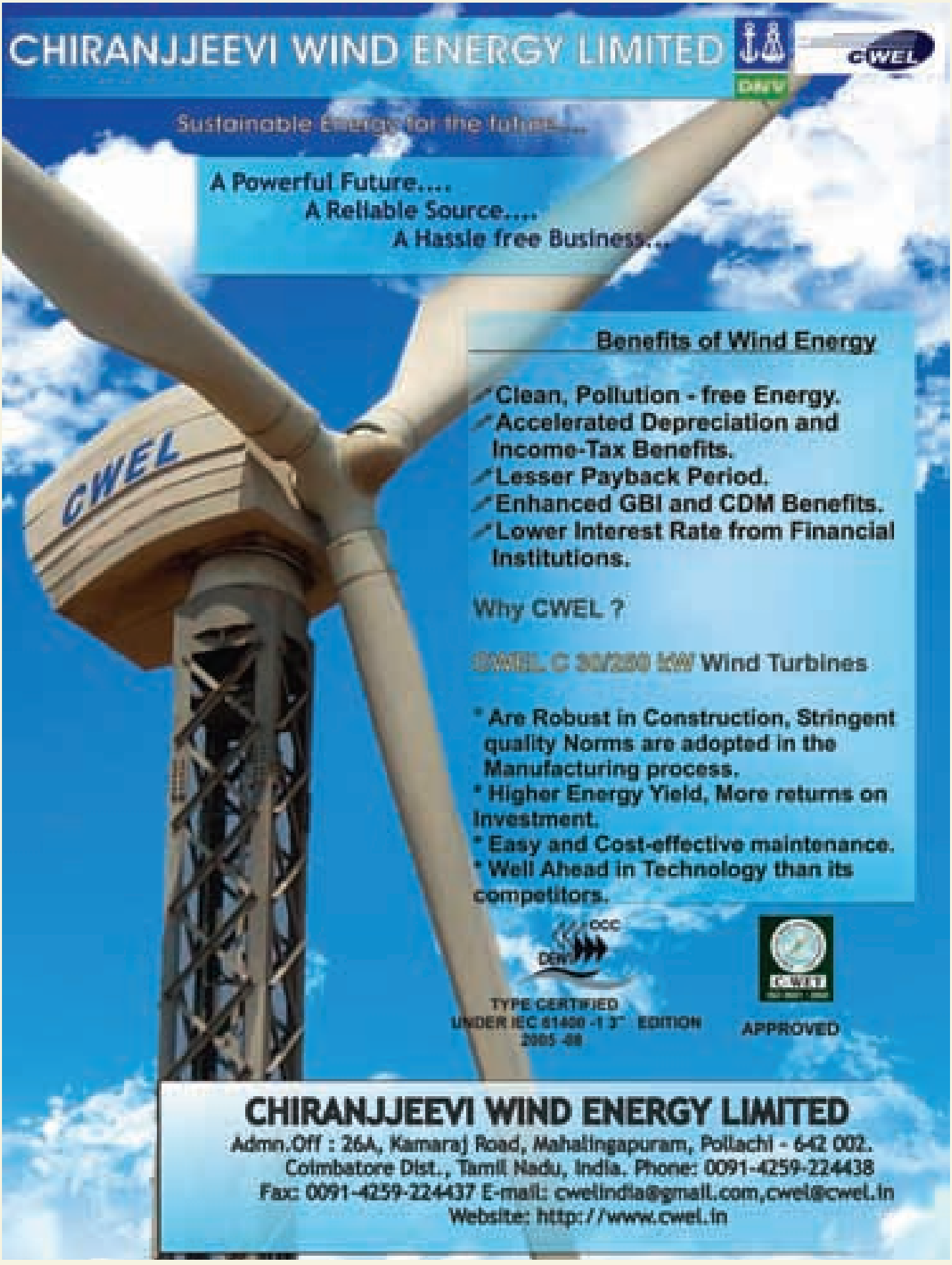
The Asset management plan will have to be backed by sufficient asset management tools which may range from Online real time SCADA system, SMS gateways, Distance Relaying System, Condition Monitoring System, Wind Power Production forecasting, Online Power Curve verifier,Wind trend analysis and probability forecasting, Asset benchmarking through KPI, Line Loss & Power Quality Regulator, Active & Reactive power regulation through SCADA and others for Asset Managers to take good quick and proactive decision.

10.4 Issues for Discussion :

In the wake of larger capacity addition plans and the consequently increasing significance for the Asset Management practice in the Indian context, some of the key questions to be discussed include the following.

- What are the steps involved in certification - process, timelines, role of entities & costs?
- What are the certification standards for Wind Farm Operators?
- How Certification & Performance are is interlinked? - Case Study or learning experience?
- What are the impact of such practices in reducing O&M cost, optimising O&M scheduling and improving wind farm availability
- What are predictive & preventive O&M practices in Wind Farm asset management?
- How does one increase Operational efficiency of wind power plants using these O&M practices? - Case Study & Learning Experience.
- What is the significance of Fault analysis and condition monitoring?
- What are the techniques of wind turbine/wind farm condition monitoring in terms of grid quality and availability issues

Article over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Fax: 0091-4259-224437 E-mail: cwelindia@gmail.com,cwel@cwel.in
Website: http://www.cwel.in

Letter to Honourable Prime Minister for Evacuation Issues in Tamilnadu

To :

Dr. Manmohan Singh
Honorable Prime Minister, Government of India, New Delhi

Dear Sir,

Sub : In Power Starved Tamil Nadu 1000 to 3000 MW Wind Mills installed cannot function for want or Evacuation - SOS Request for release of Rs. 1757 Crores from Clean Energy Fund

Ref : Letter No. CE/NCES/SE/EE/WPP/AEE2/F.MNRE/D.2233/10, Dt : 04.12.10 from TANGEDCO, Chennai

Tamil Nadu as a progressive state has yearly growth of demand at 10% or 1000 to 1500 MW of additional firm power. Supply shortage of 1000 MW in 2009 has grown to 3000 MW shortage in 2011. **Neglect in the Planning of generation of additional firm power** for the last 10 years is causing the state being taken to dark nights. Scheduled power cut for seven hours a day for industries plus 2 more hours of unscheduled cut is the order of the day. Nobody knows when power would come and when it would go.

On distribution side also there are bigger wows. Besides earlier installation of 5000 MW of infirm seasonal wind power, 1000 MW more of wind mills have been added in the year 2010-2011. The investors have laid lines up to 110 KV sub stations created by private developers, which in turn has been connected to TANGEDCO Sub Station. But this electrical energy cannot reach Consumer.

No 230 KV and 400 KV sub stations needed have been created by TANGEDCO or TANTRANSCO in 2010 - 11. Why? They have no money. Even though 1000 MW of Wind Mills have come in 2010-11, they have to remain idle during high windy time of May to October 2011 when domestic, industrial & agriculture is starved for energy. Similar fate awaits 2000 MW or more of Wind Mills being erected in 2011 - 13. TANGEDCO for your information has not paid the money for the energy supplied by wind mills from August 2010 for 9 months.

On 04.12.2010 TANGEDCO has sent a request to Ministry of Renewable Energy, Government of India for release of Rs 1757.00 Crores for carrying out this evacuation work in a space of 3 years. Please find a copy of this request with this letter.

We are glad to recall at during the conduct of International Wind Energy Conference “WE 20 By 2020” by Indian Wind Power Association in February 2011 at New Delhi, Honorable Dr. Farooq Abdullah was gracious enough to inaugurate the Conference and assure that Government of India would do all it could for speedy growth of Wind Energy in India. Most respected Mr. B.K. Chaturvedi, Member, Energy, Planning Commission and friend in need the Secretary, MNRE Mr. Deepak Gupta have also been good enough to participate in the Conference and assured all support to Wind Industry. We enclose a copy of booklet on the Major Findings of the above and Conference and decisions arrived (please refer pages nos. 30 to 33). One of the action plans as you could find on rear inner wrapper of the booklet request Government of India to help wind power friendly States like Tamil Nadu with Financial assistance for evacuation of Wind Power to reach the consumers.

Sir, We the 1100 investors members of Indian Wind Power Association appeal to Honorable Prime Minister Dr. Manmohan Singh, Honourable Minister, MNRE, Dr. Farooq Abdullah, Secretary MNRE Mr. Deepak Gupta, and Mr. B.K. Chaturvedi, Member, Energy, Planning Commission to handle the request from TANGEDCO as an SOS call, from Tamil Nadu to release the amount forthwith and tell TANGEDCO not to prolong EVACUATION work for 3 years but to complete it in one year before March 2012, as Japanese do Tsunami rehabilitation work in Japan. TANGEDCO has capable Engineers to do the required work.

Another important work to be done without delay is to connect Tamilnadu and Southern grid adequately with National grid so that excess wind power can flow to North and West and other power can flow down south. Now these is no proper link. With adequate capacity. Central Government and power grid corporation to have do the task in shortest possible time.

Thanking you and With Regards Wind Community

Yours faithfully
For Indian Wind Power Association

K. Kasthoorirangain,
Chairman

Representation of TANGEDCO to MNRE

From

C.P.Singh, I.A.S., Chairman & Managing Director, TANGEDCO,
144, Anna Salai, Chennai - 600 002.

To

The Secretary, Ministry of New & Renewable Energy,
Government of India, Block No.14, CGO Complex, Lodi Road, New Delhi 110 003.

Lr.No.CE/NCES/SE/EE/WPP/AEE2/F.MNRE/D.2233/10, dt: 04.12.10

Sir,

Sub : NCES – A detailed proposal seeking financial assistance from MNRE for the wind energy power evacuation works for promotion of wind energy in Tamil Nadu – Regarding.

Ref : Meeting held on 27.09.2010 with Secretary, MNRE / New Delhi.

.....

A detailed proposal seeking financial assistance from MNRE for the wind energy power evacuation works for promotion of wind energy in Tamil Nadu is enclosed herewith.

2.0. I request that the proposal may be considered and necessary arrangement may be made to grant the financial assistance to TANGEDCO.

Yours faithfully,
CMD/TANGEDCO

Encl : Detailed proposal.

TNEB assures wind power units of early clearance of dues

The Tamil Nadu Electricity Board has assured wind power generators that it would pay their overdue electricity tariffs from the current month and look into issues relating to evacuation of wind power, according to sources in the know.

Wind energy generators have been sore over TNEB backing down power from the wind energy generators in the last fortnight due to the power cut in vogue. Also, the delay in the payment by the board to the wind energy generators for power fed into the grid has hit them with dues accumulating since August 2010, according to industry sources.

At a co-ordination committee meeting between TNEB officials and representatives of the Indian Wind Power Association (IWPA), South India Mills Association and representatives from the spinning mills today, TNEB has said it would make the payment for August and September 2010 by the month-end.

Similarly, it would make monthly payments for the subsequent months in June, according to Mr K. Kasturirangaian, Chairman, IWPA.

According to TNEB officials, the total dues to the wind energy generators would be around Rs 500 crore, of which about Rs 400-450 crore would be paid in the coming one month and the balance in the next one month.

This has come as a welcome relief to wind power investors who were concerned that if the overdues of last year were not cleared, they would be further hit with current windy season starting now. Nearly 1,900 investors own the 6,000 MW of installed wind power infrastructure. Mr Kasturirangaian also welcomed TNEB's decision to bring down power cut from the present 30 per cent to about 20 per cent as this has helped in stepping up evacuation of wind power in the last two days. TNEB had cut back on wind power evacuation following the power cut between April 28 (when windy season had commenced) and May 11. During this period, nearly half the installed wind power capacity of about 6,000 MW could not operate, he said.

Wind power generators also do not have the option of third party sales though there is a provision available for it. TNEB insists on scheduling – informing it of the quantum of power that would be fed into the grid by the wind mills. This is not possible for small investors as wind forecasting is a high-cost technology, he said. .

TNEB officials said that scheduling of wind energy has been an issue in supporting third party sales or arranging evacuation. For instance, in April end, there was a spurt in wind generation with 1,700 MW being fed to the grid when TNEB had a 30 per cent power cut. But when it decided on 20 per cent cut, wind generation petered out to about 700 MW.

Courtesy: The Hindu Business Line

Renewable Energy Certificates In India

The Renewable Energy Certificate (REC) platform was formally launched by the Central Electricity Regulatory Commission (CERC) on 18 November 2010. This article focuses on the REC mechanism, and the issues and challenges involved for India.

By Anita Khuller

The power sector in India is rapidly growing in size and complexity with factors such as growth of short term power, trading instruments such as renewable energy certificates (RECs), injection of renewable power into the grid, wider participation in open access, and increasing contribution of independent power plants. Policy and regulatory changes are more frequent than before, reflecting the dynamic nature of the industry. Major developments in the power sector are being driven by issues such as the demand-supply gap, losses in state utilities, ageing infrastructure, private participation, and environmental impact among others.

Grid-connected renewable power is the key route through which the energy fuel mix can be brought in line with the desired objectives of reducing carbon emissions as well as improving the country's energy security. Renewable energy accounts for about 10 per cent share of total installed grid capacity. In energy terms, this share is about 3.5 per cent of the grid. By the end of June 2010, the cumulative achievement in grid-connected renewable power stood at 17,173.90 MW. The leading renewables include wind power, small hydropower and bagasse-based cogeneration. Wind energy corners the predominant share of about 70 per cent of total grid-connected renewable capacity.

According to the Ministry of New and Renewable Energy (MNRE), there is a potential of 84,776 MW (excluding solar) in grid-connected renewable power. Barely 18 per cent of this has been achieved so far.

The capacity share of grid connected renewables increased from 5.15 per cent in 2004-05 to 10 percent in 2009-10, i.e. from 6,099 MW in 2004-05 to 16,817 MW in 2009-10. The key driver for this has been the policy support provided by the government for such projects. The National Action Plan for Climate Change (NAPCC) has presently set a target of 5 per cent of power purchase from renewables, which will be increased by 1 per cent each year to reach 15 per cent by 2020. The renewable purchase obligations (RPOs), or the percentage of power that the distribution utilities are expected to procure from renewable generators, are set by the State Electricity Regulatory Commissions (SERCs) for their respective states.

Source	Installed capacity (MW) as of June 2010
Wind Power	12,009.48
Biomass	901.1
Small Hydro Power	2,767.05
Cogeneration - Bagasse	1,411.53
Waste to Energy	72.46
Solar Power	12.28

MNRE, through ABPS Infrastructure Advisory (P) Limited, came out with a report for circulation in June 2009, on the 'Development of Conceptual Framework for the Renewable Energy Certificates (REC) Mechanism in India'. Based on comments received, RECs were launched this year to provide a mechanism for states that do not have sufficient renewable potential to meet their RPOs.

What are RECs?

To realize the objectives identified in the NAPCC and to facilitate transactions in the renewable energy market, the Central Electricity Regulatory Commission (CERC), in consultation with the Forum of Regulators (FoR), notified regulations (CERC Notification on RECs on 14.01.2010). Salient points of the regulation and FoR's recommendations are:

- Each SERC to develop RPO framework for its respective state (as per Sec 86 (1)(e) of the Act)
- Under the RPO framework, obligatory entities like distribution licensees, open-access consumers and captive consumers would require to consume certain percentage of their energy from renewable sources of energy (both solar and non solar)
- Obligatory entities can purchase RECs to discharge their RPOs

Under an REC framework, utilities can inject a high share of renewable energy in their power mix by purchasing such certificates on an exchange. The REC mechanism classifies the cost of electricity generated into an energy cost equivalent to conventional energy and a cost for environmental attributes of such energy. The latter gets exchanged through the means of RECs. A renewable energy generator can either sell at preferential tariffs or sell the energy and environmental attributes separately. Solar power has a separate category of RECs, known as solar certificates to ensure greater support for solar power generators.

Terms and Conditions for Issuance of RECs

Some features of the CERC regulations on RECs are summarized as under:

Categories There are two categories of RECs, namely solar and non-solar. Solar RECs reflect the regulatory support for the higher cost of solar power generation as compared to other renewable energy modes.

Eligibility All grid-connected renewable generators having installed capacities of 250 kVA and above are eligible. The entity seeking an REC has to be accredited by the respective state agency (such as TEDA in Tamil Nadu) etc. Also, it should not have any power purchase agreement (PPA) with the state regulatory commission for selling the generation on preferential tariffs on offer. Further, the price of electricity sold by the entities to the local distribution utilities should not be more than the latter's 'pooled cost of power purchase'. The pooled cost of power purchase means weighted average pooled price at which the distribution licensee has purchased electricity the previous year—this includes the purchase of self generation, long term and short term purchase, but excludes purchase of RE generation. The generator could also be selling power to any other licensee or open access consumer at a mutually agreed price or through a power exchange at a market determined price.

Central agency for REC The regulations provide for a central agency entrusted with all operational functions related to RECs such as registration of entities, issuance of certificates, maintaining and settling REC accounts, transaction repository and others. Taking specific note of procedural delays, REC regulations provide that the central agency will issue certificates to eligible entities within 15 days of application. CERC designated the National Load Despatch Centre (NLDC was constituted by the Ministry of Power in March 2005 for optimum scheduling and dispatch of electricity) as the 'central agency' for the purpose of REC Regulations, 2010.

Denomination of certificates Each REC would represent one-megawatt hour of electricity generated by the renewable energy entity and injected into the grid.

Transaction Certificates will be traded only through the power exchanges. The latter are required to get prior approval of CERC on rules and byelaws related to the price discovery process of RECs.

Price	Non-solar REC	Solar REC
Forbearance price	3,900	17,000
Floor price	1,500	12,000

Price Price determination of RECs will be within the limits set by CERC in terms of forbearance and floor price. As a follow up to its regulation on issuance of RECs, CERC notified the prices in suo moto order dated June 1, 2010.

Validity REC will remain valid for up to a year from the date of issuance. The validity will stand even if the entity's accreditation is revoked at a later date.

Compliance auditors CERC can appoint compliance auditors for verification of regulatory processes related to RECs. Auditing will be done on a sample basis to ensure compliance of regulations at central and state level.

The procedure to participate in the REC mechanism is as follows:

Accreditation

- One REC for each MWh of electricity generation
- Solar & non-solar certificates
- RE generator not having PPA with Discom at preferential tariff and not selling to Discom at price more than Discom's pooled cost
- Required to get accredited from its respective State Nodal Agency (SNA)

Registration with the Central Agency

- Generator to get registered with NLDC (Central Agency)
- Generator will approach NLDC for issuance of certificates with certified injection
- NLDC to issue and maintain accounts and repository

Issuance of REC

- RE generator to apply for REC within three months from generation
- NLDC to issue REC to the applicant within 15 days (Post verification of actual electricity generation from respective SLDC)

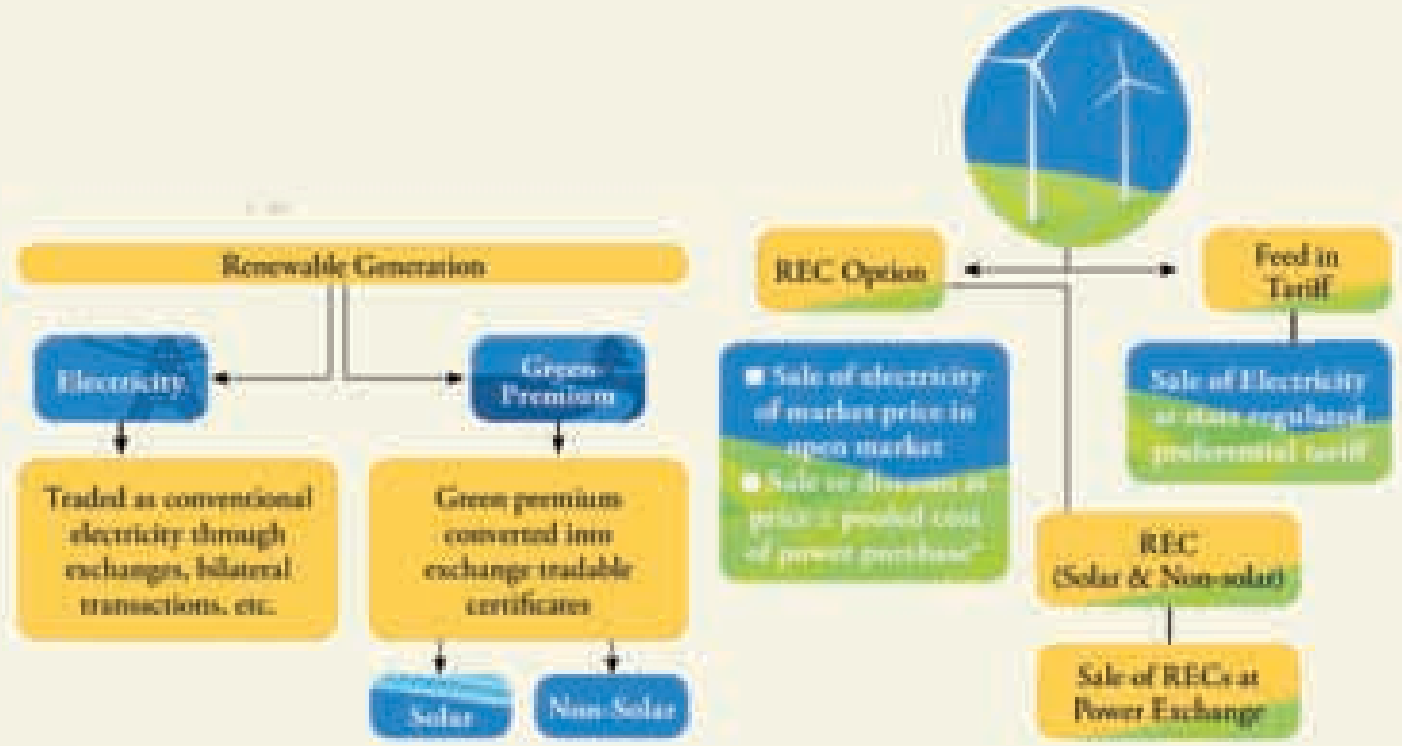
Trading of RECs through power exchanges

- RE generator can sell only through power exchanges
- Sell within 365 days of issuance
- Obligated entities (Discom/captive power plant-CPP/ open access-OA consumer) to buy to meet RPO

Recent Developments

The REC framework requires uniform regulatory structure across the states. In this regard, the FoR has devised model REC regulations for uniform formulation by SERCs, who are required to notify their regulations to complete the envisaged framework. As of 5 August 2010, 3 SERCs— Gujarat, Himachal Pradesh and Maharashtra and JERC for Mizoram and Manipur passed the final REC regulations. Eight other states have notified draft REC regulations and are waiting for state commission approvals.

On 29 September 2010, the regulator passed an amendment to its REC Regulations, 2010. These amendments clarified the regulatory position for two scenarios:–



- Participation in case of premature termination of PPA: If an order or ruling has been passed against a generating company regarding breach of terms under the PPA, the company cannot participate in the REC market till three years from the date of termination or till expiry of the PPA, whichever is earlier.
- Eligibility of captive power producers based on renewable energy source: A CPP based on renewable energy will be eligible to participate in the REC market using the entire energy generated, provided that the entity has not availed any concessional benefits. If the plant forgoes such benefits on its own, it can join the market only after three years from the date of forgoing the benefits. This facility however does not hold if the benefits were withdrawn by regulatory authorities or state governments.

As things stand, CERC has already granted approval to the two power exchanges (IEX and PXIL) for introducing RECs as trading products. The regulator has mandated that a double-sided closed bid auction with uniform price solutions should be utilized as the price discovery mechanism for REC contracts. RECs were launched collectively by the Ministry of Power and MNRE on 18 November 2010. Reports indicate that the exchanges have also completed the mandatory mock trading sessions at the NLDC.

Sources at CERC told Business Standard, "The SERCs have been asked to provide an update on REC regulations from time to time. This, we believe, would facilitate implementation of the REC mechanism. Also, MNRE has already agreed to provide financial assistance of Rs 9 crore over the next 3 years towards implementation of the mechanism. This financial support would be provided for developing relevant software and hardware and for providing manpower to both central and state agencies."

Challenges Ahead

Selected states such as Tamil Nadu, Karnataka, Gujarat, Andhra Pradesh and Maharashtra known for high wind power potential, or others such as Rajasthan, Gujarat, West Bengal and Orissa for high solar potential will be expected to drive capacities in the coming years catalysed by the RECs. There is an uneven distribution of renewable energy potential in the country; certain states are generating a high percentage of electricity from renewable sources while others are not procuring even a minimum percentage; resulting in uneven tariff burdens on consumers across the country. An REC system could help offset, to a certain extent, this anomaly.

RECs would help make the renewable electricity market stable and predictable by maximizing the benefits of renewable generation while reducing costs. Besides, introduction of tradable RECs would provide an additional source of revenue to the renewable energy-based power generators and these could also be used by those states, which do not have substantial renewable resources, to meet their RPOs.

The REC mechanism enables market growth and improves the commercial viability and provides a greater push to renewable electricity by way of removing bottlenecks like higher costs, uneven distribution of renewable resources across India, and

scheduling or dispatchability of renewable electricity; and thus helps in procurement by utilities. The REC has been used extensively as a successful market based policy instrument to promote renewables in many countries, and which would be relevant in the current legal and regulatory set up of the Indian power sector for facilitating compliance with RPOs/the RPS5 (Renewable Portfolio Standard).

The REC mechanism assures a guaranteed return of at least Rs 12,000 and Rs 1,500 per certificate to solar power and non-solar generators, respectively, proving that RECs will give monetary returns to developers by compensating them for loss of preferential tariff.

But though the RECs have been launched, there are concerns about their adoption. The procedural stipulations between the accreditation and registration of the eligible entities and the final trading session could translate into a gap of over a month. There are several infrastructural and systemic challenges at the state agency level. Another reason for delay from generators could be that REC participation will be outside the current preferential tariff, implying that new entrants have to be attracted to this market. This will take time to materialize.

There are several primary and secondary activities, especially related to regulatory processes such as approval of the rules and bye-laws of the REC registry/rxchange platform, standard amendments to the existing grid code to enable energy accounting, etc., which may have to be undertaken at the CERC and SERC level.

Also, regarding several other activities such as development of hardware and software by the REC registry and REC exchange platform, the Regulator may have to approve the specifications as well as audit the system. Similarly, a monitoring committee will have to be set up to develop database of all renewable energy installations in the State. This activity would require significant upfront effort. In addition, significant capacity building activity will have to be undertaken at the State and Central levels to ensure successful implementation of this mechanism.

Courtesy : Akshay Urja

APTEL issues notice to SERCs for non-revision of rates

The APTEL has also issued notice to the secretary of the Forum of Regulators to assist the Tribunal by collecting all particulars from the SERCs concerned.

The Appellate Tribunal for Electricity (APTEL) has issued notices to all state electricity regulatory commissions (SERCs) and joint commissions to send the status report on determining an annual revenue requirement and rate for all years since these bodies were constituted. The SERCs have been asked to give necessary particulars and information in the form of a status report before March 7. APTEL has slated the next date of hearing on March 14 to pass further orders.

A recent communication sent by the power ministry requesting APTEL to invoke its authority under section 121 of the Electricity Act, 2003 and to issue suitable directions to all SERCs especially when the rate revisions have not taken place in most of the states prompted the move. Th ministry communique said this was in turn contributing to the poor financial health of state distribution utilities as reported by the Finance Commission.

The 13th Finance Commission estimated that the net losses of state transmission and distribution utilities will rise from Rs 68, 643 crore in 2010-11 to a staggering Rs 1,16,089 crore in 2014-15 if immediate steps are not taken to reform the utilities.

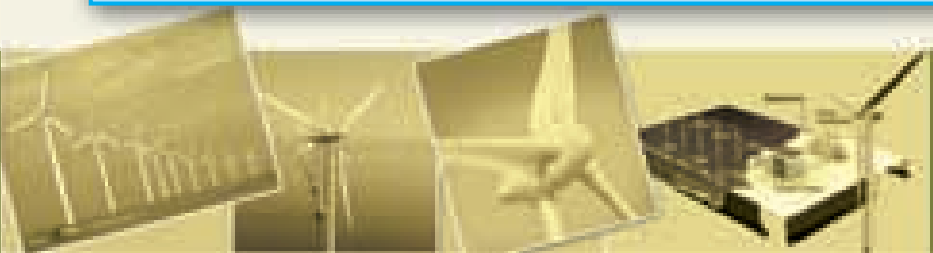
According to the Finance Commission, absence of timely rate increases has increased the gap and has impaired utility operations further. Some states have not raised tariffs for the past eight to nine years in spite of increasing deficits.

APTEL has treated the power ministry letter dated January 21 as a petition and issued notices to SERCs and joint commissions. The power ministry said that one of the reasons for the delay in rate revisions was that the utilities have failed to file annual rate revision petitions in time. As per the Tariff Policy, SERCs can suo-motu take up the revision of tariffs even if the utilities have not filed the revision petitions for the same in time. Power ministry sources confirmed APTEL's directive to all SERCs and joint commissions.

The ministry argued that determination of annual revenue requirement and rate was in the interest of improving the financial health and long-term viability of the electricity sector in general and distribution utilities in particular.

APTEL ruled: "In view of the particulars given in the letter and also request made by the Power Ministry, we deem it appropriate to take up suo-motu action. Accordingly, we entertain this letter as a suo-motu petition. While we issue notices to all state commissions, we think it fit to appoint MG Ramachandran, Amit Kapur, RK Mehta and Buddy A Ranganadhan, the learned counsels as Amicus Curiae to assist this Tribunal for passing appropriate orders in the matter."

Courtesy: TECA News Letter



TNERC Order dated : 25-4-2011 regarding Quota

Petition filed by different petitioners with the prayer to clarify that the quota to be fixed by the respondent is on the 'A' portion of the respondent's Memo. CE/Comml/EE/DSM/AEE/PMM/F. Powercut/D.28/2008 dated 17-11-2008 which is the base demand and base energy on the power supplied by the respondent and that the power cut is to be applied only on this component and that the entire base demand and base energy fixed pursuant to the order dated 28-11-2008 passed by the Commission in M.P. No.42 of 2008 is to be considered as the respondent component and no further deduction from this should be made when the extra power is sourced through CPP, Wind, third party, etc., and consequently to set aside the Memo. No. CE/Comml/EE/DSM/AEE1/F.Power cut/D.358/10, dated 17-9-2010 issued by the respondent in total violation of the order dated 7-9-2010 passed by the Commission in M.P. Nos. 6, 9 and 17 of 2010 and D.R.P. No. 9 of 2010.

Since the relief sought for in all the three petitions is the same, the petitions were heard together on various dates and the cases were taken up for final hearing on 25-4-2011. The counsel of the petitioner filed a joint memo on behalf of Tamil Nadu Electricity Consumer Association (petitioner in M.P. No.43 of 2010), Southern India Mills Association (Petitioner in M.P. No. 44 of 2010) and Indian Wind Power Association (petitioner in M.P.No.45 of 2010) submitting that during the pendency of the above M.Ps. several individual consumers had filed W.Ps. before the High Court of Madras, who have passed an order thereon. Along with the joint memo the counsel submitted a copy of the order of the High Court dated 15-3-2011 passed in W.P. Nos. 6526 and 6527 of 2011 and M.P. Nos. 1 and 2 of 2011 and prayed that in view of the said comprehensive orders of the High Court covering the entire issue as also the subsequent circular issued by the respondent Board, the Commission may be pleased to record the judgment of the High Court and dispose of the above M.Ps. in accordance therewith. After hearing the arguments of both side the Commission made the following:

COMMON ORDER

We record the order of the Hon'ble High Court of Madras. In this regard the Commission would like to refer to the minutes of the meeting convened by the Hon'ble Deputy Chief Minister with the Confederation of Indian Industries (CII) / SIMA etc., on 27-1-2011. Para 3.0 (ii) deals with fixation of demand and energy quota which permitted consumers to opt for any three consecutive months favourable to the consumer for calculation of base energy. The formula communicated by the TNEB in their earlier memo dated 1-11-2008 and 17-11-2008 were approved by the commission in order in M.P.No.42 of 2008 dated 28-11-2008 and S.M.P.No.1 of 2009 dated 28-10-2009. The formula communicated by the TNEB on 11-2-2011 modified the formula contained in the circular of TNEB dated 1-11-2008 and therefore the amended formula should have been submitted to the Commission for approval. This was not done. Nor was this brought to the notice of the High Court. The TNEB should have explained to the Hon'ble Deputy Chief Minister that the amended formula should be submitted to the TNERC for approval.

This was also not done by the TNEB.

The TNEB has clarified in their memo dated 11-2-2011 that the amended formula for computation of base energy and base demand would have prospective effect i.e. from 11-2-2011. The High Court has directed that the benefit of the revised quota should be given to the consumers from 17-9-2010. The High Court has indicated that the bills will have to be re-worked from 17-9-2010, the date on which the TNEB issued a memo on the basis of 7-9-2010 order of the Commission.

M.P.No.43 of 2010, M.P.No.44 of 2010 and M.P.No.45 of 2010 are disposed of with the above observation.

Consequently, the common interim order dated 6-12-2010 made in the above interim applications is withdrawn and interim applications are dismissed.

Boot Strapping Wind Power In India

Dr S Gomathinayagam, Executive Director, Centre for Wind Energy Technology, Chennai-600 100. E-mail: ed@cwet.res.in

INTRODUCTION

India is in 5th position having a total installed capacity of 12 GW in the Grid connected Wind Power next to China, USA, Germany and Spain. However, there is a significant boost in average capacity of installed wind mills in India which is close to 1 MW per installed wind machine. Yet, the expected capacity utilization factor all over India stands oscillating between 17-20%. This needs a thorough relook and revamping of the existing grid connection norms and operational maintenance issues of wind turbines as well as wind farms which are geographically spaced all around India.

The policy which has been driving wind power developments in India has been the Accelerated Depreciation. Even though, the Government of India has announced special schemes for those non-tax liable investors, viz. G.B.I (Generation Based Incentive), the Projects registered under GBI scheme as on date are quite few, when compared to the expectations of the Ministry of New and Renewable Energy, Government of India. The registered few projects under GBI are also triggered only by IPP (Indian Power Projects) developers who have been instrumental in the public/private sectors and several other Government Undertakings to invest in wind power. Even though, several of these public sectors and Government Undertakings have shown interest in investing in wind power most of them seem to hang on to the Accelerated Depreciation clause of policy.

The current trend needs total reversal. The effect of carbon reduction and climate change should be a very clear awareness driver on the development of Green Power and Green Environment to sustain energy needs and consequently to sustain drinking water needs of mankind.

This article reveals the various way forward to boot strap wind power in India to achieve the targeted growth, while reviewing status of developments in terms of technological features of WEGs available in the Indian Market.

STATUS OF WIND POWER DEVELOPMENT IN INDIA

Figure 1 gives the cumulative wind power installed capacity since 1986 when the demonstration wind farms in India came into being in several States. Beyond 1995, the growth has been quite good till 2002 , when most of the machines were all lower than 500 kW capacity. Since 2002, several machines with higher capacities like 750 kW, 800 kW and 1 MW machines started coming into Indian Market. Now the highest capacity available in Indian market is 2.5 MW. The addition of MW class machines in Indian electric grid has shown a steep and steady growth in the last 5 years inspite of recession.

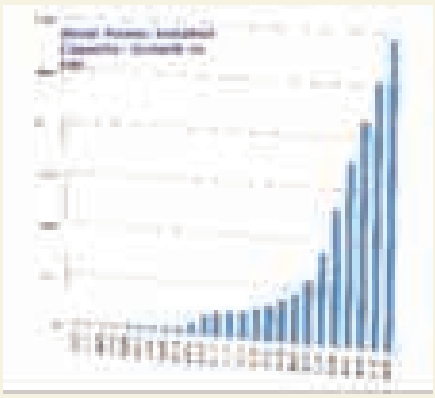


Fig:1 Cumulative installed Wind Power capacity in India

Figure 2 indicates the status of the State wise and year wise capacity addition of wind power installations while Figure 3 shows the state-wise share of cumulative installed capacity in Indian States.

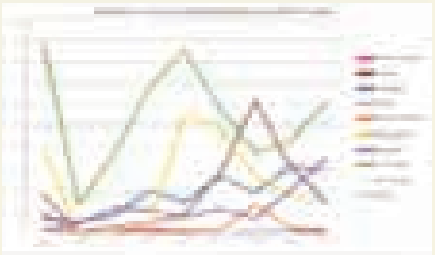


Fig:2 State wise annual capacity addition of wind power installations

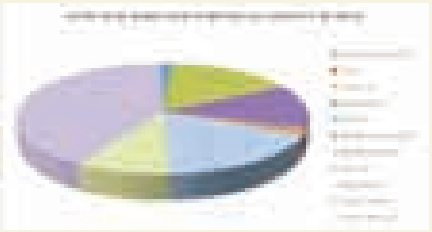


Fig:3 Cumulative distribution of Indian Wind power

With the introduction of higher liberalized Government guidelines in terms of certification and quality assurance of WEGs (Wind Electric Generators) connected in Indian grids, now there are as many as 39 wind turbine models catering the different investors segments are available from over 17 manufacturers in India. Figure 4 gives the market share of wind power projects totaling 1567MW by various players in India in the year 2009-2010.

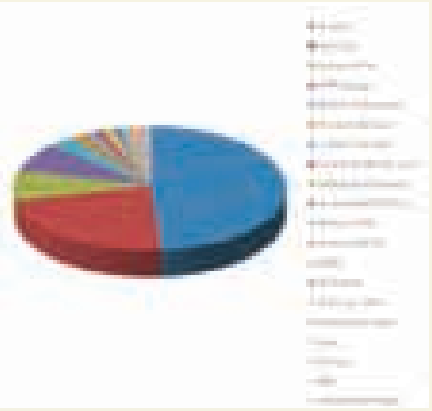


Fig:4 Market share of Indian manufacturers in 2009-10

Figure 5 shows much evidently the average rating of WEGs capacity in kW. This has been steadily growing in the millennium decade and it stands at 932 kW in 2010. Several States have got the benefit of wind power development in the Country while the cumulative generation runs to Seventy-Seven million crores so far resulting in about Seventy-Seven thousand and thousand tons of carbon-di-oxide reduction with significant saving of coal as whole.

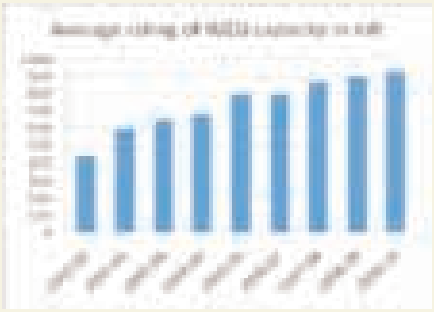


Fig:5 Growth of average rating per wind mill in India

In Figure 6, the contribution of wind electric generation cumulates over the years in various states of India are shown and Tamil Nadu has a signicant contribution of over 70% of the wind generation India.

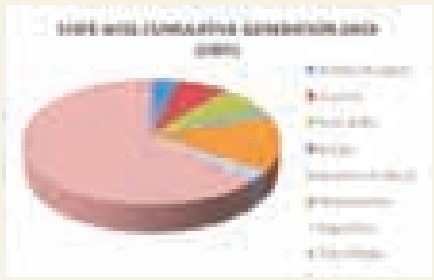


Fig:6 State-Share of cumulative wind electric generation

The status of wind power development as on date has a steady growth irrespective of the profit fluctuation of various Industry in India. This point needs to be highlighted because without industrial profit, wind power development would have not taken place in India. Since the tax incentive of Accelerated Depreciation has essentially steered the growth of wind power development in the Country until now.

TECHNOLOGICAL STATUS: In terms of technology, if one looks at the various wind machines available in the Indian market, the capacities ranges from 225 kW to 2.5 MW (2500 kW). There are essentially about 5 aspects which require consideration. 2 comparing the various techniques available in the Indian market, they are the type of rotor and wind power regulation techniques, drive train (with or without gear) and finally the generator type.

Coming to the rotor, the early wind machines had fixed speed machines in order to keep the design simple. And now the trend is towards the use of variable speed or dual speed rotor in WEGs and obviously, the advantage of variable speed rotor wind machine is that the machine will be able to capture 15 to 20% more energy from wind then the constant speed of the fixed speed rotor, which means every fluctuation that is happening in the wind will be matched and efficient power capture will be ensured by technology.

POWER REGULATION : The achievement of variable speed operations of wind turbine when there is a requirement at the generator end, a constant voltage and constant frequency for grid connected there are which 2 methods of power regulation flow. In controlling the angle of attack of the blade to the wind these are known as power regulator technique. When the blade is not rotated above its own axis to regulate power it is known as stall regulation. When the blade is rotated above its own axis as the wind velocity varies in time it is called pitch regulation. Pitch regulation requires additional controls and hydro-dynamic or electric motorised systems for active control of pitch of the blades. The current trends are towards pitch regulation include feedback controls for effecting active pitch control.

DRIVE TRAIN TECHNIQUES : In order to convert the low RPM (Revolution Per Minute) of the rotor to a higher RPM to match the grid frequency of 50 Hz (cycles per second) in India and 60 Hz in US. Most of the WEGs use a gear box which has an efficiency of 94-97%. However, in practice, several gear boxes have failed in the early stages of wind power developments in India which has also prompted some of the manufacturers to bring in new models which are having gearless transmission techniques to transfer Kinetic Energy of Wind Energy to Mechanical rotation energy suitable to drive the generators.

GENERATOR TYPES : Of the available generators, the most fundamental type of generator was Squirrelcage Induction Generator (SIG), since this induction generators are asynchronous generators which derive power to magnetise the coil from the electric grid. This in turn, results in some reactive power consumption of the power generated by the wind turbine. The modern generators are of type PMSG (Permanent Magnet Synchronous Generator), EESG (Electrically Exited Synchronous Generator) and DFIG (Doubly Fed Induction Generator) While the advantage of conventional SIG is its simplicity, the modern generators have the advantage of semi or full power conversion through a sophisticated AC-DC-AC convertor involving considerable power electronic controls and circulatory.

POWER PERFORMANCE : Of various combinations of wind turbine techniques, the ultimate goal of the designer is to maximize the annual energy production of any given site. The annual energy production at any given site depends on 3 major sets of parameters. The first one is the wind resource at the given site which is usually described by the annual probability of accurance of a particular wind speed at the given site. Normally these probabilistic prediction should also be fine tuned taking into account the long term fluctuation of the annual wind speed at the given site. The second important set of parameter relate to the power performance of the WEGs. The power performance is a measured and certified power curve of

the machine indicating the generated output of the machine under various wind speed conditions. The available WEGs in the Indian market and their power curve characteristics are given in Figure 7 to Figure 9.

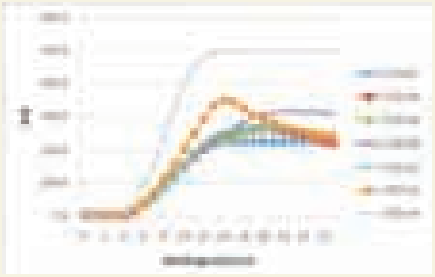


Fig 7 : Lower capacity WEGs and Power curves

It is worth highlighting the importance of this power curve of same capacity machines. Their shapes as well as their rated wind speeds are quite important for maximizing the annual energy production (AEP). In Figure 7 it can be seen, that the older machines with lower capacity has dipping of power curves after having reached the rated capacity of the wind turbines at a rated wind speed they start declining in the power output. This is typical, especially of the machines which are not designed with better power capture ability in the post stall regime. In the medium capacity, machines in the range of 750 kW and 950 kW, there are a few machines which have this typical post stall behavior(Fig.8) after the rated wind speed. However, it may be noted in the lower range as well as medium range, there are certain modern wind machines (Fig.9) which have a flat response (Flat power output beyond the rated wind speed) upto cut-off wind speed. Apart from mean annual wind velocity and the associated probability densities the choice of a wind turbine of appropriate capacity for optimizing AEP to suit the site's long duration availability of wind speed will be desirable.

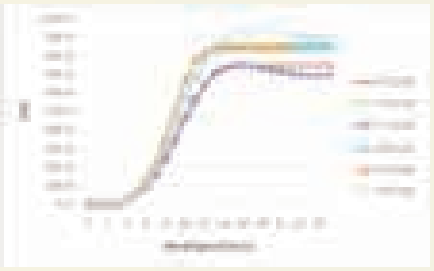


Fig 8 Sub-mega watt medium capacity WEGs and Power curves

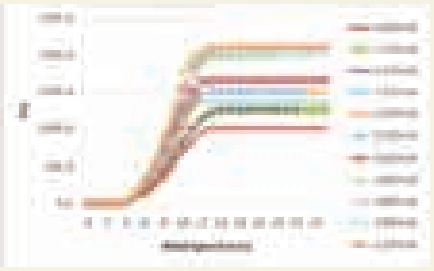


Fig:9 Mega-watt class WEGs and Power curves

In case of MW class of wind machines, given in the bottom set of curves it can be observed that most machines have a flat power performance beyond the rated wind speed upto the cut-off wind speed of 25 m/s. This is an indication to better power capture from wind when the wind speed increased beyond the rated wind speed resulting in higher output of AEP by the MW class machines. It may be stated that this efficient performance is possible due to the technology of active pitch regulation and full convertibility using AC-DC-AC power-electronics. One can also think of alternate torque converters which may use conversion of variable torque from wind fluctuations to constant torque as need to run induction generators.

WAY FORWARD FOR BOOT STRAPPING WIND POWER DEVELOPMENTS IN INDIA:

i. In the year 2009, certain new initiatives have been spelt out by Ministry of New & Renewable Energy, Govt. of India, of which the notable ones are Generation Based Incentive (G.B.I) for those non-tax liable investors and Renewable Energy Certificates (RECs). Renewable energy certificates will enable meeting RPO (Renewable Portfolio and Obligation) levels in electricity generation in of certain States of India which do not have wind resources.

ii. To make available to the Indian investors new models from existing manufacturers as well as to bring in new manufacturers with latest technologies in India, a completely revised self certification guidelines as a policy has been introduced.

This has certainly facilitated new models as well as new manufactures having WEGs with latest techniques to come into India even when their models are in design stage/certification and testing stage. To make further impetus on wind power growth in India, there is need to do drastic cost reduction on various WEG components starting from the blade and to the overall project developments. This cost reduction can be achieved only by serious interaction of the industry and to carry out indigenous R&D to retain the foreign exchange outflow in the sustaining supply chain of WEG components. Another important area which needs focus is Human Resource Development since Wind energy exploitation involves multi disciplinary engineering approach.

IN SUMMARY : The industry experts suggest further improvement in certain issues regarding the policy and regulatory matters which seem to be critical for enabling boot strapping of wind power in the electricity supply

systems. There is a need for National Renewable Standard priority sector lending, mega developmental project in wind power zones setting up of SEZ's for wind projects with policies for repowering and even to establish a renewable power corporation, if necessary. The noted constraints are well known. Availability of large windy area - since the best windy sites are already occupied. An adequate and cost effective power evacuation/ transmission / distribution system. As a relook into the Accelerated Depreciation driven in the wind power development in the Country, it is worth observing the trends in different parts of India as indicated by the available data on wind power generation and installed capacity in different states. Figure 10 gives a summary of performance and trends in India. As it can be seen, the millions of units generated per MW installed capacity has been taken as a Wind Utilisation Index (WUI) which will indicate the effective utilization wind power in the Country in different States.

It is worth to note from the figure that the improved technological advancements while this WUI shows a healthy upward trend in most of the States there are a few downward trends occasionally, which needs caution and proper regulatory function to ensure the investment as expected yield to meet the targets of the wind power development of the Country. The reasons could be due to several factors such as metering errors, recorded generation errors, climatic low wind cycles, nonperforming machines/ machinery/GRID, or even O&M issues.

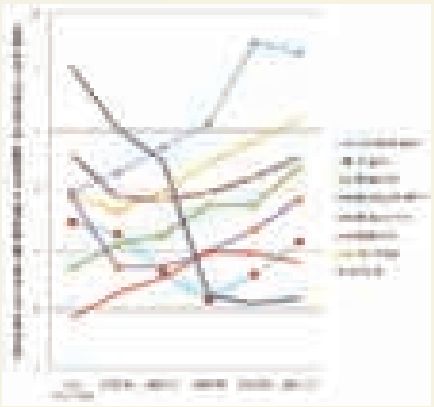


Fig:10 Wind Utilisation Index (WUI) over the years

The author sincerely feels there is a need for indigenous Research & Development and Human Resource Development in several areas of the wind electric generation with active industry participation. Some of the areas are listed below

(i) Aero-elastic and structural design of rotor blades for efficiently capturing wind energy for low wind regime.

(ii) Seamlessly interfacing of small wind turbine, wind-solar hybrid systems with and without batteries into the utility grid, cost effectively maintaining the grid frequencies and voltage in stable condition.

(iii) To exploit the off-shore wind power economically with proven technologies including high reliability of operations and performance of wind turbines. To develop methodologies of installation and commissioning of offshore wind turbines cost effectively by carrying out manufacturing mostly on shore and developing methodologies for transport for installation and commissioning of massive components which have to resist loads due to water, waste, current and winds at a offshore power plant.

(iv) To overcome the intermittency of wind power which is affecting the scheduling of wind power and penetration of wind generated electricity into operational utility grids by effectively forecasting wind and wind power for efficient load dispatching ensuring reliability of wind power as good as convectional electric power.

(v) To carryout distributed generation and distributed usage of generated power without much of transmission of electricity. This is going to be the future order in the World while more and more renewable energy from different sources becoming available locally. This is equivalent to demand side management of the ever increasing power demand or energy demand all over the World by the mankind.

(vi) Wind flow simulation in complex terrain and micrositing of wind turbines in a wind farm, using technologies such as computational fluid dynamics(CFD) and meso/ micro scale wind atlas, and synthetic aperture Radar, SAR techniques.

(vii) High resolution satellite imagery and remote sensing data products validated with appropriate ground measurements, for wind power mapping.

(viii) Studies on repowering and inter-cropping in wind farms including Wind turbine wake studies for policy framework. (ix) Grid interfacing investigations and power quality issues in a weak grid. (x) Energy transfer/storage technologies such as Compressed air / pumped hydel reservoir storage of surplus electricity generated by wind for restoration during lull (no Wind) conditions. Wind to water techniques for sustainability. (Statistical source referred : Indian Wind Power Directory - 2010)

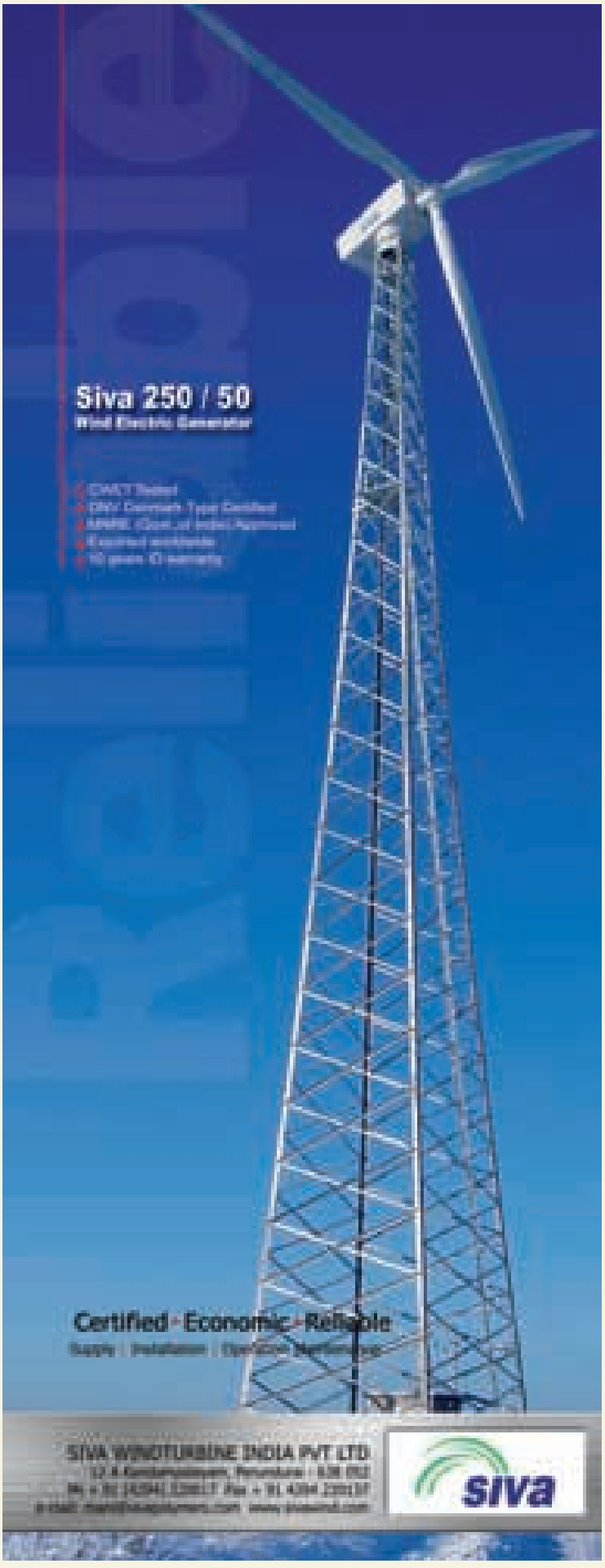
Courtesy : PAVAN Newsletter

WIND MILLS CAN NOT BE DISPLACED: OBSERVES BOMBAY HIGH COURT

A PIL was filed in Mumbai High Court against various activities in Satara district which is adversely affecting the wild life. Wildlife Authorities had also issued the notice that the Wind Mills have been illegally erected in the area notified as Koyna Wildlife Sanctuary. As per the notification of 1985 none of the survey numbers on which the wind mills are installed comes under Koyana Wild Life Sanctuary area. In Satara district in Maharashtra there are many good wind sites. The concerned authorities had permitted the installation and commissioning of the wind mills in the area as per the policy of the State Government declared in 1998. All necessary clearances were obtained before installation of wind mills. The MHEB had constructed the 220 KV Sub Station at Vankuswade site and transmission lines at their cost for the evacuation of power generated by these wind mills.

"The Chief Secretary, Government of Maharashtra, supported the wind mills and while submitting his report to the court reiterated that the plateau in the Vankusawade Region has been considered as one of the most ideal sites for setting up wind energy projects and hence the wind mills have come up on non-forest land on the plateau. Although these lands falls within the geographical boundaries of Koyana Sanctuary notified in 1985, they are on private lands proposed to be deleted from the final notification of the Sanctuary according to the reports of the Enquiry Officer to the Government. …..Energy generated by wind mills is one of the most clean energies and the land occupied for these wind mills is also not very large. It has also provided financial relief to the people who had foregone their land for setting up of wind mills and financial benefits continue to accrue to the villages for every unit of power. …. These wind mills are feeding 140 million units of power to the Maharashtra State Grid.

The Mumbai High Court observed that the wind mills are necessary for employment generation in remote areas where there are no chances for locals to get job. … At the same time we do not want to displace wind mills as they are important for power generation…… We have to strike a balance between environmental concerns and the right of people to earn their livelihood.



STATISTICS OF WEGs

REPORT ON MONTHLY GENERATION % OF RKVAH FOR THE MONTH OF MARCH 2011

S.No.	Name of the Wind Farm	Total Capacity	Location / Village	Region	State	March'11 Generation Units	% of RKVAH
1	M/s. Muthoot Finance Ltd	3.750 MW	Devarkulam	Tirunelveli	Tamilnadu	72,756	2.20%
2	M/s. Muthoot Fincorp Ltd	2.525 MW	Muppandal	Kanyakumari	Tamilnadu	1,02,487	4.12%
		13.000 MW	Sankaneri	Tirunelveli	Tamilnadu	9,37,998	0.65%
		5.000 MW	Devarkulam	Tirunelveli	Tamilnadu	1,00,926	1.61%
3	M/s. Sri Seethalakshmi Steel Castings (P) Ltd	0.350 MW	Myvadi	Coimbatore	Tamil Nadu	6,163	-

REPORT ON MONTHLY GENERATION % OF RKVAH FOR THE MONTH OF APRIL 2011

S.No.	Name of the Wind Farm	Total Capacity	Location / Village	Region	State	March'11 Generation Units	% of RKVAH
1	M/s. ACC Limited	9.000 MW	Sankaneri	Tirunelveli	Tamil Nadu	4,88,808	0.46%
2	M/s. Agni Steels P. Ltd	0.750 MW	Pazhavoor	Tirunelveli	Tamil Nadu	33,679	0.45%
3	M/s. Aquasub Engineering	2.900 MW	Muppandal	Kanyakumari	Tamil Nadu	1,49,520	2.63%
4	M/s. Aquapump Industries	1.500 MW	Muppandal	Kanyakumari	Tamil Nadu	86,497	9.35%
5	M/s. ARC Retreading Company (P) Ltd	0.250 MW	Muppandal	Kanyakumari	Tamil Nadu	9,276	-
6	M/s. Cape Flour Mills (P) Ltd	0.250 MW	Aralvoimozhy	Kanyakumari	Tamil Nadu	83,894	1.30%
		0.500 MW	Muppandal	Kanyakumari	Tamil Nadu		
		0.750 MW	Pazhavoor	Tirunelveli	Tamil Nadu		
7	M/s. Kanam Latex Industries Private Limited	1.000 MW	Erukkandurai	Tirunelveli	Tamil Nadu	36,866	2.64%
8	M/s. Kanishk Steel Industries Ltd	2.475 MW	Vadambacheri	Coimbatore	Tamil Nadu	85,930	2.66%
9	M/s. Kilburn Chemicals Limited	4.000 MW	Devarkulam	Tirunelveli	Tamil Nadu	1,36,878	0.50%
10	M/s. KLRF Limited	1.000 MW	Muppandal	Kanyakumari	Tamil Nadu	2,69,410	1.44%
		3.750 MW	Sankaneri	Tirunelveli	Tamil Nadu		
		1.500 MW	Pazhavoor	Tirunelveli	Tamil Nadu		
11	M/s. Kurian Abraham (P) Ltd	1.800 MW	Muppandal	Kanyakumari	Tamil Nadu	93,704	3.11%
12	M/s. MRF Limited	0.900 MW	Chithabalam	Coimbatore	Tamil Nadu	37,822	0.91%
13	M/s. Narangs International Hotels Pvt. Ltd	3.375 MW	Pazhavoor	Tirunelveli	Tamil Nadu	1,50,906	0.20%
		2.250 MW	Muppandal	Kanyakumari	Tamil Nadu		
14	M/s. Natesan Synchrocones Pvt. Ltd	0.900 MW	Pazhavoor	Tirunelveli	Tamil Nadu	71,058	1.18%
		0.725 MW	Chithambaram	Tirunelveli	Tamil Nadu	33,885	2.51%
15	M/s. Newlink Overseas Finance Ltd	0.225 MW	Kayathar	Tirunelveli	Tamil Nadu	87,491	1.57%
		0.450 MW	Pazhavoor	Tirunelveli	Tamil Nadu		
		0.500 MW	Keezha Pavoor	Tirunelveli	Tamil Nadu		
		0.600 MW	Keezha Veeranam	Tirunelveli	Tamil Nadu		
16	M/s. NRG Tex	0.250 MW	Gudimangalam	Tirupur	Tamil Nadu	2,540	-
17	M/s. Pandian Chemicals Ltd	1.000 MW	Aralvoimozhy	Nagercoil	Tamil Nadu	69,440	2.72%
		0.750 MW	Surandai	Tirunelveli	Tamil Nadu		
18	M/s. Pioneer Jellice India Pvt. Ltd	0.750 MW	Karungulam	Tirunelveli	Tamil Nadu	1,06,704	0.44%
		0.855 MW	Kanyakumari	Kanyakumari	Tamil Nadu		
19	M/s. Polyspin Exports	0.250 MW	Pazhavoor	Tirunelveli	Tamil Nadu	10,705	6.00%
20	M/s. Sree Ayyanar Spinning and Weaving Mills Ltd	5.950 MW	Kanyakumari	Kanyakumari	Tamil Nadu	3,10,072	1.03%

S.No.	Name of the Wind Farm	Total Capacity	Location / Village	Region	State	March'11 Generation Units	% of RKVAH
21	M/s. Southern Wires	0.450 MW	Muppandal	Kanyakumari	Tamil Nadu	28,996	0.50%
22	M/s. Sri Devi Cinemas Pvt. Ltd	0.600 MW	Sankaneri	Tirunelveli	Tamil Nadu	39,123	0.46%
23	M/s. Sri Seethalakshmi Steel Castings (P) Ltd	0.350 MW	Myvadi	Coimbatore	Tamil Nadu	11,117	7.70%
24	M/s. The Bombay Burmah Trading Corporation Ltd.	2.700 MW	Muppandal	Kanyakumari	Tamil Nadu	1,49,372	1.81%
25	M/s. Ucal Fuel Systems Ltd.	1.675 MW	Nallurpalayam	Coimbatore	Tamil Nadu	53,892	1.53%
		0.450 MW	Muppandal	Kanyakumari	Tamil Nadu	23,288	1.53%
26	M/s. V.V.D. and Sons Private Limited	0.750 MW	Achankuttam	Tirunelveli	Tamil Nadu	27,948	0.52%
		0.750 MW	Ayan Surandai	Tirunelveli	Tamil Nadu	26,616	0.23%
		2.250 MW	Sambavar Vadakarai	Tirunelveli	Tamil Nadu	1,02,396	1.49%
		0.750 MW	Kulayaneri	Tirunelveli	Tamil Nadu	31,060	0.93%
		1.500 MW	Parameshwarapuram	Tirunelveli	Tamil Nadu	79,848	0.48%
		1.250 MW	Veppilankulam	Tirunelveli	Tamil Nadu	45,486	0.55%
		1.500 MW	Udayathoor	Tirunelveli	Tamil Nadu	77,304	--
		4.200 MW	Kurukkalpatti	Tirunelveli	Tamil Nadu	1,23,270	0.22%
27	M/s. Yogalaxmi Spinning Mills (P) Ltd	0.500 MW	Metrathi	Coimbatore	Tamil Nadu	14,380	6.70%

GAMESA WIND TURBINES PVT. LTD.,
No. 469, GNT Road, Thamal Kamaan Village
Vadagaral Post, Redhills, Chennai - 600052
E-mail: sales.india@gamesacorp.com
Phone: +91 44 3098 9000

GAMESA G5X-850 kW

OPTIMUM PERFORMANCE WITH MORE THAN 8,600 UNITS INSTALLED WORLDWIDE

Reliability is the cornerstone of the Gamesa G5X-850 kW platform. A robust structural platform which guarantees excellent performance from the wind turbines belonging to the G52-850 kW and Gamesa G58-850 kW platforms, making them the most installed product platforms in Europe.

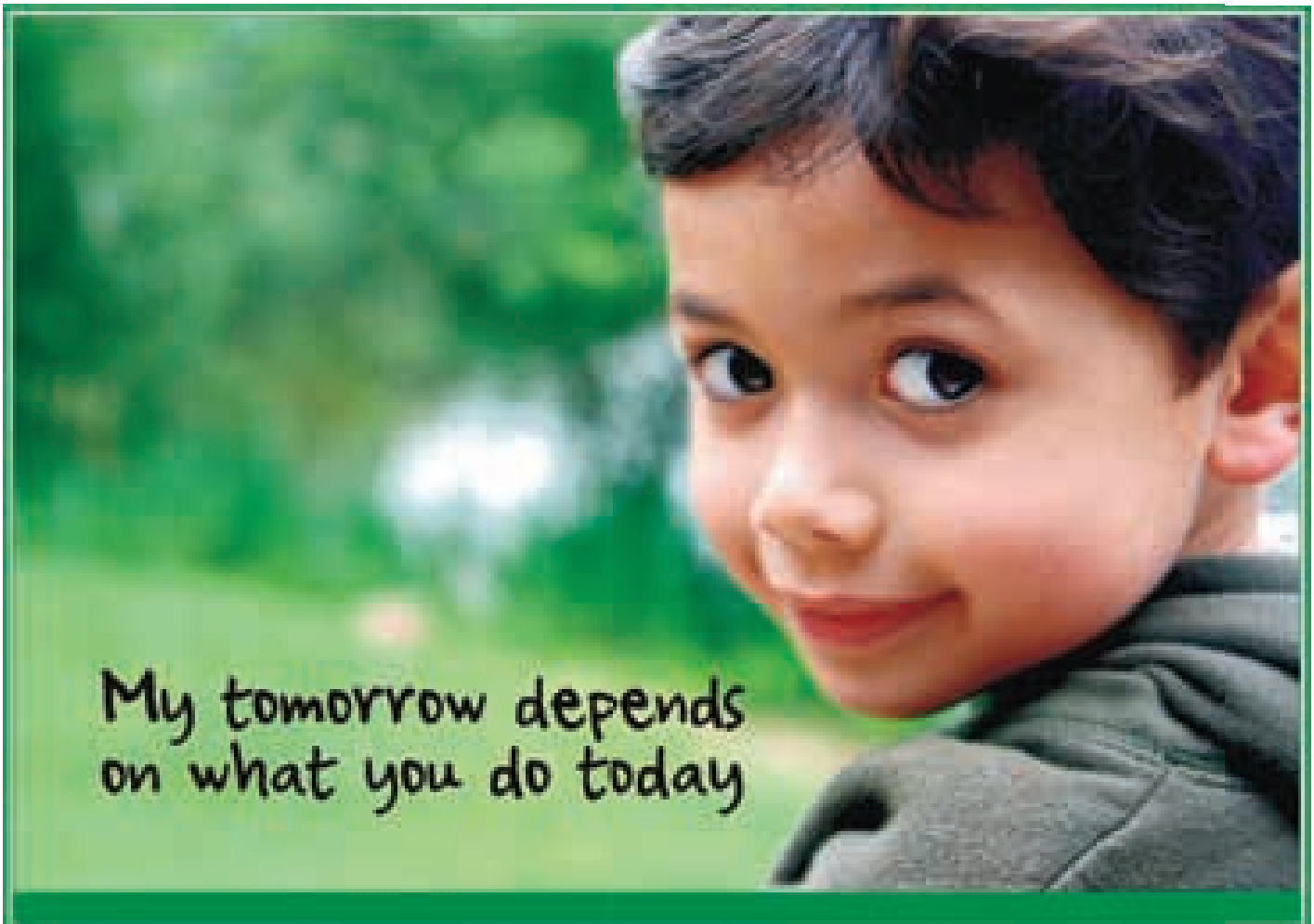
The Gamesa G5X-850 kW platform features speed control and variable pitch. It also exploits the latest advances in technology to extract maximum energy from the wind with the greatest efficiency: Gamesa WindEye®, the new SCADA system developed by Gamesa; Gamesa SMP (predictive maintenance) or Gamesa NRS® (load control), in addition to ensuring an integral optimum connection to the grid.

Excellent performance at low, mid and high winds. This is the guarantee offered by the Gamesa G5X-850 kW wind turbines. We are in addition our commitment to Sustainable Economic Development through a new concept: Global Technology, Everlasting Energy. Our objective is to develop electricity technological solutions to ensure that the wind farms supplied by Gamesa are the most efficient and sustainable on the market.

	IEC	Power	Grid Code	Tower Heights	50 Hz
Gamesa G52-850 kW	IA	850 kW	✔	44 m	✔
Gamesa G58-850 kW	IIA	850 kW	✔	55 m, 67 m	✔

Suitable for IEC CLASS IIIB (annual average wind speeds of below 7.5 m/s) sites of India

Gamesa



Decisions of today will shape the world of tomorrow.

Representing future generations and their interests in today's decision-making processes is ingrained in the ethos of MSPL. Our approach therefore transcends regulatory, programmatic and jurisdictional constraints, and emphasizes on synergizing ecology and economy.

It is this responsibility towards mother earth and its future residents that has led us to invest in wind energy. An initiative which shall ensure availability of much needed power for accelerated progress, at a minimal environmental footprint. Today with a Group wide installed generation capacity of 216 MW we are one of the largest producers of wind energy in the country and we are on course to double this capacity by 2012.

At MSPL, we want to make a difference and it is our endeavour to gift our children a more sustainable world than the one we inherited.

BALDOTA

MSPL LIMITED

Baldota Enclave, Alsheraj Baldota Road
Hospet-583203, Karnataka, India.
www.msplimited.com